

RC4741

General Purpose Operation Amplifier

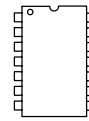
Features

- Unity gain bandwidth — 3.5 MHz
- High slew rate — 1.6 V/ μ S
- Low noise voltage — 9 nV/ $\sqrt{\text{Hz}}$
- Input offset voltage — 0.5 mV
- Input bias current — 60 nA
- Indefinite short circuit protection
- No crossover distortion
- Internal compensation
- Wide power supply range — $\pm 2\text{V}$ to $\pm 20\text{V}$

Applications

- Universal active filters
- Audio amplifiers
- Battery powered equipment

Package



14 pin DIP

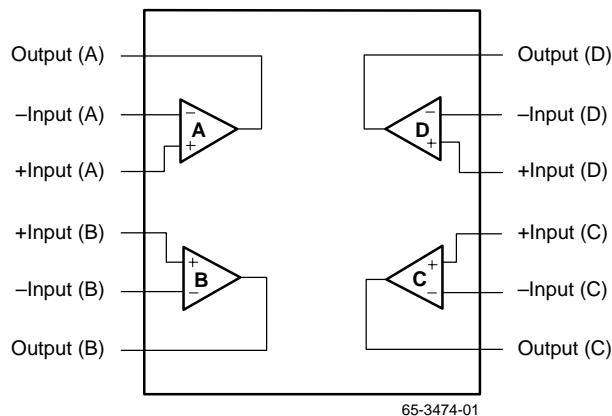
Description

The RC4741 is a monolithic integrated circuit, consisting of four independent operational amplifiers constructed with the planar epitaxial process.

A wide range of supply voltages ($\pm 2\text{V}$ to $\pm 20\text{V}$) can be used to power the RC4741, making it compatible with almost any system including battery powered equipment.

These amplifiers feature AC and DC performance which exceed that of the 741 type amplifiers. Its superior bandwidth, slew rate and noise characteristics make it an excellent choice for active filter or audio amplifier applications.

Block Diagram



Absolute Maximum Ratings

(beyond which the device may be damaged)¹

| Parameter | | Min | Typ | Max | Units |
|--|--------------|-----|------------|------|-------|
| Supply Voltage | | | | ±20 | V |
| Input Voltage ² | | | | ±15 | V |
| Differential Input Voltage | | | | 30 | V |
| P _{DTA} < 50°C | PDIP | | | 468 | mW |
| | CerDIP | | | 1042 | |
| | SOIC | | | 300 | |
| Output Short Circuit Duration ³ | | | Indefinite | | |
| Junction Temperature | PDIP, SOIC | | | 125 | °C |
| | CerDIP | | | 175 | |
| Storage Temperature | | -65 | | 150 | °C |
| Operating Temperature | RM4741 | -55 | | 125 | °C |
| | RC4741 | 0 | | 70 | |
| Lead Soldering Temperature | 60 sec, DIP | | | 300 | °C |
| | 10 sec, SOIC | | | 260 | |

Notes:

- Functional operation under any of these conditions is NOT implied. Performance and reliability are guaranteed only if Operating Conditions are not exceeded.
- For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
- Short circuit to ground on one amplifier only.

Operating Conditions

| Parameter | | Min | Typ | Max | Units |
|-------------------------------------|--------------------|-----|------|-----|-------|
| θ _{JC} | Thermal resistance | | 60 | | °C/W |
| θ _{JA} | Thermal resistance | | 160 | | °C/W |
| | | | 120 | | |
| | | | 200 | | |
| For T _A > 50°C Derate at | PDIP | | 6.25 | | mW/°C |
| | CerDIP | | 8.38 | | |
| | SOIC | | 5.0 | | |

Electrical Characteristics

($V_S = \pm 15V$ and $T_A = 25^\circ C$ unless otherwise specified)

