Texas Instruments

# Analog Designer's Guide and Reference

## Designer's Guide

2000

Advanced Analog Products

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FIFTH EDITION

# Analog/Mixed-Signal Products

# Designer's Guide

**February 2000**

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TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

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## How to use this publication

Welcome to the fifth edition of TI's *Analog/Mixed-Signal Products Designer's Guide*. This guide is intended to provide you, the designer, with the information you will need to easily identify the most appropriate analog and mixed-signal products for your design. We hope you will find the *Analog/Mixed-Signal Products Designer's Guide* and the accompanying CD-ROM a valuable addition to your complete library of TI product databooks.

For even more in-depth information on TI Analog/Mixed Signal Products visit us at **www.ti.com/sc/docs/products/msp/index.htm**

## New Product Previews

In the front of some sections you will find "New Product Previews" showcasing products that are expected to release in early 2000. If you would like more information on these products, please refer to the list of resources at the end of each product section. To reach a TI representative ready to answer your questions, refer to the contacts on the last page of this book.

## Decision Trees

Most product sections are structured to guide you through the process of narrowing your choice of products based on system requirements and key specifications. The table of contents in each section will direct you to the specific product category of interest. For example, in Chapter 1, Amplifiers are broken into categories like "low noise," "single-supply," "low voltage," etc. Once you start with these broader categories, the branches of the tree narrow your choice of devices by further qualifying the search criteria.

## Selection Guides

Following each decision tree is a table of key specifications most appropriately associated with products in that category. "Low Noise Op Amps," for example, are sorted by noise figure, from lowest to highest. The Sorted By symbol at the top of a column shows when a table is sorted by a column other than the Device Name. Other specifications in these tables relate to applications where these devices would be used. These Selection Guides allow you to quickly compare key specs to choose a single device, or devices, from among those segregated by the decision trees. From here you should refer to the individual product datasheets (listed in Appendix C) for complete specifications.

## Analog/DSP Compatibility Reference Guide (Appendix A)

When designing with DSPs, designers face multiple challenges, not the least of which is determining how power will be managed in the system and how the system will translate analog data to digital data and vice versa. To aid the designer in this sometimes difficult process, Appendix A has been included to help identify Data Converter and Power Management products that are compatible and optimized for our powerful family of DSPs.

## Ordering Guide

Appendix B provides a general ordering guide to help you identify device numbers for each product group. The package suffix options for a particular device can be located in Appendix C. With this information, the ordering guide helps you construct the full device part number.

## Index

Appendix C is an index of Texas Instruments Analog/Mixed-Signal Products. The index will tell you the device family, what chapter to find it in, the literature number of the most current datasheet, and the package suffix options for each device. Package suffix definitions are in Appendix B. When looking for information about an unidentified device, this index is the place to start.

## Samples and Literature

If you have questions, or need to order samples or request any literature referenced in this guide, see the list of resources at the end of each product section.

**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

1—Amplifiers and Comparators

2—Audio Products

3—Clocks and Timers

4—Control and Monitoring Products

5—Data Converters

6—Interface Products

7—Microcontrollers

8—Power Management Products

9—RF Products

10—Speech and Graphics Processors

11—Telecom Products

12—Video and Imaging Products

**Appendices**

Appendix A—Analog/DSP Compatibility Reference Guide
Appendix B—Device Number Ordering Guide
Appendix C—Device Index for Analog/Mixed-Signal Products

Contact Information—See last page of Notes

# Amplifiers and Comparators

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**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

Selecting the right amplifier for a specific application requires you to have your design goals clearly in mind along with a firm understanding of what the published specifications mean for the amplifiers. TI makes every effort to help you select the right amplifier for your specific need by categorizing its amplifiers into three major families and then breaking them down further into clearly defined specs. TI's three major amplifier families include: Operational Amplifiers, High-Speed Amplifiers, and Audio Power Amplifiers.

Operational Amplifiers may be considered as performance general-purpose amplifiers. This family is further broken down into precision, low noise, rail-to-rail, shutdown, BiFET, and other clearly defined categories which makes your selection an easy process. High-Speed Amplifiers include amplifiers with a 20-MHz to 2.25-GHz gain-bandwidth product and a slew rate of 100 to 6500 V/μs. This family also includes xDSL drivers and receivers. Audio Power Amplifiers include Class-AB (Linear) and Class-D (Digital) amplifiers. Class-AB audio power amplifiers are recommended whenever low shutdown current is ideal in the application or when the audio isn't always energized. Class-D audio power amplifiers, on the other hand, are recommended in applications where low operating supply current and low heat dissipation are needed.

## Amplifiers and Comparators New Product Previews

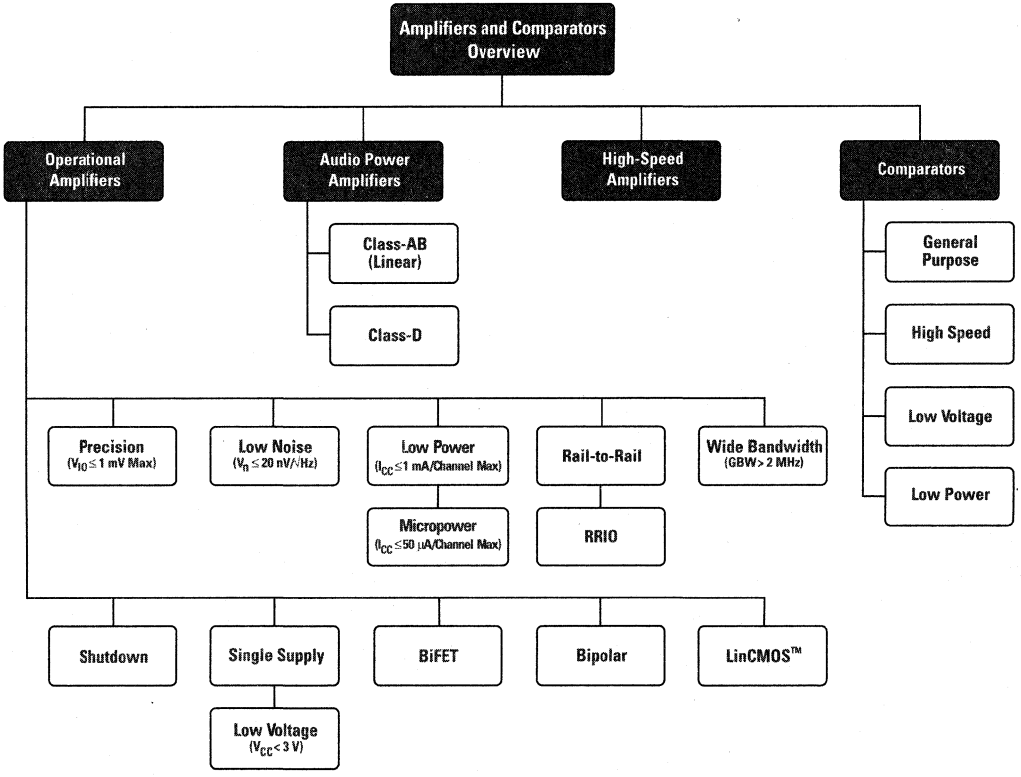
The following new devices are expected to be released in the near future. For the most recent information, please refer to the Designer's Guide CD-ROM, literature number SLYC005D, or www.ti.com.

| Device | Description |
|---|---|
| **Operational Amplifiers** | |
| TLV2401 | 1-μA/Channel, RRIO, 2.5-V to 16-V Single Op Amp |
| TLV2402 | 1-μA/Channel, RRIO, 2.5-V to 16-V Dual Op Amp |
| TLV2404 | 1-μA/Channel, RRIO, 2.5-V to 16-V Quad Op Amp |
| TLV4110 | High-Output Current, RRO, Wide BW, Single Op Amp with Shutdown |
| TLV4111 | High-Output Current, RRO, Wide BW, Single Op Amp |
| TLV4112 | High-Output Current, RRO, Wide BW, Dual Op Amp |
| TLV4113 | High-Output Current, RRO, Wide BW, Dual Op Amp with Shutdown |
| TLV4121 | High-Output Current, RRO, Wide BW, Differential, Single Op Amp |
| **High-Speed Amplifiers** | |
| THS3002 | 420 MHz, 6500 V/μs, Dual Amplifier |
| **Audio Power Amplifiers (APA)** | |
| TPA0211 | 2W Mono APA |
| TPA0213 | 2W Mono APA with Stereo Headphone Drive |
| TPA0223 | 2W Mono APA with Stereo Headphone Drive |
| TPA0233 | 2W Mono APA with Stereo Headphone Drive |
| TPA0243 | 2W Mono APA with Stereo Headphone Drive |
| TPA0253 | 0.5W Mono APA with Stereo Headphone Drive |
| TPA032D01 | 10W Mono Class-D APA |
| TPA032D02 | 10W Stereo Class-D APA |
| TPA032D03 | 10W Mono Class-D APA with Stereo Headphone Drive |
| TPA032D04 | 10W Stereo Class-D APA with Stereo Headphone Drive |

### Web Locations for Specific Product Groups

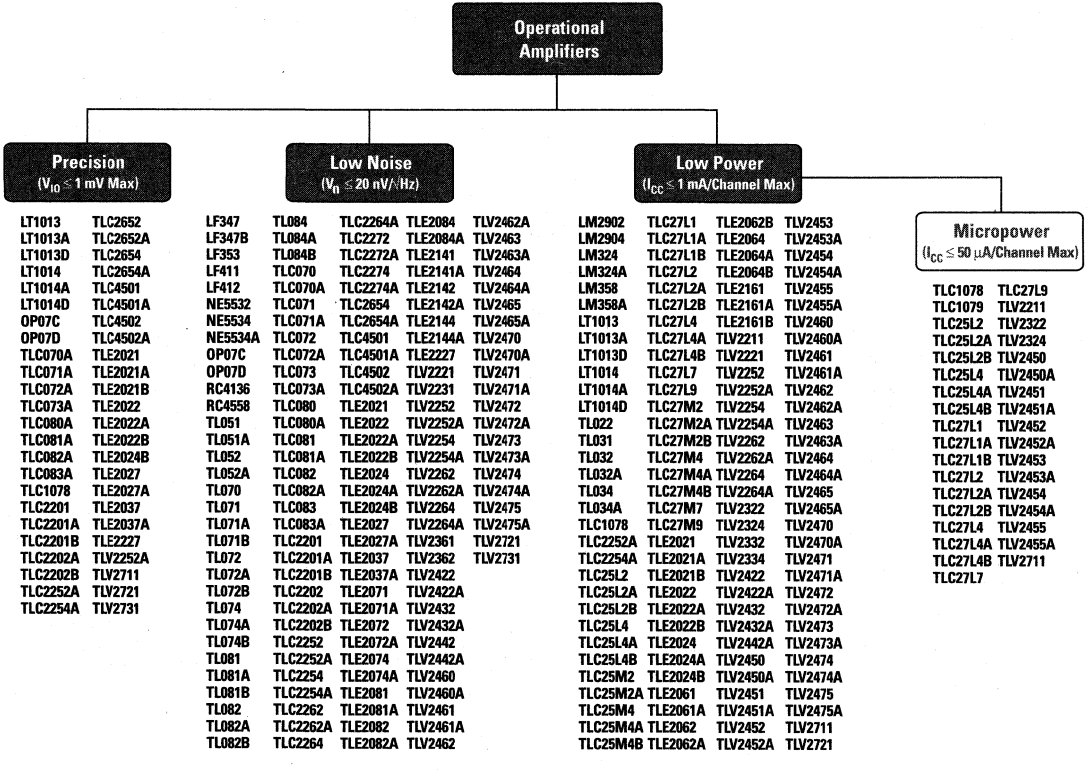
Amplifiers and Comparators www.ti.com/sc/docs/products/msp/amp_comp/index.htm

## Amplifiers and Comparators Overview




**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/amp_comp/index.htm**

## Operational Amplifiers




| | |
|---|---|
| LT1013 | TLC2652 |
| LT1013A | TLC2652A |
| LT1013D | TLC2654 |
| LT1014 | TLC2654A |
| LT1014A | TLC4501 |
| LT1014D | TLC4501A |
| OP07C | TLC4502 |
| OP07D | TLC4502A |
| TLC070A | TLE2021 |
| TLC071A | TLE2021A |
| TLC072A | TLE2021B |
| TLC073A | TLE2022 |
| TLC080A | TLE2022A |
| TLC081A | TLE2022B |
| TLC082A | TLE2024B |
| TLC083A | TLE2027 |
| TLC1078 | TLE2027A |
| TLC2201 | TLE2037 |
| TLC2201A | TLE2037A |
| TLC2201B | TLE2227 |
| TLC2202A | TLV2252A |
| TLC2202B | TLV2711 |
| TLC2252A | TLV2721 |
| TLC2254A | TLV2731 |

| | | | |
|---|---|---|---|
| LF347 | TL084 | TLC2264A | TLE2084 | TLV2462A |
| LF347B | TL084A | TLC2272 | TLE2084A | TLV2463 |
| LF353 | TL084B | TLC2272A | TLE2141 | TLV2463A |
| LF411 | TLC070 | TLC2274 | TLE2141A | TLV2464 |
| LF412 | TLC070A | TLC2274A | TLE2142 | TLV2464A |
| NE5532 | TLC071 | TLC2654 | TLE2142A | TLV2465 |
| NE5534 | TLC071A | TLC2654A | TLE2144 | TLV2465A |
| NE5534A | TLC072 | TLC4501 | TLE2144A | TLV2470 |
| OP07C | TLC072A | TLC4501A | TLE2227 | TLV2470A |
| OP07D | TLC073 | TLC4502 | TLV2221 | TLV2471 |
| RC4136 | TLC073A | TLC4502A | TLV2231 | TLV2471A |
| RC4558 | TLC080 | TLE2021 | TLV2252 | TLV2472 |
| TL051 | TLC080A | TLE2022 | TLV2252A | TLV2472A |
| TL051A | TLC081 | TLE2022A | TLV2254 | TLV2473 |
| TL052 | TLC081A | TLE2022B | TLV2254A | TLV2473A |
| TL052A | TLC082 | TLE2024 | TLV2262 | TLV2474 |
| TL070 | TLC082A | TLE2024A | TLV2262A | TLV2474A |
| TL071 | TLC083 | TLE2024B | TLV2264 | TLV2475 |
| TL071A | TLC083A | TLE2027 | TLV2264A | TLV2475A |
| TL071B | TLC2201 | TLE2027A | TLV2361 | TLV2721 |
| TL072 | TLC2201A | TLE2037 | TLV2362 | TLV2731 |
| TL072A | TLC2201B | TLE2037A | TLV2422 | |
| TL072B | TLC2202 | TLE2071 | TLV2422A | |
| TL074 | TLC2202A | TLE2071A | TLV2432 | |
| TL074A | TLC2202B | TLE2072 | TLV2432A | |
| TL074B | TLC2252 | TLE2072A | TLV2442 | |
| TL081 | TLC2252A | TLE2074 | TLV2442A | |
| TL081A | TLC2254 | TLE2074A | TLV2460 | |
| TL081B | TLC2254A | TLE2081 | TLV2460A | |
| TL082 | TLC2262 | TLE2081A | TLV2461 | |
| TL082A | TLC2262A | TLE2082 | TLV2461A | |
| TL082B | TLC2264 | TLE2082A | TLV2462 | |

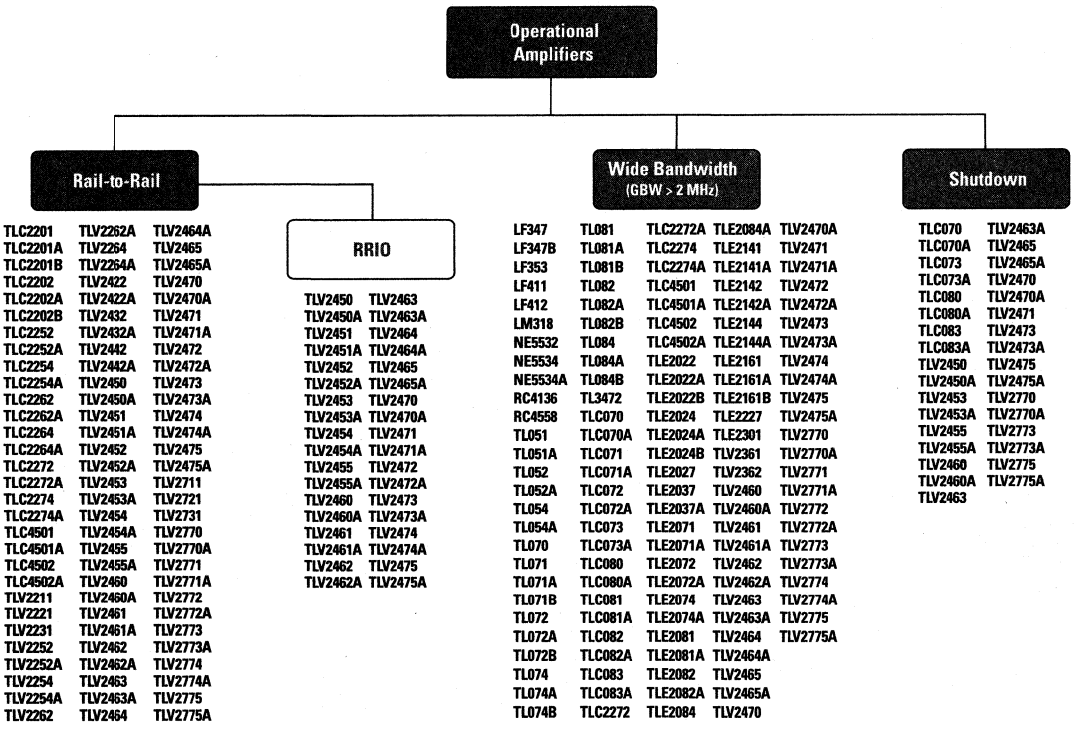
| | | | |
|---|---|---|---|
| LM2902 | TLC27L1 | TLE2062B | TLV2453 |
| LM2904 | TLC27L1A | TLE2064 | TLV2453A |
| LM324 | TLC27L1B | TLE2064A | TLV2454 |
| LM324A | TLC27L2 | TLE2064B | TLV2454A |
| LM358 | TLC27L2A | TLE2161 | TLV2455 |
| LM358A | TLC27L2B | TLE2161A | TLV2455A |
| LT1013 | TLC27L4 | TLE2161B | TLV2460 |
| LT1013A | TLC27L4A | TLV2211 | TLV2460A |
| LT1013D | TLC27L4B | TLV2221 | TLV2461 |
| LT1014 | TLC27L7 | TLV2252 | TLV2461A |
| LT1014A | TLC27L9 | TLV2252A | TLV2462 |
| LT1014D | TLC27M2 | TLV2254 | TLV2462A |
| TL022 | TLC27M2A | TLV2254A | TLV2463 |
| TL031 | TLC27M2B | TLV2262 | TLV2463A |
| TL032 | TLC27M4 | TLV2262A | TLV2464 |
| TL032A | TLC27M4A | TLV2264 | TLV2464A |
| TL034 | TLC27M4B | TLV2264A | TLV2465 |
| TL034A | TLC27M7 | TLV2322 | TLV2465A |
| TLC1078 | TLC27M9 | TLV2324 | TLV2470 |
| TLC2252A | TLE2021 | TLV2332 | TLV2470A |
| TLC2254A | TLE2021A | TLV2334 | TLV2471 |
| TLC25L2 | TLE2021B | TLV2422 | TLV2471A |
| TLC25L2A | TLE2022 | TLV2422A | TLV2472 |
| TLC25L2B | TLE2022A | TLV2432 | TLV2472A |
| TLC25L4 | TLE2022B | TLV2432A | TLV2473 |
| TLC25L4A | TLE2024 | TLV2442A | TLV2473A |
| TLC25L4B | TLE2024A | TLV2450 | TLV2474 |
| TLC25M2 | TLE2024B | TLV2450A | TLV2474A |
| TLC25M2A | TLE2061 | TLV2451 | TLV2475 |
| TLC25M4 | TLE2061A | TLV2451A | TLV2475A |
| TLC25M4A | TLE2062 | TLV2452 | TLV2711 |
| TLC25M4B | TLE2062A | TLV2452A | TLV2721 |

| | |
|---|---|
| TLC1078 | TLC27L9 |
| TLC1079 | TLV2211 |
| TLC25L2 | TLV2322 |
| TLC25L2A | TLV2324 |
| TLC25L2B | TLV2450 |
| TLC25L4 | TLV2450A |
| TLC25L4A | TLV2451 |
| TLC25L4B | TLV2451A |
| TLC27L1 | TLV2452 |
| TLC27L1A | TLV2452A |
| TLC27L1B | TLV2453 |
| TLC27L2 | TLV2453A |
| TLC27L2A | TLV2454 |
| TLC27L2B | TLV2454A |
| TLC27L4 | TLV2455 |
| TLC27L4A | TLV2455A |
| TLC27L4B | TLV2711 |
| TLC27L7 | |

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/amp_comp/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Operational Amplifiers (Continued)




**Rail-to-Rail**

| | | |
|---|---|---|
| TLC2201 | TLV2262A | TLV2464A |
| TLC2201A | TLV2264 | TLV2465 |
| TLC2201B | TLV2264A | TLV2465A |
| TLC2202 | TLV2422 | TLV2470 |
| TLC2202A | TLV2422A | TLV2470A |
| TLC2202B | TLV2432 | TLV2471 |
| TLC2252 | TLV2432A | TLV2471A |
| TLC2252A | TLV2442 | TLV2472 |
| TLC2254 | TLV2442A | TLV2472A |
| TLC2254A | TLV2450 | TLV2473 |
| TLC2262 | TLV2450A | TLV2473A |
| TLC2262A | TLV2451 | TLV2474 |
| TLC2264 | TLV2451A | TLV2474A |
| TLC2264A | TLV2452 | TLV2475 |
| TLC2272 | TLV2452A | TLV2475A |
| TLC2272A | TLV2453 | TLV2711 |
| TLC2274 | TLV2453A | TLV2721 |
| TLC2274A | TLV2454 | TLV2731 |
| TLC4501 | TLV2454A | TLV2770 |
| TLC4501A | TLV2455 | TLV2770A |
| TLC4502 | TLV2455A | TLV2771 |
| TLC4502A | TLV2460 | TLV2771A |
| TLV2211 | TLV2460A | TLV2772 |
| TLV2221 | TLV2461 | TLV2772A |
| TLV2231 | TLV2461A | TLV2773 |
| TLV2252 | TLV2462 | TLV2773A |
| TLV2252A | TLV2462A | TLV2774 |
| TLV2254 | TLV2463 | TLV2774A |
| TLV2254A | TLV2463A | TLV2775 |
| TLV2262 | TLV2464 | TLV2775A |

**RRIO**

| | |
|---|---|
| TLV2450 | TLV2463 |
| TLV2450A | TLV2463A |
| TLV2451 | TLV2464 |
| TLV2451A | TLV2464A |
| TLV2452 | TLV2465 |
| TLV2452A | TLV2465A |
| TLV2453 | TLV2470 |
| TLV2453A | TLV2470A |
| TLV2454 | TLV2471 |
| TLV2454A | TLV2471A |
| TLV2455 | TLV2472 |
| TLV2455A | TLV2472A |
| TLV2460 | TLV2473 |
| TLV2460A | TLV2473A |
| TLV2461 | TLV2474 |
| TLV2461A | TLV2474A |
| TLV2462 | TLV2475 |
| TLV2462A | TLV2475A |

**Wide Bandwidth (GBW > 2 MHz)**

| | | | | |
|---|---|---|---|---|
| LF347 | TL081 | TLC2272A | TLE2084A | TLV2470A |
| LF347B | TL081A | TLC2274 | TLE2141 | TLV2471 |
| LF353 | TL081B | TLC2274A | TLE2141A | TLV2471A |
| LF411 | TL082 | TLC4501 | TLE2142 | TLV2472 |
| LF412 | TL082A | TLC4501A | TLE2142A | TLV2472A |
| LM318 | TL082B | TLC4502 | TLE2144 | TLV2473 |
| NE5532 | TL084 | TLC4502A | TLE2144A | TLV2473A |
| NE5534 | TL084A | TLE2022 | TLE2161 | TLV2474 |
| NE5534A | TL084B | TLE2022A | TLE2161A | TLV2474A |
| RC4136 | TL3472 | TLE2022B | TLE2161B | TLV2475 |
| RC4558 | TLC070 | TLE2024 | TLE2227 | TLV2475A |
| TL051 | TLC070A | TLE2024A | TLE2301 | TLV2770 |
| TL051A | TLC071 | TLE2024B | TLV2361 | TLV2770A |
| TL052 | TLC071A | TLE2027 | TLV2362 | TLV2771 |
| TL052A | TLC072 | TLE2037 | TLV2460 | TLV2771A |
| TL054 | TLC072A | TLE2037A | TLV2460A | TLV2772 |
| TL054A | TLC073 | TLE2071 | TLV2461 | TLV2772A |
| TL070 | TLC073A | TLE2071A | TLV2461A | TLV2773 |
| TL071 | TLC080 | TLE2072 | TLV2462 | TLV2773A |
| TL071A | TLC080A | TLE2072A | TLV2462A | TLV2774 |
| TL071B | TLC081 | TLE2074 | TLV2463 | TLV2774A |
| TL072 | TLC081A | TLE2074A | TLV2463A | TLV2775 |
| TL072A | TLC082 | TLE2081 | TLV2464 | TLV2775A |
| TL072B | TLC082A | TLE2081A | TLV2464A | |
| TL074 | TLC083 | TLE2082 | TLV2465 | |
| TL074A | TLC083A | TLE2082A | TLV2465A | |
| TL074B | TLC2272 | TLE2084 | TLV2470 | |

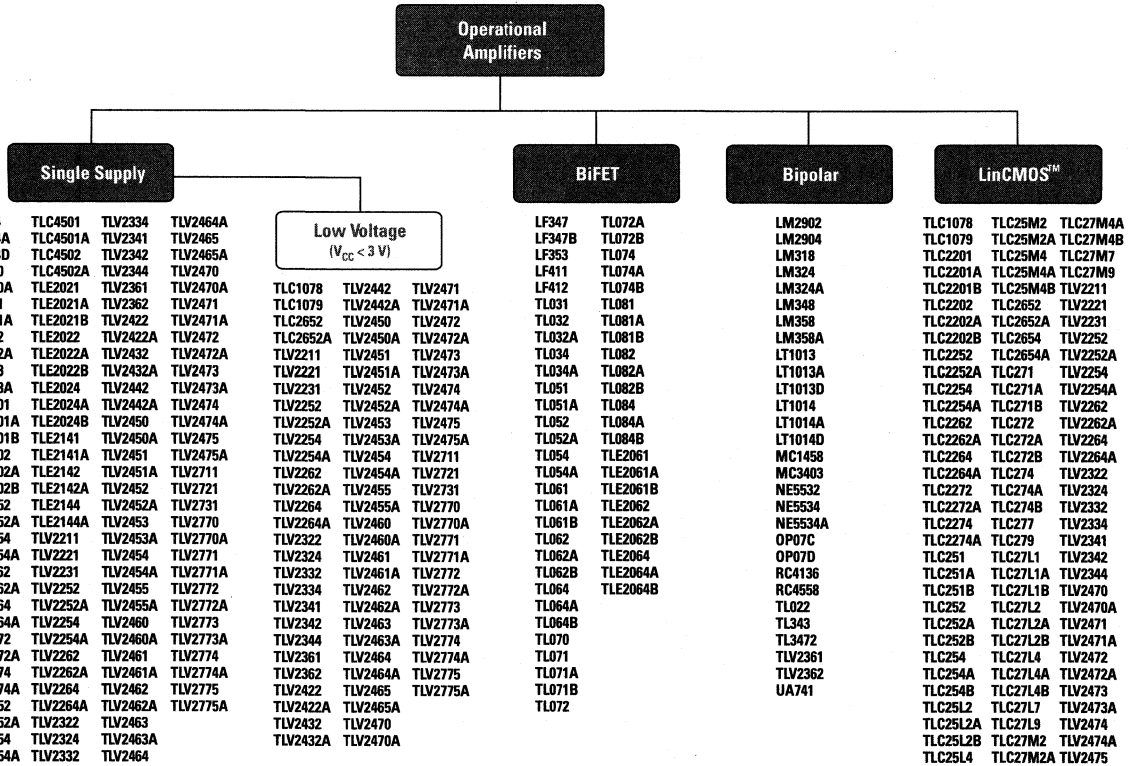
**Shutdown**

| | |
|---|---|
| TLC070 | TLV2463A |
| TLC070A | TLV2465 |
| TLC073 | TLV2465A |
| TLC073A | TLV2470 |
| TLC080 | TLV2470A |
| TLC080A | TLV2471 |
| TLC083 | TLV2473 |
| TLC083A | TLV2473A |
| TLV2450 | TLV2475 |
| TLV2450A | TLV2475A |
| TLV2453 | TLV2770 |
| TLV2453A | TLV2770A |
| TLV2455 | TLV2773 |
| TLV2455A | TLV2773A |
| TLV2460 | TLV2775 |
| TLV2460A | TLV2775A |
| TLV2463 | |

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/amp_comp/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Operational Amplifiers (Continued)




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/amp_comp/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Operational Amplifiers—Precision ($V_{IO}$ ≤ 1 mV max)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | Sorted By $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC2652A | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.002 | 0.001 | 4 | 140 | 35 | 1 | ±5 | Advanced LinCMOS™ Precision Chopper-Stabilized Op Amp |
| TLC2652 | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.004 | 0.003 | 4 | 140 | 23 | 1 | ±5 | Precision Chopper-Stabilized Op Amp |
| TLC2654A | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.024 | 0.01 | 50 | 125 | 20 | 1 | ±5 | Advanced LinCMOS Low-Noise Chopper-Stabilized Op Amp |
| TLC2654 | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.034 | 0.02 | 50 | 125 | 13 | 1 | ±5 | Low-Noise Chopper-Stabilized Op Amp |
| TLC4501A | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.04 | 0.04 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision OpAmp |
| TLC4502A | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.05 | 0.05 | 1 | 100 | 12 | 2 | 5 | Advanced,Self-Calibrating, Precision, Dual Op Amp |
| TLC4501 | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.08 | 0.08 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Single Op Amp |
| TLC4502 | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.1 | 0.1 | 1 | 100 | 12 | 2 | 5 | Advanced LinEPIC Self-Calibrating Precision Dual Op Amp |
| TLE2027A | 38 | 8 | 5.3 | 3.8 | 13 | 2.8 | 0.1 | 0.025 | 15000 | 131 | 2.5 | 1 | ±15 | Low-Noise High-Speed Precision Op Amp |
| TLE2037A | 38 | 8 | 5.3 | 3.8 | 50 | 7.5 | 0.1 | 0.025 | 15000 | 131 | 2.5 | 1 | ±15 | Excalibur Low-Noise High-Speed Precision Decompensated Operational-Amplifier |
| TLE2027 | 38 | 8 | 5.3 | 3.8 | 13 | 2.8 | 0.145 | 0.1 | 15000 | 131 | 2.5 | 1 | ±15 | Low-Noise Precision Op Amp |
| TLE2037 | 38 | 8 | 5.3 | 3.8 | 50 | 7.5 | 0.145 | 0.1 | 15000 | 131 | 2.5 | 1 | ±15 | Low-Noise High-Speed Precision Decomp. Op Amp |
| LT1013A | 44 | 4 | 0.5 | 0.35 | | 0.4 | 0.24 | 0.15 | −12000 | 117 | 22 | 2 | ±15 | Dual Precision Op Amp |
| OP07C | 36 | 6 | 5 | 2.7 | 0.6 | 0.3 | 0.25 | 0.15 | ±1800 | 120 | 9.8 | 1 | ±15 | Low-Offset Voltage Op Amp |
| OP07D | 36 | 6 | 5 | 2.7 | 0.6 | 0.3 | 0.25 | 0.15 | ±2000 | 110 | 9.8 | 1 | ±15 | Low-Offset Voltage Op Amp |
| TLC2201A | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 15 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLC2201B | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 12 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLE2021B | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.3 | 0.2 | 25000 | 110 | 30 | 1 | 5 | Excalibur High-Speed Low-Power Precision Op Amp |
| LT1014A | 44 | 5 | 0.5 | 0.35 | 1 | 0.4 | 0.35 | 0.18 | −12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1013 | 44 | 4 | 0.55 | 0.35 | | 0.4 | 0.4 | 0.3 | −15000 | 114 | 22 | 2 | ±15 | Dual Precision Low-Power Op Amp |
| TLE2022B | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.4 | 0.3 | 33000 | 105 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLV2711 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 0.47 | 3 | 1 | 83 | 22 | 1 | 3 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLE2227 | 38 | 8 | 5.3 | 3.65 | 13 | 2.5 | 0.5 | 0.35 | 15000 | 115 | 2.5 | 2 | ±15 | Dual Low-Noise High-Speed Precision Op Amp |
| LT1014 | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 0.55 | 0.3 | −12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| TLE2022A | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.55 | 0.4 | 33000 | 102 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLC2201 | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.6 | 0.5 | 1 | 110 | 8 | 1 | 5 | Low Noise Precision Rail-to-Rail Output Op Amp |
| TLE2021A | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.6 | 0.3 | 25000 | 110 | 30 | 1 | 5 | Excalibur High-Speed Low-Power Precision Op Amp |
| TLV2721 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 0.6 | 3 | 1 | 82 | 20 | 1 | 3 | Single LinCMOS Rail-to-Rail Very Low-Power Op Amp |
| TLC2202A | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 15 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2202B | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 12 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLV2731 | 10 | 2.7 | 1.2 | 0.75 | 2 | 1.25 | 0.75 | 3 | 1 | 70 | 16 | 1 | 3 | Single LinCMOS Rail-to-Rail Low-Power Op Amp |
| TLC1078 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 0.8 | 0.45 | 0.6 | 95 | 68 | 2 | 5 | Dual Micropower Precision Low-Voltage Op Amp |

## Operational Amplifiers—Precision ($V_{IO}$ ≤ 1 mV max) (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{OD}/I_{CC}$ per Channel (max) (mA) | $I_{OD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2022 | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.8 | 0.6 | 35000 | 100 | 15 | 2 | 5 | Dual Precision Low-Power Single Supply Op Amp |
| TLE2024B | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 0.8 | 0.6 | 35000 | 95 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2021 | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.85 | 0.6 | 25000 | 110 | 15 | 1 | 5 | Precision Low-Power Single Supply Op Amp |
| LT1013D | 44 | 4 | 0.55 | 0.35 | | 0.4 | 1 | 0.8 | –15000 | 114 | 22 | 2 | ±15 | Dual Precision Op Amp |
| LT1014D | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 1 | 0.8 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| TLC070A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Single Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC071A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Single Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC072A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLC073A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 2 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC080A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC081A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC082A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC083A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC2252A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 2 | 5 | Rail-to-Rail Dual Op Amp |
| TLC2254A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 4 | 5 | Rail-to-Rail Quad Op Amp |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Voltage Rail-to-Rail Dual Op Amp |

## Operational Amplifiers—Low Noise ($V_n \leq 20$ nV/√Hz)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2027 | 38 | 8 | 5.3 | 3.8 | 13 | 2.8 | 0.145 | 0.1 | 15000 | 131 | 2.5 | 1 | ±15 | Precision JFET-Input Op Amp |
| TLE2027A | 38 | 8 | 5.3 | 3.8 | 13 | 2.8 | 0.1 | 0.025 | 15000 | 131 | 2.5 | 1 | ±15 | Dual JFET-Input Op Amp |
| TLE2037 | 38 | 8 | 5.3 | 3.8 | 50 | 7.5 | 0.145 | 0.1 | 15000 | 131 | 2.5 | 1 | ±15 | Dual General-Purpose JFET-Input Op Amp |
| TLE2037A | 38 | 8 | 5.3 | 3.8 | 50 | 7.5 | 0.1 | 0.025 | 15000 | 131 | 2.5 | 1 | ±15 | Quad General-Purpose JFET-Input Op Amp |
| TLE2227 | 38 | 8 | 5.3 | 3.65 | 13 | 2.5 | 0.5 | 0.35 | 15000 | 115 | 2.5 | 2 | ±15 | Wide-Bandwidth JFET-Input Quad Op Amp |
| NE5534A | 30 | 10 | 8 | 4 | 10 | 13 | 5 | 4 | 500000 | 100 | 3.5 | 1 | ±15 | Dual Low-Noise High-Speed Audio Op Amp |
| NE5534 | 30 | 10 | 8 | 4 | 10 | 13 | 5 | 4 | 500000 | 100 | 4 | 1 | ±15 | Low-Noise High-Speed Audio Op Amp |
| NE5532 | 30 | 10 | 8 | 4 | 10 | 9 | 5 | 4 | 200000 | 100 | 5 | 2 | ±15 | Low-Noise Op Amp |
| TLC070 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Enhanced-JFET Precision Dual Op Amp |
| TLC070A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Low-Offset Voltage Op Amp |
| TLC071 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Dual Enhanced JFET Precision Op Amp |
| TLC071A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Dual General-Purpose Op Amp |
| TLC072 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Enhanced-JFET Precision Op Amp |
| TLC072A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Low-Offset Voltage Op Amp |
| TLC073 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 2 | 5 | Enhanced JFET Precision Op Amp |
| TLC073A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 2 | 5 | Quad General-Purpose Op Amp |
| RC4136 | 30 | 10 | 2.825 | 1.25 | 3 | 1.7 | 7.5 | 6 | 140000 | 90 | 8 | 4 | ±15 | Dual Low-Noise JFET-Input General-Purpose Op Amp |
| RC4558 | 30 | 10 | 2.8 | 1.25 | 3 | 1.7 | 7.5 | 6 | 150000 | 90 | 8 | 2 | ±15 | Low-Noise JFET-Input Op Amp |
| TLC2201 | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.6 | 0.5 | 1 | 110 | 8 | 1 | 5 | Low-Noise JFET-Input Decompensated Op Amp |
| TLC2202 | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 1.15 | 1 | 1 | 100 | 8 | 2 | 5 | Low-Noise JFET-Input Op Amp |
| TLV2361 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 1 | ±2.5 | Low-Noise JFET-Input General-Purpose Op Amp |
| TLV2362 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 2 | ±2.5 | Low-Noise JFET-Input Op Amp |
| TLC080 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | JFET-Input General-Purpose Op Amp |
| TLC080A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Quad Low-Noise JFET-Input General-Purpose Op Amp |
| TLC081 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | Low-Noise JFET-Input Op Amp |
| TLC081A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Low-Noise JFET-Input Op Amp |
| TLC082 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Low-Noise JFET-Input Op Amp |
| TLC082A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | JFET-Input Op Amp |
| TLC083 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Dual JFET-Input General-Purpose Op Amp |
| TLC083A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | JFET-Input Op Amp |
| TLC2272 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 2 | 5 | JFET-Input Op Amp |
| TLC2272A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 2 | 5 | Quad JFET-Input General-Purpose Op Amp |
| TLC2274 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 4 | 5 | JFET-Input Op Amp |
| TLC2274A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 4 | 5 | JFET-Input Op Amp |
| OP07C | 36 | 6 | 5 | 2.7 | 0.6 | 0.3 | 0.25 | 0.15 | ±1800 | 120 | 9.8 | 1 | ±15 | JFET-Input Op Amp |

## Operational Amplifiers—Low Noise ($V_n \leq 20$ nV/$\sqrt{Hz}$) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sorted By | | | | | | | | |
| OP07D | 36 | 6 | 5 | 2.7 | 0.6 | 0.3 | 0.25 | 0.15 | ±2000 | 110 | 9.8 | 1 | ±15 | Single Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLE2141 | 44 | 4 | 4.5 | 3.5 | 5.9 | 45 | 1.3 | 0.9 | –7000 | 108 | 10.5 | 1 | ±15 | Single Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLE2141A | 44 | 4 | 4.5 | 3.5 | 5.9 | 45 | 0.8 | 0.5 | –7000 | 108 | 10.5 | 1 | ±15 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLE2142 | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 1.6 | 1.2 | –7000 | 108 | 10.5 | 2 | ±15 | Single Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLE2142A | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 1.2 | 0.75 | –7000 | 108 | 10.5 | 2 | ±15 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLE2144 | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 3.2 | 2.4 | –7000 | 108 | 10.5 | 4 | ±15 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLE2144A | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 2.4 | 1.5 | –7000 | 108 | 10.5 | 4 | ±15 | Single Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Low Noise Precision Rail-to-Rail Output Op Amp |
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |

## Operational Amplifiers—Low Noise ($V_n \leq 20$ nV/$\sqrt{Hz}$) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC2201B | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 12 | 1 | 5 | Dual Low-Noise Rail-to-Rail Op Amp |
| TLC2202B | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 12 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2262 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Quad Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2262A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Quad Low-Noise Rail-to-Rail Op Amp |
| TLC2264 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2264A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Dual Rail-to-Rail Micropower Op Amp |
| TLC4501 | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.08 | 0.08 | 1 | 100 | 12 | 1 | 5 | Quad Rail-to-Rail Micropower Op Amp |
| TLC4501A | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.04 | 0.04 | 1 | 100 | 12 | 1 | 5 | Dual Low-Noise Precision Rail-to-Rail Op Amp |
| TLC4502 | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.1 | 0.1 | 1 | 100 | 12 | 2 | 5 | Rail-to-Rail Quad Op Amp |
| TLC4502A | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.05 | 0.05 | 1 | 100 | 12 | 2 | 5 | Dual Advanced LinCMOS Rail-to-Rail Op Amp |
| TLV2262 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLV2262A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Rail-to-Rail Dual Op Amp |
| TLV2264 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLV2264A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2654 | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.034 | 0.02 | 50 | 125 | 13 | 1 | ±5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLE2071 | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 6 | 4 | 20 | 98 | 14 | 1 | ±15 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2071A | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 4 | 2 | 20 | 98 | 14 | 1 | ±15 | Advanced LinEPIC Self-Calibrating Precision Dual Op Amp |
| TLE2072 | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 7.8 | 6 | 20 | 98 | 14 | 2 | ±15 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2072A | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 5.3 | 3.5 | 20 | 98 | 14 | 2 | ±15 | Low-Noise Chopper-Stabilized Op Amp |
| TLE2074 | 38 | 4.5 | 1.875 | 1.425 | 10 | 45 | 7.1 | 5 | 25 | 98 | 14 | 4 | ±15 | Precision Low-Power Single Supply Op Amp |
| TLE2074A | 38 | 4.5 | 1.875 | 1.425 | 10 | 45 | 5.1 | 3 | 25 | 98 | 14 | 4 | ±15 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Op Amp |
| TLE2081 | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 8 | 6 | 20 | 98 | 14 | 1 | ±15 | Advanced,Self-Calibrating, Precision, Dual Op Amp |
| TLE2081A | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 5 | 3 | 20 | 98 | 14 | 1 | ±15 | Dual Precision Low-Power Single Supply Op Amp |
| TLE2082 | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 8.1 | 7 | 20 | 98 | 14 | 2 | ±15 | Quad Precision Low-Power Single Supply Op Amp |
| TLE2082A | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 5.1 | 4 | 20 | 98 | 14 | 2 | ±15 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2084 | 38 | 4.5 | 1.875 | 1.625 | 10 | 45 | 9.1 | 7 | 25 | 98 | 14 | 4 | ±15 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Single Op Amp |
| TLE2084A | 38 | 4.5 | 1.875 | 1.625 | 10 | 45 | 6.1 | 4 | 25 | 98 | 14 | 4 | ±15 | Advanced LinCMOS Low-Noise Chopper-Stabilized Op Amp |
| TLC2201A | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 15 | 1 | 5 | Dual Low-Noise High-Speed Precision Op Amp |
| TLC2202A | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 15 | 2 | 5 | Excalibur Low-Noise High-Speed Precision Decompensated Operational-Amplifier |
| TLE2021 | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.85 | 0.6 | 25000 | 110 | 15 | 1 | 5 | Excalibur Low-Noise High-Speed Precision Op Amp |
| TLE2022 | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.8 | 0.6 | 35000 | 100 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2022A | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.55 | 0.4 | 33000 | 102 | 15 | 2 | 5 | Excalibur High-Speed JFET-Input Dual Op Amp |

Sorted By

## Operational Amplifiers—Low Noise ($V_n \leq 20\ nV/\sqrt{Hz}$) (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{SS}/I_{CC}$ per Channel (max) (mA) | $I_{SS}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) ($nV/\sqrt{Hz}$) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2022B | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.4 | 0.3 | 33000 | 105 | 15 | 2 | 5 | Quad Low-Noise High-Speed JFET-Input Op Amp |
| TLE2024 | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.3 | 1.1 | 46000 | 90 | 15 | 4 | 5 | Low-Noise Precision Op Amp |
| TLE2024A | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.05 | 0.85 | 40000 | 92 | 15 | 4 | 5 | Low-Noise High-Speed Precision Decomp. Op Amp |
| TLE2024B | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 0.8 | 0.6 | 35000 | 95 | 15 | 4 | 5 | Low Noise High-Speed Precision Single Supply Op Amp |
| TLV2231 | 10 | 2.7 | 1.2 | 0.85 | 2 | 1.6 | 3 | 0.45 | 1 | 70 | 15 | 1 | 5 | Low-Noise High-Speed JFET-Input Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Excalibur Low-Noise High-Speed JFET-Input Op Amp |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Excalibur High-Speed JFET-Input Quad Op Amp |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Dual Low-Noise High-Speed JFET-Input Op Amp |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Quad Low-Noise High-Speed Precision Op Amp |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Excalibur Low-Noise High-Speed JFET-Input Dual Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Noise High-Speed Precision Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Excalibur Low-Noise High-Speed JFET-Input Quad Op Amp |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Excalibur High-Speed JFET-Input Op Amp |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | High-Speed JFET-Input Op Amp |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Quad High-Speed JFET-Input Op Amp |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Dual High-Speed JFET-Input Op Amp |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Excalibur Low-Noise High-Speed Precision Dual Op Amp |
| TLV2731 | 10 | 2.7 | 1.2 | 0.75 | 2 | 1.25 | 0.75 | 3 | 1 | 70 | 16 | 1 | 3 | Excalibur Low-Noise High-Speed Precision Quad Op Amp |
| LF347 | 36 | 7 | 2.75 | 2 | 3 | 13 | 13 | 10 | 50 | 100 | 18 | 4 | ±15 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| LF347B | 36 | 7 | 2.75 | 2 | 3 | 13 | 7 | 5 | 50 | 100 | 18 | 4 | ±15 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| LF353 | 36 | 7 | 3.25 | 1.8 | 3 | 13 | 13 | 10 | 50 | 100 | 18 | 2 | ±15 | Dual Low-Noise High-Speed Precision Op Amp |
| LF411 | 36 | 7 | 3.4 | 2 | 3 | 13 | | 2 | 50 | 100 | 18 | 1 | ±15 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| LF412 | 36 | 7 | 3.4 | 2.25 | 3 | 13 | | 3 | 50 | 100 | 18 | 2 | ±15 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TL051 | 30 | 10 | 3.2 | 2.7 | 3.1 | 20 | 2.5 | 1.5 | 30 | 93 | 18 | 1 | ±15 | Dual Wide-Input-Voltage Micropower, Rail-to-Rail Single-Supply Op Amp |
| TL051A | 30 | 10 | 3.2 | 2.7 | 3.1 | 20 | 1.8 | 0.8 | 30 | 93 | 18 | 1 | ±15 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TL070 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 1 | ±15 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TL071 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 1 | ±15 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TL071A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 1 | ±15 | Dual Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TL071B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 1 | ±15 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TL072 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 2 | ±15 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TL072A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 2 | ±15 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TL072B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 2 | ±15 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TL074 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 4 | ±15 | Single LinCMOS Rail-to-Rail Micropower Op Amp |

## Operational Amplifiers—Low Noise ($V_n \leq 20$ nV/√Hz) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TL074A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 4 | ±15 | Low-Voltage Rail-to-Rail Op Amp |
| TL074B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 4 | ±15 | Single High-Performance, Low-Voltage Op Amp |
| TL081 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 1 | ±15 | Rail-to-Rail Output Wide-Input-Voltage Micropower Dual Op Amps |
| TL081A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 1 | ±15 | Dual Rail-to-Rail Low-Voltage Micropower Op Amp |
| TL081B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 1 | ±15 | Low-Voltage Rail-to-Rail Dual Op Amp |
| TL082 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 2 | ±15 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TL082A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 2 | ±15 | Quad Rail-to-Rail Low-Voltage Micropower Op Amp |
| TL082B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 2 | ±15 | Quad Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TL084 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 4 | ±15 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TL084A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 4 | ±15 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TL084B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 4 | ±15 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2422 | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Dual High-Performance, Low-Voltage Op Amp |
| TLV2422A | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 1.5 | 0.95 | 1 | 90 | 18 | 2 | 5 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2432 | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2432A | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 1.5 | 0.95 | 1 | 83 | 18 | 2 | 5 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2442 | 10 | 2.7 | 1.1 | 0.75 | 1.75 | 1.3 | 2.5 | 2 | 1 | 75 | 18 | 2 | 5 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2442A | 10 | 2.7 | 0.725 | 1.1 | 1.75 | 1.3 | 1.5 | 0.95 | 1 | 75 | 18 | 2 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TL052 | 30 | 10 | 2.8 | 2.4 | 3 | 20.7 | 2.5 | 1.5 | 30 | 93 | 19 | 2 | ±15 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TL052A | 30 | 10 | 2.8 | 2.4 | 3 | 20.7 | 1.8 | 0.8 | 30 | 93 | 19 | 2 | ±15 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLC2252 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 2 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLC2252A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 2 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLC2254 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 4 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLC2254A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 4 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2221 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 3 | 0.45 | 1 | 85 | 19 | 1 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2252 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 2 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2254 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 4 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2254A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 4 | 5 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLC2654A | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.024 | 0.01 | 50 | 125 | 20 | 1 | ±5 | Single LinCMOS Rail-to-Rail Low-Power Op Amp |
| TLV2721 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 0.6 | 3 | 1 | 82 | 20 | 1 | 3 | Single LinCMOS Rail-to-Rail Very Low-Power Op Amp |

## Operational Amplifiers—Low Power ($I_{CC}$ ≤ 1 mA/channel max)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | Sorted By $I_{OS}/I_{CC}$ per Channel (max) (mA) | $I_{OS}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IO}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC1078 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 0.8 | 0.45 | 0.6 | 95 | 68 | 2 | 5 | Dual Micropower Precision Low-Voltage Op Amp |
| TLC25L2 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 68 | 2 | 5 | Dual Micropower Low-Voltage Op Amp |
| TLC25L2A | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25L2B | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25L4 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 70 | 4 | 5 | Quad Micropower Low-Voltage Op Amp |
| TLC25L4A | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25L4B | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC27L1 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 13 | 10 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L1A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 7 | 5 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L1B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3.5 | 2 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L2 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 13 | 10 | 0.6 | 94 | 68 | 2 | 5 | Dual Precision Single Supply Micropower Op Amp |
| TLC27L2A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 7 | 5 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27L2B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3.5 | 2 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27L4 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 70 | 4 | 5 | Quad Precision Single Supply Micropower Op Amp |
| TLC27L4A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27L4B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27L7 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 2 | 0.5 | 0.6 | 94 | 68 | 2 | 5 | Dual Precision Single Supply Micropower Op Amp |
| TLC27L9 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 1.5 | 0.9 | 0.6 | 94 | 70 | 4 | 5 | Quad Precision Single Supply Micropower Op Amp |
| TLV2322 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 11 | 9 | 0.6 | 94 | 68 | 2 | 5 | Dual Low-Voltage Micropower Op Amp |
| TLV2324 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 12 | 10 | 0.6 | 94 | 68 | 4 | 5 | Quad Low-Voltage Micropower Op Amp |
| TLV2211 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 3 | 0.45 | 1 | 83 | 22 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2711 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 0.47 | 3 | 1 | 83 | 22 | 1 | 3 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2454 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2454A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Low Power ($I_{CC}$ ≤ 1 mA/channel max) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | Sorted By $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLC2252A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 2 | 5 | Rail-to-Rail Dual Op Amp |
| TLC2254A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 4 | 5 | Rail-to-Rail Quad Op Amp |
| TLV2252 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Voltage Rail-to-Rail Dual Op Amp |
| TLV2254 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2254A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 4 | 5 | Low-Voltage Rail-to-Rail Op Amp |
| TLV2422 | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Dual Wide-Input-Voltage Micropower, Rail-to-Rail Single-Supply Op Amp |
| TLV2422A | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 1.5 | 0.95 | 1 | 90 | 18 | 2 | 5 | Rail-to-Rail Output Wide-Input-Voltage Micropower Dual Op Amps |
| TL022 | 30 | 10 | 0.125 | 0.065 | 0.5 | 0.5 | 7.5 | 5 | 100000 | 72 | 50 | 2 | ±15 | Dual Low-Power General-Purpose Op Amp |
| TLV2432 | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2432A | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 1.5 | 0.95 | 1 | 83 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2221 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 3 | 0.45 | 1 | 85 | 19 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2721 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 0.6 | 3 | 1 | 82 | 20 | 1 | 3 | Single LinCMOS Rail-to-Rail Very Low-Power Op Amp |
| TLV2262 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2262A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLV2264 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2264A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TL031 | 30 | 10 | 0.28 | 0.217 | 1.1 | 5.1 | 2.5 | 1.5 | 2 | 94 | 41 | 1 | ±15 | Enhanced JFET Low-Power Precision Op Amp |
| TL032 | 30 | 10 | 0.28 | 0.211 | 1.1 | 5.1 | 2.5 | 1.5 | 2 | 94 | 41 | 2 | ±15 | Dual Enhanced JFET Low-Power Precision Op Amp |
| TL032A | 30 | 10 | 0.28 | 0.211 | 1.1 | 5.1 | 1.8 | 0.8 | 2 | 94 | 41 | 2 | ±15 | Enhanced-JFET Low-Power Low-Offset Dual Op Amp |
| TL034 | 30 | 10 | 0.28 | 0.2175 | 1.1 | 5.1 | 6.2 | 4 | 2 | 94 | 43 | 4 | ±15 | Quad Enhanced JFET Low-Power Precision Op Amp |
| TL034A | 30 | 10 | 0.28 | 0.2175 | 1.1 | 5.1 | 3.7 | 1.5 | 2 | 94 | 43 | 4 | ±15 | Enhanced-JFET Low-Power Low-Offset Quad Op Amp |
| TLC25M2 | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 12 | 10 | 0.6 | 91 | 32 | 2 | 5 | Dual Low-Power Low-Voltage Op Amp |
| TLC25M2A | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 6.5 | 5 | 0.6 | 91 | 32 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25M4 | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Low-Power Low-Voltage Op Amp |
| TLC25M4A | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 6.5 | 5 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25M4B | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 3 | 2 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC27M2 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 13 | 10 | 0.6 | 91 | 32 | 2 | 5 | Dual Precision Single Supply Low-Power Op Amp |
| TLC27M2A | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 7 | 5 | 0.6 | 91 | 32 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27M2B | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 3.5 | 2 | 0.6 | 91 | 32 | 2 | 5 | LinCMOS Precision Dual Op Amp |

## Operational Amplifiers—Low Power ($I_{CC}$ ≤ 1 mA/channel max) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | Sorted By $I_{IO}/I_{CC}$ per Channel (max) (mA) | $I_{IO}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC27M4 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Precision Single Supply Low-Power Op Amp |
| TLC27M4A | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 6.5 | 5 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27M4B | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 3 | 2 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27M7 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 2 | 0.5 | 0.6 | 91 | 32 | 2 | 5 | Dual Precision Single Supply Low-Power Op Amp |
| TLC27M9 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 1.5 | 0.9 | 0.6 | 91 | 32 | 4 | 5 | Quad Precision Single Supply Low-Power Op Amp |
| TLV2332 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 11 | 9 | 0.6 | 91 | 32 | 2 | 5 | Dual Low-Voltage Low-Power Op Amp |
| TLV2334 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Low-Voltage Low-Power Op Amp |
| LM2902 | 26 | 3 | 0.3 | 0.175 | 0.4 | 0.25 | 10 | 7 | –20000 | 80 | 23 | 4 | 5 | Quad General-Purpose Op Amp |
| LM324 | 32 | 3 | 0.3 | 0.175 | 0.4 | 0.25 | 9 | 7 | –20000 | 80 | 23 | 4 | 5 | Quad General-Purpose Op Amp |
| LM324A | 32 | 3 | 0.3 | 0.175 | 0.4 | 0.25 | 5 | 3 | –15000 | 80 | 23 | 4 | 5 | Quadruple Op Amp |
| TLE2021 | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.85 | 0.6 | 25000 | 110 | 15 | 1 | 5 | Precision Low-Power Single Supply Op Amp |
| TLE2021A | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.6 | 0.3 | 25000 | 110 | 30 | 1 | 5 | Excalibur High-Speed Low-Power Precision Op Amp |
| TLE2021B | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.3 | 0.2 | 25000 | 110 | 30 | 1 | 5 | Excalibur High-Speed Low-Power Precision Op Amp |
| TLE2022 | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.8 | 0.6 | 35000 | 100 | 15 | 2 | 5 | Dual Precision Low-Power Single Supply Op Amp |
| TLE2022A | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.55 | 0.4 | 33000 | 102 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2022B | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.4 | 0.3 | 33000 | 105 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2062 | 36 | 7 | 0.345 | 0.31 | 2 | 3.4 | 4.9 | 4 | 4 | 90 | 40 | 2 | ±15 | Dual JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2062A | 36 | 7 | 0.345 | 0.31 | 2 | 3.4 | 2.9 | 2 | 4 | 90 | 40 | 2 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Dual Op Amp |
| TLE2062B | 36 | 7 | 0.345 | 0.31 | 2 | 3.4 | 1.9 | 1 | 4 | 90 | 40 | 2 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Dual Op Amp |
| TLE2024 | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.3 | 1.1 | 46000 | 90 | 15 | 4 | 5 | Quad Precision Low-Power Single Supply Op Amp |
| TLE2024A | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.05 | 0.85 | 40000 | 92 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2024B | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 0.8 | 0.6 | 35000 | 95 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2061 | 36 | 7 | 0.35 | 0.29 | 2 | 3.4 | 4 | 3 | 4 | 90 | 40 | 1 | ±15 | JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2061A | 36 | 7 | 0.35 | 0.29 | 2 | 3.4 | 3.5 | 2.6 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp (Low-Power Version TIE2071) |
| TLE2064 | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 6.9 | 6 | 4 | 90 | 40 | 4 | ±15 | Quad JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2064A | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 4.9 | 4 | 4 | 90 | 40 | 4 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Quad Op Amp |
| TLE2064B | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 2.9 | 2 | 4 | 90 | 40 | 4 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Quad Op Amp |
| TLE2161 | 36 | 7 | 0.35 | 0.29 | 6.4 | 10 | 3.9 | 3 | 4 | 90 | 40 | 1 | ±15 | JFET-Input High-Output-Drive Low-Power Decompensated Op Amp |
| TLE2161A | 36 | 7 | 0.35 | 0.29 | 6.4 | 10 | 2.5 | 1.5 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp |

## Operational Amplifiers—Low Power ($I_{CC}$ ≤ 1 mA/channel max) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | Sorted By $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2161B | 36 | 7 | 0.35 | 0.29 | 6.4 | 10 | 1 | 0.5 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp |
| LT1013A | 44 | 4 | 0.5 | 0.35 | | 0.4 | 0.24 | 0.15 | –12000 | 117 | 22 | 2 | ±15 | Dual Precision Op Amp |
| LT1014A | 44 | 5 | 0.5 | 0.35 | 1 | 0.4 | 0.35 | 0.18 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1013 | 44 | 4 | 0.55 | 0.35 | | 0.4 | 0.4 | 0.3 | –15000 | 114 | 22 | 2 | ±15 | Dual Precision Low-Power Op Amp |
| LT1013D | 44 | 4 | 0.55 | 0.35 | | 0.4 | 1 | 0.8 | –15000 | 114 | 22 | 2 | ±15 | Dual Precision Op Amp |
| LT1014 | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 0.55 | 0.3 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1014D | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 1 | 0.8 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| LM2904 | 26 | 3 | 0.6 | 0.35 | 0.4 | 0.15 | 10 | 7 | –20000 | 80 | 23 | 2 | 5 | Dual General-Purpose Op Amp |
| TLV2442A | 10 | 2.7 | 0.725 | 1.1 | 1.75 | 1.3 | 1.5 | 0.95 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |

## Operational Amplifiers—Low Power ($I_{CC}$ ≤ 1 mA/channel max) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | Sorted By $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (nA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LM358 | 32 | 3 | 1 | 0.5 | 0.4 | | 9 | 7 | –20000 | 80 | 23 | 2 | 5 | Dual General-Purpose Op Amp |
| LM358A | 32 | 3 | 1 | 0.5 | 0.4 | | 5 | 3 | –15000 | 80 | 23 | 2 | 5 | Dual Op Amp |
| **Micropower ($I_{CC}$ ≤ 50 µA/channel max)** | | | | | | | | | | | | | | |
| TLC1078 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 0.8 | 0.45 | 0.6 | 95 | 68 | 2 | 5 | Dual Micropower Precision Low-Voltage Op Amp |
| TLC1079 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 1.2 | 0.85 | 0.6 | 95 | 68 | 4 | 5 | Quad Micropower Precision Low-Voltage Op Amp |
| TLC25L2 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 68 | 2 | 5 | Dual Micropower Low-Voltage Op Amp |
| TLC25L2A | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25L2B | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25L4 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 70 | 4 | 5 | Quad Micropower Low-Voltage Op Amp |
| TLC25L4A | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25L4B | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC27L1 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 13 | 10 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L1A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 7 | 5 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L1B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3.5 | 2 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L2 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 13 | 10 | 0.6 | 94 | 68 | 2 | 5 | Dual Precision Single Supply Micropower Op Amp |
| TLC27L2A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 7 | 5 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27L2B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3.5 | 2 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27L4 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 70 | 4 | 5 | Quad Precision Single Supply Micropower Op Amp |
| TLC27L4A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27L4B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27L7 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 2 | 0.5 | 0.6 | 94 | 68 | 2 | 5 | Dual Precision Single Supply Micropower Op Amp |
| TLC27L9 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 1.5 | 0.9 | 0.6 | 94 | 70 | 4 | 5 | Quad Precision Single Supply Micropower Op Amp |
| TLV2322 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 11 | 9 | 0.6 | 94 | 68 | 2 | 5 | Dual Low-Voltage Micropower Op Amp |
| TLV2324 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 12 | 10 | 0.6 | 94 | 68 | 4 | 5 | Quad Low-Voltage Micropower Op Amp |
| TLV2211 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 3 | 0.45 | 1 | 83 | 22 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2711 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 0.47 | 3 | 1 | 83 | 22 | 1 | 3 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Low Power ($I_{CC}$ ≤ 1 mA/channel max) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | Sorted By $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Micropower ($I_{CC}$ ≤ 50 μA/channel max) (Continued)** | | | | | | | | | | | | | | |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-μA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2454 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2454A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Rail-to-Rail

| Device Name | Sorted By: $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2770 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2770A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2211 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 3 | 0.45 | 1 | 83 | 22 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2221 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 3 | 0.45 | 1 | 85 | 19 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2231 | 10 | 2.7 | 1.2 | 0.85 | 2 | 1.6 | 3 | 0.45 | 1 | 70 | 15 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2252 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Voltage Rail-to-Rail Dual Op Amp |
| TLV2254 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2254A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 4 | 5 | Low-Voltage Rail-to-Rail Op Amp |
| TLV2262 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2262A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLV2264 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2264A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLV2422 | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Dual Wide-Input-Voltage Micropower, Rail-to-Rail Single-Supply Op Amp |
| TLV2422A | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 1.5 | 0.95 | 1 | 90 | 18 | 2 | 5 | Rail-to-Rail Output Wide-Input-Voltage Micropower Dual Op Amps |
| TLV2432 | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2432A | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 1.5 | 0.95 | 1 | 83 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2442 | 10 | 2.7 | 1.1 | 0.75 | 1.75 | 1.3 | 2.5 | 2 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2442A | 10 | 2.7 | 0.725 | 1.1 | 1.75 | 1.3 | 1.5 | 0.95 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |

## Operational Amplifiers—Rail-to-Rail (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IO}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2454 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2454A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |

## Operational Amplifiers—Rail-to-Rail (Continued)

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2711 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 0.47 | 3 | 1 | 83 | 22 | 1 | 3 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2721 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 0.6 | 3 | 1 | 82 | 20 | 1 | 3 | Single LinCMOS Rail-to-Rail Very Low-Power Op Amp |
| TLV2731 | 10 | 2.7 | 1.2 | 0.75 | 2 | 1.25 | 0.75 | 3 | 1 | 70 | 16 | 1 | 3 | Single LinCMOS Rail-to-Rail Low-Power Op Amp |
| TLC4501 | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.08 | 0.08 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Single Op Amp |
| TLC4501A | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.04 | 0.04 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Op Amp |
| TLC4502 | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.1 | 0.1 | 1 | 100 | 12 | 2 | 5 | Advanced LinEPIC Self-Calibrating Precision Dual Op Amp |
| TLC4502A | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.05 | 0.05 | 1 | 100 | 12 | 2 | 5 | Advanced,Self-Calibrating, Precision, Dual Op Amp |
| TLC2252 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 2 | 5 | Dual Rail-to-Rail Micropower Op Amp |
| TLC2252A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 2 | 5 | Rail-to-Rail Dual Op Amp |
| TLC2254 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 4 | 5 | Quad Rail-to-Rail Micropower Op Amp |
| TLC2254A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 4 | 5 | Rail-to-Rail Quad Op Amp |
| TLC2262 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2262A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2264 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2264A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLC2272 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 2 | 5 | Dual Low-Noise Rail-to-Rail Op Amp |
| TLC2272A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2274 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 4 | 5 | Quad Low-Noise Rail-to-Rail Op Amp |
| TLC2274A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLC2201 | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.6 | 0.5 | 1 | 110 | 8 | 1 | 5 | Low Noise Precision Rail-to-Rail Output Op Amp |
| TLC2201A | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 15 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLC2201B | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 12 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLC2202 | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 1.15 | 1 | 1 | 100 | 8 | 2 | 5 | Dual Low-Noise Precision Rail-to-Rail Op Amp |
| TLC2202A | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 15 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2202B | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 12 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| **RRIO** | | | | | | | | | | | | | | |
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Rail-to-Rail (Continued)

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{OD}/I_{CC}$ per Channel (max) (mA) | $I_{OD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full-Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RRIO (Continued)** | | | | | | | | | | | | | | |
| TLV2452 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2454 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2454A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |

## Operational Amplifiers—Wide Bandwidth (GBW > 2 MHz)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | Sorted By GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2037 | 38 | 8 | 5.3 | 3.8 | 50 | 7.5 | 0.145 | 0.1 | 15000 | 131 | 2.5 | 1 | ±15 | Low-Noise High-Speed Precision Decomp. Op Amp |
| TLE2037A | 38 | 8 | 5.3 | 3.8 | 50 | 7.5 | 0.1 | 0.025 | 15000 | 131 | 2.5 | 1 | ±15 | Excalibur Low-Noise High-Speed Precision Decompensated Op Amp |
| LM318 | 40 | 10 | 10 | 5 | 15 | 70 | 15 | 10 | 150000 | 100 | 23 | 1 | ±15 | Single High-Speed Op Amp |
| TLE2027 | 38 | 8 | 5.3 | 3.8 | 13 | 2.8 | 0.145 | 0.1 | 15000 | 131 | 2.5 | 1 | ±15 | Low-Noise Precision Op Amp |
| TLE2227 | 38 | 8 | 5.3 | 3.65 | 13 | 2.5 | 0.5 | 0.35 | 15000 | 115 | 2.5 | 2 | ±15 | Dual Low-Noise High-Speed Precision Op Amp |
| NE5532 | 30 | 10 | 8 | 4 | 10 | 9 | 5 | 4 | 200000 | 100 | 5 | 2 | ±15 | Dual Low-Noise High-Speed Audio Op Amp |
| NE5534 | 30 | 10 | 8 | 4 | 10 | 13 | 5 | 4 | 500000 | 100 | 4 | 1 | ±15 | Low-Noise High-Speed Audio Op Amp |
| NE5534A | 30 | 10 | 8 | 4 | 10 | 13 | 5 | 4 | 500000 | 100 | 3.5 | 1 | ±15 | Low-Noise Op Amp |
| TLC070 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Single Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC070A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Single Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC071 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Single Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLC071A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Single Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC072 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLC072A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp - No Shutdown |
| TLC073 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 2 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC073A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 2 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC080 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC080A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC081 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC081A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC082 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |

## Operational Amplifiers—Wide Bandwidth (GBW > 2 MHz) (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (nA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IR}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC082A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC083 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC083A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLE2071 | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 6 | 4 | 20 | 98 | 14 | 1 | ±15 | Low-Noise High-Speed JFET-Input Op Amp |
| TLE2071A | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 4 | 2 | 20 | 98 | 14 | 1 | ±15 | Excalibur Low-Noise High-Speed JFET-Input Op Amp |
| TLE2072 | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 7.8 | 6 | 20 | 98 | 14 | 2 | ±15 | Dual Low-Noise High-Speed JFET-Input Op Amp |
| TLE2072A | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 5.3 | 3.5 | 20 | 98 | 14 | 2 | ±15 | Excalibur Low-Noise High-Speed JFET-Input Dual Op Amp |
| TLE2074 | 38 | 4.5 | 1.875 | 1.425 | 10 | 45 | 7.1 | 5 | 25 | 98 | 14 | 4 | ±15 | Quad Low-Noise High-Speed JFET-Input Op Amp |
| TLE2074A | 38 | 4.5 | 1.875 | 1.425 | 10 | 45 | 5.1 | 3 | 25 | 98 | 14 | 4 | ±15 | Excalibur Low-Noise High-Speed JFET-Input Quad Op Amp |
| TLE2081 | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 8 | 6 | 20 | 98 | 14 | 1 | ±15 | High-Speed JFET-Input Op Amp |
| TLE2081A | 38 | 4.5 | 2.2 | 1.7 | 10 | 45 | 5 | 3 | 20 | 98 | 14 | 1 | ±15 | Excalibur High-Speed JFET-Input Op Amp |
| TLE2082 | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 8.1 | 7 | 20 | 98 | 14 | 2 | ±15 | Dual High-Speed JFET-Input Op Amp |
| TLE2082A | 38 | 4.5 | 1.8 | 1.55 | 10 | 45 | 5.1 | 4 | 20 | 98 | 14 | 2 | ±15 | Excalibur High-Speed JFET-Input Dual Op Amp |
| TLE2084 | 38 | 4.5 | 1.875 | 1.625 | 10 | 45 | 9.1 | 7 | 25 | 98 | 14 | 4 | ±15 | Quad High-Speed JFET-Input Op Amp |
| TLE2084A | 38 | 4.5 | 1.875 | 1.625 | 10 | 45 | 6.1 | 4 | 25 | 98 | 14 | 4 | ±15 | Excalibur High-Speed JFET-Input Quad Op Amp |
| TLE2301 | 40 | 9 | 3.5 | 2.2 | 8 | 14 | 15 | 10 | 260000 | 97 | 44 | 1 | ±15 | Excalibur 3-State-Output Wide-Bandwidth Power Op Amp |
| TLV2361 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 1 | ±2.5 | Single High-Performance, Low-Voltage Op Amp |
| TLV2362 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 2 | ±2.5 | Dual High-Performance, Low-Voltage Op Amp |
| TLE2161 | 36 | 7 | 0.35 | 0.29 | 6.4 | 10 | 3.9 | 3 | 4 | 90 | 40 | 1 | ±15 | JFET-Input High-Output-Drive Low-Power Decompensated Op Amp |
| TLE2161A | 36 | 7 | 0.35 | 0.29 | 6.4 | 10 | 2.5 | 1.5 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2161B | 36 | 7 | 0.35 | 0.29 | 6.4 | 10 | 1 | 0.5 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2141 | 44 | 4 | 4.5 | 3.5 | 5.9 | 45 | 1.3 | 0.9 | -7000 | 108 | 10.5 | 1 | ±15 | Low Noise High-Speed Precision Single Supply Op Amp |
| TLE2141A | 44 | 4 | 4.5 | 3.5 | 5.9 | 45 | 0.8 | 0.5 | -7000 | 108 | 10.5 | 1 | ±15 | Excalibur Low-Noise High-Speed Precision Op Amp |
| TLE2142 | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 1.6 | 1.2 | -7000 | 108 | 10.5 | 2 | ±15 | Dual Low-Noise High-Speed Precision Op Amp |
| TLE2142A | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 1.2 | 0.75 | -7000 | 108 | 10.5 | 2 | ±15 | Excalibur Low-Noise High-Speed Precision Dual Op Amp |
| TLE2144 | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 3.2 | 2.4 | -7000 | 108 | 10.5 | 4 | ±15 | Quad Low-Noise High-Speed Precision Op Amp |
| TLE2144A | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 2.4 | 1.5 | -7000 | 108 | 10.5 | 4 | ±15 | Excalibur Low-Noise High-Speed Precision Quad Op Amp |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Wide Bandwidth (GBW > 2 MHz) (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2770 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2770A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLC4501 | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.08 | 0.08 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Single Op Amp |
| TLC4501A | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.04 | 0.04 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Op Amp |
| TLC4502 | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.1 | 0.1 | 1 | 100 | 12 | 2 | 5 | Advanced LinEPIC Self-Calibrating Precision Dual Op Amp |
| TLC4502A | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.05 | 0.05 | 1 | 100 | 12 | 2 | 5 | Advanced,Self-Calibrating, Precision, Dual Op Amp |
| TL3472 | 36 | 4 | 4.5 | 3.5 | 4 | 13 | 12 | 10 | 100000 | 97 | 49 | 2 | ±15 | High-Slew-Rate, Single-Supply Op Amp |
| TL051 | 30 | 10 | 3.2 | 2.7 | 3.1 | 20 | 2.5 | 1.5 | 30 | 93 | 18 | 1 | ±15 | Enhanced JFET Precision Op Amp |
| TL051A | 30 | 10 | 3.2 | 2.7 | 3.1 | 20 | 1.8 | 0.8 | 30 | 93 | 18 | 1 | ±15 | Enhanced-JFET Precision Op Amp |
| LF347 | 36 | 7 | 2.75 | 2 | 3 | 13 | 13 | 10 | 50 | 100 | 18 | 4 | ±15 | Quad General-Purpose JFET-Input Op Amp |
| LF347B | 36 | 7 | 2.75 | 2 | 3 | 13 | 7 | 5 | 50 | 100 | 18 | 4 | ±15 | Wide-Bandwidth JFET-Input Quad Op Amp |
| LF353 | 36 | 7 | 3.25 | 1.8 | 3 | 13 | 13 | 10 | 50 | 100 | 18 | 2 | ±15 | Dual General-Purpose JFET-Input Op Amp |
| LF411 | 36 | 7 | 3.4 | 2 | 3 | 13 | | 2 | 50 | 100 | 18 | 1 | ±15 | Precision JFET-Input Op Amp |
| LF412 | 36 | 7 | 3.4 | 2.25 | 3 | 13 | | 3 | 50 | 100 | 18 | 2 | ±15 | Dual JFET-Input Op Amp |
| RC4136 | 30 | 10 | 2.825 | 1.25 | 3 | 1.7 | 7.5 | 6 | 140000 | 90 | 8 | 4 | ±15 | Quad General-Purpose Op Amp |

## Operational Amplifiers—Wide Bandwidth (GBW > 2 MHz) (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC4558 | 30 | 10 | 2.8 | 1.25 | 3 | 1.7 | 7.5 | 6 | 150000 | 90 | 8 | 2 | ±15 | Dual General-Purpose Op Amp |
| TL052 | 30 | 10 | 2.8 | 2.4 | 3 | 20.7 | 2.5 | 1.5 | 30 | 93 | 19 | 2 | ±15 | Dual Enhanced JFET Precision Op Amp |
| TL052A | 30 | 10 | 2.8 | 2.4 | 3 | 20.7 | 1.8 | 0.8 | 30 | 93 | 19 | 2 | ±15 | Enhanced-JFET Precision Dual Op Amp |
| TL070 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input Decompensated Op Amp |
| TL071 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input General-Purpose Op Amp |
| TL071A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input Op Amp |
| TL071B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input Op Amp |
| TL072 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 2 | ±15 | Dual Low-Noise JFET-Input General-Purpose Op Amp |
| TL072A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 2 | ±15 | Low-Noise JFET-Input Op Amp |
| TL072B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 2 | ±15 | Low-Noise JFET-Input Op Amp |
| TL074 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 4 | ±15 | Quad Low-Noise JFET-Input General-Purpose Op Amp |
| TL074A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 4 | ±15 | Low-Noise JFET-Input Op Amp |
| TL074B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 4 | ±15 | Low-Noise JFET-Input Op Amp |
| TL081 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 1 | ±15 | JFET-Input General-Purpose Op Amp |
| TL081A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 1 | ±15 | JFET-Input Op Amp |
| TL081B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 1 | ±15 | JFET-Input Op Amp |
| TL082 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 2 | ±15 | Dual JFET-Input General-Purpose Op Amp |
| TL082A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 2 | ±15 | JFET-Input Op Amp |
| TL082B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 2 | ±15 | JFET-Input Op Amp |
| TL084 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 4 | ±15 | Quad JFET-Input General-Purpose Op Amp |
| TL084A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 4 | ±15 | JFET-Input Op Amp |
| TL084B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 4 | ±15 | JFET-Input Op Amp |
| TLE2022 | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.8 | 0.6 | 35000 | 100 | 15 | 2 | 5 | Dual Precision Low-Power Single Supply Op Amp |
| TLE2022A | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.55 | 0.4 | 33000 | 102 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2022B | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.4 | 0.3 | 33000 | 105 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2024 | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.3 | 1.1 | 46000 | 90 | 15 | 4 | 5 | Quad Precision Low-Power Single Supply Op Amp |
| TLE2024A | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.05 | 0.85 | 40000 | 92 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2024B | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 0.8 | 0.6 | 35000 | 95 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |

## Operational Amplifiers—Wide Bandwidth (GBW > 2 MHz) (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TL054 | 30 | 10 | 2.8 | 2.1 | 2.7 | 17.8 | 6.2 | 4 | 30 | 92 | 21 | 4 | ±15 | Quad Enhanced JFET Precision Op Amp |
| TL054A | 30 | 10 | 2.8 | 2.1 | 2.7 | 17.8 | 3.7 | 1.5 | 30 | 92 | 21 | 4 | ±15 | Enhanced-JFET Precision Quad Op Amp |
| TLC2272 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 2 | 5 | Dual Low-Noise Rail-to-Rail Op Amp |
| TLC2272A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2274 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 4 | 5 | Quad Low-Noise Rail-to-Rail Op Amp |
| TLC2274A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |

## Operational Amplifiers—Shutdown

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC070 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 1 | 5 | Single Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC070A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 1 | 5 | Single Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC073 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 1.5 | 140 | 7 | 2 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC073A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 1.5 | 140 | 7 | 2 | 5 | Dual Wide-Bandwidth High-Output-Drive Single-Supply Op Amp with Shutdown |
| TLC080 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC080A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC083 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC083A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-μA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |

## Operational Amplifiers—Shutdown (Continued)

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IO}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2770 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2770A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |

## Operational Amplifiers—Single Supply

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2322 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 11 | 9 | 0.6 | 94 | 68 | 2 | 5 | Dual Low-Voltage Micropower Op Amp |
| TLV2324 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 12 | 10 | 0.6 | 94 | 68 | 4 | 5 | Quad Low-Voltage Micropower Op Amp |
| TLV2332 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 11 | 9 | 0.6 | 91 | 32 | 2 | 5 | Dual Low-Voltage Low-Power Op Amp |
| TLV2334 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Low-Voltage Low-Power Op Amp |
| TLV2341 | 8 | 2 | 1.6 | 0.675 | 1.7 | 3.6 | 10 | 8 | 0.6 | 80 | 25 | 1 | 5 | LinCMOS Programmable Low-Voltage Op Amp |
| TLV2342 | 8 | 2 | 1.5 | 0.325 | 0.79 | 2.1 | 11 | 9 | 0.6 | 80 | 25 | 2 | 5 | Dual LinCMOS Low-Voltage High-Speed Op Amp |
| TLV2344 | 8 | 2 | 1.5 | 0.325 | 0.79 | 2.1 | 12 | 10 | 0.6 | 78 | 25 | 4 | 5 | Quad LinCMOS Low-Voltage High-Speed Op Amp |
| TLV2361 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 1 | ±2.5 | Single High-Performance, Low-Voltage Op Amp |
| TLV2362 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 2 | ±2.5 | Dual High-Performance, Low-Voltage Op Amp |
| TLV2770 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2770A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2211 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 3 | 0.45 | 1 | 83 | 22 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2221 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 3 | 0.45 | 1 | 85 | 19 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2231 | 10 | 2.7 | 1.2 | 0.85 | 2 | 1.6 | 3 | 0.45 | 1 | 70 | 15 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2252 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Voltage Rail-to-Rail Dual Op Amp |
| TLV2254 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2254A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 4 | 5 | Low-Voltage Rail-to-Rail Op Amp |
| TLV2262 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2262A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLV2264 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2264A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLV2422 | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Dual Wide-Input-Voltage Micropower, Rail-to-Rail Single-Supply Op Amp |

## Operational Amplifiers—Single Supply (Continued)

| Device Name | Sorted By: $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{IB}/I_{CC}$ per Channel (max) (mA) | $I_{IB}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2422A | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 1.5 | 0.95 | 1 | 90 | 18 | 2 | 5 | Rail-to-Rail Output Wide-Input-Voltage Micropower Dual Op Amps |
| TLV2432 | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2432A | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 1.5 | 0.95 | 1 | 83 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2442 | 10 | 2.7 | 1.1 | 0.75 | 1.75 | 1.3 | 2.5 | 2 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2442A | 10 | 2.7 | 0.725 | 1.1 | 1.75 | 1.3 | 1.5 | 0.95 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2454 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2454A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Single Supply (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2711 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 0.47 | 3 | 1 | 83 | 22 | 1 | 3 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2721 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 0.6 | 3 | 1 | 82 | 20 | 1 | 3 | Single LinCMOS Rail-to-Rail Very Low-Power Op Amp |
| TLV2731 | 10 | 2.7 | 1.2 | 0.75 | 2 | 1.25 | 0.75 | 3 | 1 | 70 | 16 | 1 | 3 | Single LinCMOS Rail-to-Rail Low-Power Op Amp |
| TLC2652 | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.004 | 0.003 | 4 | 140 | 23 | 1 | ±5 | Precision Chopper-Stabilized Op Amp |
| TLC2652A | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.002 | 0.001 | 4 | 140 | 35 | 1 | ±5 | Advanced LinCMOS Precision Chopper-Stabilized Op Amp |
| TLC4501 | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.08 | 0.08 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Single Op Amp |
| TLC4501A | 6 | 4 | 1.5 | 1 | 4.7 | 2.5 | 0.04 | 0.04 | 1 | 100 | 12 | 1 | 5 | Advanced LinEPIC Self-Calibrating (Self-Cal) Precision Op Amp |
| TLC4502 | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.1 | 0.1 | 1 | 100 | 12 | 2 | 5 | Advanced LinEPIC Self-Calibrating Precision Dual Op Amp |
| TLC4502A | 6 | 4 | 3.5 | 1.25 | 4.7 | 2.5 | 0.05 | 0.05 | 1 | 100 | 12 | 2 | 5 | Advanced, Self-Calibrating, Precision, Dual Op Amp |
| TLE2021 | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.85 | 0.6 | 25000 | 110 | 15 | 1 | 5 | Precision Low-Power Single Supply Op Amp |
| TLE2021A | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.6 | 0.3 | 25000 | 110 | 30 | 1 | 5 | Excalibur High-Speed Low-Power Precision Op Amp |
| TLE2021B | 40 | 4 | 0.3 | 0.2 | 2 | 0.65 | 0.3 | 0.2 | 25000 | 110 | 30 | 1 | 5 | Excalibur High-Speed Low-Power Precision Op Amp |
| TLE2022 | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.8 | 0.6 | 35000 | 100 | 15 | 2 | 5 | Dual Precision Low-Power Single Supply Op Amp |
| TLE2022A | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.55 | 0.4 | 33000 | 102 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2022B | 40 | 4 | 0.3 | 0.225 | 2.8 | 0.65 | 0.4 | 0.3 | 33000 | 105 | 15 | 2 | 5 | Excalibur High-Speed Low-Power Precision Dual Op Amp |
| TLE2024 | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.3 | 1.1 | 46000 | 90 | 15 | 4 | 5 | Quad Precision Low-Power Single Supply Op Amp |
| TLE2024A | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 1.05 | 0.85 | 40000 | 92 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2024B | 40 | 4 | 0.35 | 0.26 | 2.8 | 0.7 | 0.8 | 0.6 | 35000 | 95 | 15 | 4 | 5 | Excalibur High-Speed Low-Power Precision Quad Op Amp |
| TLE2141 | 44 | 4 | 4.5 | 3.5 | 5.9 | 45 | 1.3 | 0.9 | –7000 | 108 | 10.5 | 1 | ±15 | Low Noise High-Speed Precision Single Supply Op Amp |
| TLE2141A | 44 | 4 | 4.5 | 3.5 | 5.9 | 45 | 0.8 | 0.5 | –7000 | 108 | 10.5 | 1 | ±15 | Excalibur Low-Noise High-Speed Precision Op Amp |

## Operational Amplifiers—Single Supply (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2142 | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 1.6 | 1.2 | –7000 | 108 | 10.5 | 2 | ±15 | Dual Low-Noise High-Speed Precision Op Amp |
| TLE2142A | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 1.2 | 0.75 | –7000 | 108 | 10.5 | 2 | ±15 | Excalibur Low-Noise High-Speed Precision Dual Op Amp |
| TLE2144 | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 3.2 | 2.4 | –7000 | 108 | 10.5 | 4 | ±15 | Quad Low-Noise High-Speed Precision Op Amp |
| TLE2144A | 44 | 4 | 4.5 | 3.45 | 5.9 | 45 | 2.4 | 1.5 | –7000 | 108 | 10.5 | 4 | ±15 | Excalibur Low-Noise High-Speed Precision Quad Op Amp |
| TLC2252 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 2 | 5 | Dual Rail-to-Rail Micropower Op Amp |
| TLC2252A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 2 | 5 | Rail-to-Rail Dual Op Amp |
| TLC2254 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 4 | 5 | Quad Rail-to-Rail Micropower Op Amp |
| TLC2254A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 4 | 5 | Rail-to-Rail Quad Op Amp |
| TLC2262 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2262A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2264 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2264A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLC2272 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 2 | 5 | Dual Low-Noise Rail-to-Rail Op Amp |
| TLC2272A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2274 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 4 | 5 | Quad Low-Noise Rail-to-Rail Op Amp |
| TLC2274A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLC080 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC080A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC081 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC081A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 1 | 5 | Single Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC082 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC082A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp - No Shutdown |
| TLC083 | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1.5 | 1 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC083A | 16 | 4.5 | 2.5 | 1.9 | 10 | 16 | 1 | 0.75 | 3 | 140 | 8.5 | 2 | 5 | Dual Negative Rail Wide Bandwidth High Output Drive Single Supply Op Amp with Shutdown |
| TLC2201 | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.6 | 0.5 | 1 | 110 | 8 | 1 | 5 | Low Noise Precision Rail-to-Rail Output Op Amp |
| TLC2201A | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 15 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLC2201B | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 12 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |

## Operational Amplifiers—Single Supply (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC2202 | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 1.15 | 1 | 1 | 100 | 8 | 2 | 5 | Dual Low-Noise Precision Rail-to-Rail Op Amp |
| TLC2202A | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 15 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2202B | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 12 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2654 | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.034 | 0.02 | 50 | 125 | 13 | 1 | ±5 | Low-Noise Chopper-Stabilized Op Amp |
| TLC2654A | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.024 | 0.01 | 50 | 125 | 20 | 1 | ±5 | Advanced LinCMOS Low-Noise Chopper-Stabilized Op Amp |
| LT1014 | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 0.55 | 0.3 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1014A | 44 | 5 | 0.5 | 0.35 | 1 | 0.4 | 0.35 | 0.18 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1014D | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 1 | 0.8 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| **Low Voltage ($V_{CC}$ < 3 V)** | | | | | | | | | | | | | | |
| TLC1078 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 0.8 | 0.45 | 0.6 | 95 | 68 | 2 | 5 | Dual Micropower Precision Low-Voltage Op Amp |
| TLC1079 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 1.2 | 0.85 | 0.6 | 95 | 68 | 4 | 5 | Quad Micropower Precision Low-Voltage Op Amp |
| TLV2322 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 11 | 9 | 0.6 | 94 | 68 | 2 | 5 | Dual Low-Voltage Micropower Op Amp |
| TLV2324 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 12 | 10 | 0.6 | 94 | 68 | 4 | 5 | Quad Low-Voltage Micropower Op Amp |
| TLV2332 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 11 | 9 | 0.6 | 91 | 32 | 2 | 5 | Dual Low-Voltage Low-Power Op Amp |
| TLV2334 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Low-Voltage Low-Power Op Amp |
| TLV2341 | 8 | 2 | 1.6 | 0.675 | 1.7 | 3.6 | 10 | 8 | 0.6 | 80 | 25 | 1 | 5 | LinCMOS Programmable Low-Voltage Op Amp |
| TLV2342 | 8 | 2 | 1.5 | 0.325 | 0.79 | 2.1 | 11 | 9 | 0.6 | 80 | 25 | 2 | 5 | Dual LinCMOS Low-Voltage High-Speed Op Amp |
| TLV2344 | 8 | 2 | 1.5 | 0.325 | 0.79 | 2.1 | 12 | 10 | 0.6 | 78 | 25 | 4 | 5 | Quad LinCMOS Low-Voltage High-Speed Op Amp |
| TLV2361 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 1 | ±2.5 | Single High-Performance, Low-Voltage Op Amp |
| TLV2362 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 2 | ±2.5 | Dual High-Performance, Low-Voltage Op Amp |
| TLV2770 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2770A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2771A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 1 | 2.7 | Single 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2772A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.7 | 2.5 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2773A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 1.9 | 1.6 | 2 | 84 | 21 | 2 | 2.7 | Dual 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2774A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775 | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.9 | 2.7 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2775A | 5.5 | 2.5 | 2 | 1 | 4.8 | 9 | 2.2 | 2.1 | 2 | 84 | 21 | 4 | 2.7 | Quad 2.7-V High-Slew-Rate Rail-to-Rail Output Op Amp |
| TLV2211 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 3 | 0.45 | 1 | 83 | 22 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2221 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 3 | 0.45 | 1 | 85 | 19 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2231 | 10 | 2.7 | 1.2 | 0.85 | 2 | 1.6 | 3 | 0.45 | 1 | 70 | 15 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |

## Operational Amplifiers—Single Supply (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Voltage ($V_{CC}$ < 3 V) (Continued)** | | | | | | | | | | | | | | |
| TLV2252 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Voltage Rail-to-Rail Dual Op Amp |
| TLV2254 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2254A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 4 | 5 | Low-Voltage Rail-to-Rail Op Amp |
| TLV2262 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2262A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLV2264 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2264A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLV2422 | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Dual Wide-Input-Voltage Micropower, Rail-to-Rail Single-Supply Op Amp |
| TLV2422A | 10 | 2.7 | 0.075 | 0.05 | 0.052 | 0.02 | 1.5 | 0.95 | 1 | 90 | 18 | 2 | 5 | Rail-to-Rail Output Wide-Input-Voltage Micropower Dual Op Amps |
| TLV2432 | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 2.5 | 2 | 1 | 90 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2432A | 10 | 2.7 | 0.125 | 0.098 | 0.5 | 0.25 | 1.5 | 0.95 | 1 | 83 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2442 | 10 | 2.7 | 1.1 | 0.75 | 1.75 | 1.3 | 2.5 | 2 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2442A | 10 | 2.7 | 0.725 | 1.1 | 1.75 | 1.3 | 1.5 | 0.95 | 1 | 75 | 18 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Output Wide-Input-Voltage Dual Op Amp |
| TLV2450 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2450A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2451A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 1 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2452A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2453 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 2 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2453A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 2 | 3 | 23-µA 220-kHz Rail-to-Rail Input/Output Op Amp with Shutdown |
| TLV2454 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2454A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455 | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 2 | 1.5 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |
| TLV2455A | 6 | 2.7 | 0.035 | 0.023 | 0.22 | 0.12 | 1.3 | 1 | 900 | 86 | 51 | 4 | 3 | Micropower Rail-to-Rail Input/Output Op Amp |

## Operational Amplifiers—Single Supply (Continued)

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Voltage ($V_{CC}$ < 3 V) (Continued)** | | | | | | | | | | | | | | |
| TLV2460 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2460A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2461A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 1 | 3 | Single Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2462A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2463A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 2 | 3 | Dual Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2464A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465 | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 2.2 | 2 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2465A | 6 | 2.7 | 0.575 | 0.5 | 5.2 | 1.6 | 1.7 | 1.5 | 4400 | 80 | 11 | 4 | 3 | Quad Low-Power, Rail-to-Rail Input/Output Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2711 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 0.47 | 3 | 1 | 83 | 22 | 1 | 3 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2721 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 0.6 | 3 | 1 | 82 | 20 | 1 | 3 | Single LinCMOS Rail-to-Rail Very Low-Power Op Amp |
| TLV2731 | 10 | 2.7 | 1.2 | 0.75 | 2 | 1.25 | 0.75 | 3 | 1 | 70 | 16 | 1 | 3 | Single LinCMOS Rail-to-Rail Low-Power Op Amp |
| TLC2652 | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.004 | 0.003 | 4 | 140 | 23 | 1 | ±5 | Precision Chopper-Stabilized Op Amp |
| TLC2652A | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.002 | 0.001 | 4 | 140 | 35 | 1 | ±5 | Advanced LinCMOS Precision Chopper-Stabilized Op Amp |

## Operational Amplifiers—BiFET

Sorted By

| Device Name | $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{BB}/I_{CC}$ per Channel (max) (mA) | $I_{BB}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $e_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LF347 | 36 | 7 | 2.75 | 2 | 3 | 13 | 13 | 10 | 50 | 100 | 18 | 4 | ±15 | Quad General-Purpose JFET-Input Op Amp |
| LF347B | 36 | 7 | 2.75 | 2 | 3 | 13 | 7 | 5 | 50 | 100 | 18 | 4 | ±15 | Wide-Bandwidth JFET-Input Quad Op Amp |
| LF353 | 36 | 7 | 3.25 | 1.8 | 3 | 13 | 13 | 10 | 50 | 100 | 18 | 2 | ±15 | Dual General-Purpose JFET-Input Op Amp |
| LF411 | 36 | 7 | 3.4 | 2 | 3 | 13 | | 2 | 50 | 100 | 18 | 1 | ±15 | Precision JFET-Input Op Amp |
| LF412 | 36 | 7 | 3.4 | 2.25 | 3 | 13 | | 3 | 50 | 100 | 18 | 2 | ±15 | Dual JFET-Input Op Amp |
| TL061 | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 20 | 15 | 30 | 86 | 42 | 1 | ±15 | Low-Power JFET-Input General-Purpose Op Amp |
| TL061A | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 7.5 | 6 | 30 | 86 | 42 | 1 | ±15 | Low-Power JFET-Input Op Amp |
| TL061B | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 5 | 3 | 30 | 86 | 42 | 1 | ±15 | Low-Power JFET-Input Op Amp |
| TL062 | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 20 | 15 | 30 | 86 | 42 | 2 | ±15 | Dual Low-Power JFET-Input General-Purpose Op Amp |
| TL062A | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 7.5 | 6 | 30 | 86 | 42 | 2 | ±15 | Low-Power JFET-Input Op Amp |
| TL062B | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 5 | 3 | 30 | 86 | 42 | 2 | ±15 | Low-Power JFET-Input Op Amp |
| TL064 | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 20 | 15 | 30 | 86 | 42 | 4 | ±15 | Quad Low-Power JFET-Input General-Purpose Op Amp |
| TL064A | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 7.5 | 6 | 30 | 86 | 42 | 4 | ±15 | Low-Power JFET-Input Op Amp |
| TL064B | 36 | 7 | 0.25 | 0.2 | 1 | 3.5 | 5 | 3 | 30 | 86 | 42 | 4 | ±15 | Low-Power JFET-Input Op Amp |
| TL070 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input Decompensated Op Amp |
| TL071 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input General-Purpose Op Amp |
| TL071A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input Op Amp |
| TL071B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 1 | ±15 | Low-Noise JFET-Input Op Amp |
| TL072 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 2 | ±15 | Dual Low-Noise JFET-Input General-Purpose Op Amp |
| TL072A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 2 | ±15 | Low-Noise JFET-Input Op Amp |
| TL072B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 2 | ±15 | Low-Noise JFET-Input Op Amp |
| TL074 | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 13 | 10 | 65 | 100 | 18 | 4 | ±15 | Quad Low-Noise JFET-Input General-Purpose Op Amp |
| TL074A | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 7.5 | 6 | 65 | 100 | 18 | 4 | ±15 | Low-Noise JFET-Input Op Amp |
| TL074B | 36 | 7 | 2.5 | 1.4 | 3 | 13 | 5 | 3 | 65 | 100 | 18 | 4 | ±15 | Low-Noise JFET-Input Op Amp |
| TL081 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 1 | ±15 | JFET-Input General-Purpose Op Amp |
| TL081A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 1 | ±15 | JFET-Input Op Amp |
| TL081B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 1 | ±15 | JFET-Input Op Amp |
| TL082 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 2 | ±15 | Dual JFET-Input General-Purpose Op Amp |
| TL082A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 2 | ±15 | JFET-Input Op Amp |
| TL082B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 2 | ±15 | JFET-Input Op Amp |
| TL084 | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 20 | 15 | 30 | 86 | 18 | 4 | ±15 | Quad JFET-Input General-Purpose Op Amp |
| TL084A | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 7.5 | 6 | 30 | 86 | 18 | 4 | ±15 | JFET-Input Op Amp |
| TL084B | 36 | 7 | 2.8 | 1.4 | 3 | 13 | 5 | 3 | 30 | 86 | 18 | 4 | ±15 | JFET-Input Op Amp |
| TLE2061 | 36 | 7 | 0.35 | 0.29 | 2 | 3.4 | 4 | 3 | 4 | 90 | 40 | 1 | ±15 | JFET-Input High-Output-Drive Micropower Op Amp |

## Operational Amplifiers—BiFET (Continued)

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{IO}/I_{CC}$ per Channel (max) (mA) | $I_{IO}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/μs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IO}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLE2061A | 36 | 7 | 0.35 | 0.29 | 2 | 3.4 | 3.5 | 2.6 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp (Low-Power Version TIE2071) |
| TLE2061B | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 2.4 | 1.9 | 4 | 90 | 40 | 1 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2062 | 36 | 7 | 0.345 | 0.31 | 2 | 3.4 | 4.9 | 4 | 4 | 90 | 40 | 2 | ±15 | Dual JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2062A | 36 | 7 | 0.345 | 0.31 | 2 | 3.4 | 2.9 | 2 | 4 | 90 | 40 | 2 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Dual Op Amp |
| TLE2062B | 36 | 7 | 0.345 | 0.31 | 2 | 3.4 | 1.9 | 1 | 4 | 90 | 40 | 2 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Dual Op Amp |
| TLE2064 | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 6.9 | 6 | 4 | 90 | 40 | 4 | ±15 | Quad JFET-Input High-Output-Drive Micropower Op Amp |
| TLE2064A | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 4.9 | 4 | 4 | 90 | 40 | 4 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Quad Op Amp |
| TLE2064B | 36 | 7 | 0.35 | 0.31 | 2 | 3.4 | 2.9 | 2 | 4 | 90 | 40 | 4 | ±15 | Excalibur JFET-Input High-Output-Drive Micropower Quad Op Amp |
| TL031 | 30 | 10 | 0.28 | 0.217 | 1.1 | 5.1 | 2.5 | 1.5 | 2 | 94 | 41 | 1 | ±15 | Enhanced JFET Low-Power Precision Op Amp |
| TL032 | 30 | 10 | 0.28 | 0.211 | 1.1 | 5.1 | 2.5 | 1.5 | 2 | 94 | 41 | 2 | ±15 | Dual Enhanced JFET Low-Power Precision Op Amp |
| TL032A | 30 | 10 | 0.28 | 0.211 | 1.1 | 5.1 | 1.8 | 0.8 | 2 | 94 | 41 | 2 | ±15 | Enhanced-JFET Low-Power Low-Offset Dual Op Amp |
| TL034 | 30 | 10 | 0.28 | 0.2175 | 1.1 | 5.1 | 6.2 | 4 | 2 | 94 | 43 | 4 | ±15 | Quad Enhanced JFET Low-Power Precision Op Amp |
| TL034A | 30 | 10 | 0.28 | 0.2175 | 1.1 | 5.1 | 3.7 | 1.5 | 2 | 94 | 43 | 4 | ±15 | Enhanced-JFET Low-Power Low-Offset Quad Op Amp |
| TL051 | 30 | 10 | 3.2 | 2.7 | 3.1 | 20 | 2.5 | 1.5 | 30 | 93 | 18 | 1 | ±15 | Enhanced JFET Precision Op Amp |
| TL051A | 30 | 10 | 3.2 | 2.7 | 3.1 | 20 | 1.8 | 0.8 | 30 | 93 | 18 | 1 | ±15 | Enhanced-JFET Precision Op Amp |
| TL052 | 30 | 10 | 2.8 | 2.4 | 3 | 20.7 | 2.5 | 1.5 | 30 | 93 | 19 | 2 | ±15 | Dual Enhanced JFET Precision Op Amp |
| TL052A | 30 | 10 | 2.8 | 2.4 | 3 | 20.7 | 1.8 | 0.8 | 30 | 93 | 19 | 2 | ±15 | Enhanced-JFET Precision Dual Op Amp |
| TL054 | 30 | 10 | 2.8 | 2.1 | 2.7 | 17.8 | 6.2 | 4 | 30 | 92 | 21 | 4 | ±15 | Quad Enhanced JFET Precision Op Amp |
| TL054A | 30 | 10 | 2.8 | 2.1 | 2.7 | 17.8 | 3.7 | 1.5 | 30 | 92 | 21 | 4 | ±15 | Enhanced-JFET Precision Quad Op Amp |

## Operational Amplifiers—Bipolar

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2361 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 1 | ±2.5 | Single High-Performance, Low-Voltage Op Amp |
| TLV2362 | 5 | 2 | 2.5 | 1.75 | 7 | 3 | 7.5 | 6 | 20000 | 85 | 8 | 2 | ±2.5 | Dual High-Performance, Low-Voltage Op Amp |
| LM2902 | 26 | 3 | 0.3 | 0.175 | 0.4 | 0.25 | 10 | 7 | –20000 | 80 | 23 | 4 | 5 | Quad General-Purpose Op Amp |
| LM2904 | 26 | 3 | 0.6 | 0.35 | 0.4 | 0.15 | 10 | 7 | –20000 | 80 | 23 | 2 | 5 | Dual General-Purpose Op Amp |
| LM324 | 32 | 3 | 0.3 | 0.175 | 0.4 | 0.25 | 9 | 7 | –20000 | 80 | 23 | 4 | 5 | Quad General-Purpose Op Amp |
| LM324A | 32 | 3 | 0.3 | 0.175 | 0.4 | 0.25 | 5 | 3 | –15000 | 80 | 23 | 4 | 5 | Quadruple Op Amp |
| LM358 | 32 | 3 | 1 | 0.5 | 0.4 | | 9 | 7 | –20000 | 80 | 23 | 2 | 5 | Dual General-Purpose Op Amp |
| LM358A | 32 | 3 | 1 | 0.5 | 0.4 | | 5 | 3 | –15000 | 80 | 23 | 2 | 5 | Dual Op Amp |
| TL343 | 36 | 3 | 2.8 | 0.7 | 1 | 1 | 12 | 10 | –200 | 90 | | 1 | ±15 | Single Low-Power Op Amp |
| LT1013 | 44 | 4 | 0.55 | 0.35 | | 0.4 | 0.4 | 0.3 | –15000 | 114 | 22 | 2 | ±15 | Dual Precision Low-Power Op Amp |
| LT1013A | 44 | 4 | 0.5 | 0.35 | | 0.4 | 0.24 | 0.15 | –12000 | 117 | 22 | 2 | ±15 | Dual Precision Op Amp |
| LT1013D | 44 | 4 | 0.55 | 0.35 | | 0.4 | 1 | 0.8 | –15000 | 114 | 22 | 2 | ±15 | Dual Precision Op Amp |
| TL3472 | 36 | 4 | 4.5 | 3.5 | 4 | 13 | 12 | 10 | 100000 | 97 | 49 | 2 | ±15 | High-Slew-Rate, Single-Supply Op Amp |
| LT1014 | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 0.55 | 0.3 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1014A | 44 | 5 | 0.5 | 0.35 | 1 | 0.4 | 0.35 | 0.18 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| LT1014D | 44 | 5 | 0.55 | 0.35 | 1 | 0.4 | 1 | 0.8 | –12000 | 117 | 22 | 4 | ±15 | Quad Precision Op Amp |
| MC3403 | 30 | 5 | 1.75 | 0.7 | 1 | 0.6 | 12 | 10 | –200000 | 90 | | 4 | ±15 | Quad Low-Power General-Purpose Op Amp |
| OP07C | 36 | 6 | 5 | 2.7 | 0.6 | 0.3 | 0.25 | 0.15 | ±1800 | 120 | 9.8 | 1 | ±15 | Low-Offset Voltage Op Amp |
| OP07D | 36 | 6 | 5 | 2.7 | 0.6 | 0.3 | 0.25 | 0.15 | ±2000 | 110 | 9.8 | 1 | ±15 | Low-Offset Voltage Op Amp |
| UA741 | 36 | 7 | 2.8 | 1.7 | 1 | 0.5 | 7.5 | 6 | 80000 | 90 | | 1 | ±15 | General-Purpose Op Amp |
| LM348 | 36 | 8 | 1.125 | 0.6 | 1 | 0.5 | 7.5 | 6 | 30000 | 90 | 23 | 4 | ±15 | Quad General-Purpose Op Amp |
| LM318 | 40 | 10 | 10 | 5 | 15 | 70 | 15 | 10 | 150000 | 100 | 23 | 1 | ±15 | Single High-Speed Op Amp |
| MC1458 | 30 | 10 | 2.8 | 1.7 | 1 | 0.5 | 7.5 | 6 | 80000 | 90 | 45 | 2 | ±15 | Dual General-Purpose Op Amp |
| NE5532 | 30 | 10 | 8 | 4 | 10 | 9 | 5 | 4 | 200000 | 100 | 5 | 2 | ±15 | Dual Low-Noise High-Speed Audio Op Amp |
| NE5534 | 30 | 10 | 8 | 4 | 10 | 13 | 5 | 4 | 500000 | 100 | 4 | 1 | ±15 | Low-Noise High-Speed Audio Op Amp |
| NE5534A | 30 | 10 | 8 | 4 | 10 | 13 | 5 | 4 | 500000 | 100 | 3.5 | 1 | ±15 | Low-Noise Op Amp |
| RC4136 | 30 | 10 | 2.825 | 1.25 | 3 | 1.7 | 7.5 | 6 | 140000 | 90 | 8 | 4 | ±15 | Quad General-Purpose Op Amp |
| RC4558 | 30 | 10 | 2.8 | 1.25 | 3 | 1.7 | 7.5 | 6 | 150000 | 90 | 8 | 2 | ±15 | Dual General-Purpose Op Amp |
| TL022 | 30 | 10 | 0.125 | 0.065 | 0.5 | 0.5 | 7.5 | 5 | 100000 | 72 | 50 | 2 | ±15 | Dual Low-Power General-Purpose Op Amp |

## Operational Amplifiers—LinCMOS

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC1078 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 0.8 | 0.45 | 0.6 | 95 | 68 | 2 | 5 | Dual Micropower Precision Low-Voltage Op Amp |
| TLC1079 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.032 | 1.2 | 0.85 | 0.6 | 95 | 68 | 4 | 5 | Quad Micropower Precision Low-Voltage Op Amp |
| TLC251 | 16 | 1.4 | 1.6 | 0.675 | 1.7 | 3.6 | 12 | 10 | 0.6 | 80 | 25 | 1 | 5 | LinCMOS Programmable Low-Power Op Amp |
| TLC251A | 16 | 1.4 | 1.6 | 0.675 | 1.7 | 3.6 | 6.5 | 5 | 0.6 | 80 | 25 | 1 | 5 | Programmable Low-Power Op Amp |
| TLC251B | 16 | 1.4 | 1.6 | 0.675 | 1.7 | 3.6 | 3 | 2 | 0.6 | 80 | 25 | 1 | 5 | Programmable Low-Power Op Amp |
| TLC252 | 16 | 1.4 | 1.6 | 0.7 | 1.7 | 3.6 | 12 | 10 | 0.6 | 80 | 25 | 2 | 5 | Dual Low-Voltage Op Amp |
| TLC252A | 16 | 1.4 | 1.6 | 0.7 | 1.7 | 3.6 | 6.5 | 5 | 0.6 | 80 | 25 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC252B | 16 | 1.4 | 1.6 | 0.7 | 1.7 | 3.6 | 3 | 2 | 0.6 | 80 | 25 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC254 | 16 | 1.4 | 1.8 | 0.775 | 1.7 | 3.6 | 12 | 10 | 0.6 | 80 | 25 | 4 | 5 | Quad Low-Voltage Op Amp |
| TLC254A | 16 | 1.4 | 1.8 | 0.775 | 1.7 | 3.6 | 6.5 | 5 | 0.6 | 80 | 25 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC254B | 16 | 1.4 | 1.8 | 0.775 | 1.7 | 3.6 | 3 | 2 | 0.6 | 80 | 25 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25L2 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 68 | 2 | 5 | Dual Micropower Low-Voltage Op Amp |
| TLC25L2A | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25L2B | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25L4 | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 70 | 4 | 5 | Quad Micropower Low-Voltage Op Amp |
| TLC25L4A | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25L4B | 16 | 1.4 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25M2 | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 12 | 10 | 0.6 | 91 | 32 | 2 | 5 | Dual Low-Power Low-Voltage Op Amp |
| TLC25M2A | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 6.5 | 5 | 0.6 | 91 | 32 | 2 | 5 | LinCMOS Dual Op Amp |
| TLC25M4 | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Low-Power Low-Voltage Op Amp |
| TLC25M4A | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 6.5 | 5 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Quad Op Amp |
| TLC25M4B | 16 | 1.4 | 0.28 | 0.105 | 0.525 | 0.43 | 3 | 2 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Quad Op Amp |
| TLV2322 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 11 | 9 | 0.6 | 94 | 68 | 2 | 5 | Dual Low-Voltage Micropower Op Amp |
| TLV2324 | 8 | 2 | 0.017 | 0.01 | 0.027 | 0.02 | 12 | 10 | 0.6 | 94 | 68 | 4 | 5 | Quad Low-Voltage Micropower Op Amp |
| TLV2332 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 11 | 9 | 0.6 | 91 | 32 | 2 | 5 | Dual Low-Voltage Low-Power Op Amp |
| TLV2334 | 8 | 2 | 0.28 | 0.1 | 0.3 | 0.38 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Low-Voltage Low-Power Op Amp |
| TLV2341 | 8 | 2 | 1.6 | 0.675 | 1.7 | 3.6 | 10 | 8 | 0.6 | 80 | 25 | 1 | 5 | LinCMOS Programmable Low-Voltage Op Amp |
| TLV2342 | 8 | 2 | 1.5 | 0.325 | 0.79 | 2.1 | 11 | 9 | 0.6 | 80 | 25 | 2 | 5 | Dual LinCMOS Low-Voltage High-Speed Op Amp |
| TLV2344 | 8 | 2 | 1.5 | 0.325 | 0.79 | 2.1 | 12 | 10 | 0.6 | 78 | 25 | 4 | 5 | Quad LinCMOS Low-Voltage High-Speed Op Amp |
| TLV2211 | 10 | 2.7 | 0.025 | 0.013 | 0.065 | 0.025 | 3 | 0.45 | 1 | 83 | 22 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2221 | 10 | 2.7 | 0.15 | 0.11 | 0.51 | 0.18 | 3 | 0.45 | 1 | 85 | 19 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2231 | 10 | 2.7 | 1.2 | 0.85 | 2 | 1.6 | 3 | 0.45 | 1 | 70 | 15 | 1 | 5 | Single LinCMOS Rail-to-Rail Micropower Op Amp |
| TLV2252 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Micropower Op Amp |
| TLV2252A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 2 | 5 | Low-Voltage Rail-to-Rail Dual Op Amp |
| TLV2254 | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1.75 | 1.5 | 1 | 75 | 19 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Micropower Op Amp |

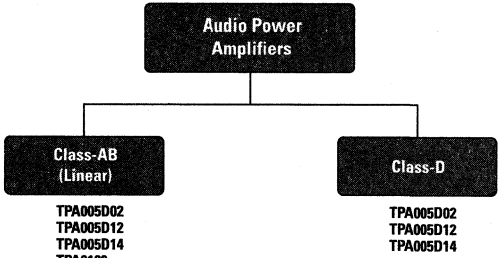
## Operational Amplifiers—LinCMOS (Continued)

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLV2254A | 8 | 2.7 | 0.0625 | 0.034 | 0.187 | 0.1 | 1 | 0.85 | 1 | 75 | 19 | 4 | 5 | Low-Voltage Rail-to-Rail Op Amp |
| TLV2262 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2262A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLV2264 | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Rail-to-Rail Low-Voltage Low-Power Op Amp |
| TLV2264A | 8 | 2.7 | 0.25 | 0.2 | 0.67 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLV2470 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2470A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2471A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 1 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2472 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2472A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp |
| TLV2473 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2473A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 2 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2474A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475 | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 2.4 | 2.2 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLV2475A | 6 | 2.7 | 0.75 | 0.55 | 2.8 | 1.4 | 1.8 | 1.6 | 2 | 78 | 15 | 4 | 3 | Low-Power Rail-to-Rail Input/Output Op Amp w/Shutdown |
| TLC271 | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 12 | 10 | 0.6 | 80 | 25 | 1 | 5 | LinCMOS Programmable Low-Power Op Amp |
| TLC271A | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 6.5 | 5 | 0.6 | 80 | 25 | 1 | 5 | Programmable Low-Power Op Amp |
| TLC271B | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 3 | 2 | 0.6 | 80 | 25 | 1 | 5 | Programmable Low-Power Op Amp |
| TLC272 | 16 | 3 | 1.6 | 0.7 | 1.7 | 3.6 | 12 | 10 | 0.6 | 80 | 25 | 2 | 5 | Dual Single Supply Op Amp |
| TLC272A | 16 | 3 | 1.6 | 0.7 | 1.7 | 3.6 | 6.5 | 5 | 0.6 | 80 | 25 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC272B | 16 | 3 | 1.6 | 0.7 | 1.7 | 3.6 | 3 | 2 | 0.6 | 80 | 25 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC274 | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 12 | 10 | 0.6 | 80 | 25 | 4 | 5 | Quad Single Supply Op Amp |
| TLC274A | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 6.5 | 5 | 0.6 | 80 | 25 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC274B | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 3 | 2 | 0.6 | 80 | 25 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC277 | 16 | 3 | 1.6 | 0.7 | 1.7 | 3.6 | 1.5 | 0.5 | 0.6 | 80 | 25 | 2 | 5 | Dual Precision Single Supply Op Amp |
| TLC279 | 16 | 3 | 1.6 | 0.675 | 1.7 | 3.6 | 1.5 | 0.9 | 0.6 | 80 | 25 | 4 | 5 | Quad Precision Single Supply Op Amp |
| TLC27L1 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 13 | 10 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L1A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 7 | 5 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L1B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3.5 | 2 | 0.6 | 94 | 68 | 1 | 5 | LinCMOS Low-Power Op Amp |
| TLC27L2 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 13 | 10 | 0.6 | 94 | 68 | 2 | 5 | Dual Precision Single Supply Micropower Op Amp |
| TLC27L2A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 7 | 5 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27L2B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3.5 | 2 | 0.6 | 94 | 68 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27L4 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 12 | 10 | 0.6 | 94 | 70 | 4 | 5 | Quad Precision Single Supply Micropower Op Amp |

## Operational Amplifiers—LinCMOS (Continued)

| Device Name | Sorted By $\Delta V_{CC}$ (max) (V) | $\Delta V_{CC}$ (min) (V) | $I_{DD}/I_{CC}$ per Channel (max) (mA) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | GBW (typ) (MHz) | Slew Rate (typ) (V/µs) | $V_{IO}$ (Full Range) (max) (mV) | $V_{IO}$ (25°C) (max) (mV) | $I_{IB}$ (typ) (pA) | CMRR (typ) (dB) | $V_n$ (typ) (nV/√Hz) | No. of Chan. | Spec'd at $V_{CC}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLC27L4A | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 6.5 | 5 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27L4B | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 3 | 2 | 0.6 | 94 | 70 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27L7 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 2 | 0.5 | 0.6 | 94 | 68 | 2 | 5 | Dual Precision Single Supply Micropower Op Amp |
| TLC27L9 | 16 | 3 | 0.017 | 0.01 | 0.085 | 0.03 | 1.5 | 0.9 | 0.6 | 94 | 70 | 4 | 5 | Quad Precision Single Supply Micropower Op Amp |
| TLC27M2 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 13 | 10 | 0.6 | 91 | 32 | 2 | 5 | Dual Precision Single Supply Low-Power Op Amp |
| TLC27M2A | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 7 | 5 | 0.6 | 91 | 32 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27M2B | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 3.5 | 2 | 0.6 | 91 | 32 | 2 | 5 | LinCMOS Precision Dual Op Amp |
| TLC27M4 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 12 | 10 | 0.6 | 91 | 32 | 4 | 5 | Quad Precision Single Supply Low-Power Op Amp |
| TLC27M4A | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 6.5 | 5 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27M4B | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 3 | 2 | 0.6 | 91 | 32 | 4 | 5 | LinCMOS Precision Quad Op Amp |
| TLC27M7 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 2 | 0.5 | 0.6 | 91 | 32 | 2 | 5 | Dual Precision Single Supply Low-Power Op Amp |
| TLC27M9 | 16 | 3 | 0.28 | 0.105 | 0.525 | 0.43 | 1.5 | 0.9 | 0.6 | 91 | 32 | 4 | 5 | Quad Precision Single Supply Low-Power Op Amp |
| TLC2652 | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.004 | 0.003 | 4 | 140 | 23 | 1 | ±5 | Precision Chopper-Stabilized Op Amp |
| TLC2652A | 16 | 3.8 | 2.4 | 1.5 | 1.9 | 3.1 | 0.002 | 0.001 | 4 | 140 | 35 | 1 | ±5 | Advanced LinCMOS Precision Chopper-Stabilized Op Amp |
| TLC2252 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 2 | 5 | Dual Rail-to-Rail Micropower Op Amp |
| TLC2252A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 2 | 5 | Rail-to-Rail Dual Op Amp |
| TLC2254 | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1.75 | 1.5 | 1 | 83 | 19 | 4 | 5 | Quad Rail-to-Rail Micropower Op Amp |
| TLC2254A | 16 | 4.4 | 0.0625 | 0.035 | 0.2 | 0.12 | 1 | 0.85 | 1 | 83 | 19 | 4 | 5 | Rail-to-Rail Quad Op Amp |
| TLC2262 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 2 | 5 | Dual Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2262A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2264 | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 3 | 2.5 | 1 | 83 | 12 | 4 | 5 | Quad Advanced LinCMOS Rail-to-Rail Op Amp |
| TLC2264A | 16 | 4.4 | 0.25 | 0.2 | 0.82 | 0.55 | 1.5 | 0.95 | 1 | 83 | 12 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLC2272 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 2 | 5 | Dual Low-Noise Rail-to-Rail Op Amp |
| TLC2272A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 2 | 5 | Advanced LinCMOS Rail-to-Rail Dual Op Amp |
| TLC2274 | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 3 | 2.5 | 1 | 75 | 9 | 4 | 5 | Quad Low-Noise Rail-to-Rail Op Amp |
| TLC2274A | 16 | 4.4 | 1.5 | 1.1 | 2.18 | 3.6 | 1.5 | 0.95 | 1 | 75 | 9 | 4 | 5 | Advanced LinCMOS Rail-to-Rail Quad Op Amp |
| TLC2201 | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.6 | 0.5 | 1 | 110 | 8 | 1 | 5 | Low Noise Precision Rail-to-Rail Output Op Amp |
| TLC2201A | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 15 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLC2201B | 16 | 4.6 | 1.5 | 1 | 1.8 | 2.5 | 0.3 | 0.2 | 1 | 110 | 12 | 1 | 5 | Advanced LinCMOS Low-Noise Precision Op Amp |
| TLC2202 | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 1.15 | 1 | 1 | 100 | 8 | 2 | 5 | Dual Low-Noise Precision Rail-to-Rail Op Amp |
| TLC2202A | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 15 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2202B | 16 | 4.6 | 1.3 | 0.85 | 1.9 | 2.5 | 0.65 | 0.5 | 1 | 100 | 12 | 2 | 5 | Advanced LinCMOS Low-Noise Precision Dual Op Amp |
| TLC2654 | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.034 | 0.02 | 50 | 125 | 13 | 1 | ±5 | Low-Noise Chopper-Stabilized Op Amp |
| TLC2654A | 16 | 4.6 | 2.4 | 1.5 | 1.9 | 3.7 | 0.024 | 0.01 | 50 | 125 | 20 | 1 | ±5 | Advanced LinCMOS Low-Noise Chopper-Stabilized Op Amp |

## Audio Power Amplifiers




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/amp_comp/index.htm

## Audio Power Amplifiers

| Device Name | Output Power (W) | $V_{CC}/V_{DD}$ (max) (V) | $V_{CC}/V_{DD}$ (min) (V) | THD+N @ 1 kHz (%) | PSRR (dB) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | ISD (µA) | Description |
|---|---|---|---|---|---|---|---|---|
| **Class-AB (Linear)** | | | | | | | | |
| TPA005D02 | 2 | 5.5 | 4.5 | 0.4 | 40 | 12 | 400 | 2W Stereo Class-D Audio Amplifier |
| TPA005D12 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amplifier |
| TPA005D14 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amplifier |
| TPA0102 | 1.5 | 5.5 | 3 | 0.05 | 75 | 10 | 5 | 1.5W Stereo Audio Power Amplifier |
| TPA0103 | 1.75 | 5.5 | 3 | 0.05 | 75 | 10 | 5 | 1.75W 3-Channel Stereo Audio Power Amplifier |
| TPA0112 | 2 | 5.5 | 4.5 | 0.75 | 77 | 3 | 150 | Stereo 2W APA with Internal Gain Settings |
| TPA0122 | 2 | 5.5 | 4.5 | 0.5 | 77 | 9 | 150 | 2W Stereo APA with Internal Gain Settings |
| TPA0132 | 2 | 5.5 | 4.5 | 0.4 | 67 | 5 | 150 | 2W Stereo APA with DC Volume Control |
| TPA0142 | 2 | 5.5 | 4.5 | 0.22 | 67 | 10 | 150 | 2W Stereo APA with DC Volume Control |
| TPA0152 | 2 | 5.5 | 4.5 | 0.3 | 67 | 5 | 150 | Stereo 2W Audio Power Amplifier with Digital Volume Control |
| TPA0162 | 2 | 5.5 | 4.5 | 0.22 | 67 | 10 | 150 | 2W Stereo APA with Digital Volume Control |
| TPA0202 | 2 | 5.5 | 3 | 0.05 | 75 | 10 | 5 | 2W Stereo Audio Power Amplifier |
| TPA102 | 0.15 | 5.5 | 2.5 | 0.05 | 76 | 0.75 | 60 | 150-mW Stereo Audio Power Amplifier |
| TPA112 | 0.15 | 5.5 | 2.5 | 0.05 | 76 | 0.75 | | 150-mW Stereo Audio Power Amplifier |
| TPA122 | 0.15 | 5.5 | 2.5 | 0.05 | 76 | 0.75 | 60 | 150-mW Stereo Audio Power Amplifier |
| TPA1517 | 6 | 18 | 9.5 | 10 | 65 | 20 | 7 | 6W Stereo Audio Power Amplifier |
| TPA152 | 0.075 | 5.5 | 4.5 | 0.02 | 81 | 3 | | Single-Ended Audio Power Amplifier |
| TPA301 | 0.35 | 5.5 | 2.5 | 0.3 | 78 | 0.7 | 0.15 | 0.35W Mono Audio Power Amplifier |
| TPA302 | 0.3 | 5.5 | 2.7 | 0.08 | 65 | 2 | 0.6 | 0.3W Stereo Audio Power Amplifier |
| TPA311 | 0.35 | 5.5 | 2.5 | 0.3 | 78 | 0.7 | 7 | 0.35W Mono Audio Power Amplifier |
| TPA4860 | 1 | 5.5 | 2.7 | 0.3 | 75 | 3.5 | 0.6 | 1W Mono Audio Power Amplifier |
| TPA4861 | 1 | 5.5 | 2.7 | 0.3 | 75 | 3.5 | 0.6 | 1W Mono Audio Power Amplifier |
| TPA701 | 0.7 | 5.5 | 2.5 | 0.2 | 85 | 1.25 | 0.0015 | 700-mW Low-Voltage Audio Power Amplifier |
| TPA711 | 0.7 | 5.5 | 2.5 | 0.2 | 85 | 1.25 | 50 | 700-mW Low-Voltage Audio Power Amplifier |
| TPA721 | 0.7 | 5.5 | 2.5 | 0.2 | 85 | 1.25 | 50 | 700-mW Low-Voltage Audio Power Amplifier |
| **Class-D** | | | | | | | | |
| TPA005D02 | 2 | 5.5 | 4.5 | 0.4 | 40 | 12 | 400 | 2W Stereo Class-D Audio Amplifier |
| TPA005D12 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amplifier |
| TPA005D14 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amplifier |

## High-Speed Amplifiers

**High-Speed Amplifiers**

THS3001
THS3002
THS4001
THS4011
THS4012
THS4021
THS4022
THS4031
THS4032
THS4041
THS4042
THS4051
THS4052
THS4061
THS4062
THS6002
THS6012
THS6022
THS6062
THS7001
THS7002

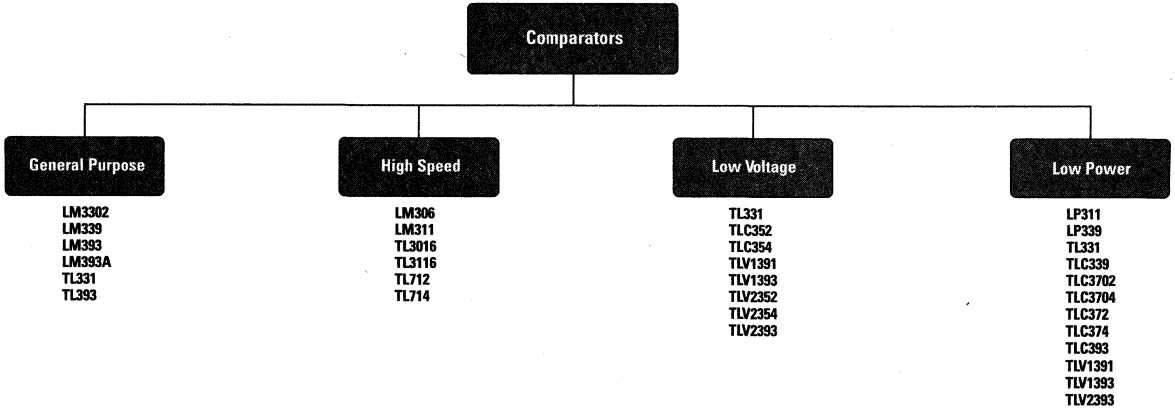
For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/amp_comp/index.htm

For an overview of High-Speed Amplifiers, refer to:
www.ti.com/sc/docs/products/msp/amp_comp/hi_speed.htm

## High-Speed Amplifiers

| Device Name | $V_{CC}/V_{DD}$ ±15 (V) | ±5 (V) | 5 (V) | $A_{CL}$, min Stable Gain (V/V) | BW @ $A_{CL}$ (MHz) | Slew Rate (V/µs) | Settling Time (0.1%) (typ) (ns) | Settling Time (0.01%) (typ) (ns) | $I_O$ (typ) (mA) | THD ($F_C$ = 1 MHz) (typ) (dB) | Diff Gain (%) | Diff Phase (°) | $V_n$ (typ) (nV/√Hz) | $V_{io}$ (max) (mV) | $I_{IB}$ (max) (µA) | $I_{CC}$ per Channel (typ) (mA) | No. of Chan. | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THS3001 | Yes | Yes | No | 1 | 420 | 6500 | 40 | | 120 | –96 | 0.01 | 0.02 | | 3 | 10 | 7.5 | 1 | 420-MHz High-Speed Amplifier |
| THS3002 | Yes | Yes | No | 1 | 420 | 470 | 40 | | 120 | –80 | 0.01 | 0.02 | 1.6 | 3 | 10 | 6.6 | 2 | High-Speed Amplifiers |
| THS4001 | Yes | Yes | Yes | 1 | 270 | 400 | 40 | | 100 | –72 | 0.04 | 0.15 | 12.5 | 8 | 5 | 7.8 | 1 | 270-MHz High-Speed Amplifier |
| THS4011 | | | | 1 | 290 | 310 | 37 | 90 | 110 | –80 | 0.006 | 0.01 | 7.5 | 6 | 6 | 7.8 | 1 | 290-MHz Low-Distortion High-Speed Amplifier |
| THS4012 | | | | 1 | 290 | 310 | 37 | 90 | 110 | –80 | 0.006 | 0.01 | 7.5 | 6 | 6 | 7.8 | 2 | 290-MHz Dual Low-Distortion High-Speed Amplifier |
| THS4021 | | | | 10 | 350 | 470 | | | 100 | | 0.02 | 0.08 | 1.5 | 2 | 6 | 7.8 | 1 | Very Low Noise High-Speed Operational Amplifier |
| THS4022 | | | | 10 | 350 | 470 | | | 100 | | 0.02 | 0.08 | 1.5 | 2 | 6 | 7.8 | 2 | 350-MHz Low-Noise High-Speed Amplifier |
| THS4031 | | | | 2 | 100 | 100 | 60 | 90 | 90 | –72 | 0.015 | 0.025 | 1.6 | 2 | 6 | 8.5 | 1 | Low-Noise High-Speed Amplifier |
| THS4032 | | | No | 2 | 100 | 100 | 60 | 90 | 90 | –72 | 0.015 | 0.025 | 1.6 | 2 | 6 | 8.5 | 2 | Low-Noise Dual High-Speed Amplifiers |
| THS4041 | Yes | Yes | Yes | 1 | 165 | 400 | | | 100 | | 0.01 | 0.01 | 14 | 10 | 6 | 8 | 1 | 165-MHz C-Stable High-Speed Amplifier |
| THS4042 | | | | 1 | 165 | 400 | | | 100 | | 0.01 | 0.01 | 14 | 10 | 6 | 8 | 2 | 180-MHz Dual C-Stable High-Speed Amplifiers |
| THS4051 | | | | 1 | 70 | 240 | 60 | 130 | 100 | –82 | 0.01 | 0.01 | 14 | 10 | 6 | 8.5 | 1 | 70-MHz High-Speed Amplifier |
| THS4052 | | | | 1 | 70 | 240 | 60 | 130 | 100 | –82 | 0.01 | 0.01 | 14 | 10 | 6 | 8.5 | 2 | 70-MHz Dual High-Speed Amplifiers |
| THS4061 | | | | 1 | 180 | 400 | 40 | 140 | 115 | –72 | 0.02 | 0.02 | 14.5 | 8 | 6 | 7.8 | 1 | 180-MHz High-Speed Amplifier |
| THS4062 | | | | 1 | 180 | 400 | 40 | 140 | 115 | –72 | 0.02 | 0.02 | 14.5 | 8 | 6 | 7.8 | 2 | 180-MHz Dual High-Speed Amplifiers |
| THS6002 | Yes | Yes | | 1 | 140 | 1000 | 70 | | 480 | –62 | 0.05 | 0.08 | | 5 | 9 | 11.2 | 4 | Dual Differential Line Drivers and Receivers |
| THS6012 | Yes | Yes | | 1 | 140 | 1300 | 70 | | 500 | –65 | 0.05 | 0.08 | | 5 | 9 | 11.5 | 2 | 500-mA Dual High-Speed Amplifiers |
| THS6022 | Yes | Yes | | 1 | 210 | 1900 | 70 | | 250 | –66 | 0.04 | 0.06 | | 4 | 9 | 7.2 | 2 | 250-mA Dual High-Speed Amplifiers |
| THS6062 | Yes | Yes | | 2 | 100 | 100 | 60 | 90 | 90 | –72 | | | 1.6 | 6 | 6 | 8.5 | 2 | Low-Noise ADSL Differential Receiver |
| THS7001 | | | No | 1 | 75 | 175 | 125 | | 50 | | 0.02 | 0.01 | 1.7 | 5 | 6 | 12 | 1 | 70-MHz Programmable-Gain Amplifier |
| THS7002 | | | No | 1 | 75 | 175 | 125 | | 50 | –69 | 0.02 | 0.01 | 1.7 | 5 | 6 | 12 | 2 | 70-MHz Dual Programmable-Gain Amplifiers |

## Comparators




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/amp_comp/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Comparators

| Device Name | $V_{CC}/V_{DD}$ (max) (V) | $V_{CC}/V_{DD}$ (min) (V) | $I_{CC}/I_{DD}$ per Channel (max) (mA) | $V_{IO}$ (max) (mV) | $V_{ICR}$ (max) (V) | $V_{ICR}$ (min) (V) | $I_{OL}$ (min) (mA) | $t_{RESP}$ Low-to-High (µs) | Description |
|---|---|---|---|---|---|---|---|---|---|
| **General Purpose** | | | | | | | | | |
| LM3302 | 28 | 2 | 0.2 | 20 | 3.5 | 0 | 6 | 0.3 | Quad General Purpose Differential Comparator |
| LM339 | 30 | 4 | 0.5 | 5 | 3.5 | 0 | 6 | 0.3 | Quad General Purpose Differential Comparator |
| LM393 | 30 | 4 | 1.25 | 5 | 3.5 | 0 | 6 | 0.3 | Dual General Purpose Differential Comparator |
| LM393A | 30 | 4 | 0.5 | 2 | 3.5 | 0 | 6 | 0.3 | Dual General Purpose Differential Comparator |
| TL331 | 36 | 2 | 0.7 | 0.4 | 34.5 | 0 | 6 | 0.3 | Single Differential Comparator |
| TL393 | 7 | 2 | 0.4 | 5 | 3.8 | 0 | 6 | 0.2 | Dual General Purpose Differential Comparator |
| **High Speed** | | | | | | | | | |
| LM306 | 12 | –6 | 6.8 | 5 | 5 | –5 | 100 | 0.028 | Single Strobed, High-Speed Differential Comparator |
| LM311 | 30 | 4 | 7.5 | 7.5 | 13.8 | –14.7 | 8 | 0.115 | Single Strobed Differential Comparator |
| TL3016 | 7 | –7 | 12.5 | 3 | 3.5 | –3.75 | | 0.0078 | Ultra-Fast Low-Power Precision Comparator |
| TL3116 | 7 | –7 | 14.7 | 3 | 2.5 | -5 | | 0.0099 | Ultra-Fast Low-Power Precision Comparator |
| TL712 | 5.25 | 4.75 | 20 | 5+ | 5 | 0 | 16 | 0.025 | Differential Comparator |
| TL714 | 5.25 | 4.75 | 12 | 10+ | 5 | 0 | 16 | 0.006 | High-Speed Differential Comparator |
| **Low Voltage** | | | | | | | | | |
| TL331 | 36 | 2 | 0.7 | 0.4 | 34.5 | 0 | 6 | 0.3 | Single Differential Comparator |
| TLC352 | 16 | 1.4 | 0.15 | 5 | 4 | 0 | 6 | 0.2 | Dual Low-Voltage LinCMOS Differential Comparator |
| TLC354 | 16 | 1.4 | 0.15 | 5 | 4 | 0 | 6 | 0.2 | Quad Low-Voltage LinCMOS Differential Comparator |
| TLV1391 | 7 | 2 | 0.15 | 5 | 3.8 | 0 | 0.6 | 0.65 | Single Differential Comparator |
| TLV1393 | 7 | 2 | 0.125 | 5 | 1.8 | 0 | 0.5 | 0.7 | Dual Low-Voltage, Low-Power Differential Comparator |
| TLV2352 | 8 | 2 | 0.125 | 5 | 2 | 0 | 6 | 0.2 | Dual Low-Voltage LinCMOS Differential Comparator |
| TLV2354 | 8 | 2 | 0.125 | 5 | 2 | 0 | 6 | 0.2 | Quad Low-Voltage LinCMOS Differential Comparator |
| TLV2393 | 7 | 2 | 0.65 | 5 | 1.8 | 0 | 4 | 0.45 | Dual Low-Voltage Differential Comparator |

## Comparators (Continued)

| Device Name | $V_{CC}/V_{DD}$ (max) (V) | $V_{CC}/V_{DD}$ (min) (V) | $I_{CC}/I_{DD}$ per Channel (max) (mA) | $V_{IO}$ (max) (mV) | $V_{ICR}$ (max) (V) | $V_{ICR}$ (min) (V) | $I_{OL}$ (min) (mA) | $t_{PHL}$ Low-to-High (µs) | Description |
|---|---|---|---|---|---|---|---|---|---|
| **Low Voltage** | | | | | | | | | |
| LP311 | 30 | 4 | 0.3 | 7.5 | 13.5 | –14.5 | 1.6 | 1.2 | Single Low-Power, Strobed Differential Comparator |
| LP339 | 30 | 4 | 0.025 | 5 | 3.5 | 0 | 6 | 1.3 | Quad Low-Power, General Purpose Differential Comparator |
| TL331 | 36 | 2 | 0.7 | 0.4 | 34.5 | 0 | 6 | 0.3 | Single Differential Comparator |
| TLC339 | 16 | 3 | 0.02 | 5 | 4 | 0 | 6 | 1 | Quad Micropower LinCMOS Comparator |
| TLC3702 | 16 | 3 | 0.02 | 5 | 4 | 0 | 4 | 1.1 | Dual Micropower Push-Pull Outputs, LinCMOS Voltage Comparator |
| TLC3704 | 16 | 3 | 0.02 | 5 | 4 | 0 | 4 | 1.1 | Quad Micropower Push-Pull Outputs, LinCMOS Voltage Comparator |
| TLC372 | 16 | 3 | 0.15 | 5 | 4 | 0 | 6 | 0.2 | Dual General Purpose LinCMOS Differential Comparator |
| TLC374 | 16 | 3 | 0.15 | 5 | 4 | 0 | 6 | 0.2 | Quad General Purpose LinCMOS Differential Comparator |
| TLC393 | 16 | 3 | 0.02 | 5 | 4 | 0 | 6 | 1.1 | Dual Micropower LinCMOS Voltage Comparator |
| TLV1391 | 7 | 2 | 0.15 | 5 | 3.8 | 0 | 0.6 | 0.65 | Single Differential Comparator |
| TLV1393 | 7 | 2 | 0.125 | 5 | 1.8 | 0 | 0.5 | 0.7 | Dual Low-Voltage, Low-Power Differential Comparator |
| TLV2393 | 7 | 2 | 0.65 | 5 | 1.8 | 0 | 4 | 0.45 | Dual Low-Voltage Differential Comparator |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

Audio Power Amplifiers, 2000 ..... SLOD004
High-Speed Amplifiers, 2000 ..... SLOD005
Operational Amplifiers and Comparators Vol A, 1997 ..... SLYD011A
Operational Amplifiers and Comparators Vol B, 1997 ..... SLYD012A
Operational Amplifiers Data Book of New Releases, 2000 ..... SLOD002
Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D

## Selection Guides

Audio Power Amplifiers Sine On, Autumn/Winter 1999 ..... SLLM016
Operational Amplifiers/High-Speed Amplifiers Sine On, 1999 ..... SLOT131
Operational Amplifiers EVM Selection Guide ..... SLOU060

## Application Notes

***Operational Amplifiers***

Low-Power Signal Conditioning for a Pressure Sensor ..... SLAA034
Understanding Operational Amplifier Specifications ..... SLOA011
Using the TLV246X as a Multiplexer with Gain in a Data Acquisition System ..... SLOA012
Effect of Parasitic Capacitance in Op Amp Circuits ..... SLOA013
Feedback Amplifier Analysis Tools ..... SLOA017
Noise Analysis in Op Amp Circuits ..... SLVA043
3-V Accelerometer Featuring TLV2772 Application Brief ..... SLVA050
Choosing an ADC and Op Amp for Minimum Offset ..... SLAA064
Stability Analysis of Voltage-Feedback Op Amps Including Compensation Technique ..... SLOA020
Understanding Basic Analog-Passive Devices ..... SLOA027
Understanding Basic Analog-Active Devices ..... SLOA026
Understanding Basic Analog Circuit Equations ..... SLOA025
Single Supply Op Amp Design Techniques ..... SLOA030
Application of Rail-to-Rail Op Amps ..... SLOA039

***High-Speed Amplifiers***

Noise Analysis in Op Amp Circuits ..... SLVA043
Measuring Differential Gain and Phase ..... SLOA040
Current Feedback Amplifier Analysis and Compensation ..... SLOA021
PowerPAD™ Thermally Enhanced Package Application Report ..... SLMA002
Effect of Parasitic Capacitance in Op Amp Circuits ..... SLOA013
Analysis of the Sallen-Key Architecture ..... SLOA024A
PowerPAD Made Easy ..... SLMA004
Driving Capacitance with the THS3001 ..... SLOA014
Driving Capacitance with the THS4001 ..... SLOA015
Feedback Amplifier Analysis Tools ..... SLOA017
Building a Simple Spice Model for the THS3001 ..... SLOA018
Gain Block Analysis for the THS3001 ..... SLOA019
Voltage Feedback vs. Current Feedback Op Amps ..... SLVA051
10-MHz Butterworth Filter Using the Operational Amplifier THS4001 ..... SLOA032

***Audio Power Amplifiers***

Design Considerations for Class-D Audio Power Amplifiers ..... SLOA031
Mono Configuration of the TPA005D02 Class-D Audio Power Amplifier ..... SLOA028
Reducing and Eliminating the Class-D Output Filter ..... SLOA023

## Evaluation Modules and Development Tools

Each evaluation module (EVM) kit contains a fully-assembled evaluation board, a data sheet and a user's guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number, 1-800-477-8924, ext. 5800 in North America. To check availability and CE certification, and to order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see www.ti.com/sc/docs/general/distrib.htm for distributor listings.

| TITLE | ORDER NO. |
|---|---|
| ***Operational Amplifiers*** | |
| Universal EVM for Operational Amplifiers | SLOP120 or UNIV-OPAMP-1B |
| Universal EVM for Operational Amplifiers with Shutdown | SLOP224 or UNIV-OPAMP-2B |
| ***High-Speed Amplifiers*** | |
| THS3001 . . . . . 420-MHz, 6500-V/µs | THS3001EVM |
| THS4001 . . . . . 3000-MHz, 400-V/µs | THS4001EVM |
| THS4011 . . . . . 290-MHz, 310-V/µs | THS4011EVM |
| THS4012 . . . . . 290-MHz, 310-V/µs | THS4012EVM |
| THS4021 . . . . . 350-MHz, 470-V/µs, Low Noise | THS4021EVM |
| THS4022 . . . . . 350-MHz, 470-V/µs, Low Noise | THS4022EVM |
| THS4031 . . . . . 100-MHz, 100-V/µs, Low Noise | THS4031EVM |
| THS4032 . . . . . 100-MHz, 100-V/µs, Low Noise | THS4032EVM |
| THS4041 . . . . . 165-MHz, 400-V/µs | THS4041EVM |
| THS4042 . . . . . 165-MHz, 400-V/µs | THS4042EVM |
| THS4051 . . . . . 70-MHz, 240-V/µs | THS4051EVM |
| THS4052 . . . . . 70-MHz, 240-V/µs | THS4052EVM |
| THS4061 . . . . . 180-MHz, 400-V/µs | THS4061EVM |
| THS4062 . . . . . 180-MHz, 400-V/µs | THS4062EVM |
| THS6002 . . . . . ADSL Transceiver | THS6002EVM |
| THS6012 . . . . . ADSL Driver | THS6012EVM |
| THS6022 . . . . . ADSL Driver | THS6022EVM |
| THS6032 . . . . . ADSL Driver | THS6032EVM |
| THS6062 . . . . . ADSL Receiver | THS6062EVM |
| THS7001 . . . . . 70-MHz, PGA | THS7001EVM |
| THS7002 . . . . . 70-MHz, PGA | THS7002EVM |
| ***Audio Power Amplifiers*** | |
| . . . . . Plug-n-Play DC/DC Converter Platform | TL5001EVM-097 |
| . . . . . APA Plug-n-Play Microphone Mixer | MIC/MIXEREVM |
| . . . . . Plug-n-Play Platform & Speaker | TPABASEKITEVM |
| TPA005D12. . . . . 2W Class-D Stereo APA | TPA005D12EVM |
| TPA005D14. . . . . 2W Class-D Stereo APA with headphone drive | TPA005D14EVM |
| TPA0102. . . . . 1.5W Stereo APA | TPA0102EVM |
| TPA0103. . . . . 1.75W Mono APA with Stereo Headphone Drive | TPA0103EVM |
| TPA0112. . . . . 2W Stereo APA with Internal Gain Settings | TPA0112EVM |
| TPA0122. . . . . 2W Stereo APA with Internal Gain Settings | TPA0122EVM |
| TPA0132. . . . . 2W Stereo APA with DC Volume Control | TPA0132EVM |
| TPA0142. . . . . 2W Stereo APA with DC Volume Control | TPA0142EVM |
| TPA0152. . . . . 2W Stereo APA with Digital Volume Control | TPA0152EVM |
| TPA0162. . . . . 2W Stereo APA with Digital Volume Control | TPA0162EVM |

## Evaluation Modules and Development Tools (Continued)

| TITLE | | ORDER NO. |
|---|---|---|
| ***Audio Power Amplifiers (Continued)*** | | |
| TPA0202 | 2W Stereo APA with Depop | TPA0202EVM |
| TPA102MSOP | 150-mW Stereo Headphone APA | TPA102MSOPEVM |
| TPA112MSOP | 150-mW Stereo Headphone APA | TPA112MSOPEVM |
| TPA122MSOP | 150-mW Stereo Headphone APA | TPA122MSOPEVM |
| TPA1517DWP | 6W Stereo APA (SOIC) | TPA1517DWPEVM |
| TPA1517NE | 6W Stereo APA (PDIP) | TPA1517NEEVM |
| TPA152 | 75-mW Hi-Fi Stereo Headphone APA | TPA152EVM |
| TPA301 | 350-mW Mono APA with Ultra-Low Shutdown | TPA301EVM |
| TPA302 | Audio Power Amplifier | TPA302EVM |
| TPA311 | 350-mW Mono Speaker or Headphone APA | TPA311EVM |
| TPA311MSOP | 350-mW Mono Speaker or Headphone APA | TPA311MSOPEVM |
| TPA4860 | 1W Mono APA with Headphone Sense | TPA4860EVM |
| TPA4861 | 1W Mono APA | TPA4861EVM |
| TPA701MSOP | 700-mW Mono APA with Ultra-Low Shutdown | TPA701MSOPEVM |
| TPA711MSOP | 700-mW Mono Speaker or Headphone APA | TPA711MSOPEVM |
| TPA721MSOP | 700-mW Mono APA with Depop | TPA721MSOPEVM |

# Audio Products



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Digital Filtering Processors ..... 2-5
USB Audio ..... 2-5

**Resources** ..... 2-6

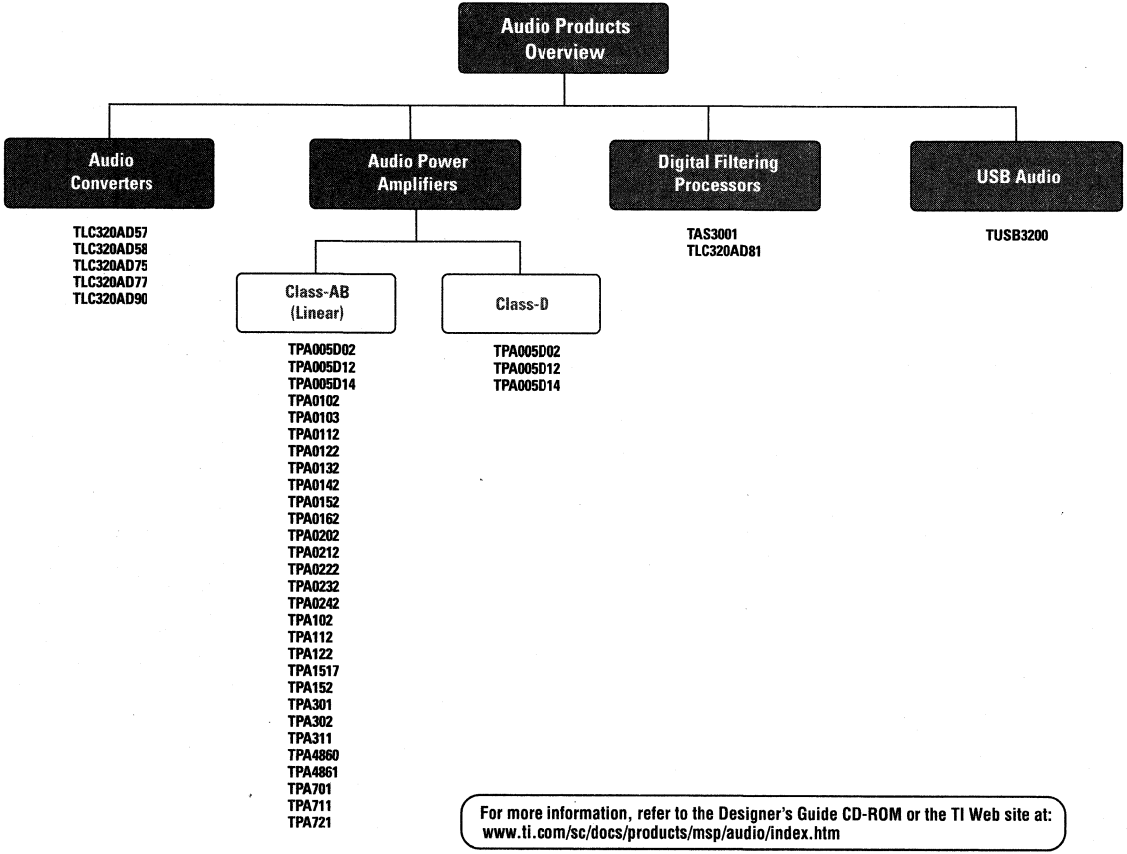
**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

## Audio Products Overview




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/audio/index.htm

## Audio Converters

| Device Name | Resolution (Bits) | SNR (typ) (dB) | Architecture | Supply Voltage(s) (V) | Bandwidth (Hz) | $P_d$ (typ) (mW) | Sampling Rate (max) (kHz) | Description |
|---|---|---|---|---|---|---|---|---|
| TLC320AD57 | 16/18 | 97 | Stereo ADC | 5 | 20 to 20K | 220 | 48 | 18-Bit Stereo ADC |
| TLC320AD58 | 16/18 | 100 | Stereo ADC | 5 | 20 to 20K | 250 | 48 | 18-Bit Stereo ADC |
| TLC320AD75 | 20 | 104 | Stereo Codec | 5 | 20 to 20K | 400 | 44.1 | 20-Bit Stereo Audio Codec, 104-dB SNR |
| TLC320AD77 | 24 | 100 | Stereo Codec | 3.3 | 20 to 20K | 160 | 96 | Stereo Audio ADA |
| TLC320AD90 | 20 | 90 | AC97 Codec | 3.3, 5 | 20 to 20K | 235 | 48 | 20-Bit Stereo AC97 Audio Codec |

## Audio Power Amplifiers

| Device Name | Sorted By Output Power (W) | $V_{CC}/V_{DD}$ (max) (V) | $V_{CC}/V_{DD}$ (min) (V) | THD+N @ 1 kHz (%) | PSRR (dB) | $I_{DD}/I_{CC}$ per Channel (typ) (mA) | ISD (µA) | Description |
|---|---|---|---|---|---|---|---|---|
| **Class-AB (Linear)** | | | | | | | | |
| TPA152 | 0.075 | 5.5 | 4.5 | 0.02 | 81 | 3 | | Single-Ended Audio Power Amplifier |
| TPA102 | 0.15 | 5.5 | 2.5 | 0.05 | 76 | 0.75 | 60 | 150-mW Stereo Audio Power Amplifier |
| TPA112 | 0.15 | 5.5 | 2.5 | 0.05 | 76 | 0.75 | | 150-mW Stereo Audio Power Amplifier |
| TPA122 | 0.15 | 5.5 | 2.5 | 0.05 | 76 | 0.75 | 60 | 150-mW Stereo Audio Power Amplifier |
| TPA302 | 0.3 | 5.5 | 2.7 | 0.08 | 65 | 2 | 0.6 | 0.3W Stereo Audio Power Amplifier |
| TPA301 | 0.35 | 5.5 | 2.5 | 0.3 | 78 | 0.7 | 0.15 | 0.35W Mono Audio Power Amplifier |
| TPA311 | 0.35 | 5.5 | 2.5 | 0.3 | 78 | 0.7 | 7 | 0.35W Mono Audio Power Amplifier |
| TPA701 | 0.7 | 5.5 | 2.5 | 0.2 | 85 | 1.25 | 0.0015 | 700-mW Low-Voltage Audio Power Amp |
| TPA711 | 0.7 | 5.5 | 2.5 | 0.2 | 85 | 1.25 | 50 | 700-mW Low-Voltage Audio Power Amp |
| TPA721 | 0.7 | 5.5 | 2.5 | 0.2 | 85 | 1.25 | 50 | 700-mW Low-Voltage Audio Power Amp |
| TPA4860 | 1 | 5.5 | 2.7 | 0.3 | 75 | 3.5 | 0.6 | 1W Mono Audio Power Amplifier |
| TPA4861 | 1 | 5.5 | 2.7 | 0.3 | 75 | 3.5 | 0.6 | 1W Mono Audio Power Amplifier |
| TPA0102 | 1.5 | 5.5 | 3 | 0.05 | 75 | 10 | 5 | 1.5W Stereo Audio Power Amplifier |
| TPA0103 | 1.75 | 5.5 | 3 | 0.05 | 75 | 10 | 5 | 1.75W 3-Channel Stereo Audio Power Amplifier |
| TPA005D02 | 2 | 5.5 | 4.5 | 0.4 | 40 | 12 | 400 | 2W Stereo Class-D Audio Amplifier |
| TPA005D12 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amp |
| TPA005D14 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amp |
| TPA0112 | 2 | 5.5 | 4.5 | 0.75 | 77 | 3 | 150 | Stereo 2W APA with Internal Gain Settings |
| TPA0122 | 2 | 5.5 | 4.5 | 0.5 | 77 | 9 | 150 | 2W Stereo APA with Internal Gain Settings |
| TPA0132 | 2 | 5.5 | 4.5 | 0.4 | 67 | 5 | 150 | 2W Stereo APA with DC Volume Control |
| TPA0142 | 2 | 5.5 | 4.5 | 0.22 | 67 | 10 | 150 | 2W Stereo APA with DC Volume Control |
| TPA0152 | 2 | 5.5 | 4.5 | 0.3 | 67 | 5 | 150 | Stereo 2W Audio Power Amp with Digital Volume Control |
| TPA0162 | 2 | 5.5 | 4.5 | 0.22 | 67 | 10 | 150 | 2W Stereo APA with Digital Volume Control |
| TPA0202 | 2 | 5.5 | 3 | 0.05 | 75 | 10 | 5 | 2W Stereo Audio Power Amplifier |
| TPA0212 | 2 | 5.5 | 4.5 | 0.75 | 77 | 3 | 150 | Stereo 2W Audio Power Amp with 4 Selectable Gain Settings |
| TPA0222 | 2 | 5.5 | 4.5 | 0.5 | 77 | 9 | 150 | Stereo 2W Audio Power Amp with 4 Selectable Gain Settings |
| TPA0232 | 2 | 5.5 | 4.5 | 0.4 | 67 | 5 | 150 | Stereo 2W Audio Power Amp with DC Volume Control |
| TPA0242 | 2 | 5.5 | 4.5 | 0.22 | 67 | 10 | 150 | Stereo 2W Audio Power Amp with DC Volume Control |
| TPA1517 | 6 | 18 | 9.5 | 10 | 65 | 20 | 7 | 6W Stereo Audio Power Amplifier |
| **Class-D** | | | | | | | | |
| TPA005D02 | 2 | 5.5 | 4.5 | 0.4 | 40 | 12 | 400 | 2W Stereo Class-D Audio Amplifier |
| TPA005D12 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amp |
| TPA005D14 | 2 | 5.5 | 4.5 | 0.2 | 40 | 12.5 | 0.2 | Class-D Stereo Audio Power Amp |

## Digital Filtering Processors

| Device Name | Resolution (Bits) | SNR (typ) (dB) | Supply Voltage(s) (V) | Bandwidth (Hz) | $P_d$ (typ) (mW) | Sampling Rate (kHz) | Description |
|---|---|---|---|---|---|---|---|
| TAS3001 | 20 | | 3.3 | 0 to 20K | 40 | 48 | Stereo Audio Digital Equalizer |
| TLC320AD81 | 18 | 98 | 3.3 | 20 to 20K | 84 | 44.1 or 48 | Stereo Audio Digital Equalizer DAC |

## USB Audio

| Device Name | DMA Channels | Number of Audio Channels (max) | Application Code Space (kB) | Buffer Size (kB) | Supply Voltage(s) (V) | Description |
|---|---|---|---|---|---|---|
| TUSB3200 | 4 | 8 | 8 | 2 | 3.3, 5 | USB Streaming Controller (STC) |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

Audio Power Amplifiers, 2000 ..... SLOD004
Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D

## Selection Guides

Audio Power Amplifiers Sine On, 1999 ..... SLLM016

## Application Notes

***Audio Power Amplifiers***

Design Considerations for Class-D Audio Power Amplifiers ..... SLOA031
Mono Configuration of the TPA005D02 Class-D Audio Power Amplifier ..... SLOA028
Reducing and Eliminating the Class-D Output Filter ..... SLOA023

## Evaluation Modules and Development Tools

Each evaluation module (EVM) kit contains a fully-assembled evaluation board, a data sheet and a user's guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number, 1-800-477-8924, ext. 5800 in North America. To check availability and CE certification, and to order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see www.ti.com/sc/docs/general/distrib.htm for distributor listings.

| | TITLE | ORDER NO. |
|---|---|---|
| ***Audio Power Amplifiers (APA)*** | | |
| ..... | Plug-n-Play DC/DC Converter Platform | TL5001EVM-097 |
| ..... | APA Plug-n-Play Microphone Mixer | MIC/MIXEREVM |
| ..... | Plug-n-Play Platform & Speaker | TPABASEKITEVM |
| THS3001 | 420-MHz High-Speed Current Feedback Amplifier | THS3001EVM |
| THS4001 | 270-MHz High-Speed Amplifier | THS4001EVM |
| THS6002 | Dual Differential Line Drivers & Receivers | THS6002EVM |
| THS7002 | Dual 70-MHz Programmable Gain Amplifier | THS7002EVM |
| THS6062 | Low-Noise xDSL Differential Receiver | THS6062EVM |
| THS6022 | Dual 250-mA High-Speed Amplifier | THS6022EVM |
| THS6012 | Dual 500-mA High-Speed Amplifiers | THS6012EVM |
| THS4061 | 180-MHz High-Speed Amplifier | THS4061EVM |
| THS4062 | Dual 180-MHz High-Speed Amplifiers | THS4062EVM |
| THS4051 | 70-MHz High-Speed Amplifier | THS4051EVM |
| THS4052 | Dual 70-MHz High-Speed Amplifiers | THS4052EVM |
| THS4041 | 180-MHz C-Stable High-Speed Amplifier | THS4041EVM |
| THS4042 | Dual 180-MHz C-Stable High-Speed Amplifiers | THS4042EVM |
| THS4031 | 100-MHz Low-Noise High-Speed Amplifier | THS4031EVM |
| THS4032 | Dual 100-MHz Low-Noise High-Speed Amplifiers | THS4032EVM |
| TPA005D12 | 2W Class-D Stereo APA | TPA005D12EVM |
| TPA005D14 | 2W Class-D Stereo APA with headphone drive | TPA005D14EVM |
| TPA0102 | 1.5W Stereo APA | TPA0102EVM |
| TPA0103 | 1.75W Mono APA with Stereo Headphone Drive | TPA0103EVM |

## Evaluation Modules and Development Tools (Continued)

| TITLE | | ORDER NO. |
|---|---|---|
| ***Audio Power Amplifiers (APA) (Continued)*** | | |
| TPA0112 | 2W Stereo APA with Internal Gain Settings | TPA0112EVM |
| TPA0122 | 2W Stereo APA with Internal Gain Settings | TPA0122EVM |
| TPA0132 | 2W Stereo APA with DC Volume Control | TPA0132EVM |
| TPA0142 | 2W Stereo APA with DC Volume Control | TPA0142EVM |
| TPA0152 | 2W Stereo APA with Digital Volume Control | TPA0152EVM |
| TPA0162 | 2W Stereo APA with Digital Volume Control | TPA0162EVM |
| TPA0202 | 2W Stereo APA with Depop | TPA0202EVM |
| TPA032D01 | 10W Mono Class-D APA | TPA032D01EVM |
| TPA032D02 | 10W Stereo Class-D APA | TPA032D02EVM |
| TPA032D03 | 10W Mono Class-D APA with Stereo Headphone Drive | TPA032D03EVM |
| TPA032D04 | 10W Stereo Class-D APA with Stereo Headphone Drive | TPA032D04EVM |
| TPA102MSOP | 150-mW Stereo Headphone APA | TPA102MSOPEVM |
| TPA112MSOP | 150-mW Stereo Headphone APA | TPA112MSOPEVM |
| TPA122MSOP | 150-mW Stereo Headphone APA | TPA122MSOPEVM |
| TPA1517DWP | 6W Stereo APA (SOIC) | TPA1517DWPEVM |
| TPA1517NE | 6W Stereo APA (PDIP) | TPA1517NEEVM |
| TPA152 | 75-mW Hi-Fi Stereo Headphone APA | TPA152EVM |
| TPA301 | 350-mW Mono APA with Ultra-Low Shutdown | TPA301EVM |
| TPA302 | Audio Power Amplifier | TPA302EVM |
| TPA311 | 350-mW Mono Speaker or Headphone APA | TPA311EVM |
| TPA311MSOP | 350-mW Mono Speaker or Headphone APA | TPA311MSOPEVM |
| TPA4860 | 1W Mono APA with Headphone Sense | TPA4860EVM |
| TPA4861 | 1W Mono APA | TPA4861EVM |
| TPA701MSOP | 700-mW Mono APA with Ultra-Low Shutdown | TPA701MSOPEVM |
| TPA711MSOP | 700-mW Mono Speaker or Headphone APA | TPA711MSOPEVM |
| TPA721MSOP | 700-mW Mono APA with Depop | TPA721MSOPEVM |

# Clocks and Timers

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**Introduction and New Product Previews** ..... 3-2

**Product Decision Tree and Selection Guides**

Clocks and Timers Overview ..... 3-3
- Clock Buffers/Drivers ..... 3-4
- Clock Synthesizers/Drivers ..... 3-4
- Direct RambusTM Clock Generators ..... 3-5
- Phase-Lock Loops (PLLs) ..... 3-5
- PLL Clock Drivers ..... 3-6
- Timers ..... 3-7
- Digital Phase-Locked Loops (PLLs) ..... 3-7

**Resources** ..... 3-8

**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

## Clocks and Timers

TI's clock distribution circuits provide accurate clock-generation circuitry fundamental to every digital system, producing timing signals that are used to synchronize system activity. To meet the stringent clock-signal timing requirements of today's systems, TI offers a series of low propagation delay and skew, high-fan-out clock drivers designed to effectively drive high-performance clocking systems.