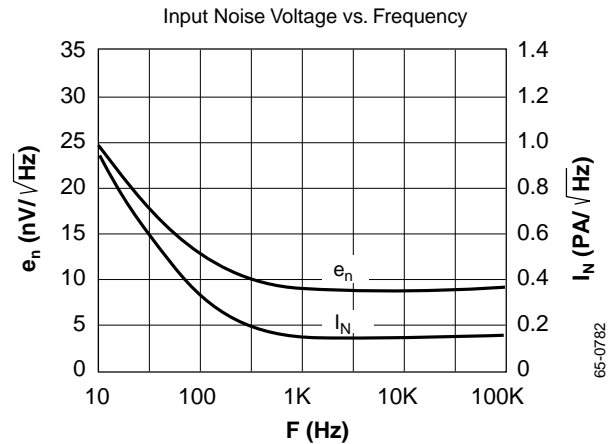
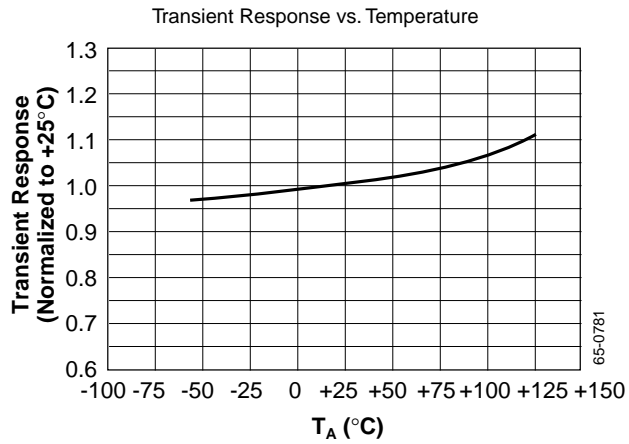
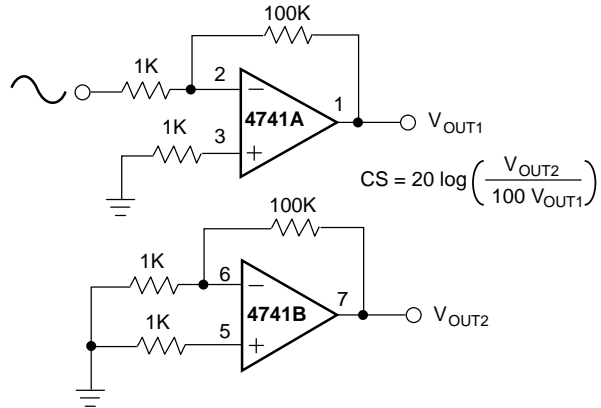
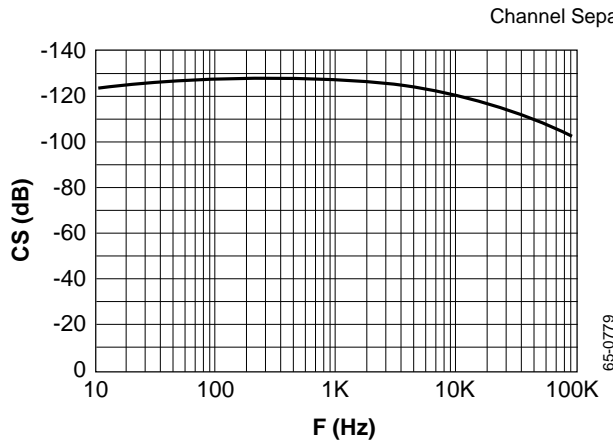
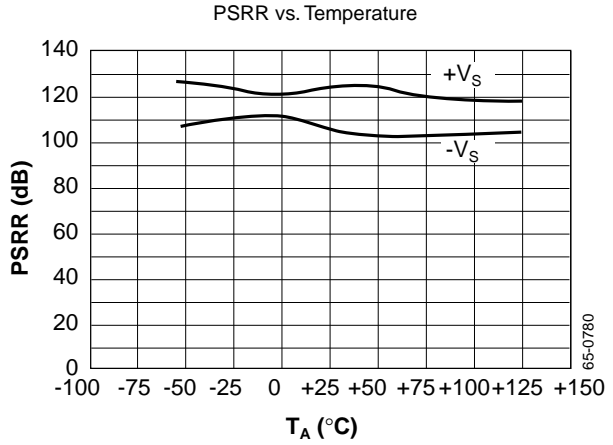
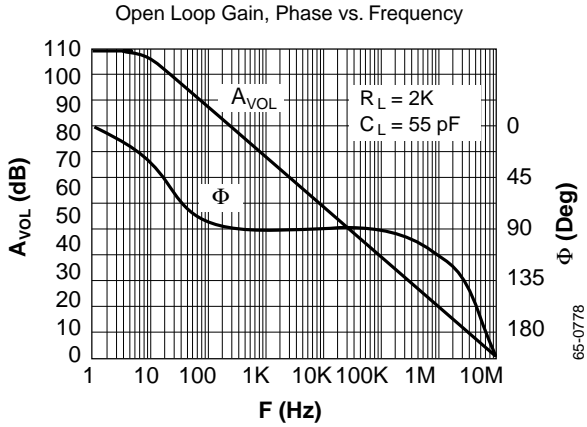
| Parameters | Test Conditions | RM4741 | | | RC4741 | | | Units |
|---------------------------------|--|----------|----------|-----|----------|----------|-----|-----------------|
| | | Min | Typ | Max | Min | Typ | Max | |
| Input Offset Voltage | $R_S \leq 10k\Omega$ | | 0.5 | 3.0 | | 1.0 | 5.0 | mV |
| Input Offset Current | | | 15 | 30 | | 30 | 50 | nA |
| Input Bias Current | | | 60 | 200 | | 60 | 300 | nA |
| Input Resistance | | | 0.5 | | | 0.5 | | M Ω |
| Large Signal Voltage Gain | $R_L \geq 2k\Omega$, $V_{OUT} \pm 10V$ | 50 | 100 | | 25 | 50 | | V/mV |
| Input Voltage Range | | ± 12 | | | ± 12 | | | V |
| Output Resistance | | | 300 | | | 300 | | Ω |
| Output Current | $V_{OUT} \pm 10V$ | ± 5 | ± 15 | | ± 5 | ± 15 | | mA |
| Common Mode | $R_S \leq 10k\Omega$ | 80 | | | 80 | | | dB |
| Rejection Ratio | $\Delta V = \pm 5$ | | | | | | | |
| Supply Current (All Amplifiers) | | | 4.5 | 5.0 | | 5.0 | 7.0 | mA |
| Transient Response | Rise Time | | 75 | | | 75 | | nS |
| | Overshoot | | 25 | | | 25 | | % |
| | Slew Rate | | 1.6 | | | 1.6 | | V/ μ S |
| Unity Gain Bandwidth | | | 3.5 | | | 3.5 | | MHz |
| Power Bandwidth | $V_{OUT} = 20V_{p-p}$, $R_L = 2k$ | | 25 | | | 25 | | kHz |
| Input Noise Voltage Density | $F = 1kHz$ | | 9.0 | | | 9.0 | | nV/ \sqrt{Hz} |
| Channel Separation | | | 108 | | | 108 | | dB |