- Low propagation delay and skew, high-fan-out clock drivers designed to effectively drive high-performance clocking systems.
- Provide accurate clock-generation circuitry fundamentals to every digital system.
- Special clock-driver functions available in the ACL, ABT, and AS technologies, as well as 3 V and 5 V.
- Come in buffered, flip-flop, and phase-locked loop-based elements.
- Available in a variety of packages, including standard and advanced surface-mount packaging.

## Phase-Lock Loops

For general purpose video clock synchronization and generation, TI's TLC29xx CMOS family of products is an industry leader in analog PLLs because of its variable-frequency locking-point capability. High speed and stable oscillation make these devices suitable for high-performance operation. Typical applications include:

- Frequency synthesis
- Modulation/demodulation
- Fractional Frequency Division

## Clocks and Timers New Product Previews

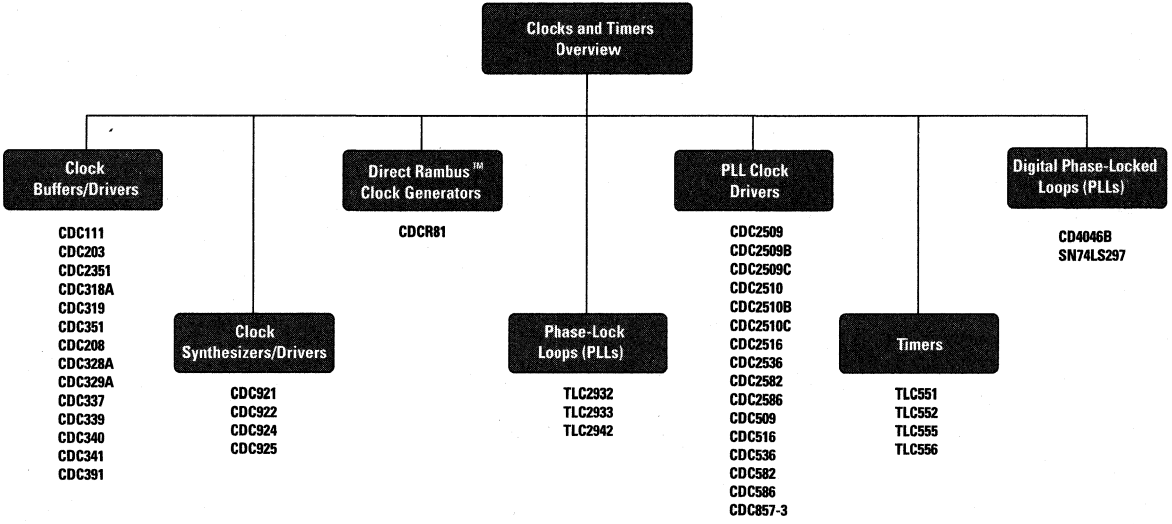
The following new devices are expected to be released in the near future. For more information, please refer to the Designer's Guide CD-ROM, literature number SLYC005D.

| Device | Description |
|---|---|
| **Phase-Lock Loops** | |
| TLC2940 | 75-MHz High-Performance CMOS VCO |
| TLC2943 | 100-MHz High-Performance Dual PLL Building Block |

### Web Locations for Specific Product Groups

| | |
|---|---|
| Clocks and Timers | www.ti.com/sc/docs/products/msp/clock/index.htm |

## Clocks and Timers Overview




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/clock/index.htm

For an overview of Clock Buffers/Drivers, Clock Synthesizers/Drivers, Direct Rambus Clock Generators, and PLL Clock Drivers, refer to:
www.ti.com/sc/docs/products/msp/clock/cdc/cdc.htm

For an overview of Digital Phase-Locked Loops (PLLs), refer to:
www.ti.com/sc/docs/products/logic/overview.htm

For an overview of Phase-Lock Loops (PLLs), refer to:
www.ti.com/sc/docs/products/msp/clock/pll/overview.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Clock Buffers/Drivers

| Device Name | Input Level | Output Level | Sorted By $V_{CC}$ (V) | No. of Outputs | Frequency (max) (MHz) | $I^2C$ | Hex Inverter | Description |
|---|---|---|---|---|---|---|---|---|
| CDC111 | LVPECL | LVPECL | 3.3 | 9 | 500 | No | No | 3.3-V Driver |
| CDC203 | CMOS | CMOS | 3.3 | 6 | 40 | No | Yes | 3.3-V Driver |
| CDC2351 | LVTTL | LVTTL | 3.3 | 10 | 100 | No | No | 3.3-V Driver |
| CDC318A | LVTTL | LVTTL/TTL | 3.3 | 18 | 100 | Yes | No | 1-Line to 18-Line Clock Driver with $I^2C$ Control Interface |
| CDC319 | LVTTL | LVTTL/TTL | 3.3 | 10 | 100 | Yes | No | 1-Line to 10-Line Clock Driver |
| CDC351 | LVTTL | LVTTL | 3.3 | 10 | 100 | No | No | 3.3-V Driver |
| CDC208 | TTL | CMOS | 5 | 8 | 60 | No | No | Dual 1-to-4 Clock Drivers |
| CDC328A | TTL | TTL | 5 | 6 | 100 | No | No | 1-to-6 Clock Driver with Selectable Polarity |
| CDC329A | TTL | CMOS | 5 | 6 | 80 | No | No | 1-to-6 Clock Driver with Selectable Polarity |
| CDC337 | TTL | CMOS | 5 | 8 | 80 | No | No | 1-to-8 (4 Same Frequency, 4 Divide-By-2) Clock Driver with Clear |
| CDC339 | TTL | TTL | 5 | 8 | 80 | No | No | 1-to-8 (4 Same Frequency, 4 Divide-By-2) Clock Driver with Clear |
| CDC340 | TTL | TTL | 5 | 8 | 80 | No | No | 1-to-8 Clock Driver with Tight AC Specification |
| CDC341 | TTL | TTL | 5 | 8 | 80 | No | No | 1-to-8 Clock Driver with Tight AC Specification |
| CDC391 | TTL | TTL | | 6 | | | | 1-to-6 Clock Driver with Selectable Polarity |

## Clock Synthesizers/Drivers

| Device Name | Input Level | Output Level | $V_{CC}$ Range (V) | No. of 100/133-MHz Outputs | No. of 50/66-MHz Outputs | No. of 48-MHz Outputs | No. of 33-MHz Outputs | Description |
|---|---|---|---|---|---|---|---|---|
| CDC921 | CMOS | CMOS | 3 to 3.6 | 3 | 4 | 1 | 10 | 133-MHz Clock Synthesizer/Driver for PC Motherboards with 3-State Outputs |
| CDC922 | CMOS | CMOS | 3 to 3.6 | 3 | 4 | 1 | 10 | 133-MHz Clock Synthesizer/Driver for PC Motherboards with 3-State Outputs |
| CDC924 | CMOS | CMOS | 3 to 3.6 | 4 | 6 | 1 | 8 | PC Motherboard 133-MHz Clock Synthesizer w/3-State Outputs |
| CDC925 | CMOS | CMOS | 3 to 3.6 | 4 | 6 | 1 | 8 | 133-MHz Clock Synthesizer/Driver for PC Motherboards with 3-State Outputs |

## Direct Rambus™ Clock Generators

| Device Name | Input Level | Output Level | Main Supply ($V_{DD}$) (V) | Frequency (max) (MHz) | Jitter (Cycle-to-Cycle) (ps) | Gear Ratio | Description |
|---|---|---|---|---|---|---|---|
| CDCR81 | TTL | RSL | 3.3 | 400 | 50 | 4,6,8,8/3 | Direct Rambus Clock Generator |

## Phase-Lock Loops (PLLs)

| Device Name | Supply Voltage(s) (V) | 5-V Lock Frequency x 1 Output (MHz) | 5-V Lock Frequency x 1/2 Output (MHz) | 3-V Lock Frequency x 1 Output (MHz) | 3-V Lock Frequency x 1/2 Output (MHz) | Description |
|---|---|---|---|---|---|---|
| TLC2932 | 3 or 5 | 22 to 50 | 11 to 25 | 14 to 21 | 7 to 10.5 | Phase-Lock Loop |
| TLC2933 | 3 or 5 | 43 to 100 | | 37 to 55 | | High-Performance Phase-Lock Loop |
| TLC2942 | 3 or 5 | 22 to 50 | 11 to 25 | 14 to 21 | 7 to 10.5 | High-Performance Dual Phase-Lock Loop Building Block |

## PLL Clock Drivers

| Device Name | Input Level | Output Level | $V_{CC}$ Range (V) | t (Phase Error) (max) (ps) | t (Phase Error) (min) (ps) | No. of Outputs | Operating Frequency Range (max) (MHz) | Spread Spectrum Clocking (SSC) | Absolute Jitter (Cycle-to-Cycle) (ps) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| CDC2509 | LVTTL | TTL | 3.3 | 480 | 100 | 9 | 25 to 126 | No | | 3.3-V Phase-Lock Loop Clock Driver with 3-State Outputs |
| CDC2509B | LVTTL | TTL | 3.3 | 200 | –200 | 9 | 25 to 125 | Yes | 100 | 1-to-9 PLL Clock Driver |
| CDC2509C | LVTTL | TTL | 3.3 | 150 | –150 | 9 | 25 to 126 | Yes | 100 | 1-to-9 PLL Clock Driver |
| CDC2510 | LVTTL | TTL | 3.3 | 100 | –700 | 10 | 25 to 125 | Yes | | 3.3-V Phase-Lock Loop Clock Driver |
| CDC2510B | LVTTL | TTL | 3.3 | 200 | –200 | 10 | 25 to 125 | Yes | 100 | 3.3-V Phase-Lock Loop Clock Driver |
| CDC2510C | LVTTL | TTL | 3.3 | 150 | –150 | 10 | 25 to 125 | Yes | 100 | 3.3-V Phase-Lock Loop Clock Driver |
| CDC2516 | LVTTL | TTL | 3.3 | 400 | –80 | 16 | 25 to 125 | No | | 3.3-V Phase-Lock Loop Clock Driver with 3-State Outputs |
| CDC2536 | LVTTL | TTL | 3.3 | 500 | 500 | 6 | | No | | 3.3-V Driver |
| CDC2582 | LVPECL | TTL | 3.3 | 500 | –500 | 12 | 25 to 100 | No | 100 | 3.3-V Driver |
| CDC586 | TTL | TTL | 3.3 | 500 | 500 | 12 | 25 to 100 | No | | 3.3-V Driver |
| CDC509 | LVTTL | LVTTL | 3 to 3.6 | | | 9 | | | | 3.3-V Driver |
| CDC516 | LVTTL | LVTTL | 3 to 3.6 | | | 16 | | | | 3.3-V Driver |
| CDC536 | TTL | LVTTL | 3 to 3.6 | | | 6 | | | | 3.3-V Driver |
| CDC582 | LVPECL | LVTTL | 3 to 3.6 | | | 12 | | | | 3.3-V Driver |
| CDC586 | LVTTL | LVTTL | 3 to 3.6 | | | 6 | | | | 3.3-V Driver |
| CDC857-3 | SSTL-2/LVTTL | SSTL-2 | 3 to 3.6 | | | 10 | | | | |

## Timers

| Device Name | $V_{CC}$ (max) (V) | Frequency (min) (V) | (max) (MHz) | Description |
|---|---|---|---|---|
| TLC551 | 15 | 1 | 1.8 | LinCMOS™ Timer |
| TLC552 | 18 | 1 | 2.8 | Dual LinCMOS Timer |
| TLC555 | 15 | 2 | 2.1 | Low-Power Timer |
| TLC556 | 15 | 2 | 2.1 | Dual LinCMOS Timer |

## Digital Phase-Locked Loops (PLLs)

| Device Name | Voltage Nodes (V) | Description |
|---|---|---|
| CD4046B | 5, 10, 15 | CMOS Micropower Phase-Lock Loop |
| SN74LS297 | 5 | Digital Phase-Locked-Loop Filters |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

***Clock Distribution Circuits***

Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D
CDC Clock Distribution Circuits ..... SCAD004B

## Application Notes

***Clock Distribution Circuits***

Analog Applications Journal ..... SLYT010
Application and Design Considerations for CDC5xx Phase-Lock Loop Clock Drivers ..... SCAA028
Clock Distribution In High-Performance PCs ..... SCAA030A
Electrostatic Discharge Application Note ..... SSYA008
EMI Prevention in Clock-Distribution Circuits ..... SCAA031
Minimizing Clock Driver Output Skew Using Ganged Outputs ..... SCAA032
Phase-Lock Loop-Based (PLL) Clock Drivers: Benefits Versus Costs ..... SCAA033A
Thermal Characteristics of Linear and Logic Packages Using JEDEC PCB Designs ..... SZZA017A
Advanced BiCMOS Technology (ABT) Logic Characterization Information ..... SCBA008B
Advanced BiCMOS Technology (ABT) Logic Enables Optimal System Design ..... SCBA001A
Bus-Interface Devices with Output-Damping Resistors or Reduced-Drive Outputs ..... SCBA012A
Designing with Logic ..... SDYA009C
Family of Curves Demonstrating Output Skews for Advanced BiCMOS Devices ..... SCBA006A
Implications of Slow or Floating CMOS Inputs ..... SCBA004C
Input and Output Characteristics of Digital Integrated Circuits ..... SDYA010
Live Insertion ..... SDYA012
Understanding Advanced Bus-Interface Products Design Guide ..... SCAA029

***Phase-Lock Loops***

PLL Building Block With Analog Voltage-Controlled Oscillator ..... SLAA011B
Analog Applications Journal ..... SLYT010
TLC2932 Evaluation Module Technical Reference ..... SLAU003A

***Digital Phase-Locked-Loops (PLLs) Family***

CMOS Phase-Locked-Loop Applications ..... SCHA003
COS/MOS Phase-Locked-Loop ..... SCHA002
Digital PLL Design Using the SN54/74LS297 ..... SDLA005B

## Evaluation Modules and Development Tools

Each evaluation module (EVM) kit contains a fully-assembled evaluation board, a data sheet and a user's guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number, 1-800-477-8924, ext. 5800 in North America. To check availability and CE certification, and to order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see www.ti.com/sc/docs/general/distrib.htm for distributor listings.

| TITLE | ORDER NO. |
|---|---|
| ***Phase-Lock Loops*** | |
| TLC2932 . . . . . Evaluation Module for Low Jitter PLL . . . . . | TLC2932-EVM |

# Control and Monitoring Products

## Contents

**Introduction** ..... 4-2

**Product Decision Tree and Selection Guides**

Control and Monitoring Products Overview ..... 4-3

Power+™ Control ..... 4-4

Power+ Logic™ ..... 4-5

Power+ Arrays™ ..... 4-5

Temp Monitoring and Fan Control ..... 4-5

**Resources** ..... 4-6

**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

## Control Products

Texas Instruments offers an extensive line of the industry standard integrated circuits designed to provide highly reliable circuits for switching inductive loads such as lamps, solenoids, motors, valves, and relays.

TI power devices represent technologies from the classic bipolar process to the Texas Instruments mixed-signal process, which offer improvements in power consumption and temperature stability.

This section provides information on the following products:

- Power+ Logic™—control logic integrated on same substrate with multiple power FETs
- Power+™ Control—integrated power ICs and FET pre-drivers with companion power FET arrays
- Power+ Arrays™—integrated multiple, rugged power FETs in cost-effective packaging

TI continues to enhance quality and reliability of integrated circuits by improving materials, processes, test methods, and test equipment. Quality and performance are monitored throughout all phases of manufacturing; quality specifications and programs are continuously enhanced.

## Monitoring Products

Hardware monitoring and control (HMC) reduces the total cost of PC ownership and operation and increases user satisfaction through thermal management. The cost of ownership is reduced by lowering the power consumption which reduces operating cost and increases the reliability of PCs. User productivity is maximized by allowing the processor to operate at the optimal speed and by early problem detection to minimize system downtime and loss of costly data. Fan rpm control improves the work environment by reducing fan noise.

HMC provides solutions to enhance electronic system reliability by:

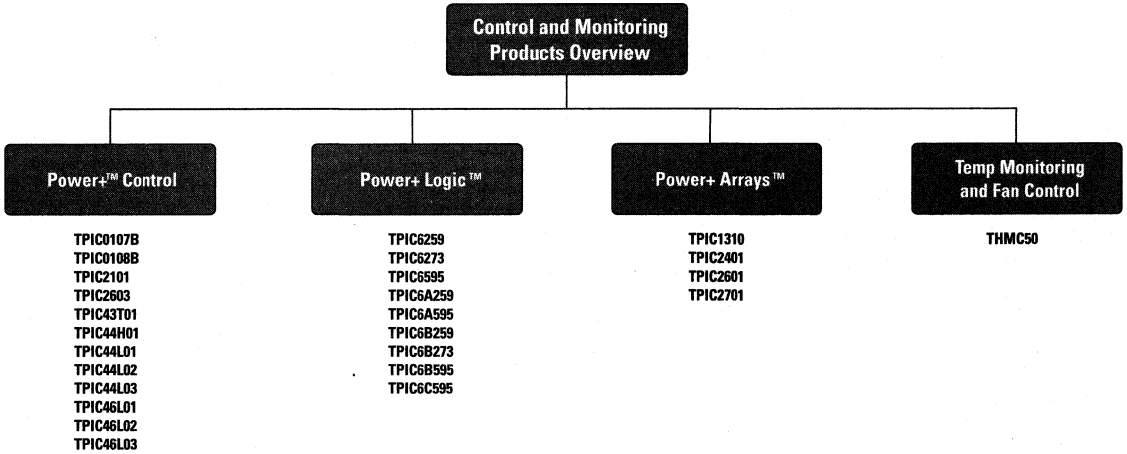
- Monitoring key parameters of critical hardware
- Storing measured data for periodic reporting
- Communicating data to system host (SMBus)
- Alerting system of dangerous conditions
- Early warning to prevent loss of service or data
- Modifying system operation to alleviate/minimize potential failures
- Reducing power consumption

HMC is vital in the PC market to monitor CPU die and ambient temperature, critical supply voltages, fan rpm and health, and thermal management.

## Web Location

Control and Monitoring Products www.ti.com/sc/docs/products/msp/control/index.htm

## Control and Monitoring Products Overview




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/control/index.htm

For an overview of Power+ Control, Power+ Logic, and Power+ Arrays, refer to:
www.ti.com/sc/docs/msp/powr_con/default.htm

For an overview of Temp Monitoring and Fan Control, refer to:
www.ti.com/sc/docs/msp/hmc/default.htm

## Power+™ Control

| Device Name | Diagnostics | $f_{PWM}$ (kHz) | Fault Protection | Freq. (typ) (MHz) | $f_{SCLK}$ (MHz) | $I_{bat}$ (typ) (mA) | $I_O/I_{PEAK}$ (max) (A) | $I_L$ (µA) | $I_{SD}$ (max) (mA) | $r_{DS(on)}$ (typ) (ohms) | Rise/Fall Time (max) (µs) | $V_{bat}$ (V) | $V_{DS}$ (max) (V) | $V_{CC}$ Range (V) | $V_{GATE}$ (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPIC0107B | Yes | | Yes | 0.002 | | | 3/5 | | | 0.28 | | | 40 | 6 to 18 | | PWM Control Intelligent H-Bridge |
| TPIC0108B | Yes | | Yes | 0.002 | | | 3/5 | 20 | | 0.28 | | | 40 | 6 to 18 | | PWM Control Intelligent H-Bridge |
| TPIC2101 | No | 20 | Yes | | | 4 | | | 50 | | 1/0.8 | 8 to 16 | | | | Single Phase Low-Side Pre-FET Driver |
| TPIC2603 | Yes | | Yes | 4 | | | 0.35/2.25 | | | 0.7 | | 5.5 to 25 | 68 | | | 6-Channel Serial Interface Low-Side Driver |
| TPIC43T01 | No | 10000 | Yes | | | | | | | | | | | | | Three-Phase Brushless Motor RPM Controller |
| TPIC44H01 | Yes | | Yes | | 5 (max) | 4 | | | | | | 8 to 24 | | | $V_{bat}$+4 to $V_{bat}$+18 | 4-Channel Serial/Parallel High-Side Pre-FET Driver |
| TPIC44L01 | Yes | | Yes | | 10 | 0.5 | | | | | | 8 to 24 | | | 7 to 13.5 | 4-Channel Serial/Parallel Low-Side Pre-FET Driver |
| TPIC44L02 | Yes | | Yes | | 10 | 0.5 | | | | | | 8 to 24 | | | 7 to 13.5 | 4-Channel Serial/Parallel Low-Side Pre-FET Driver |
| TPIC44L03 | Yes | | Yes | | 10 | 0.5 | | | | | | 8 to 24 | | | 7 to 13.5 | 4-Channel Serial/Parallel Low-Side Pre-FET Driver |
| TPIC46L01 | Yes | | Yes | | 10 | 0.5 | | | | | | 8 to 24 | | | 7 to 13.5 | 6-Channel Serial/Parallel Low-Side Pre-FET Driver |
| TPIC46L02 | Yes | | Yes | | 10 | 0.5 | | | | | | 8 to 24 | | | 7 to 13.5 | 6-Channel Serial/Parallel Low-Side Pre-FET Driver |
| TPIC46L03 | Yes | | Yes | | 10 | 0.5 | | | | | | 8 to 24 | | | 7 to 13.5 | 6-Channel Serial/Parallel Low-Side Pre-FET Driver |

## Power+ Logic™

| Device Name | $V_{DS}$ (max) (V) | $r_{DS(on)}$ (ohms) | $I_{CC}$ (µA) | $I_{O(CONT)}$ (A) | $I_{O(PEAK)}$ (A) | $t_{PLH}$ (ns) | $E_{AS}$ (mJ) | Description |
|---|---|---|---|---|---|---|---|---|
| TPIC6259 | 45 | 1.3 | 15 | 0.25 | 0.75 | 625 | 75 | 8-Bit Addressable Latch |
| TPIC6273 | 45 | 1.3 | 15 | 0.25 | 0.75 | 625 | 75 | Octal D-Type Latch |
| TPIC6595 | 45 | 1.3 | 15 | 0.25 | 0.75 | 650 | 75 | 8-Bit Shift Register |
| TPIC6A259 | 50 | 1 | 500 | 0.35 | 1.1 | 125 | 75 | 8-Bit Addressable Latch |
| TPIC6A595 | 50 | 1 | 500 | 0.35 | 1.1 | 125 | 75 | 8-Bit Shift Register |
| TPIC6B259 | 50 | 5 | 20 | 0.15 | 0.5 | 150 | 30 | 8-Bit Addressable Latch |
| TPIC6B273 | 50 | 5 | 20 | 0.15 | 0.5 | 150 | 30 | Octal D-Type Latch |
| TPIC6B595 | 50 | 5 | 20 | 0.15 | 0.5 | 150 | 30 | 8-Bit Shift Register |
| TPIC6C595 | 33 | 7 | 20 | 0.1 | 0.25 | 80 | 30 | 8-Bit Shift Register |

## Power+ Arrays™

| Device Name | Number of Channels | $r_{DS(on)}$ (ohms) | $t_r$ (typ) (ns) | $I_{O(CONT)}$ (A) | $I_{O(PEAK)}$ (A) | $V_{DS}$ (max) (V) | $V_{GS}$ (nom) (V) | $Q_g$ (typ) (nC) | $E_{AS}$ (mJ) | ESD | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPIC1310 | 3 | 0.25 | 30 | 3 | 12 | 30 | 10 | 1.6 | | Yes | 3-Half H-Bridge Gate Protected Power DMOS Array |
| TPIC2401 | 4 | 0.3 | 80 | 1.5 | 6 | 60 | 10 | 4 | 36 | Yes | 4-Channel Common-Source Driver |
| TPIC2601 | 6 | 0.25 | 72 | 2 | 10 | 60 | 10 | 5.1 | 105 | Yes | 6-Channel Common-Source Driver |
| TPIC2701 | 7 | 0.5 | 165 | 0.5 | 3 | 60 | 15 | 2.8 | 22 | No | 7-Channel Common-Source Driver |

## Temp Monitoring and Fan Control

| Device Name | $V_{CC}$ (nom) (V) | Supply Current (max) (mA) | Standby Current (max) (µA) | Description |
|---|---|---|---|---|
| THMC50 | 3.3 | 2 | 500 | Remote/Local Temperature Monitor & Fan Controller w/SMbus Interface |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

Linear Circuits Power+™ Products Peripheral Drivers/Actuators, 1996 . . . . . SLYD010A
Semiconductor Group Package Outlines Reference Guide, 1998 . . . . . SSYU001D

## Selection Guides

Power Control Products Sine On, 1999 . . . . . SLYM041
Power+ Products Selection Guide . . . . . SLIC003

## Application Notes

***Power Control Products***

DC Brush Motor Control Using the TPIC2101 . . . . . SLIT110
Automotive Solenoid and Lamp Control Using the TPIC2603 . . . . . SLIT111
Automotive Anti-Lock Brake System Control Using the TPIC44L0x and TPIC46L0x . . . . . SLIT114A
Automotive Fuel Injector Control Using the TPIC44L0x, TPIC2401, TPIC46L0x and TPIC2601 . . . . . SLIT112
Precision RPM Control of 3-Phase Brushless DC Motor with TPIC43T01 . . . . . SLIT117
Power+ Logic TPIC6595, 8-Bit Shift Register with Low-Side Power DMOS Switches . . . . . SLPA004

# Data Converters

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**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

The Texas Instruments data converter family provides cost effective, versatile solutions for data acquisition systems. This section provides a specification summary for the analog-to-digital converters (ADCs), the digital-to-analog converters (DACs) and special functions such as ADC for flex pager chipset. Fabricated from the TI advanced bipolar, CMOS and BiCMOS fabrication processes, the devices have excellent performance characteristics and quality.

The general purpose ADCs are used for applications such as

- Instrumentation
- Automotive
- Military
- Process Monitoring and Control
- Medical
- Battery Operated Equipment

The general purpose DACs can be used for applications such as

- Programmable Voltage Sources
- Mobile Communications
- Military
- Test Equipment
- Digitally Controlled Amplifiers
- Process Control
- Mass Storage

The high-speed video ADCs and DACs are used for applications such as

- Quadrature Phase Shift Keying (QPSK)
- Digital Down Converters
- Communications, Baseband, I/F
- Digital Set-Top Boxes
- Video Signal Processing
- Flat Panel Displays
- Imaging



## Data Converters New Product Previews

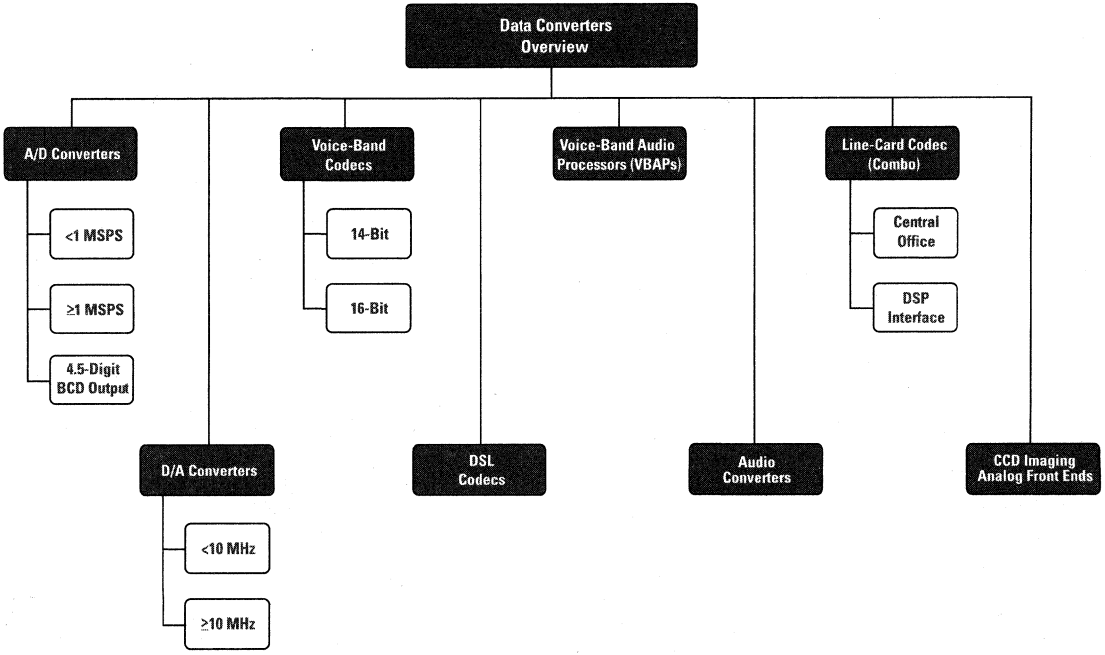
The following new devices are expected to be released in the near future. For more information, please refer to the Designer's Guide CD-ROM, literature number SLYC005D.

| | |
|---|---|
| THS0842 | 8-Bit 40-MSPS Dual Input Ch. ADC |
| THS10064 | 10-Bit 6-MSPS Quad Input Ch. ADC |
| THS10082 | 10-Bit 8-MSPS Dual Input Ch. ADC |
| THS1030/1031 | 10-Bit 30-MSPS ADC |
| THS1206 | 12-Bit 6-MSPS Quad Input Ch. ADC |
| THS1252 | 12-Bit 52-MSPS ADC |
| THS1408 | 14-Bit 8-MSPS ADC |
| THS14L08 | 14-Bit 8-MSPS Low Power ADC |
| THS5641A | 8-Bit 125-MSPS CommsDAC™ |
| THS5651A | 10-Bit 125-MSPS CommsDAC |
| THS5671A | 14-Bit 125-MSPS CommsDAC |
| TLC1514/1518 | 10-Bit 400-KSPS, 4/8 Ch. ADC |
| TLV1504/1508 | 10-Bit 200-KSPS, 4/8 Ch. ADC |
| TLV320A1C10 | 16-Bit 22-KSPS DSP Codec |
| TLV5606 | 10-Bit, 1-µs DAC |

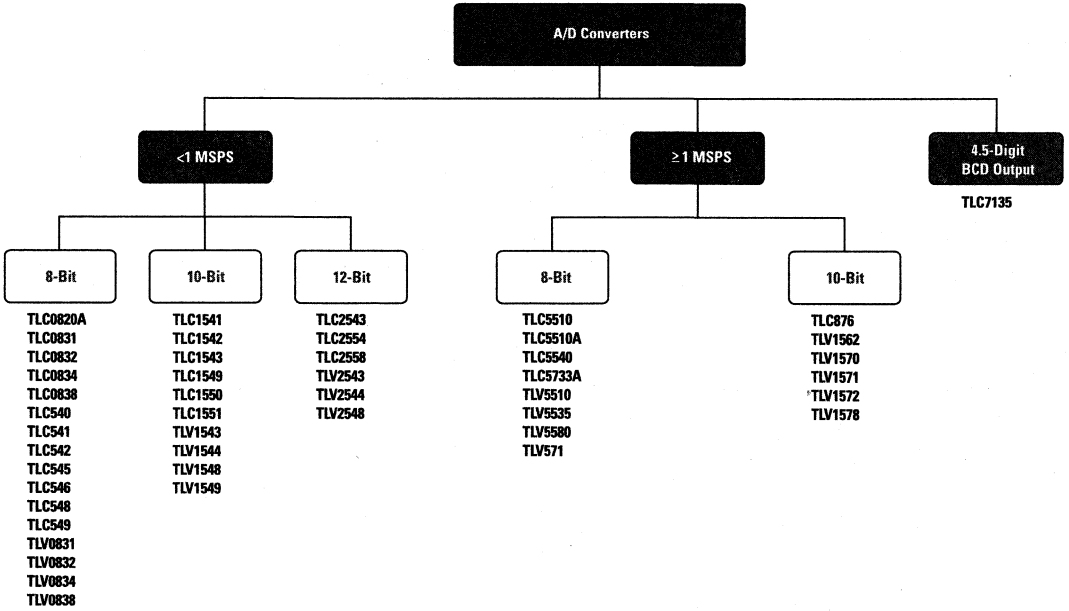
### Web Locations for Specific Product Groups

Data Converters www.ti.com/sc/docs/products/msp/dataconv/index.htm

## Data Converters Overview



## Analog-to-Digital Converters




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/dataconv/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## <1 MSPS Analog-to-Digital Converters

| Device Name | Resolution (Bits) | Sample Rate (kSPS) | Supply (V) | Data-Bus Interface (Bits) | Analog Inputs | Power (typ) (mW) | $V_{ref}$ (Int/Ext) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| **8-Bit** | | | | | | | | | | |
| TLC0820A | 8 | 392 | 5 | P8 | 1 | 37.5 | Ext | 0.5 | 1 | Differential Reference Inputs; Track & Hold; Int Clk |
| TLC0831 | 8 | 31 | 5 | Serial | 1 | 3 | Ext | 0.4 | 0.4 | One differential input channel, can configure as single-ended inputs |
| TLC0832 | 8 | 22 | 5 | Serial | 2 | 12.5 | Int | 0.4 | 0.4 | Mux'd twin input channels; Single ended or differential input |
| TLC0834 | 8 | 20 | 5 | Serial | 4 | 3 | Ext | 0.4 | 0.4 | TTL/MOS I/O compatible; 0-5V input range |
| TLC0838 | 8 | 20 | 5 | Serial | 8 | 3 | Ext | 0.4 | 0.4 | Easily configure for pseudo-differential input |
| TLC540 | 8 | 75 | 5 | Serial | 11 | 6 | Ext | 0.5 | 0.5 | System clock input to 4 MHz; I/O clk input to 2.048 MHz; S&H |
| TLC541 | 8 | 40 | 5 | Serial | 11 | 6 | Ext | 0.5 | 0.5 | System clock input to 2.1 MHz; I/O clk input to 1.1 MHz; S&H |
| TLC542 | 8 | 25 | 5 | Serial | 11 | 6 | Ext | 0.5 | 0.5 | Int System clock; Typ I/O clk input to 1.1 MHz; Compatible w/ 10-bit TLC1542/1543 |
| TLC545 | 8 | 76 | 5 | Serial | 19 | 6 | Ext | 0.5 | 0.5 | System clock input to 4 MHz; I/O clk input to 2.048 MHz; S&H; Simultaneous Read/Write |
| TLC546 | 8 | 40 | 5 | Serial | 19 | 6 | Ext | 0.5 | 0.5 | System clock input to 2.1 MHz; I/O clk input to 1.1 MHz; S&H; Simultaneous Read/Write |
| TLC548 | 8 | 45.5 | 3 to 6 | Serial | 1 | 9 | Ext | 0.5 | 0.5 | 4 MHz typ Int system clk; I/O clk input to 2.048 MHz; S&H; Compatible w/ 10-bit TLC1540 |
| TLC549 | 8 | 40 | 3 to 6 | Serial | 1 | 9 | Ext | 0.5 | 0.5 | 4 MHz typ Int system clock; I/O clk input to 1.1 MHz; S&H; Compatible w/ 10-bit TLC1540 |
| TLV0831 | 8 | 49 | 3.3 | Serial | 1 | 0.67 | Ext | 0.5 | 0.5 | One differential input channel, can configure as single-ended inputs |
| TLV0832 | 8 | 44.7 | 3.3 | Serial | 2 | 5 | Int | 0.5 | 0.5 | Mux'd twin input channels; Single ended or differential input |
| TLV0834 | 8 | 41 | 3.3 | Serial | 4 | 2.7 | Ext | 0.5 | 0.5 | TTL/MOS I/O compatible; 0-3.6V input range; Inputs configurable for single-ended, differential, or p |
| TLV0838 | 8 | 37.9 | 3.3 | Serial | 8 | 2.7 | Ext | 0.5 | 0.5 | TTL/MOS I/O compatible; 0-3.6V input range; Inputs configurable for single-ended, differential, or p |

## <1 MSPS Analog-to-Digital Converters (Continued)

| Device Name | Resolution (Bits) | Sample Rate (kSPS) | Supply (V) | Data-Bus Interface (Bits) | Analog Inputs | Power (typ) (mW) | $V_{ref}$ (Int/Ext) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| **10-Bit** | | | | | | | | | | |
| TLC1541 | 10 | 32 | 5 | Serial | 11 | 6.5 | Ext | 1 | 1 | S&H; Simultaneous Read/Write; Compatible to 8-bit TLC540 |
| TLC1542 | 10 | 38 | 5 | Serial | 11 | 4 | Ext | 0.5 | 0.5 | System clock; S&H; terminal compatible w/ TLC542 |
| TLC1543 | 10 | 38 | 5 | Serial | 11 | 4 | Ext | 1 | 1 | System clock; S&H; terminal compatible w/ TLC542 |
| TLC1549 | 10 | 38 | 5 | Serial | 1 | 4 | Ext | 1 | 1 | System clock; Input S&H |
| TLC1550 | 10 | 164 | 5 | P10 | 1 | 10 | Ext | 0.5 | 0.5 | Int/Ext clock option |
| TLC1551 | 10 | 164 | 5 | P10 | 1 | 10 | Ext | 1 | 1 | Int/Ext clock option |
| TLV1543 | 10 | 38 | 3.3 | Serial | 11 | 2.7 | Ext | 1 | 1 | System clock; compatible w/ TLC1543 |
| TLV1544 | 10 | 85 | 2.7 to 5.5 | Serial | 4 | 1.05 | Ext | 1 | 1 | Sync/Async modes; extended sampling capability; programmable power vs. conversion rate |
| TLV1548 | 10 | 85 | 2.7 to 5.5 | Serial | 8 | 1.05 | Ext | 1 | 1 | Sync/Async modes; extended sampling capability; programmable power vs. conversion rate |
| TLV1549 | 10 | 38 | 3.3 | Serial | 1 | 1.32 | Ext | 1 | 1 | System clock; S&H; compatible w/ TLC1549 |
| **12-Bit** | | | | | | | | | | |
| TLC2543 | 12 | 66 | 5 | Serial | 11 | 5 | Ext | 1 | 1 | System clock; Unipolar/Bipolar output; Auto S&H |
| TLC2554 | 12 | 400 | 5 | Serial | 4 | 4.5 | Int | 1 | 1 | 8x Int FIFO; Int clk; Analog input 0V to $V_{CC}$ w/ 50 |
| TLC2558 | 12 | 400 | 5 | Serial | 8 | 3.3 | Int | 1 | 1 | 8x Int FIFO; Int clk; Analog input 0V to $V_{CC}$ w/ 50 |
| TLV2543 | 12 | 66 | 3.3 | Serial | 11 | 3.3 | Ext | 1 | 1 | System clock; Unipolar/Bipolar output; Auto S&H |
| TLV2544 | 12 | 200 | 2.7 to 5.5 | Serial | 4 | 4.5 | Int | 1 | 1 | 8x Int FIFO; Int clk; Analog input 0V to $V_{CC}$ w/ 500kHz BW; SFDR –84dB, ENOB 11.57bits, THD –82dB @ fi = 12 kHz |
| TLV2548 | 12 | 200 | 2.7 to 5.5 | Serial | 8 | 4.5 | Int | 1 | 1 | 8x Int FIFO; Int clk; Analog input 0V to $V_{CC}$ w/ 500kHz BW; SFDR –84dB, ENOB 11.57bits, THD –82dB @ fi = 12 kHz |

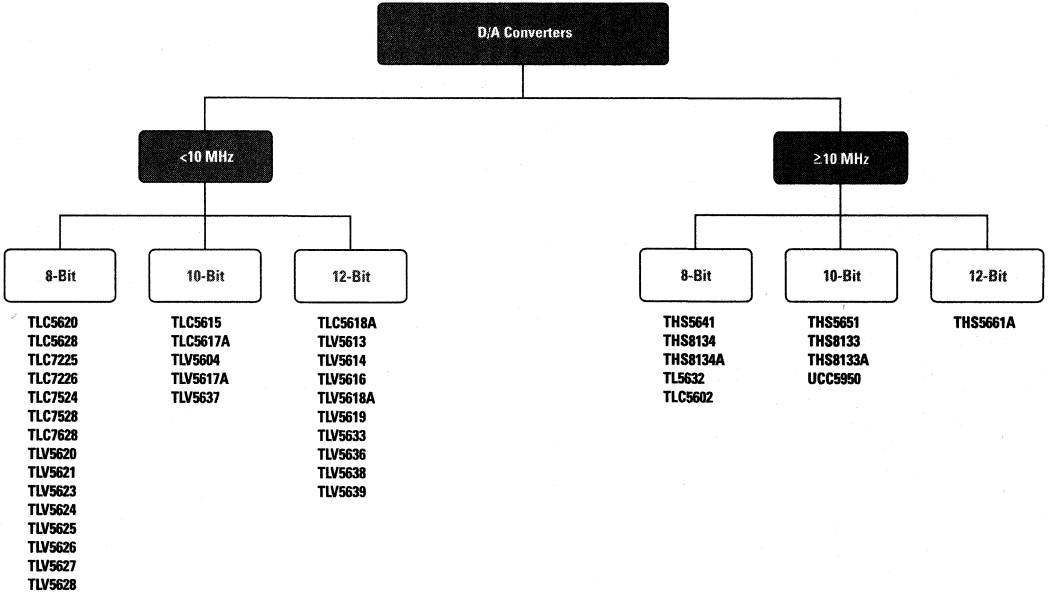
## ≥1 MSPS Analog-to-Digital Converters

| Device Name | Resolution (Bits) | Sample Rate (MSPS) | Supply (V) | Analog Inputs | Power (typ) (mW) | Analog Input BW (MHz) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|
| **8-Bit** | | | | | | | | | |
| TLC5510 | 8 | 20 | 5 | 1 | 90 | 14 | 0.5 | 0.75 | SFDR –46dBc, SNR 46 @ fi=3MHz |
| TLC5510A | 8 | 20 | 5 | 1 | 90 | 14 | 0.5 | 0.75 | SFDR –46dBc, SNR 46 @ fi=3MHz |
| TLC5540 | 8 | 40 | 5 | 1 | 85 | 75 | 0.75 | 1 | SFDR –46dBc, SNR 47, THD –42, ENOB 7.61 @ fi=3MHz |
| TLC5733A | 8 | 20 | 5 | 3 | 250 | 14 | 0.5 | 1 | 3 ch ADC w/ precision clamp; 2.7 to 5.25 V Digital Supply |
| TLV5510 | 8 | 10 | 3 | 1 | 42 | 36 | 0.75 | 1 | SFDR 41dB, SNR 40 dB @ fi=1MHz |
| TLV5535 | 8 | 35 | 3.3 | 1 | 90 | 600 | 1.3 | 1.5 | 3.3V TTL/CMOS Digital I/O; SFDR 58 dB, THD –54 dB, |
| TLV5580 | 8 | 80 | 3.3 | 1 | 165 | 700 | 1.3 | 2.4 | 3.3V TTL/CMOS Digital I/O; SFDR 48.5dB, THD –45.5dB, ENOB 6.6 @ fi= 76MHz |
| TLV571 | 8 | | | | 35 | | | | 2.7V to 5.5V, 1-channel Parallel ADC |
| **10-Bit** | | | | | | | | | |
| TLC876 | 10 | 20 | 5 | 1 | 107 | 200 | 0.75 | 1.2 | 5V or 3.3V Digital I/O; SFDR –64dB, THD –62DB, ENOB 8.5 @ fi= 3.58MHz |
| TLV1562 | 10 | 2 | 2.7 to 5.5 | 4 | 15 | 120 | 1.5 | 1.5 | 4 to 10-bit programmable ADC w/ dual matched S&H; 2-7MSPS; SFDR –70.3dB, THD –68.8dB, ENOB 9.4 @ fi= 800 kHz |
| TLV1570 | 10 | 1.25 | 2.7 to 5.5 | 8 | 8 | 25 | 1 | 1 | SFDR –73dB, ENOB 9.3, SINAD 58dB, SNR 61dB, THD –70dB @ fi = 100 kHz |
| TLV1571 | 10 | 1.25 | 2.7 to 5.5 | 1 | 12 | 30 | 1 | 1 | SFDR –63dB, ENOB 9.3, SINAD 60dB, SNR 60dB, THD–60dB @ fi = 100 kHz |
| TLV1572 | 10 | 1.25 | 2.7 to 5.5 | 1 | 8 | 12 | 1 | 1 | SFDR –62dB, ENOB 9.35, SINAD 58dB, THD –60dB @ fi= 200 kHz, BW to 12 MHz |
| TLV1578 | 10 | 1.25 | 2.7 to 5.5 | 8 | 12 | 30 | 1 | 1 | SFDR –63dB, ENOB 9.3, SINAD 60dB, SNR 60dB, THD –60dB @ fi = 100 kHz |

## 4.5-Digit, Multiplexed BCD-Output, Dual-Slope Analog-to-Digital Converter

| Device Name | Resolution (Bits) | Sample Rate (ASPS) | Supply (V) | Data Bus Interface (Bits) | Analog Inputs | Power (typ) (mW) | $V_{ref}$ (Int/Ext) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| **4.5-Bit** | | | | | | | | | | |
| TLC7135 | 4.5 | 0.003 | –5 to +5 | BCD | 1 | 5 | Ext | 0.01 | 0.5 | 4-1/2 digit precision ADC; Mux'd BCD output; True differential input; 1-pA typ input current |

## Digital-to-Analog Converters




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/dataconv/index.htm
For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## <10 MHz Digital-to-Analog Converters

| Device Name | Resolution (Bits) | Supply (V) | Data-Bus Interface (Bits) | Settling Time (µs) | Number of DACs | Power (typ) (mW) | Output (I or V) | $V_{ref}$ (Int/Ext) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **8-Bit** | | | | | | | | | | | |
| TLC5620 | 8 | 5 | Serial | 10 | 4 | 8 | V | Ext | 0.9 | 1 | Quad; Programmable 1x or 2x output range |
| TLC5628 | 8 | 5 | Serial | 10 | 8 | 15 | V | Ext | 0.9 | 1 | Octal; Programmable for 1x or 2x Output; Simultaneous update |
| TLC7225 | 8 | 5 to 15 | Parallel | 5 | 4 | 60 | V | Ext | 1 | 1 | Quad; Single or dual supply; Direct bipolar operation without an external level-shift amplifier; TTL |
| TLC7226 | 8 | 15 | Parallel | 5 | 4 | 60 | V | Ext | 1 | 1 | Quad Multiplying DAC; Single or dual supply; TTL/CMOS compatible |
| TLC7524 | 8 | 5 to 15 | Parallel | 0.1 | 1 | 5 | I | Ext | 0.5 | 0.5 | MDAC; Fast Control Signaling; Low Glitch Output; on-chip data latches; super easy micro interface |
| TLC7528 | 8 | 5 to 15 | Parallel | 0.1 | 2 | 7.5 | I | Ext | 0.5 | 0.5 | Dual TLC7524 (Multiplying DAC) |
| TLC7628 | 8 | 11 to 15 | Parallel | 0.1 | 2 | 20 | I | Ext | 0.5 | 0.5 | Dual Multiplying DAC; TTL-compatible digital inputs; super easy micro interface |
| TLV5620 | 8 | 2.7 to 5.5 | Serial | 10 | 4 | 6 | V | Ext | 0.9 | 1 | Simultaneous-update Quad; Programmable 1x or 2x Output Range |
| TLV5621 | 8 | 2.7 to 5.5 | Serial | 10 | 4 | 3.6 | V | Ext | 0.9 | 1 | Simple two-wire interface in single-buffered mode; Simultaneous update in double-buffered mode; one |
| TLV5623 | 8 | 2.7 to 5.5 | | 3 | 1 | | V | | | | 2.7V to 5.5V, Low Power, 8-Bit DAC with Power Down |
| TLV5624 | 8 | 2.7 to 5.5 | | 1.0 to 3.5 | 1 | | V | | | | 2.7 V to 5.5 V Low Power 12-Bit D/A Converter w/Internal Ref.And Pwr Down |
| TLV5625 | 8 | 2.7 to 5.5 | | 2.5 or 12 | 2 | | V | | | | 2.7V to 5.5V Low Power Dual 8-Bit Digital-To-Analog Converter with Power Down |
| TLV5626 | 8 | 2.7 to 5.5 | | 1 | 2 | | V | | | | 2.7V to 5.5V Low Power Dual 8-Bit DAC w/Internal Ref. & Power Down |
| TLV5627 | 8 | 2.7 to 5.5 | | 3 | 4 | | V | | | | 2.7V to 5.5V, 8-Bit, 4-Channel, DAC with Power Down |
| TLV5628 | 8 | 2.7 to 5.5 | Serial | 10 | 8 | 12 | V | Ext | 0.9 | 1 | Octal; Programmable for 1x or 2x Output; Simultaneous update |
| **10-Bit** | | | | | | | | | | | |
| TLC5615 | 10 | 5 | Serial | 12.5 | 1 | 0.75 | V | Ext | 0.5 | 1 | 1.21 MHz Update Rate; SINAD 60 dB @ 1kHz |
| TLC5617A | 10 | 5 | Serial | 2.5 | 2 | 3 | V | Ext | 0.5 | 1 | Simultaneous Dual DAC update; Programmable pwr consumption |
| TLV5604 | 10 | 2.7 to 5.5 | Serial | 3 | 4 | 3.3 | V | Ext | 0.5 | 0.5 | Simultaneous Quad DAC update; Programmable pwr consumption; Separate digital/analog supplies |
| TLV5617A | 10 | 2.7 to 5.5 | | 2.5 | 2 | | V | | | | 2.7 V to 5.5 V Low Power Dual 10-Bit D/A Converter |
| TLV5637 | 10 | 2.7 to 5.5 | | 1 | 2 | | V | | | | 2.7V to 5.5V Dual 10-Bit Serial DAC w/Internal Ref. |

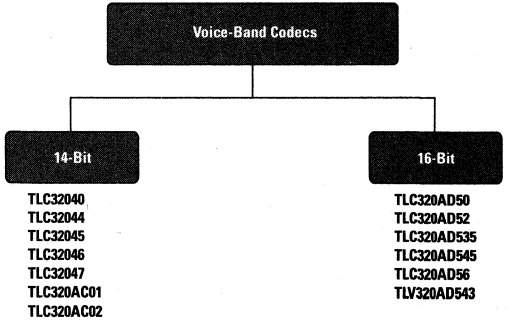
## <10 MHz Digital-to-Analog Converters (Continued)

| Device Name | Resolution (Bits) | Supply (V) | Data-Bus Interface (Bits) | Settling Time (µs) | Number of DACs | Power (typ) (mW) | Output (I or V) | $V_{ref}$ (Int/Ext) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **12-Bit** | | | | | | | | | | | |
| TLC5618A | 12 | 5 | Serial | 2.5 | 2 | 3 | V | Ext | 1 | 4 | Simultaneous Dual DAC update; Programmable pwr consumption |
| TLV5613 | 12 | 2.7 to 5.5 | P8 | 1 | 1 | 1.2 | V | Ext | 1 | 4 | Programmable pwr consumption; Separate digital/ analog supplies; Synchronous/Asynchronous update |
| TLV5614 | 12 | 2.7 to 5.5 | Serial | 3 | 4 | 3.6 | V | Ext | 1 | 4 | Simultaneous Quad DAC update; Programmable pwr consumption; Independent digital/analog supplies |
| TLV5616 | 12 | 2.7 to 5.5 | Serial | 3 | 1 | 0.9 | V | Ext | 1 | 4 | Programmable pwr consumption; Super small MSOP-8 package; SNR 74 dB @ $f_{out}$ = 1.1 kHz |
| TLV5618A | 12 | 2.7 to 5.5 | | 2.5 | 2 | | V | | | | 2.7V to 5.5 V Low Power Dual 12-Bit D/A Converter with Power Down |
| TLV5619 | 12 | 2.7 to 5.5 | P12 | 1 | 1 | 4.3 | V | Ext | 1 | 4 | Asynchronous Update; SNR 78 dB, SFDR –72 dB @ $f_{out}$ = 1 kHz |
| TLV5633 | 12 | 2.7 to 5.5 | P8 | 1 | 1 | 2.7 | V | Int | 0.5 | 3 | Programmable: Int Ref, pwr consumption, settling time; SNR 78 dB, SFDR –74 dB @ $f_{out}$ = 1 kHz |
| TLV5636 | 12 | 2.7 to 5.5 | Serial | 1 | 1 | 4.5 | V | Int | 1 | 4 | Programmable: Int Ref, pwr consumption, settling time; SNR 75 dB, SFDR –69 dB @ $f_{out}$ = 1 kHz |
| TLV5638 | 12 | 2.7 to 5.5 | Serial | 1 | 2 | 4.5 | V | Int | 1 | 4 | Simultaneous Dual DAC Update; Programmable: Int Ref, pwr consumption, settling time; SNR 78 dB, SFDR |
| TLV5639 | 12 | 2.7 to 5.5 | P12 | 1 | 1 | 2.7 | V | Int | 0.5 | 3 | Programmable: Int Ref, pwr consumption, settling time; SNR 78 dB, SFDR –74 dB @ $f_{out}$ = 1 kHz |

## ≥10 MHz Digital-to-Analog Converters

| Device Name | Resolution (Bits) | Supply (V) | Update Rate (MSPS) | Settling Time (ns) | Number of DACs | Power (typ) (mW) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|
| **8-Bit** | | | | | | | | | |
| THS5641 | 8 | 3.0 to 5.0 | 100 | 35 | 1 | 175 | 0.5 | 1 | CommsDAC; 66 dBc SFDR @ $f_{clk}$ = 25MSPS, $f_{out}$ =1MHz; ; Binary or 2s complement input modes |
| THS8134 | 8 | 3.0 to 5.0 | 80 | 5 | 3 | 525 | 1.2 | 1 | SMPTE compliant Tri-level Sync generation, Multiplexed YPbPr/GBR input mode |
| THS8134A | 8 | 3.0 to 5.0 | 80 | 5 | 3 | 525 | 1.2 | 1 | SMPTE compliant Tri-level Sync generation, Multiplexed YPbPr/GBR input mode |
| TL5632 | 8 | 5 | 60 | 10 | 3 | 350 | 0.5 | 0.5 | High performance at lowest cost for high speed system |
| TLC5602 | 8 | 5 | 30 | 30 | 1 | 80 | 0.5 | 0.5 | TTL digital input voltage |
| **10-Bit** | | | | | | | | | |
| THS5651 | 10 | 3.0 to 5.0 | 100 | 35 | 1 | 175 | 0.5 | 1 | CommsDAC; 75 dBc SFDR @ $f_{clk}$ = 25MSPS, $f_{out}$ =1MHz; Binary or 2s complement input modes |
| THS8133 | 10 | 3.0 to 5.0 | 80 | 5 | 3 | 525 | 1.2 | 1 | SMPTE compliant Tri-level Sync generation, Multiplexed YPbPr/GBR input mode |
| THS8133A | 10 | 3.0 to 5.0 | 80 | 5 | 3 | 525 | 1.2 | 1 | SMPTE compliant Tri-level Sync generation, Multiplexed YPbPr/GBR input mode |
| UCC5950 | 10 | 5 | | 2500 | 1 | 7.5 | 1 | 2 | 10-Bit Serial D/A Converter with Sleep Mode |
| **12-Bit** | | | | | | | | | |
| THS5661A | 12 | 3.0 to 5.0 | 125 | 35 | 1 | 175 | 0.5 | 0.75 | CommsDAC; 76 dBc SFDR @ $f_{clk}$ = 25MSPS, $f_{out}$ =1M |

## Voice-Band Codecs




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/dataconv/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Voice-Band Codecs

| Device Name | Resolution (Bits) | Sampling Rate (kHz) | Bandwidth (kHz) | Conversion Method | Number of Channels | $P_d$ (typ) (mW) | Description |
|---|---|---|---|---|---|---|---|
| **14-Bit** | | | | | | | |
| TLC32040 | 14 | 19.2 | 0.3 to 3.4 | successive approx. | 1 | 120 | Single Channel Codec |
| TLC32044 | 14 | 19.2 | 0.15 to 3.6 | successive approx. | 1 | 125 | Single Channel Codec |
| TLC32045 | 14 | 19.2 | 0.15 to 3.6 | successive approx. | 1 | 125 | Single Channel Codec |
| TLC32046 | 14 | 25 | 0.3 to 7.3 | successive approx. | 1 | 125 | Single Channel Codec |
| TLC32047 | 14 | 25 | 0.45 to 10.95 | successive approx. | 1 | 130 | Single Channel Codec |
| TLC320AC01 | 14 | 25 | up to 10.8 | successive approx. | 1 | 100 | Single Channel Codec-Bandwidth Independent of Sampling Rate |
| TLC320AC02 | 14 | 25 | up to 10.8 | successive approx. | 1 | 100 | Single Channel Codec-Bandwidth Independent of Sampling Rate |
| **16-Bit** | | | | | | | |
| TLC320AD50 | 16 | 22.05 | up to 9.92 | sigma-delta | 1 | 120 | Single Channel Codec w/Master-Slave Function (3 Slaves) and 89-dB SNR |
| TLC320AD52 | 16 | 22.05 | up to 9.92 | sigma-delta | 1 | 120 | Single Channel Codec w/Master-Slave Function (1 Slave) |
| TLC320AD535 | 16 | 11.025 | up to 4.96 | sigma-delta | 2 | 240 | Dual Channel Codec w/Hybrid Op Amps, Speaker Driver & Microphone Interface |
| TLC320AD545 | 16 | 11.025 | up to 4.96 | sigma-delta | 1 | 120 | Single Channel Codec w/Hybrid Op Amps & Speaker Driver |
| TLC320AD56 | 16 | 22.05 | up to 8.82 | sigma-delta | 1 | 100 | Single Channel Codec with 85- to 87-dB Dynamic Range |
| TLV320AD543 | 16 | 11.025 | up to 4.96 | sigma-delta | 1 | 90 | 3-V Single Channel Codec w/Hybrid Op Amps & Speaker Driver |

## DSL Codecs

**DSL Codecs**

**TLFD500**
**TLV320AD11A**
**TLV320AD12A**

**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/dataconv/index.htm**

| Device Name | Resolution (Bits) | Conversion Rate (MSPS) | Analog Supply Voltage (V) | Digital Supply Voltage (V) | Description |
|---|---|---|---|---|---|
| TLFD500 | 14 | 2.208 | 3.3 | 3.3 | 3.3-V Integrated ADSL Codec for Central Office |
| TLV320AD11A | 14 | 2.208 | 3.3 | 3.3 | 3.3-V Integrated ADSL Codec for RT |
| TLV320AD12A | 14 | 1.104 | 3.3 | 3.3 | 3.3-V Integrated ADSL G.Lite Codec for RT |

## Voice-Band Audio Processors (VBAPs)

**Voice-Band Audio Processors (VBAPs)**

**TCM320AC36**
**TCM320AC37**
**TLV320AC36**
**TLV320AC37**
**TLV320AC40**
**TLV320AC56**
**TWL1101**
**TWL1102**
**TWL1103**

**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/dataconv/index.htm**

| Device Name | Master Clock (MHz) | Supply Voltage (±10%) (V) | Audio In/Out | Filter | Package | I²C Programmable | Mic Bias Enable Logic | Speaker Drive | DTMF | Companding | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM320AC36 | 2.048 | 5 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | Voice-Band Audio Processor |
| TCM320AC37 | 2.048 | 5 | 1 | switch cap | 20/48 | No | No | | No | A-Law | Voice-Band Audio Processor |
| TLV320AC36 | 2.048 | 3 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | Voice-Band Audio Processor |
| TLV320AC37 | 2.048 | 3 | 1 | switch cap | 20/48 | No | No | | No | A-Law | Voice-Band Audio Processor |
| TLV320AC40 | 1.152 | 3 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | 3-V Voice-Band Audio Processors |
| TLV320AC56 | 2.048 | 3 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | 3-V Voice-Band Audio Processors |
| TWL1101 | 2.048 | 3 | 2 | sigma-delta | 48 | Yes | No | | No | μ-Law | Voice-Band Audio Processor |
| TWL1102 | 2.048 | 3 | 2 | sigma-delta | 32 | Yes | No | 16/32 | Yes | both | Voice-Band Audio Processor |
| TWL1103 | 2.048 | 3 | 2 | sigma-delta | 32 | Yes | Yes | 16/32 | Yes | both | Voice-Band Audio Processor |

## Audio Converters

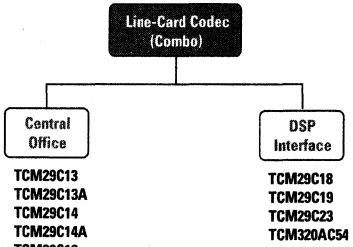
**Audio Converters**

**TLC320AD57**
**TLC320AD58**
**TLC320AD75**
**TLC320AD77**
**TLC320AD90**

**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/dataconv/index.htm**

| Device Name | Resolution (Bits) | SNR (typ) (dB) | Architecture | Supply Voltage(s) (V) | Bandwidth (Hz) | $P_D$ (typ) (mW) | Sampling Rate (max) (kHz) | Description |
|---|---|---|---|---|---|---|---|---|
| TLC320AD57 | 16/18 | 97 | Stereo ADC | 5 | 20 to 20K | 220 | 48 | 18-Bit Stereo Analog-To-Digital Converter |
| TLC320AD58 | 16/18 | 100 | Stereo ADC | 5 | 20 to 20K | 250 | 48 | 18-Bit Stereo Analog-To-Digital Converter |
| TLC320AD75 | 20 | 104 | Stereo Codec | 5 | 20 to 20K | 400 | 44.1 | 20-Bit Stereo Audio Codec, 104 dB SNR |
| TLC320AD77 | 24 | 100 | Stereo Codec | 3.3 | 20 to 20K | 160 | 96 | Stereo Audio ADA |
| TLC320AD90 | 20 | 90 | AC97 Codec | 3.3, 5 | 20 to 20K | 235 | 48 | 20-Bit Stereo AC97 Audio Codec |

## Line-Card Codec (Combo)




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/dataconv/index.htm

## Line-Card Codec (Combo)

| Device Name | Companding | Clock Frequency (MHz) | Timing | Supply Voltage (V) | Number of Channels | Description |
|---|---|---|---|---|---|---|
| **Central Office** | | | | | | |
| TCM29C13 | both | 1.536, 1.544, 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C13A | both | 1.536, 1.544, 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C14 | both | 1.536, 1.544, 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C14A | both | 1.536, 1.544, 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C16 | μ-Law | 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C16A | μ-Law | 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C17 | A-Law | 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM29C17A | A-Law | 2.048 | Intel | –5 | 1 | Combination Codec/Filter |
| TCM37C14A | both | 1.536, 1.544, 2.048 | Intel | –5 | 1 | PCM Combo with Programmable Gain Control |
| TCM37C15A | A-Law | 2.048 | Intel | –5 | 1 | PCM Combo with Programmable Gain Control |
| TCM38C17 | both | 2.048 | Intel | 5 | 4 | Four-Channel (Quad) PCM Combo™ |
| TP3054A | μ-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3054B | μ-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3056B | both | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3057A | A-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3057B | A-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3064B | μ-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3067A | A-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| TP3067B | A-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Combination Codec/Filter |
| **DSP Interface** | | | | | | |
| TCM29C18 | μ-Law | 2.048 | Intel | –5 | 1 | Combination Codec/Filter, Analog Interface to DSP |
| TCM29C19 | μ-Law | 1.536 | Intel | –5 | 1 | Combination Codec/Filter, Analog Interface to DSP |
| TCM29C23 | both | up to 4.096 | Intel | –5 | 1 | Combination Codec/Filter, Analog Interface to DSP |
| TCM320AC54 | μ-Law | 1.536, 1.544, 2.048 | National | –5 | 1 | Monolithic Serial Interface Combined PCM Codec and Filter |

## CCD Imaging Analog Front Ends

**CCD Imaging Analog Front Ends**

**TLC8188**
**TLV977-10**
**TLV986**
**TLV987**

**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/dataconv/index.htm**
**For an overview of CCD Imaging Analog Front Ends, refer to:**
**www.ti.com/sc/docs/products/msp/videoimg/ccd/index.htm**

| Device Name | Resolution (Bits) | Samples/ Sec (MSPS) | Pd (typ) (mW) | Supply Voltage(s) (V) | Gain (max) (dB) | Gain (min) (dB) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|
| TLC8188 | 10 | 4 | 190 | 5 | 14 | 0 | ±2 | ±1 | CIS/CCD Scanner AFE Using Pipeline-Architecture ADC at 4 MSPS |
| TLV977-10 | 10 | 21 | 140 | 3 | 36 | 0 | 1 | 2 | CCD Imaging Analog Front End |
| TLV986 | 10 | 12.5 | 140 | 3 | 36 | 0 | 1.5 | 2 | 3-V, 10-Bit, 12.5-MSPS, Area CCD Sensor Processor |
| TLV987 | 10 | 27 | 200 | 3 | 36 | 0 | 1.5 | 2 | 3-V, 10-Bit, 27-MSPS, Area CCD Sensor Signal Processor |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

Data Acquisition Circuits, 1998 ..... SLAD001A
Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D

## Selection Guides

Data Converter Sine On, 1999 ..... SLAM023

## Application Notes

10-Bit, 2m Sample, A/D Converter, Parallel Data Output EVM ..... SLAU031
10-Bit, Area CCD Analog Front End ..... SLAA069
Analog Applications ..... SLYT005
Characteristics, Operation, And Use Of The TLV157x EVM ..... SLAU025
Choosing An ADC And Op Amp For Minimum Offset ..... SLAA064
Designing With The TLC320AC01 Analog Interface For DSPs ..... SLAA006
Designing With The Voice-Band Audio Processor ..... SLWA001B
Evaluation Module Technical Reference ..... SLAU004
General-Purpose Tone Decoding And DTMF Detection (Contains Scanned Text) ..... SPRA082
Interfacing A/D Converters TLC5540/10 To The DSKplus DSP Starter Kit TMS320C54x ..... SLAAE14
Interfacing The TLC2543 ADC To The TMS320C25 DSP ..... SLAA017
Interfacing The TLC2543 To TMS320C542DSP ..... SLAA084
Interfacing The TLC32040 Family To The TMS320 Family ..... SLAU001A
Interfacing The TLC5510 Analog-To-Digital Converter To The TMS320C203 DSP ..... SLAA029
Interfacing The TLC5540 Analog-To-Digital Converter To The TMS320C203-80 DSP ..... SLAA032
Interfacing The TLC5618a Digital-To-Analog Converter To The TMS320C203 DSP ..... SLAA033
Interfacing The TLV1544 Analog-To-Digital Converter To The TMS320C50 DSP ..... SLAA025A
Interfacing The TLV1544/TLV1548 Analog Digital Converter To Digital Processors ..... SLAA022
Interfacing The TLV1549 10-Bit Serial-Out ADC To Popular 3.3-V Microcontrollers ..... SLAA005
Interfacing The TLV1562 Parallel ADC To The TMS320C54x DSP ..... SLAA040
Interfacing The TLV1571/78 Analog-To-Digital Converter To The TMS320C542 DSP ..... SLAA077
Interfacing The TLV1572 Analog-To-Digital Converter To The TMS320C203 DSP ..... SLAA026B
Interfacing TLC320AD57 Sigma-Delta Stereo ADC (In Master Mode) w/TMS320C5x DSP ... SPRA090
Interfacing TMS320C54x DSPs To The TLC320AC01/02 ..... SPRA527
Interfacing Two Analog Interface Circuits To One TMS320C5x Serial Port ..... SPRA268
Line Card Codec/Filter Combo System/Design Considerations ..... SLWA006
Low Voltage Modem Platform Based On TMS320LC56 ..... BPRA049
Low-Power Signal Conditioning For A Pressure Sensor ..... SLAA034
Microcontroller Based Data Acquisition Using The TLC2543 12-Bit Serial Out ADC ..... SLAA012
Minimizing Input Design Problems With The TLV5590 ..... SWCA001
Multiple TLC320AC01/02 Analog I/F Circuits On One TMS320C5x DSP Serial Port ..... SLAA016
Signal Acquisition And Conditioning With Low Supply Voltages ..... SLAA018
Switched-Capacitor ADC Analog Input Calculations ..... SLAA036
TCM320AC3x/4x Voice-Band Audio Processors ..... SPRA146
TCM38C17 Quad Combo Design Considerations ..... SLWA014
TLC320AD57C Sigma-Delta Stereo Analog-To-Digital Converter ..... SLAA010
TLC320AD58C Sigma-Delta Stereo Analog-To-Digital Converter ..... SLAA015
TLC5540/TLC5510/TLC5510A/TLV5540/TLV5510 EVM ..... SLAU007C
TMS320 Hardware Applications (Contains Scanned Text) ..... SPRA390
TMS320C54x DSKplus Adapter Kit ..... SLAU030
Understanding Data Converters ..... SLAA013
Using References To Generate Offsets For The TLV55xx Family Data Converters ..... SLAA063

## Evaluation Modules and Development Tools

Each evaluation module (EVM) kit contains a fully-assembled evaluation board, a data sheet and a user's guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number, 1-800-477-8924, ext. 5800 in North America. To check availability and CE certification, and to order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see www.ti.com/sc/docs/general/distrib.htm for distributor listings.

| | TITLE | ORDER NO. |
|---|---|---|
| THS5661A | 12-Bit, 100 MSPS CommsDAC | THS5661AEVM |
| THS5671A | 14-Bit, 125 MSPS CommsDAC | THS5671AEVM |
| THS56x1 | THS56x1 EVM For The THS5641/51/61/71 8-Bit, 10-Bit, 12-Bit, And 14-Bit ADC User's Guide | SLAU032 |
| THS8133 | Triple 10-Bit, 80 MSPS Video D/A Converter w/Tri-Level Sync Generation | THS8133EVM |
| THS8133 | THS8133 EVM User's Guide | SLVU020A |
| THS8134 | Triple 8-Bit, 80 MSPS Video D/A Converter With Tri-Level Sync Generation | THS8134 EVM |
| TLC2543 | 12-Bit, 66KSPS Serial-Out 11-Input Analog-To-Digital Converter | TLC2543EVM |
| TLC2543 | TLC2543 Evaluation Module User's Guide | SLAU002A |
| TLC320AD50 | 16-Bit, 22.05kHz Single Channel Codec w/Master-Slave Function (3 Slaves) | TLC320AD50EVM |
| TLC320AD545 | Evaluation Board For The TLC320AD545 DSP Analog Interface Circuit User's Guide | SLAA085 |
| TLC5510 | 8-Bit High-Speed Analog-To-Digital Converter | TLC5510EVM |
| TLC5510A | 8-Bit High-Speed Analog-To-Digital Converters | TLC5510AEVM |
| TLC5540 | 8-Bit High-Speed Analog-To-Digital Converter | TLC5540EVM |
| TLC876 | 10-Bit 20 MHz Analog-To-Digital Converter | TLC876EVM |
| TLV1544 | 10-Bit, 85 KSPS Low-Voltage Analog-To-Digital Converter With Serial Control | TLV1544EVM |
| TLV1544 | TLV1544 Evaluation Module User's Guide | SLAU014 |
| TLV1562 | Interface For The TLV1562 And TLVx544/x548 ADC Modules | TMS320C54x DSKplus Adaptor Kit |
| TLV1562 | 10-Bit, 2 MSPS CMOS High Speed Programmable ADC w/On Board DAC | TLV1562EVM |
| TLV1570 | 10-Bit, 1.25 MSPS 8-Channel Serial ADC | TLV1570EVM |
| TLV1570 | TLV1570 Evaluation Module User's Guide | SLAU024 |
| TLV1571 | 10-Bit, 1.25 MSPS 1-Channel 10-Bit 1.25 MSPS Parallel Analog-To-Digital Converter | TLV1571EVM |
| TLV1572 | 10-Bit, 1.25 MSPS Analog-To-Digital Converter | TLV1572EVM |
| TLV1572 | TLV1572EVM Evaluation Module User's Guide | SLAU018 |
| TLV1578 | 10-Bit, 1.25 MSPS 8-Channel Parallel Analog-To-Digital Converter | TLV1578EVM |
| TLV2543 | 12-Bit, 66 KSPS Serial-Out 11-Input Analog-To-Digital Converter | TLV2543EVM |
| TLV2544 | 12-Bit, 200 KSPS, 2.7V To 5.5V, 4-Channel, Low Power, Serial ADC w/Auto PD | TLV2544EVM |
| TLV5510 | 8-Bit, 10 MSPS 3 Volt High-Speed Analog-To-Digital Converter | TLV5510EVM |
| TLV5535 | 8-Bit, 35 MSPS, Low Power Analog-To-Digital Converter | TLV5535EVM |
| TLV5580 | 8 Bit, 80 MSPS Low-Pwr ADC | TLV5580EVM |

## Evaluation Modules and Development Tools (Continued)

| TITLE | ORDER NO. |
|---|---|
| TLV571 . . . . . 8-Bit, 1.25 MSPS @ 5V, 625 KSPS @ 3V, 1-Channel, Parallel ADC | TLV571EVM |
| TLVx544/2548. . . . TLVx544/2548EVM Evaluation Module For The TLVx544/TLV2548 10-Bit And 12-Bit ADC User's Guide | SLAU029 |
| TLVx544/x548. . . . Interface For The TLV1562 And TLVx544/x548 ADC Modules | TMS320C54x DSKplus Adaptor Kit |

**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

# Interface Products

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Thirty years ago, before anyone had heard of the Internet, and computers were anything but personal, Texas Instruments was already a leader in interface. In the intervening years, TI's research and development in Low-Voltage Differential Signaling (LVDS), TIA/EIA-485, TIA/EIA-232, SCSI, IEEE 1394 FireWire™ and other technologies has allowed us to build upon that legacy. TI will continue to feed the pipeline with breakthrough products that can provide the backbone of tomorrow's global information infrastructure. TI's Interface Product Line may be divided into five major families:

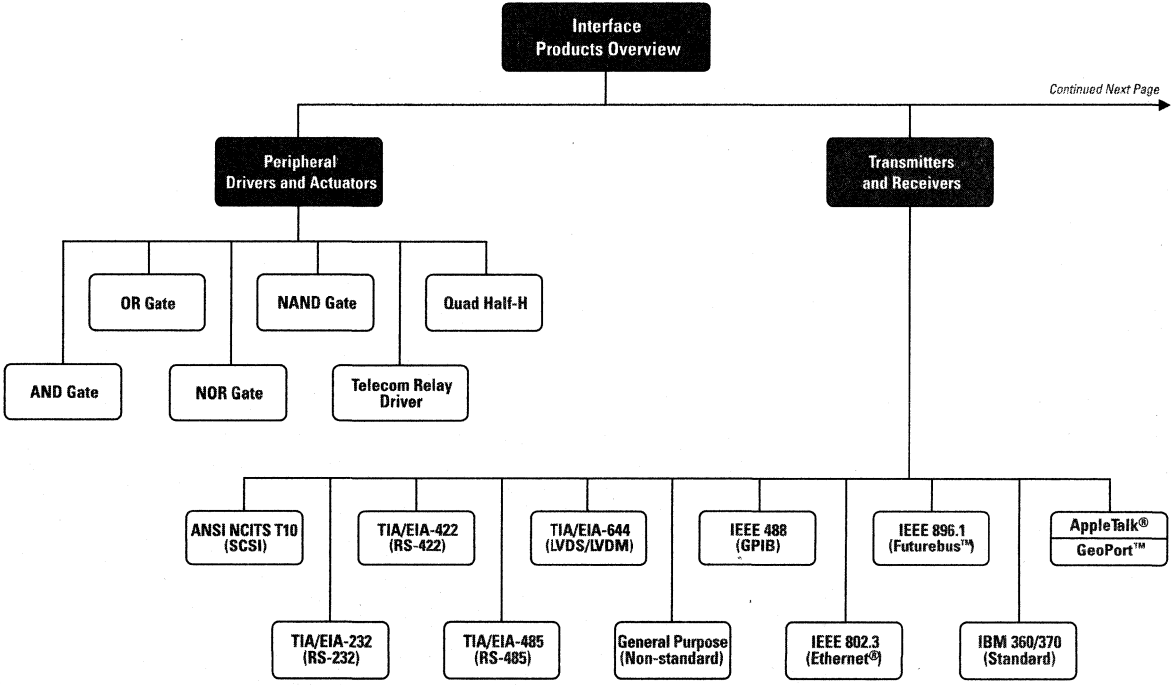
1. Peripheral Drivers and Actuators
2. Transmitters and Receivers
3. Communication Controllers
4. Data Serialization/Deserialization
5. Bus Terminators

## Interface New Product Previews

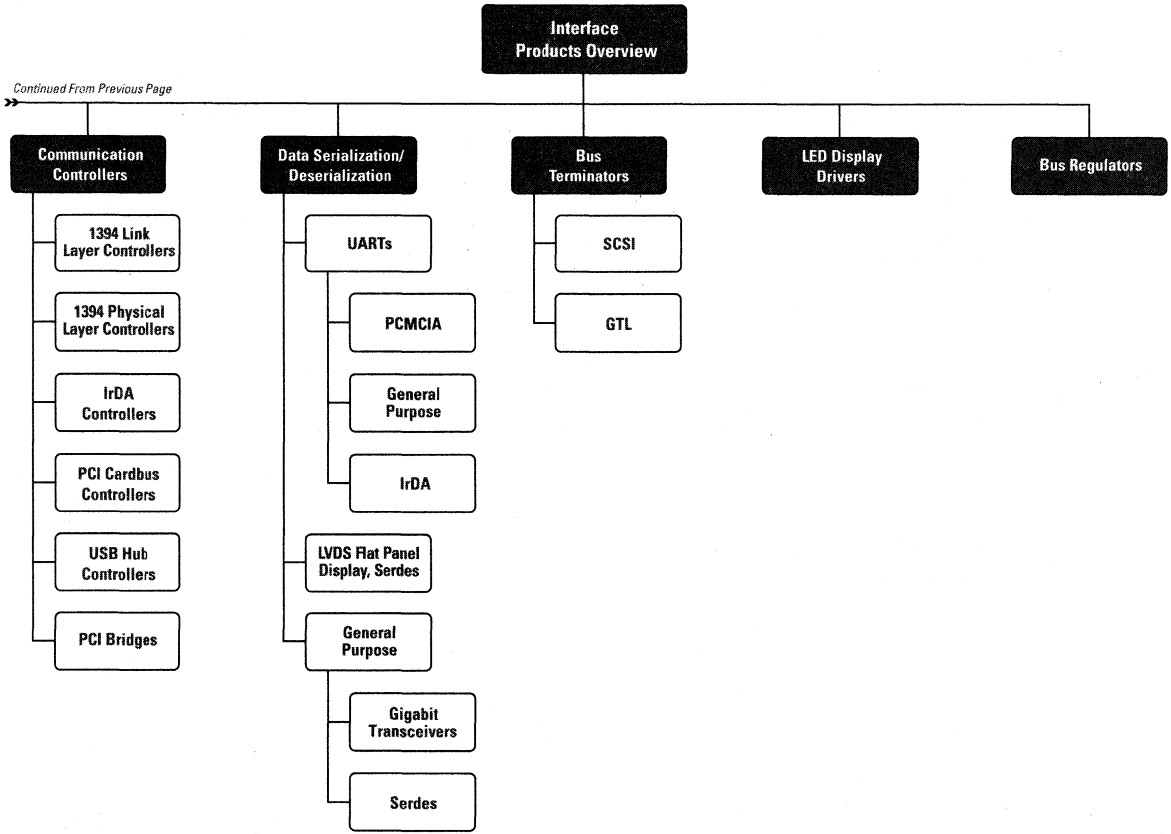
The following new devices are expected to be released in the near future. For more information, please refer to the Designer's Guide CD-ROM, literature number SLYC005D.

| Device | Description |
|---|---|
| **Transmitters and Receivers** | |
| ***TIA/EIA-485 (RS-485)*** | |
| SN65LBC176A | Single-Channel TIA/EIA-485 Transceiver |
| SN65LBC179A | Single-Channel TIA/EIA-485 Transceiver |
| SN65LBC180A | Single-Channel TIA/EIA-485 Transceiver |
| ***TIA/EIA-644 (LVDS/LVDM)*** | |
| SN65LVDM1676 | 16-Channel LVDM Transceiver for Half-duplex or Bidirectional Data Transmission |
| SN65LVDM1677 | 16-Channel LVDM Transceiver with Integrated Termination for Half-duplex or Bidirectional Data Transmission |
| SN65LVDS2 | Single Receiver with No Termination |
| SN65LVDS32A | Quad LVDS Receiver with Wider-common Mode Range |
| SN65LVDS3486A | Quad LVDS Receiver with Wider-common Mode Range |
| SN65LVDS386 | 16-Channel Receiver |
| SN65LVDS388 | 8-Channel Receiver |
| SN65LVDS9637A | Dual LVDS Receiver with Wider-common Mode Range |
| SN65LVDT32A | Quad LVDS Receiver with Wider-common Mode Range and Integrated Termination |
| SN65LVDT3486A | Quad LVDS Receiver with Wider-common Mode Range and Integrated Termination |
| SN65LVDT386 | 16-Channel Receiver with Terminations |
| SN65LVDT388 | 8-Channel Receiver with Terminations |
| SN65LVDT9637A | Dual LVDS Receiver with Wider-common Mode Range and Integrated Termination |
| SN75LVDS386 | 16-Channel Receiver |
| SN75LVDS388 | 8-Channel Receiver |
| SN75LVDT386 | 16-Channel Receiver with Terminations |
| SN75LVDT388 | 8-Channel Receiver with Terminations |
| **LVDS Flat Panel Display, Serdes** | |
| SN75LVDS88A | LVDS Panel Timing Controller which integrates Flatlink™ signal interface with TFT LCD timing controller |
| **Gigabit Transceivers** | |
| TLK2500 | Multigigabit transceiver used for ultra-high-speed bidirectional point-to-point data transmissions which supports an effective serial interface speed of 1.6 Gbps to 2.5 Gbps |
| **USB Hub Controllers** | |
| TUSB2046A | 3.3-V, 4-Port USB 1.1 Compliant Hub |
| TUSB2077 | 3.3-V, 7-Port USB 1.1 Compliant Hub |
| **UARTs** | |
| TL16C752B | Dual UART with 64-byte FIFO |
| TL16C754B | Quad UART with 64-byte FIFO |
| **Web Locations for Specific Product Groups** | |
| Interface Products | www.ti.com/sc/docs/products/msp/intrface/index.htm |

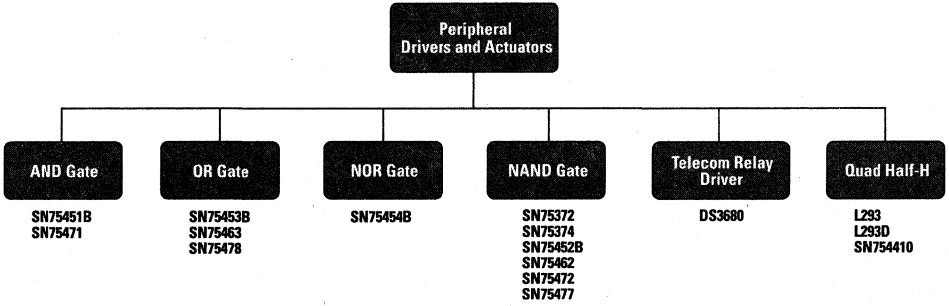
## Interface Products Overview



## Interface Products Overview (Continued)



## Peripheral Drivers and Actuators



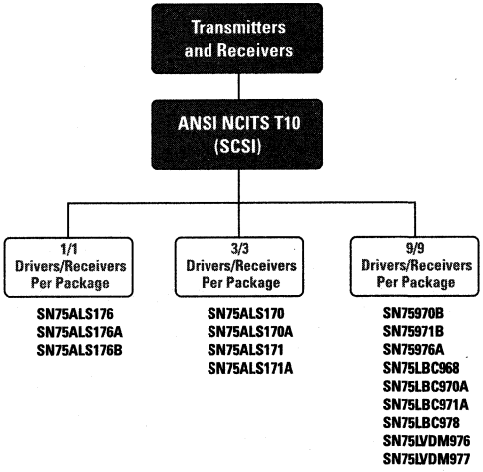

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/intrface/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Peripheral Drivers and Actuators

| Device Name | Output Voltage (max) (V) | Switching Voltage (max) (V) | Peak Output Current (mA) | Drivers per Package | Output Clamp Diodes | Input Compatibility | Delay Time (typ) (ns) | Description |
|---|---|---|---|---|---|---|---|---|
| **AND Gate** | | | | | | | | |
| SN75451B | 30 | 20 | 500 | 2 | No | TTL | 18 | Peripheral Driver |
| SN75471 | 70 | 55 | 500 | 2 | No | TTL | 30 | Peripheral Driver |
| **OR Gate** | | | | | | | | |
| SN75453B | 30 | 20 | 500 | 2 | No | TTL | 18 | Peripheral Driver |
| SN75463 | 35 | 30 | 500 | 2 | No | TTL | 30 | Peripheral Driver |
| SN75478 | 100 | 55 | 500 | 2 | Yes | CMOS,TTL | 200 | Peripheral Driver |
| **NOR Gate** | | | | | | | | |
| SN75454B | 30 | 20 | 500 | 2 | No | TTL | 27 | Peripheral Driver |
| **NAND Gate** | | | | | | | | |
| SN75372 | 24 | 24 | 500 | 2 | Yes | TTL | 20 | MOSFET Driver |
| SN75374 | 24 | 24 | 500 | 4 | Yes | TTL | 20 | MOSFET Driver |
| SN75452B | 30 | 20 | 500 | 2 | No | TTL | 26 | Peripheral Driver |
| SN75462 | 35 | 30 | 500 | 2 | No | TTL | 45 | Peripheral Driver |
| SN75472 | 70 | 55 | 500 | 2 | No | TTL | 45 | Peripheral Driver |
| SN75477 | 100 | 55 | 500 | 2 | Yes | CMOS,TTL | 200 | Peripheral Driver |
| **Telecom Relay Driver** | | | | | | | | |
| DS3680 | 60 | 60 | 100 | 4 | Yes | CMOS,TTL | 1000 | Telephone Relay Driver |
| **Quad Half-H** | | | | | | | | |
| L293 | 36 | 36 | 2000 | 4 | No | TTL | 800 | Half-H Driver |
| L293D | 36 | 36 | 1200 | 4 | Yes | TTL | 800 | Half-H Driver |
| SN754410 | 36 | 36 | 2000 | 4 | Yes | CMOS,TTL | 800 | Half-H Driver |

## Transmitters and Receivers—ANSI NCITS T10 (SCSI)



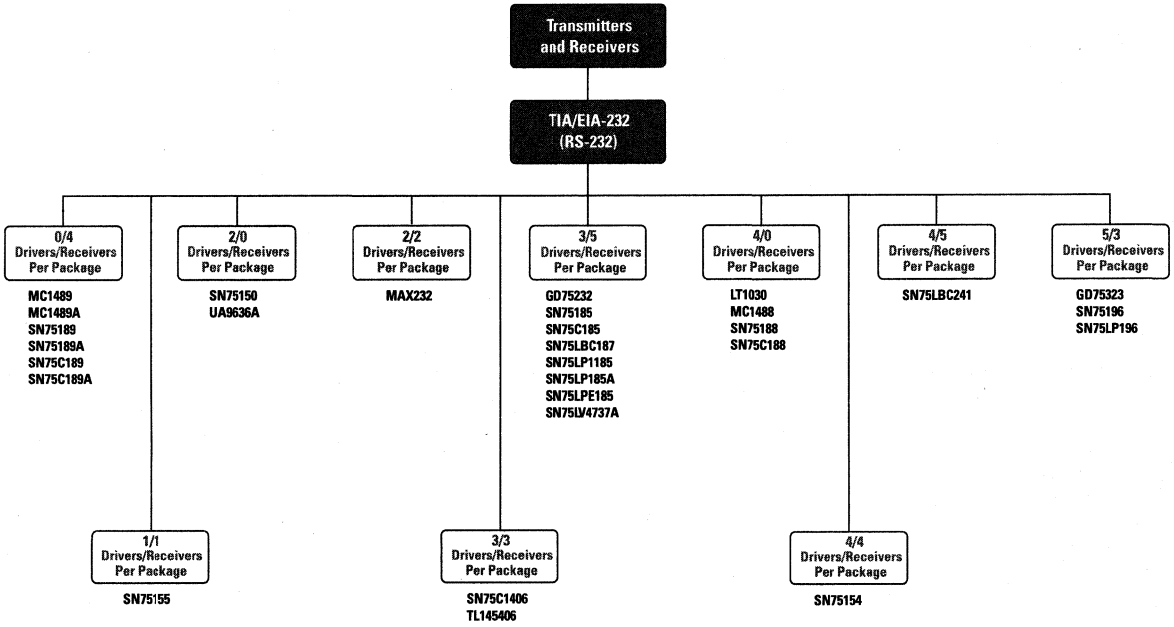

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/intrface/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Transmitters and Receivers—ANSI NCITS T10 (SCSI)

| Device Name | Sorted By Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Receiver ($V_{th}$) (mV) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| SN75ALS176 | 1 | 1 | 8 | 19 | | | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS176A | 1 | 1 | 7 | 18 | | | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS176B | 1 | 1 | 8 | 16.5 | | | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS170 | 3 | 3 | 13 | 19 | | | 5 | 90 | SN75ALS170 | Triple Differential Bus Transceiver |
| SN75ALS170A | 3 | 3 | 10.5 | 16.5 | | | 5 | 90 | SN75ALS170 | Triple Differential Bus Transceiver |
| SN75ALS171 | 3 | 3 | 13 | 19 | | | 5 | 90 | SN75ALS171 | Triple Differential Bus Transceiver |
| SN75ALS171A | 3 | 3 | 11 | 16 | | | 5 | 90 | SN75ALS171 | Triple Differential Bus Transceiver |
| SN75970B | 9 | 9 | 6 | 6 | | | 5 | 95 | SN75LBC970A | SCSI Differential Converter Control |
| SN75971B | 9 | 9 | 6 | 6 | | | 5 | 50 | SN75LBC971A | SCSI Differential Converter-Data |
| SN75976A | 9 | 9 | 13.5 | 16.5 | 60 | | 5 | 60 | SN75LBC976 | 9-Channel Differential Transceiver |
| SN75LBC968 | 9 | 9 | 45 | 25 | 60 | | 5 | 45 | SN75LBC968 | 9-Channel Bus Transceiver with Active Termination |
| SN75LBC970A | 9 | 9 | 8.5 | 8.5 | | | 5 | 94 | SN75LBC970 | SCSI Differential Converter-Control |
| SN75LBC971A | 9 | 9 | 8.5 | 8.5 | | | 5 | 36 | SN75LBC971 | SCSI Differential Converter-Data Product Preview |
| SN75LBC978 | 9 | 9 | 26.4 | 30.7 | | | 5 | 45 | SN75LBC978 | 9-Channel Differential Transceiver |
| SN75LVDM976 | 9 | 9 | 8.8 | 10 | 100 | 30 | 5 | 26 | SN75976 | 9-Channel Dual-Mode SCSI Transceiver |
| SN75LVDM977 | 9 | 9 | 8.8 | 10 | 100 | 30 | 5 | 26 | SN75976 | 9-Channel Dual-Mode Transceivers |

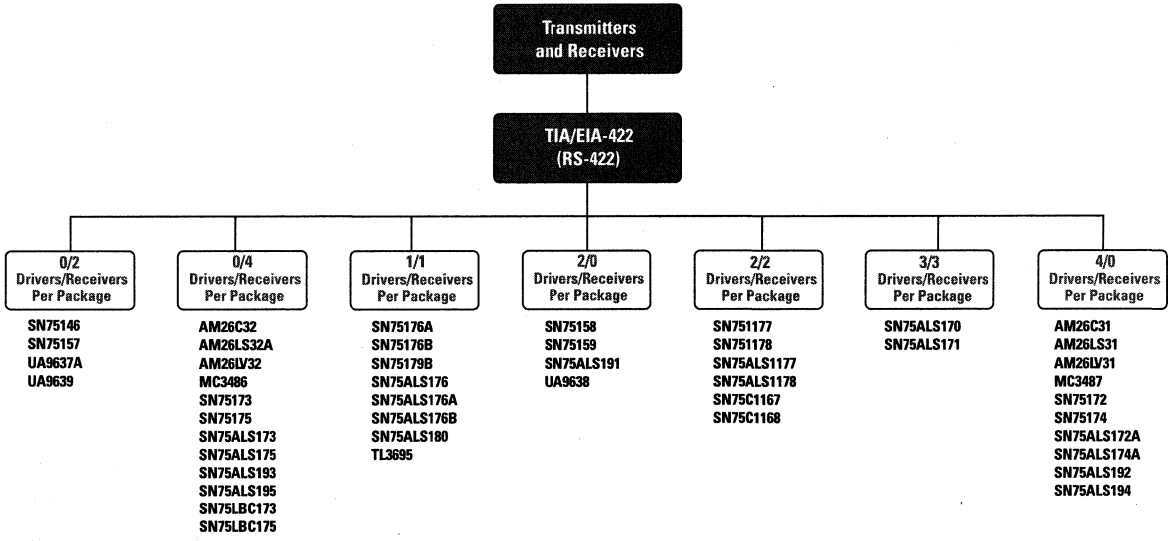
## Transmitters and Receivers—TIA/EIA-232 (RS-232)



## Transmitters and Receivers—TIA/EIA-232 (RS-232)

| Device Name | Sorted By Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|
| MC1489 | 0 | 4 | | 85 | | 5 | 26 | MC1489 | Quadruple Line Receiver |
| MC1489A | 0 | 4 | | 85 | | 5 | 26 | MC1489 | Quadruple Line Receiver |
| SN75189 | 0 | 4 | | 85 | | 5 | 26 | MC1489 | Quadruple Line Receiver |
| SN75189A | 0 | 4 | | 85 | | 5 | 26 | MC1489 | Quadruple Line Receiver |
| SN75C189 | 0 | 4 | | 6000 | | 5 | 0.7 | MC1489 | Quadruple Low-Power Line Receiver |
| SN75C189A | 0 | 4 | | 6000 | | 5 | 0.7 | MC1489 | Quadruple Low-Power Line Receiver |
| SN75155 | 1 | 1 | 480 | 245 | 300 | ±12 | 14 | SN75155 | Line Driver and Receiver |
| SN75150 | 2 | 0 | 60 | | | ±12 | 22 | SN75150 | Dual Line Driver |
| UA9636A | 2 | 0 | | | | ±12 | 18 | uA9636 | Dual Line Driver with Adjustable Slew Rate |
| MAX232 | 2 | 2 | | 500 | | 5 | 10 | MAX232 | Dual EIA-232 Driver/Receiver |
| SN75C1406 | 3 | 3 | 3500 | 4000 | | ±12, 5 | 0.45 | MC14506 | Triple Low-Power Drivers and Receivers |
| TL145406 | 3 | 3 | 500 | 425 | | ±12, 5 | 20 | MC14506 | Triple RS-232 Drivers/Receivers |
| GD75232 | 3 | 5 | 500 | 500 | | ±12, 5 | 20 | GD75232 | Multiple RS-232 Drivers and Receivers |
| SN75185 | 3 | 5 | 500 | 500 | | ±12, 5 | 30 | SN75185 | Multiple RS-232 Drivers and Receivers |
| SN75C185 | 3 | 5 | 3500 | 4000 | 300 | ±12, 5 | 0.75 | SN75C185 | Low-Power Multiple Drivers and Receivers |
| SN75LBC187 | 3 | 5 | 1250 | 1250 | 3000 | 5 | 30 | SN75LBC187 | Multichannel EIA-232 Driver/Receiver with Charge Pump |
| SN75LP1185 | 3 | 5 | 1600 | 900 | | 5, ±12 | 1 | SN75LP185 | Low-Power Multiple RS-232 Drivers and Receivers |
| SN75LP185A | 3 | 5 | 1600 | 900 | 300 | 5, ±12 | 1 | SN75LP185 | Low-Power Multiple RS-232 Drivers and Receivers |
| SN75LPE185 | 3 | 5 | 1600 | 900 | 300 | 5, ±12 | 1 | SN75LP185 | Low-Power Multiple Drivers and Receivers with Enable |
| SN75LV4737A | 3 | 5 | 850 | 200 | 300 | 3 or 5 | 20.7 | SN75LV4737A | 3.3-V/5-V Multichannel RS-232 Line Driver/Receiver |
| LT1030 | 4 | 0 | | | | ±5 | 1 | LT1030 | Quadruple Low-Power Line Driver |
| MC1488 | 4 | 0 | 350 | | | ±9 | 25 | MC1488 | Quadruple Line Driver |
| SN75188 | 4 | 0 | 350 | | | ±9 | 25 | MC1488 | Quadruple Line Driver |
| SN75C188 | 4 | 0 | 3500 | | 300 | ±12 | 0.16 | MC1488 | Quadruple Low-Power Line Driver |
| SN75154 | 4 | 4 | 11 | | | 5 or 12 | 35 | SN75154 | Quadruple Differential Line Receiver |
| SN75LBC241 | 4 | 5 | | 500 | 3000 | 5 | 8 | MAX241 | Low-Power LinBiCMOS Multiple Drivers and Receivers |
| GD75323 | 5 | 3 | 500 | 500 | | ±12, 5 | 32 | GD75323 | Multiple RS-232 Drivers and Receivers |
| SN75196 | 5 | 3 | 500 | 500 | 300 | ±12, 5 | 20 | SN75196 | Multiple RS-232 Driver and Receiver |
| SN75LP196 | 5 | 3 | 1600 | 900 | | 5, ±12 | 1 | SN75LP185 | Low-Power Multiple RS-232 Drivers and Receivers |

## Transmitters and Receivers—TIA/EIA-422 (RS-422)



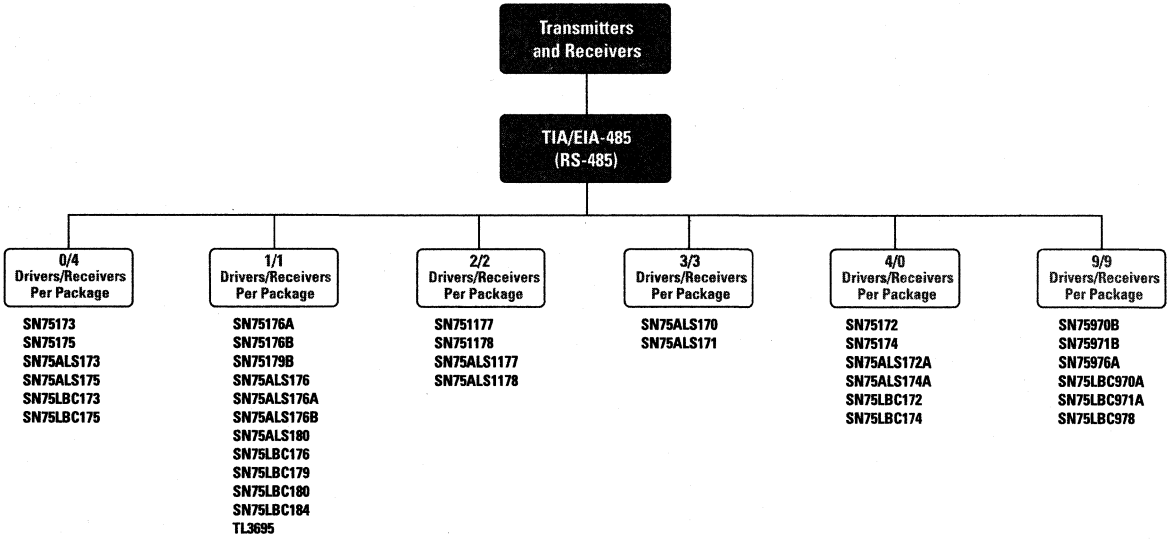
## Transmitters and Receivers—TIA/EIA-422 (RS-422)

| Device Name | Sorted By Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|
| SN75146 | 0 | 2 | | 300 | 5 | 50 | uA9637 | Dual Differential Line Receiver |
| SN75157 | 0 | 2 | | 25 | 5 | 50 | SN75157 | Dual Differential Line Receiver |
| UA9637A | 0 | 2 | | 25 | 5 | 50 | uA9637 | Dual Differential Line Receiver |
| UA9639 | 0 | 2 | | 85 | 5 | 50 | uA9639 | Dual Differential Line Receiver |
| AM26C32 | 0 | 4 | | 27 | 5 | 15 | AM26LS32 | Quadruple Differential Line Receiver |
| AM26LS32A | 0 | 4 | | 35 | 5 | 70 | AM26LS32 | Quadruple Differential Line Receiver |
| AM26LV32 | 0 | 4 | | 20 | 3.3 | 17 | AM26LS32 | Low-Voltage High-Speed Quadruple Differential Line Receiver |
| MC3486 | 0 | 4 | | 35 | 5 | 85 | MC3486 | Quadruple Differential Line Receiver with 3-State Outputs |
| SN75173 | 0 | 4 | | 35 | 5 | 70 | AM26LS32 | Quadruple Differential Line Receiver |
| SN75175 | 0 | 4 | | 35 | 5 | 70 | MC3486 | Quadruple Differential Line Receiver |
| SN75ALS173 | 0 | 4 | | 27 | 5 | 24 | AM26LS32 | Quadruple Differential Line Receiver |
| SN75ALS175 | 0 | 4 | | 27 | 5 | 24 | MC3486 | Quadruple Differential Line Receiver |
| SN75ALS193 | 0 | 4 | | 22 | 5 | 35 | AM26LS32 | Quadruple Differential Line Receiver |
| SN75ALS195 | 0 | 4 | | 22 | 5 | 35 | MC3486 | Quadruple Differential Line Receiver |
| SN75LBC173 | 0 | 4 | | 30 | 5 | 20 | AM26LS32 | Quadruple Low-Power Differential Line Receiver |
| SN75LBC175 | 0 | 4 | | 30 | 5 | 20 | MC3486 | Quadruple Low-Power Differential Line Receiver |
| SN75176A | 1 | 1 | 60 | 35 | 5 | 50 | SN75176 | Differential Bus Transceiver |
| SN75176B | 1 | 1 | 22 | 35 | 5 | 70 | SN75176 | Differential Bus Transceiver |
| SN75179B | 1 | 1 | 22 | 35 | 5 | 70 | SN75179 | Differential Driver and Receiver Pair |
| SN75ALS176 | 1 | 1 | 8 | 19 | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS176A | 1 | 1 | 7 | 18 | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS176B | 1 | 1 | 8 | 16.5 | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS180 | 1 | 1 | 13 | 19 | 5 | 30 | SN75ALS180 | Differential Driver and Receiver Pair |
| TL3695 | 1 | 1 | 22 | 37 | 5 | 50 | SN75176 | Differential Bus Transreceiver |
| SN75158 | 2 | 0 | 25 | | 5 | 50 | SN75158 | Dual Differential Line Driver |
| SN75159 | 2 | 0 | 25 | | 5 | 65 | SN75159 | Dual Differential Line Driver with 3-State Outputs |
| SN75ALS191 | 2 | 0 | 7 | | 5 | 40 | uA9638 | Dual Differential Line Driver |
| UA9638 | 2 | 0 | 20 | | 5 | 65 | uA9638 | Dual High-Speed Differential Line Driver |
| SN751177 | 2 | 2 | | 35 | 5 | 110 | MC34050 | Dual Differential Driver/Receiver Pairs |
| SN751178 | 2 | 2 | | 35 | 5 | 110 | MC34051 | Dual Differential Driver/Receiver Pairs |
| SN75ALS1177 | 2 | 2 | 22 | 37 | 5 | 50 | MC34050 | Dual Differential Drivers and Receivers |

## Transmitters and Receivers—TIA/EIA-422 (RS-422) (Continued)

| Device Name | Sorted By: Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|
| SN75ALS1178 | 2 | 2 | 22 | 37 | 5 | 50 | MC34051 | Dual Differential Drivers and Receivers |
| SN75C1167 | 2 | 2 | 12 | 27 | 5 | 9 | MC34050 | Dual Differential Drivers and Receivers |
| SN75C1168 | 2 | 2 | 12 | 27 | 5 | 9 | MC34051 | Dual Differential Drivers and Receivers |
| SN75ALS170 | 3 | 3 | 13 | 19 | 5 | 90 | SN75ALS170 | Triple Differential Bus Transceiver |
| SN75ALS171 | 3 | 3 | 13 | 19 | 5 | 90 | SN75ALS171 | Triple Differential Bus Transceiver |
| AM26C31 | 4 | 0 | 12 | | 5 | 3 | AM26LS31 | Quadruple Differential Line Driver |
| AM26LS31 | 4 | 0 | 20 | | 5 | 80 | AM26LS31 | Quadruple Differential Line Driver |
| AM26LV31 | 4 | 0 | 12 | | 3.3 | 0.1 | AM26LS31 | Low-Voltage High-Speed Quadruple Differential Line Driver |
| MC3487 | 4 | 0 | 20 | | 5 | 85 | MC3487 | Quadruple Differential Line Driver |
| SN75172 | 4 | 0 | 65 | | 5 | 60 | AM26LS31 | Quadruple Differential Line Driver |
| SN75174 | 4 | 0 | 65 | | 5 | 60 | MC3487 | Quadruple Differential Line Driver |
| SN75ALS172A | 4 | 0 | 22 | | 5 | 55 | AM26LS31 | Quadruple Differential Line Driver |
| SN75ALS174A | 4 | 0 | 22 | | 5 | 55 | MC3487 | Quadruple Differential Line Driver |
| SN75ALS192 | 4 | 0 | 14 | | 5 | 45 | AM26LS31 | Quadruple Differential Line Driver |
| SN75ALS194 | 4 | 0 | 14 | | 5 | 45 | MC3487 | Quadruple Differential Line Driver |

## Transmitters and Receivers—TIA/EIA-485 (RS-485)

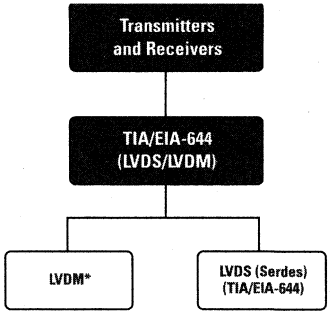



| Device Name | Sorted By: Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|
| SN75173 | 0 | 4 | | 35 | | 5 | 70 | AM26LS32 | Quadruple Differential Line Receiver |
| SN75175 | 0 | 4 | | 35 | | 5 | 70 | MC3486 | Quadruple Differential Line Receiver |
| SN75ALS173 | 0 | 4 | | 27 | | 5 | 24 | AM26LS32 | Quadruple Differential Line Receiver |
| SN75ALS175 | 0 | 4 | | 27 | | 5 | 24 | MC3486 | Quadruple Differential Line Receiver |
| SN75LBC173 | 0 | 4 | | 30 | | 5 | 20 | AM26LS32 | Quadruple Low-Power Differential Line Receiver |

## Transmitters and Receivers—TIA/EIA-485 (RS-485) (Continued)

| Device Name | Sorted By Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Supply Voltage(s), (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|
| SN75LBC175 | 0 | 4 | | 30 | | 5 | 20 | MC3486 | Quadruple Low-Power Differential Line Receiver |
| SN75176A | 1 | 1 | 60 | 35 | | 5 | 50 | SN75176 | Differential Bus Transceiver |
| SN75176B | 1 | 1 | 22 | 35 | | 5 | 70 | SN75176 | Differential Bus Transceiver |
| SN75179B | 1 | 1 | 22 | 35 | | 5 | 70 | SN75179 | Differential Driver and Receiver Pair |
| SN75ALS176 | 1 | 1 | 8 | 19 | | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS176A | 1 | 1 | 7 | 18 | | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS176B | 1 | 1 | 8 | 16.5 | | 5 | 30 | SN75176 | Differential Bus Transreceiver |
| SN75ALS180 | 1 | 1 | 13 | 19 | | 5 | 30 | SN75ALS180 | Differential Driver and Receiver Pair |
| SN75LBC176 | 1 | 1 | 25 | 33 | | 5 | 5.4 | SN75176 | Differential Bus Transreceiver |
| SN75LBC179 | 1 | 1 | 18 | 30 | | 5 | 5 | SN75179 | Low-Power Differential Line Driver and Receiver Pair |
| SN75LBC180 | 1 | 1 | 18 | 33 | | 5 | 5 | SN75LBC180 | Low-Power Differential Line Driver and Receiver Pair |
| SN75LBC184 | 1 | 1 | 1500 | 300 | | 5 | 25 | SN75176 | Transient Voltage Suppression Differential Transceiver |
| TL3695 | 1 | 1 | 22 | 37 | | 5 | 50 | SN75176 | Differential Bus Transreceiver |
| SN751177 | 2 | 2 | | 35 | | 5 | 110 | MC34050 | Dual Differential Driver/Receiver Pairs |
| SN751178 | 2 | 2 | | 35 | | 5 | 110 | MC34051 | Dual Differential Driver/Receiver Pairs |
| SN75ALS1177 | 2 | 2 | 22 | 37 | | 5 | 50 | MC34050 | Dual Differential Drivers and Receivers |
| SN75ALS1178 | 2 | 2 | 22 | 37 | | 5 | 50 | MC34051 | Dual Differential Drivers and Receivers |
| SN75ALS170 | 3 | 3 | 13 | 19 | | 5 | 90 | SN75ALS170 | Triple Differential Bus Transceiver |
| SN75ALS171 | 3 | 3 | 13 | 19 | | 5 | 90 | SN75ALS171 | Triple Differential Bus Transceiver |
| SN75172 | 4 | 0 | 65 | | | 5 | 60 | AM26LS31 | Quadruple Differential Line Driver |
| SN75174 | 4 | 0 | 65 | | | 5 | 60 | MC3487 | Quadruple Differential Line Driver |
| SN75ALS172A | 4 | 0 | 22 | | | 5 | 55 | AM26LS31 | Quadruple Differential Line Driver |
| SN75ALS174A | 4 | 0 | 22 | | | 5 | 55 | MC3487 | Quadruple Differential Line Driver |
| SN75LBC172 | 4 | 0 | 20 | | | 5 | 7 | AM26LS31 | Quadruple Low-Power Differential Line Driver |
| SN75LBC174 | 4 | 0 | 20 | | | 5 | 7 | MC3487 | Quadruple Low-Power Differential Line Driver |
| SN75970B | 9 | 9 | 6 | 6 | | 5 | 95 | SN75LBC970A | SCSI Differential Converter Control |
| SN75971B | 9 | 9 | 6 | 6 | | 5 | 50 | SN75LBC971A | SCSI Differential Converter-Data |
| SN75976A | 9 | 9 | 13.5 | 16.5 | 60 | 5 | 60 | SN75LBC976 | 9-Channel Differential Transceiver |
| SN75LBC970A | 9 | 9 | 8.5 | 8.5 | | 5 | 94 | SN75LBC970 | SCSI Differential Converter-Control |
| SN75LBC971A | 9 | 9 | 8.5 | 8.5 | | 5 | 36 | SN75LBC971 | SCSI Differential Converter-Data Product Preview |
| SN75LBC978 | 9 | 9 | 26.4 | 30.7 | | 5 | 45 | SN75LBC978 | 9-Channel Differential Transceiver |

## Transmitters and Receivers—TIA/EIA-644 (LVDS/LVDM)




**SN65LVDM050**
**SN65LVDM051**
**SN65LVDM176**
**SN65LVDM179**
**SN65LVDM180**
**SN65LVDM22**
**SN75LVDM976**
**SN75LVDM977**

* Low voltage differential multipoint (50-Ω) transmission

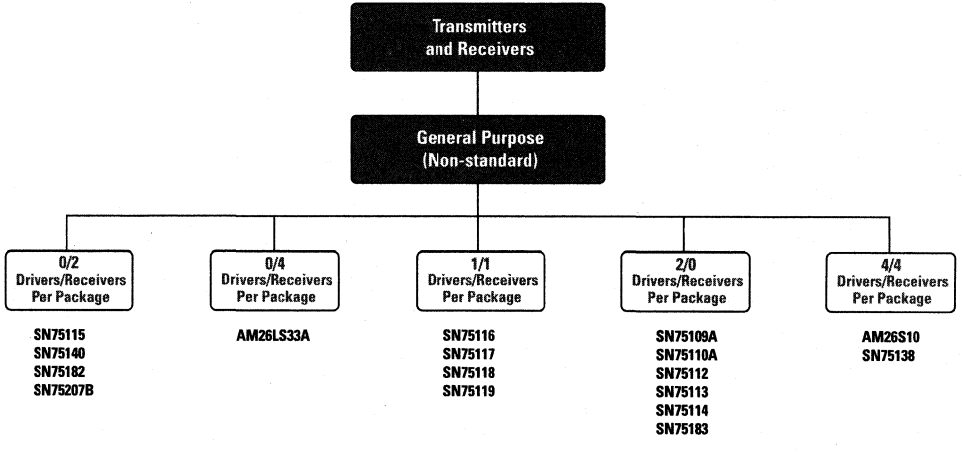
**SN65LVDS050**
**SN65LVDS051**
**SN65LVDS1**
**SN65LVDS1050**
**SN65LVDS108**
**SN65LVDS109**
**SN65LVDS116**
**SN65LVDS117**
**SN65LVDS179**
**SN65LVDS180**
**SN65LVDS22**
**SN65LVDS31**
**SN65LVDS32**
**SN65LVDS3486**
**SN65LVDS3487**
**SN65LVDS387**
**SN65LVDS389**
**SN65LVDS9637**
**SN65LVDS9637A**
**SN65LVDS9638**
**SN65LVDT2**
**SN65LVDT9637A**
**SN75LVDS389**

**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/intrface/index.htm**
**For military qualified products, refer to:**
**www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm**

## Transmitters and Receivers—TIA/EIA-644 (LVDS/LVDM)

| Device Name | Sorted By Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Receiver ($V_{th}$) (mV) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| SN65LVDT2 | 0 | 1 | | 2.6 | | ±100 | 3.3 | 6 | SN65LVDT2 | High-Speed Differential Line Receiver |
| SN65LVDS9637 | 0 | 2 | | 2.2 | | ±100 | 3.3 | 10 | uA9637 | Dual High-Speed Differential Receiver |
| SN65LVDS9637A | 0 | 2 | | 2.2 | | ±100 | 3.3 | 10 | uA9637 | High-Speed Differential Receivers |
| SN65LVDT9637A | 0 | 2 | | 2.2 | | ±100 | 3.3 | 10 | uA9637 | High-Speed Differential Receivers |
| SN65LVDS32 | 0 | 4 | | 2.2 | | ±100 | 3.3 | 18 | AM26LS32 | Quad High-Speed Differential Receivers |
| SN65LVDS3486 | 0 | 4 | | 2.2 | | ±100 | 3.3 | 18 | MC3486 | Quad High-Speed Differential Receivers |
| SN65LVDS1 | 1 | 0 | 2.7 | | 100 | | 3.3 | 8 | SN65LVDS1 | High-Speed Differential Line Driver |
| SN65LVDM176 | 1 | 1 | 1.7 | 1.7 | 100 | ±100 | 3.3 | 15 | SN75176 | High Speed Differential Multipoint Transceiver |
| SN65LVDM179 | 1 | 1 | 1.7 | 1.7 | 50 | ±100 | 3.3 | 15 | SN75179 | High-Speed Differential Line Drivers and Receivers |
| SN65LVDM180 | 1 | 1 | 1.7 | 1.7 | 50 | ±100 | 3.3 | 13 | SN75ALS180 | High-Speed Differential Line Drivers and Receivers |
| SN65LVDS179 | 1 | 1 | 1.7 | 3 | 100 | ±100 | 3.3 | 12 | SN75179 | Single High-Speed Differential Driver and Receiver |
| SN65LVDS180 | 1 | 1 | 1.7 | 3 | 100 | ±100 | 3.3 | 12 | SN75ALS180 | Single High-Speed Differential Driver and Receiver |
| SN65LVDS9638 | 2 | 0 | 1.4 | | 100 | | 3.3 | 13 | uA9638 | Dual Differential High-Speed Driver |
| SN65LVDM050 | 2 | 2 | 1.7 | 1.7 | 50 | ±100 | 3.3 | 27 | MC34050 | High-Speed Differential Line Drivers and Receivers |
| SN65LVDM051 | 2 | 2 | 1.7 | 1.7 | 50 | ±100 | 3.3 | 27 | MC34051 | High-Speed Differential Line Drivers and Receivers |
| SN65LVDM22 | 2 | 2 | 4 | 4 | 50 | ±100 | 3.3 | 27 | SN65LVDS22 | Dual Multiplexed LVDS Transceivers |
| SN65LVDS050 | 2 | 2 | 1.7 | 3 | 100 | ±100 | 3.3 | 20 | MC34050 | Dual High-Speed Differential Drivers and Receivers |
| SN65LVDS051 | 2 | 2 | 1.7 | 3 | 100 | ±100 | 3.3 | 20 | MC34051 | Dual High-Speed Differential Drivers and Receivers |
| SN65LVDS1050 | 2 | 2 | 1.7 | 3.7 | 100 | ±100 | 2.7 | 20 | MC34050 | High-Speed Differential Line Drivers and Receivers |
| SN65LVDS22 | 2 | 2 | 4 | 4 | 100 | ±100 | 3.3 | 20 | SN65LVDS22 | Dual Multiplexed LVDS Transceivers |
| SN65LVDS31 | 4 | 0 | 1.4 | | 100 | | 3.3 | 35 | AM26LS31 | Quad High-Speed Differential Drivers |
| SN65LVDS3487 | 4 | 0 | 1.4 | | 100 | | 3.3 | 35 | MC3487 | Quad High-Speed Differential Drivers |
| SN65LVDS109 | 4 | 1 | | 2.8 | 100 | 100 | 3.3 | 64 | SN65LVDS109 | Dual 4-Port Repeater |
| SN65LVDS389 | 8 | 0 | 2.1 | | 100 | | 3.3 | 70 | SN65LVDS389 | High-Speed Differential Line Drivers |
| SN75LVDS389 | 8 | 0 | 2.1 | | 100 | | 3.3 | 70 | SN65LVDS389 | High-Speed Differential Line Drivers |
| SN65LVDS108 | 8 | 1 | | 2.8 | 100 | 100 | 3.3 | 85 | SN65LVDS108 | 1:8 LVDS Repeater |
| SN65LVDS117 | 8 | 1 | 2.8 | | 100 | 100 | 3.3 | | | Dual 8-Port Repeater |
| SN75LVDM976 | 9 | 9 | 8.8 | 10 | 100 | 30 | 5 | 26 | SN75976 | 9-Channel Dual-Mode SCSI Transceiver |
| SN75LVDM977 | 9 | 9 | 8.8 | 10 | 100 | 30 | 5 | 26 | SN75976 | 9-Channel Dual-Mode Transceivers |
| SN65LVDS387 | 16 | 0 | 2 | | 100 | | 3.3 | 115 | SN65LVDS387 | High-Speed Differential Line Drivers |
| SN65LVDS116 | 16 | 1 | | 2.8 | 100 | 100 | 3.3 | 115 | SN65LVDS116 | 1:16 LVDS Repeater |

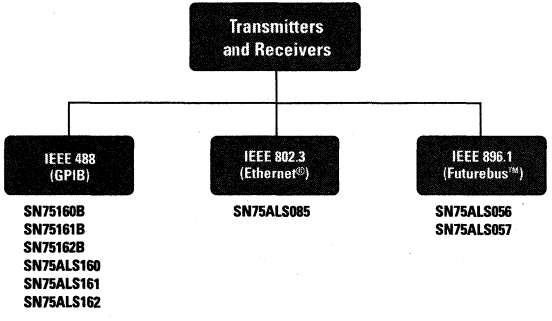
## Transmitters and Receivers—General Purpose (Non-standard)



## Transmitters and Receivers—General Purpose (Non-standard)

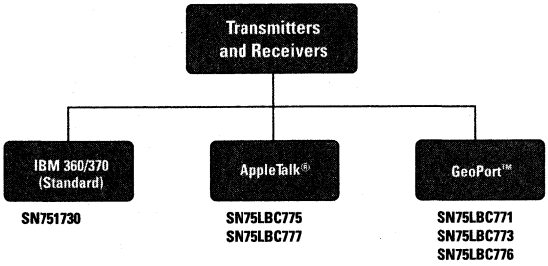
| Device Name | Sorted By Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver $(R_L)$ (ohms) | Receiver $(V_{ID})$ (mV) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| SN75115 | 0 | 2 | | 75 | | 1000 | 5 | 50 | SN75115 | Dual Differential Line Receiver |
| SN75140 | 0 | 2 | | 35 | | Adjustable | 5 | 35 | SN75140 | Dual Line Receiver |
| SN75182 | 0 | 2 | | 45 | | 1000 | 5 | 10.2 | DS8820 | Dual Differential Line Receiver |
| SN75207B | 0 | 2 | | 35 | | 25 | ±5 | 30 | SN75107 | Dual High-Sensitivity Line Receiver |
| AM26LS33A | 0 | 4 | | 35 | | 500 | 5 | 70 | AM26LS32 | Quadruple Differential Line Receiver |
| SN75116 | 1 | 1 | | 30 | 100 | 1000 | 5 | 60 | SN75116 | Differential Line Transreceiver |
| SN75117 | 1 | 1 | | 30 | 100 | 1000 | 5 | 60 | SN75117 | Differential Line Transreceiver |
| SN75118 | 1 | 1 | | 30 | 100 | 1000 | 5 | 60 | SN75118 | Differential Line Transceiver |
| SN75119 | 1 | 1 | | 30 | 100 | 1000 | 5 | 60 | SN75119 | Differential Line Transceiver |
| SN75109A | 2 | 0 | | | | | | | SN75109 | Dual Line Driver |
| SN75110A | 2 | 0 | 15 | | | | ±5 | 35 | SN75110 | Dual Line Driver |
| SN75112 | 2 | 0 | 15 | | | | ±5 | 40 | SN75112 | Dual Line Driver |
| SN75113 | 2 | 0 | 30 | | 100 | | 5 | 65 | SN75113 | Dual Differential Line Driver |
| SN75114 | 2 | 0 | 30 | | 100 | | 5 | 50 | SN75114 | Dual Differential Line Driver |
| SN75183 | 2 | 0 | 18 | | 100 | | 5 | 18 | DS8830 | Quadruple Differential Line Driver |
| AM26S10 | 4 | 4 | | | 50 | | 5 | 80 | AM26S10 | Quadruple Bus Transceiver |
| SN75138 | 4 | 4 | 24 | 15 | 50 | | 5 | 65 | SN75138 | Quadruple Bus Transceiver |

## Transmitters and Receivers—IEEE 488 (GPIB), IEEE 802.3 (Ethernet®), IEEE 896.1 (Futurebus™)



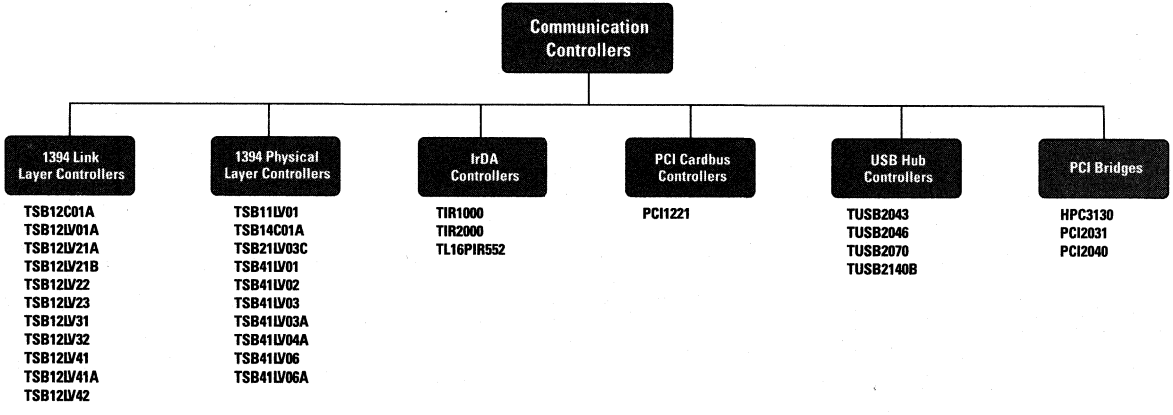

| Device Name | Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Supply Voltage(s) (V) | $I_{CC}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|
| **IEEE 488 (GPIB)** | | | | | | | | |
| SN75160B | 8 | 8 | 20 | 22 | 5 | 110 | SN75160 | Octal General-Purpose Interface Bus Transceiver |
| SN75161B | 8 | 8 | 20 | 35 | 5 | 110 | SN75161 | Octal General-Purpose Interface Bus Transceiver |
| SN75162B | 8 | 8 | 20 | 35 | 5 | 110 | SN75162 | Octal General-Purpose Interface Bus Transceiver |
| SN75ALS160 | 8 | 8 | 20 | 18 | 5 | 80 | SN75160 | Octal General-Purpose Interface Bus Transceiver |
| SN75ALS161 | 8 | 8 | 20 | 14 | 5 | 75 | SN75161 | Octal General-Purpose Interface Bus Transceiver |
| SN75ALS162 | 8 | 8 | 20 | 14 | 5 | 75 | SN75162 | Octal General-Purpose Interface Bus Transceiver |
| **IEEE 802.3 (Ethernet)** | | | | | | | | |
| SN75ALS085 | 2 | 2 | 15 | 15 | 5 | 225 | SN75ALS085 | LAN Access Unit Interface Dual Driver/Receiver |
| **IEEE 896.1 (Futurebus)** | | | | | | | | |
| SN75ALS056 | 8 | 8 | | | 5 | 75 | DS3896 | Trapezoidal-Waveform Interface Bus Transceiver |
| SN75ALS057 | 4 | 4 | | | 5 | 40 | DS3897 | Trapezoidal-Waveform Interface Bus Transceiver |

## Transmitters and Receivers—IBM 360/370 (Standard), AppleTalk®/GeoPort™




| Device Name | Drivers per Package | Receivers per Package | Driver $t_{pd}$ (ns) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Supply Voltage(s) (V) | $I_{cc}$ (max) (mA) | Footprint | Description |
|---|---|---|---|---|---|---|---|---|---|
| **IBM 360/370 (Standard)** | | | | | | | | | |
| SN751730 | 3 | 3 | 18.5 | 19.5 | | 5 | 80 | SN751730 | Triple Line Driver/Receiver |
| **AppleTalk** | | | | | | | | | |
| SN75LBC775 | 2 | 2 | 100 | 50 | | 5 | 10 | SN75LBC775 | Single-Chip AppleTalk and LocalTalk™ Transceiver |
| SN75LBC777 | 3 | 2 | 40 | 35 | 120 | 5 | 15 | SN75LBC777 | Single-Chip GeoPort/AppleTalk Transceiver |
| **GeoPort** | | | | | | | | | |
| SN75LBC771 | 2 | 3 | 75 | 35 | 120 | ±5 | 10 | SN75LBC771 | GeoPort Transceiver |
| SN75LBC773 | 2 | 3 | 35 | 20 | 120 | ±5 | 10 | SN75LBC773 | GeoPort Transceiver |
| SN75LBC776 | 2 | 3 | 75 | 21 | | 5 | 15 | SN75LBC776 | Single-Chip GeoPort Transceiver |

## Communication Controllers




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/intrface/index.htm

For an overview of 1394 Link Layer Controllers and Physical Layer Controllers, refer to:
www.ti.com/sc/docs/msp/1394/1394.htm

For an overview of IrDA Controllers, refer to:
www.ti.com/sc/docs/msp/irda/default.htm

For an overview of PCI Cardbus Controllers and PCI Bridges, refer to:
www.ti.com/sc/docs/msp/pci/pci.htm

For an overview of USB Hub Controllers, refer to:
www.ti.com/sc/docs/msp/usb/mainpage.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Communication Controllers—1394 Link Layer Controllers

| Device Name | Supply Voltage(s) (V) | Speed (max) (Mbps) | FIFO (kb) | Description |
|---|---|---|---|---|
| TSB12C01A | 5 | 400 | 2 | High-Performance 5-V Link Layer with 32-Bit Host I/F, 2K FIFOs |
| TSB12LV01A | 3.3 | 400 | 2 | High-Performance 3.3-V Link Layer with 32-Bit Host I/F, 2K FIFOs |
| TSB12LV21A | 3.3 | 400 | 1 | PCILynx™ - PCI-to-1394 3.3-V Link Layer with 32-Bit PCI I/F, 1K FIFOs |
| TSB12LV21B | 3.3 | 400 | 2 | PCILynx - PCI-to-1394 3.3-V Link Layer with 32-Bit PCI I/F, 2K FIFOs |
| TSB12LV22 | 3.3 | 400 | 8 | PCI-to-1394 Host Controller (OHCI-Lynx™) |
| TSB12LV23 | 3.3 | 400 | 8 | OHCI-Lynx - PCI-to-1394 3.3-V Open Host Controller Interface Link Layer w/32-Bit PCI I/F, 8K FIFOs |
| TSB12LV31 | 3.3 | 200 | 0.2 | GPLynx™ - General Purpose 1394 3.3-V Link Layer with 8/16-Bit I/F, 200-byte FIFOs w/Isochronous Port |
| TSB12LV32 | 3.3 | 400 | 2 | General Purpose Link Layer Controller (GP2Lynx) |
| TSB12LV41 | 3.3 | 200 | 8 | MPEG2Lynx™ - 1394 Link Layer Controller |
| TSB12LV41A | 3.3 | 200 | 8 | MPEG2Lynx - High-Performance 1394 3.3-V Link Layer for MPEG, Audio, and Video, 8/16-Bit I/F, 8K FIFO |
| TSB12LV42 | 3.3 | 200 | 8 | DVLynx™ - High-Performance 1394 3.3-V Link Layer for DV, Audio and Video, 8/16-Bit I/F, 8K FIFOs, and |

## Communication Controllers—1394 Physical Layer Controllers

| Device Name | Supply Voltage(s) (V) | Speed (max) (Mbps) | Description |
|---|---|---|---|
| TSB11LV01 | 3.3 | 100 | IEEE 1394-1995, 3.3-V, 1-Port, 100-Mbps Physical Layer Controller |
| TSB14C01A | 5 | 100 | IEEE 1394-1995, 5-V, 1-Port, 50/100-Mbps Backplane Physical Layer Controller |
| TSB21LV03C | 3.3 | 200 | IEEE 1394-1995, 3.3-V, 3-Port, 100/200-Mbps Physical Layer Controller |
| TSB41LV01 | 3.3 | 400 | IEEE 1394a 1-Port Cable Transceiver/Arbiter |
| TSB41LV02 | 3.3 | 400 | IEEE 1394-1995, 1394a, 3.3-V, 2-Port, 100/200/400-Mbps Physical Layer Controller |
| TSB41LV03 | 3.3 | 400 | IEEE 1394-1995, 1394a, 3.3-V, 3-Port, 100/200/400-Mbps Physical Layer Controller |
| TSB41LV03A | 3.3 | 400 | IEEE 1394a 3-Port Cable Transceiver/Arbiter |
| TSB41LV04A | 3.3 | 400 | IEEE 1394a 4-Port Cable Transceiver/Arbiter |
| TSB41LV06 | 3.3 | 400 | IEEE 1394-1995, 1394a, 3.3-V, 6-Port, 100/200/400-Mbps Physical Layer Controller |
| TSB41LV06A | 3.3 | 400 | IEEE 1394a 6-Port Cable Transceiver/Arbiter |

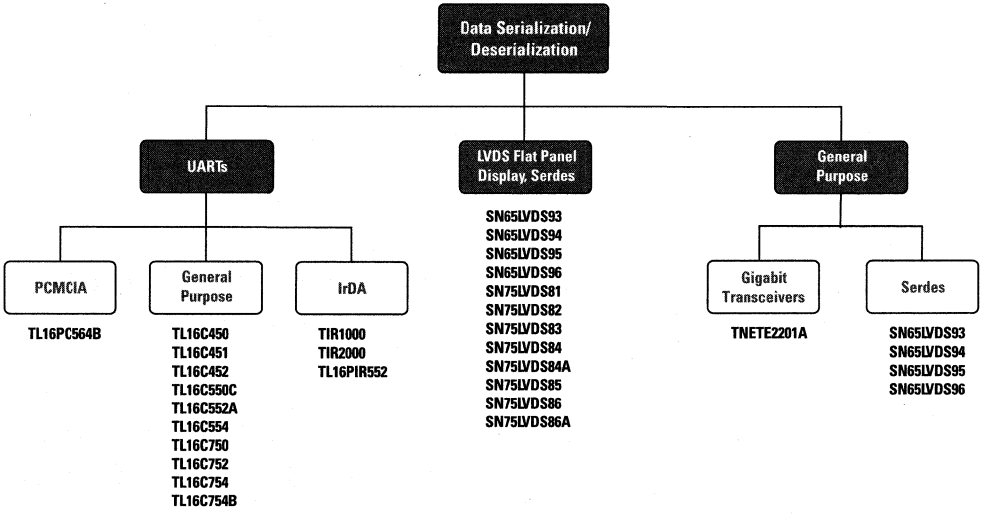
## Communication Controllers—IrDA Controllers

| Device Name | Data Rate (max) (kbps) | IrDA Standard | Description |
|---|---|---|---|
| TIR1000 | 115 | 1.0 | Standalone IrDA Encoder & Decoder |
| TIR2000 | 4000 | 1.0 & 1.1 | High-Speed IrDA Compliant Controller |
| TL16PIR552 | | 1.0 | Dual UART with 16-Byte FIFOs, Selectable IR & 1284 Modes |

## Communication Controllers—PCI Cardbus Controllers, USB Hub Controllers, PCI Bridges

| Device Name | Supply Voltage(s) (V) | Description |
|---|---|---|
| **PCI Cardbus Controllers** | | |
| PCI1221 | 3.3, 5 | Dual Socket PCI-to-Cardbus PC Card Controller |
| **USB Hub Controllers** | | |
| TUSB2043 | 3.3 | 4-Port USB Hub w/Optional Serial EEPROM Interface (Input Clock: 48-MHz Oscillator/Clock Source) |
| TUSB2046 | 3.3 | 4-Port USB Hub w/Optional Serial EEPROM Interface (Input Clock: 6-MHz Crystal) |
| TUSB2070 | 3.3 | 7-Port USB Hub |
| TUSB2140B | 3.3/5 | 4-Port USB Hub w/I²C Microcontroller Interface |
| **PCI Bridges** | | |
| HPC3130 | 3.3 | Hot Plug Controller |
| PCI2031 | 3.3, 5 | PCI Power Management-Compliant 32-Bit PCI-to-PCI Bridge |
| PCI2040 | 3.3, 5 | PCI-to-DSP Bridge Controller, Compliant to Compact PCI Hot Swap Specification 1.0 |

## Data Serialization/Deserialization




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/intrface/index.htm

For an overview of LVDS Flat Panel Display, Serdes, refer to:
www.ti.com/sc/docs/products/msp/intrface/flatlink/flatlink.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Data Serialization/Deserialization—UARTs—PCMCIA, General Purpose

| Device Name | Number of Channels | FIFOs | Operating Voltage (V) | Description |
|---|---|---|---|---|
| **PCMCIA** | | | | |
| TL16PC564B | Single | 64-Byte | 5 & 3.3/3 | Single UART with 64-Byte FIFOs, PCMCIA Interface |
| **General Purpose** | | | | |
| TL16C450 | Single | None | 5 | Single UART without FIFO |
| TL16C451 | Single | None | 5 | Single UART with Parallel Port and without FIFO |
| TL16C452 | Dual | None | 5 | Single UART with Parallel Port and without FIFO |
| TL16C550C | Single | 16-Byte | 5 & 3.3 | Single UART with 16-Byte FIFOs and Auto Flow Control |
| TL16C552A | Dual | 16-Byte | 5 | Dual UART with 16-Byte FIFOs and Parallel Port |
| TL16C554 | Quad | 16-Byte | 5 | Quad UART with 16-Byte FIFOs |
| TL16C750 | Single | 64-Byte | 5 & 3 | Single UART with 64-Byte FIFOs, Auto Flow Control, Low-Power Modes |
| TL16C752 | Dual | 64-Byte | 3.3 | Dual UART with 64-Byte FIFO |
| TL16C754 | Quad | 64-Byte | 5 & 3.3 | Quad UART with 64-Byte FIFOs, Auto Flow Control, Low-Power Modes |
| TL16C754B | Quad | 64-Byte | 5 & 3.3 | Quad UART with 64-Byte FIFO |

## Data Serialization/Deserialization—UARTs—IrDA

| Device Name | Data Rate (max) (kbps) | IrDA Standard | Description |
|---|---|---|---|
| TIR1000 | 115 | 1.0 | Standalone IrDA Encoder & Decoder |
| TIR2000 | 4000 | 1.0 & 1.1 | High-Speed IrDA Compliant Controller |
| TL16PIR552 | | 1.0 | Dual UART with 16-Byte FIFOs, Selectable IR & 1284 Modes |

## Data Serialization/Deserialization—LVDS Flat Panel Display, Serdes

| Device Name | Footprint | Type of Line Circuit | Serial Data Transmitter Channels | Number of Parallel Inputs | Serial Data Receiver Channels | Number of Parallel Outputs | PLL Frequency (MHz) | Data Throughput (MB/s) | $I_{CC}$ (mA) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Driver $t_{pd}$ (ns) | Supply Voltage(s) (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN65LVDS93 | SN75LVDS83 | LVDS | 4 | 28 | 0 | 0 | 31 to 65 | 1820 | 120 | 0 | 100 | 14.2 | 3.3 | Serdes (Serializer/ Deserializer) Transmitter |
| SN65LVDS94 | SN65LVDS84 | LVDS | 0 | 0 | 4 | 28 | 32 to 65 | 1820 | 74 | 8.7 | 0 | 0 | 3.3 | Serdes (Serializer/ Deserializer) Receiver |
| SN65LVDS95 | SN65LVDS85 | LVDS | 3 | 21 | 0 | 0 | 33 to 65 | 1360 | 110 | 0 | 90 | 14.2 | 3.3 | Serdes (Serializer/ Deserializer) Transmitter |
| SN65LVDS96 | SN65LVDS86 | LVDS | 0 | 0 | 3 | 21 | 31 to 67 | 1300 | 94 | 8.7 | 0 | 0 | 3.3 | Serdes (Serializer/ Deserializer) Receiver |
| SN75LVDS81 | DS90C581 | LVDS | 4 | 28 | 0 | 0 | 30 to 68 | 227.5 | 110 | 0 | 100 | 14.2 | 3.3 | Flatlink Transmitter |
| SN75LVDS82 | DS90C582 | LVDS | 0 | 0 | 4 | 28 | 31 to 68 | 227.5 | 125 | 8.7 | 0 | 0 | 3.3 | Flatlink Receiver |
| SN75LVDS83 | DS90C581 | LVDS | 4 | 28 | 0 | 0 | 32 to 68 | 227.5 | 110 | 0 | 100 | 14.2 | 3.3 | Flatlink Transmitter |
| SN75LVDS84 | DS90C561 | LVDS | 3 | 21 | 0 | 0 | 31 to 68 | 163 | 100 | 0 | 100 | 14.2 | 3.3 | Flatlink Transmitter |
| SN75LVDS84A | SN75LVDS84 | LVDS | 3 | 21 | 0 | 0 | 31 to 75 | 197 | 35 | 0 | 100 | 0 | 3.3 | Flatlink Transmitter |
| SN75LVDS85 | DS90C561 | LVDS | 3 | 21 | 0 | 0 | 31 to 68 | 163 | 100 | 0 | 100 | 14.2 | 3.3 | Flatlink Transmitter |
| SN75LVDS86 | DS90C562 | LVDS | 0 | 0 | 3 | 21 | 31 to 68 | 163 | 100 | 8.7 | 0 | 0 | 3.3 | Flatlink Receiver |
| SN75LVDS86A | SN75LVDS86 | LVDS | 0 | 0 | 3 | 21 | 32 to 68 | 163 | 68 | 5 | 0 | 0 | 3.3 | Flatlink Receiver |

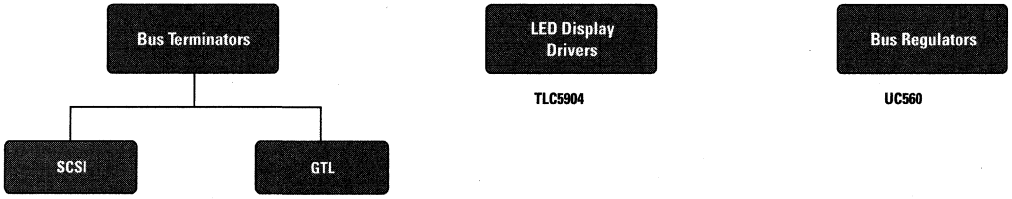
## Data Serialization/Deserialization—General Purpose—Gigabit Transceivers

| Device Name | $V_{CC}$ (max) (V) | $V_{CC}$ (min) (V) | $V_{CC}$ (nom) (V) | $I_{CC}$ (max) (mA) | $V_{IH}$ (max) (V) | $V_{IH}$ (min) (V) | $V_{IL}$ (max) (V) | $I_{IH}$ (max) (µA) | $I_{IL}$ (max) (µA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| TNETE2201A | 3.47 | 3.14 | 3.3 | 260 | 5.5 | 2 | 0.8 | 900 | –900 | 1.25-Gigabit Ethernet Transceiver |

## Data Serialization/Deserialization—General Purpose—Serdes

| Device Name | Footprint | Type of Line Circuit | Serial Data Transmitter Channels | Number of Parallel Inputs | Serial Data Receiver Channels | Number of Parallel Outputs | PLL Frequency (MHz) | Data Throughput (MB/s) | $I_{CC}$ (mA) | Receiver $t_{pd}$ (ns) | Driver ($R_L$) (ohms) | Driver $t_{pd}$ (ns) | Supply Voltage(s) (V) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN65LVDS93 | SN75LVDS83 | LVDS | 4 | 28 | 0 | 0 | 31 to 65 | 1820 | 120 | 0 | 100 | 14.2 | 3.3 | Serdes (Serializer/ Deserializer) Transmitter |
| SN65LVDS94 | SN65LVDS84 | LVDS | 0 | 0 | 4 | 28 | 32 to 65 | 1820 | 74 | 8.7 | 0 | 0 | 3.3 | Serdes (Serializer/ Deserializer) Receiver |
| SN65LVDS95 | SN65LVDS85 | LVDS | 3 | 21 | 0 | 0 | 33 to 65 | 1360 | 110 | 0 | 90 | 14.2 | 3.3 | Serdes (Serializer/ Deserializer) Transmitter |
| SN65LVDS96 | SN65LVDS86 | LVDS | 0 | 0 | 3 | 21 | 31 to 67 | 1300 | 94 | 8.7 | 0 | 0 | 3.3 | Serdes (Serializer/ Deserializer) Receiver |

## Bus Terminators, LED Display Drivers, Bus Regulators




**SCSI**

TL2217-285
TL2218-285
TL-SCSI285
UC5601
UC5602
UC5603
UC5604
UC5605
UC5608
UC5609
UC5612
UC5613
UC5661
UCC5510
UCC5606
UCC561
UCC5610
UCC5611
UCC5614
UCC5617
UCC5618
UCC5619
UCC5620
UCC5621
UCC5622
UCC5628
UCC5630A
UCC5638
UCC5639
UCC5640
UCC5672

**GTL**

UC182-1
UC282-1
UC285-1
UC382-1
UC385-1

**LED Display Drivers**

TLC5904

**Bus Regulators**

UC560

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/intrface/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Bus Terminators—SCSI

| Device Name | $V_{in}$ Range (V) | $V_O$ (nom) (V) | $I_O$ per Channel (max) (mA) | $I_q$ (typ) (mA) | Shutdown | Tolerance (%) | Number of Lines | Description |
|---|---|---|---|---|---|---|---|---|
| TL2217-285 | 4.0 to 5.5 | 2.85 | 500 | 26 | No | 1.5 | 9 | Fixed-Voltage Regulators for SCSI Active Termination |
| TL2218-285 | 4.0 to 5.5 | 2.85 | –24 | 0.6 | Yes | 0.65 | 9 | Current-Mode SCSI Terminator |
| TL-SCSI285 | 4.0 to 5.5 | 2.85 | 500 | 26 | No | 1 | 9 | Fixed-Voltage Regulators for SCSI Active Termination |
| UC5601 | 4.0 to 5.25 | 2.9 | 25.4 | 25 | High | 3 | 18 | 18-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5602 | 4.0 to 5.25 | 2.9 | 25.4 | 29 | High | 7 | 18 | Cost Reduced 18-Line 5-V Terminator for SCSI and Fast SCSI |
| UC5603 | 4.0 to 5.25 | 2.9 | 25.4 | 18 | High | 3 | 9 | 9-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5604 | 4.0 to 5.25 | 2.9 | 25.4 | 20 | High | 7 | 9 | Cost Reduced 9-Line 5-V Terminator for SCSI and Fast SCSI |
| UC5605 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | Low | 5 | 9 | 9-Line 5-V SE Terminator for SCSI and Fast SCSI with Inverted Sensing & Reverse Disconnect |
| UC5608 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | High | 5 | 18 | Lower Capacitance 18-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5609 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | Low | 5 | 18 | Lower Capacitance 18-Line 5-V SE Terminator for SCSI and Fast SCSI with Reverse Disconnect |
| UC5612 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | High | 5 | 9 | 9-Line 5-V SE Terminator for SCSI and Fast SCSI with Inverted Sensing |
| UC5613 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | High | 5 | 9 | Lower Capacitance 9-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5661 | | | | | Yes | | | Ethernet Coaxial Impedance Monitor |
| UCC5510 | 3 to 5.25 | 2.7 | 24 | 20 | Yes | 5 | 9 | 9-Line Multimode Terminator for Plugs and Connectors |
| UCC5606 | 2.7 to 5.25 | 2.7 | 24 | 0.001 | High | 4 | 9 | Lowest Capacitance 9-Line 3- to 5-V SE Terminator for SCSI Through Ultra SCSI with Reverse Disconnect |
| UCC561 | 2.7 to 5.25 | 0.75, 1.3, 1.75 | 25.4 | 40 | No | 7, 8, 3 | 27 | 27-Line Low Voltage Differential SCSI Bias Regulator |
| UCC5610 | 2.7 to 7.0 | 2.7 | 24 | 2 | High | 4 | 9 | Lowest Capacitance 18-Line 3- to 5-V SE Terminator for SCSI Through Ultra SCSI |
| UCC5611 | 2.7 to 7.0 | 2.7 | 24 | 2 | Low | 4 | 9 | Lowest Capacitance 18-Line 3- to 5-V SE Terminator for SCSI Through Ultra SCSI with Reverse Disconnect |
| UCC5614 | 2.7 to 7.0 | 2.7 | 24 | 2 | High | 4 | 9 | Lowest Capacitance 9-Line 3- to 5-V SE Terminator for SCSI Through Ultra SCSI |
| UCC5617 | 4.0 to 5.25 | 2.8 | 24 | 2 | Low | 5 | 18 | Lowest Capacitance 18-Line 5-V SE Terminator for SCSI Through Ultra SCSI with Inverted Sensing |
| UCC5618 | 4.0 to 5.25 | 2.8 | 24 | 2 | High | 5 | 18 | Lowest Capacitance 9-Line 5-V SE Term for SCSI Through Ultra SCSI with Inv Sensing & Rev Disconnect |
| UCC5619 | 4.0 to 7.0 | 2.8 | 24 | 2 | Low | 5 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI with Reverse Disconnect |
| UCC5620 | 4.0 to 7.0 | 2.8 | 24 | 2 | High | 7 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI |

## Bus Terminators—SCSI (Continued)

| Device Name | $V_{in}$ Range (V) | $V_O$ (nom) (V) | $I_O$ per Channel (max) (mA) | $I_q$ (typ) (mA) | Shutdown | Tolerance (%) | Number of Lines | Description |
|---|---|---|---|---|---|---|---|---|
| UCC5621 | 4.0 to 7.0 | 2.8 | 24 | 2 | Low | 5 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI with Dual, Reverse Disconnect |
| UCC5622 | 4.0 to 7.0 | 2.8 | 24 | 2 | High | 5 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI with Dual Disconnect |
| UCC5628 | 2.7 to 5.25 | 1.25, 1.3, 2.7 | 25.4 | 1.6 | High | 7 | 14 | 14-Line 3- to 5-V Multimode Terminator for SCSI Through Ultra3 SCSI |
| UCC5630A | 2.7 to 5.25 | 1.25, 2.7 | 25.4 | 1.6 | High | 5 | 9 | 9-Line 3- to 5-V Multimode Terminator for SCSI Through Ultra3 SCSI |
| UCC5638 | 2.7 to 5.25 | 1.25, 1.3, 2.7 | 25.4 | 1.6 | High | 5 | 15 | 15-Line 3- to 5-V Multimode Terminator for SCSI Through Ultra3 SCSI |
| UCC5639 | 2.7 to 5.25 | 1.25, 1.3, 2.7 | 25.4 | 1.6 | Low | 5 | 15 | 15-Line 3- to 5-V Multimode Terminator for SCSI Through Ultra3 SCSI with Reverse Disconnect |
| UCC5640 | 2.7 to 5.25 | 1.25, 1.3 | | | High | 5 | 9 | 9-Line 3- to 5-V LVD Terminator for Ultra2 and Ultra3 SCSI |
| UCC5672 | 3.0 to 5.0 | | | | | | 9 | 9-Line 3- to 5-V Multimode Terminator for SCSI Through Ultra3 SCSI with Mode Change Delay |

## Bus Terminators—GTL

| Device Name | $V_O$ (max) (V) | $V_O$ (min) (V) | $I_O$ (max) (mA) | $V_{dd}$ (max) (V) | $V_{dt}$ (typ) (V) | $V_{IH}$ (max) (V) | Description |
|---|---|---|---|---|---|---|---|
| UC385-1 | | | 5000 | | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |
| UC382-1 | 1.515 | 1.485 | 3000 | 0.45 at 3 A | 0.45 at 3 A | 7.5 | Fast LDO Linear Regulator |
| UC285-1 | | | 5000 | | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |
| UC282-1 | 1.515 | 1.485 | 3000 | 0.45 at 3 A | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |
| UC182-1 | 1.515 | 1.485 | 3000 | 0.45 at 3 A | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |

## LED Display Drivers

| Device Name | Description |
|---|---|
| TLC5904 | LED Driver |

## Bus Regulators

| Device Name | Number of Lines | $I_O$ per Channel (max) (mA) | $V_{IN}$ Range (V) | $V_O$ (nom) (V) | Tolerance (%) | $I_q$ (typ) (mA) | Shutdown | Description |
|---|---|---|---|---|---|---|---|---|
| UC560 | 27 | 25.4 | 4.0 to 5.25 | 2.9 | 1.4 | 0.1 | High | 27-Line Single-Ended SCSI Source/Sink Regulator |
| UCC561 | 27 | 25.4 | 2.7 to 5.25 | 0.75, 1.3, 1.75 | 7, 8, 3 | 40 | No | 27-Line Low-Voltage Differential SCSI Bias Regulator |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

Data Transmission Circuits–Line Circuits, 1998 ..... SLLD001B
Data Transmission Circuits–Communications Controllers, 1996 ..... SLLD003
Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D

## Selection Guides

Data Transmission Sine On, 1999 ..... SLYM028

## Application Notes

***Interface Products***

Evaluating the Low-Voltage Differential Signaling (LVDS) EVM ..... SLLA033
Interface Circuits for SCSI ..... SLLA035
Interface Circuits for TIA/EIA-232-F ..... SLLA037
LVDS Multidrop Connections ..... SLLA054
Performance of LVDS with Different Cables ..... SLLA053
Powering an LVDS Com-Link in a 5-V System ..... SLLA059
Skew Definitions ..... SLLA060
Interface Circuits for TIA/EIA-485 ..... SLLA036
Interface Circuits for TIA/EIA-644 ..... SLLA038
Low-Voltage Differential Signaling (LVDS) Design Notes ..... SLLA014
Reducing EMI with LVDS ..... SLLA030A
Slew-Rate Control of LVDS Circuits ..... SLLA034
SN75976A 9-Channel Differential Transceiver Thermal Analysis ..... SLLA029
Using an LVDS Receiver with 422 Data ..... SLLA031
LVDS Devices Operate with $V_{CC}$ = 2.5 $V_{DC}$ ..... SLLA046
LVDS Serdes 48 EVM Kit Setup and Usage ..... SLLA043
LVDS in Harsh Environments with the Next-Generation Receivers from TI ..... SLLA061

## Evaluation Modules and Development Tools

Each evaluation module (EVM) kit contains a fully-assembled evaluation board, a data sheet and a user's guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number, 1-800-477-8924, ext. 5800 in North America. To check availability and CE certification, and to order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see www.ti.com/sc/docs/general/distrib.htm for distributor listings.

| TITLE | ORDER NO. |
|---|---|
| ***Transmitters and Receivers*** | |
| LVDS Evalutaion Kit | SN65LVDS31/32 |
| ***Data Serialization/Deserialization*** | |
| LVDS Serdes 48 Transmitter Board | SN65LVDS9TXEVM |
| LVDS Serdes 48 Receiver Board | SN65LVDS9RXEVM |
| TIR2000: Interface TIR2000 4-MBPS IrDA Evaluation Module | TIR2000EVM |
| ***1394 Designer Kits*** | |
| Three TSB12C01A LINK Layers, TSB14C01 Backplane PHY, 100 Mbps PHY and 200 Mbps PHY—Backplane Card with TMS320C52 Controller and Sample Software | TSBKBACKPL |
| TSB12LV23 and TSB41LV03A—1394a Compliant Host Adapter, Runs under Windows 98 | TSBKOHCI403 |
| TSB12LV21B and TSB41LV03—Board Shows Optional Isolation Build and Includes Software for Windows 95 | TSBKPCI403 |

# Microcontrollers

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**Product Decision Tree and Selection Guide**

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**Resources** ..... 7-4

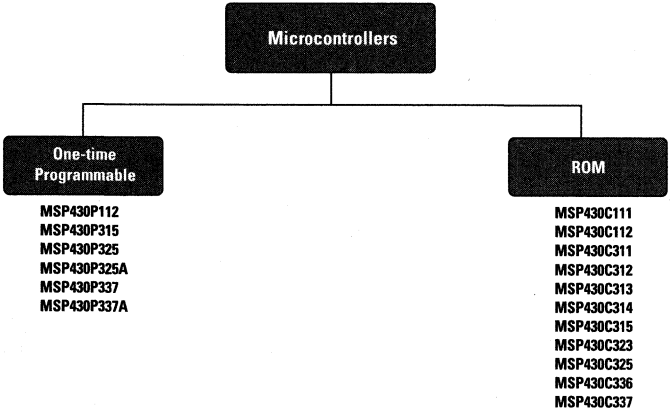
**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

## Microcontrollers




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/micro/index.htm

For an overview of MSP430 Ultra-Low-Power Microcontrollers, refer to:
www.ti.com/sc/docs/products/micro/msp430/msp430.htm

## Microcontrollers

| Device Name | ROM/ OTP/ EPROM (kB) | RAM (bytes) | ADC | LCD Segments | Capture/ Compare plus Timer | UART | Hardware Multiplier | Number of Timers | Description |
|---|---|---|---|---|---|---|---|---|---|
| **One-time Programmable** | | | | | | | | | |
| MSP430P112 | 4 | 256 | slope | | Yes | software | No | 2 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer - No LCD Driver |
| MSP430P315 | 16 | 512 | slope | 92 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430P325 | 16 | 512 | 14-bit | 84 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430P325A | 16 | 512 | 14-bit | 84 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430P337 | 32 | 1024 | slope | 120 | Yes | hardware | Yes | 7 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430P337A | 32 | 1024 | slope | 120 | Yes | hardware | Yes | 7 | Mixed-Signal Microcontrollers |
| **ROM** | | | | | | | | | |
| MSP430C111 | 2 | 128 | slope | | Yes | software | No | 2 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer - No LCD Driver |
| MSP430C112 | 4 | 256 | slope | | Yes | software | No | 2 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer - No LCD Driver |
| MSP430C311 | 2 | 128 | slope | 64 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C312 | 4 | 256 | slope | 92 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C313 | 8 | 256 | slope | 92 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C314 | 12 | 512 | slope | 92 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C315 | 16 | 512 | slope | 92 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C323 | 8 | 256 | 14-bit | 84 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C325 | 16 | 512 | 14-bit | 84 | No | software | No | 6 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C336 | 24 | 1024 | slope | 120 | Yes | hardware | Yes | 7 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |
| MSP430C337 | 32 | 1024 | slope | 120 | Yes | hardware | Yes | 7 | 16-Bit RISC-Like Ultra-Low-Power Microcontroller w/6-µs Wakeup, Watchdog Timer |

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| TITLE | ORDER NO. |
|---|---|

## Data Books

| | |
|---|---|
| MSP430 Family Architecture Guide and Module Library | SLAUE10B |
| MSP430 Family Architectural Guide and Module Library, Volume 2 | SLAU038 |
| Semiconductor Group Package Outlines Reference Guide, 1998 | SSYU001D |

## Selection Guides

| | |
|---|---|
| MSP430 Ultra-Low-Power Microcontrollers, 2Q-1999 | SLAB034A |

## Application Notes

| | |
|---|---|
| MSP430 Application Report | SLAA024 |
| Basic Clock Module, Oscillator and Clock Generator | SLAU023 |
| Electrostatic Discharge Application Note | SSYA008 |
| FSK Modulation and Demodulation with the Microcontroller MSP430 | SLAA037 |
| Getting Started with the MSP430 Microcontroller | SLAU028 |
| MSP430 Family Programming Adapter Manual | SLAU026 |
| MSP430 SMbus | SLAA073 |
| MSP430 Starter Kit Evaluation Kit Manual | SLAS191A |
| MSP430C112 IrDA SIR Encoder/Decoder | SLAA044 |
| Using the MSP430 as a Real Time Clock | SLAA076 |
| *MSP430x11x1* | |
| A Low-Cost Single-Phase Electricity Meter Using MSP430C11x | SLAA075 |
| Configuring the Basic Clock System | SLAA082 |
| Economic Measurement Techniques with the Comparator_A Module | SLAA071 |
| Implementing a UART Function with Timer_A3 | SLAA078 |
| Low Cost Triac Control with MSP430 16-Bit Microcontroller | SLAA043A |
| *MSP430x11x* | |
| A Low-Cost Single-Phase Electricity Meter Using MSP430C11x | SLAA075 |
| Configuring the Basic Clock System | SLAA082 |
| Implementing a UART Function with Timer_A3 | SLAA078 |
| Low Cost Triac Control with MSP430 16-Bit Microcontroller | SLAA043A |
| *MSP430x31x* | |
| Economic Voltage Measurement with the MSP430 Family | SLAA061 |
| Generation and Recognition of DTMF Signals with the Microcontroller MSP430 | SLAAE16 |
| MSP430 Based Digital Thermometer | SLAA038 |
| *MSP430x32x* | |
| Additive Improvement of the MSP430 14-Bit ADC Characteristic | SLAA047 |
| Application Basics for the MSP430 14-Bit ADC | SLAA046 |
| Architecture and Function of the MSP430 14-Bit ADC | SLAA045 |
| Economic Voltage Measurement with the MSP430 Family | SLAA061 |
| Experiments for the MSP430 Starter Kit | SLAA079 |
| Generation and Recognition of DTMF Signals with the Microcontroller MSP430 | SLAAE16 |
| Linear Improvement of the MSP430 14-Bit ADC Characteristic | SLAA048 |
| MSP430 Based Digital Thermometer | SLAA038 |
| Non-Linear Improvement of the MSP430 14-Bit ADC Characteristic | SLAA050 |
| Understanding the MSP430x325 14-Bit ADC | SLAA039 |

## Application Notes (Continued)

| TITLE | ORDER NO. |
|---|---|
| *MSP430x33x* | |
| Economic Voltage Measurement with the MSP430 Family | SLAA061 |
| Generation and Recognition of DTMF Signals with the Microcontroller MSP430 | SLAAE16 |
| Low Cost Triac Control with MSP430 16-Bit Microcontroller | SLAA043A |
| MSP430 Based Digital Thermometer | SLAA038 |
| MSP430 Hardware Multiplier Application Report | SLAA042 |
| MSP430 Universal Synchronous Asynchronous Receive/Transmit Communication Interfa | SLAA049 |

## Evaluation Modules and Development Tools

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| TITLE | ORDER NO. |
|---|---|
| MSP430 Starter Kit | MSP-STK430B320 |
| MSP430x32x Evaluation Kit | MSP-EVK430X320 |
| MSP430x33x Evaluation Kit | MSP-EVK430X330 |
| MSP430x11x Evaluation Kit | MSP-EVK430A110 |
| MSP430 Simulation Environment | MSP-SIM430 |
| MSP430 Floating-Point Package | MSP-FPP430V400 |
| MSP430 Programming Adapter | MSP-PRG430 |

# Power Management Products

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**Product Decision Trees and Selection Guides**

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DC/DC Converters ..... 8-24
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**Two other resources for product information are:**

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**2) the Semiconductor products category at the TI Web site www.ti.com**

The Texas Instruments family of Power Management devices offers one of the most complete, cost-effective power management portfolios in the industry. In addition to the product portfolio, Texas Instruments also provides customers with one of the most comprehensive "solution portfolios" in regards to ICs, EVMs, application notes and power modules.

With the recent acquisitions of both Unitrode/Benchmarq and Power Trends, our customers can now find the majority, if not all, of their power management needs from Texas Instruments. From a simple low dropout regulator to a complete power brick, TI has the solution. This section outlines the various product spaces within TI's powerful line-up of Power Management solutions.

In addition to the acquisition devices, TI has greatly enhanced several of the existing product areas. Look for the following new devices in this section and on the CD-ROM.

| Device | Description |
|---|---|

### Low Power DC-DC (Charge pumps)

| | |
|---|---|
| TPS60120 | 200-mA, 3.3-V output, regulated high-efficiency charge pump, $I_q$ = 60 µA |
| TPS60121 | 100-mA, 3.3-V output, regulated high-efficiency charge pump, $I_q$ = 60 µA |
| TPS60130 | 300-mA, 5.0-V output, regulated high-efficiency charge pump, $I_q$ = 60 µA |
| TPS60131 | 150-mA, 5.0-V output, regulated high-efficiency charge pump, $I_q$ = 60 µA |

### Power Distribution

| | |
|---|---|
| TPS2102 | $V_{AUX}$ power distribution switch, seamless switching of multiple power supplies, Active-Low enable; 2.7- to 4.0-V input range |
| TPS2103 | $V_{AUX}$ power distribution switch, seamless switching of multiple power supplies, Active-High enable; 2.7- to 4.0-V input range |
| TPS2104 | $V_{AUX}$ power distribution switch, seamless switching of multiple power supplies, Active-Low enable; 2.7- to 5.5-V input range |
| TPS2105 | $V_{AUX}$ power distribution switch, seamless switching of multiple power supplies, Active-High enable; 2.7- to 5.5-V input range |

The TPS2102/3/4/5 are the latest additions to the TPS21xx family of $V_{AUX}$ power distribution switches. These power switches enable seamless switching between multiple power supplies or rails. Applications include battery-powered equipment such as calculators, cellular phones, and personal digital assistants (PDAs).

### Low Dropout Regulators (LDO)

| | |
|---|---|
| TPS76501 | Ultra-low quiescent current 150-mA adjustable low dropout regulator with Power Good. Output adjustable from 1.2 V to 5.5 V |
| TPS76515 | 1.5-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76518 | 1.8-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76525 | 2.5-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76527 | 2.7-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76528 | 2.8-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76530 | 3.0-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |

| Device | Description |
|---|---|
| **Low Dropout Regulators (Continued)** | |
| TPS76533 | 3.3-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76550 | 5.0-V Ultra-low quiescent current 150-mA low dropout regulator with Power Good. |
| TPS76601 | Ultra-low quiescent current 250-mA adjustable low dropout regulator with Power Good. Output adjustable from 1.2 V to 5.5 V |
| TPS76615 | 1.5-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76618 | 1.8-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76625 | 2.5-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76627 | 2.7-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76628 | 2.8-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76630 | 3.0-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76633 | 3.3-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76650 | 5.0-V Ultra-low quiescent current 250-mA low dropout regulator with Power Good. |
| TPS76701 | Fast transient response 1-A adjustable low dropout regulator with Reset. Output adjustable from 1.5 V to 5.5 V. |
| TPS76715 | 1.5-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76718 | 1.8-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76725 | 2.5-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76727 | 2.7-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76728 | 2.8-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76730 | 3.0-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76733 | 3.3-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS76750 | 5.0-V Fast transient response 1-A low dropout regulator with Reset. |
| TPS767D301 | Dual fast transient response LDO, 1-A output, Dual Resets. Outputs 3.3 V and adjustable 1.5 V to 5.5 V. |
| TPS767D318 | Dual fast transient response LDO, 1-A output, Dual Resets. Outputs 3.3 V and 1.8 V. |
| TPS767D325 | Dual fast transient response LDO, 1-A output, Dual Resets. Outputs 3.3 V and 2.5 V. |
| TPS76801 | Fast transient response 1-A adjustable low dropout regulator with Power Good. Output adjustable from 1.5 V to 5.5 V. |
| TPS76815 | 1.5-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76818 | 1.8-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76825 | 2.5-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76827 | 2.7-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76828 | 2.8-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76830 | 3.0-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76833 | 3.3-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76850 | 5.0-V Fast transient response 1-A low dropout regulator with Power Good. |
| TPS76901 | Ultra low power 100-mA adjustable low dropout regulator. Output adjustable from 1.2 V to 5.5 V. |
| TPS76912 | 1.2-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76915 | 1.5-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76918 | 1.8-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76925 | 2.5-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76927 | 5.7-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76928 | 2.8-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76930 | 3.0-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76933 | 3.3-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS76950 | 5.0-V ultra low power 100-mA SOT23 low dropout regulator |
| TPS77001 | Ultra low power 50-mA adjustable low dropout regulator. Output adjustable from 1.2 V to 5.5 V. |

| Device | Description |
|---|---|
| **Low Dropout Regulators (Continued)** | |
| TPS77012 | 1.2V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77015 | 1.5-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77018 | 1.8-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77025 | 2.5-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77027 | 2.7-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77028 | 2.8-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77030 | 3.0-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77033 | 3.3-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77050 | 5.0-V ultra low power 50-mA SOT23 low dropout regulator |
| TPS77501 | Fast transient response 500-mA adjustable low dropout regulator with Reset. Output adjustable from 1.2 V to 5.5 V. |
| TPS77515 | 1.5-V Fast transient response 500-mA low dropout regulator with Reset. |
| TPS77518 | 1.8-V Fast transient response 500-mA low dropout regulator with Reset. |
| TPS77525 | 2.5-V Fast transient response 500-mA low dropout regulator with Reset. |
| TPS77533 | 3.3-V Fast transient response 500-mA low dropout regulator with Reset. |
| TPS77601 | Fast transient response 500-mA adjustable low dropout regulator with Power Good. Output adjustable from 1.2 V to 5.5 V. |
| TPS77615 | 1.5-V Fast transient response 500-mA low dropout regulator with Power Good. |
| TPS77618 | 1.8-V Fast transient response 500-mA low dropout regulator with Power Good. |
| TPS77625 | 2.5-V Fast transient response 500-mA low dropout regulator with Power Good. |
| TPS77633 | 3.3-V Fast transient response 500-mA low dropout regulator with Power Good. |
| TPS77701 | Fast transient response 750-mA adjustable low dropout regulator with Reset. Output adjustable from 1.2 V to 5.5 V. |
| TPS77715 | 1.5-V Fast transient response 750-mA low dropout regulator with Reset. |
| TPS77718 | 1.8-V Fast transient response 750-mA low dropout regulator with Reset. |
| TPS77725 | 2.5-V Fast transient response 750-mA low dropout regulator with Reset. |
| TPS77733 | 3.3-V Fast transient response 750-mA low dropout regulator with Reset. |
| TPS77801 | Fast transient response 750-mA adjustable low dropout regulator with Power Good. Output adjustable from 1.2 V to 5.5 V. |
| TPS77815 | 1.5-V Fast transient response 750-mA low dropout regulator with Power Good. |
| TPS77818 | 1.8-V Fast transient response 750-mA low dropout regulator with Power Good. |
| TPS77825 | 2.5-V Fast transient response 750-mA low dropout regulator with Power Good. |
| TPS77833 | 3.3-V Fast transient response 750-mA low dropout regulator with Power Good. |
| **Supervisory Circuits (SVS)** | |
| TPS3820 | Processor supervisory circuit (SVS), 15-µA supply current, WDI, /MR, SOT23, 25-ms delay |
| TPS3825 | Processor supervisory circuit (SVS), 15-µA supply current, RESET, /MR, SOT23, 200-ms delay |
| TPS3828 | Processor supervisory circuit (SVS), 15-µA supply current, /MR, RESET, SOT23, 200-ms delay |

### Web Locations for Specific Product Groups

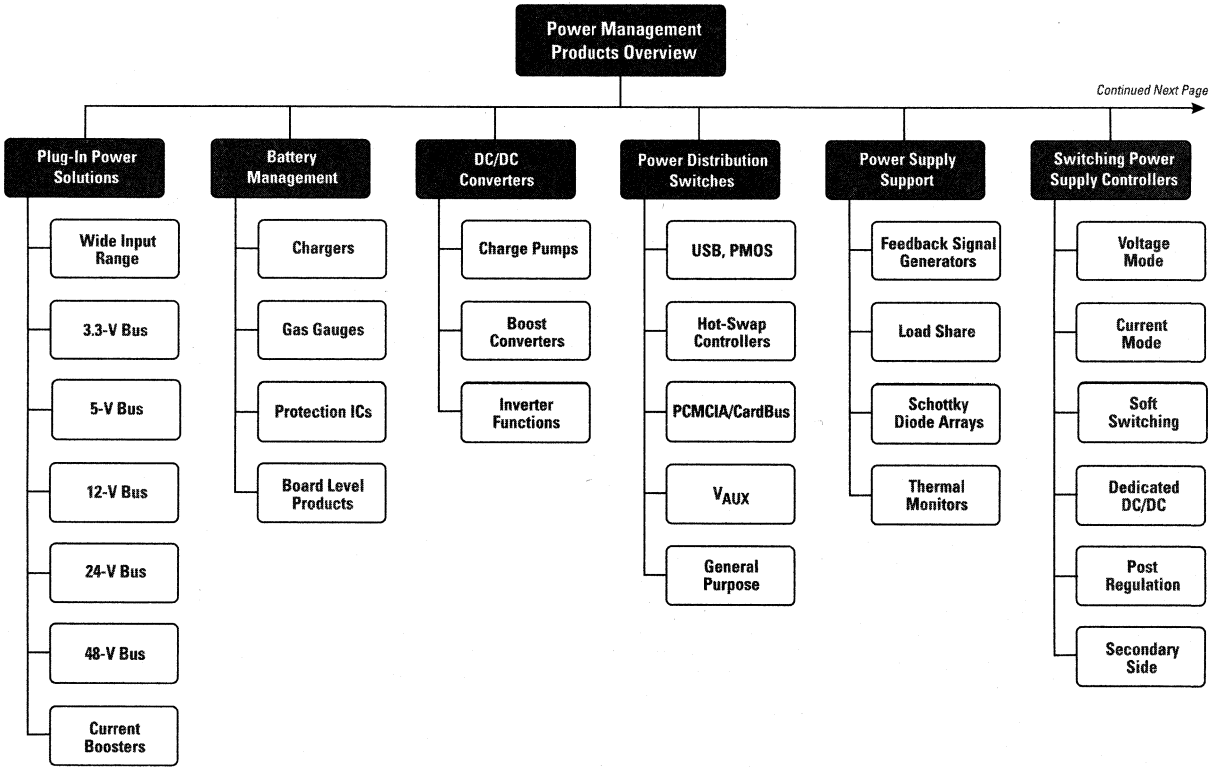
Data Converters www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

## Power Management New Product Previews

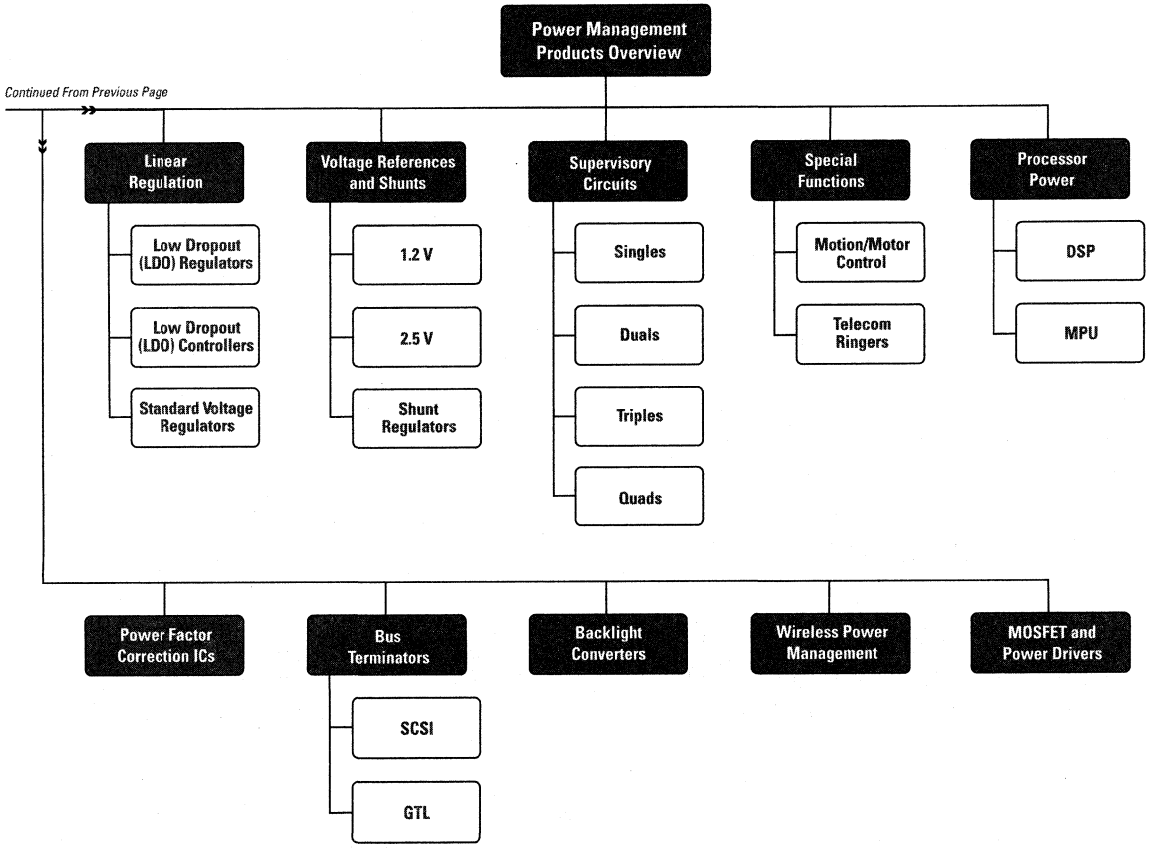
The following new devices are expected to be released in the near future. For more information, please refer to the Designer's Guide CD-ROM, literature number SLYC005D.

| Device | Description |
|---|---|
| **Power Distribution** | |
| TPS2216A | Power switch for dual-socket PC-card applications, the TPS2216A is a lower-cost alternative to the TPS2216. |
| **Low Drop Out Regulators (LDO)** | |
| TPS70102 | Dual 500-mA/250-mA low dropout regulator with outputs adjustable from 1.2-V to 5-V and power-up sequencing. |
| TPS70145 | Dual 500-mA/250-mA low dropout regulator with 3.3-V/1.2-V outputs and power-up sequencing. |
| TPS70148 | Dual 500-mA/250-mA low dropout regulator with 3.3-V/1.5-V outputs and power-up sequencing. |
| TPS70151 | Dual 500-mA/250-mA low dropout regulator with 3.3-V/1.8-V outputs and power-up sequencing. |
| TPS70158 | Dual 500-mA/250-mA low dropout regulator with 3.3-V/2.5-V outputs and power-up sequencing. |
| TPS7415 | 1.5-V Fast transient response 200-mA low dropout regulator |
| TPS7418 | 1.8-V Fast transient response 200-mA low dropout regulator |
| TPS7425 | 2.5-V Fast transient response 200-mA low dropout regulator |
| TPS7430 | 3.0-V Fast transient response 200-mA low dropout regulator |
| TPS7433 | 3.3-V Fast transient response 200-mA low dropout regulator |
| TPS77628 | 2.8-V Fast transient response 500-mA low dropout regulator with Power Good. |
| TPS77101 | Fast transient response 150-mA low dropout regulator with Reset and adjustable output from 1.2 V to 5.5 V |
| TPS77118 | 1.8-V Fast transient response 150-mA low dropout regulator with Reset |
| TPS77127 | 2.7-V Fast transient response 150-mA low dropout regulator with Reset |
| TPS77128 | 2.8-V Fast transient response 150-mA low dropout regulator with Reset |
| TPS77133 | 3.3-V Fast transient response 150-mA low dropout regulator with Reset |
| **Supervisory Circuits (SVS)** | |
| TPS3123 | 1.2-V, 1.5-V, 1.8-V ultra-low voltage supervisor with RESET (high), Manual RESET, Watchdog |
| TPS3124 | 1.2-V, 1.5-V, 1.8-V ultra-low voltage supervisor with RESET (high), RESET (low), Watchdog |
| TPS3125 | 1.2-V, 1.5-V, 1.8-V ultra-low voltage supervisor with RESET (high), RESET (low), Manual RESET |
| **Processor Power** | |
| TPS56300 | Dual output controller (synchronous buck regulator and a low dropout controller) with 3.3/5-V input, and fixed output voltage options ranging from 1.3 V to 3.3 V. The TPS56300 is a dual-channel power management device that accepts an input voltage ranging from 2.8 to 6.0 V. The device allows the designer to easily select a range of core and I/O DSP voltages, and is ideal for 'C6000 DSP applications. The TPS56300 features programmable soft-start and a discharge circuit to aid in properly powering up/down the core and the I/O of a DSP or microcontroller. These features promote better system reliability ensuring simultaneous power up of the core and I/O. |

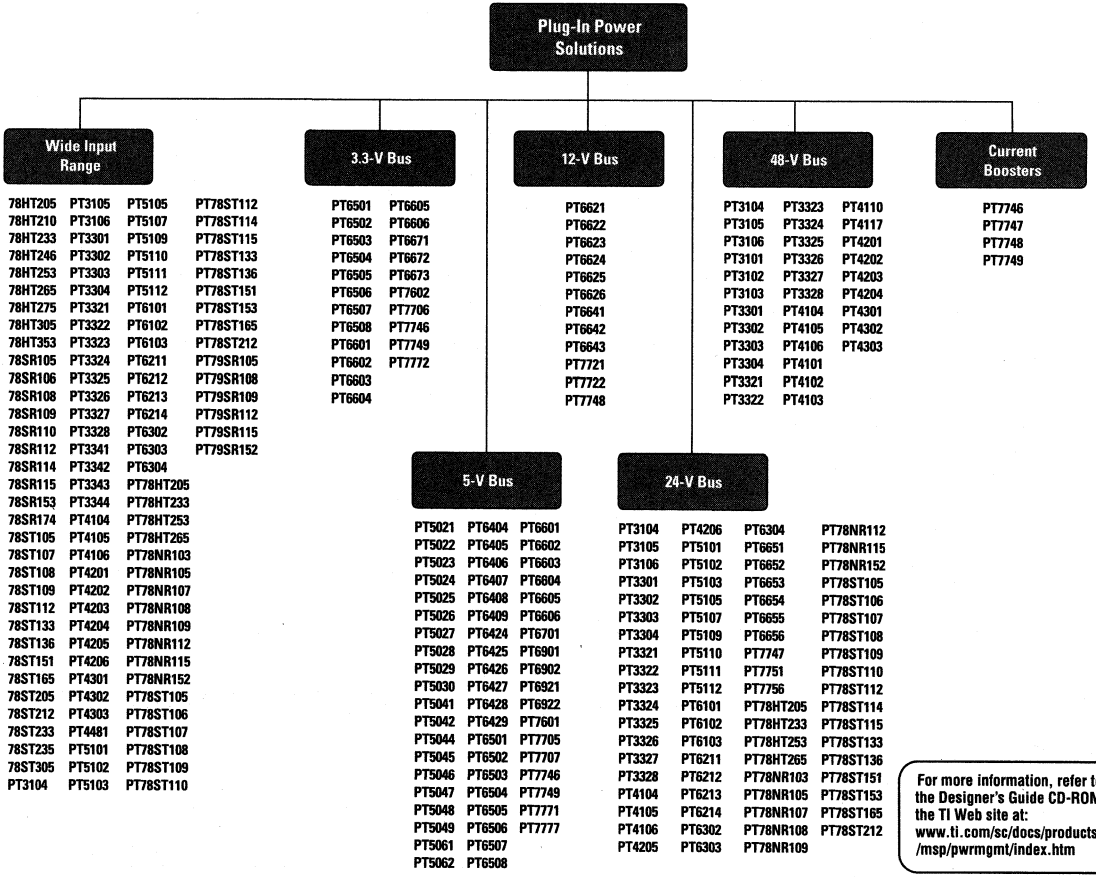
## Power Management Products Overview



## Power Management Products Overview



## Plug-In Power Solutions




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at: www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

## Plug-In Power Solutions

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **Wide Input Range** | | | | | | | |
| 78HT205 | 7 | 28 | 5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT210 | 12 | 28 | 10 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT233 | 7 | 15 | 3.3 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT246 | 7 | 28 | 4.6 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT253 | 7.25 | 28 | 5.25 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT265 | 8.5 | 28 | 6.5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT275 | 9.5 | 28 | 7.5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT305 | 8 | 28 | 5 | 3 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78HT353 | 8.3 | 28 | 5.3 | 3 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78SR105 | 7 | 30 | 5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR106 | 8 | 30 | 6 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR108 | 10 | 30 | 8 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR109 | 11.2 | 30 | 9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR110 | 12.3 | 30 | 10 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR112 | 14.5 | 30 | 12 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR114 | 16.5 | 30 | 13.9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR115 | 18 | 30 | 15 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR153 | 7.25 | 30 | 5.25 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78SR174 | 9.15 | 30 | 7.15 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST105 | 7 | 30 | 5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST107 | 9 | 30 | 7 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST108 | 10 | 30 | 8 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST109 | 11.2 | 30 | 9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST112 | 14.5 | 30 | 12 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST133 | 7 | 26 | 3.3 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST136 | 7 | 26 | 3.6 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST151 | 7 | 30 | 5.1 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST165 | 8.5 | 30 | 6.5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| 78ST205 | 8 | 20 | 5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78ST212 | 14.5 | 28 | 12 | 3 | No | No | 12-V 2-Amp Positive Step-down Integrated Switching Regulator |
| 78ST233 | 7 | 15 | 3.3 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78ST235 | 7 | 15 | 3.45 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| 78ST305 | 8 | 20 | 5 | 3 | No | No | 3-Amp Positive Step-down Integrated Switching Regulator |
| PT3104 | 18 | 40 | 5 | 3 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3105 | 18 | 40 | 12 | 1.25 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **Wide Input Range (Continued)** | | | | | | | |
| PT3106 | 18 | 40 | 15 | 1 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3301 | 20 | 60 | 3.3 | 8 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3302 | 20 | 60 | 5 | 6 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3303 | 20 | 60 | 12 | 2.5 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3304 | 20 | 60 | 15 | 2 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3321 | 36 | 75 | 3.3 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3322 | 36 | 75 | 5 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3323 | 36 | 75 | 12 | 2.5 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3324 | 36 | 75 | 15 | 2 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3325 | 36 | 75 | 2 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3326 | 36 | 75 | 2.5 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3327 | 36 | 75 | 1.8 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3328 | 36 | 75 | 5.2 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3341 | 18 | 60 | 3.3 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3342 | 18 | 60 | 5 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3343 | 18 | 60 | 12 | 2.5 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3344 | 18 | 60 | 15 | 2 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT4104 | 18 | 40 | 5 | 3 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4105 | 18 | 40 | 12 | 1.25 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4106 | 18 | 40 | 15 | 1 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4201 | 36 | 75 | 2 | 1.5 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4202 | 36 | 75 | 3.3 | 1.5 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4203 | 36 | 75 | 5 | 1.2 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4204 | 36 | 75 | 12 | 0.6 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4205 | 18 | 36 | 3.3 | 1.8 | Yes | Yes | 3 to 7-Watt 24-V Input Isolated DC/DC Converter |
| PT4206 | 18 | 36 | 5 | 1.2 | Yes | Yes | 3 to 7-Watt 24-V Input Isolated DC/DC Converter |
| PT4301 | 36 | 75 | ±5 | 1 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4302 | 36 | 75 | 5/3.3 | 1 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4303 | 36 | 75 | ±12 | 0.25 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4481 | 36 | 75 | 1.3 to 3.5 | 30 | Yes | Yes | 30-Amp 48-V Input Isolated DC/DC Converter |
| PT5101 | 9 | 38 | 5 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5102 | 16 | 38 | 12 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5103 | 7.3 | 38 | 3.3 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5105 | 10.5 | 38 | 6.5 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5107 | 19 | 38 | 15 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **Wide Input Range (Continued)** | | | | | | | |
| PT5109 | 9.6 | 38 | 5.6 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5110 | 13 | 38 | 9 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5111 | 14 | 38 | 10 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5112 | 12 | 38 | 8 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT6101 | 9 | 38 | 5 | 1 | Yes | No | 1-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6102 | 7.3 | 38 | 3.3 | 1 | Yes | No | 1-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6103 | 16 | 38 | 12 | 1 | Yes | No | 1-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6211 | 9.1 | 38 | 5.1 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6212 | 9 | 38 | 5 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6213 | 7.3 | 38 | 3.3 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6214 | 16 | 38 | 12 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6302 | 9 | 38 | 5 | 3 | Yes | No | 3-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6303 | 7.3 | 38 | 3.3 | 3 | Yes | No | 3-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6304 | 16 | 38 | 12 | 3 | Yes | No | 3-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT78HT205 | 9 | 28 | 5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78HT233 | 7.3 | 28 | 3.3 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78HT253 | 9.3 | 28 | 5.3 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78HT265 | 10.5 | 28 | 6.5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78NR103 | 7 | 25 | –3 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR105 | 7 | 25 | –5 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR107 | 7 | 25 | –7 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR108 | 7 | 25 | –8 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR109 | 7 | 25 | –9 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR112 | 7 | 25 | –12 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR115 | 7 | 25 | –15 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR152 | 7 | 25 | –5.2 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78ST105 | 9 | 38 | 5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST106 | 10 | 38 | 6 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST107 | 11 | 38 | 7 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST108 | 12 | 38 | 8 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST109 | 13 | 38 | 9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST110 | 14 | 38 | 10 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST112 | 16 | 38 | 12 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST114 | 17.9 | 38 | 13.9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST115 | 19 | 38 | 15 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **Wide Input Range (Continued)** | | | | | | | |
| PT78ST133 | 7.3 | 38 | 3.3 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST136 | 7.6 | 38 | 3.6 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST151 | 9.1 | 38 | 5.1 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST153 | 9.25 | 38 | 5.25 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST165 | 10.5 | 38 | 6.5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST212 | 16 | 28 | 12 | 2 | No | No | 12-V 2-Amp Positive Step-down Integrated Switching Regulator |
| PT79SR105 | –9 | –30 | –5 | 1.5 | No | No | (-) 1.5-Amp Negative Step-down Integrated Switching Regulator |
| PT79SR108 | –12 | –30 | –8 | 1.5 | No | No | (-) 1.5-Amp Negative Step-down Integrated Switching Regulator |
| PT79SR109 | –13 | –30 | –9 | 1.5 | No | No | (-) 1.5-Amp Negative Step-down Integrated Switching Regulator |
| PT79SR112 | –16 | –30 | –12 | 1.5 | No | No | (-) 1.5-Amp Negative Step-down Integrated Switching Regulator |
| PT79SR115 | –19 | –30 | –15 | 1.5 | No | No | (-) 1.5-Amp Negative Step-down Integrated Switching Regulator |
| PT79SR152 | –9.2 | –30 | –5.2 | 1.5 | No | No | (-) 1.5-Amp Negative Step-down Integrated Switching Regulator |
| **3.3-V Bus** | | | | | | | |
| PT6501 | 3.1 | 6 | 3.3 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6502 | 3.1 | 6 | 1.5 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6503 | 3.1 | 6 | 2.5 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6504 | 3.1 | 6 | 3.6 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6505 | 3.1 | 6 | 1.2 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6506 | 3.1 | 6 | 1.8 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6507 | 3.1 | 6 | 1.3 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6508 | 3.1 | 6 | 1.7 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6601 | 3.1 | 6 | 3.3 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6602 | 3.1 | 6 | 1.5 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6603 | 3.1 | 6 | 2.5 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6604 | 3.1 | 6 | 3.6 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6605 | 3.1 | 6 | 1.2 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6606 | 3.1 | 6 | 1.8 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6671 | 3 | 3.6 | 5 | 3 | Yes | No | 3.3-V Input 20-W Boost Integrated Switching Regulator |
| PT6672 | 3 | 3.6 | 9 | 3 | Yes | No | 3.3-V Input 20-W Boost Integrated Switching Regulator |
| PT6673 | 3 | 3.6 | 12 | 3 | Yes | No | 3.3-V Input 20-W Boost Integrated Switching Regulator |
| PT7602 | 3.1 | 3.6 | 1.3 to 2.05 | 10 | Yes | No | 3.3-V Input 10-A Programmable Integrated Switching Regulator |
| PT7706 | 3.1 | 3.6 | 1.3 to 2.05 | 18 | Yes | No | 18-Amp "Big-Hammer" Programmable Integrated Switching Regulator |
| PT7746 | 3 | 5.5 | Auto Tracks the PT7771/2 | 32 | Yes | No | 32-Amp "Current Booster" For the PT7770 Series |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **3.3-V Bus (Continued)** | | | | | | | |
| PT7749 | 3 | 5.5 | Auto Tracks the PT7705/6 | 18 | Yes | No | 18-Amp "Current Booster" For the PT7770 Series |
| PT7772 | 3.1 | 3.6 | 1.3 to 2.05 | 32 | Yes | No | 32-Amp High-Performance "Sledge Hammer" Programmable ISR |
| **5-V Bus** | | | | | | | |
| PT5021 | 4.5 | 7 | –3.5 | 1 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5022 | 4.5 | 7 | –5 | 1 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5023 | 4.5 | 7 | –9 | 0.6 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5024 | 4.5 | 7 | –12 | 0.5 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5025 | 4.5 | 7 | –15 | 0.3 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5026 | 4.5 | 7 | –5.2 | 1 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5027 | 4.5 | 7 | –8 | 0.8 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5028 | 4.5 | 7 | –6.5 | 1 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5029 | 4.5 | 7 | –5.5 | 1 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5030 | 4.5 | 7 | –6 | 1 | No | No | Positive Intput/Negative Output Integrated Switching Regulator |
| PT5041 | 4.75 | 11 | 12 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5042 | 4.75 | 14 | 15 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5044 | 4.75 | 7 | 8 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5045 | 4.75 | 8 | 9 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5046 | 4.75 | 9 | 10 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5047 | 4.75 | 14 | 18 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5048 | 4.75 | 11.6 | 12.6 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5049 | 4.75 | 14 | 20 | 1 | No | No | 1-Amp Step-up Integrated Switching Regulator |
| PT5061 | 4.75 | 11 | +12/–12 | 0.5/0.25 | Yes | No | (+) 5-V to ±12-V/15/-V 9-W Dual Output Integrated Switching Regulator |
| PT5062 | 4.75 | 14 | +15/–15 | 0.4/0.2 | Yes | No | (+) 5-V to ±12-V/15/-V 9-W Dual Output Integrated Switching Regulator |
| PT6404 | 4.5 | 5.5 | 1.5 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6405 | 4.5 | 5.5 | 3.3 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6406 | 4.5 | 5.5 | 1.8 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6407 | 4.5 | 5.5 | 2.1 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6408 | 4.5 | 5.5 | 1.2 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6409 | 4.5 | 5.5 | 2.5 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6424 | 4.5 | 5.5 | 1.5 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6425 | 4.5 | 5.5 | 3.3 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6426 | 4.5 | 5.5 | 1.8 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6427 | 4.5 | 5.5 | 2.1 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6428 | 4.5 | 5.5 | 1.2 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **5-V Bus (Continued)** | | | | | | | |
| PT6429 | 4.5 | 5.5 | 2.5 | 3 | Yes | No | 3-Amp Adjustable Integrated Switching Regulator |
| PT6501 | 3.1 | 6 | 3.3 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6502 | 3.1 | 6 | 1.5 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6503 | 3.1 | 6 | 2.5 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6504 | 3.1 | 6 | 3.6 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6505 | 3.1 | 6 | 1.2 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6506 | 3.1 | 6 | 1.8 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6507 | 3.1 | 6 | 1.3 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6508 | 3.1 | 6 | 1.7 | 8 | Yes | No | 8-Amp Adjustable ISR with Short-Circuit Protection |
| PT6601 | 3.1 | 6 | 3.3 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6602 | 3.1 | 6 | 1.5 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6603 | 3.1 | 6 | 2.5 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6604 | 3.1 | 6 | 3.6 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6605 | 3.1 | 6 | 1.2 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6606 | 3.1 | 6 | 1.8 | 9 | Yes | No | 9-Amp Adjustable Integrated Switching Regulator |
| PT6701 | 4.5 | 5.5 | 1.3 to 3.5 | 13 | Yes | No | 13-Amp Programmable Integrated Switching Regulator |
| PT6901 | 4.75 | 5.5 | –2 | 3 | Yes | No | 12-Watt Plus to Minus Voltage Converter |
| PT6902 | 4.75 | 5.5 | –5.2 | 3 | Yes | No | 12-Watt Plus to Minus Voltage Converter |
| PT6921 | 4.5 | 5.5 | 3.3, 2.5/1.8 | 5.5, 2.2/1.75 | Yes | No | 5-V to 3.3-V/2.5-V 25-Watt Dual Output Integrated Switching Regulator |
| PT6922 | 4.5 | 5.5 | 3.3, 1.5 | 5.5,1.2 | Yes | No | 5-V to 3.3-V/2.5-V 25-Watt Dual Output Integrated Switching Regulator |
| PT7601 | 4.5 | 5.5 | 1.3 to 3.5 | 10 | Yes | No | 10-Amp Programmable Integrated Switching Regulator |
| PT7705 | 4.5 | 5.5 | 1.3 to 3.5 | 18 | Yes | No | 18-Amp "Big-Hammer" Programmable Integrated Switching Regulator |
| PT7707 | 4.5 | 5.5 | 1.3 to 3.5 | 18 | Yes | No | 18-Amp "Big-Hammer" Programmable Integrated Switching Regulator |
| PT7746 | 3 | 5.5 | Auto Tracks the PT7771/2 | 32 | Yes | No | 32-Amp "Current Booster" For the PT7770 Series |
| PT7749 | 3 | 5.5 | Auto Tracks the PT7705/6 | 18 | Yes | No | 18-Amp "Current Booster" For the PT7770 Series |
| PT7771 | 4.5 | 5.5 | 1.3 to 3.5 | 32 | Yes | No | 32-Amp High-Performance "Sledge Hammer" Programmable ISR |
| PT7777 | 4.5 | 5.5 | 1.3 to 3.5 | 32 | Yes | No | 32-Amp High-Performance "Sledge Hammer" Programmable ISR |
| **12-V Bus** | | | | | | | |
| PT6621 | 9 | 14 | 3.3 | 6 | Yes | No | 6-Amp 12-V Input Integrated Switching Regulator |
| PT6622 | 9 | 14 | 1.5 | 6 | Yes | No | 6-Amp 12-V Input Integrated Switching Regulator |
| PT6623 | 9 | 14 | 2.5 | 6 | Yes | No | 6-Amp 12-V Input Integrated Switching Regulator |
| PT6624 | 9 | 14 | 3.6 | 6 | Yes | No | 6-Amp 12-V Input Integrated Switching Regulator |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **12-V Bus (Continued)** | | | | | | | |
| PT6625 | 9 | 14 | 5 | 6 | Yes | No | 6-Amp 12-V Input Integrated Switching Regulator |
| PT6626 | 12 | 14 | 9 | 6 | Yes | No | 6-Amp 12-V Input Integrated Switching Regulator |
| PT6641 | 9 | 14 | 3.3 | 4 | Yes | No | 24-W Plus to Minus Voltage Converter |
| PT6642 | 9 | 14 | 5 | 4 | Yes | No | 24-W Plus to Minus Voltage Converter |
| PT6643 | 9 | 14 | 12 | 2 | Yes | No | 24-W Plus to Minus Voltage Converter |
| PT7721 | 11 | 14 | 1.3 to 3.5 or 4.5 to 7.6 | 17 | Yes | No | 17-Amp 12-V Input "Big-Hammer II" Programmable ISR |
| PT7722 | 11 | 14 | 1.3 to 3.5 or 4.5 to 7.6 | 17 | Yes | No | 17-Amp 12-V Input "Big-Hammer II" Programmable ISR |
| PT7748 | 11 | 14 | Auto Tracks $V_O$ of PT7721/2 | 17 | Yes | No | 17-Amp "Current Booster" For the PT7720 Series |
| **24-V Bus** | | | | | | | |
| PT3104 | 18 | 40 | 5 | 3 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3105 | 18 | 40 | 12 | 1.25 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3106 | 18 | 40 | 15 | 1 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3301 | 20 | 60 | 3.3 | 8 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3302 | 20 | 60 | 5 | 6 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3303 | 20 | 60 | 12 | 2.5 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3304 | 20 | 60 | 15 | 2 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3321 | 36 | 75 | 3.3 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3322 | 36 | 75 | 5 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3323 | 36 | 75 | 12 | 2.5 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3324 | 36 | 75 | 15 | 2 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3325 | 36 | 75 | 2 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3326 | 36 | 75 | 2.5 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3327 | 36 | 75 | 1.8 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3328 | 36 | 75 | 5.2 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT4104 | 18 | 40 | 5 | 3 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4105 | 18 | 40 | 12 | 1.25 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4106 | 18 | 40 | 15 | 1 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4205 | 18 | 36 | 3.3 | 1.8 | Yes | Yes | 3 to 7-Watt 24-V Input Isolated DC/DC Converter |
| PT4206 | 18 | 36 | 5 | 1.2 | Yes | Yes | 3 to 7-Watt 24-V Input Isolated DC/DC Converter |
| PT5101 | 9 | 38 | 5 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5102 | 16 | 38 | 12 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5103 | 7.3 | 38 | 3.3 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5105 | 10.5 | 38 | 6.5 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| 24-V Bus (Continued) | | | | | | | |
| PT5107 | 19 | 38 | 15 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5109 | 9.6 | 38 | 5.6 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5110 | 13 | 38 | 9 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5111 | 14 | 38 | 10 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT5112 | 12 | 38 | 8 | 1 | No | No | 1-Amp Positive Step-down Integrated Switching Regulator |
| PT6101 | 9 | 38 | 5 | 1 | Yes | No | 1-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6102 | 7.3 | 38 | 3.3 | 1 | Yes | No | 1-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6103 | 16 | 38 | 12 | 1 | Yes | No | 1-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6211 | 9.1 | 38 | 5.1 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6212 | 9 | 38 | 5 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6213 | 7.3 | 38 | 3.3 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6214 | 16 | 38 | 12 | 2 | Yes | No | 2-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6302 | 9 | 38 | 5 | 3 | Yes | No | 3-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6303 | 7.3 | 38 | 3.3 | 3 | Yes | No | 3-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6304 | 16 | 38 | 12 | 3 | Yes | No | 3-Amp Adjustable Positive Step-down Integrated Switching Regulator |
| PT6651 | 9 | 28 | 3.3 | 5 | Yes | No | 5-Amp 24-V Input Integrated Switching Regulator |
| PT6652 | 9 | 28 | 2.5 | 5 | Yes | No | 5-Amp 24-V Input Integrated Switching Regulator |
| PT6653 | 9 | 28 | 5 | 5 | Yes | No | 5-Amp 24-V Input Integrated Switching Regulator |
| PT6654 | 9 | 28 | 9 | 5 | Yes | No | 5-Amp 24-V Input Integrated Switching Regulator |
| PT6655 | 9 | 28 | 15 | 5 | Yes | No | 5-Amp 24-V Input Integrated Switching Regulator |
| PT6656 | 9 | 28 | 12 | 5 | Yes | No | 5-Amp 24-V Input Integrated Switching Regulator |
| PT7747 | 20 | 28 | Auto Tracks $V_O$ or the PT7751/6 | 15 | Yes | No | 15-Amp "Current Booster" For the PT7750 Series |
| PT7751 | 20 | 28 | 2.5 to 5.6 | 15 | Yes | No | 15-Amp 24-V Input "Big-Hammer III" Programmable ISR |
| PT7756 | 20 | 28 | 6.6 to 12.8 | 15 | Yes | No | 15-Amp 24-V Input "Big-Hammer III" Programmable ISR |
| PT78HT205 | 9 | 28 | 5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78HT233 | 7.3 | 28 | 3.3 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78HT253 | 9.3 | 28 | 5.3 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78HT265 | 10.5 | 28 | 6.5 | 2 | No | No | 2-Amp Positive Step-down Integrated Switching Regulator |
| PT78NR103 | 7 | 25 | –3 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR105 | 7 | 25 | –5 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR107 | 7 | 25 | –7 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR108 | 7 | 25 | –8 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR109 | 7 | 25 | –9 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR112 | 7 | 25 | –12 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |

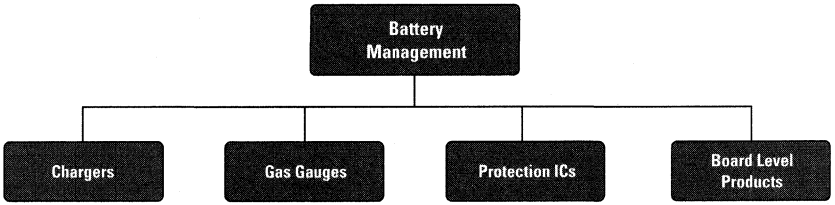
## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **24-V Bus (Continued)** | | | | | | | |
| PT78NR115 | 7 | 25 | –15 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78NR152 | 7 | 25 | –5.2 | 1 | No | No | 1-Amp Plus to Minus Voltage Integrated Switching Regulator |
| PT78ST105 | 9 | 38 | 5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST106 | 10 | 38 | 6 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST107 | 11 | 38 | 7 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST108 | 12 | 38 | 8 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST109 | 13 | 38 | 9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST110 | 14 | 38 | 10 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST112 | 16 | 38 | 12 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST114 | 17.9 | 38 | 13.9 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST115 | 19 | 38 | 15 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST133 | 7.3 | 38 | 3.3 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST136 | 7.6 | 38 | 3.6 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST151 | 9.1 | 38 | 5.1 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST153 | 9.25 | 38 | 5.25 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST165 | 10.5 | 38 | 6.5 | 1.5 | No | No | 1.5-Amp Positive Step-down Integrated Switching Regulator |
| PT78ST212 | 16 | 28 | 12 | 2 | No | No | 12-V 2-Amp Positive Step-down Integrated Switching Regulator |
| **48-V Bus** | | | | | | | |
| PT3104 | 18 | 40 | 5 | 3 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3105 | 18 | 40 | 12 | 1.25 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3106 | 18 | 40 | 15 | 1 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3101 | 36 | 75 | 5 | 3 | No | Yes | 15-Watt 48-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3102 | 36 | 75 | 12 | 1.25 | No | Yes | 15-Watt 48-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3103 | 36 | 75 | 15 | 1 | No | Yes | 15-Watt 48-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT3301 | 20 | 60 | 3.3 | 8 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3302 | 20 | 60 | 5 | 6 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3303 | 20 | 60 | 12 | 2.5 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3304 | 20 | 60 | 15 | 2 | Yes | No | 30-Watt Postive Step-Down Intergrated Switching Regulator |
| PT3321 | 36 | 75 | 3.3 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3322 | 36 | 75 | 5 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3323 | 36 | 75 | 12 | 2.5 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3324 | 36 | 75 | 15 | 2 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3325 | 36 | 75 | 2 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3326 | 36 | 75 | 2.5 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |

## Plug-In Power Solutions (Continued)

| Device Name | Input Voltage (min) (V) | Input Voltage (max) (V) | Output Voltage (V) | Output Current (A) | $V_O$ Adjustable | Isolated Outputs | Description |
|---|---|---|---|---|---|---|---|
| **48-V Bus (Continued)** | | | | | | | |
| PT3327 | 36 | 75 | 1.8 | 8 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT3328 | 36 | 75 | 5.2 | 6 | Yes | Yes | 30-Watt Isolated DC/DC Converter |
| PT4104 | 18 | 40 | 5 | 3 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4105 | 18 | 40 | 12 | 1.25 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4106 | 18 | 40 | 15 | 1 | No | Yes | 15-Watt 24-V to 5-V/12-V/15-V Isolated DC/DC Converter |
| PT4101 | 36 | 75 | 5 | 3 | No | Yes | 48-V 15-Watt Isolated DC/DC Converter |
| PT4102 | 36 | 75 | 12 | 1.25 | No | Yes | 48-V 15-Watt Isolated DC/DC Converter |
| PT4103 | 36 | 75 | 15 | 1 | No | Yes | 48-V 15-Watt Isolated DC/DC Converter |
| PT4110 | 36 | 75 | 3.3 | 4 | No | Yes | 48-V 15-Watt Isolated DC/DC Converter |
| PT4117 | 36 | 75 | 5.2 | 3 | No | Yes | 48-V 15-Watt Isolated DC/DC Converter |
| PT4201 | 36 | 75 | 2 | 1.5 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4202 | 36 | 75 | 3.3 | 1.5 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4203 | 36 | 75 | 5 | 1.2 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4204 | 36 | 75 | 12 | 0.6 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4301 | 36 | 75 | ±5 | 1 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4302 | 36 | 75 | 5/3.3 | 1 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| PT4303 | 36 | 75 | ±12 | 0.25 | Yes | Yes | 3 to 7-Watt 48-V Input Isolated DC/DC Converter |
| **Current Boosters** | | | | | | | |
| PT7746 | 3 | 5.5 | Auto Tracks the PT7771/2 | 32 | Yes | No | 32-Amp "Current Booster" For the PT7770 Series |
| PT7747 | 20 | 28 | Auto Tracks $V_O$ or the PT7751/6 | 15 | Yes | No | 15-Amp "Current Booster" For the PT7750 Series |
| PT7748 | 11 | 14 | Auto Tracks $V_O$ of PT7721/2 | 17 | Yes | No | 17-Amp "Current Booster" For the PT7720 Series |
| PT7749 | 3 | 5.5 | Auto Tracks the PT7705/6 | 18 | Yes | No | 18-Amp "Current Booster" For the PT7770 Series |

## Battery Management




**Chargers**

BQ2000
BQ2000T
BQ2002
BQ2002C
BQ2002D
BQ2002E
BQ2002F
BQ2002G
BQ2002T
BQ2003
BQ2004
BQ2004E
BQ2004H
BQ2005
BQ2007
BQ2031
BQ2054
BQ2056
BQ2056T
BQ2056V
BQ2057
BQ2954
UC2906
UC2909
UC3906
UC3909
UCC2956
UCC3956

**Gas Gauges**

BQ2010
BQ2011
BQ2011J
BQ2011K
BQ2012
BQ2013H
BQ2014
BQ2014H
BQ2018
BQ2040
BQ2050
BQ2050H
BQ2052
BQ2060
BQ2092
BQ2945

**Protection ICs**

BQ2058
BQ2058T
UCC3911
UCC3957-1
UCC3957-2
UCC3957-3
UCC3957-4
UCC3958-1
UCC3958-2
UCC3958-3
UCC3958-4

**Board Level Products**

BQ2110
BQ2111L
BQ2112
BQ2114
BQ2118
BQ2145
BQ2148
BQ2150
BQ2150H
BQ2164
BQ2167
BQ2168
BQ219XL

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

## Battery Management—Chargers

| Device Name | Battery Chemistry | Control Topology | Charge Termination Method | Safety Charge Timer | Temperature Monitoring | Charge Status Outputs | Description |
|---|---|---|---|---|---|---|---|
| BQ2000 | Multi-chemistry | Switchmode | PVD, min current, max temp, time | Yes | Yes | 1 | Programmable Multi-Chemistry Fast-Charge Management IC |
| BQ2000T | Multi-chemistry | Switchmode | Delta T/Delta t, min current, max temp, time | Yes | Yes | 1 | Programmable Multi-Chemistry Fast-Charge Management IC |
| BQ2002 | NiCd, NiMH | Linear/Pulsed | –Delta V, PVD, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |
| BQ2002C | NiCd, NiMH | Linear/Pulsed | –Delta V, PVD, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |

## Battery Management—Chargers (Continued)

| Device Name | Battery Chemistry | Control Topology | Charge Termination Method | Safety Charge Timer | Temperature Monitoring | Charge Status Outputs | Description |
|---|---|---|---|---|---|---|---|
| BQ2002D | NiCd, NiMH | Linear/Pulsed | Delta T/Delta t, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |
| BQ2002E | NiCd, NiMH | Linear/Pulsed | –Delta V, PVD, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |
| BQ2002F | NiCd, NiMH | Linear/Pulsed | –Delta V, PVD, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |
| BQ2002G | NiCd, NiMH | Linear/Pulsed | –Delta V, PVD, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |
| BQ2002T | NiCd, NiMH | Linear/Pulsed | Delta T/Delta t, max temp, time | Yes | Yes | 1 | Simple 8-Pin Fast-Charge Controller with Termination |
| BQ2003 | NiCd, NiMH | Switchmode | –Delta V, Delta T/ Delta t, max temp, time | Yes | Yes | 2 | Complete Charge Management with Integrated PWM Switching Controller |
| BQ2004 | NiCd, NiMH | Switchmode | –Delta V, PVD, Delta T/ Delta t, max temp, time | Yes | Yes | 2 | Charge Management with Integrated PWM, Peak Voltage Detection & Maintenance |
| BQ2004E | NiCd, NiMH | Switchmode | –Delta V, PVD, Delta T/ Delta t, max temp, time | Yes | Yes | 2 | Charge Management with Integrated PWM, Peak Voltage Detection & Maintenance |
| BQ2004H | NiCd, NiMH | Switchmode | –Delta V, PVD, Delta T/ Delta t, max temp, time | Yes | Yes | 2 | Charge Management with Integrated PWM, Peak Voltage Detection & Maintenance |
| BQ2005 | NiCd, NiMH | Switchmode | –Delta V, Delta T/ Delta t, max | Yes | Yes | 4 | Dual Sequential Charge Controller for 2-Bay Chargers |
| BQ2007 | NiCd, NiMH | Switchmode | Delta V, PVD, max temp, time | Yes | Yes | 9 | Full-Charge Management with Advanced LED and LCD Display Driver |
| BQ2031 | Lead-Acid | Switchmode | Max voltage, –Delta 2V, min current, time | Yes | Yes | 3 | Charge Management with PWM Switching Controller and User-Selectable Algorithms |
| BQ2054 | Lithium-Ion | Switchmode | Min current, time | Yes | Yes | 3 | Charge Management with Integrated PWM Switching Controller |
| BQ2056 | Lithium-Ion | Linear | Max voltage | No | No | 2 | Low Dropout Linear Charge Control with Autocomptm Feature |
| BQ2056T | Lithium-Ion | Linear | Max voltage | No | No | 2 | Low Dropout Linear Charge Control with Autocomptm Feature |
| BQ2056V | Lithium-Ion | Linear | Max voltage | No | No | 2 | Low Dropout Linear Charge Control with Autocomptm Feature |
| BQ2057 | Lithium-Ion | Linear | Minimum current | No | Yes | 1 | Advanced Li-Ion Linear Charge Management IC |
| BQ2954 | Lithium-Ion | Switchmode | Min current, time | Yes | Yes | 2 | Enhanced Charge Management with Integrated PWM Switching Controller |
| UC2906 | Lead-Acid | Linear | Max voltage, min current | No | No | 1 | Sealed Lead-Acid Battery Charger |
| UC2909 | Lead-Acid | Switchmode | Max voltage, min current | No | Yes | 2 | Switchmode Lead-Acid Battery Charger |
| UC3906 | Lead-Acid | Linear | Max voltage, min current | No | No | 1 | Sealed Lead-Acid Battery Charger |
| UC3909 | Lead-Acid | Switchmode | Max voltage, min current | No | Yes | 2 | Switchmode Lead-Acid Battery Charger |
| UCC2956 | Lithium-Ion | Switchmode | Min current, time | Yes | No | 2 | Switch Mode Lithium-Ion Battery Charger Controller |
| UCC3956 | Lithium-Ion | Switchmode | Min current, time | Yes | No | 2 | Switch Mode Lithium-Ion Battery Charger Controller |

## Battery Management—Gas Gauges

| Device Name | Battery Chemistry | Target Application | Approx. Battery Capacity (mAh) | Number of LEDs Driven | Interface | Description |
|---|---|---|---|---|---|---|
| BQ2010 | NiCd, NiMH | General Purpose | 500 to 5000 | 5 or 6 | 1-Wire | Gas Gauge with 1-Wire (DQ) Interface and 5 LED Drivers |
| BQ2011 | NiCd | Power Tool/ High Discharge Rates | 800 to 2000 | 5 | 1-Wire | Gas Gauge for High Discharge Rates (>5A), Small Pack Capacities (<2AH) & 5-10 mOhm Sense Resistor |
| BQ2011J | NiCd | Power Tool/ High Discharge Rates | 800 to 2000 | 5 | 1-Wire | Gas Gauge for High Discharge Rates (>5A), Small Pack Capacities (<2AH), <5 mOhm Sense Resistor |
| BQ2011K | NiCd | Power Tool/ High Discharge Rates | 800 to 2000 | 5 | 1-Wire | Gas Gauge for High Discharge Rates (>5A), Small Pack Capacities (<2AH), <5 mOhm Sense Resistor With |
| BQ2012 | NiCd, NiMH | General Purpose | 500 to 5000 | 5 or 6 | 1-Wire | Gas Gauge with 1-Wire (DQ) Interface, 5 LED Drivers and Slow Charge Control |
| BQ2013H | NiCd, NiMH, Lead Acid | Electric Bicycle/Power Tool/High Discharge Rates | 2000 to 10000 | 5 | High-Speed 1-Wire | Gas Gauge for High Discharge Rates (>10A), Large Pack Capacities (>2AH), and <10 mOhm Sense Resistor |
| BQ2014 | NiCd, NiMH | General Purpose | 500 to 5000 | 5 | 1-Wire | Gas Gauge with 1-Wire (DQ) Interface, 5 LED Drivers and Control Signals for The BQ2004 Fast Charge I |
| BQ2014H | NiCd, NiMH | General Purpose | 500 to 5000 | 5 | High-Speed 1-Wire | Gas Gauge with High-Speed 1-Wire (HDQ) Interface and 5 LED Drivers |
| BQ2018 | NiCd, NiMH, Lithium Ion, Lead Acid | Charge/Discharge Counter Cellular/PDA | No Limits | 0 | High Speed 1-Wire | Analog Microcontroller Peripheral IC with High-Speed 1-Wire Interface (HDQ) for Charge/Discharge Cou |
| BQ2040 | NiCd, NiMH, Lithium Ion, Lead Acid | Smart Battery v1.0 Notebooks/Other Portables | 800 to 10000 | 4 | SM Bus | Smart Battery System (SBS) 1.0 Compliant Gas Gauge with 4 LED Drivers |
| BQ2050 | Lithium Ion | General Purpose | 500 to 5000 | 5 | 1-Wire | Gas Gauge with 1-Wire (DQ) Interface and 5 LED Drivers |
| BQ2050H | Lithium Ion | General Purpose | 500 to 5000 | 5 | High-Speed 1-Wire | Gas Gauge with High-Speed 1-Wire (HDQ) Interface and 5 LED Drivers |
| BQ2052 | Lithium Sulphur/ Manganese | Primary Battery Discharge Monitoring | 1000 to 12000 | 2, 4, or 5 | High Speed 1-Wire | Gas Gauge with High-Speed 1-Wire (HDQ) Interface and 3 Programmable LED Patterns |
| BQ2060 | NiCd, NiMH, Lithium Ion, Lead Acid | Smart Battery v1.1 Notebooks/Other Portables | 800 to 10000 | 4 or 5 | High-Speed 1-Wire or SM Bus | Sbs 1.0 Compliant Gas Gauge with 5 LED Drivers and Additional Battery Management Control |
| BQ2092 | NiCd, NiMH, Lithium Ion, Lead Acid | Smart Battery v0.95 Notebooks/Other Portables | 800 to 10000 | 4 | SM Bus | Sbs 0.95 Compliant Gas Gauge with 4 LED Drivers |
| BQ2945 | NiCd, NiMH, Lithium Ion, Lead Acid | Smart Battery v1.0 Notebooks/Other Portables | 800 to 10000 | 5 | SM Bus | Sbs 1.0 Compliant Gas Gauge with 5 LED Drivers |

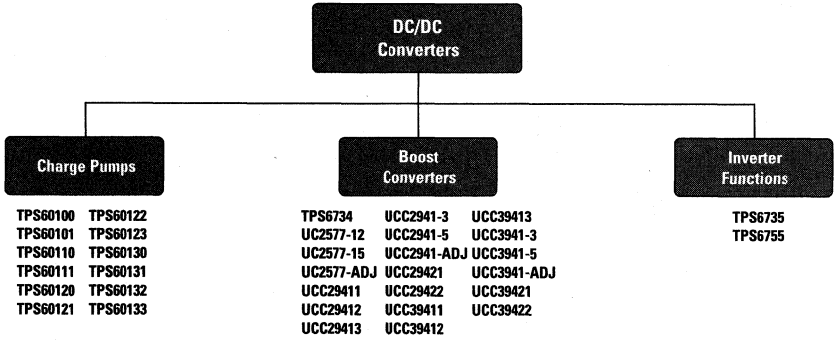
## Battery Management—Protection ICs

| Device Name | Battery Chemistry | Cells Protected | Threshold Tolerance (mV) | Protection FETs | Overcurrent Protection | Overcurrent Delay | Serial Bus | A/D | Shutdown Current (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| BQ2058 | Lithium Ion | 3, 4 | 50 | External | Yes | Yes | No | No | 0.007 | Lithium-Ion Pack Supervisor IC |
| BQ2058T | Lithium Ion | 2 | 55 | External | Yes | Yes | No | No | 0.007 | Lithium-Ion Pack Supervisor IC |
| UCC3911 | Lithium Ion | 2 | 50 | Internal | Yes | Yes | No | No | 3.5 | Lithium-Ion Battery Protector |
| UCC3957-1 | Lithium Ion | 3, 4 | 50 | External PMOS | Yes | Yes | No | No | 3.5 | Three- to Four-Cell Lithium-Ion Protector Circuit |
| UCC3957-2 | Lithium Ion | 3, 4 | 50 | External PMOS | Yes | Yes | No | No | 3.5 | Three- to Four-Cell Lithium-Ion Protector Circuit |
| UCC3957-3 | Lithium Ion | 3, 4 | 50 | External PMOS | Yes | Yes | No | No | 3.5 | Three- to Four-Cell Lithium-Ion Protector Circuit |
| UCC3957-4 | Lithium Ion | 3, 4 | 50 | External PMOS | Yes | Yes | No | No | 3.5 | Three- to Four-Cell Lithium-Ion Protector Circuit |
| UCC3958-1 | Lithium Ion | 1 | 50 | Internal | Yes | Yes | No | No | 0.007 | Single-Cell Lithium-Ion Battery Protection Circuit |
| UCC3958-2 | Lithium Ion | 1 | 50 | Internal | Yes | Yes | No | No | 0.007 | Single-Cell Lithium-Ion Battery Protection Circuit |
| UCC3958-3 | Lithium Ion | 1 | 50 | Internal | Yes | Yes | No | No | 0.007 | Single-Cell Lithium-Ion Battery Protection Circuit |
| UCC3958-4 | Lithium Ion | 1 | 50 | Internal | Yes | Yes | No | No | 0.007 | Single-Cell Lithium-Ion Battery Protection Circuit |

## Battery Management—Board Level Products

| Device Name | Board Function | Battery Chemistry | Target Application | Stand Alone | ICs on Board | LEDs on Board | Description |
|---|---|---|---|---|---|---|---|
| BQ2110 | Gas Gauge | NiCd, NiMH | 4- to 12-cell Series Applications | Yes | BQ2010 | 6 | Gas Gauge Module with LEDs and Switch (L-Version) BQ2010 Based |
| BQ2111L | Gas Gauge | NiCd | 4- to 12-cell Series Applications | Yes | BQ2011 | 5 | Gas Gauge Module with LEDs and Switch, BQ2011 Based |
| BQ2112 | Gas Gauge | NiCd, NiMH | 4- to 12-cell Series Applications | Yes | BQ2012 | 6 | Gas Gauge Module with LEDs and Switch (L-Version) BQ2012 Based |
| BQ2114 | Gas Gauge | NiCd, NiMH | 4- to 12-cell Series Applications | Yes | BQ2014 | 5 | Gas Gauge Module with LEDs and Switch (L-Version) BQ2014 Based |
| BQ2118 | Power Minder | NiCd, NiMH, Lithium Ion, Lead Acid | Hand Held Applications | No | BQ2018 | 0 | Power Minder Mini-Board Evaluati Module, BQ2018 Based |
| BQ2145 | Smart Battery Gas Gauge | NiCd, NiMH, Lithium Ion, Lead Acid | Notebook Battery Pack Integration | Yes | BQ2945 | 5 | Smart Battery Gas Gauge Module with LEDs and Switch, BQ2945 Based |
| BQ2148 | Smart Battery Gas Gauge and Pack Supervisor | Lithium Ion | Notebook Battery Pack Integration | Yes | BQ2040, BQ2059 | 4 | Smart Battery Gas Gauge Module with LEDs, Switch, and Pack Supervisor, BQ2040 and BQ2058 Based |
| BQ2150 | Gas Gauge | lithium Ion | 2- to 4-cell Series Applications | Yes | BQ2050 | 5 | Gas Gauge Module with LEDs and Switch (L-Version), BQ2050 Based |
| BQ2150H | Gas Gauge | Lithium Ion | 2- to 5-cell Series Applications | Yes | BQ2050H | 5 | Gas Gauge Module with LEDs and Switch (L-Version), BQ2050h Based |
| BQ2164 | Charge Controller and Gas Gauge | NiCd, NiMH | 5- to 12-cell series Fast Charge Applications | No | BQ2014, BQ2005 | 0 | Gas Gauge Module with LEDs and Switch (L-Version) BQ2014 and BQ2004 Based |
| BQ2167 | Gas Gauge and Pack Supervisor | Lithium Ion | 3- or 4-cell Series Applications | Yes | BQ2050, BQ2059 | 5 | Gas Gauge Module with LEDs, Switch, and Pack Supervisor, BQ2050 and BQ2058 Based |
| BQ2168 | Gas Gauge and Pack Supervisor | Lithium Ion | 3- or 4-cell Series Applications | Yes | BQ2050H, BQ2059 | 5 | Gas Gauge Module with LEDs, Switch, and Pack Supervisor, BQ2050h and BQ2058 Based |
| BQ219XL | Smart Battery Gas Gauge | NiCd, NiMH, Lithium Ion, Lead Acid | DR35 or DR36 Type Smart Battery Packs | Yes | BQ2092, BQ2041 | 4 | Smart Battery Gas Gauge Module with LEDs and Switch, BQ2092 Or BQ2040 Based |

## DC/DC Converters




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

## DC/DC Converters—Charge Pumps

| Device Name | $V_{CC}$ (max) (V) | $V_{CC}$ (min) (V) | $V_O$ (V) | Output Voltage Tolerance (± %) | $I_O$ (max) (mA) | Switching Frequency (kHz) | $I_Q$ (typ) (μA) | Shutdown Current (max) (μA) | Power Good Comparator | Low-Battery Warning | Shutdown | Under-voltage Lockout | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS60100 | 3.6 | 1.8 | 3.3 | 4 | 200 | 300 | 50 | 1 | No | No | Yes | Yes | Regulated 3.3-V High-Power Low-Noise Charge Pump DC/DC Converter |
| TPS60101 | 3.6 | 1.8 | 3.3 | 4 | 100 | 300 | 50 | 1 | No | No | Yes | Yes | Regulated 3.3-V High-Power Low-Noise Charge Pump DC/DC Converter |
| TPS60110 | 5.4 | 2.7 | 5 | 4 | 300 | 300 | 50 | 1 | No | No | Yes | Yes | Regulated 5-V High-Power Low-Noise Charge Pump DC/DC Converter |
| TPS60111 | 5.4 | 2.7 | 5 | 4 | 150 | 300 | 50 | 1 | No | No | Yes | Yes | Regulated 5-V High-Power Low-Noise Charge Pump DC/DC Converter |
| TPS60120 | 3.6 | 1.8 | 3.3 | 4 | 200 | 300 | 55 | 1 | No | Yes | Yes | Yes | Regulated 3.3-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60121 | 3.6 | 1.8 | 3.3 | 4 | 200 | 300 | 55 | 1 | Yes | No | Yes | Yes | Regulated 3.3-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60122 | 3.6 | 1.8 | 3.3 | 4 | 100 | 300 | 55 | 1 | No | Yes | Yes | Yes | Regulated 3.3-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60123 | 3.6 | 1.8 | 3.3 | 4 | 100 | 300 | 55 | 1 | Yes | No | Yes | Yes | Regulated 3.3-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60130 | 5.4 | 2.7 | 5 | 4 | 300 | 300 | 60 | 1 | No | Yes | Yes | Yes | Regulated 5-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60131 | 5.4 | 2.7 | 5 | 4 | 300 | 300 | 60 | 1 | Yes | No | Yes | Yes | Regulated 5-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60132 | 5.4 | 2.7 | 5 | 4 | 150 | 300 | 60 | 1 | No | Yes | Yes | Yes | Regulated 5-V High-Efficiency Charge Pump DC/DC Converter |
| TPS60133 | 5.4 | 2.7 | 5 | 4 | 150 | 300 | 60 | 1 | Yes | No | Yes | Yes | Regulated 5-V High-Efficiency Charge Pump DC/DC Converter |

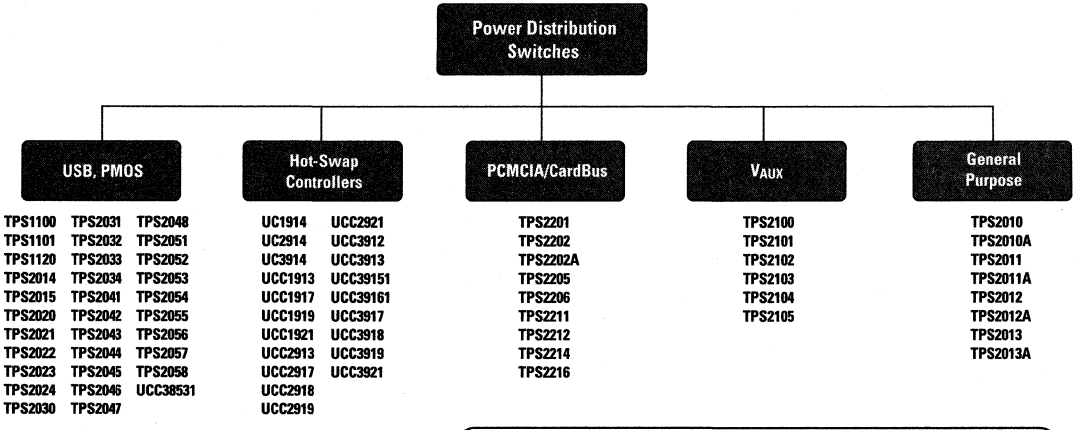
## DC/DC Converters—Boost Converters

| Device Name | $V_{CC}$ (max) (V) | $V_{CC}$ (min) (V) | $V_O$ (V) | $V_{OUT}$ Accuracy (%) | Output Current (mA) | Frequency (max) (kHz) | $I_q$ (typ) (μA) | Shutdown Current (max) (μA) | Efficiency (typ) (%) | Shut-Down | Under-voltage Lockout | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS6734 | 12 | 5 | 12 | 4 | 225 | 170 | 1200 | 3 | 86 | Yes | No | Fixed 12-V 120-mA Boost-Converter Supply |
| UC2577-12 | 12 | 5 | Adj | 2 | 3000 | 52 | 45000 | 7500 | | Yes | Yes | Simple Step-Up Fixed Voltage Regulators |
| UC2577-15 | 40 | 5 | Adj | 2 | 3000 | 52 | 45000 | 7500 | | Yes | Yes | Simple Step-Up Fixed Voltage Regulators |
| UC2577-ADJ | 40 | 5 | Adj | 2 | 3000 | 52 | 45000 | 7500 | | Yes | Yes | Simple Step-Up Voltage Regulator |
| UCC29411 | 3.2 | 1.3 | Adj | | | 200 | 10000 | 8 | | | | Low-Power Synchronous Boost Converter |
| UCC29412 | 3.2 | 1.3 | Adj | | | 200 | 10000 | 8 | | | | Low-Power Synchronous Boost Converter |
| UCC29413 | 3.2 | 1.3 | Adj | | | 200 | 10000 | 8 | | | | Low-Power Synchronous Boost Converter |
| UCC2941-3 | | | Adj | | 800 | 200 | 10000 | 8 | | Yes | No | 1-V Synchronous Boost Converter |
| UCC2941-5 | | | Adj | | 800 | 200 | 10000 | 8 | | Yes | No | 1-V Synchronous Boost Converter |
| UCC2941-ADJ | | | Adj | | 900 | 200 | 10000 | 8 | | Yes | No | 1-V Synchronous Boost Converter |
| UCC29421 | | | | | | 2000 | | | | Yes | No | High Power Synchronous Boost Controller |
| UCC29422 | | | | | | 2000 | | | | Yes | No | High Power Synchronous Boost Controller |
| UCC39411 | 3.2 | 1.1 | Adj | | | 200 | 10000 | 6 | | | | Low-Power Synchronous Boost Converter |
| UCC39412 | 3.2 | 1.1 | Adj | | | 200 | 10000 | 6 | | | | Low-Power Synchronous Boost Converter |
| UCC39413 | 3.2 | 1.1 | Adj | | | 200 | 10000 | 6 | | | | Low-Power Synchronous Boost Converter |
| UCC3941-3 | 3.8 | 1 | Adj | | 800 | 200 | 1000 | | | Yes | No | 1-V Synchronous Boost Converter |
| UCC3941-5 | 5.5 | 1 | Adj | | 800 | 200 | 1000 | | | Yes | No | 1-V Synchronous Boost Converter |
| UCC3941-ADJ | 5.5 | 1 | Adj | | 900 | 200 | 1000 | | | Yes | No | 1-V Synchronous Boost Converter |
| UCC39421 | | | | | | 2000 | | | | Yes | No | High Power Synchronous Boost Controller |
| UCC39422 | | | | | | 2000 | | | | Yes | No | High Power Synchronous Boost Controller |

## DC/DC Converters—Inverter Functions

| Device Name | $V_{CC}$ (max) (V) | $V_{CC}$ (min) (V) | $V_O$ (V) | $V_{OUT}$ Accuracy (%) | Output Current (mA) | Frequency (max) (kHz) | $I_q$ (typ) (μA) | Shutdown Current (max) (μA) | Efficiency (typ) (%) | Soft Start | Shut-down | Under-voltage Lockout | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS6735 | 6.2 | 4 | –5 | 4 | 200 | 160 | 1900 | 10 | 78 | Yes | Yes | Yes | Fixed Negative 5-V 200-mA Inverting DC/DC Converter |
| TPS6755 | 9 | 2.7 | Adj | 4 | 200 | 160 | 1900 | 10 | 78 | Yes | Yes | No | Adjustable Inverting DC/DC Converter |

## Power Distribution Switches




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified Hot-Swap Controllers, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Power Distribution Switches—USB, PMOS

| Device Name | Number of FETs | $r_{DS(on)}$ per FET (typ) (mOhms) | Current Limit (typ) (A) | $I_O$ (max) (A) | $V_{IN}$ Range (typ) (V) | $V_{OS}$ (max) (V) | $I_O$ (max) (A) | ESD Circuitry | Over Current Reporting | Over Temp Reporting | Enable | IN1 $r_{DS(on)}$ (typ) (mOhm) | $r_{DS(on)}$ typ, $V_{GS}$ = 4.5 V (mOhm) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS1100 | 1 | | | | | 15 | 1.6 | Yes | | | | | 400 | Single P-Channel Enhancement Mode MOSFET |
| TPS1101 | 1 | | | | | 15 | 2.3 | Yes | | | | | 190 | Single P-Channel Enhancement Mode MOSFET |
| TPS1120 | 2 | | | | | 15 | 1.17 | Yes | | | | | 400 | Dual P-Channel Enhancemenent Mode MOSFET |

## Power Distribution Switches—USB, PMOS (Continued)

| Device Name | Number of FETs | $r_{DS(on)}$ per FET (typ) (mOhms) | Current Limit (typ) (A) | $I_O$ (max) (A) | $V_{IN}$ Range (typ) (V) | $V_{OS}$ (max) (V) | $I_O$ (max) (A) | ESD Circuitry | Over Current Reporting | Over Temp Reporting | Enable | IN1 $r_{DS(on)}$ (typ) (mOhm) | $r_{DS(on)}$ typ. $V_{GS}$ = 4.5 V (mOhm) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS2014 | 1 | 75 | 1.2 | 0.6 | 4.0 to 5.5 | | | Yes | Yes | No | Neg | 95 | | Power-Distribution Switches |
| TPS2015 | 1 | 75 | 2 | 1 | 4.0 to 5.5 | | | Yes | Yes | No | Neg | 95 | | Power-Distribution Switches |
| TPS2020 | 1 | 33 | 0.3 | 0.2 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | | | Power-Distribution Switches |
| TPS2021 | 1 | 33 | 0.9 | 0.6 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | | | Power-Distribution Switches |
| TPS2022 | 1 | 33 | 1.5 | 1 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | | | Power-Distribution Switches |
| TPS2023 | 1 | 33 | 2.2 | 1.5 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | | | Power-Distribution Switches |
| TPS2024 | 1 | 33 | 3 | 2 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | | | Power-Distribution Switches |
| TPS2030 | 1 | 33 | 0.3 | 0.2 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 30 | | Power Distribution Switches |
| TPS2031 | 1 | 33 | 0.9 | 0.6 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 30 | | Power Distribution Switches |
| TPS2032 | 1 | 33 | 1.5 | 1 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 30 | | Power Distribution Switches |
| TPS2033 | 1 | 33 | 2.2 | 1.5 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 30 | | Power Distribution Switches |
| TPS2034 | 1 | 33 | 3 | 2 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 30 | | Power Distribution Switches |
| TPS2041 | 1 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | 80 | | Single Power Distribution Switch w/Neg Enable |
| TPS2042 | 2 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Each | Yes | Neg | 80 | | Dual Power Distribution Switch w/Neg Enable |
| TPS2043 | 3 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Each | Yes | Neg | 80 | | Triple Power-Distribution Sw. |
| TPS2044 | 4 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Each | Yes | Neg | 80 | | Quad Power Distribution Switch w/Neg Enable |
| TPS2045 | 1 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | 80 | | Power-Distribution Switches |
| TPS2046 | 2 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | 80 | | Power-Distribution Switches |
| TPS2047 | 3 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | 80 | | Triple Power-Distribution Sw. |
| TPS2048 | 4 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Neg | 80 | | Quad Power-Distribution Sw. |
| TPS2051 | 1 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 80 | | Single Power Distribution Switch w/Pos Enable |
| TPS2052 | 2 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Each | Yes | Pos | 80 | | Dual Power Distribution Switch w/Pos Enable |
| TPS2053 | 3 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Each | Yes | Pos | 80 | | Triple Power-Distribution Sw. |
| TPS2054 | 4 | 80 | 0.9 | 0.5 | 2.7 to 5.5 | | | Yes | Each | Yes | Pos | 80 | | Quad Power Distribution Switch w/Pos Enable |
| TPS2055 | 1 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 80 | | Power-Distribution Switches |
| TPS2056 | 2 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 80 | | Power-Distribution Switches |
| TPS2057 | 3 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 80 | | Triple Power-Distribution Sw. |
| TPS2058 | 4 | 80 | 0.44 | 0.25 | 2.7 to 5.5 | | | Yes | Yes | Yes | Pos | 80 | | Quad Power-Distribution Sw. |
| UCC38531 | | | 0.5 | | 4.5 to 9 | 9 | 0.003 | | Yes | No | Yes | | | Universal Serial Bus Power Controller |

## Power Distribution Switches—Hot-Swap Controllers

| Device Name | $V_{IN}$ Range (typ) (V) | Current Range | Integrated Power FET | $r_{DS(on)}$ (mΩ) | Programmable Fault Threshold | Programmable Time Delay | Latched Fault Mode | Average Power Limiting | Description |
|---|---|---|---|---|---|---|---|---|---|
| UC1914 | 5 to 35 | Ext. Limited | No | | Yes | Yes | Yes | Yes | 5-V to 35-V Hot Swap Power Manager |
| UC2914 | 5 to 35 | Ext. Limited | No | | Yes | Yes | Yes | Yes | 5-V to 35-V Hot Swap Power Manager |
| UC3914 | 5 to 35 | Ext. Limited | No | | Yes | Yes | Yes | Yes | 5-V to 35-V Hot Swap Power Manager |
| UCC1913 | –10 to Ext. Limit | Ext. Limited | No | | Yes | Yes | No | Yes | Negative Voltage Hot Swap Power Manager |
| UCC1917 | 7 to Ext. Limit | Ext. Limited | No | | Yes | Yes | Yes | Yes | Positive Floating Hot Swap Power Manager |
| UCC1919 | 3 to 8 | Ext. Limited | No | | Yes | Yes | Yes | Yes | 3-V to 8-V Hot Swap Power Manager |
| UCC1921 | –10 to Ext. Limit | Ext. Limited | No | | Yes | Yes | Yes | Yes | Latchable Negative Floating Hot Swap Power Manager |
| UCC2913 | –10 to Ext. Limit | Ext. Limited | No | | Yes | Yes | No | Yes | Negative Voltage Hot Swap Power Manager |
| UCC2917 | 7 to Ext. Limit | Ext. Limited | No | | Yes | Yes | Yes | Yes | Positive Floating Hot Swap Power Manager |
| UCC2918 | 3 to 6 | 0A to 4A | Yes | 75 | Yes | Yes | No | Yes | Low On-Resistance Hot Swap Power Manager |
| UCC2919 | 3 to 8 | Ext. Limited | No | | Yes | Yes | Yes | Yes | 3-V to 8-V Hot Swap Power Manager |
| UCC2921 | –10 to Ext. Limit | Ext. Limited | No | | Yes | Yes | Yes | Yes | Latchable Negative Floating Hot Swap Power Manager |
| UCC3912 | 3 to 8 | 0A to 3A | Yes | 150 | Yes | Yes | No | Yes | Programmable Hot Swap Power Manager |
| UCC3913 | –10 to Ext. Limit | Ext. Limited | No | | Yes | Yes | No | Yes | Negative Voltage Hot Swap Power Manager |
| UCC39151 | 7 to 15 | 0A to 3A | Yes | 150 | Yes | Yes | No | Yes | 15-V Programmable Hot Swap Power Manager |
| UCC39161 | 4 to 6 | 0A to 0.8A | Yes | 220 | | Yes | | | Low Current Hot Swap Power Manager |
| UCC3917 | 7 to Ext. Limit | Ext. Limited | No | | Yes | Yes | Yes | Yes | Positive Floating Hot Swap Power Manager |
| UCC3918 | 3 to 6 | 0A to 4A | Yes | 75 | Yes | Yes | No | Yes | Low On-Resistance Hot Swap Power Manager |
| UCC3919 | 3 to 8 | Ext. Limited | No | | Yes | Yes | Yes | Yes | 3-V to 8-V Hot Swap Power Manager |
| UCC3921 | –10 to Ext. Limit | Ext. Limited | No | | Yes | Yes | Yes | Yes | Latchable Negative Floating Hot Swap Power Manager |

## Power Distribution Switches—PCMCIA/CardBus

| Device Name | 12-V Supply Required | 3-V/5-V $r_{DS(on)}$ (typ) (mOhm) | Control Inputs | Current and Temperature Protection | VPP_Good and OC Reporting | Description |
|---|---|---|---|---|---|---|
| TPS2201 | No | 225/160 | 8 Line Parallel | Yes | Yes | 2-Slot PC Card Power-I/F Switch for Parallel PCMCIA Controller |
| TPS2202 | No | 225/160 | 3 Line Serial | Yes | Yes | 2-Slot PC Card Power-I/F Sw for Serial PCMCIA Controller |
| TPS2202A | No | 225/160 | 3 Line Serial w/Reset | Yes | Yes | 2-Slot PC Card Power-I/F Switch w/Reset for Serial PCMCIA Controller |
| TPS2205 | No | 110/140 | 8 Line Parallel | Yes | N/Y | 2-Slot PC Card Pwr-I/F Switch for Parallel PCMCIA Controller |
| TPS2206 | No | 110/140 | 3 Line Serial w/Reset | Yes | N/Y | 2-Slot PC Card Pwr-I/F Switch for Serial PCMCIA Controller |
| TPS2211 | No | 50 | 4 Line Parallel | Yes | N/Y | Single PC Card Power-I/F Switch for Parallel PCMCIA Controller |
| TPS2212 | No | 160 | 4 Line Parallel | Yes | N/Y | PC Card Interface Switch |
| TPS2214 | No | 60 | 3 Line Serial, w/independent VCC/VPP | Yes | N/Y | Dual-Slot PC Card Power-Interface Switch |
| TPS2216 | No | 60 | 3 Line Serial, w/independent VCC/VPP | Yes | N/Y | Dual-Slot PC Card Power-Interface Switch |

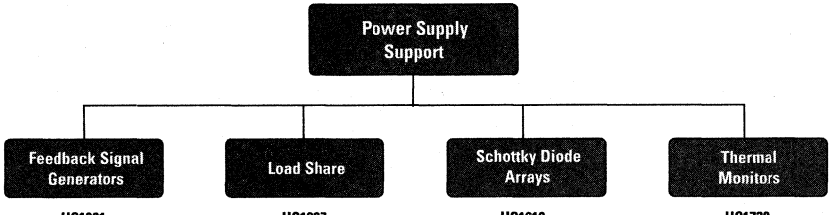
## Power Distribution Switches—$V_{AUX}$

| Device Name | Number of Inputs | IN1 $r_{DS(on)}$ (typ) (mOhm) | IN2 $r_{DS(on)}$ (typ) (Ohms) | IN1 Output Current (mA) | IN2 Output Current (mA) | IN1 Supply Current (typ) (µA) | IN2 Supply Current (typ) (µA) | IN1, IN2 Input Voltage Range (V) | Ambient Temp. Range (°C) | Switching Time (IN1 to IN2) (typ) (µs) | Switching Time (IN2 to IN1) (typ) (ms) | Enable | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS2100 | 2 | 250 | 1.3 | 500 | 10 | 10 | 0.75 | 2.7 to 4.0 | –40 to 70 | 4 | 0.9 | Neg | $V_{AUX}$ Power-Distribution Switch |
| TPS2101 | 2 | 250 | 1.3 | 500 | 10 | 10 | 0.75 | 2.7 to 4.0 | –40 to 70 | 4 | 0.9 | Pos | $V_{AUX}$ Power-Distribution Switch |
| TPS2102 | 2 | 250 | 1.3 | 500 | 100 | 14 | 0.75 | 2.7 to 4.0 | –40 to 70 | 3 | 0.7 | Neg | Power-Distribution Switches |
| TPS2103 | 2 | 250 | 1.3 | 500 | 100 | 14 | 0.75 | 2.7 to 4.0 | –40 to 70 | 3 | 0.7 | Pos | Power-Distribution Switches |
| TPS2104 | 2 | 250 | 1.3 | 500 | 100 | 18 | 0.75 | 2.7 to 5.5 | –40 to 85 | 3 | 0.7 | Neg | Power-Distribution Switches |
| TPS2105 | 2 | 250 | 1.3 | 500 | 100 | 18 | 0.75 | 2.7 to 5.5 | –40 to 85 | 3 | 0.7 | Pos | Power-Distribution Switches |

## Power Distribution Switches—General Purpose

| Device Name | Number of FETs | $r_{DS(on)}$ per FET (typ) (mOhms) | IN1 $r_{DS(on)}$ (typ) (mOhms) | Current Limit (typ) (A) | $V_{IN}$ Range (typ) (V) | $I_O$ (max) (A) | ESD Circuitry | Over Current Reporting | Over Temp Reporting | Enable | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS2010 | | 75 | 95 | 0.4 | 2.7 to 5.5 | 0.2 | No | No | No | Neg | Power Distribution Switch |
| TPS2010A | 1 | 30 | 30 | 0.3 | 2.7 to 5.5 | 0.2 | Yes | No | No | Neg | Power Distribution Switches |
| TPS2011 | | 75 | 95 | 1.2 | 2.7 to 5.5 | 0.6 | No | No | No | Neg | Power Distribution Switch |
| TPS2011A | 1 | 30 | 30 | 0.9 | 2.7 to 5.5 | 0.6 | Yes | No | No | Neg | Power Distribution Switches |
| TPS2012 | | 75 | 95 | 2 | 2.7 to 5.5 | 1 | No | No | No | Neg | Power Distribution Switch |
| TPS2012A | 1 | 30 | 30 | 1.5 | 2.7 to 5.5 | 1 | Yes | No | No | Neg | Power Distribution Switches |
| TPS2013 | | 75 | 95 | 2.6 | 2.7 to 5.5 | 1.5 | No | No | No | Neg | Power Distribution Switch |
| TPS2013A | 1 | 30 | 30 | 2.2 | 2.7 to 5.5 | 1.5 | Yes | No | No | Neg | Power Distribution Switches |

## Power Supply Support




**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm**

**For military qualified products, refer to:**
**www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm**

## Power Supply Support—Feedback Signal Generators

| Device Name | $V_{IN}$ Range (V) | Output Current (A) | On Board Reference | On Board Oscillator | UVLO | Shut-down | Soft Start | Description |
|---|---|---|---|---|---|---|---|---|
| UC1901 | 4.5 to 40 | 0.035 | Yes/1% | Useable to 5 MHz | Yes | No | No | Isolated Feedback Generator |
| UC19431 | 2.2 to 36 | 0.1 | 2.82, 3.12, 5.1, 7.8, 10.42, 12.24/0.7% | | | | | Precision Adjustable Shunt Regulator |
| UC19432 | 2.2 to 36 | 0.1 | 1.3 | No | No | No | No | Precision Analog Controller |
| UC2901 | 4.5 to 40 | 0.035 | Yes/1% | Useable to 5 MHz | Yes | No | No | Isolated Feedback Generator |
| UC29431 | 2.2 to 36 | 0.1 | 2.82, 3.12, 5.1, 7.8, 10.42, 12.24/0.7% | | | | | Precision Adjustable Shunt Regulator |
| UC29432 | 2.2 to 36 | 0.1 | 1.3 | No | No | No | No | Precision Analog Controller |
| UC3901 | 4.5 to 40 | 0.035 | Yes/1% | Useable to 5 MHz | Yes | No | No | Isolated Feedback Generator |
| UC39431 | 2.2 to 36 | 0.1 | 2.82, 3.12, 5.1, 7.8, 10.42, 12.24/0.7% | | | | | Precision Adjustable Shunt Regulator |
| UC39432 | 2.2 to 36 | 0.1 | 1.3 | No | No | No | No | Precision Analog Controller |
| UC39432B | 2.2 to 36 | 0.13 | 1.3 | No | No | No | No | Precision Adjustable Shunt Regulator |

## Power Supply Support—Load Share

| Device Name | $V_{IN}$ Range (V) | On Board Reference | Share Bus | UVLO | Share Loop Compensation | Description |
|---|---|---|---|---|---|---|
| UC1907 | 4.5 to 35 | Yes/1.25% | Single-Ended | No | | Load Share Controller |
| UC2902 | 2.7 to 20 | No | Differential | Yes | User Programmable | Load Share Controller |
| UC2907 | 4.5 to 35 | Yes/1.25% | Single-Ended | No | | Load Share Controller |
| UC3902 | 2.7 to 20 | No | Differential | Yes | User Programmable | Load Share Controller |
| UC3907 | 4.5 to 35 | Yes/1.25% | Single-Ended | No | | Load Share Controller |

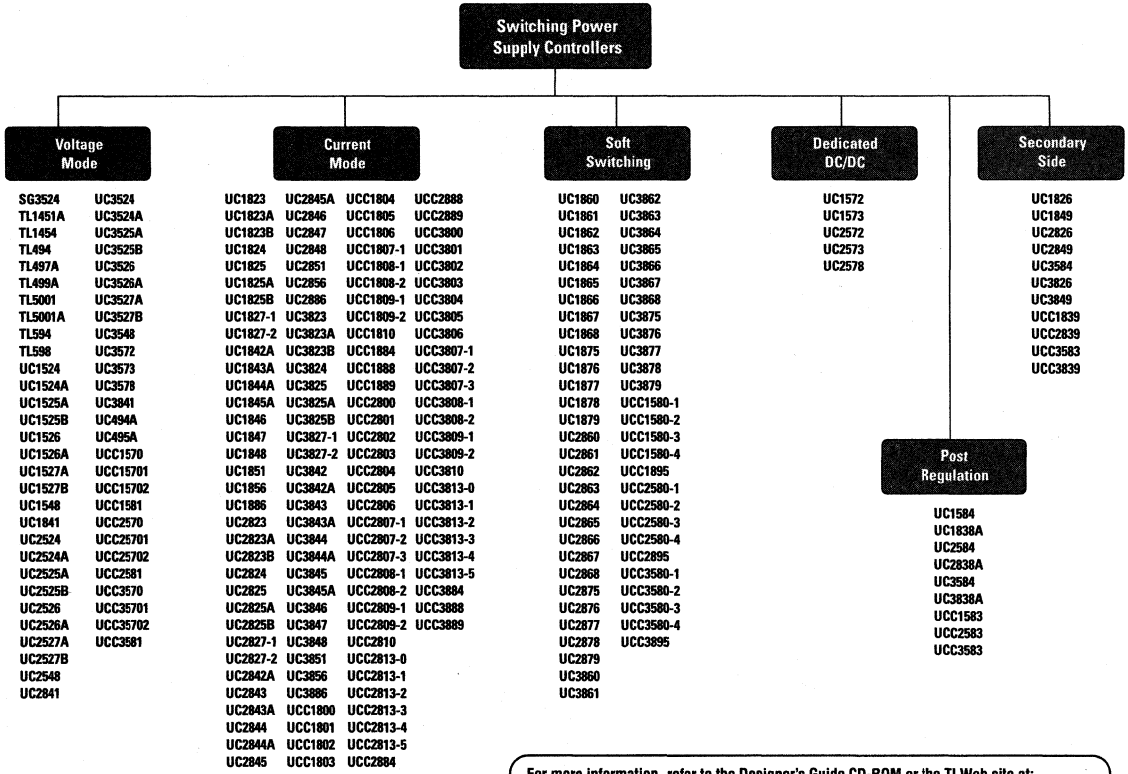
## Power Supply Support—Schottky Diode Arrays

| Device Name | $V_{IN}$ Range (V) | Output Current (A) | On Board Reference | On Board Oscillator | UVLO | Shut-down | Soft Start | Description |
|---|---|---|---|---|---|---|---|---|
| UC1610 | 0 to 50 | 3 | No | No | No | No | No | Dual Schottky Diode Bridge |
| UC1611 | 0 to 50 | 3 | No | No | No | No | No | Quad Schottky Diode Array |
| UC2610 | 0 to 50 | 3 | No | No | No | No | No | Dual Schottky Diode Bridge |
| UC3610 | 0 to 50 | 3 | No | No | No | No | No | Dual Schottky Diode Bridge |
| UC3611 | 0 to 50 | 3 | No | No | No | No | No | Quad Schottky Diode Array |

## Power Supply Support—Thermal Monitors

| Device Name | $V_T$ (V) | $V_{IN}$ Tolerance (%) | $I_{CC}$ (min) (V) | (max) (mA) | Description |
|---|---|---|---|---|---|
| UC1730 | 1.5 | 1 | 5 to 35 | 4 | Thermal Monitor |
| UC2730 | 1.5 | 1 | 5 to 35 | 4 | Thermal Monitor |
| UC3730 | 1.5 | 1 | 5 to 35 | 4 | Thermal Monitor |

## Switching Power Supply Controllers




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Switching Power Supply Controllers—Voltage Mode

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Standby Current (mA) | Ref Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SG3524 | Yes | No | 8 to 40 | Note 1 | 100 | 500 | NA/8 | 5 | 8 | 90 | No | 1 | Yes | No | No | 1 | No | Regulating PWM |
| TL1451A | No | No | 3.6 to 50 | Note 1 | 20 | 500 | 1.7/1.3 | 2.5 | 4 | 100 | Yes | 2 | No | Yes | No | | Yes | Dual PWM Control Circuit |
| TL1454 | No | No | 3.6 to 20 | Note 6 | –40 | 2000 | 3.5/3.1 | 1.25 | 2.5 | 100 | Yes | 2 | No | Yes | No | | Yes | Dual-Channel PWM Control Circuit |
| TL494 | No | No | 7 to 40 | Note 1 | 200 | 300 | 7.5/6 | 5 | 5 | 90 | No | 2 | Yes | Yes | Yes | | Yes | PWM Control Circuit |
| TL497A | Yes | No | 4.5 to 12 | Note 1 | 500 | 50 | 36470 | 1.2 | 5 | | No | 1 | No | Yes | No | 1 | No | Switching Voltage Regulator |
| TL499A | No | No | 1.1 to 35 | Note 1 | 500 | 40 | 1.8/NA | 1.26 | 5 | | No | 1 | No | Yes | No | | No | Wide-Range Power-Supply Controller |
| TL5001 | No | No | 3.6 to 40 | Note 1 | 20 | 400 | 1.1/1 | 1 | 5 | 100 | Yes | 1 | No | Yes | No | | Yes | PWM Control Circuit |
| TL5001A | No | No | 3.6 to 40 | Note 1 | 20 | 400 | 1.1/1 | 1 | 3 | 100 | Yes | 1 | No | Yes | No | | Yes | PWM Control Circuits |
| TL594 | No | No | 7 to 40 | Note 1 | 200 | 300 | 12.4/9 | 5 | 1 | 90 | Yes | 2 | Yes | Yes | Yes | | Yes | PWM Control Circuit |
| TL598 | No | No | 7 to 40 | Note 6 | –250 | 300 | 15/NA | 5 | 1 | 90 | Yes | 2 | Yes | Yes | Yes | | Yes | PWM Control Circuit |
| UC1524 | Yes | No | 8 to 40 | Note 7 | 100 | 300 | | 5 | 4 | 50/50 | No | 1 | Yes | Yes | No | 1 | No | Advanced Regulating PWM |
| UC1524A | Yes | No | 8 to 40 | Note 7 | 200 | 500 | | 5 | 1 | 50/50 | Yes | 1 | Yes | Yes | No | 1 | No | Advanced Regulating PWM |
| UC1525A | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC1525B | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 0.75 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC1526 | Yes | No | 8 to 35 | Note 3 | 100 | 400 | | 5 | 1 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC1526A | Yes | No | 7 to 35 | Note 3 | 200 | 600 | | 5 | 1 | 50/50 | Yes | 1 | Yes | No | No | 1 | Yes | Regulating PWM |
| UC1527A | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC1527B | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 0.75 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC1548 | No | Yes | 12 to 20 | Note 5 | 2000 | 1000 | | 5 | 1 | Prog. | Yes | 2 | No | Yes | No | 1 | No | Primary Side PWM Controller |
| UC1841 | Yes | Yes | 8 to 30 | Note 5 | 1000 | 500 | 10/4.5 | 5 | 1 | Prog. | Yes | 3 | No | Yes | No | 1 | No | Programmable, Off-Line, PWM Controller |
| UC2524 | Yes | No | 8 to 40 | Note 7 | 100 | 300 | | 5 | 4 | 50/50 | No | 1 | Yes | Yes | No | 1 | No | Advanced Regulating PWM |
| UC2524A | Yes | No | 8 to 40 | Note 7 | 200 | 500 | | 5 | 1 | 50/50 | Yes | 1 | Yes | Yes | No | 1 | No | Advanced Regulating PWM |
| UC2525A | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC2525B | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 0.75 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC2526 | Yes | No | 8 to 35 | Note 3 | 100 | 400 | | 5 | 1 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC2526A | Yes | No | 7 to 35 | Note 3 | 200 | 600 | | 5 | 1 | 50/50 | Yes | 1 | Yes | No | No | 1 | Yes | Regulating PWM |
| UC2527A | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC2527B | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 0.75 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC2548 | No | Yes | 12 to 20 | Note 5 | 2000 | 1000 | | 5 | 1 | Prog. | Yes | 2 | No | Yes | No | 1 | No | Primary Side PWM Controller |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single, Totem Pole
6. Totem Pole
7. Dual Alternating, Uncommitted
8. Single-Ended or Push-Pull
9. Single, Floating Totem Pole

## Switching Power Supply Controllers—Voltage Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{SENSE}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Standby Current (mA) | Ref Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UC2841 | Yes | Yes | 8 to 30 | Note 5 | 1000 | 500 | 10/4.5 | 5 | 1 | Prog. | Yes | 3 | No | Yes | No | 1 | No | Programmable, Off-Line, PWM Controller |
| UC3524 | Yes | No | 8 to 40 | Note 7 | 100 | 300 | | 5 | 8 | 50/50 | No | 1 | Yes | Yes | No | 1 | No | Advanced Regulating PWM |
| UC3524A | Yes | No | 8 to 40 | Note 7 | 200 | 500 | | 5 | 2 | 50/50 | Yes | 1 | Yes | Yes | No | 1 | No | Advanced Regulating PWM |
| UC3525A | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 2 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC3525B | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 1.25 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC3526 | Yes | No | 8 to 35 | Note 3 | 100 | 400 | | 5 | 2 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC3526A | Yes | No | 7 to 35 | Note 3 | 200 | 550 | | 5 | 2 | 50/50 | Yes | 1 | Yes | No | No | 1 | Yes | Regulating PWM |
| UC3527A | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 2 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC3527B | Yes | No | 8 to 35 | Note 3 | 200 | 500 | | 5.1 | 1.25 | 50/50 | Yes | 1 | Yes | No | No | | Yes | Regulating PWM |
| UC3548 | No | Yes | 36514 | Note 5 | 2000 | 1000 | | 5 | 1 | Prog. | Yes | 2 | No | Yes | No | 1 | No | Primary Side PWM Controller |
| UC3572 | Yes | Yes | 4.75 to 30 | Note 5 | 500 | 300 | 9/0.05 | 3 | 2 | 100 | Yes | 1 | No | Yes | No | | No | Negative Output Flyback PWM |
| UC3573 | Yes | Yes | 4.75 to 30 | Note 5 | 500 | 300 | 9/0.05 | 3 | 2 | 100 | Yes | 1 | No | Yes | No | | No | Buck PWM Stepdown Voltage Regulator |
| UC3578 | Yes | No | 14 to 72 | Note 9 | 200 | 100 | | 2 | 2 | 90 | Yes | 1 | No | Yes | No | | No | Buck PWM Stepdown Voltage Regulator |
| UC3841 | Yes | Yes | 8 to 30 | Note 5 | 1000 | 500 | 10/4.5 | 5 | 1 | Prog. | Yes | 3 | No | Yes | No | 1 | No | Programmable, Off-Line, PWM Controller |
| UC494A | No | No | 7 to 40 | Note 8 | 200 | 300 | | 5 | 1 | Prog. | Yes | 2 | Yes | Yes | Yes | Yes | Yes | Advanced Regulating PWM |
| UC495A | No | No | 7 to 40 | Note 8 | 200 | 300 | | 5 | 1 | Prog. | Yes | 2 | Yes | Yes | Yes | Yes | Yes | Advanced Regulating PWM |
| UCC1570 | Yes | No | 10 to 13 | Note 5 | 1000 | 500 | 1/0.085 | 5 | 2 | 80 | Yes | | No | Yes | No | | No | Low-Power PWM |
| UCC15701 | Yes | Yes | 10 to 13 | Note 5 | 1000 | 700 | 0.75/0.13 | 5 | 2 | 99 | Yes | | No | Yes | No | | No | Advanced Voltage Mode PWM |
| UCC15702 | Yes | Yes | 10 to 13 | Note 5 | 1000 | 700 | 0.75/0.13 | 5 | 2 | 99 | Yes | | No | Yes | No | | No | Advanced Voltage Mode PWM |
| UCC1581 | Yes | No | 7.5 to 15 | Note 5 | 1000 | 100 | 0.3/0.085 | 4 | 1.5 | 83 | Yes | | No | Yes | No | | No | Micropower Voltage Mode PWM |
| UCC2570 | Yes | No | 10 to 13 | Note 5 | 1000 | 500 | 1/0.085 | 5 | 2 | 80 | Yes | | No | Yes | No | | No | Low-Power PWM |
| UCC25701 | Yes | Yes | 10 to 13 | Note 5 | 1000 | 700 | 0.75/0.13 | 5 | 2 | 99 | Yes | | No | Yes | No | | No | Advanced Voltage Mode PWM |
| UCC25702 | Yes | Yes | 10 to 13 | Note 5 | 1000 | | 0.75/0.13 | 5 | 2 | 99 | Yes | | No | Yes | No | | No | Advanced Voltage Mode PWM |
| UCC2581 | Yes | No | 7.5 to 15 | Note 5 | 1000 | 100 | 0.3/0.085 | 4 | 1.5 | 83 | Yes | | No | Yes | No | | No | Micropower Voltage Mode PWM |
| UCC3570 | Yes | No | 10 to 13 | Note 5 | 1000 | 500 | 1/0.085 | 5 | 2 | 80 | Yes | | No | Yes | No | | No | Low-Power PWM |
| UCC35701 | Yes | Yes | 10 to 13 | Note 5 | 1000 | 700 | 0.75/0.13 | 5 | 2 | 99 | Yes | | No | Yes | No | | No | Advanced Voltage Mode PWM |
| UCC35702 | Yes | Yes | 10 to 13 | Note 5 | 1000 | | 0.75/0.13 | 5 | 2 | 99 | Yes | | No | Yes | No | | No | Advanced Voltage Mode PWM |
| UCC3581 | Yes | No | 7.5 to 15 | Note 5 | 1000 | 100 | 0.3/0.085 | 4 | 1.5 | 83 | Yes | | No | Yes | No | | No | Micropower Voltage Mode PWM |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single, Totem Pole
6. Totem Pole
7. Dual Alternating, Uncommitted
8. Single-Ended or Push-Pull
9. Single, Floating Totem Pole

## Switching Power Supply Controllers—Current Mode

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Standby Current (mA) | Ref Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UC1823 | Yes | Yes | 10 to 30 | Note 1 | 1500 | 1000 | 22/61 | 5.1 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC1823A | Yes | Yes | 12 to 20 | Note 1 | 2000 | 1000 | 20/0.1 | 5.1 | 1 | Prog. | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC1823B | Yes | Yes | 12 to 20 | Note 1 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC1824 | Yes | Yes | 10 to 30 | Note 2 | 1500 | 1000 | 22/1.1 | 5.1 | 1 | 100 | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC1825 | Yes | Yes | 10 to 30 | Note 3 | 1500 | 1000 | 22/1.1 | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC1825A | Yes | Yes | 12 to 20 | Note 3 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC1825B | Yes | Yes | 12 to 20 | Note 3 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC1827-1 | No | No | 9.5 to 20 | | 200 | 500 | 32/1 | 5 | 4 | 150 | Yes | 2 | No | Yes | No | Yes | No | Buck Current/Voltage Fed Push-Pull PWM Controllers |
| UC1827-2 | No | No | 9.5 to 20 | Note 4 | 200 | 500 | 32/1 | 5 | 4 | 150 | Yes | 2 | Yes | No | No | Yes | Yes | Buck Current/Voltage Fed Push-Pull PWM Controllers |
| UC1842A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC1843A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC1844A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC1845A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC1846 | Yes | Yes | 8 to 40 | Note 3 | 500 | 500 | NA/17 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Current Mode PWM Controller |
| UC1847 | Yes | Yes | 8 to 40 | Note 3 | 500 | 500 | NA/17 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Current Mode PWM Controller |
| UC1848 | No | No | 12 to 20 | Note 1 | 2000 | 1000 | 22/0.2 | 5 | 1 | Prog. | Yes | 1 | No | Yes | No | Yes | No | Average Current Mode PWM Controller |
| UC1851 | Yes | Yes | 8 to 30 | Note 1 | 400 | 500 | 15/4.5 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Programmable, Off-Line, PWM Controller |
| UC1856 | Yes | No | 8 to 40 | Note 3 | 1500 | 1000 | NA/18 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | Yes | Improved Current Mode PWM Controller |
| UC1886 | No | No | 10.3 to 20 | Note 5 | 1500 | 400 | 10/NA | 5 | 1.5 | 95 | Yes | 3 | No | Yes | No | Yes | No | Average Current Mode PWM Controller IC |
| UC2823 | Yes | Yes | 10 to 30 | Note 1 | 1500 | 1000 | 22/1.1 | 5.1 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC2823A | Yes | Yes | 12 to 20 | Note 1 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC2823B | Yes | Yes | 12 to 20 | Note 1 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC2824 | Yes | Yes | 10 to 30 | Note 2 | 1500 | 1000 | 22/1.1 | 5.1 | 1 | 100 | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC2825 | Yes | Yes | 10 to 30 | Note 3 | 1500 | 1000 | 7.8/1.1 | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC2825A | Yes | Yes | 12 to 20 | Note 3 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC2825B | Yes | Yes | 12 to 20 | Note 3 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Current Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Operate/ Freq (max) (kHz) | Standby Current (mA) | Ref Voltage (V) | $V_{REF}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dual Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UC2827-1 | No | No | 9.5 to 20 | | 200 | 500 | 32/1 | 5 | 4 | 50 | Yes | 2 | No | Yes | No | Yes | No | Buck Current/Voltage Fed Push-Pull PWM Controllers |
| UC2827-2 | No | No | 9.5 to 20 | Note 4 | 200 | 500 | 32/1 | 5 | 4 | 50 | Yes | 2 | Yes | No | No | Yes | Yes | Buck Current/Voltage Fed Push-Pull PWM Controllers |
| UC2842A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC2843 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 1 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |
| UC2843A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC2844 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 1 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |
| UC2844A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC2845 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 1 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |
| UC2845A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC2846 | Yes | Yes | 8 to 40 | Note 3 | 500 | 500 | NA/17 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Current Mode PWM Controller |
| UC2847 | Yes | Yes | 8 to 40 | Note 3 | 500 | 500 | NA/17 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Current Mode PWM Controller |
| UC2848 | No | No | 12 to 20 | Note 1 | 2000 | 1000 | 22/0.2 | 5 | 1 | Prog. | Yes | 1 | No | Yes | No | Yes | No | Average Current Mode PWM Controller |
| UC2851 | Yes | Yes | 8 to 30 | Note 1 | 400 | 500 | 15/4.5 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Programmable, Off-Line, PWM Controller |
| UC2856 | Yes | No | 8 to 40 | Note 3 | 1500 | 1000 | NA/18 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | Yes | Improved Current Mode PWM Controller |
| UC2886 | No | No | 10.3 to 20 | Note 5 | 1500 | 400 | 10/NA | 5 | 1.5 | 95 | Yes | 3 | No | Yes | No | Yes | No | Average Current Mode PWM Controller IC |
| UC3823 | Yes | Yes | 10 to 30 | Note 1 | 1500 | 1000 | 22/1.1 | 5.1 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC3823A | Yes | Yes | 12 to 20 | Note 1 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC3823B | Yes | Yes | 12 to 20 | Note 1 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | No | Yes | No | No | No | High-Speed PWM Controller |
| UC3824 | Yes | Yes | 10 to 30 | Note 2 | 1500 | 1000 | 22/1.1 | 5.1 | 1 | 100 | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC3825 | Yes | Yes | 10 to 30 | Note 3 | 1500 | 1000 | 28/1.1 | 5.1 | 1 | 50/50 | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC3825A | Yes | Yes | 12 to 20 | Note 3 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC3825B | Yes | Yes | 12 to 20 | Note 3 | 2000 | 1000 | 28/0.1 | 5.1 | 1 | Prog. | Yes | 1 | Yes | No | No | No | No | High-Speed PWM Controller |
| UC3827-1 | No | No | 9.5 to 20 | | 200 | 500 | 32/1 | 5 | 4 | 50 | Yes | 2 | No | Yes | No | Yes | No | Buck Current/Voltage Fed Push-Pull PWM Controllers |
| UC3827-2 | No | No | 9.5 to 20 | Note 4 | 200 | 500 | 32/1 | 5 | 4 | 50 | Yes | 2 | Yes | No | No | Yes | Yes | Buck Current/Voltage Fed Push-Pull PWM Controllers |
| UC3842 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 2 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Current Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{limit}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Standby Current (mA) | Ref. Voltage (V) | $V_{ref}$ Tol. (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UC3842A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC3843 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 2 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |
| UC3843A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 100 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC3844 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 2 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |
| UC3844A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC3845 | No | Yes | 30 | Note 6 | –200 | 500 | 11/NA | 5 | 2 | 97 | Yes | 1 | No | Yes | No | 1 | No | Current-Mode PWM Controller |
| UC3845A | No | Yes | 12 to 25 | Note 1 | 200 | 500 | 11/0.3 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Current Mode PWM Controller |
| UC3846 | Yes | Yes | 8 to 40 | Note 3 | 500 | 500 | NA/17 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Current Mode PWM Controller |
| UC3847 | Yes | Yes | 8 to 40 | Note 3 | 500 | 500 | NA/17 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Current Mode PWM Controller |
| UC3848 | No | No | 12 to 20 | Note 1 | 2000 | 1000 | 22/0.2 | 5 | 1 | Prog. | Yes | 1 | No | Yes | No | Yes | No | Average Current Mode PWM Controller |
| UC3851 | Yes | Yes | 8 to 30 | Note 1 | 400 | 500 | 15/4.5 | 5 | 1 | 50 | Yes | 1 | No | Yes | No | No | No | Programmable, Off-Line, PWM Controller |
| UC3856 | Yes | No | 8 to 40 | Note 3 | 1500 | 1000 | NA/18 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | Yes | Improved Current Mode PWM Controller |
| UC3886 | No | No | 10.3 to 20 | Note 5 | 1500 | 400 | 10/NA | 5 | 1.5 | 95 | Yes | 3 | No | Yes | No | Yes | No | Average Current Mode PWM Controller IC |
| UCC1800 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC1801 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC1802 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC1803 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC1804 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC1805 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC1806 | Yes | Yes | 10 to 15 | Note 3 | 200 | 1000 | 1.4/0.1 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Low-Power Dual Output, Current Mode PWM Controller |
| UCC1807-1 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Current Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Standby Current (mA) | Ref Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCC1808-1 | No | No | 10 to 15 | Note 3 | 1000 | 1000 | 1/0.13 | | 2 | 50/50 | Yes | 1 | Yes | No | No | No | No | Low-Power Current Mode Push-Pull PWM |
| UCC1808-2 | No | No | 10 to 15 | Note 3 | 1000 | 1000 | 1/0.13 | | 2 | 50/50 | Yes | 1 | Yes | No | No | No | No | Low-Power Current Mode Push-Pull PWM |
| UCC1809-1 | Yes | No | 10 to 15 | Note 1 | 800 | 1000 | 0.6/0.1 | 5 | 5 | Prog. | Yes | 0 | No | Yes | No | No | No | Economy Primary Side Controller |
| UCC1809-2 | Yes | No | 10 to 15 | Note 1 | 800 | 1000 | 0.6/0.1 | 5 | 5 | Prog. | Yes | 0 | No | Yes | No | No | No | Economy Primary Side Controller |
| UCC1810 | No | No | 8.8 to 11 | Note 1 | 1000 | 1000 | 2/0.15 | 5 | 1.5 | 50 | Yes | 2 | Yes | No | No | No | No | Dual Channel Synchronized Current Mode PWM |
| UCC1884 | Yes | Yes | 10 to 12 | Note 5 | 1000 | 750 | 5/0.25 | 5 | 2 | Prog. | Yes | 1 | No | Yes | No | No | No | Frequency Foldback Current Mode PWM Controller |
| UCC1888 | No | No | 100 to 400 | Note 1 | 200 | 250 | 1.2/0.15 | 2.5 | 3 | 55 | Yes | 1 | No | Yes | No | No | No | Off-Line Power Supply Controller |
| UCC1889 | No | No | 100 to 400 | Note 1 | 100 | 250 | 1.2/0.15 | 2.5 | 3 | 5 | Yes | 1 | No | Yes | No | No | No | Off-Line Power Supply Controller |
| UCC2800 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC2801 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC2802 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC2803 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC2804 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC2805 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 5.0/0.1 | 4 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC2806 | Yes | Yes | 10 to 15 | Note 3 | 200 | 1000 | 1.4/0.1 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Low-Power Dual Output, Current Mode PWM Controller |
| UCC2807-1 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |
| UCC2807-2 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |
| UCC2807-3 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Current Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Standby Current (mA) | Ref. Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCC2808-1 | No | No | 10 to 15 | Note 3 | 1000 | 1000 | 1/0.13 | | 2 | 50/50 | Yes | 1 | Yes | No | No | No | No | Low-Power Current Mode Push-Pull PWM |
| UCC2808-2 | No | No | 10 to 15 | Note 3 | 1000 | 1000 | 1/0.13 | | 2 | 50/50 | Yes | 1 | Yes | No | No | No | No | Low-Power Current Mode Push-Pull PWM |
| UCC2809-1 | Yes | No | 10 to 15 | Note 1 | 800 | 1000 | 0.6/0.1 | 5 | 5 | 90 | Yes | 0 | No | Yes | No | No | No | Economy Primary Side Controller |
| UCC2809-2 | Yes | No | 10 to 15 | Note 1 | 800 | 1000 | 0.6/0.1 | 5 | 5 | 90 | Yes | 0 | No | Yes | No | No | No | Economy Primary Side Controller |
| UCC2810 | No | No | 8.8 to 11 | Note 1 | 1000 | 1000 | 2/0.15 | 5 | 1.5 | 50 | Yes | 2 | Yes | No | No | No | No | Dual Channel Synchronized Current Mode PWM |
| UCC2813-0 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC2813-1 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC2813-2 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC2813-3 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 100 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC2813-4 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC2813-5 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 50 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC2884 | Yes | Yes | 10 to 12 | Note 5 | 1000 | 750 | 5/0.25 | 5 | 2 | Prog. | Yes | 1 | No | Yes | No | No | No | Frequency Foldback Current Mode PWM Controller |
| UCC2888 | Yes | No | 100 to 400 | Note 1 | 200 | 250 | 1.2/0.15 | 2.5 | 3 | 55 | Yes | 1 | No | Yes | No | No | No | Off-Line Power Supply Controller |
| UCC2889 | No | No | 100 to 400 | Note 1 | 100 | 250 | 1.2/0.15 | 2.5 | 3 | 5 | Yes | 1 | No | Yes | No | No | No | Off-Line Power Supply Controller |
| UCC3800 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC3801 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC3802 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC3803 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 100 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Current Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{IN}$ Range (VDC) | Output Type | Output Current (mA) | Operate/ Freq (max) (kHz) | Standby Current (mA) | Ref Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCC3804 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC3805 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 50 | Yes | 0 | No | Yes | No | No | No | Low-Power BiCMOS Current-Mode PWM |
| UCC3806 | Yes | Yes | 10 to 15 | Note 3 | 200 | 1000 | 1.4/0.1 | 5.1 | 1 | 50/50 | Yes | 2 | Yes | No | No | Yes | No | Low-Power Dual Output, Current Mode PWM Controller |
| UCC3807-1 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |
| UCC3807-2 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |
| UCC3807-3 | No | No | 12 | Note 1 | 1000 | 1000 | 1.3/0.1 | | 1.5 | Prog. | Yes | 0 | No | Yes | No | No | No | Programmable Maximum Duty Cycle PWM Controller |
| UCC3808-1 | No | No | 10 to 15 | Note 3 | 1000 | 1000 | 1/0.13 | | 2 | 50/50 | Yes | 1 | Yes | No | No | No | No | Low-Power Current Mode Push-Pull PWM |
| UCC3808-2 | No | No | 10 to 15 | Note 3 | 1000 | 1000 | 1/0.13 | | 2 | 50/50 | Yes | 1 | Yes | No | No | No | No | Low-Power Current Mode Push-Pull PWM |
| UCC3809-1 | Yes | No | 10 to 15 | Note 1 | 800 | 1000 | 0.6/0.1 | 5 | 5 | 90 | Yes | 0 | No | Yes | No | No | No | Economy Primary Side Controller |
| UCC3809-2 | Yes | No | 10 to 15 | Note 1 | 800 | 1000 | 0.6/0.1 | 5 | 5 | 90 | Yes | 0 | No | Yes | No | No | No | Economy Primary Side Controller |
| UCC3810 | No | No | 8.8 to 11 | Note 1 | 1000 | 1000 | 2/0.15 | 5 | 1.5 | 50 | Yes | 2 | Yes | No | No | No | No | Dual Channel Synchronized Current Mode PWM |
| UCC3813-0 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC3813-1 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC3813-2 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 100 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC3813-3 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 100 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC3813-4 | No | No | 5.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 5 | 1.5 | 50 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |
| UCC3813-5 | No | No | 4.2 to 12 | Note 1 | 1000 | 1000 | 0.5/0.1 | 4 | 1.5 | 50 | Yes | 1 | No | Yes | No | No | No | Low-Power Economy BiCMOS Current Mode PWM |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Current Mode (Continued)

| Device Name | Shut-down | Pulse-by-Pulse $I_{sense}$ | $V_{in}$ Range (VDC) | Output Type | Output Current (mA) | Freq (max) (kHz) | Operate/ Steady Current (mA) | Ref Voltage (V) | $V_{ref}$ Tol (%) | Duty Cycle (max) (%) | Under-voltage Lockout | On-board Amps | Output Mode Fixed Push-Pull | Output Mode Single-Ended | Prog Outputs | Current Sense Amps | Dead Time Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCC3884 | Yes | Yes | 10 to 12 | Note 5 | 1000 | 750 | 5/0.25 | 5 | 2 | Prog. | Yes | 1 | No | Yes | No | No | No | Frequency Foldback Current Mode PWM Controller |
| UCC3888 | No | No | 100 to 400 | Note 1 | 200 | 250 | 1.2/0.15 | 2.5 | 3 | 55 | Yes | 1 | No | Yes | No | No | No | Off-Line Power Supply Controller |
| UCC3889 | No | No | 100 to 400 | Note 1 | 100 | 250 | 1.2/0.15 | 2.5 | 3 | 55 | Yes | 1 | No | Yes | No | No | No | Off-Line Power Supply Controller |

Output Type Notes:
1. Single Switch
2. Dual Complementary, Totem Pole
3. Dual Alternating, Totem Pole
4. Dual Complementary
5. Single
6. Totem Pole

## Switching Power Supply Controllers—Soft Switching

| Device Name | $V_{ref}$ Tol (%) | Peak Output Current (A) | Frequency (max) (kHz) | Output Type | Startup Current (µA) | Duty Cycle (max) (%) | Separate Oscillator/ Sync Terminal | Control Topology | Description |
|---|---|---|---|---|---|---|---|---|---|
| UC1860 | 1 | 2 | 2000 | Note 1 | 300 | Prog. | Yes | Half Bridge, Full Bridge | Resonant Mode Power Supply Controller |
| UC1861 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC1862 | 1 | 1 | 1000 | Note 3 | 150 | 100 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC1863 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC1864 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC1865 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC1866 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC1867 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC1868 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC1875 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC1876 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC1877 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC1878 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC1879 | 1 | 0.1 | 300 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC2860 | 1 | 2 | 2000 | Note 1 | 300 | Prog. | Yes | Half Bridge, Full Bridge | Resonant Mode Power Supply Controller |
| UC2861 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |

Output Type Notes:
1. Dual Programmable, Totem Pole
2. Dual Alternating, Totem Pole
3. Single, Totem Pole
4. Quad Phase Shifted, Totem Pole
5. Dual Complementary, Totem Pole

## Switching Power Supply Controllers—Soft Switching (Continued)

| Device Name | $V_{ref}$ Tol (%) | Peak Output Current (A) | Frequency (max) (kHz) | Output Type | Startup Current (µA) | Duty Cycle (max) (%) | Separate Oscillator/ Sync Terminal | Control Topology | Description |
|---|---|---|---|---|---|---|---|---|---|
| UC2862 | 1 | 1 | 1000 | Note 3 | 150 | 100 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC2863 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC2864 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC2865 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC2866 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC2867 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC2868 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC2875 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC2876 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC2877 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC2878 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC2879 | 1 | 0.1 | 300 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC3860 | 1 | 2 | 2000 | Note 1 | 300 | Prog. | Yes | Half Bridge, Full Bridge | Resonant Mode Power Supply Controller |
| UC3861 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC3862 | 1 | 1 | 1000 | Note 3 | 150 | 100 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC3863 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC3864 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC3865 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC3866 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC3867 | 1 | 1 | 1000 | Note 2 | 150 | 50/50 | No | Half Bridge, Full Bridge | Resonant-Mode Power Supply Controllers |
| UC3868 | 1 | 1 | 1000 | Note 3 | 150 | 1 | No | Forward, Flyback | Resonant-Mode Power Supply Controllers |
| UC3875 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC3876 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC3877 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC3878 | 1 | 2 | 1000 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UC3879 | 1 | 0.1 | 300 | Note 4 | 150 | 100 | No | Half Bridge | Phase Shift Resonant Controller |
| UCC1580-1 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC1580-2 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC1580-3 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC1580-4 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC1895 | 1 | | 1000 | Note 4 | | 100 | | | BiCMOS Advanced Phase Shift Resonant Controller |

Output Type Notes:
1. Dual Programmable, Totem Pole
2. Dual Alternating, Totem Pole
3. Single, Totem Pole
4. Quad Phase Shifted, Totem Pole
5. Dual Complementary, Totem Pole

## Switching Power Supply Controllers—Soft Switching (Continued)

| Device Name | $V_{ref}$ Tol (%) | Peak Output Current (A) | Frequency (max) (kHz) | Output Type | Startup Current (µA) | Duty Cycle (max) (%) | Separate Oscillator/ Sync Terminal | Control Topology | Description |
|---|---|---|---|---|---|---|---|---|---|
| UCC2580-1 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC2580-2 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC2580-3 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC2580-4 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single Ended Active Clamp/Reset PWM |
| UCC2895 | 1 | | 1000 | Note 4 | | 100 | | | BiCMOS Advanced Phase Shift Resonant Controller |
| UCC3580-1 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single-Ended Active Clamp/Reset PWM |
| UCC3580-2 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single-Ended Active Clamp/Reset PWM |
| UCC3580-3 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single-Ended Active Clamp/Reset PWM |
| UCC3580-4 | 1.5 | | 1000 | Note 5 | | Prog. | | | Single-Ended Active Clamp/Reset PWM |
| UCC3895 | 1 | | 1000 | Note 4 | | 100 | | | BiCMOS Advanced Phase Shift PWM Controller |

Output Type Notes:
1. Dual Programmable, Totem Pole
2. Dual Alternating, Totem Pole
3. Single, Totem Pole
4. Quad Phase Shifted, Totem Pole
5. Dual Complementary, Totem Pole

## Switching Power Supply Controllers—Dedicated DC/DC

| Device Name | $V_{ref}$ Tol (%) | Frequency (max) (kHz) | Output Type | Duty Cycle (max) (%) | Description |
|---|---|---|---|---|---|
| UC1572 | 2 | 300 | Single, Totem Pole | 100 | Negative Output Flyback Pulse Width Modulator |
| UC1573 | 2 | 300 | Single, Totem Pole | 100 | Buck Pulse Width Modulator Stepdown Voltage Regulator |
| UC2572 | 2 | 300 | Single, Totem Pole | 100 | Negative Output Flyback Pulse Width Modulator |
| UC2573 | 2 | 300 | Single, Totem Pole | 100 | Buck Pulse Width Modulator Stepdown Voltage Regulator |
| UC2578 | 2 | 100 | Single, Floating Totem Pole | 90 | Buck Pulse Width Modulator Stepdown Voltage Regulator |

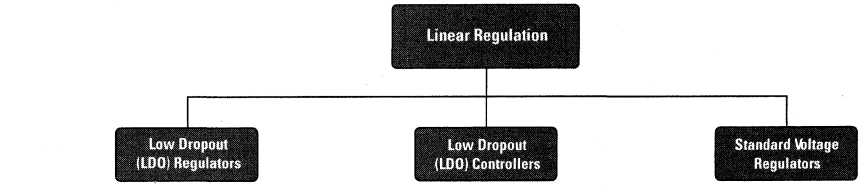
## Switching Power Supply Controllers—Post Regulation

| Device Name | $V_{ref}$ Tol (%) | Frequency (max) (kHz) | Output Type | Duty Cycle (max) (%) | Description |
|---|---|---|---|---|---|
| UC1584 | 1 | 1000 | Single, Totem Pole | 94 | Secondary Side Synchronous Post Regulator |
| UC1838A | 1 | 1000 | | | Magnetic Amplifier Controller |
| UC2584 | 1 | 1000 | Single, Totem Pole | 94 | Secondary Side Synchronous Post Regulator |
| UC2838A | 1 | 1000 | | | Magnetic Amplifier Controller |
| UC3584 | 1 | 1000 | Single, Totem Pole | 94 | Secondary Side Synchronous Post Regulator |
| UC3838A | 1 | 1000 | | | Magnetic Amplifier Controller |
| UCC1583 | 1.5 | 500 | Single, Totem Pole | 95 | Switch Mode Secondary Side Post Regulator |
| UCC2583 | 1.5 | 500 | Single, Totem Pole | 95 | Switch Mode Secondary Side Post Regulator |
| UCC3583 | 1.5 | 500 | Single, Totem Pole | 95 | Switch Mode Secondary Side Post Regulator |

## Switching Power Supply Controllers—Secondary Side

| Device Name | $V_{ref}$ Tol (%) | Frequency (max) (kHz) | Output Type | Duty Cycle (max) (%) | Description |
|---|---|---|---|---|---|
| UC1826 | 1 | 1000 | Single, Totem Pole | Programmable | Secondary Side Average Current Mode Controller |
| UC1849 | 1 | 1000 | Single, Totem Pole | Programmable | Secondary Side Average Current Mode Controller |
| UC2826 | 1 | 1000 | Single, Totem Pole | Programmable | Secondary Side Average Current Mode Controller |
| UC2849 | 1 | 1000 | Single, Totem Pole | Programmable | Secondary Side Average Current Mode Controller |
| UC3584 | 1 | 1000 | Single, Totem Pole | 94 | Secondary Side Synchronous Post Regulator |
| UC3826 | 1 | 1000 | Single, Totem Pole | Programmable | Secondary Side Average Current Mode Controller |
| UC3849 | 1 | 1000 | Single, Totem Pole | Programmable | Secondary Side Average Current Mode Controller |
| UCC1839 | 1 | 1000 | Opto-coupler Drive | | Secondary Side Average Current Mode Controller |
| UCC2839 | 1 | 1000 | Opto-coupler Drive | | Secondary Side Average Current Mode Controller |
| UCC3583 | 1.5 | 500 | Single, Totem Pole | 95 | Switch Mode Secondary Side Post Regulator |
| UCC3839 | 1 | 1000 | Opto-coupler Drive | | Secondary Side Average Current Mode Controller |

## Linear Regulation




**Low Dropout (LDO) Regulators**

TL750L05
TL750L08
TL750L10
TL750L12
TL750M05
TL750M08
TL750M10
TL750M12
TL751L05
TL751L08
TL751L10
TL751L12
TL751M05
TL751M08
TL751M10
TL751M12
TLV2217-33
TPS7101
TPS71025
TPS7133
TPS7148
TPS7150
TPS71H01
TPS71H33
TPS71H48
TPS71H50
TPS7201
TPS7225
TPS7230
TPS7233
TPS7248
TPS7250
TPS7301
TPS7325
TPS7330
TPS7333
TPS7348
TPS7350
TPS73HD301
TPS73HD318
TPS73HD325
TPS76030
TPS76032
TPS76033
TPS76038
TPS76050
TPS76130
TPS76132
TPS76133
TPS76138
TPS76150
TPS76301
TPS76316
TPS76318
TPS76325
TPS76327
TPS76328
TPS76330
TPS76333
TPS76338
TPS76350
TPS76425
TPS76427
TPS76428
TPS76430
TPS76433
TPS76501
TPS76515
TPS76518
TPS76525
TPS76527
TPS76528
TPS76530
TPS76533
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TPS76627
TPS76628
TPS76630
TPS76633
TPS76650
TPS76701
TPS76715
TPS76718
TPS76725
TPS76727
TPS76728
TPS76730
TPS76733
TPS76750
TPS767D301
TPS767D318
TPS767D325
TPS76801
TPS76815
TPS76818
TPS76825
TPS76827
TPS76828
TPS76830
TPS76833
TPS76850
TPS76901
TPS76912
TPS76915
TPS76918
TPS76925
TPS76927
TPS76928
TPS76930
TPS76933
TPS76950
TPS77001
TPS77012
TPS77015
TPS77018
TPS77025
TPS77027
TPS77028
TPS77030
TPS77033
TPS77050
TPS77501
TPS77515
TPS77518
TPS77525
TPS77533
TPS77601
TPS77615
TPS77618
TPS77625
TPS77633
TPS77701
TPS77715
TPS77718
TPS77725
TPS77733
TPS77801
TPS77815
TPS77818
TPS77825
TPS77833
UC182-1
UC182-2
UC182-3
UC182-ADJ
UC282-1
UC282-2
UC282-3
UC282-ADJ
UC285-1
UC285-2
UC285-3
UC285-ADJ
UC382-1
UC382-2
UC382-3
UC382-ADJ
UC385-1
UC385-2
UC385-3
UC385-ADJ
UCC281-3
UCC281-5
UCC281-ADJ
UCC283-3
UCC283-5
UCC283-ADJ
UCC284-12
UCC284-5
UCC284-ADJ
UCC286
UCC287
UCC288
UCC381-3
UCC381-5
UCC381-ADJ
UCC383-3
UCC383-5
UCC383-ADJ
UCC384-12
UCC384-5
UCC384-ADJ
UCC386
UCC387
UCC388

**Low Dropout (LDO) Controllers**

UC1832
UC1833
UC1834
UC1835
UC1836
UC2832
UC2833
UC2834
UC2835
UC2836
UC3832
UC3833
UC3834
UC3835
UC3836
UCC1837
UCC2837
UCC3837

**Standard Voltage Regulators**

MC79L05A
MC79L12
MC79L12A
MC79L15
MC79L15A
TL317
TL780-05
TL780-12
TL780-15
TL783
UA723
UA7805
UA7806
UA7808
UA7810
UA7812
UA7815
UA7818
UA7824
UA7885
UA78L02A
UA78L05
UA78L05A
UA78L06
UA78L06A
UA78L08
UA78L08A
UA78L09
UA78L09A
UA78L10A
UA78L12
UA78L12A
UA78L15A
UA78M05
UA78M06
UA78M08
UA78M09
UA78M10
UA78M12
UA78M15
UA79M05
UA79M08
UA79M12
UA79M15

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Linear Regulation—Low Dropout (LDO) Regulators

| Device Name | $V_{IO}$ (max) (V) | $V_{IO}$ (typ) (V) | $I_Q$ (typ) (mA) | $V_{IN}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TL750L05 | 0.6 | 0.2 | 10 | 26 | 4 | No | 5.2 | 4.8 | 5 | | No | 150 | LDO PNP, Low Current Voltage Reg. |
| TL750L08 | 0.7 | 0.2 | 10 | 26 | 4 | No | 8.32 | 7.68 | 8 | | No | 150 | LDO PNP, Low Current Voltage Reg. |
| TL750L10 | 0.8 | 0.2 | 10 | 26 | 4 | No | 10.4 | 9.6 | 10 | | No | 150 | LDO PNP, Low Current Voltage Reg. |
| TL750L12 | 0.9 | 0.2 | 10 | 26 | 4 | No | 12.48 | 11.52 | 12 | | No | 150 | LDO PNP, Low Current Voltage Reg. |
| TL750M05 | 0.6 | 0.5 | 60 | 26 | 2 | No | 5.1 | 4.9 | 5 | | No | 750 | LDO PNP, High Current Voltage Reg. |
| TL750M08 | 0.7 | 0.5 | 60 | 26 | 2 | No | 8.16 | 7.84 | 8 | | No | 750 | LDO PNP, High Current Voltage Reg. |
| TL750M10 | 0.8 | 0.5 | 60 | 26 | 2 | No | 10.2 | 9.8 | 10 | | No | 750 | LDO PNP, High Current Voltage Reg. |
| TL750M12 | 0.9 | 0.5 | 60 | 26 | 2 | No | 12.24 | 11.76 | 12 | | No | 750 | LDO PNP, High Current Voltage Reg. |
| TL751L05 | 0.6 | 0.2 | 10 | 26 | 4 | Yes | 5.2 | 4.8 | 5 | | No | 150 | LDO PNP, Low Current Voltage Reg. with Shutdown |
| TL751L08 | 0.7 | 0.2 | 10 | 26 | 4 | Yes | 8.32 | 7.68 | 8 | | No | 150 | LDO PNP, Low Current Voltage Reg. with Shutdown |
| TL751L10 | 0.8 | 0.2 | 10 | 26 | 4 | Yes | 10.4 | 9.6 | 10 | | No | 150 | LDO PNP, Low Current Voltage Reg. with Shutdown |
| TL751L12 | 0.9 | 0.2 | 10 | 26 | 4 | Yes | 12.48 | 11.52 | 12 | | No | 150 | LDO PNP, Low Current Voltage Reg. with Shutdown |
| TL751M05 | 0.6 | 0.5 | 60 | 26 | 2 | Yes | 5.1 | 4.9 | 5 | | No | 750 | LDO PNP, High Current Voltage Regs. with Shutdown |
| TL751M08 | 0.7 | 0.5 | 60 | 26 | 2 | Yes | 8.16 | 7.84 | 8 | | No | 750 | LDO PNP, High Current Voltage Reg. with Shutdown |
| TL751M10 | 0.8 | 0.5 | 60 | 26 | 2 | Yes | 10.2 | 9.8 | 10 | | No | 750 | LDO PNP, High Current Voltage Reg. with Shutdown |
| TL751M12 | 0.9 | 0.5 | 60 | 26 | 2 | Yes | 12.24 | 11.76 | 12 | | No | 750 | LDO PNP, High Current Voltage Reg. with Shutdown |
| TLV2217-33 | 0.5 | 0.4 | 19 | 12 | 1 | No | 3.333 | 3.267 | 3.3 | | No | 500 | LDO 3.3-V PNP Fixed Voltage Reg. |
| TPS7101 | 0.085 | 0.052 | 0.285 | 10 | 3 | Yes | | | | 1.2 to 9.75 | No | 500 | Lowest Dropout PMOS Adjustable Voltage Reg. |
| TPS71025 | 0.5 | 0.33 | 0.29 | 10 | 2 | Yes | 2.55 | 2.45 | 2.5 | | No | 500 | LDO Voltage Reg. |
| TPS7133 | 0.06 | 0.047 | 0.285 | 10 | 2 | Yes | | | 3.3 | | No | 500 | Lowest Dropout PMOS Voltage Reg. |
| TPS7148 | 0.037 | 0.03 | 0.285 | 10 | 2 | Yes | | | 4.85 | | No | 500 | Lowest Dropout PMOS Voltage Reg. |
| TPS7150 | 0.033 | 0.027 | 0.285 | 10 | 2 | Yes | | | 5 | | No | 500 | Lowest Dropout PMOS Voltage Reg. |
| TPS71H01 | 0.085 | 0.052 | 0.285 | 10 | 3 | Yes | | | | 1.2 to 9.75 | No | 500 | LDO Voltage Reg. |
| TPS71H33 | 0.06 | 0.047 | 0.285 | 10 | 2 | Yes | | | 3.3 | | No | 500 | LDO Voltage Reg. |
| TPS71H48 | 0.047 | 0.03 | 0.285 | 10 | 2 | Yes | | | 4.85 | | No | 500 | LDO Voltage Reg. |
| TPS71H50 | 0.033 | 0.027 | 0.285 | 10 | 2 | Yes | | | 5 | | No | 500 | LDO Voltage Reg. |
| TPS7201 | 0.27 | 0.16 | 0.155 | 10 | 3 | Yes | | | | 1.2 to 9.75 | No | 250 | Micropower Very LDO PMOS Adj Voltage Reg. |
| TPS7225 | 0.85 | 0.56 | 0.18 | 10 | 2 | Yes | 2.55 | 2.45 | 2.5 | | No | 250 | Micropower Very LDO PMOS Adj Voltage Reg. |
| TPS7230 | 0.9 | 0.39 | 0.18 | 10 | 2 | Yes | 3.06 | 2.94 | 3 | | No | 250 | Micropower Very LDO PMOS Adj Voltage Reg. |
| TPS7233 | 0.18 | 0.14 | 0.155 | 10 | 2 | Yes | | | 3.3 | | No | 250 | Micropower Very LDO PMOS Voltage Reg. |
| TPS7248 | 0.1 | 0.09 | 0.155 | 10 | 2 | Yes | | | 4.85 | | No | 250 | Micropower Very LDO PMOS Voltage Reg. |
| TPS7250 | 0.85 | 0.76 | 0.155 | 10 | 2 | Yes | | | 5 | | No | 250 | Micropower Very LDO PMOS Voltage Reg. |
| TPS7301 | 0.085 | 0.052 | 0.34 | 10 | 3 | Yes | | | | 1.2 to 9.75 | Yes | 500 | Lowest Dropout PMOS Voltage Reg. with Integrated Supply Voltage Supervisor |
| TPS7325 | 0.6 | 0.27 | 0.34 | 10 | 2 | Yes | 2.575 | 2.425 | 2.5 | | Yes | 500 | LDO Voltage Reg. with Integrated Delayed Reset Function |

## Linear Regulation—Low Dropout (LDO) Regulators (Continued)

| Device Name | $V_{do}$ (max) (V) | $V_{do}$ (typ) (V) | $I_q$ (typ) (mA) | $V_{IN}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS7330 | 0.075 | 0.052 | 0.34 | 10 | 2 | Yes | | | 3 | | Yes | 500 | LDO Voltage Reg. with Integrated Delayed Reset Function |
| TPS7333 | 0.06 | 0.044 | 0.34 | 10 | 2 | Yes | | | 3.3 | | Yes | 500 | Lowest Dropout PMOS Voltage Reg. with Integrated Supply Voltage Supervisor |
| TPS7348 | 0.037 | 0.028 | 0.34 | 10 | 2 | Yes | | | 4.85 | | Yes | 500 | Lowest Dropout PMOS Voltage Reg. with Integrated Supply Voltage Supervisor |
| TPS7350 | 0.035 | 0.027 | 0.34 | 10 | 2 | Yes | | | 5 | | Yes | 500 | Lowest Dropout PMOS Voltage Reg. with Integrated Supply Voltage Supervisor |
| TPS73HD301 | 0.75 | 0.353 | 1.1 | 10 | 3 | Yes | 3.37 | 3.23 | 3.3 | 1.2 to 9.75 | Yes | 750 | Dual-Output LDO Reg. |
| TPS73HD318 | 0.75 | 0.353 | 0.55 | 10 | 2 | Yes | 3.37 | 1.746 | | 1.8 to 3.3 | Yes | 750 | Dual Output LDO Voltage Reg. |
| TPS73HD325 | 0.75 | 0.353 | 0.55 | 10 | 2 | Yes | 3.37 | 2.45 | | 2.5 to 3.3 | Yes | 750 | Dual Output LDO Voltage Reg. |
| TPS76030 | 0.18 | 0.12 | 0.85 | 16 | 3 | Yes | 3.07 | 2.91 | 3 | | No | 50 | Low-Power 50-mA LDO Reg. |
| TPS76032 | 0.18 | 0.12 | 0.85 | 16 | 3.1 | Yes | 3.3 | 3.1 | 3.2 | | No | 50 | Low-Power 50-mA LDO Reg. |
| TPS76033 | 0.18 | 0.12 | 0.85 | 16 | 3 | Yes | 3.4 | 3.2 | 3.3 | | No | 50 | Low-Power 50-mA LDO Reg. |
| TPS76038 | 0.18 | 0.12 | 0.85 | 16 | 2.6 | Yes | 3.9 | 3.7 | 3.8 | | No | 50 | Low-Power 50-mA LDO Reg. |
| TPS76050 | 0.18 | 0.12 | 0.85 | 16 | 2 | Yes | 5.1 | 4.89 | 5 | | No | 50 | Low-Power 50-mA LDO Reg. |
| TPS76130 | 0.28 | 0.17 | 2.6 | 16 | 3.6 | Yes | 3.07 | 2.89 | 3 | | No | 100 | Low-Power 100-mA LDO Linear Reg. |
| TPS76132 | 0.28 | 0.17 | 2.6 | 16 | 3 | Yes | 3.33 | 3.08 | 3.2 | | No | 100 | Low-Power 100-mA LDO Linear Reg. |
| TPS76133 | 0.28 | 0.17 | 2.6 | 16 | 3 | Yes | 3.4 | 3.18 | 3.3 | | No | 100 | Low-Power 100-mA LDO Linear Reg. |
| TPS76138 | 0.28 | 0.17 | 2.6 | 16 | 3 | Yes | 3.68 | 3.9 | 3.8 | | No | 100 | Low-Power 100-mA LDO Linear Reg. |
| TPS76150 | 0.28 | 0.17 | 2.6 | 16 | 2.8 | Yes | 5.1 | 4.86 | 5 | | No | 100 | Low-Power 100-mA LDO Linear Reg. |
| TPS76301 | 0.6 | 0.6 | 0.085 | 10 | 3 | Yes | | | | 1.5 to 6.5 | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76316 | 0.6 | 0.36 | 0.085 | 10 | 4 | Yes | 1.664 | 1.536 | 1.6 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76318 | 0.5 | 0.3 | 0.085 | 10 | 3.7 | Yes | 1.867 | 1.733 | 1.8 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76325 | 0.6 | 0.36 | 0.085 | 10 | 3.7 | Yes | 2.593 | 2.407 | 2.5 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76327 | 0.6 | 0.36 | 0.085 | 10 | 3.75 | Yes | 2.801 | 2.599 | 2.7 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76328 | 0.55 | 0.35 | 0.085 | 10 | 3.75 | Yes | 2.905 | 2.695 | 2.8 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76330 | 0.55 | 0.35 | 0.085 | 10 | 3.75 | Yes | 3.112 | 2.888 | 3 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76333 | 0.5 | 0.3 | 0.085 | 10 | 3.7 | Yes | 3.423 | 3.177 | 3.3 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76338 | 0.6 | 0.36 | 0.085 | 10 | 3.5 | Yes | 3.933 | 3.667 | 3.8 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76350 | 0.3 | 0.18 | 0.085 | 10 | 4 | Yes | 5.2 | 4.8 | 5 | | No | 150 | Low-Power 150-mA LDO Linear Reg. |
| TPS76425 | 0.6 | 0.36 | 0.085 | 10 | 3.7 | Yes | 2.593 | 2.407 | 2.5 | | No | 150 | Low-Power 150-mA Low-Noise LDO Linear Reg. |
| TPS76427 | 0.6 | 0.36 | 0.085 | 10 | 3.7 | Yes | 2.801 | 2.598 | 2.7 | | No | 150 | Low-Power 150-mA Low-Noise LDO Linear Reg. |
| TPS76428 | 0.6 | 0.36 | 0.085 | 10 | 3.8 | Yes | 2.905 | 2.695 | 2.8 | | No | 150 | Low-Power Low-Noise 150-mA LDO Linear Reg. |
| TPS76430 | 0.6 | 0.36 | 0.085 | 10 | 3.8 | Yes | 3.112 | 2.887 | 3 | | No | 150 | Low-Power 150-mA Low-Noise LDO Linear Reg. |
| TPS76433 | 0.5 | 0.3 | 0.085 | 10 | 3.7 | Yes | 3.423 | 3.177 | 3.3 | | No | 150 | Low-Power 150-mA Low-Noise LDO Linear Reg. |

## Linear Regulation—Low Dropout (LDO) Regulators (Continued)

| Device Name | $V_{do}$ (max) (V) | $V_{do}$ (typ) (V) | $I_q$ (typ) (mA) | $V_{in}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS76501 | 0.33 | 0.16 | 0.038 | 13.5 | 3 | Yes | | | | 1.2 to 5.5 | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76515 | 0.33 | 0.19 | 0.038 | 13.5 | 3 | Yes | 1.545 | 1.455 | 1.5 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76518 | 0.33 | 0.19 | 0.038 | 13.5 | 3 | Yes | 1.854 | 1.746 | 1.8 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76525 | 0.33 | 0.19 | 0.038 | 13.5 | 3 | Yes | 2.575 | 2.425 | 2.5 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76527 | 0.33 | 0.19 | 0.038 | 13.5 | 3 | Yes | 2.781 | 2.619 | 2.7 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76528 | 0.33 | 0.19 | 0.038 | 13.5 | 3 | Yes | 2.884 | 2.716 | 2.8 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76530 | 0.28 | 0.16 | 0.038 | 13.5 | 3 | Yes | 3.09 | 2.91 | 3 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76533 | 0.24 | 0.14 | 0.038 | 13.5 | 3 | Yes | 3.399 | 3.201 | 3.3 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76550 | 0.15 | 0.085 | 0.038 | 13.5 | 3 | Yes | 5.15 | 4.85 | 5 | | No | 150 | Ultra-Low-Quiescent-Current 150-mA LDO Linear Reg. |
| TPS76601 | 0.54 | 0.23 | 0.038 | 13.5 | 3 | Yes | | | | 1.2 to 5.5 | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76615 | 0.54 | 0.31 | 0.038 | 13.5 | 3 | Yes | 1.545 | 1.455 | 1.5 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76618 | 0.54 | 0.31 | 0.038 | 13.5 | 3 | Yes | 1.854 | 1.746 | 1.8 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76625 | 0.54 | 0.31 | 0.038 | 13.5 | 3 | Yes | 2.575 | 2.425 | 2.5 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76627 | 0.54 | 0.31 | 0.038 | 13.5 | 3 | Yes | 2.781 | 2.619 | 2.7 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76628 | 0.54 | 0.31 | 0.038 | 13.5 | 3 | Yes | 2.884 | 2.716 | 2.8 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76630 | 0.54 | 0.31 | 0.038 | 13.5 | 3 | Yes | 3.309 | 2.91 | 3 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76633 | 0.4 | 0.23 | 0.038 | 13.5 | 3 | Yes | 3.399 | 3.201 | 3.3 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76650 | 0.25 | 0.14 | 0.038 | 13.5 | 3 | Yes | 5.15 | 4.85 | 5 | | No | 250 | Ultra-Low Quiescent Current 250-mA LDO Linear Reg. |
| TPS76701 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | | | | 1.5 to 5.5 | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76715 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 1.53 | 1.47 | 1.5 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76718 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 1.836 | 1.764 | 1.8 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76725 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 2.55 | 2.45 | 2.5 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76727 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 2.754 | 2.646 | 2.7 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76728 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 2.856 | 2.744 | 2.8 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76730 | 0.675 | 0.45 | 0.085 | 10 | 2 | Yes | 3.06 | 2.94 | 3 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76733 | 0.575 | 0.35 | 0.085 | 10 | 2 | Yes | 3.366 | 3.234 | 3.3 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS76750 | 0.38 | 0.23 | 0.085 | 10 | 2 | Yes | 5.1 | 4.9 | 5 | | Yes | 1000 | Micropower LDO Voltage Reg. |
| TPS767D301 | 0.825 | 0.35 | 0.085 | 10 | 2 | Yes | 3.234 | 3.366 | 3.3 | 1.2 to 5.5 | Yes | 1000 | Dual-Output LDO Voltage Reg. |
| TPS767D318 | 0.825 | 0.35 | 0.085 | 10 | 2 | Yes | 3.234 | 1.764 | 1.8 | | Yes | 1000 | Dual-Output LDO Voltage Reg. |
| TPS767D325 | 0.825 | 0.35 | 0.085 | 10 | 2 | Yes | 3.234 | 2.45 | 2.5 | | Yes | 1000 | Dual-Output LDO Voltage Reg. |
| TPS76801 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | | | | 1.5 to 5.5 | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76815 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 1.53 | 1.47 | 1.5 | | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76818 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 1.836 | 1.764 | 1.8 | | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76825 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 2.55 | 2.45 | 2.5 | | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76827 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 2.754 | 2.646 | 2.7 | | No | 1000 | Fast-Transient-Response 1-A LDO Voltage Reg. |
| TPS76828 | 0.825 | 0.5 | 0.085 | 10 | 2 | Yes | 2.856 | 2.744 | 2.8 | | No | 1000 | Fast-Transient-Response 1-A LDO Voltage Reg. |

## Linear Regulation—Low Dropout (LDO) Regulators (Continued)

| Device Name | $V_{DO}$ (max) (V) | $V_{DO}$ (typ) (V) | $I_q$ (typ) (mA) | $V_{IN}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS76830 | 0.675 | 0.45 | 0.085 | 10 | 2 | Yes | 3.06 | 2.94 | 3 | | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76833 | 0.575 | 0.35 | 0.085 | 10 | 2 | Yes | 3.366 | 3.234 | 3.3 | | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76850 | 0.38 | 0.23 | 0.085 | 10 | 2 | Yes | 5.1 | 4.9 | 5 | | No | 1000 | Micropower LDO Voltage Reg. |
| TPS76901 | 0.245 | 0.071 | 0.017 | 13.5 | 3 | Yes | | | | 1.2 to 5.5 | No | 100 | Ultra Low-Power 100-mA LDO Line Reg. |
| TPS76912 | 0.245 | 0.122 | 0.017 | 13.5 | 3 | Yes | 1.261 | 1.187 | 1.224 | | No | 100 | Ultra Low-Power 100-mA LDO Line Reg. |
| TPS76915 | 0.245 | 0.122 | 0.017 | 13.5 | 3 | Yes | 1.545 | 1.455 | 1.5 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76918 | 0.245 | 0.122 | 0.017 | 13.5 | 3 | Yes | 1.854 | 1.746 | 1.8 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76925 | 0.245 | 0.122 | 0.017 | 13.5 | 3 | Yes | 2.575 | 2.425 | 2.5 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76927 | 0.245 | 0.122 | 0.017 | 13.5 | 3 | Yes | 2.781 | 2.619 | 2.7 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76928 | 0.245 | 0.122 | 0.017 | 13.5 | 3 | Yes | 2.884 | 2.719 | 2.8 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76930 | 0.23 | 0.115 | 0.017 | 13.5 | 3 | Yes | 3.09 | 2.91 | 3 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76933 | 0.2 | 0.098 | 0.017 | 13.5 | 3 | Yes | 3.399 | 3.201 | 3.3 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS76950 | 0.17 | 0.071 | 0.017 | 13.5 | 3 | Yes | 5.15 | 4.85 | 5 | | No | 100 | Ultra Low-Power 100-mA LDO Line Regulators |
| TPS77001 | 0.125 | 0.035 | 0.017 | 13.5 | 3 | Yes | | | | 1.2 to 5.5 | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77012 | 0.125 | 0.06 | 0.017 | 13.5 | 3 | Yes | 1.261 | 1.187 | 1.224 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77015 | 0.125 | 0.06 | 0.017 | 13.5 | 3 | Yes | 1.545 | 1.455 | 1.5 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77018 | 0.125 | 0.06 | 0.017 | 13.5 | 3 | Yes | 1.854 | 1.746 | 1.8 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77025 | 0.125 | 0.06 | 0.017 | 13.5 | 3 | Yes | 2.575 | 2.425 | 2.5 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77027 | 0.125 | 0.06 | 0.017 | 13.5 | 3 | Yes | 2.781 | 2.619 | 2.7 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77028 | 0.125 | 0.06 | 0.017 | 13.5 | 3 | Yes | 2.884 | 2.719 | 2.8 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77030 | 0.1 | 0.048 | 0.017 | 13.5 | 3 | Yes | 3.399 | 2.91 | 3 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77033 | 0.1 | 0.048 | 0.017 | 13.5 | 3 | Yes | 3.399 | 3.21 | 3.3 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77050 | 0.085 | 0.035 | 0.017 | 13.5 | 3 | Yes | 5.15 | 4.85 | 5 | | No | 50 | Ultra Low-Power 50-mA LDO Linear Regulators |
| TPS77501 | | | 0.085 | 13.5 | 2 | Yes | | | | 1.2 to 5.5 | Yes | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77515 | | | 0.085 | 13.5 | 2 | Yes | 1.53 | 1.47 | 1.5 | | Yes | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77518 | | | 0.085 | 13.5 | 2 | Yes | 1.836 | 1.764 | 1.8 | | Yes | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77525 | | | 0.085 | 13.5 | 2 | Yes | 2.55 | 2.45 | 2.5 | | Yes | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77533 | 0.287 | 0.169 | 0.085 | 13.5 | 2 | Yes | 3.366 | 3.234 | 3.3 | | Yes | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77601 | | | 0.085 | 13.5 | 2 | Yes | | | | 1.2 to 5.5 | No | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77615 | | | 0.085 | 13.5 | 2 | Yes | 1.53 | 1.47 | 1.5 | | No | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77618 | | | 0.085 | 13.5 | 2 | Yes | 1.836 | 1.764 | 1.8 | | No | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77625 | | | 0.085 | 13.5 | 2 | Yes | 2.55 | 2.45 | 2.5 | | No | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77633 | 0.287 | 0.169 | 0.085 | 13.5 | 2 | Yes | 3.366 | 3.234 | 3.3 | | No | 500 | Fast-Transient-Response 500-mA LDO Voltage Reg. |
| TPS77701 | | | 0.085 | 13.5 | 2 | Yes | | | | 1.2 to 5.5 | Yes | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77715 | | | 0.085 | 13.5 | 2 | Yes | 1.53 | 1.47 | 1.5 | | Yes | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77718 | | | 0.085 | 13.5 | 2 | Yes | 1.836 | 1.764 | 1.8 | | Yes | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |

## Linear Regulation—Low Dropout (LDO) Regulators (Continued)

| Device Name | $V_{DO}$ (max) (V) | $V_{DO}$ (typ) (V) | $I_Q$ (typ) (mA) | $V_{IN}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS77725 | | | 0.085 | 13.5 | 2 | Yes | 2.55 | 2.45 | 2.5 | | Yes | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77733 | 0.427 | 0.26 | 0.085 | 13.5 | 2 | Yes | 3.366 | 3.234 | 3.3 | | Yes | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77801 | | | 0.085 | 13.5 | 2 | Yes | | | | 1.2 to 5.5 | No | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77815 | | | 0.085 | 13.5 | 2 | Yes | 1.53 | 1.47 | 1.5 | | No | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77818 | | | 0.085 | 13.5 | 2 | Yes | 1.836 | 1.764 | 1.8 | | No | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77825 | | | 0.085 | 13.5 | 2 | Yes | 2.55 | 2.45 | 2.5 | | No | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| TPS77833 | 0.427 | 0.26 | 0.085 | 13.5 | 2 | Yes | 3.366 | 3.234 | 3.3 | | No | 750 | Fast-Transient-Response 750-mA LDO Voltage Reg. |
| UC182-1 | 0.45 at 3A | 0.45 at 1A | | 7.5 | | | 1.515 | 1.485 | | | | 3000 | Fast LDO Linear Regulator |
| UC182-2 | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 2.121 | 2.079 | 2.1 | | No | 3000 | Fast LDO Linear Regulator |
| UC182-3 | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 2.525 | 2.475 | 2.5 | | No | 3000 | Fast LDO Linear Regulator |
| UC182-ADJ | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 6 | 1.2 | | 1.2 to 6 | No | 3000 | Fast LDO Linear Regulator |
| UC282-1 | 0.45 at 3A | 0.45 at 1A | | 7.5 | | | 1.515 | 1.485 | | | | 3000 | Fast LDO Linear Regulator |
| UC282-2 | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 2.121 | 2.078 | 2.1 | | No | 3000 | Fast LDO Linear Regulator |
| UC282-3 | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 2.525 | 2.475 | 2.5 | | No | 3000 | Fast LDO Linear Regulator |
| UC282-ADJ | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 6 | 1.2 | | 1.2 to 6 | No | 3000 | Fast LDO Linear Regulator |
| UC285-1 | | 0.45 at 1A | | 7.5 | | | | | | | | 5000 | Fast LDO Linear Regulator |
| UC285-2 | 0.5 | 0.35 at 1A | 40 | 7.5 | | No | 2.121 | 2.058 | 2.1 | | No | 5000 | Fast LDO Linear Regulator |
| UC285-3 | 0.5 | 0.35 at 1A | 40 | 7.5 | | No | 2.525 | 2.45 | 2.5 | | No | 5000 | Fast LDO Linear Regulator |
| UC285-ADJ | | 0.45 at 1A | 40 | 7.5 | | No | | | | 1.2 | No | 5000 | Fast LDO Linear Regulator |
| UC382-1 | 0.45 at 3A | 0.45 at 3A | | 7.5 | | | 1.515 | 1.485 | | | | 3000 | Fast LDO Linear Regulator |
| UC382-2 | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 2.121 | 2.078 | 2.1 | | No | 3000 | Fast LDO Linear Regulator |
| UC382-3 | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 2.525 | 2.475 | 2.5 | | No | 3000 | Fast LDO Linear Regulator |
| UC382-ADJ | 0.45 at 3A | 0.45 at 1A | 10 | 7.5 | 1 | No | 6 | 1.2 | | 1.2 to 6 | No | 3000 | Fast LDO Linear Regulator |
| UC385-1 | | 0.45 at 1A | | 7.5 | | | | | | | | 5000 | Fast LDO Linear Regulator |
| UC385-2 | 0.49 | 0.35 at 1A | 40 | 7.5 | | No | 2.121 | 2.079 | 2.1 | | No | 5000 | Fast LDO Linear Regulator |
| UC385-3 | 0.49 | 0.35 at 1A | 40 | 7.5 | | No | 2.525 | 2.475 | 2.5 | | No | 5000 | Fast LDO Linear Regulator |
| UC385-ADJ | | 0.35 at 5A | 40 | 7.5 | | No | | | | 1.2 | No | 5000 | Fast LDO Linear Regulator |
| UCC281-3 | 0.8 | 0.45 at 1A | 25 | 9 | 2.5 | Yes | 3.38 | 3.22 | 3.3 | | No | 1000 | LDO 1 Ampere Linear Regulator Family |
| UCC281-5 | 0.6 | 0.45 at 1A | 25 | 9 | 2.5 | Yes | 5.125 | 4.875 | 5 | | No | 1000 | LDO 1 Ampere Linear Regulator Family |
| UCC281-ADJ | 0.6 | 0.45 at 1A | 25 | 9 | 2.5 | Yes | 1.28 | 1.22 | 1.25 | 1.22 to 8.85 | No | 1000 | LDO 1 Ampere Linear Regulator Family |
| UCC283-3 | 0.6 | 0.45 at 3A | 0.4 | 9 | 2.5 | Yes | 3.38 | 3.22 | 3.3 | | No | 3000 | LDO 3-Ampere Linear Regulator Family |
| UCC283-5 | 0.6 | 0.45 at 3A | 0.4 | 9 | 2.5 | Yes | 5.125 | 4.875 | 5 | | No | 3000 | LDO 3-Ampere Linear Regulator Family |
| UCC283-ADJ | 0.6 | 0.45 at 3A | 0.4 | 9 | 2.5 | Yes | 1.28 | 1.22 | 1.25 | 1.25 to 8.85 | No | 3000 | LDO 3-Ampere Linear Regulator Family |
| UCC284-12 | 0.5 | 0.2 at 500mA | 0.2 | –16 | 2.5 | Yes | –11.64 | –12.24 | –12 | | No | 500 | LDO 0.5-A Negative Linear Regulator |
| UCC284-5 | 0.5 | 0.2 at 500mA | 0.2 | –16 | 2.5 | Yes | –4.85 | –5.1 | –5 | | No | 500 | LDO 0.5-A Negative Linear Regulator |
| UCC284-ADJ | 0.5 | 0.2 at 500mA | 0.2 | –16 | 2.5 | Yes | –1.215 | –1.275 | –1.25 | | No | 500 | LDO 0.5-A Negative Linear Regulator |

## Linear Regulation—Low Dropout (LDO) Regulators (Continued)

| Device Name | $V_{do}$ (max) (V) | $V_{do}$ (typ) (V) | $I_q$ (typ) (mA) | $V_{IN}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCC286 | 0.5 | 0.2 at 200mA | 0.01 | 9 | 1.5 | Yes | 3.38 | 3.22 | 3.3 | | No | 200 | LDO 200-mA Linear Regulator |
| UCC287 | 0.5 | 0.2 at 200mA | 0.01 | 9 | 1.5 | Yes | 5.125 | 4.785 | 5 | | No | 200 | LDO 200-mA Linear Regulator |
| UCC288 | 0.5 | 0.2 at 200mA | 0.01 | 9 | 1.5 | Yes | 1.28 | 1.22 | 1.25 | | No | 200 | LDO 200-mA Linear Regulator |
| UCC381-3 | 0.8 | 0.45 at 1A | 25 | 9 | 2.5 | Yes | 3.38 | 3.22 | 3.3 | | No | 1000 | LDO 1 Ampere Linear Regulator Family |
| UCC381-5 | 0.6 | 0.45 at 1A | 25 | 9 | 2.5 | Yes | 5.125 | 4.875 | 5 | | No | 1000 | LDO 1 Ampere Linear Regulator Family |
| UCC381-ADJ | 0.6 | 0.45 at 1A | 25 | 9 | 2.5 | Yes | 1.28 | 1.22 | 1.25 | 1.25 to 8.85 | No | 1000 | LDO 1 Ampere Linear Regulator Family |
| UCC383-3 | 0.6 | 0.45 at 1A | 0.4 | 9 | 2.5 | Yes | 3.38 | 3.22 | 3.3 | | No | 3000 | LDO 3 Ampere Linear Regulator |
| UCC383-5 | 0.6 | 0.45 at 3A | 0.4 | 9 | 2.5 | Yes | 5.125 | 4.875 | 5 | | No | 3000 | LDO 3 Ampere Linear Regulator |
| UCC383-ADJ | 0.6 | 0.45 at 1A | 0.4 | 9 | 2.5 | Yes | 1.28 | 1.22 | 1.25 | 1.25 to 8.85 | No | 3000 | LDO 3 Ampere Linear Regulator |
| UCC384-12 | 0.5 | 0.2 at 500mA | 0.2 | –16 | 2.5 | Yes | –11.64 | –12.24 | –12 | | No | 500 | LDO 0.5A Negative Linear Regulator |
| UCC384-5 | 0.5 | 0.2 at 500mA | 0.2 | –16 | 2.5 | Yes | –4.85 | –5.1 | –5 | | No | 500 | LDO 0.5A Negative Linear Regulator |
| UCC384-ADJ | 0.5 | 0.2 at 500mA | 0.2 | –16 | 2.5 | Yes | –1.215 | –1.275 | –1.25 | | No | 500 | LDO 0.5A Negative Linear Regulator |
| UCC386 | 0.5 | 0.2 at 200mA | 0.01 | 9 | 1.5 | Yes | 3.38 | 3.22 | 3.3 | | No | 200 | LDO 200-mA Linear Regulator |
| UCC387 | 0.5 | 0.2 at 200mA | 0.01 | 9 | 1.5 | Yes | 5.125 | 4.785 | 5 | | No | 200 | LDO 200-mA Linear Regulator |
| UCC388 | 0.5 | 0.2 at 200mA | 0.01 | 9 | 1.5 | Yes | 1.28 | 1.22 | 1.25 | | No | 200 | LDO 200-mA Linear Regulator |

## Linear Regulation—Low Dropout (LDO) Controllers

| Device Name | $V_{DO}$ (max) (V) | $V_{DO}$ (typ) (V) | $I_Q$ (typ) (mA) | $V_{IN}$ (max) (V) | Tol (%) | Shut-down | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adjust (nom) (V) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UC1832 | | | 3.3 | 36 | 2 | Yes | | 2 | | | No | 100 | Precision Low Dropout Linear Controllers |
| UC1833 | | 0.35 | 3.3 | 36 | 2 | Yes | | 2 | | | No | 100 | Precision Low Dropout Linear Controllers |
| UC1834 | 0.5 | | 5.5 | 40 | 3/4 | Yes | +1.53/–1.94 | 1.47/–2.06 | +1.5/–2.0 | | Yes | 200 | High Efficiency Linear Reg |
| UC1835 | 0.5 | | 3.75 | 40 | 2 | Yes | 5.1 | 4.9 | 5 | | No | 2500 | High Efficiency Reg Controller |
| UC1836 | 0.5 | | 3.75 | 40 | 2 | Yes | 35 | 2.5 | | 2.5 to 35 | No | 2500 | High Efficiency Reg Controller |
| UC2832 | | | 3.3 | | | Yes | | | | | No | 100 | Precision Low Dropout Linear Controllers |
| UC2833 | | | 3.3 | | | Yes | | | | | No | 100 | Precision Low Dropout Linear Controllers |
| UC2834 | 0.5 | | 5.5 | 40 | | Yes | 1.53/–1.94 | 1.47/–2.06 | 1.5/–2.0 | | Yes | 200 | High Efficiency Linear Reg |
| UC2835 | 0.5 | | 3.75 | 40 | | Yes | 5.1 | 4.9 | 5 | | No | 2500 | High Efficiency Reg Controller |
| UC2836 | 0.5 | | 3.75 | 40 | | Yes | 35 | 2.5 | | 2.5 to 35 | No | 2500 | High Efficiency Reg Controller |
| UC3832 | | | 3.3 | 36 | 2 | Yes | | 2 | | | No | 100 | Precision Low Dropout Linear Controllers |
| UC3833 | | | 3.3 | 36 | 2 | Yes | | 2 | | | No | 100 | Precision Low Dropout Linear Controllers |
| UC3834 | 0.5 | | 5.5 | 40 | 3/4 | Yes | 1.545/–1.92 | 1.455/–2.08 | +1.5/–2.0 | | Yes | 200 | High Efficiency Linear Reg |
| UC3835 | 0.5 | | 3.75 | 40 | 2 | Yes | 5.1 | 4.9 | 5 | | No | 2500 | High Efficiency Reg Controller |
| UC3836 | 0.5 | | 3.75 | 40 | 2 | Yes | 35 | 2.5 | | 2.5 to 35 | No | 2500 | High Efficiency Reg Controller |
| UCC1837 | | | 1.2 | 12 | 2 | No | | 1.5 | | | No | 1.5 | 8-Pin N-FET Linear Reg Controller |
| UCC2837 | | | 1.2 | 12 | 2 | No | | 1.5 | | | No | 1.5 | 8-Pin N-FET Linear Reg Controller |
| UCC3837 | | | 1.2 | 12 | 2 | No | | 1.5 | | | No | 1.5 | 8-Pin N-FET Linear Reg Controller |

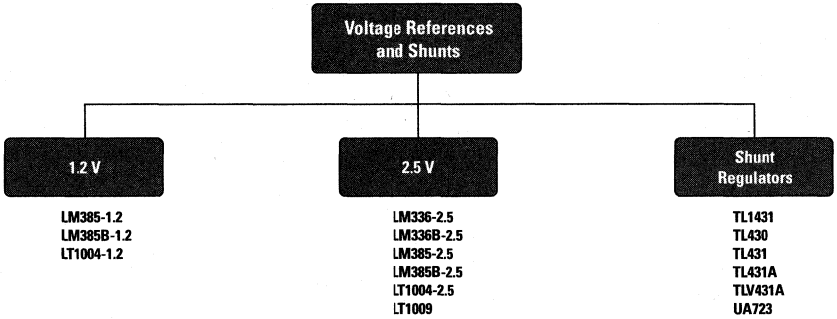
## Linear Regulation—Standard Voltage Regulators

| Device Name | $V_{IN}$ (max) (V) | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adj (nom) (V) | Tolerance (%) | Shut-down | $V_{DO}$ (max) (V) | $V_{DO}$ (typ) (V) | $I_Q$ (typ) (mA) | SVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MC79L05A | –20 | –4.8 | –5.2 | –5 | | 5 | No | 3 | 2 | 5 | No | 100 | Negative-Voltage Regulator, Low Current |
| MC79L12 | –27 | –11.1 | –12.9 | –12 | | 10 | No | 3 | 2.5 | 10 | No | 100 | Negative-Voltage Reg, Low Current |
| MC79L12A | –27 | –11.5 | –12.5 | –12 | | 5 | No | 3 | 2.5 | 5 | No | 100 | Negative-Voltage Reg, Low Current |
| MC79L15 | –30 | –13.8 | –16.2 | –15 | | 10 | No | 3 | 2.5 | 10 | No | 100 | Negative-Voltage Reg, Low Current |
| MC79L15A | –30 | –14.4 | –15.6 | –15 | | 5 | No | 3 | 2.5 | 5 | No | 100 | Negative-Voltage Reg, Low Current |
| TL317 | 35 | 32 | 1.2 | | 1.2 to 32.0 | 4 | No | 3 | 2.5 | 1.5 | No | 100 | General Purpose Low Current 3-Terminal Adj Reg |
| TL780-05 | 25 | 5.05 | 4.95 | 5 | | 1 | No | 3 | 2 | 5 | No | 1500 | High Current +Voltage Reg (Upgrade for UA7805) |
| TL780-12 | 30 | 12.12 | 11.88 | 12 | | 1 | No | 3 | 2.5 | 5.5 | No | 1500 | High Current +Voltage Reg (Upgrade for UA7812) |
| TL780-15 | 30 | 15.15 | 14.85 | 15 | | 1 | No | 3 | 2.5 | 5.5 | No | 1500 | High Current +Voltage Reg (Upgrade for UA7815) |

## Linear Regulation—Standard Voltage Regulators (Continued)

| Device Name | $V_{IN}$ (max) (V) | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_O$ (nom) (V) | $V_O$ Adj (nom) (V) | Tolerance (%) | Shut-down | $V_{DO}$ (max) (V) | $V_{DO}$ (typ) (V) | $I_Q$ (typ) (mA) | CVS | $I_O$ (max) (mA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TL783 | 125 | 125 | 1.25 | | 1.25 to 125.0 | 6 | No | 15 | 10 | 15 | No | 700 | High Voltage High Current Adjustable Reg |
| UA723 | 40 | | | | 2 to 37 | 1 | No | 3 | | 2.3 | No | 150 | Precision Voltage Reg |
| UA7805 | 25 | 5.2 | 4.8 | 5 | | 4 | No | 3 | 2 | 4.2 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7806 | 25 | 6.25 | 5.75 | 6 | | 4 | No | 3 | 2 | 4.3 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7808 | 25 | 8.3 | 7.7 | 8 | | 4 | No | 3 | 2.5 | 4.3 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7810 | 28 | 10.4 | 9.6 | 10 | | 4 | No | 3 | 2.5 | 4.3 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7812 | 30 | 12.5 | 11.5 | 12 | | 4 | No | 3 | 2.5 | 4.3 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7815 | 30 | 15.6 | 14.4 | 15 | | 4 | No | 3 | 2.5 | 4.4 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7818 | 33 | 18.7 | 17.3 | 18 | | 4 | No | 3 | 3 | 4.5 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7824 | 38 | 25 | 23 | 24 | | 4 | No | 3 | 3 | 4.6 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA7885 | 25 | 8.85 | 8.15 | 8 | | 4 | No | 3 | 2 | 4.3 | No | 1500 | General Purpose, High Current +Voltage Reg |
| UA78L02A | 20 | 2.7 | 2.5 | 2 | | 5 | No | 3 | 1.7 | 3.6 | No | 100 | +Voltage Reg |
| UA78L05 | 20 | 5.4 | 4.6 | 5 | | 10 | No | 3 | 2 | 3.8 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L05A | 20 | 5.2 | 4.8 | 5 | | 5 | No | 3 | 1.7 | 3.8 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L06 | 20 | 6.7 | 5.7 | 6 | | 10 | No | 3 | 1.7 | 3.9 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L06A | 20 | 6.45 | 5.95 | 6 | | 5 | No | 3 | 1.7 | 3.9 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L08 | 23 | 8.64 | 7.36 | 8 | | 10 | No | 3 | 1.7 | 4 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L08A | 23 | 8.3 | 7.7 | 8 | | 5 | No | 3 | 1.7 | 4 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L09 | 24 | 9.7 | 8.3 | 9 | | 10 | No | 3 | 1.7 | 4.1 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L09A | 24 | 9.4 | 8.6 | 9 | | 5 | No | 3 | 1.7 | 4.1 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L10A | 25 | 10.4 | 9.6 | 10 | | 5 | No | 3 | 1.7 | 4.2 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L12 | 27 | 12.9 | 11.1 | 12 | | 10 | No | 3 | 1.7 | 4.3 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L12A | 27 | 12.5 | 11.5 | 12 | | 5 | No | 3 | 1.7 | 4.3 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78L15A | 30 | 15.6 | 14.4 | 15 | | 5 | No | 3 | 1.7 | 4.6 | No | 100 | General Purpose, Low Current +Voltage Reg |
| UA78M05 | 25 | 5.2 | 4.8 | 5 | | 4 | No | 3 | 2 | 4.5 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA78M06 | 25 | 6.25 | 5.75 | 6 | | 4 | No | 3 | 2 | 4.5 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA78M08 | 25 | 8.3 | 7.7 | 8 | | 4 | No | 3 | 2.5 | 4.6 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA78M09 | 26 | 9.4 | 8.6 | 9 | | 4 | No | 3 | 2.5 | 4.6 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA78M10 | 28 | 10.4 | 9.6 | 10 | | 4 | No | 3 | 2.5 | 4.6 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA78M12 | 30 | 12.5 | 11.5 | 12 | | 4 | No | 3 | 2.5 | 4.8 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA78M15 | 30 | 15.6 | 14.4 | 15 | | 4 | No | 3 | 2.5 | 4.8 | No | 500 | General Purpose, Medium Current +Voltage Reg |
| UA79M05 | –25 | –4.8 | –5.2 | –5 | | 4 | No | 3 | 2 | 1 | No | 500 | Negative Gen Purpose, Med Current Voltage Reg |
| UA79M08 | –25 | –7.7 | –8.3 | –8 | | 4 | No | 3 | 2.5 | 1 | No | 500 | Negative Gen Purpose, Med Current Voltage Reg |
| UA79M12 | –30 | –11.5 | –12.5 | –12 | | 4 | No | 3 | 2.5 | 1.5 | No | 500 | Negative Gen Purpose, Med Current Voltage Reg |
| UA79M15 | –30 | –14.4 | –15.6 | –15 | | 4 | No | 3 | 2.5 | 1.5 | No | 500 | Negative Gen Purpose, Med Current Voltage Reg |

## Voltage References and Shunts




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified Shunt Regulators, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

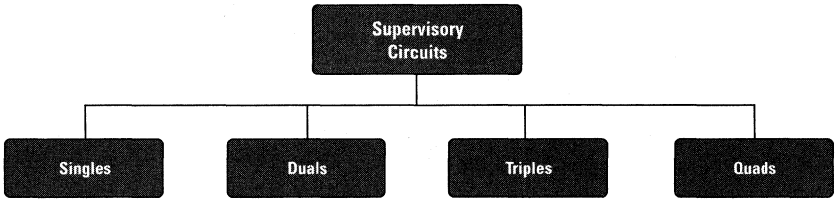
## Voltage References and Shunts—1.2 V, 2.5 V

| Device Name | $V_{ref}$ (V) | Tolerance (%) | $I_Z$ (min) (μA) | $I_Z$ (max) (mA) | Temp Coeff (typ) (ppm/°C) | Description |
|---|---|---|---|---|---|---|
| **1.2 V** | | | | | | |
| LM385-1.2 | 1.2 | 2 | 10 | 20 | –20 | Micropower Voltage Reference |
| LM385B-1.2 | 1.2 | 1 | 10 | 20 | –20 | Micropower Voltage Reference |
| LT1004-1.2 | 1.2 | 0.3 | 10 | 20 | 20 | Micropower Integrated Precision Voltage Reference |
| **2.5 V** | | | | | | |
| LM336-2.5 | 2.5 | 4 | 400 | 10 | N/A | 2.5-V Integrated Reference Circuit |
| LM336B-2.5 | 2.5 | 1 | 400 | 10 | N/A | Precision Voltage Reference |
| LM385-2.5 | 2.5 | 3 | 20 | 20 | –20 | Micropower Voltage Reference |
| LM385B-2.5 | 2.5 | 1.5 | 20 | 20 | –20 | Micropower Voltage Reference |
| LT1004-2.5 | 2.5 | 0.8 | 20 | 20 | 20 | Micropower Integrated Precision Voltage Reference |
| LT1009 | 2.5 | 2 | 400 | 20 | 15 | 2.5-V Integrated Reference Circuit |

## Voltage References and Shunts—Shunt Regulators

| Device Name | $V_{ref}$ (V) | Tolerance (%) | $I_Z$ (min) (μA) | $I_Z$ (max) (mA) | Temp Coeff (typ) (ppm/°C) | $V_I$ (max) (V) | $V_O$ (max) (V) | $V_O$ (min) (V) | Description |
|---|---|---|---|---|---|---|---|---|---|
| TL1431 | 2.5 | 0.4 | 1000 | 100 | 30 | 36 | 36 | $V_{ref}$ | Precision Adjustable (Programmable) Shunt Reference |
| TL430 | 2.75 | 9 | 2000 | 100 | 120 | 30 | 30 | $V_{ref}$ | Adjustable Shunt Regulator |
| TL431 | 2.5 | 2 | 1000 | 100 | 30 | 36 | 36 | $V_{ref}$ | Adjustable Precision Shunt Regulator |
| TL431A | 2.5 | 1 | 1000 | 100 | 30 | 36 | 36 | $V_{ref}$ | Adjustable Precision Shunt Regulator |
| TLV431A | 1.24 | 1 | 100 | 15 | 46 | 6 | 6 | $V_{ref}$ | Low-Voltage Adjustable Precision Shunt Regulator |
| UA723 | | 1 | | | | | | | Precision Voltage Regulator |

## Supervisory Circuits




**Singles**

UCC3946
UCC2946
UCC1946
TPS3824-50
TPS3824-33
TPS3824-30
TPS3824-25
TPS3823-50
TPS3823-33
TPS3823-30
TPS3823-25
TPS3809L30
TPS3809K33
TPS3809J25
TPS3809I50
TPS3801L30
TPS3801K33
TPS3801J25
TPS3801I50
TPS3707-50
TPS3707-33
TPS3707-30
TPS3707-25
TPS3705-50
TPS3705-33
TPS3705-30
TPS3125L30
TPS3125J18
TPS3125J12
TPS3125G15
TPS3124J18
TPS3124J12
TPS3124G15
TPS3123J18
TPS3123J12
TPS3123G15
TLC7733
TLC7725
TLC7705
TLC7703
TLC7701
TL7759
TL7757
TL7715A
TL7712A
TL7709A
TL7705B
TL7705A
TL7702B
TL7702A

**Duals**

TL7770-15
TL7770-5
TPS3305-18
TPS3305-25
TPS3305-33
UC1543
UC1544
UC2543
UC2544
UC3543
UC3544

**Triples**

TPS3307-18
TPS3307-25
TPS3307-33
TPS5510
TPS5511

**Quads**

UC1903
UC1904
UC2903
UC2904
UC3903
UC3904

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified products (except Triples), refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

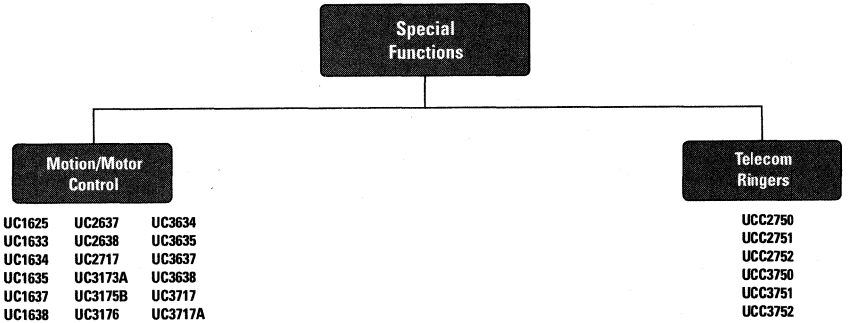
## Supervisory Circuits—Singles

| Device Name | $V_{CC}$ (nom) (V) | $V_t$ (V) | Tolerance (%) | $V_{IH}$ (min) (V) | Number of SVS | Complementary Outputs | $I_{CC}$ (max) (mA) | Over Voltage Sense | WDI | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| **Singles** | | | | | | | | | | |
| TL7702A | pgm | pgm | 2 | 3.6 | 1 | Yes | 3 | No | No | Single SVS with Pgmmable UV Threshold & Reset Time Delay |
| TL7702B | pgm | pgm | 2 | 1 | 1 | Yes | 3 | No | No | Single SVS with Pgmmable UV Threshold & Reset Time Delay |
| TL7705A | 5 | 4.55 | 2 | 3.6 | 1 | Yes | 3 | No | No | Single SVS for 5-V Systems w/Pgmmable Time Delay |
| TL7705B | 5 | 4.55 | 2 | 1 | 1 | Yes | 3 | No | No | Single SVS for 5-V Systems w/Pgmmable Time Delay |
| TL7709A | 9 | 7.6 | 2 | 3.6 | 1 | Yes | 3 | No | No | Single SVS for 9-V Systems w/Pgmmable Time Delay |
| TL7712A | 12 | 10.8 | 2 | 3.6 | 1 | Yes | 3 | No | No | Single SVS for 12-V Systems w/Pgmmable Time Delay |
| TL7715A | 15 | 13.5 | 2 | 3.6 | 1 | Yes | 3 | No | No | Single SVS for 15-V Systems w/Pgmmable Time Delay |
| TL7757 | 5 | 4.55 | 3 | 1 | 1 | No | 2.5 | No | No | 3-Terminal SVS & Precision Voltage Detector for 5-V Systems |
| TL7759 | 5 | 4.55 | 3 | 1 | 1 | Yes | 2 | No | No | 4-Terminal SVS for 5-V Systems |
| TLC7701 | adj | 1.1 | 5.4 | 1 | 1 | Yes | 0.016 | No | No | Adjustable Single SVS w/Programmable Time Delay |
| TLC7703 | 3 | 2.63 | 2.7 | 1 | 1 | Yes | 0.016 | No | No | Single SVS for 3.0-V Systems w/Programmable Time Delay |
| TLC7705 | 5 | 4.55 | 1.5 | 1 | 1 | Yes | 0.016 | No | No | Single Power SVS (5V) w/Pgmmable Time Delay & Push-Pull Outputs |
| TLC7725 | 2.5 | 2.25 | 3 | 1 | 1 | Yes | 0.016 | No | No | Micropower Supply Voltage Supervisor |
| TLC7733 | 3.3 | 2.93 | 2.4 | 1 | 1 | Yes | 0.016 | No | No | Single SVS for 3.3-V Systems w/Programmable Time Delay |
| TPS3123G15 | 1.5 | 1.4 | 2 | 0.75 | 1 | No | 0.03 | No | Yes | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3123J12 | 1.2 | 1.08 | 2 | 0.75 | 1 | No | 0.03 | No | Yes | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3123J18 | 1.8 | 1.62 | 2 | 0.75 | 1 | No | 0.03 | No | Yes | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3124G15 | 1.5 | 1.4 | 2 | 0.75 | 1 | Yes | 0.03 | No | Yes | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3124J12 | 1.2 | 1.08 | 2 | 0.75 | 1 | Yes | 0.03 | No | Yes | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3124J18 | 1.8 | 1.62 | 2 | 0.75 | 1 | Yes | 0.03 | No | Yes | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3125G15 | 1.5 | 1.4 | 2 | 0.75 | 1 | Yes | 0.03 | No | No | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3125J12 | 1.2 | 1.08 | 2 | 0.75 | 1 | Yes | 0.03 | No | No | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3125J18 | 1.8 | 1.62 | 2 | 0.75 | 1 | Yes | 0.03 | No | No | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3125L30 | 3 | 2.64 | 2 | 0.75 | 1 | Yes | 0.03 | No | No | Ultra-Low-Voltage Processor Supervisory Circuit |
| TPS3705-30 | 3 | 2.63 | 2 | 2 | 1 | No | 0.05 | No | Yes | Processor Supervisory Circuits with Power-Fail |
| TPS3705-33 | 3.3 | 2.93 | 2 | 2 | 1 | No | 0.05 | No | Yes | Processor Supervisory Circuits with Power-Fail |
| TPS3705-50 | 5 | 4.55 | 2 | 2 | 1 | No | 0.05 | No | Yes | Processor Supervisory Circuits with Power-Fail |
| TPS3707-25 | 2.5 | 2.25 | 2 | 2 | 1 | Yes | 0.05 | No | No | Processor Supervisory Circuits with Power-Fail |
| TPS3707-30 | 3 | 2.63 | 2 | 2 | 1 | Yes | 0.05 | No | No | Processor Supervisory Circuits with Power-Fail |
| TPS3707-33 | 3.3 | 2.93 | 2 | 2 | 1 | Yes | 0.05 | No | No | Processor Supervisory Circuits with Power-Fail |
| TPS3707-50 | 5 | 4.55 | 2 | 2 | 1 | Yes | 0.05 | No | No | Processor Supervisory Circuits with Power-Fail |
| TPS3801I50 | 5 | 4.55 | 2 | 2 | 1 | No | 0.012 | No | No | Processor Supervisory Circuits |
| TPS3801J25 | 2.5 | 2.25 | 2 | 2 | 1 | No | 0.012 | No | No | Processor Supervisory Circuits |
| TPS3801K33 | 3.3 | 2.93 | 2 | 2 | 1 | No | 0.012 | No | No | Processor Supervisory Circuits |
| TPS3801L30 | 3 | 2.64 | 2 | 2 | 1 | No | 0.012 | No | No | Processor Supervisory Circuits |

## Supervisory Circuits—Singles, Duals, Triples (Continued)

| Device Name | $V_{CC}$ (nom) (V) | $V_t$ (V) | Tolerance (%) | $V_{IN}$ (min) (V) | Number of SVS | Complementary Outputs | $I_{CC}$ (max) (mA) | Over Voltage Sense | WDI | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| **Singles (Continued)** | | | | | | | | | | |
| TPS3809I50 | 5 | 4.55 | 2 | 2 | 1 | No | 0.012 | No | No | 3-Pin Supply Voltage Supervisor |
| TPS3809J25 | 2.5 | 2.25 | 2 | 2 | 1 | No | 0.012 | No | No | 3-Pin Supply Voltage Supervisor |
| TPS3809K33 | 3.3 | 2.93 | 2 | 2 | 1 | No | 0.012 | No | No | 3-Pin Supply Voltage Supervisor |
| TPS3809L30 | 3 | 2.64 | 2 | 2 | 1 | No | 0.012 | No | No | 3-Pin Supply Voltage Supervisor |
| TPS3823-25 | 2.5 | 2.25 | 1.8 | | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3823-30 | 3 | 2.63 | 1.5 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3823-33 | 3.3 | 2.93 | 1.7 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3823-50 | 5 | 4.55 | 1.3 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3824-25 | 2.5 | 2.25 | 2 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3824-30 | 3 | 2.63 | 2 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3824-33 | 3.3 | 2.93 | 2 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| TPS3824-50 | 5 | 4.55 | 2 | 1.1 | 1 | Yes | 0.025 | No | Yes | Processor Supervisory Circuits |
| UCC1946 | 2 to 5.5 | 1.235 | 2 | | 1 | No | 0.0015 | No | Yes | Microprocessor Supervisor with Watchdog Timer |
| UCC2946 | 2 to 5.5 | 1.235 | 2 | | 1 | No | 0.0015 | No | Yes | Microprocessor Supervisor with Watchdog Timer |
| UCC3946 | 2 to 5.5 | 1.235 | 2 | | 1 | No | 0.0015 | No | Yes | Microprocessor Supervisor with Watchdog Timer |
| **Duals** | | | | | | | | | | |
| TL7770-15 | 15 | 13.64 | 1 | 1 | 2 | Yes | 5 | Yes | No | Dual SVS, 15-V & Pgmmable w/Pgmmable Time Delay |
| TL7770-5 | 5 | 4.55 | 1 | 1 | 2 | Yes | 5 | Yes | No | Dual SVS, 5-V & Pgmmable, w/Pgmmable Time Delay |
| TPS3305-18 | 1.8 | 1.68 | 2 | 2.7 | 2 | Yes | 0.04 | No | Yes | Dual Processor Supervisory Circuits |
| TPS3305-25 | 2.5 | 2.25 | 2 | 2.7 | 2 | Yes | 0.04 | No | Yes | Dual Processor Supervisory Circuits |
| TPS3305-33 | 5 | 4.55 | 2 | 2.7 | 2 | Yes | 0.04 | No | Yes | Dual Processor Supervisory Circuits |
| UC1543 | 4.5 to 40 | 2.5 | 1 | 4.5 | 2 | No | 15 | Yes | No | Power Supply Supervisory Circuit |
| UC1544 | 4.5 to 40 | 2.5 | 1 | 4.5 | 2 | No | 15 | Yes | No | Power Supply Supervisory Circuit |
| UC2543 | 4.5 to 40 | 2.5 | 1 | 4.5 | 2 | No | 15 | Yes | No | Power Supply Supervisory Circuit |
| UC2544 | 4.5 to 40 | 2.5 | 1 | 4.5 | 2 | No | 15 | Yes | No | Power Supply Supervisory Circuit |
| UC3543 | 4.5 to 40 | 2.5 | 1 | 4.5 | 2 | No | 15 | Yes | No | Power Supply Supervisory Circuit |
| UC3544 | 4.5 to 40 | 2.5 | 1 | 4.5 | 2 | No | 15 | Yes | No | Power Supply Supervisory Circuit |
| **Triples** | | | | | | | | | | |
| TPS3307-18 | 1.8 | 1.68 | 2 | 2 | 3 | Yes | 0.04 | No | No | Triple Processor Supervisory Circuits |
| TPS3307-25 | 2.5 | 2.25 | 2 | 2 | 3 | Yes | 0.04 | No | No | Triple Processor Supervisory Circuits |
| TPS3307-33 | 5 | 4.55 | 2 | 2 | 3 | Yes | 0.04 | No | No | Triple Processor Supervisory Circuits |
| TPS5510 | | | 3 | 4 | 3 | Yes | 1 | Yes | No | 3 Channel Power Supply Supervisor |
| TPS5511 | | | 3 | 4 | 3 | Yes | 1 | Yes | No | 3-Channel Power Supply Supervisor |

## Special Functions




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Special Functions—Motion/Motor Control

| Device Name | Output Clamp Diodes | Output Current (A) | Operating Voltage (V) | Differential Current Sense Amplifier | Thermal Shutdown | Current Limit | No. of Outputs | Description |
|---|---|---|---|---|---|---|---|---|
| UC1625 | No | 0.1 | 10 to 18 | Yes | | Yes | 3 LS/3HS | Brushless DC Motor Controller |
| UC1633 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC1634 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC1635 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC1637 | No | 0.1 | 2.5 to 20 | No | Yes | Yes | 2 | Switched Mode Controller for DC Motor Drive |
| UC1638 | No | 0.1/0.05 | 10 to 36 | Yes | Yes | Yes | 2 LS/2HS | Advanced PWM Motor Controller |
| UC1717 | Yes | 0.8 | 10 to 45 | No | Yes | Yes | 2 | Stepper Motor Drive Circuit |
| UC2625 | No | 0.1 | 10 to 18 | Yes | | Yes | 3 LS/3 HS | Brushless DC Motor Controller |
| UC2633 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC2634 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC2635 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC2637 | No | 0.1 | 2.5 to 20 | No | Yes | Yes | 2 | Switched Mode Controller for DC Motor Drive |

## Supervisory Circuits—Quads

| Device Name | $V_{IN}$ Range (V) | Programmable Fault Threshold | Window Adjust | Programmable Time Delay | Current Limit | Power Supply Monitor | Description |
|---|---|---|---|---|---|---|---|
| UC1903 | 8 to 40 | Yes | Yes | Yes | No | Quad | Quad Supply and Line Monitor |
| UC1904 | 4.75 to 18 | Yes | Yes | Yes | No | Quad | Precision Quad Supply and Line Monitor |
| UC2903 | 8 to 40 | Yes | Yes | Yes | No | Quad | Quad Supply and Line Monitor |
| UC2904 | 4.75 to 18 | Yes | Yes | Yes | No | Quad | Precision Quad Supply and Line Monitor |
| UC3903 | 8 to 40 | Yes | Yes | Yes | No | Quad | Quad Supply and Line Monitor |
| UC3904 | 4.75 to 18 | Yes | Yes | Yes | No | Quad | Precision Quad Supply and Line Monitor |

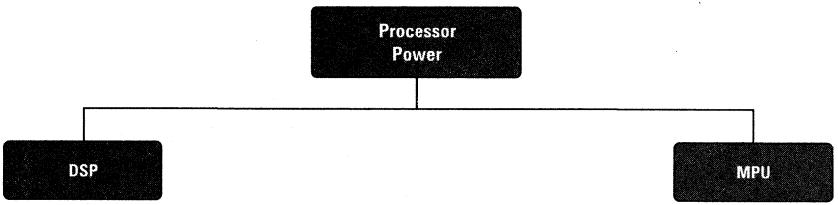
## Special Functions—Motion/Motor Control (Continued)

| Device Name | Output Clamp Diodes | Output Current (A) | Operating Voltage (V) | Differential Current Sense Amplifier | Thermal Shutdown | Current Limit | No. of Outputs | Description |
|---|---|---|---|---|---|---|---|---|
| UC2638 | No | 0.1/0.05 | 10 to 36 | Yes | Yes | Yes | 2 LS/2 HS | Advanced PWM Motor Controller |
| UC2717 | Yes | 0.8 | 10 to 45 | No | Yes | Yes | 2 | Stepper Motor Drive Circuit |
| UC3173A | Yes | 0.55 | 5 or 12 | Yes | Yes | Yes | 2 | Full Bridge Power Amplifier |
| UC3175B | Yes | 0.55 | 4 to 15 | Yes | Yes | Yes | 2 | Full Bridge Power Amplifier |
| UC3176 | Yes | 2 | 3 to 35 | Yes | Yes | Yes | 2 | Full Bridge Power Amplifier |
| UC3177 | Yes | 2 | 3 to 35 | Yes | Yes | Yes | 2 | Full Bridge Power Amplifier |
| UC3178 | Yes | 0.45 | 3 to 15 | Yes | Yes | Yes | 2 | Full Bridge Power Amplifier |
| UC3517 | No | 0.35 | 5 and 10 to 40 | No | No | No | 4 | Stepper Motor Drive Circuit |
| UC3625 | No | 0.1 | 10 to 18 | Yes | | Yes | 3 LS/3 HS | Brushless DC Motor Controller |
| UC3633 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC3634 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC3635 | No | 0.008/0.005 | 8 to 15 | No | No | No | 1 | Phase Locked Frequency Controller |
| UC3637 | No | 0.1 | 2.5 to 20 | No | Yes | Yes | 2 | Switched Mode Controller for DC Motor Drive |
| UC3638 | No | 0.1/0.05 | 10 to 36 | Yes | Yes | Yes | 2 LS/2 HS | Advanced PWM Motor Controller |
| UC3717 | Yes | 0.8 | 10 to 45 | No | Yes | Yes | 2 | Stepper Motor Drive Circuit |
| UC3717A | Yes | 1 | 10 to 45 | No | Yes | Yes | 2 | Stepper Motor Drive Circuit |
| UC3770A | Lower | 1.3 | 10 to 50 | No | Yes | Yes | 2 | High Performance Stepper Motor Drive Circuit |
| UC3770B | Lower | 1.3 | 10 to 50 | No | Yes | Yes | 2 | High Performance Stepper Motor Drive Circuit |
| UCC3626 | No | 0.01 | 11 to 14.5 | Yes | No | Yes | 6 | Brushless DC Motor Controller |

## Special Functions—Telecom Ringers

| Device Name | Ring Frequency (Hz) | Supply Current (mA) | $V_{IN}$ Range (V) | Current Limit | Description |
|---|---|---|---|---|---|
| UCC2750 | 20, 25, 50 | 0.5 | 5 | Yes | Source Ringer Controller |
| UCC2751 | 12, 25, 50 | 0.5 | 10 to 13 | Yes | Single Line Ring Generator Controller |
| UCC2752 | 12, 25, 50 | 0.5 | 10 to 13 | Yes | Resonant Ring Generator Controller |
| UCC3750 | 20, 25, 50 | 0.5 | 5 | Yes | Source Ringer Controller |
| UCC3751 | 12, 25, 50 | 0.5 | 10 to 13 | Yes | Single Line Ring Generator Controller |
| UCC3752 | 12, 25, 50 | 0.5 | 10 to 13 | Yes | Resonant Ring Generator Controller |

## Processor Power




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

## Processor Power—DSP

| Device Name | $V_{IN}$ (V) | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_{ref}$ Tol (%) | Driver Current (A) | Output Current (A) | Multiple Outputs | Adaptive Voltage Positioning | Power Good | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| TPS5602 | 4.5 to 25 | 24 | 1.2 | 2 | 1 | Set by FET | Yes | No | No | Dual Hysteretic Synchronous Rectifier Controller |
| TPS56100 | 5 | 4.5 | 0.9 | 1.5 | 2 | Set by FET | No | No | Yes | Programmable Synchronous-Buck Regulator Controller |
| TPS5615 | 12 | 1.5 | 1.5 | 1 | 2.4 | Set by FET | No | No | Yes | 1.5-V Output Voltage Synchronous-Buck Hysteretic Regulator Controller |
| TPS5618 | 12 | 1.8 | 1.8 | 1 | 2.4 | Set by FET | No | No | Yes | 1.8-V Output Voltage Synchronous-Buck Hysteretic Regulator Controller |
| TPS5625 | 12 | 2.5 | 2.5 | 1 | 2.4 | Set by FET | No | No | Yes | 2.5-V Output Voltage Synchronous-Buck Hysteretic Regulator Controller |
| TPS56300 | 2.8 to 6.0 | 3.3 | 1.3 | 1 | 2 | Set by FET | Yes | Yes | Yes | Dual Output, Low Input Voltage DSP Power Supply Controller with Sequencing |
| TPS5633 | 12 | 3.3 | 3.3 | 1 | 2.4 | Set by FET | No | No | Yes | 3.3-V Output Voltage Synchronous-Buck Hysteretic Regulator Controller |

## Processor Power—MPU

| Device Name | $V_{IN}$ (V) | $V_O$ (max) (V) | $V_O$ (min) (V) | $V_{ref}$ Tol (%) | Driver Current (A) | Output Current (A) | Multiple Outputs | Adaptive Voltage Positioning | Power Good | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| TPS5102 | | 24 | 1.2 | 1.5 | 1.5 | Set by FET | Yes | No | No | Dual High Efficiency Controller for Notebook System Power |
| TPS5103 | | 24 | 1.2 | 1.5 | 1.5 | Set by FET | No | No | No | Multi-Mode Synchronous DC/DC Controller |
| TPS5210 | | 3.5 | 1.3 | 1 | 2.4 | Set by FET | No | Yes | Yes | Programmable Synchronous Buck Regulator Controller |
| TPS5211 | | 3.5 | 1.3 | 1.5 | 2.4 | Set by FET | No | Yes | Yes | High Frequency Programmable Synchronous-Buck Regulator Controller |
| UCC2880-4 | 5 | 3.5 | 2 | 1 | | ±0.1 | | | Yes | Pentium Pro Controller |
| UCC2880-5 | 5 | 3.5 | 2 | 1 | | ±0.1 | | | Yes | Pentium Pro Controller |
| UCC2880-6 | 5 | 3.5 | 2 | 1 | | ±0.1 | | | Yes | Pentium Pro Controller |
| UCC2882 | | | | 1 | | | | | | Average Current Mode Synchronous Controller with 5-Bit DAC |
| UCC2882-1 | | | | 1 | | | | | | Average Current Mode Synchronous Controller with 5-Bit DAC |
| UCC3588 | 5 or 12 | 3.5 | 1.3 | 1 | | | | | Yes | 5-Bit Programmable Output BiCMOS Power Supply Controller |
| UCC3830-4 | 5 or 12 | 3.5 | 1.8 | 1 | | | | | Yes | 5-Bit Microprocessor Power Supply Controller |
| UCC3830-5 | 5 or 12 | 3.5 | 1.8 | 1 | | | | | Yes | 5-Bit Microprocessor Power Supply Controller |
| UCC3830-6 | 5 or 12 | 3.5 | 1.8 | 1 | | | | | Yes | 5-Bit Microprocessor Power Supply Controller |
| UCC3880-4 | 5 | 3.5 | 2 | 1 | | ±0.1 | | | Yes | Pentium Pro Controller |
| UCC3880-5 | 5 | 3.5 | 2 | 1 | | ±0.1 | | | Yes | Pentium Pro Controller |
| UCC3880-6 | 5 | 3.5 | 2 | 1 | | ±0.1 | | | Yes | Pentium Pro Controller |
| UCC3882 | | | | 1 | | | | | | Average Current Mode Synchronous Controller with 5-Bit DAC |
| UCC3882-1 | | | | 1 | | | | | | Average Current Mode Synchronous Controller with 5-Bit DAC |

## Power Factor Correction ICs

**Power Factor Correction ICs**

| | |
|---|---|
| UC1852 | UCC1857 |
| UC1853 | UCC1858 |
| UC1854 | UCC2857 |
| UC1854A | UCC2858 |
| UC1854B | UCC3817 |
| UC1855A | UCC3818 |
| UC1855B | UCC38500 |
| UC3852 | UCC38501 |
| UC3853 | UCC38502 |
| UC3854 | UCC38503 |
| UC3854A | UCC3857 |
| UC3854B | UCC3858 |
| UC3855A | |
| UC3855B | |

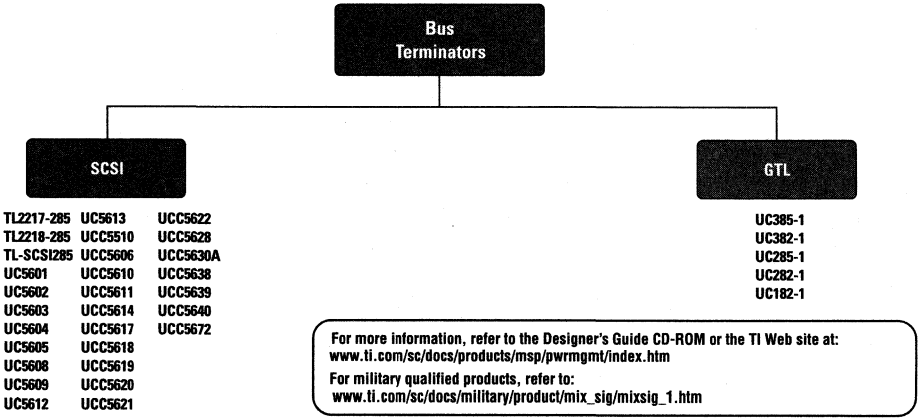
For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Power Factor Correction ICs

| Device Name | Practical Operating Frequency (max) (MHz) | Current Error Amplifier Bandwidth (MHz) | Average Current Mode Control | WW AC Input Voltage Operation | Output Drive Current (A) | Startup Current (mA) | Undervoltage Lockout | OVP | Enable | Multiplier/ Divider Feedforward | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| UC1852 | Variable | 2.5 | No | | 0.5 | 1 | 16.3 V/11.5 V | | No | | High Power-Factor Preregulator |
| UC1853 | 0.125 | 1 | Yes | Yes | 1 | 0.25 | 11.5 V/9.5 V | Yes | No | Yes | High Power-Factor Preregulator |
| UC1854 | 0.2 | 0.8 | Yes | Yes | 1 | 1.5 | 16 V/10 V | | Yes | Yes | High Power Factor Preregulator |
| UC1854A | 0.2 | 5 | Yes | Yes | 1 | 0.3 | 16 V/10 V | | Yes | Yes | Enhanced High Power Factor Preregulator |
| UC1854B | 0.2 | 5 | Yes | Yes | 1 | 0.3 | 10.5 V/10 V | | Yes | Yes | Enhanced High Power Factor Preregulator |
| UC1855A | 0.5 | 5 | Yes | Yes | 1.5 | 0.15 | 16 V/10 V | Yes | Yes | Yes | High Performance Power Factor Preregulator |
| UC1855B | 0.5 | 5 | Yes | Yes | 1.5 | 0.15 | 10.5 V/10 V | Yes | Yes | Yes | High Performance Power Factor Preregulator |
| UC3852 | Variable | 2.5 | No | | 0.5 | 1 | 16.3 V/11.5 V | | No | | High Power-Factor Preregulator |
| UC3853 | 0.125 | 1 | Yes | Yes | 1 | 0.25 | 11.5 V/9.5 V | Yes | No | Yes | High Power-Factor Preregulator |
| UC3854 | 0.2 | 0.8 | Yes | Yes | 1 | 1.5 | 16 V/10 V | | Yes | Yes | High Power Factor Preregulator |
| UC3854A | 0.2 | 5 | Yes | Yes | 1 | 0.3 | 16 V/10 V | | Yes | Yes | Enhanced High Power Factor Preregulator |
| UC3854B | 0.2 | 5 | Yes | Yes | 1 | 0.3 | 10.5 V/10 V | | Yes | Yes | Enhanced High Power Factor Preregulator |
| UC3855A | 0.5 | 5 | Yes | Yes | 1.5 | 0.15 | 16 V/10 V | Yes | Yes | Yes | High Performance Power Factor Preregulator |
| UC3855B | 0.5 | 5 | Yes | Yes | 1.5 | 0.15 | 10.5 V/10 V | Yes | Yes | Yes | High Performance Power Factor Preregulator |
| UCC1857 | 0.5 | 5 | Yes | Yes | 1 | 0.06 | 13.8 V/10 V | | No | Yes | Isolated Boost PFC Preregulator Controller |
| UCC1858 | 0.5 | 5 | Yes | Yes | 0.5 | 0.1 | 13.8 V/10 V | Yes | Yes | Yes | High Efficiency, High Power Factor Preregulator |
| UCC2857 | 0.5 | 5 | Yes | Yes | 1 | 0.06 | 13.8 V/10 V | | No | Yes | Isolated Boost PFC Preregulator Controller |
| UCC2858 | 0.5 | 5 | Yes | Yes | 0.5 | 0.1 | 13.8 V/10 V | Yes | Yes | Yes | High Efficiency, High Power Factor Preregulator |
| UCC3817 | 0.1 | 2.5 | Yes | | | 0.15 | 16 V/10 V | Yes | Yes | Yes | BiCMOS Power Factor Preregulator |
| UCC3818 | 0.1 | 2.5 | Yes | | | 0.15 | 16 V/10 V | Yes | Yes | Yes | BiCMOS Power Factor Preregulator |
| UCC38500 | | 2.5 | Yes | | | | 16 V/10 V | Yes | Yes | Yes | BiCMOS PFC/PWM Combination Controller |
| UCC38501 | | 2.5 | Yes | | | | 10.5 V/10 V | Yes | Yes | Yes | BiCMOS PFC/PWM Combination Controller |
| UCC38502 | | 2.5 | Yes | | | | 16 V/10 V | Yes | Yes | Yes | BiCMOS PFC/PWM Combination Controller |
| UCC38503 | | 2.5 | Yes | | | | 10.5 V/10 V | Yes | Yes | Yes | BiCMOS PFC/PWM Combination Controller |
| UCC3857 | 0.5 | 5 | Yes | Yes | 1 | 0.06 | 13.8 V/10 V | | No | Yes | Isolated Boost PFC Preregulator Controller |
| UCC3858 | 0.5 | 5 | Yes | Yes | 0.5 | 0.1 | 13.8 V/10 V | Yes | Yes | Yes | High Efficiency, High Power Factor Preregulator |

## Bus Terminators




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Bus Terminators—SCSI

| Device Name | $V_{IR}$ Range (V) | $V_O$ (nom) (V) | $I_O$ per Channel (max) (mA) | $I_q$ (typ) (mA) | Shutdown | Tolerance (%) | Number of Lines | Description |
|---|---|---|---|---|---|---|---|---|
| TL2217-285 | 4.0 to 5.5 | 2.85 | 500 | 26 | No | 1.5 | 9 | Fixed-Voltage Regulators for SCSI Active Termination |
| TL2218-285 | 4.0 to 5.5 | 2.85 | –24 | 0.6 | Yes | 0.65 | 9 | Current-Mode SCSI Terminator |
| TL-SCSI285 | 4.0 to 5.5 | 2.85 | 500 | 26 | No | 1 | 9 | Fixed-Voltage Regulators for SCSI Active Termination |
| UC5601 | 4.0 to 5.25 | 2.9 | 25.4 | 25 | High | 3 | 18 | 18-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5602 | 4.0 to 5.25 | 2.9 | 25.4 | 29 | High | 7 | 18 | Cost Reduced 18-Line 5-V Terminator for SCSI and Fast SCSI |
| UC5603 | 4.0 to 5.25 | 2.9 | 25.4 | 18 | High | 3 | 9 | 9-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5604 | 4.0 to 5.25 | 2.9 | 25.4 | 20 | High | 7 | 9 | Cost Reduced 9-Line 5-V Terminator for SCSI and Fast SCSI |
| UC5605 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | Low | 5 | 9 | 9-Line 5-V SE Terminator for SCSI and Fast SCSI with Inverted Sensing & Reverse Disconnect |
| UC5608 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | High | 5 | 18 | Lower Capacitance 18-Line 5-V SE Terminator for SCSI and Fast SCSI |
| UC5609 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | Low | 5 | 18 | Lower Capacitance 18-Line 5-V SE Terminator for SCSI and Fast SCSI with Reverse Disconnect |
| UC5612 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | High | 5 | 9 | 9-Line 5-V SE Terminator for SCSI and Fast SCSI with Inverted Sensing |
| UC5613 | 4.0 to 5.25 | 2.9 | 25.4 | 0.1 | High | 5 | 9 | Lower Capacitance 9-Line 5-V SE Terminator for SCSI and Fast SCSI |

## Bus Terminators—SCSI (Continued)

| Device Name | $V_{IN}$ Range (V) | $V_O$ (nom) (V) | $I_O$ per Channel (max) (mA) | $I_q$ (typ) (mA) | Shutdown | Tolerance (%) | Number of Lines | Description |
|---|---|---|---|---|---|---|---|---|
| UCC5510 | 3 to 5.25 | 2.7 | 24 | 20 | Yes | 5 | 9 | 9-Line Multimode Terminator for Plugs and Connectors |
| UCC5606 | 2.7 to 5.25 | 2.7 | 24 | 0.001 | High | 4 | 9 | Lowest Capacitance 9-Line 3-5-V SE Terminator for SCSI Through Ultra SCSI with Reverse Disconnect |
| UCC5610 | 2.7 to 7.0 | 2.7 | 24 | 2 | High | 4 | 9 | Lowest Capacitance 18-Line 3-5-V SE Terminator for SCSI Through Ultra SCSI |
| UCC5611 | 2.7 to 7.0 | 2.7 | 24 | 2 | Low | 4 | 9 | Lowest Capacitance 18-Line 3-5-V SE Terminator for SCSI Through Ultra SCSI with Reverse Disconnect |
| UCC5614 | 2.7 to 7.0 | 2.7 | 24 | 2 | High | 4 | 9 | Lowest Capacitance 9-Line 3-5-V SE Terminator for SCSI Through Ultra SCSI |
| UCC5617 | 4.0 to 5.25 | 2.8 | 24 | 2 | Low | 5 | 18 | Lowest Capacitance 18-Line 5-V SE Terminator for SCSI Through Ultra SCSI with Inverted Sensing |
| UCC5618 | 4.0 to 5.25 | 2.8 | 24 | 2 | High | 5 | 18 | Lowest Capacitance 9-Line 5-V SE Term for SCSI Through Ultra SCSI with Inv Sensing & Rev Disconnect |
| UCC5619 | 4.0 to 7.0 | 2.8 | 24 | 2 | Low | 5 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI with Reverse Disconnect |
| UCC5620 | 4.0 to 7.0 | 2.8 | 24 | 2 | High | 7 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI |
| UCC5621 | 4.0 to 7.0 | 2.8 | 24 | 2 | Low | 5 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI with Dual Reverse Disconnect |
| UCC5622 | 4.0 to 7.0 | 2.8 | 24 | 2 | High | 5 | 27 | 27-Line 5-V SE Terminator for Fast and Ultra SCSI with Dual Disconnect |
| UCC5628 | 2.7 to 5.25 | 1.25, 1.3, 2.7 | 25.4 | 1.6 | High | 7 | 14 | 14-Line 3-5-V Multimode Terminator for SCSI Through Ultra3 SCSI |
| UCC5630A | 2.7 to 5.25 | 1.25, 2.7 | 25.4 | 1.6 | High | 5 | 9 | 9-Line 3-5-V Multimode Terminator for SCSI Through Ultra3 SCSI |
| UCC5638 | 2.7 to 5.25 | 1.25, 1.3, 2.7 | 25.4 | 1.6 | High | 5 | 15 | 15-Line 3-5-V Multimode Terminator for SCSI Through Ultra3 SCSI |
| UCC5639 | 2.7 to 5.25 | 1.25, 1.3, 2.7 | 25.4 | 1.6 | Low | 5 | 15 | 15-Line 3-5-V Multimode Terminator for SCSI Through Ultra3 SCSI with Reverse Disconnect |
| UCC5640 | 2.7 to 5.25 | 1.25, 1.3 | | | High | 5 | 9 | 9-Line 3-5-V Lvd Terminator for Ultra2 and Ultra3 SCSI |
| UCC5672 | 3.0 to 5.0 | | | | | | 9 | 9-Line 3-5-V Multimode Terminator for SCSI Through Ultra3 SCSI with Mode Change Delay |

## Bus Terminators—GTL

| Device Name | $V_O$ (max) (V) | $V_O$ (min) (V) | $I_O$ (max) (mA) | $V_{do}$ (max) (V) | $V_{do}$ (typ) (V) | $V_{IN}$ (max) (V) | Description |
|---|---|---|---|---|---|---|---|
| UC385-1 | | | 5000 | | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |
| UC382-1 | 1.515 | 1.485 | 3000 | 0.45 at 3 A | 0.45 at 3 A | 7.5 | Fast LDO Linear Regulator |
| UC285-1 | | | 5000 | | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |
| UC282-1 | 1.515 | 1.485 | 3000 | 0.45 at 3 A | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |
| UC182-1 | 1.515 | 1.485 | 3000 | 0.45 at 3 A | 0.45 at 1 A | 7.5 | Fast LDO Linear Regulator |

## Backlight Converters

**Backlight Converters**

**UC1871**
**UC1872**
**UC2871**
**UC2872**
**UC3871**
**UC3872**
**UCC1972**
**UCC2972**
**UCC3972**

**For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:**
**www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm**
**For military qualified products, refer to:**
**www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm**

## Backlight Converters

| Device Name | Control Topology | $V_{IN}$ Range (typ) (V) | $V_{ref}$ Tol (%) | Open Lamp Detect | Soft Start | External Sync | Shutdown Current (mA) | Frequency (max) (kHz) | Lamp Intensity Control | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| UC1871 | Push-Pull | 4.5 to 20 | 1.2 | Yes | Yes | Yes | 1 | 200 | Yes | Resonant Fluorescent Lamp Driver |
| UC1872 | Push-Pull | 4.5 to 24 | 1.2 | Yes | Yes | Yes | 1 | 200 | Yes | Resonant Lamp Ballast Controller |
| UC2871 | Push-Pull | 4.5 to 20 | 1.2 | Yes | Yes | Yes | 1 | 200 | Yes | Resonant Fluorescent Lamp Driver |
| UC2872 | Push-Pull | 4.5 to 24 | 1.2 | Yes | Yes | Yes | 1 | 200 | Yes | Resonant Lamp Ballast Controller |
| UC3871 | Push-Pull | 4.5 to 20 | 1.2 | Yes | Yes | Yes | 1 | 200 | Yes | Resonant Fluorescent Lamp Driver |
| UC3872 | Push-Pull | 4.5 to 24 | 1.2 | Yes | Yes | Yes | 1 | 200 | Yes | Resonant Lamp Ballast Controller |
| UCC1972 | Push-Pull | 4.5 to 25 | | Yes | | Yes | 1 | 220 | Yes | BiCMOS Cold Cathode Fluorescent Lamp Driver Controller |
| UCC2972 | Push-Pull | 4.5 to 25 | | Yes | | Yes | 1 | 220 | Yes | BiCMOS Cold Cathode Fluorescent Lamp Driver Controller |
| UCC3972 | Push-Pull | 4.5 to 25 | | Yes | | Yes | 1 | 220 | Yes | BiCMOS Cold Cathode Fluorescent Lamp Driver Controller |

## Wireless Power Management


TPS9103
TPS9104

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm
For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Wireless Power Management

| Device Name | $I_{O(CONT)}$ (max) (A) | $I_{O(CONT)}$ (max) (mA) | $I_Q$ (typ) (μA) | $V_{CC}/V_{DD}$ (max) (V) | $V_{DD}$ (max) (V) | $V_{IN}$ (max) (V) | Description |
|---|---|---|---|---|---|---|---|
| TPS9103 | 2 | 10 | 500 | 5.5 | N/A | 9 | Integrated Gaas Power Supply and Protection |
| TPS9104 | N/A | 100 | 100 | 10 | 200 | 5 | Integrated Wireless Comm Power Supply and Audio |

## MOSFET and Power Drivers

**MOSFET and Power Drivers**

| | | | |
|---|---|---|---|
| TPS2811 | TPS2833 | UC1724 | UC3706 |
| TPS2812 | TPS2834 | UC1725 | UC3707 |
| TPS2813 | TPS2835 | UC2705 | UC3708 |
| TPS2814 | TPS2836 | UC2706 | UC3709 |
| TPS2815 | TPS2837 | UC2707 | UC3710 |
| TPS2816 | UC1705 | UC2708 | UC3711 |
| TPS2817 | UC1706 | UC2709 | UC37131 |
| TPS2818 | UC1707 | UC2710 | UC37132 |
| TPS2819 | UC1708 | UC2714 | UC37133 |
| TPS2828 | UC1709 | UC2715 | UC3714 |
| TPS2829 | UC1710 | UC2724 | UC3715 |
| TPS2830 | UC1711 | UC2725 | UC3724 |
| TPS2831 | UC1714 | UC2950 | UC3725 |
| TPS2832 | UC1715 | UC3705 | |

For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/pwrmgmt/index.htm
For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## MOSFET and Power Drivers

| Device Name | $I_{CC}$ (µA) | Internal Regulator | Output Current (max) (A) | Rise/Fall Time (max) (ns) | Supply Voltage(s) (V) | Description |
|---|---|---|---|---|---|---|
| TPS2811 | 5 | Yes (8 to 40 V) | 2 | 20 | 4 to 14 | Dual High-Speed MOSFET Drivers, Inverting |
| TPS2812 | 5 | Yes (8 to 40 V) | 2 | 20 | 4 to 14 | Dual High-Speed MOSFET Drivers, Noninverting |
| TPS2813 | 5 | Yes (8 to 40 V) | 2 | 20 | 4 to 14 | Dual High-Speed MOSFET Drivers, 1 Noninverting, 1 Inverting |
| TPS2814 | 5 | No | 2 | 20 | 4 to 14 | Dual High-Speed MOSFET Drivers, and w/1 Noninverting, 1 Inverting |
| TPS2815 | 5 | No | 2 | 20 | 4 to 14 | Dual High-Speed MOSFET Drivers, 2 Input NAND |
| TPS2816 | 150 | Yes (8 to 40 V) | 2 | 25 | 4 to 14 | Single Channel High-Speed MOSFET Drivers |
| TPS2817 | 150 | Yes (8 to 40 V) | 2 | 25 | 4 to 14 | Single Channel High-Speed MOSFET Drivers |
| TPS2818 | 25 | Yes (8 to 40 V) | 2 | 25 | 4 to 14 | Single Channel High-Speed MOSFET Drivers |
| TPS2819 | 25 | Yes (8 to 40 V) | 2 | 25 | 4 to 14 | Single Channel High-Speed MOSFET Driver |
| TPS2828 | 25 | No | 2 | 25 | 4 to 14 | Single Channel High-Speed MOSFET Driver |
| TPS2829 | 25 | No | 2 | 25 | 4 to 14 | Single Channel High-Speed MOSFET Driver |
| TPS2830 | 1 | No | 2 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| TPS2831 | 1 | No | 2 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| TPS2832 | 1 | No | 2 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| TPS2833 | 1 | No | 2 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| TPS2834 | 1 | No | 2.4 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| TPS2835 | 1 | No | 2.4 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |

## MOSFET and Power Drivers (Continued)

| Device Name | $I_{CC}$ (μA) | Internal Regulator | Output Current (max) (A) | Rise/Fall Time (max) (ns) | Supply Voltage(s) (V) | Description |
|---|---|---|---|---|---|---|
| TPS2836 | 1 | No | 2.4 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| TPS2837 | 1 | No | 2.4 | 50/85 | 4.5 to 15 | Synchronous-Buck MOSFET Driver with Dead Time Control |
| UC1705 | 8000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | High-Speed Power Driver |
| UC1706 | 8000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual Output Driver |
| UC1707 | 12000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual Channel Power Driver |
| UC1708 | 18000 | Yes (5.6) | 3 | 25/25 | 5 to 35 | Dual Non-Inverting Power Driver |
| UC1709 | 10000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual High-Speed FET Driver |
| UC1710 | 26000 | No | 6 | 20/20 | 4.7 to 18 | High Current FET Driver |
| UC1711 | 41000 | Yes (7.5V) | 1.5 | 25/25 | 5 to 35 | Dual Ultra High-Speed FET Driver |
| UC1714 | 18000 | Yes (3V) | 1.0/2.0 | 30/25 | 7 to 20 | Complementary Switch FET Drivers |
| UC1715 | 18000 | Yes (3V) | 1.0/2.0 | 30/25 | 7 to 20 | Complementary Switch FET Drivers |
| UC1724 | 15000 | No | 0.5 | 30/30 | 9 to 35 | Isolated Drive Transmitter |
| UC1725 | 15000 | No | 0.5 | 30/30 | 9 to 35 | Isolated High Side FET Driver |
| UC2705 | 8000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | High-Speed Power Driver |
| UC2706 | 8000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual Output Driver |
| UC2707 | 12000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual Channel Power Driver |
| UC2708 | 18000 | Yes (5.6V) | 3 | 25/25 | 5 to 35 | Dual Non-Inverting Power Driver |
| UC2709 | 10000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual High-Speed FET Driver |
| UC2710 | 26000 | No | 6 | 20/20 | 4.7 to 18 | High Current FET Driver |
| UC2714 | 18000 | Yes (3V) | 1.0/2.0 | 30/25 | 7 to 20 | Complementary Switch FET Drivers |
| UC2715 | 18000 | Yes (3V) | 1.0/2.0 | 30/25 | 7 to 20 | Complementary Switch FET Drivers |
| UC2724 | 15000 | No | 0.5 | 30/30 | 9 to 35 | Isolated Drive Transmitter |
| UC2725 | 15000 | No | 0.5 | 30/30 | 9 to 35 | Isolated High Side FET Driver |
| UC2950 | 20000 | Yes (5V) | 4 | | 8 to 35 | Half-Bridge Bipolar Switch |
| UC3705 | 8000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | High-Speed Power Driver |
| UC3706 | 8000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual Output Driver |
| UC3707 | 12000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual Channel Power Driver |
| UC3708 | 18000 | Yes (5.6) | 3 | 25/25 | 5 to 35 | Dual Non-Inverting Power Driver |
| UC3709 | 10000 | Yes (5V) | 1.5 | 40/40 | 5 to 40 | Dual High-Speed FET Driver |
| UC3710 | 26000 | No | 6 | 20/20 | 4.7 to 18 | High Current FET Driver |
| UC3711 | 41000 | Yes (7.5V) | 1.5 | 25/25 | 5 to 35 | Dual Ultra High-Speed FET Driver |
| UC37131 | | Yes (6V) | | | 8 to 65 | Smart Power Switch |
| UC37132 | | Yes (6V) | | | 8 to 65 | Smart Power Switch |
| UC37133 | | Yes (6V) | | | 8 to 65 | Smart Power Switch |
| UC3714 | 18000 | Yes (3V) | 1.0/2.0 | 30/25 | 7 to 20 | Complementary Switch FET Drivers |
| UC3715 | 18000 | Yes (3V) | 1.0/2.0 | 30/25 | 7 to 20 | Complementary Switch FET Drivers |
| UC3724 | 15000 | No | 0.5 | 30/30 | 9 to 35 | Isolated Drive Transmitter |
| UC3725 | 15000 | No | 0.5 | 30/30 | 9 to 35 | Isolated High Side FET Driver |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

| TITLE | ORDER NO. |
|---|---|

## Data Books

| | |
|---|---|
| Power Supply Circuits Data Book, Vol. A, 1999 | SLVD003 |
| Power Supply Circuits Data Book, Vol. B, 1999 | SLVD004 |
| Power Supply Circuits Data Book, Vol. C, 1999 | SLVD005 |
| Semiconductor Group Package Outlines Reference Guide, 1998 | SSYU001D |

## Selection Guides

| | |
|---|---|
| Low Dropout Regulators Sine On, 1999 | SLYM042 |
| Power and Controls Sine On, 1999 | SLYM041 |
| Power Distribution Sine On, 1999 | SLYM026A |
| Supply Voltage Supervisors Sine On, 1999 | SLVB005A |
| 3-V Voltage Regulators Selection Guide, Mar '96 | SLVB002 |

## Application Notes

| | |
|---|---|
| Designing with the TL5001 PWM Controller | SLVA034A |
| USB Power Distribution Using the TPS2014 and TPS2015 Power Distribution Switches | SLVA037 |
| TPS382x Microprocessor Supervisory Circuits w/Watchdog Function | SLVA039 |
| TPS370x Family Application Report | SLVA045 |
| Low Cost Power Solution for TMS320c6201 DSP Applications | SLVA046 |
| TPS5625 Working with TMS320C6201 Applications | SLVA047 |
| TPS202x/3x and TPS204x/5x USB Power Distribution | SLVA049 |
| TPS2205/TPS2211 PCMCIA Switch Interface To Ricoh Cardbus™ PCMCIA Controllers | SLVA053 |
| Extended Output Voltage Adjustment Using the TPS5210 | SLVA054 |
| TPS3305 and TPS3307 Supervising DSP and Processor Applications | SLVA056 |
| Understanding Buck Power Stages in Switchmode Power Supplies | SLVA057 |
| Understanding Buck-Boost Power Stages in Switchmode Power Supplies | SLVA059 |
| DC-to-DC Converter Parallel Operation Using Droop Compensation of TPS5210 | SLVA060 |
| Understanding Boost Power Stages in Switchmode Power Supplies | SLVA061 |
| DC-to-DC Converter Derives 1.2 V From 12 V | SLVA063 |
| TMS320C62x/67x Power Supply Solutions for 1-2 DSPs Using the TL5001A and TPS7133 | SLVA066A |
| Fundamental Theory of PMOS Low-Dropout Voltage Regulators | SLVA068 |
| Providing a DSP Power Solution From +5-V or a 3.3-V Only System | SLVA069 |
| TPS6010x/TPS6011x Charge Pump | SLVA070 |
| Low Power 150-mA LDO Linear Regulators Extended Output Voltage Adjustment Range | SLVA071 |
| Technical Review of Low Dropout Voltage Regulator Operation and Performance | SLVA072 |
| TPS3801/09 – Smallest SVS for Monitoring DSPs and Processors | SLVA075 |
| Supply Voltage Drop On Fast Current Demand | SLVA076 |
| TPS312x Series Supervisory Circuits in Ultra-Low-Voltage Applications | SLVA077 |
| Understanding the Terms and Definitions of LDO Voltage Regulators | SLVA079 |
| TLC770x Series of BiCMOS Supply Voltage Supervisors | SLVAE03 |
| Supply Voltage Supervisor TL77xx Series | SLVAE04 |
| Examples of Applications with the Pulse Width Modulator TL5001 | SLVAE05 |

## Evaluation Modules and Development Tools

Each evaluation module (EVM) kit contains a fully-assembled evaluation board, a data sheet and a user's guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number, 1-800-477-8924, ext. 5800 in North America. To check availability and CE certification, and to order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see www.ti.com/sc/docs/general/distrib.htm for distributor listings.

| TITLE | ORDER NO. |
|---|---|
| TL1454: 5-V to 3.3-V and 12-V Dual Output Buck and Boost Converters | TL1454EVM-085 |
| TL5001: 5-V to 1.8-V, 3-A Small-Profile Buck Converter | TL5001EVM-103 |
| TL5001: 5-V to 2.5-V, 3-A Small-Profile Buck Converter | TL5001EVM-102 |
| TL5001: 5-V to 20-V/40-V Adjustable Boost Converter | TL5001EVM-088 |
| TL5001: 5-V to 3.3-V, 3-A Buck Converter | TL5001EVM-087 |
| TL5001: 5-V to 3.3-V, 3-A Small-Profile Buck Converter | TL5001EVM-101 |
| TL5001: 9-V to 3.3-V, 3-A Synchronous Buck Converter | TL5001EVM-089 |
| TL5001: 9-V to 3.3-V/5-V, 2.6-A Selectable Buck Converter | TL5001EVM-097 |
| TL5001A: 5-V to 1.8-V, 3-A Buck Converter | TL5001AEVM-110 |
| TL5001A: 5-V to 2.5-V, 3-A Buck Converter | TL5001AEVM-109 |
| TL5001A: 5-V to 3.3-V, 3-A Buck Converter | TL5001AEVM-108 |
| TPS5102: Dual PWM Controller with 5-V to 25-V Input and Both 3.3-V and 5-V Output Voltage at 4 A | TPS5102EVM-135 |
| TPS5103: PWM Controller with Input Voltage from 5-V to 25-V and 1.8-V Output at 4 A | TPS5103EVM-135 |
| TPS5210: TPS5210 Programmable Voltage, 20-A Evaluation Board | TPS5210EVM-119 |
| TPS5210: TPS5210 Programmable voltage, 40-A Evaluation board | TPS5210EVM-126 |
| TPS5210: TPS5210 UP Power Supply (VRM Rev. 8.3), Programmable Voltage, 19 A | TPS5210EVM-116 |
| TPS5211: TPS5211 22A VRM8.4 Power Supply Evaluation Module for Desktop PCs | TPS5211EVM-147 |
| TPS5602: 5-V Dual Hysteretic Synchronous Buck Controller at 3.3 V (3 A) and 1.8 V (4 A) | TPS5602EVM-121 |
| TPS56100: 5-V, 6-A Synchronous Buck Converter with Programmable Output | TPS56100EVM128 |
| TPS5615: 5-V to 1.5-V, 6-A Surface Mount Sync Buck Converter | TPS5615EVM-114 |
| TPS5615: 5-V to 1.5-V, 8-A Small-Profile Sync Buck Converter | TPS5615EVM-115 |
| TPS5618: 5-V to 1.8-V, 6-A Surface Mount Sync Buck Converter | TPS5618EVM-113 |
| TPS5618: 5-V to 1.8-V, 8-A Small-Profile Sync Buck Converter | TPS5618EVM-106 |
| TPS5625: 5-V to 2.5-V, 6-A Surface Mount Sync Buck Converter | TPS5625EVM-112 |
| TPS5625: 5-V to 2.5-V, 8-A Small-Profile Sync Buck Converter | TPS5625EVM-105 |
| TPS56300: Dual Output, Low Voltage Power Supply Evaluation Module for C6000 DSPs. | TPS56300EVM-139 |
| TPS5633: 5-V to 3.3-V, 6-A Surface Mount Sync Buck Converter | TPS5633EVM-111 |
| TPS5633: 5-V to 3.3-V, 8-A Small-Profile Sync Buck Converter | TPS5633EVM-104 |
| TPS60100: Evaluation Module for the Low Ripple Charge Pump TPS60100 | TPS60100EVM-131 |
| TPS60110: Evaluation Module for the Low Ripple Charge Pump TPS60110 | TPS60110EVM-132 |
| TPS6734: 5-V to 12-V 200-mA Boost Converter | TPS6734EVM |
| TPS6735: 5-V to -5-V, 200-mA Buck-Boost Converter (Inverter) | TPS6735EVM |
| TPS76901: 1-V LDO Regulator | TPS76901EVM127 |
| TPS76xxx: Dual SOT-23 LDO Test and Evaluation Board with On-board Transient-load Generator | TPS76xxxEVM-125 |
| TPS9104: Integrated Power Supply, Audio Power System | TPS9104EVM |

# RF Products

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**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

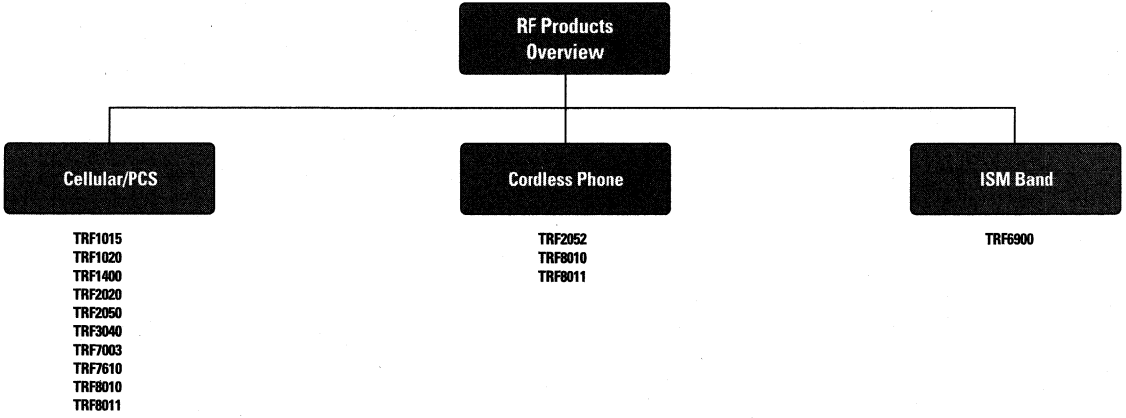
TI's wireless RF products extend the TI advantage to every major wireless system block. In addition to providing leadership performance and multi-function RF integration with minimal power consumption, TI's wireless RF products are designed for optimal performance with TI's leadership digital and analog baseband products. Optimal performance is achieved by applying TI's established systems expertise to RF product development which results in optimal RF function partitioning and integration.

This optimal integrated performance enables comprehensive wireless digital signal processing solutions which reduce system power consumption, component count and time-to-market. TI's power-efficient RF design and manufacturing process strengths are also leveraged to ensure TI's RF product portfolio achieves leadership performance.

TI's RF product thrust is part of the Wireless Communications Business Unit's strategic focus on providing comprehensive digital signal processing solutions for wireless communications systems which enable TI's customers to be competitive in their markets. TI's wireless RF products reflect TI's continued commitment to the wireless communications market and leverage the company's established expertise in analog and mixed-signal technologies.

### Web Location

| | |
|---|---|
| RF Products | www.ti.com/sc/docs/products/msp/rf/index.htm |




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/rf/index.htm

For an overview of Cellular/PCS, Cordless Phone, and ISM Band, refer to:
www.ti.com/sc/docs/products/rf/index.htm

## Cellular/PCS

| Device Name | Frequency (MHz) | Standards Supported | Operating Voltage (V) | Power Output (dBm) | Package | Description |
|---|---|---|---|---|---|---|
| TRF1015 | 869 to 894 | GSM, AMPS, IS-54/IS-136, 900-MHz cordless | 3.5 to 5.5 | | 20-pin SSOP | Receiver Front-End for 900-MHz Cellular and Digital Cordless |
| TRF1020 | 915 to 970 | GSM | 2.7 to 3.5 | | 48-pin PQFP | GSM Receiver |
| TRF1400 | 200 to 450 | RZ ASK | 4.5 to 5.5 | | 24-pin SSOP | RF Telemetry Receiver; VHF/UHF RZ Remote Control Receiver |
| TRF2020 | 800 to 1200 | GSM, 900-MHz cordless | 2.75 to 4.5 | | 20-pin TSSOP | Low-Voltage 1.2-GHz Triple Integer-N Synthesizer |
| TRF2050 | 800 to 1200 | AMPS, IS-54/IS-136, 900-MHz cordless | 2.9 to 5.1 | | 20-pin TSSOP | Low-Voltage 1.1-GHz Fractional-N/Integer-N Synthesizer |
| TRF3040 | 820 to 920 | AMPS, IS-54/IS-136, 900-MHz cordless | 3.6 to 3.9 | 11 | 48-pin PQFP | Modulator/Synthesizer |
| TRF7003 | 800 to 1000 | GSM, CDMA, AMPS, IS-54/IS-136, 900-MHz cordless | 3.6 to 4.8 | 32 | SOT-89 | Silicon RFMOS Discrete Transistor |
| TRF7610 | 800 to 1000 | GSM | 3.5 to 6.0 | 35 | 24-pin TSSOP PowerPAD™ | Power Amplifier IC for GSM |
| TRF8010 | 800 to 1000 | GSM, CDMA, AMPS, IS-54/IS-136, 900-MHz cordless | 3.0 to 5.0 | 23 | 20-pin TSSOP PowerPAD | 900-MHz Cellular |
| TRF8011 | 800 to 1000 | GSM, CDMA, AMPS, IS-54/IS-136, 900-MHz cordless | 3.0 to 5.0 | 24.5 | 20-pin TSSOP PowerPAD | 900-MHz Cellular |

## Cordless Phone

| Device Name | Functionality | Description |
|---|---|---|
| TRF2052 | Wireless Local Loop (WLL) Applications | Low-Voltage 2-GHz Synthesizer |
| TRF8010 | Operates from 3.6-V or 4.8-V Power Supplies for AMPS/NADC and GSM Applications Respectively | 900-MHz Cellular |
| TRF8011 | Operates from 4.8-V Power Supply for 900-MHz Applications | 900-MHz Cellular |

## ISM Band

| Device Name | Functionality | Description |
|---|---|---|
| TRF6900 | Low-Cost FSK Transceiver to Establish a Frequency-Agile, Half-Duplex, Bidirectional RF Link | Single-Chip Transceiver for 868-MHz and 915-MHz ISM Bands |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

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## Data Books

Semiconductor Group Package Outlines Reference Guide, 1998 . . . . . SSYU001D
Wireless & Telecommunications Products, 1996 . . . . . SLWD001

# Speech and Graphics Processors

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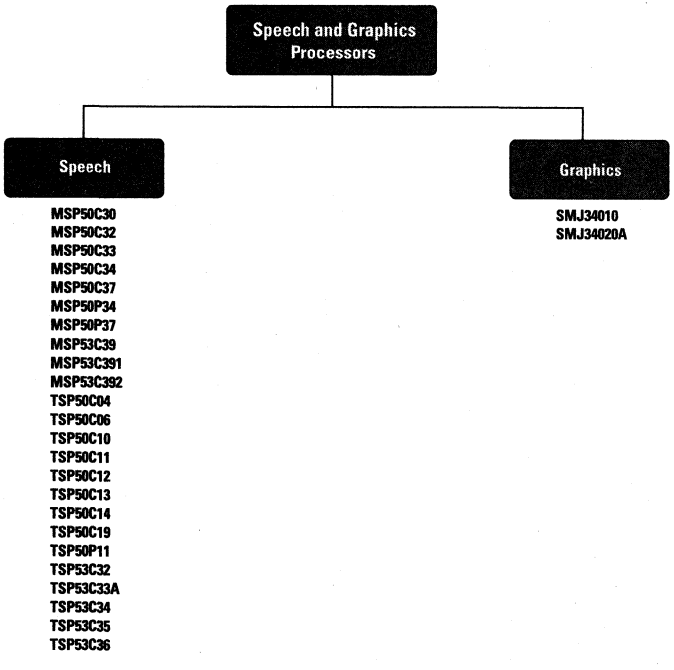
**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

**Two other resources for product information are:**

**1) the Designer's Guide CD-ROM (literature # SLYC005D)**

**2) the Semiconductor products category at the TI Web site www.ti.com**

## Speech and Graphics Processors




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/speech/index.htm

For an overview of Speech Processors, refer to:
www.ti.com/sc/docs/msp/speech/index.htm

## Speech

| Device Name | ROM (kB) | RAM (bits) | $I_O$ Pins (max) | Instruction Cycle Rate (Inst/s) | Synthesis Algorithms Supported | Direct Speaker Drive? (32 ohms) | On-Chip Oscillator | Description |
|---|---|---|---|---|---|---|---|---|
| MSP50C30 | 4 | 8320 | 28 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Long Duration Processor |
| MSP50C32 | 16 | 2176 | 10 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Masked ROM |
| MSP50C33 | 32 | 2176 | 10 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Masked ROM |
| MSP50C34 | 64 | 2176 | 24 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Masked ROM |
| MSP50C37 | 16 | 2176 | 18 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Japan Only |
| MSP50P34 | 64 | 2176 | 24 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | OTP Device |
| MSP50P37 | 16 | 2176 | 18 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Japan Only |
| MSP53C39 | 16 | 2176 | 10 | 1200000 | CELP,MELP,LPC,ADPCM | Yes | Optional | Long Duration Processor |
| MSP53C391 | 32 | 2176 | 10 | 1200000 | CELP,MELP,LPC,PCM | Yes | Yes | Long Duration Processor |
| MSP53C392 | 32 | 2176 | 10 | 1200000 | CELP,MELP,LPC,PCM | Yes | Yes | Long Duration Processor |
| TSP50C04 | 4 | 576 | 10 | 600000 | LPC,PCM | Yes | Yes | Masked ROM |
| TSP50C06 | 6 | 576 | 10 | 600000 | LPC,PCM | Yes | Yes | Masked ROM |
| TSP50C10 | 8 | 1088 | 10 | 600000 | LPC,PCM | No | No | Masked ROM |
| TSP50C11 | 16 | 1088 | 10 | 600000 | LPC,PCM | No | No | Masked ROM |
| TSP50C12 | 16 | 1088 | 10 | 600000 | LPC,PCM | Yes | Optional | Masked ROM/LCD Drive |
| TSP50C13 | 8 | 1088 | 10 | 600000 | LPC,PCM | Yes | Yes | Masked ROM |
| TSP50C14 | 16 | 576 | 10 | 600000 | LPC,PCM | Yes | Yes | Masked ROM |
| TSP50C19 | 32 | 576 | 10 | 600000 | LPC,PCM | Yes | Yes | Masked ROM |
| TSP50P11 | 16 | 1088 | 10 | 600000 | LPC,PCM | No | No | OTP; Avail. for Development Only, <100/Project |
| TSP53C32 | 8 | 1088 | 10 | 600000 | LPC | No | No | Day/Time Stamp; Female |
| TSP53C33A | 16 | 1088 | 10 | 600000 | LPC | No | No | Day/Time Stamp; Male |
| TSP53C34 | 8 | 1088 | 10 | 600000 | LPC | No | No | Day/Time Stamp; Korean |
| TSP53C35 | 8 | 1088 | 10 | 600000 | LPC | No | No | Day/Time Stamp |
| TSP53C36 | 16 | 1088 | 10 | 600000 | LPC | No | No | Day/Time Stamp; German |

## Graphics

| Device Name | Description |
|---|---|
| SMJ34010 | Graphics System Processor |
| SMJ34020A | Graphics System Processor |

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

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## Data Books

Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D

# Telecom Products

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**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book.**

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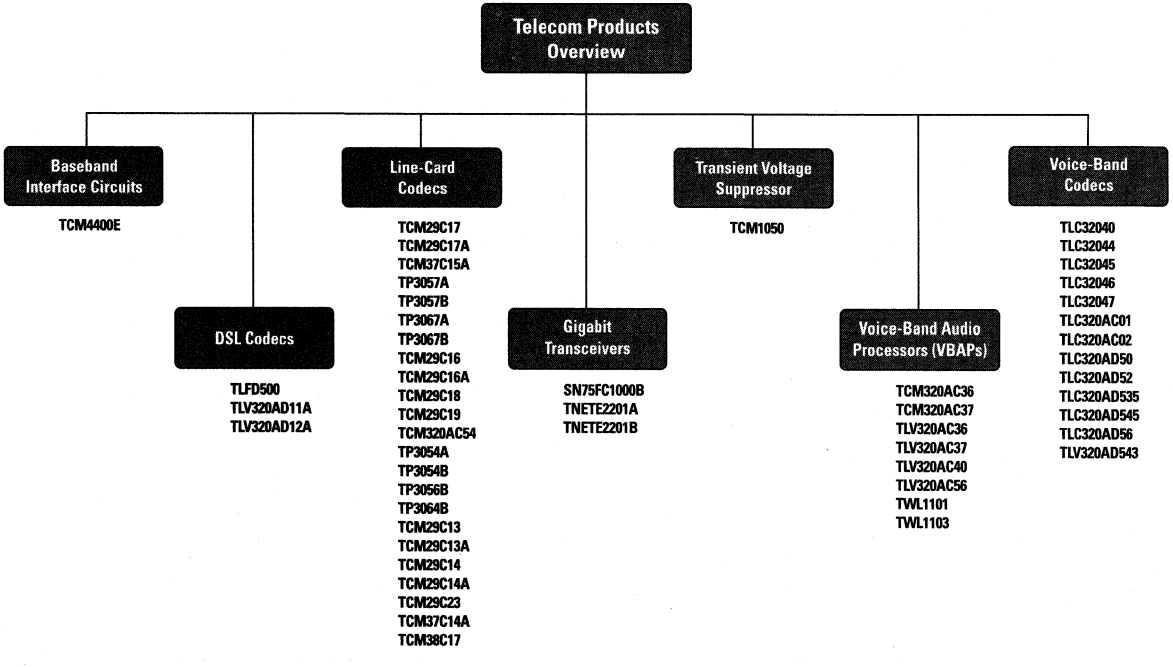
**2) the Semiconductor products category at the TI Web site www.ti.com**

## Telecom Products




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/telecom/index.htm

For military qualified Voice-Band Codecs, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## Baseband Interface Circuits

| Device Name | Description |
|---|---|
| TCM4400E | GSM/DCS Baseband and Voice A/D and D/A RF Interface Circuit |

## DSL Codecs

| Device Name | Resolution (Bits) | Conversion Rate (MSPS) | Analog Supply Voltage (V) | Digital Supply Voltage (V) | Description |
|---|---|---|---|---|---|
| TLFD500 | 14 | 1.104 | 3.3 | 3.3 | 3.3-V Integrated ADSL Codec for Central Office |
| TLV320AD11A | 14 | 2.208 | 3.3 | 3.3 | 3.3-V Integrated ADSL Codec for RT |
| TLV320AD12A | 14 | 2.208 | 3.3 | 3.3 | 3.3-V Integrated ADSL G.Lite Codec for RT |

## Line-Card Codecs

| Device Name | Companding μ-Law or A-Law | Clock Frequency (MHz) | Timing | Supply Voltage (V) | Number of Channels | Description |
|---|---|---|---|---|---|---|
| **Central Office** | | | | | | |
| TCM29C13 | both | 1.536, 1.544, 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C13A | both | 1.536, 1.544, 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C14 | both | 1.536, 1.544, 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C14A | both | 1.536, 1.544, 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C16 | μ-Law | 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C16A | μ-Law | 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C17 | A-Law | 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM29C17A | A-Law | 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter |
| TCM37C14A | both | 1.536, 1.544, 2.048 | Intel | +5 and –5 | 1 | PCM Combo with Programmable Gain Control |
| TCM37C15A | A-Law | 2.048 | Intel | +5 and –5 | 1 | PCM Combo with Programmable Gain Control |
| TCM38C17 | both | 2.048 | Intel | +5 | 4 | Four-Channel (Quad) PCM Combo |
| TP3054A | μ-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3054B | μ-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3056B | both | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3057A | A-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3057B | A-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3064B | μ-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3067A | A-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| TP3067B | A-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Combination Codec/Filter |
| **DSP Interface** | | | | | | |
| TCM29C18 | μ-Law | 2.048 | Intel | +5 and –5 | 1 | Combination Codec/Filter, Analog Interface to DSP |
| TCM29C19 | μ-Law | 1.536 | Intel | +5 and –5 | 1 | Combination Codec/Filter, Analog Interface to DSP |
| TCM29C23 | both | up to 4.096 | Intel | +5 and –5 | 1 | Combination Codec/Filter, Analog Interface to DSP |
| TCM320AC54 | μ-Law | 1.536, 1.544, 2.048 | National | +5 and –5 | 1 | Monolithic Serial Interface Combined PCM Codec and Filter |

## Gigabit Transceivers

| Device Name | $V_{CC}$ (max) (V) | $V_{CC}$ (min) (V) | $V_{CC}$ (nom) (V) | $I_{CC}$ (max) (mA) | $V_{IH}$ (max) (V) | $V_{IH}$ (min) (V) | $V_{IL}$ (max) (V) | $I_{IH}$ (max) (μA) | $I_{IL}$ (max) (μA) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| SN75FC1000B | | | | | | | | | | 1-Gigabit Fibre Channel Transceiver |
| TNETE2201A | 3.47 | 3.14 | 3.3 | 260 | 5.5 | 2 | 0.8 | 900 | –900 | 1.25-Gigabit Ethernet Transceiver |
| TNETE2201B | 3.47 | 3.14 | 3.3 | 260 | 5.5 | 2 | 0.8 | 900 | –900 | 1.25-Gigabit Ethernet Transceiver |

## Transient Voltage Suppressor

| Device Name | Description |
|---|---|
| TCM1050 | Dual Transient-Voltage Suppressors |

## Voice-Band Audio Processors (VBAPs)

| Device Name | Master Clock (MHz) | Supply Voltage (±10%) (V) | Audio In/Out | Filter | Package | I²C Programmable | Mic Bias Enable Logic | Speaker Drive | DTMF | Companding | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TCM320AC36 | 2.048 | 5 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | Voice-Band Audio Processor |
| TCM320AC37 | 2.048 | 5 | 1 | switch cap | 20/48 | No | No | | No | A-Law | Voice-Band Audio Processor |
| TLV320AC36 | 2.048 | 3 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | Voice-Band Audio Processor |
| TLV320AC37 | 2.048 | 3 | 1 | switch cap | 20/48 | No | No | | No | A-Law | Voice-Band Audio Processor |
| TLV320AC40 | 1.152 | 3 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | 3-V Voice-Band Audio Processors |
| TLV320AC56 | 2.048 | 3 | 1 | switch cap | 20/48 | No | No | | No | μ-Law | 3-V Voice-Band Audio Processors |
| TWL1101 | 2.048 | 3 | 2 | sigma-delta | 48 | Yes | No | | No | μ-Law | Voice-Band Audio Processor |
| TWL1103 | 2.048 | 3 | 2 | sigma-delta | 32 | Yes | Yes | 16/32 | Yes | both | Voice-Band Audio Processor |

## Voice-Band Codecs

| Device Name | Resolution (Bits) | Sampling Rate (kHz) | Bandwidth (kHz) | Conversion Method | Number of Channels | $P_d$ (typ) (mW) | Description |
|---|---|---|---|---|---|---|---|
| **14-Bit** | | | | | | | |
| TLC32040 | 14 | 19.2 | 0.3 to 3.4 | successive approx. | 1 | 120 | Single Channel Codec |
| TLC32044 | 14 | 19.2 | 0.15 to 3.6 | successive approx. | 1 | 125 | Single Channel Codec |
| TLC32045 | 14 | 19.2 | 0.15 to 3.6 | successive approx. | 1 | 125 | Single Channel Codec |
| TLC32046 | 14 | 25 | 0.3 to 7.3 | successive approx. | 1 | 125 | Single Channel Codec |
| TLC32047 | 14 | 25 | 0.45 to 10.95 | successive approx. | 1 | 130 | Single Channel Codec |
| TLC320AC01 | 14 | 25 | up to 10.8 | successive approx. | 1 | 100 | Single Channel Codec-Bandwidth Independent of Sampling Rate |
| TLC320AC02 | 14 | 25 | up to 10.8 | successive approx. | 1 | 100 | Single Channel Codec-Bandwidth Independent of Sampling Rate |
| **16-Bit** | | | | | | | |
| TLC320AD50 | 16 | 22.05 | up to 9.92 | sigma-delta | 1 | 120 | Single Channel Codec w/Master-Slave Function (3 Slaves) and 89-dB SNR |
| TLC320AD52 | 16 | 22.05 | up to 9.92 | sigma-delta | 1 | 120 | Single Channel Codec w/Master-Slave Function (1 Slave) |
| TLC320AD535 | 16 | 11.025 | up to 4.96 | sigma-delta | 2 | 240 | Dual Channel Codec w/Hybrid Op Amps, Speaker Driver & Microphone Interface |
| TLC320AD545 | 16 | 11.025 | up to 4.96 | sigma-delta | 1 | 120 | Single Channel Codec w/Hybrid Op Amps & Speaker Driver |
| TLC320AD56 | 16 | 22.05 | up to 8.82 | sigma-delta | 1 | 100 | Single Channel Codec with 85- to 87-dB Dynamic Range |
| TLV320AD543 | 16 | 11.025 | up to 4.96 | sigma-delta | 1 | 90 | 3-V Single Channel Codec w/Hybrid Op Amps & Speaker Driver |

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## Data Books

Semiconductor Group Package Outlines Reference Guide, 1998 ..... SSYU001D

# Video and Imaging Products

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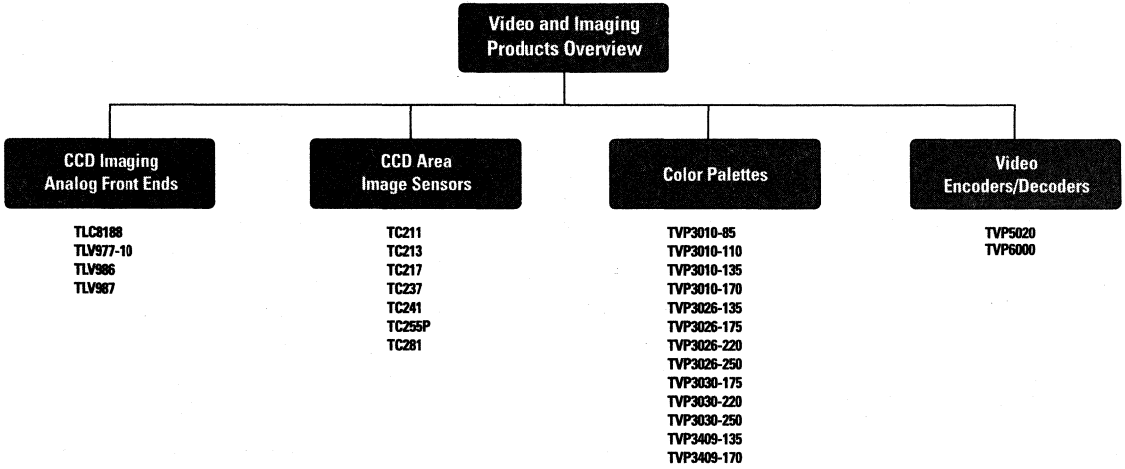
## Video and Imaging Products




For more information, refer to the Designer's Guide CD-ROM or the TI Web site at:
www.ti.com/sc/docs/products/msp/videoimg/index.htm

For an overview of CCD Imaging Analog Front Ends, refer to:
www.ti.com/sc/docs/products/msp/videoimg/ccd/index.htm

For an overview of CCD Area Image Sensors, refer to:
www.ti.com/sc/docs/msp/disp.htm

For an overview of Video Encoders/Decoders, refer to:
www.ti.com/sc/docs/products/msp/videoimg/video/video.htm

For military qualified products, refer to:
www.ti.com/sc/docs/military/product/mix_sig/mixsig_1.htm

## CCD Imaging Analog Front Ends

| Device Name | Resolution (Bits) | Samples/ Sec (MSPS) | $P_d$ (typ) (mW) | Supply Voltage(s) (V) | Gain (max) (dB) | Gain (min) (dB) | DNL (max) (±LSB) | INL (max) (±LSB) | Description |
|---|---|---|---|---|---|---|---|---|---|
| TLC8188 | 10 | 4 | 190 | 5 | 14 | 0 | ±2 | ±1 | CIS/CCD Scanner AFE Using Pipeline-Architecture ADC at 4 MSPS |
| TLV977-10 | 10 | 21 | 140 | 3 | 36 | 0 | 1 | 2 | CCD Imaging Analog Front End |
| TLV986 | 10 | 12.5 | 140 | 3 | 36 | 0 | 1.5 | 2 | 3-V, 10-Bit, 12.5-MSPS, Area CCD Sensor Processor |
| TLV987 | 10 | 27 | 200 | 3 | 36 | 0 | 1.5 | 2 | 3-V, 10-Bit, 27-MSPS, Area CCD Sensor Signal Processor |

## CCD Area Image Sensors

| Device Name | Format | Size (in) | Active Pixel Number | Pixel Size (µm) | Anti-Blooming | B/W vs. Color | Comments | Description |
|---|---|---|---|---|---|---|---|---|
| TC211 | FF | 1/6 | 192 x 165 | 13.75 x 16.0 | A-B Gate | B/W | Industrial/Scientific | 192- x 165-Pixel CCD Image Sensor |
| TC213 | FT | 1 | 1000 x 510 | 12.0 x 12.0 | A-B Gate | B/W | Industrial/Scientific | 1024- x 512-Pixel CCD Image Sensor |
| TC217 | FT_NTSC | 2/3 | 1134 x 486 | 7.8 x 13.6 | A-B Gate | B/W | High Resolution CCTV | 1158- x 488-Pixel CCD Image Sensor |
| TC237 | FT_VGA | 1/3 | 658 x 496 | 7.4 x 7.4 | L_O_Drain | B/W | VGA/Standard CCTV | 680- x 500-Pixel CCD Image Sensor Data Sheet |
| TC241 | FT_NTSC | 2/3 | 754 x 244 | 11.5 x 27.0 | A-B Gate | B/W | Std Resolution CCTV | 780- x 488-Pixel CCD Image Sensor |
| TC255P | FT_NTSC | 1/4 | 324 x 243 | 10 x 10 | A-B Gate | B/W | Low Resolution CCTV | 336- x 244-Pixel CCD Image Sensor |
| TC281 | FT | 2/3 | 1000 x 1000 | 8.0 x 8.0 | L_O_Drain | B/W | Industrial/Scientific | 1036- x 500-Pixel CCD Image Sensor |

## Color Palettes

| Device Name | Gamma Correction | Hardware Cursor | Packed Pixel | Description |
|---|---|---|---|---|
| TVP3010-110 | Yes | Yes | No | Video Interface Palette |
| TVP3010-135 | Yes | Yes | No | Video Interface Palette |
| TVP3010-170 | Yes | Yes | No | Video Interface Palette |
| TVP3010-85 | Yes | Yes | No | Video Interface Palette |
| TVP3026-135 | Yes | Yes | Yes | Video Interface Palette (RAMDAC) |
| TVP3026-175 | Yes | Yes | Yes | Video Interface Palette (RAMDAC) |
| TVP3026-220 | Yes | Yes | Yes | Video Interface Palette (RAMDAC) |
| TVP3026-250 | Yes | Yes | Yes | Video Interface Palette (RAMDAC) |
| TVP3030-175 | Yes | Yes | Yes | Video Interface Palette |
| TVP3030-220 | Yes | Yes | Yes | Video Interface Palette |
| TVP3030-250 | Yes | Yes | Yes | Video Interface Palette |
| TVP3409-135 | No | No | Yes | Video Interface Palette Extract |
| TVP3409-170 | No | No | Yes | Video Interface Palette Extract |

## Video Encoders/Decoders

| Device Name | Description |
|---|---|
| TVP5020 | NTSC/PAL Video Encoder |
| TVP6000 | NTSC/PAL Video Encoder |

## Resources

To order any of the following literature or tools by phone, contact the nearest Product Information Center listed on the last page of this book. Additional information and e-mail contact options for Analog/Mixed-Signal Products are available at the Tools & Design Assistance Web site www.ti.com/sc/docs/msp/tools/tools.htm.

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# Analog/DSP Compatibility Reference Guide

**For the latest compatibility information, visit:**
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**For device number and package definitions, see Appendix B.**

***TI is bringing DSP expertise to bear on Data Converters:***

- 8-, 16-, 32-, 64-bit dynamic external bus interface
- Upgrade path to higher resolution
- Reduced power consumption
- Unique device flexibility
- DSP-friendly interfaces
- Evaluation Modules and software drivers available on the Internet

***Processor Power***

*Switch-Mode Controllers*

- Hysteretic controller offers fast transient response to handle rapidly-changing load conditions
- High drive current a minimum of 2A
- Two families available (TPS5210 and TPS56xx)
- Evaluation modules, demonstration boards, and application notes available
- PowerPAD™ packaging available to significantly improve thermal characteristics

*Low Dropout Regulators (LDOs)*

- Large LDO portfolio designed to support the 'C6000, with roadmap to even more choices depending on application need
- Broad range of LDOs for those low-to-moderate current requirement applications

*Supply Voltage Supervisors (SVS)*

- Dual SVSs designed to support both the 'C6000's core and I/O voltage rails
- Added level of system integrity and control

## Analog-to-Digital Converters for the TMS320C6000™ DSP**

| ADC | Resolution | Conversion Rate | Power (mW) | Parallel or Serial | No. of Inputs | Supply Voltage (V) | SPI Compatible |
|---|---|---|---|---|---|---|---|
| **ADCs (<1 MSPS)** | | | | | | | |
| TLV1543 | 10 bits | 38kSPS | 4 | S | 11 | 3.3 | Yes |
| *TLV1544/8 | 10 bits | 85kSPS | 3 | S | 4 or 8 | 5 | Yes |
| *TLV1570 | 10 bits | 1.25MSPS | 8 | S | 8 | 3/5 | Yes |
| *TLV1572 | 10 bits | 1.25MSPS | 8 | S | 1 | 3/5 | Yes |
| *TLV2543 | 12 bits | 66kSPS | 3.3 | S | 11 | 3.3 | Yes |
| **ADCs (≥1 MSPS)** | | | | | | | |
| *TLC876 | 10 bits | 20MSPS | 107 | P | 1 | 3/5 | No |
| *TLV5510 | 8 bits | 10 MSPS | 40 | P | 1 | 3.3 | No |
| TLV5580 | 8 bits | 80 MSPS | 270 | P | 1 | 3.3 | No |

## Digital-to-Analog Converters for the TMS320C6000 DSP**

| ADC | Resolution | Settling Time (µs) | Power (mW) typ. | Parallel or Serial | Supply Voltage (V) | Output (V or I) | No. of DACs | SPI Compatible |
|---|---|---|---|---|---|---|---|---|
| **DACs (<10 MHz)** | | | | | | | | |
| TLV5604 | 10 bits | 3-9 | 9 | S | 3/5 | V | 4 | Yes |
| TLV5614 | 12 bits | 3-9 | 9.6 | S | 3/5 | V | 4 | Yes |
| TLV5616 | 12 bits | 3-9 | 2.1 | S | 3/5 | V | 1 | Yes |
| TLV5619 | 12 bits | 1 | 4.5 | P | 3/5 | V | 1 | No |

* Evaluation Modules available.

** Compatibility analysis done using the 'C6201

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## Voice-band Codecs for the TMS320C6000 DSP

| Part Number | Band-Pass Filter (3 dB) (Hz) | Low Pass Filter (3 dB) (Hz) | Sampling Rate (Max) (SPS) | Sin x/x Correction | Analog Supply Voltage (V) | Digital Supply Voltage (V) | Power Dissipation | Serial or Parallel | No. of Inputs |
|---|---|---|---|---|---|---|---|---|---|
| 16 Bit | | | | | | | | | |
| *TLC320AD50 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| TLC320AD52 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| *TLC320AD56 | up to 8.82kHz | 8.82k | 22.05k | No | +5 | +5/+3.3 | 100mW | S | 2 |
| TLC320AD535 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 240mW | S | 1/2 (2 ch) |
| TLC320AD545 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 120mW | S | 1 |
| TLV320AD543 | up to 4.96kHz | 4.96k | 11.025k | No | +3 | +3 | 90mW | S | 1 |

* Evaluation Modules available.

## Power Management Products for the TMS320C6000 DSP

| DSP Family | DSP Supply Voltage | SVS | DSP Power Only | Supply Current: 5A LDO | Supply Current: System Level <4A - 20+A Single DC-DC | Supply Current: >4 - 20+A Dual DC-DC |
|---|---|---|---|---|---|---|
| TMS320C6201B | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6202 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6202B | 1.5V core<br>3.3V I/O | TPS3123G15<br>TPS3824-33 | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6203 | 1.5V core<br>3.3V I/O | TPS3123G15<br>TPS3824-33 | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6204 | 1.5V core<br>3.3V I/O | TPS3123G15<br>TPS3824-33 | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6205 | 1.5V core<br>3.3V I/O | TPS3123G15<br>TPS3824-33 | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6211 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6701 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | UCC383-ADJ<br>TPS76633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |
| TMS320C6711 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | UCC383-ADJ<br>TPS77633 | UC385-ADJ<br>UC385-ADJ | TPS56100 or<br>TPS5103 | TPS5602 or<br>TPS5102 |

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***Processor Power***

*Switch-Mode Controllers*

- Hysteretic controller offers fast transient response to handle rapidly-changing load conditions
- High drive current a minimum of 2A
- Two families available (TPS5210 and TPS56xx)
- Evaluation modules, demonstration boards, and application notes available
- PowerPAD™ packaging available to significantly improve thermal characteristics

*Low Dropout Regulators (LDOs)*

- Large LDO portfolio designed to support the 'C5000, with roadmap to even more choices depending on application need
- Broad range of LDOs for those low-to-moderate current requirement applications

*Supply Voltage Supervisors (SVS)*

- Dual SVSs designed to support both the 'C5000's core and I/O voltage rails
- Added level of system integrity and control

## Analog-to-Digital Converters for the TMS320C5000™ DSP

| ADC | Resolution | Conversion Rate | Power (mW) | Parallel or Serial | No. of Inputs | Supply Voltage (V) | SPI Compatible |
|---|---|---|---|---|---|---|---|
| **ADCs (<1 MSPS)** | | | | | | | |
| TLC1550 | 10 bits | 164kSPS | 10 | P | 1 | 5 | No |
| TLC1551 | 10 bits | 164kSPS | 10 | P | 1 | 5 | No |
| *TLC2543 | 12 bits | 66kSPS | 5 | S | 11 | 5 | Yes |
| *TLV1544/8 | 10 bits | 85kSPS | 3 | S | 4 or 8 | 5 | Yes |
| *TLV1570 | 10 bits | 1.25MSPS | 8 | S | 8 | 3/5 | Yes |
| *TLV1572 | 10 bits | 1.25MSPS | 8 | S | 1 | 3/5 | Yes |
| *TLV2543 | 12 bits | 66kSPS | 3.3 | S | 11 | 3.3 | Yes |
| **ADCs (≥1 MSPS)** | | | | | | | |
| *TLC876 | 10 bits | 20MSPS | 107 | P | 1 | 3/5 | No |
| *TLC5510 | 8 bits | 20MSPS | 90 | P | 1 | 3.3 | No |
| *TLC5540 | 8 bits | 40MSPS | 85 | P | 1 | 5 | No |
| *TLV5510 | 8 bits | 10 MSPS | 40 | P | 1 | 3.3 | No |
| TLV5580 | 8 bits | 80 MSPS | 270 | P | 1 | 3.3 | No |

## Digital-to-Analog Converters for the TMS320C5000 DSP

| ADC | Resolution | Settling Time (µs) | Power (mW) typ. | Parallel or Serial | Supply Voltage (V) | Output (V or I) | No. of DACs | SPI Compatible |
|---|---|---|---|---|---|---|---|---|
| **DACs (<10 MHz)** | | | | | | | | |
| TLC5617A | 10 bits | 2.5-12.5 | 8.8 | S | 5 | V | 2 | Yes |
| TLC5618A | 12 bits | 2.5-12.5 | 8.8 | S | 5 | V | 2 | Yes |
| TLC7225 | 8 bits | 5 | 75 | P | 5/15 | V | 4 | No |
| TLC7226 | 8 bits | 5 | 96 | P | 15 | V | 4 | No |
| TLC7524 | 8 bits | 0.1 | 5 | P | 5/15 | I | 1 | No |
| TLC7528 | 8 bits | 0.1 | 10 | P | 5/15 | I | 2 | No |
| TLC7628 | 8 bits | 0.1 | 20 | P | 11/15 | I | 2 | No |
| TLV5604 | 10 bits | 3-9 | 9 | S | 3/5 | V | 4 | Yes |
| TLV5614 | 12 bits | 3-9 | 9.6 | S | 3/5 | V | 4 | Yes |
| TLV5616 | 12 bits | 3-9 | 2.1 | S | 3/5 | V | 1 | Yes |

* Evaluation Modules available.

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## Voice-band Codecs for the TMS320C5000 DSP

| Part Number | Bank Pass Filter (3 dB) (Hz) | Low Pass Filter (3 dB) (Hz) | Sampling Rate (Max) (SPS) | Sin x/x Correction | Analog Supply Voltage (V) | Digital Supply Voltage (V) | Power Dissipation | Serial or Parallel | No. of Inputs |
|---|---|---|---|---|---|---|---|---|---|
| **14 Bit** | | | | | | | | | |
| TLC32040 | 300 - 3400 Hz | 3400 Hz | 19.2 kHz | No | +/-5 | +/-5 | 120mW | S | 2 |
| TLC32044 | 150 - 3600 Hz | 3600 Hz | 19.2k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32045 | 150 - 3600 Hz | 3600 Hz | 19.2k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32046 | 300 - 7300 Hz | 7300 Hz | 25k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32047 | 450 - 10.95kHz | 10.95k | 25k | Yes | +/-5 | +/-5 | 130mW | S | 2 |
| TLC320AC01 | up to 10.8kHz | 10.8k | 25k | Yes | +5 | +/-5 | 100mW | S | 2 |
| TLC320AC02 | up to 10.8kHz | 10.8k | 25k | Yes | +5 | +/-5 | 100mW | S | 2 |
| **16 Bit** | | | | | | | | | |
| *TLC320AD50 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| TLC320AD52 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| *TLC320AD56 | up to 8.82kHz | 8.82k | 22.05k | No | +5 | +5/+3.3 | 100mW | S | 2 |
| TLC320AD535 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 240mW | S | 1/2 (2 ch) |
| TLC320AD545 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 120mW | S | 1 |
| TLV320AD543 | up to 4.96kHz | 4.96k | 11.025k | No | +3 | +3 | 90mW | S | 1 |

* Evaluation Modules available.

## Power Management Products for the TMS320C5000 DSP

| | | | | Supply Current | | | | System Level | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DSP Family | DSP Supply Voltage | SVS | DSP Power Only | <80mA Charge pump | <250 mA LDO | <500 mA LDO | 750mA - 1A Ich Dual LDO + SVS | <1A LDO | <1A - 6A SWITCH | >3 - 25A SWITCH |
| TMS320C541 | 5V | TPS3823-50 | TPS76350 | TPS60110 | TPS76650 | TPS7150 | - | TPS76850 | TL5001A | TPS5103 |
| TMS320C542 | 5V | TPS3823-50 | TPS76350 | TPS60110 | TPS76650 | TPS7150 | - | TPS76850 | TL5001A | TPS5103 |
| TMS320LC541 | 3.3V | TPS3823-33 | TPS76333 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC541B | 3.3V | TPS3823-33 | TPS76333 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC542 | 3.3V | TPS3823-33 | TPS76333 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC543 | 3.3V | TPS3823-33 | TPS76333 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC545A | 3.3V | TPS3823-33 | TPS76333 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC546A | 3.3V | TPS3823-33 | TPS76333 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC548 | 3.3V | TPS3823-33 | TPS76633 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320LC549 | 3.3V | TPS3823-33 | TPS76633 | TPS60100 | TPS76633 | TPS77633 | - | TPS76833 | - | TPS56100 |
| TMS320VC549 | 2.5V core<br>3.3V I/O | TPS3305-25<br>(dual) | TPS76325<br>TPS76333 | - <br>TPS60100 | TPS76625<br>TPS76633 | TPS77625<br>TPS77633 | TPS767D325 | TPS76825<br>TPS76833 | - <br>- | TPS5602 or<br>TPS5102 |
| TMS320VC5402 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | TPS76318<br>TPS76333 | - <br>TPS60100 | TPS76618<br>TPS76633 | TPS77618<br>TPS77633 | TPS767D318 | TPS76818<br>TPS76833 | - <br>- | TPS5602 or<br>TPS5102 |
| TMS320VC5409 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | TPS76318<br>TPS76333 | - <br>TPS60100 | TPS76618<br>TPS76633 | TPS77618<br>TPS77633 | TPS767D318 | TPS76818<br>TPS76833 | - <br>- | TPS5602 or<br>TPS5102 |
| TMS320VC5410 | 2.5Vcore<br>3.3VI/O | TPS3305-25<br>(dual) | TPS76625<br>TPS76333 | - <br>TPS60100 | TPS76625<br>TPS76633 | TPS77625<br>TPS7133 | TPS767D325 | TPS76825<br>TPS76833 | - <br>- | TPS5602 or<br>TPS5102 |
| TMS320VC5416 | 1.5Vcore<br>3.3VI/O | TPS3123G15<br>TPS3824-33 | TPS76615<br>TPS76333 | - <br>TPS60100 | TPS76615<br>TPS76633 | TPS77615<br>TPS77633 | TPS767D301 | TPS76815<br>TPS76833 | - <br>- | TPS5602 or<br>TPS5102 |
| TMS320VC5420 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | TPS76618<br>TPS76333 | - <br>TPS60100 | TPS76618<br>TPS76633 | TPS77618<br>TPS77633 | TPS767D318 | TPS76818<br>TPS76833 | - <br>- | TPS5602 or<br>TPS5102 |

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- PowerPAD™ packaging available to significantly improve thermal characteristics

*Low Dropout Regulators (LDOs)*

- Large LDO portfolio designed to support the 'C2000, with roadmap to even more choices depending on application need
- Broad range of LDOs for those low-to-moderate current requirement applications

*Supply Voltage Supervisors (SVS)*

- Dual SVSs designed to support both the 'C2000's core and I/O voltage rails
- Added level of system integrity and control

## Analog-to-Digital Converters for the TMS320C2000™ DSP

| ADC | Resolution | Conversion Rate | Power (mW) | Parallel or Serial | No. of Inputs | Supply Voltage (V) | SPI Compatible |
|---|---|---|---|---|---|---|---|
| **ADCs (<1 MSPS)** | | | | | | | |
| +TLC540 | 8 bits | 75kSPS | 6 | S | 11 | 5 | Yes |
| +TLC541 | 8 bits | 40KSPS | 6 | S | 11 | 5 | Yes |
| +TLC542 | 8 bits | 25kSPS | 6 | S | 11 | 5 | Yes |
| +TLC545 | 8 bits | 76kSPS | 6 | S | 19 | 5 | Yes |
| +TLC546 | 8 bits | 40kSPS | 6 | S | 19 | 5 | Yes |
| +TLC548 | 8 bits | 45kSPS | 8 | S | 1 | 5 | Yes |
| +TLC549 | 8 bits | 40kSPS | 8 | S | 1 | 5 | Yes |
| +TLC1541 | 10 bits | 32kSPS | 6 | S | 11 | 5 | Yes |
| +TLC1542 | 10 bits | 38kSPS | 4 | S | 11 | 5 | Yes |
| +TLC1543 | 10 bits | 38kSPS | 4 | S | 11 | 5 | Yes |
| +TLC1549 | 10 bits | 38kSPS | 4 | S | 11 | 5 | Yes |
| TLC1550 | 10 bits | 164kSPS | 10 | P | 1 | 5 | No |
| TLC1551 | 10 bits | 164kSPS | 10 | P | 1 | 5 | No |
| *TLC2543 | 12 bits | 66kSPS | 5 | S | 11 | 5 | Yes |
| +TLV1543 | 10 bits | 38kSPS | 4 | S | 11 | 3.3 | Yes |
| *TLV1544 | 10 bits | 85kSPS | 3 | S | 4 | 5 | Yes |
| *TLV1548 | 10 bits | 85kSPS | 3 | S | 8 | 3/5 | Yes |
| *TLV1570 | 10 bits | 1.25MSPS | 8 | S | 8 | 3/5 | Yes |
| *TLV1572 | 10 bits | 1.25MSPS | 8 | S | 1 | 3/5 | Yes |
| *TLV2543 | 12 bits | 66kSPS | 3.3 | S | 11 | 3.3 | Yes |
| **ADCs (≥1 MSPS)** | | | | | | | |
| *TLC876 | 10 bits | 20MSPS | 107 | P | 1 | 3/5 | No |
| *TLC5510 | 8 bits | 20MSPS | 90 | P | 1 | 3.3 | No |
| *TLC5540 | 8 bits | 40MSPS | 85 | P | 1 | 5 | No |
| *TLV5510 | 8 bits | 10 MSPS | 40 | P | 1 | 3.3 | No |
| TLV5580 | 8 bits | 80 MSPS | 270 | P | 1 | 3.3 | No |

## Digital-to-Analog Converters for the TMS320C2000 DSP

| ADC | Resolution | Settling Time (µs) | Power (mW) typ. | Parallel or Serial | Supply Voltage (V) | Output (V or I) | No. of DACs | SPI Compatible |
|---|---|---|---|---|---|---|---|---|
| **DACs (<10 MHz)** | | | | | | | | |
| +TLC5615 | 10 bits | 12.5 | 1.3 | S | 5 | V | 1 | Yes |
| TLC5617A | 10 bits | 2.5-12.5 | 8.8 | S | 5 | V | 2 | Yes |
| TLC5618A | 12 bits | 2.5-12.5 | 8.8 | S | 5 | V | 2 | Yes |
| TLC7225 | 8 bits | 5 | 75 | P | 5/15 | V | 4 | No |
| TLC7226 | 8 bits | 5 | 96 | P | 15 | V | 4 | No |
| TLC7524 | 8 bits | 0.1 | 5 | P | 5/15 | I | 1 | No |
| TLC7528 | 8 bits | 0.1 | 10 | P | 5/15 | I | 2 | No |
| TLC7628 | 8 bits | 0.1 | 20 | P | 11/15 | I | 2 | No |
| TLV5604 | 10 bits | 3-9 | 9 | S | 3/5 | V | 4 | Yes |
| TLV5614 | 12 bits | 3-9 | 9.6 | S | 3/5 | V | 4 | Yes |
| TLV5616 | 12 bits | 3-9 | 2.1 | S | 3/5 | V | 1 | Yes |
| TLV5619 | 12 bits | 1 | 4.5 | P | 3/5 | V | 1 | No |

+ Only 'C24x compatible

* Evaluation Modules available.

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## Voice-band Codecs for the TMS320C2000 DSP

| Part Number | Band Pass Filter (3 dB) (Hz) | Low Pass Filter (3 dB) (Hz) | Sampling Rate (Max) (SPS) | Sin x/x Correction | Analog Supply Voltage (V) | Digital Supply Voltage (V) | Power Dissipation | Serial or Parallel | No. of Inputs |
|---|---|---|---|---|---|---|---|---|---|
| 14 Bit | | | | | | | | | |
| TLC32040 | 300 - 3400 Hz | 3400 Hz | 19.2 kHz | No | +/-5 | +/-5 | 120mW | S | 2 |
| TLC32044 | 150 - 3600 Hz | 3600 Hz | 19.2k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32045 | 150 - 3600 Hz | 3600 Hz | 19.2k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32046 | 300 - 7300 Hz | 7300 Hz | 25k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32047 | 450 - 10.95kHz | 10.95k | 25k | Yes | +/-5 | +/-5 | 130mW | S | 2 |
| TLC320AC01 | up to 10.8kHz | 10.8k | 25k | Yes | +5 | +5 | 100mW | S | 2 |
| TLC320AC02 | up to 10.8kHz | 10.8k | 25k | Yes | +5 | +5 | 100mW | S | 2 |
| 16 Bit | | | | | | | | | |
| *TLC320AD50 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| TLC320AD52 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| *TLC320AD56 | up to 8.82kHz | 8.82k | 22.05k | No | +5 | +5/+3.3 | 100mW | S | 2 |
| TLC320AD535 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 240mW | S | 1/2 (2 ch) |
| TLC320AD545 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 120mW | S | 1 |

* Evaluation Modules available.

## Power Management Products for the TMS320C2000 DSP

| DSP Family | DSP Supply Voltage | SVS | DSP Reset Only | Supply Current: System Level: <250 mA LDO | <500 mA LDO | <1A LDO | <3A LDO | <1.2mA SWITCH |
|---|---|---|---|---|---|---|---|---|
| TMS320C203-80 | 5V | TPS3823-50 | TPS76350 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320LC203-40 | 3.3V | TPS3823-33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320C206-40 | 3.3V | TPS3305-33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS5602 or |
| | 5V I/O | (dual) | TPS76350 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5102 |
| TMS320LC206-40 | 3.3V | TPS3823-33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320F206 | 5V | TPS3823-50 | TPS76350 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320C209-57 | 5V | TPS3823-50 | TPS76350 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320C240 | 5V | TPS3809I50 | TPS76650 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320F240 | 5V | TPS3809I50 | TPS76650 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320F241 | 5V | TPS3809I50 | TPS76650 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320C242 | 5V | TPS3809I50 | TPS76650 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320F243 | 5V | TPS3809I50 | TPS76650 | TPS76650 | TPS7150 | TPS76850 | UCC383-5 | TPS5103 |
| TMS320LC2402 | 3.3V | TPS3809K33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320LF2402 | 3.3V | TPS3809K33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320LC2404 | 3.3V | TPS3809K33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320LC2406 | 3.3V | TPS3809K33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320LF2406 | 3.3V | TPS3809K33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |
| TMS320LF2407 | 3.3V | TPS3809K33 | TPS76333 | TPS76633 | TPS77633 | TPS76833 | UCC383-3 | TPS56100 |

To order any of the EVM kits, please call our toll-free order desk number 1-800-477-8924, ext. 5800 in North America. To order in Europe, Asia and other regions, contact the TI Product Information Center for your country as listed on the last page of this book. Or, contact your local TI distributor; see **www.ti.com/sc/docs/general/distrib.htm** for distributor listings.

***TI DSP and TI Advanced Analog Products = World's Leading Digital Signal Processing Solutions***

*Our products offer a range of interface options and are also available in supply voltages ranging from 2.7 V to 15 V.*

***Processor Power***

*Switch-Mode Controllers*

- Hysteretic controller offers fast transient response to handle rapidly-changing load conditions
- High drive current a minimum of 2A
- Two families available (TPS5210 and TPS56xx)
- Evaluation modules, demonstration boards, and application notes available
- PowerPAD™ packaging available to significantly improve thermal characteristics

*Low Dropout Regulators (LDOs)*

- Large LDO portfolio designed to support the 'C3x, with roadmap to even more choices depending on application need
- Broad range of LDOs for those low-to-moderate current requirement applications

*Supply Voltage Supervisors (SVS)*

- Dual SVSs designed to support both the 'C3x's core and I/O voltage rails
- Added level of system integrity and control

## Analog-to-Digital Converters for the TMS320C3x DSP

| ADC | Resolution | Conversion Rate | Power (mW) | Parallel or Serial | No. of Inputs | Supply Voltage (V) | SPI Compatible |
|---|---|---|---|---|---|---|---|
| **ADCs (<1 MSPS)** | | | | | | | |
| TLC1550 | 10 bits | 164kSPS | 10 | P | 1 | 5 | No |
| TLC1551 | 10 bits | 164kSPS | 10 | P | 1 | 5 | No |
| *TLC2543 | 12 bits | 66kSPS | 5 | S | 11 | 5 | Yes |
| *TLV1544/8 | 10 bits | 85kSPS | 3 | S | 4 or 8 | 5 | Yes |
| *TLV1570 | 10 bits | 1.25MSPS | 8 | S | 8 | 3/5 | Yes |
| *TLV1572 | 10 bits | 1.25MSPS | 8 | S | 1 | 3/5 | Yes |
| *TLV2543 | 12 bits | 66kSPS | 3.3 | S | 11 | 3.3 | Yes |
| **ADCs (≥1 MSPS)** | | | | | | | |
| *TLC876 | 10 bits | 20MSPS | 107 | P | 1 | 3/5 | No |
| *TLC5510 | 8 bits | 20MSPS | 90 | P | 1 | 3.3 | No |
| *TLC5540 | 8 bits | 40MSPS | 85 | P | 1 | 5 | No |
| *TLV5510 | 8 bits | 10 MSPS | 40 | P | 1 | 3.3 | No |
| TLV5580 | 8 bits | 80 MSPS | 270 | P | 1 | 3.3 | No |

## Digital-to-Analog Converters for the TMS320C3x DSP

| ADC | Resolution | Settling Time (µs) | Power (mW) typ. | Parallel or Serial | Supply Voltage (V) | Output (V or I) | No. of DACs | SPI Compatible |
|---|---|---|---|---|---|---|---|---|
| **DACs (<10 MHz)** | | | | | | | | |
| TLC5617A | 10 bits | 2.5-12.5 | 8.8 | S | 5 | V | 2 | Yes |
| TLC5618A | 12 bits | 2.5-12.5 | 8.8 | S | 5 | V | 2 | Yes |
| TLC7225 | 8 bits | 5 | 75 | P | 5/15 | V | 4 | No |
| TLC7226 | 8 bits | 5 | 96 | P | 15 | V | 4 | No |
| TLC7524 | 8 bits | 0.1 | 5 | P | 5/15 | I | 1 | No |
| TLC7528 | 8 bits | 0.1 | 10 | P | 5/15 | I | 2 | No |
| TLC7628 | 8 bits | 0.1 | 20 | P | 11/15 | I | 2 | No |
| TLV5604 | 10 bits | 3-9 | 9 | S | 3/5 | V | 4 | Yes |
| TLV5614 | 12 bits | 3-9 | 9.6 | S | 3/5 | V | 4 | Yes |
| TLV5616 | 12 bits | 3-9 | 2.1 | S | 3/5 | V | 1 | Yes |
| TLV5619 | 12 bits | 1 | 4.5 | P | 3/5 | V | 1 | No |

* Evaluation Modules available.

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## Voice-band Codecs for the TMS320C3x DSP

| Part Number | Bank Pass Filter (3 dB) (Hz) | Low Pass Filter (3 dB) (Hz) | Sampling Rate (Max) (SPS) | Sin x/x Correction | Analog Supply Voltage (V) | Digital Supply Voltage (V) | Power Dissipation | Serial or Parallel | No. of Inputs |
|---|---|---|---|---|---|---|---|---|---|
| 14 Bit | | | | | | | | | |
| TLC32040 | 300 - 3400 Hz | 3400 Hz | 19.2 kHz | No | +/-5 | +/-5 | 120mW | S | 2 |
| TLC32044 | 150 - 3600 Hz | 3600 Hz | 19.2k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32045 | 150 - 3600 Hz | 3600 Hz | 19.2k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32046 | 300 - 7300 Hz | 7300 Hz | 25k | Yes | +/-5 | +/-5 | 125mW | S | 2 |
| TLC32047 | 450 - 10.95kHz | 10.95k | 25k | Yes | +/-5 | +/-5 | 130mW | S | 2 |
| TLC320AC01 | up to 10.8kHz | 10.8k | 25k | Yes | +5 | +/-5 | 100mW | S | 2 |
| TLC320AC02 | up to 10.8kHz | 10.8k | 25k | Yes | +5 | +/-5 | 100mW | S | 2 |
| 16 Bit | | | | | | | | | |
| *TLC320AD50 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| TLC320AD52 | up to 9.92kHz | 9.92k | 22.05k | No | +5 | +5/+3.3 | 120mW | S | 2 |
| *TLC320AD56 | up to 8.82kHz | 8.82k | 22.05k | No | +5 | +5/+3.3 | 100mW | S | 2 |
| TLC320AD535 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 240mW | S | 1/2 (2 ch) |
| TLC320AD545 | up to 4.96kHz | 4.96k | 11.025k | No | +5/+3.3 | +5/+3.3 | 120mW | S | 1 |

* Evaluation Modules available.

## Power Management Products for the TMS320C3x DSP

| DSP Family | DSP Supply Voltage | SVS | Supply Current: DSP Power Only | Supply Current: System Level <250 mA LDO | Supply Current: System Level <500 mA LDO | Supply Current: System Level <1A LDO | Supply Current: System Level <3A LDO | Supply Current: System Level <1-20+A SWITCH |
|---|---|---|---|---|---|---|---|---|
| TMS320C30 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C30-27 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C30-40 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C30-50 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C31-40 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C31-50 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C31-60 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C31-80 | 5V core | TPS3823-50 | TPS7150 | N/A | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C32-40 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C32-50 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320C32-60 | 5V core | TPS3823-50 | TPS7150 | TPS7250 | TPS7350 | TPS76750 | UCC383-5 | TPS5103 |
| TMS320LC31 | 3.3V core | TPS3823-33 | TPS7133 | TPS7233 | TPS7333 | TPS76733 | UCC383-3 | TPS56100 |
| TMS320LC31-40 | 3.3V core | TPS3823-33 | TPS7133 | TPS7233 | TPS7333 | TPS76733 | UCC383-3 | TPS56100 |
| TMS320VC33-120 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | TPS76318<br>TPS76333 | TPS76618<br>TPS76633 | TPS77618<br>TPS77633 | TPS767D318<br>(dual) | TPS76818<br>TPS76833 | TPS5602 or<br>TPS5102 |
| TMS320VC33-150 | 1.8V core<br>3.3V I/O | TPS3305-18<br>(dual) | TPS76318<br>TPS76333 | TPS76618<br>TPS76633 | TPS77618<br>TPS77633 | TPS767D318<br>(dual) | TPS76818<br>TPS76833 | TPS5602 or<br>TPS5102 |

**To order free Data Converter or Power Supply samples, go to www.ti.com/sc/docs/msp/c3x.htm**

# Device Number Ordering Guide

This appendix provides a part number breakdown for TI Analog/Mixed-Signal Products and Products from the acquisition of Unitrode/Benchmarq and Power Trends. In general, acquired products will maintain their original part numbers in the TI order system. Product origination may be determined in most cases by the part number prefix:

UC, UCC—Unitrode
BQ—Benchmarq
PT—Power Trends

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**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book. Refer to Appendix C for a device index that includes literature and package information by device.**

**TI Part Number Example** **TLV 2442 A I D R**

| Products | Prefix Options | Typical Device Number | Optional Suffix | Temperature Suffix Options | Package Suffix Options | Carrier Suffix Options |
|---|---|---|---|---|---|---|
| **Amplifiers & Comparators** | LF, LM, LP, LT, MC, NE, OP, RC, SE, THS, TL, TLC, TLE, TLV, TPA, UA | 2442 | A, B | C, I, M, Q, Y, Z | D, DB, DBV, DCA, DGK, DGN, DGQ, DGS, DW, DWP, FK, J, JG, N, NE, NS, P, PS, PW, PWP, U, W, Y | R, T |
| **Audio** | TAS, TLC, TPA, TUSB | 0112 | | | D, DB, DBT, DCA, DGN, DL, DW, DWP, FN, NE, PW, PWP | |
| **Clocks & Timers** | CDC, CDCF, CDCR, TLC, NE | 2509, 555 | A, B | I | D, DB, DBQ, DGG, DL, DW, FN, N, PAH, PW | R |
| **Control & Monitoring** | TPIC, THMC | 2101 | n/a | n/a | D, DA, DB, DBQ, DW, DWP, J, KTA, KTC, KTR, KTS, N, NE, P, PS | R |
| **Data Converters** | ICL, TL, TLC, TLV, TMS | 0820 | A | C, I, E, M, Q | CN, D, DA, DB, DL, DW, DWB, FK, FN, FR, J, JB, N, NS, NW, P, PFB, PM, PT, PW | R |
| **Interface Products** | AM, LT, MAX, SN, TL, TSB, TUSB, UA, UC | 75LBC176 | A, B | C, I, M | D, DB, DGG, DGK, DGN, DL, DW, FK, FN, GFN, HV, J, JG, N, NS, NT, P, PAG, PBK, PBM, PDV, PFB, PFP, PGF, PH, PM, PN, PS, PT, PW, PZ, VF, WN | R |
| **Micro-controllers** | MSP | 430 | S | I | DL, DW, FN, FZ, HFD, JL, PG, PJM, PM, SZ | n/a |
| **Power Management Products** | LM, LT, MC, SG, TL, TLC, TLE, TLV, TPS, UA, UC | 2202 | A | C, I, M, Q, Y | D, DAP, DB, DBV, DCS, DF, DW, FK, J, JG, KC, KTE, KTG, KTP, LP, N, NS, P, PK, PS, PT, PW, PWP, U, Y | R |
| **RF Products** | TRF | 1015 | A, B | n/a | DB, PFB, PK, PW, PWP | n/a |
| **Speech & Graphics Proc.** | MSP, SMJ, TSP | 50C30 | A | | DW, FD, GB, HT, N, NL, PCM, PJM, Y | |
| **Telecom** | SN, TCM, TLC, TLFD, TLV, TNETE, TP, TWL | 3057 | A, B | | D, DL, DW, FK, FN, J, N, P, PET, PFB, PHD, PJD, PM, PN, PSB, PT, PZ | |
| **Video & Imaging** | TC, TLC, TLV, TVP | 3010 | | | CCD, DA, FN, GA, JD, MDN, MEP, PCE, PFB, PFP, PPA | |

## Temperature Suffix Definitions

Some temperature suffixes have alternative temperature ranges.

C = 0 to 70°C (Commercial)
I, E = –40 to 85°C (Industrial)
M = –55 to 125°C (Military)
Q = –40 to 125°C
Y = 25°C
Z = –40 to 150°C

## Carrier Suffix Options

R = Available Taped-and-Reeled

T = Available Taped-and Reeled (small quantity)

## Package Suffix Definitions

Refer to Appendix C for package availability by device number.

D: Small Outline Package (SOP)
DA: Thin Shrink Small-Outline Package (TSSOP)
DAP: PowerPAD™ Plastic Small-Outline Package
DB: Shrink Small-Outline Package (SSOP)
DBQ: Plastic Small-Outline Package (SSOP)
DBV: Small-Outline Transistor (SOT-23)
DCA: PowerPAD Plastic Small-Outline Package (TSSOP)
DF: Shrink Small-Outline Package (SSOP)
DGG: Plastic Thin Small-Outline Package (TSSOP)
DGK: Plastic Small-Outline Package (MSOP)
DGN: PowerPAD Plastic Small-Outline Package (MSOP)
DGQ: PowerPAD Plastic Small-Outline Package (MSOP)
DGS: Plastic Small-Outline Package (MSOP)
DL: Shrink Small-Outline Package (SSOP)
DW: Small Outline Package (SOP)
DWB: Plastic Small-Outline Package (SOP)
DWP: PowerPAD Thermally Enhanced Small-Outline Package (HSOP)
FK: Leadless Ceramic Chip-Carrier Package (LCCC)
FN: Plastic J-Leaded Chip-Carrier Package (PLCC)
FR: Plastic Quad Flat Package (QFP)
FZ: J-Leaded Ceramic Chip Carrier
GA: Ceramic Pin Grid Array Package (CPGA)
GFN: Plastic Ball Grid Array (BGA)
HFD: Ceramic Quad Flatpack
HV: Ceramic Quad Flat Package (CFP)
J: Side-Braze Ceramic Package (CDIP-SB)
JG: Ceramic Dual-In-Line Package (CDIP)
JL: Ceramic Dual-In-Line Package (CDIP)
JW: Ceramic Dual-In-Line Package (CDIP)
KC: Cylindrical Package (TO/SOT)
KTA: Plastic Flange-Mount Package (PFM)
KTC: Plastic Flange-Mount Package (PFM)
KTE: Plastic Flange-Mount Package (PFM)
KTG: Plastic Flange-Mount Package (PFM)
KTP: Plastic Flange-Mount Package (PFM)
KTR: Plastic Flange-Mount Package (PFM)
KTS: Plastic Flange-Mount Package (PFM)
LP: Plastic Cylindrical Package (TO/SOT)
MDN: Metal Quad Flat Package (MQFP)
MEP: Metal Quad Flat Package (MQFP)
N: Plastic Dual-In-Line Package (PDIP)
NE: Plastic Dual-In-Line Package (PDIP)
NS: Plastic Small-Outline Package (SOP)
NT: Plastic Dual-In-Line Package (PDIP)
NW: Plastic Dual-In-Line Package (PDIP)
P: Plastic Dual-In-Line Package (PDIP)
PAG: Plastic Quad Flat Package (TQFP)
PAH: Plastic Quad Flat Package (TQFP)
PBK: Plastic Quad Flat Package (TQFP)
PBM: Plastic Quad Flat Package (QFP)
PCD: Plastic Quad Flat Package (HQFP)
PCE: Plastic Quad Flat Package (HQFP)
PDV: Plastic Quad Flat Package (TQFP)
PFB: Plastic Quad Flat Package (TQFP)
PFP: PowerPAD Plastic Quad Flat Package
PG: Plastic Quad Flat Package (QFP)
PGF: Plastic Quad Flat Package (TQFP)
PH: Plastic Quad Flat Package (QFP)
PJM: Plastic Quad Flat Package (TQFP)
PK: Plastic Thermally Enhanced Single-In-Line Package (HSIP)
PM: Low Profile Quad Flat Package (LQFP)
PN: Plastic Quad Flat Package (TQFP)
PPA: Thermally Enhanced Quad Flat Package (HQFP)
PS: Small-Outline Package (SOP)
PT: Plastic Thin Quad Flat Package (HLQFP)
PW: Thin Shrink Small-Outline Package (TSSOP)
PWP: Thermally Enhanced PowerPAD Package (HTSSOP)
PZ: Plastic Quad Flat Package (TQFP)
U: Ceramic Flat Package (CFP)
VF: Plastic Quad Flat Package (QFP)
W: Ceramic Flat Package (CFP)
WN: Ceramic Quad Flat Package (CFP)
Y: Unpackaged chip

| Unitrode Part Number Example | UC | 17131 | A | J | 883B |
|---|---|---|---|---|---|
| **Prefix Options** | UC = Linear Integrated Circuits<br>UCC = BiCMOS | | | | |
| **Typical Device Number** | First Digit<br>1 = Military Temperature Range<br>2 = Industrial Temperature Range<br>3 = Commercial Temperature Range<br>Consult individual data sheets for specific temperature ranges on each part. | | | | |
| **Optional Grades** | A or B = Improved version | | | | |
| **Package Options** | See chart below. | | | | |
| **Screen/Processing OP1** | 883 = MIL-STD-883<br>Class Q or MIL-PRF-38535 | | | | |

## Unitrode Package Options

| | | | | | |
|---|---|---|---|---|---|
| **D** | Plastic Narrow Body (150 mil) S.O.I.C.<br>8-Pin SOIC (D, DP)<br>14-Pin SOIC (D)<br>16-Pin SOIC (D, DP, DS) | **J** | Ceramic Dual-in-Line (300 & 600 mil widths)<br>8-Pin Ceramic DIP (J)<br>14-Pin Ceramic DIP (J)<br>16-Pin Ceramic DIP (J)<br>18-Pin Ceramic DIP (J)<br>20-Pin Ceramic DIP (J)<br>24-Pin Ceramic DIP (J)<br>28-Pin Ceramic DIP (J) | **PW** | Thin Shrink Small Outline (TSSOP)<br>8-Pin TSSOP (PW)<br>20-Pin TSSOP (PW)<br>24-Pin TSSOP (PW, PWP) |
| **DW** | Plastic Wide Body (300 mil) S.O.I.C.<br>16-Pin SOIC (DW)<br>18-Pin SOIC (DW)<br>20-Pin SOIC (DW)<br>24-Pin SOIC (DW)<br>28-Pin SOIC (DW, DWP) | **L** | Ceramic Leadless Chip Carrier (LCC)<br>20-Pin Ceramic Leadless (L)<br>28-Pin Ceramic Leadless (L) | **PWP** | Power TSSOP<br>24-Pin TSSOP (PW, PWP)<br>28-Pin TSSOP (PWP) |
| **DP** | Plastic Narrow Body Power S.O.I.C.<br>8-Pin SOIC (D, DP)<br>16-Pin SOIC (D, DP, DS) | **LP** | Power LCC<br>28-Pin Ceramic Leadless (LP) | **Q** | Plastic Leadless Chip Carrier (PLCC)<br>20-Pin Plastic PLCC (Q)<br>28-Pin Plastic PLCC (Q, QP)<br>44-Pin Plastic PLCC (Q, QP) |
| **DS** | Plastic Narrow Body (150 mil) S.O.I.C. with Shunt Current Sense<br>16-Pin SOIC (D, DP, DS) | **M** | Shrink Small Outline (150 mil)<br>16-Pin SSOP (M)<br>20-Pin SSOP (M) | **QP** | Power PLCC<br>28-Pin Plastic PLCC (Q, QP)<br>44-Pin Plastic PLCC (Q, QP) |
| **DWP** | Plastic Wide Body Power S.O.I.C.<br>28-Pin SOIC (DW, DWP) | **MWP** | Power Quasi Shrink Small Outline (300 mil body, 0.8mm Pitch)<br>36-Pin QSOP (MWP)<br>44-Pin QSOP (MWP) | **SP** | Power Ceramic Dual-in-Line<br>16-Pin Sidebraze DIP (SP)<br>24-Pin Sidebraze DIP (SP |
| **FP** | Power Plastic Metric Quad Flatpack (MQFP)<br>64-Pin MQFP (FP) | **N** | Plastic Dual-in-Line (300 & 600-mil widths)<br>8-Pin Plastic DIP (N)<br>14-Pin Plastic DIP (N)<br>16-Pin Plastic DIP (N)<br>18-Pin Plastic DIP (N)<br>20-Pin Plastic DIP (N)<br>24-Pin Plastic DIP (N)<br>28-Pin Plastic DIP (N) | **T** | Plastic TO-220<br>3-Pin TO-220 Plastic (T)<br>5-Pin TO-220 Plastic (T) |
| **FQ** | Plastic Low Profile Quad Flatpack (LQFP)<br>48-Pin LQFP (FQ, FQP) | | | **TD** | Plastic TO-263 Power Surface Mount<br>3-Pin Plastic TO-263 Power Surface Mount (TD)<br>5-Pin Plastic TO-263 Power Surface Mount (TD) |
| | | | | **Z** | Zig-Zag In-Line Power Package<br>16-Pin Zig-Zag Inline (Z) |

| Benchmarq Part Number Example | bq | 2003 | P | 70 | N |
|---|---|---|---|---|---|
| **Prefix** | | | | | |
| **Typical Device Number** | | | | | |
| **Package Options** | See chart below. | | | | |
| **Speed Options** | | | | | |
| **Temperature Range** | Blank = Commercial (0 to 70°C)<br>I = Extended (–20 to +70°C)<br>N = Industrial (–40 to +85°C) | | | | |

| Benchmarq Package Options | |
|---|---|
| MA | A-Type Module |
| MB | B-Type Module |
| MC | C-Type Module |
| MS | Leaded Chip Carrier for LIFETIME LITHIUM Module |
| MS | LIFETIME LITHIUM Module Housing |
| MT | T-Type Module |
| P | Plastic DIP (600 mil) |
| PN | Plastic Narrow DIP (300 mil) |
| S | SOIC (300 mil) |
| SH | SOH for SNAPHAT Module |
| SH | SNAPHAT Housing for SOH-28 SNAPHAT Module |
| SN | Narrow SOIC (150 mil) |
| SS | SSOP (150 mil) |
| TS | TSSOP (172 mil) |

## Power Trends Part Number Example #1

| PT | 5107 | N |
|---|---|---|

**Prefix**

**Typical Device Number** First two or three digits designate the series or family

**Package Options**

| Mounting Style | Heat Tab or Spreader | | | | | |
|---|---|---|---|---|---|---|
| | No Tab | Heat Spreader | Side Tab | Top Tab | Copper Heat Spreader | Copper Side Tab |
| Vertical | N | P | R | S | | |
| Horizontal | A | D | G | H | M | Q |
| SMD | C | E | B | J | L | F |

## Power Trends Part Number Example #2

| PT | 78 | HT | 1 | 05 | H |
|---|---|---|---|---|---|

**Prefix**

**Series Designator** 78 for positive step-down
79 for negative step-down

**Series Type** HT, SR, ST, or NR

**Output Current** 1 = 1.5 A
2 = 2 A
3 = 3 A

**Output Voltage** 05 = 5 V
12 = 12 V

**Package Suffix** H = Horizontal
S = SMD
V = Vertical

# TI Device Index for Analog/Mixed-Signal Products

**For technical assistance, requesting datasheets or samples, see Contact Information on the last page of this book. For device number and package definitions, see Appendix B.**

## TI Device Index for Analog/Mixed-Signal Products

| TI Device | Family | Section | Literature | Package |
|---|---|---|---|---|
| 78HT205 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT210 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT233 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT246 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT253 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT265 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT275 | Power Management Products | 8 | SLTS008 | PTRD |
| 78HT305 | Power Management Products | 8 | SLTS009 | PTRD |
| 78HT353 | Power Management Products | 8 | SLTS009 | PTRD |
| 78SR105 | Power Management Products | 8 | SLTS010 | PTRD |
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| TL750L08 | Power Management Products | 8 | SLVS017I | D, KC, LP, P, PS |
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| TL750M10 | Power Management Products | 8 | SLVS021G | KC, KTE, KTP |
| TL750M12 | Power Management Products | 8 | SLVS021G | KC, KTE, KTP |
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| TL751M12 | Power Management Products | 8 | SLVS021G | KTG |
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| TLV2344 | Amplifiers and Comparators | 1 | SLOS194 | D, N, PW |
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| UC1875 | Power Management Products | 8 | SLUS229 | UTR |
| UC1876 | Power Management Products | 8 | SLUS229 | UTR |
| UC1877 | Power Management Products | 8 | SLUS229 | UTR |
| UC1878 | Power Management Products | 8 | SLUS229 | UTR |
| UC1879 | Power Management Products | 8 | SLUS230 | UTR |
| UC1886 | Power Management Products | 8 | SLUS231 | UTR |
| UC1901 | Power Management Products | 8 | SLUS279 | UTR |
| UC1903 | Power Management Products | 8 | SLUS233 | UTR |
| UC1904 | Power Management Products | 8 | SLUS276 | UTR |
| UC1907 | Power Management Products | 8 | SLUS165 | UTR |
| UC1910 | Power Management Products | 8 | SLUS174 | UTR |
| UC1914 | Power Management Products | 8 | SLUS425 | UTR |
| UC19431 | Power Management Products | 8 | SLUS192 | UTR |
| UC19432 | Power Management Products | 8 | SLUS301 | UTR |
| UC2524 | Power Management Products | 8 | SLUS180 | UTR |
| UC2524A | Power Management Products | 8 | SLUS181 | UTR |
| UC2525A | Power Management Products | 8 | SLUS191 | UTR |
| UC2525B | Power Management Products | 8 | SLUS376 | UTR |
| UC2526 | Power Management Products | 8 | SLUS185 | UTR |
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| UC2544 | Power Management Products | 8 | SLUS188 | UTR |
| UC2548 | Power Management Products | 8 | SLUS189 | UTR |
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| UC2577-ADJ | Power Management Products | 8 | SLUS216 | UTR |
| UC2578 | Power Management Products | 8 | SLUS341 | UTR |
| UC2584 | Power Management Products | 8 | SLUS218 | UTR |
| UC2610 | Power Management Products | 8 | SLUS339 | UTR |
| UC2625 | Power Management Products | 8 | SLUS353 | UTR |
| UC2633 | Power Management Products | 8 | SLUS354 | UTR |
| UC2634 | Power Management Products | 8 | SLUS359 | UTR |
| UC2635 | Power Management Products | 8 | SLUS305 | UTR |
| UC2637 | Power Management Products | 8 | SLUS283 | UTR |
| UC2638 | Power Management Products | 8 | SLUS290 | UTR |
| UC2705 | Power Management Products | 8 | SLUS370 | UTR |
| UC2706 | Power Management Products | 8 | SLUS200 | UTR |
| UC2707 | Power Management Products | 8 | SLUS177 | UTR |
| UC2708 | Power Management Products | 8 | SLUS171 | UTR |
| UC2709 | Power Management Products | 8 | SLUS196 | UTR |
| UC2710 | Power Management Products | 8 | SLUS324 | UTR |
| UC2714 | Power Management Products | 8 | SLUS170 | UTR |
| UC2715 | Power Management Products | 8 | SLUS170 | UTR |
| UC2717 | Power Management Products | 8 | SLUS284 | UTR |
| UC2724 | Power Management Products | 8 | SLUS201 | UTR |
| UC2725 | Power Management Products | 8 | SLUS202 | UTR |
| UC2730 | Power Management Products | 8 | SLUS335 | UTR |
| UC282-1 | Interface Products | 6 | SLUS317 | UTR |
| UC282-1 | Power Management Products | 8 | SLUS317 | UTR |
| UC282-2 | Power Management Products | 8 | SLUS317 | UTR |
| UC282-3 | Power Management Products | 8 | SLUS317 | UTR |
| UC282-ADJ | Power Management Products | 8 | SLUS317 | UTR |
| UC2823 | Power Management Products | 8 | SLUS219 | UTR |
| UC2823A | Power Management Products | 8 | SLUS334 | UTR |
| UC2823B | Power Management Products | 8 | SLUS334 | UTR |
| UC2824 | Power Management Products | 8 | SLUS326 | UTR |
| UC2825 | Power Management Products | 8 | SLUS235 | UTR |
| UC2825A | Power Management Products | 8 | SLUS334 | UTR |
| UC2825B | Power Management Products | 8 | SLUS334 | UTR |
| UC2826 | Power Management Products | 8 | SLUS331 | UTR |
| UC2827-1 | Power Management Products | 8 | SLUS365 | UTR |
| UC2827-2 | Power Management Products | 8 | SLUS365 | UTR |
| UC2832 | Power Management Products | 8 | SLUS387 | UTR |
| UC2833 | Power Management Products | 8 | SLUS387 | UTR |
| UC2834 | Power Management Products | 8 | SLUS363 | UTR |
| UC2835 | Power Management Products | 8 | SLUS383 | UTR |
| UC2836 | Power Management Products | 8 | SLUS383 | UTR |
| UC2838A | Power Management Products | 8 | SLUS221 | UTR |
| UC2841 | Power Management Products | 8 | SLUS208 | UTR |
| UC2842A | Power Management Products | 8 | SLUS224 | UTR |
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| UC2844 | Power Management Products | 8 | | D, P |
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| UC2845 | Power Management Products | 8 | | D, P |
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| UC2846 | Power Management Products | 8 | SLUS352 | UTR |
| UC2847 | Power Management Products | 8 | SLUS352 | UTR |
| UC2848 | Power Management Products | 8 | SLUS225 | UTR |
| UC2849 | Power Management Products | 8 | SLUS360 | UTR |
| UC285-1 | Interface Products | 6 | SLUS212 | UTR |
| UC285-1 | Power Management Products | 8 | SLUS212 | UTR |
| UC285-2 | Power Management Products | 8 | SLUS212 | UTR |
| UC285-3 | Power Management Products | 8 | SLUS212 | UTR |
| UC285-ADJ | Power Management Products | 8 | SLUS212 | UTR |
| UC2851 | Power Management Products | 8 | SLUS226 | UTR |
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| UC2865 | Power Management Products | 8 | SLUS289 | UTR |
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| UC2868 | Power Management Products | 8 | SLUS289 | UTR |
| UC2871 | Power Management Products | 8 | SLUS182 | UTR |
| UC2872 | Power Management Products | 8 | SLUS178 | UTR |
| UC2875 | Power Management Products | 8 | SLUS229 | UTR |
| UC2876 | Power Management Products | 8 | SLUS229 | UTR |
| UC2877 | Power Management Products | 8 | SLUS229 | UTR |
| UC2878 | Power Management Products | 8 | SLUS229 | UTR |
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| UC2886 | Power Management Products | 8 | SLUS231 | UTR |
| UC2901 | Power Management Products | 8 | SLUS279 | UTR |
| UC2902 | Power Management Products | 8 | SLUS232 | UTR |
| UC2903 | Power Management Products | 8 | SLUS233 | UTR |
| UC2904 | Power Management Products | 8 | SLUS276 | UTR |
| UC2906 | Power Management Products | 8 | SLUS186 | UTR |
| UC2907 | Power Management Products | 8 | SLUS165 | UTR |
| UC2909 | Power Management Products | 8 | SLUS239 | UTR |
| UC2910 | Power Management Products | 8 | SLUS174 | UTR |
| UC2914 | Power Management Products | 8 | SLUS425 | UTR |
| UC29431 | Power Management Products | 8 | SLUS192 | UTR |
| UC29432 | Power Management Products | 8 | SLUS301 | UTR |
| UC2950 | Power Management Products | 8 | SLUS280 | UTR |
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| UC3175B | Power Management Products | 8 | SLUS316 | UTR |
| UC3176 | Power Management Products | 8 | SLUS285 | UTR |
| UC3177 | Power Management Products | 8 | SLUS285 | UTR |
| UC3178 | Power Management Products | 8 | SLUS364 | UTR |
| UC3517 | Power Management Products | 8 | SLUS355 | UTR |
| UC3524 | Power Management Products | 8 | SLUS180 | UTR |
| UC3524A | Power Management Products | 8 | SLUS181 | UTR |
| UC3525A | Power Management Products | 8 | SLUS191 | UTR |
| UC3525B | Power Management Products | 8 | SLUS376 | UTR |
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| UC3527A | Power Management Products | 8 | SLUS191 | UTR |
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| UC3543 | Power Management Products | 8 | SLUS188 | UTR |
| UC3544 | Power Management Products | 8 | SLUS188 | UTR |
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| UC3572 | Power Management Products | 8 | SLUS275 | UTR |
| UC3573 | Power Management Products | 8 | SLUS346 | UTR |
| UC3578 | Power Management Products | 8 | SLUS341 | UTR |
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| UC3610 | Power Management Products | 8 | SLUS339 | UTR |
| UC3611 | Power Management Products | 8 | SLUS338 | UTR |
| UC3625 | Power Management Products | 8 | SLUS353 | UTR |
| UC3633 | Power Management Products | 8 | SLUS354 | UTR |
| UC3634 | Power Management Products | 8 | SLUS359 | UTR |
| UC3635 | Power Management Products | 8 | SLUS305 | UTR |
| UC3637 | Power Management Products | 8 | SLUS283 | UTR |
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| UC3710 | Power Management Products | 8 | SLUS324 | UTR |
| UC3711 | Power Management Products | 8 | SLUS327 | UTR |
| UC37131 | Power Management Products | 8 | SLUS340 | UTR |
| UC37132 | Power Management Products | 8 | SLUS340 | UTR |
| UC37133 | Power Management Products | 8 | SLUS340 | UTR |
| UC3714 | Power Management Products | 8 | SLUS170 | UTR |
| UC3715 | Power Management Products | 8 | SLUS170 | UTR |
| UC3717 | Power Management Products | 8 | SLUS284 | UTR |
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| UC3770A | Power Management Products | 8 | SLUS343 | UTR |
| UC3770B | Power Management Products | 8 | SLUS343 | UTR |
| UC382-1 | Interface Products | 6 | SLUS317 | UTR |
| UC382-1 | Power Management Products | 8 | SLUS317 | UTR |
| UC382-2 | Power Management Products | 8 | SLUS317 | UTR |
| UC382-3 | Power Management Products | 8 | SLUS317 | UTR |
| UC382-ADJ | Power Management Products | 8 | SLUS317 | UTR |
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| UC3842A | Power Management Products | 8 | SLUS224 | UTR |
| UC3843 | Power Management Products | 8 | | D, P |
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| UC3846 | Power Management Products | 8 | SLUS352 | UTR |
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| UC3848 | Power Management Products | 8 | SLUS225 | UTR |
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| UC385-1 | Interface Products | 6 | SLUS212 | UTR |
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| UCC35701 | Power Management Products | 8 | SLUS293 | UTR |
| UCC35702 | Power Management Products | 8 | SLUS293 | UTR |
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