Electrical Characteristics

($V_S = \pm 15V$, $R_M = -55^\circ C \leq T_A \leq +125^\circ C$, $R_C = 0^\circ C \leq T_A + 70^\circ C$)

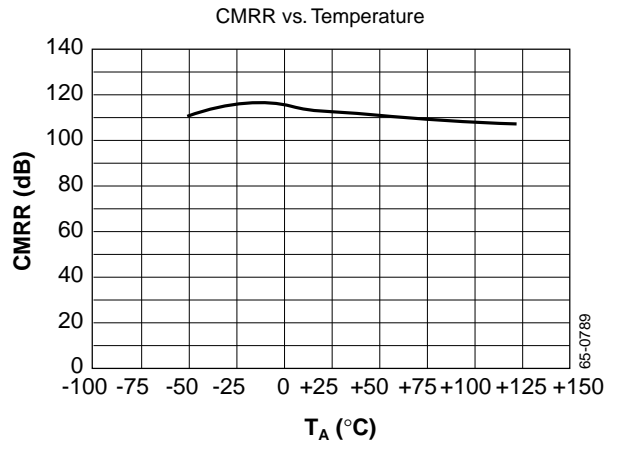
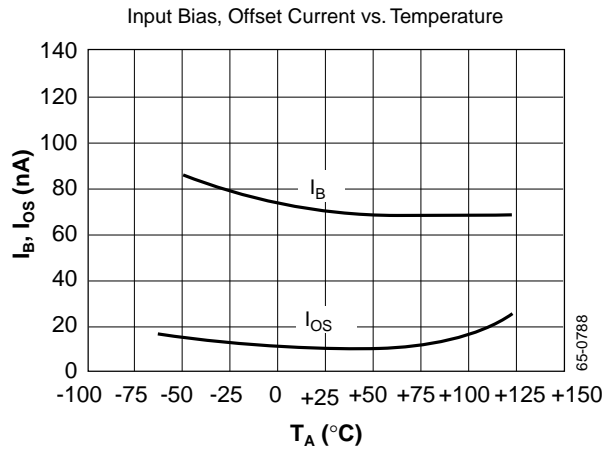
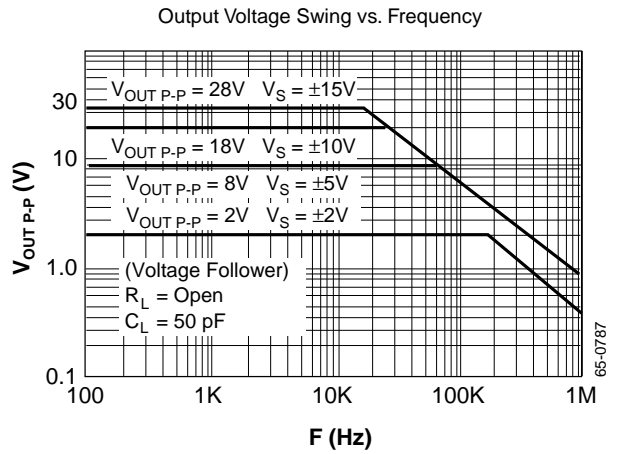
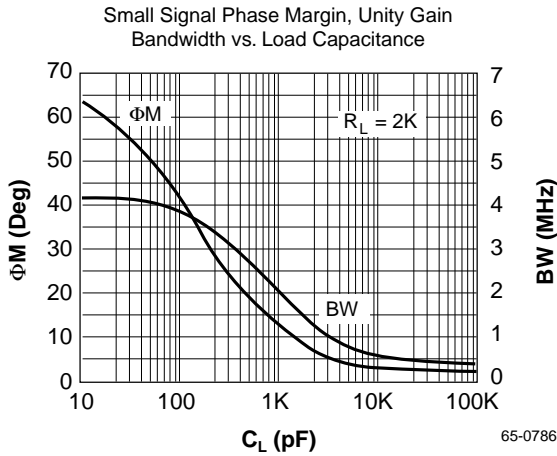
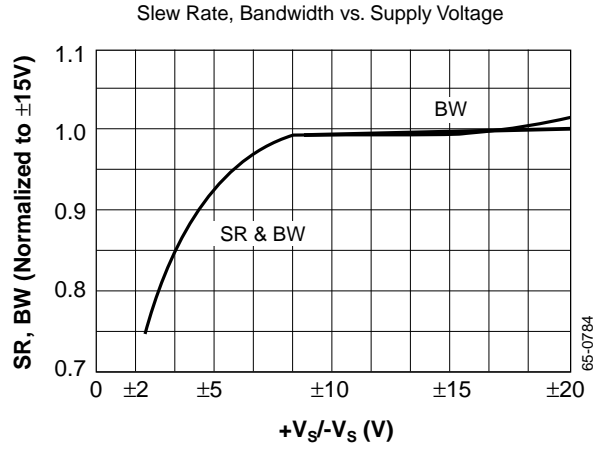
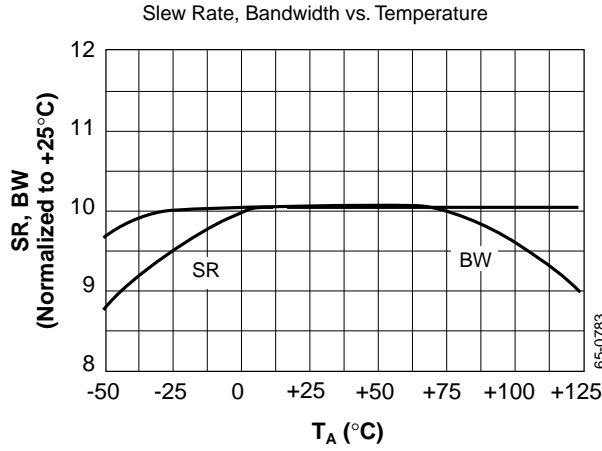
| Parameters | Test Conditions | RM4741 | | | RC4741 | | | Units |
|---------------------------------|---|----------|------------|-----|----------|------------|-----|------------------|
| | | Min | Typ | Max | Min | Typ | Max | |
| Input Offset Voltage | $R_S \leq 10k\Omega$ | | 4.0 | 5.0 | | 5.0 | 6.5 | mV |
| Input Offset Current | | | | 75 | | | 100 | nA |
| Input Bias Current | | | | 325 | | | 400 | nA |
| Large Signal | $R_L \geq 2k\Omega$ | 25 | | | 15 | | | V/mV |
| Voltage Gain | $V_{OUT} \pm 10V$ | | | | | | | |
| Output Voltage Swing | $R_L \geq 10k\Omega$ | ± 12 | ± 13.7 | | ± 12 | ± 13.7 | | |
| | $R_L \geq 2k\Omega$ | ± 10 | ± 12.5 | | ± 10 | ± 12.5 | | |
| Supply Current (All Amplifiers) | | | 10 | | | 10 | | mA |
| Average Input Offset | | | | | | | | |
| Voltage Drift | | | 5.0 | | | 5.0 | | $\mu V/^\circ C$ |
| Common Mode Rejection Ratio | $R_S \leq 10k\Omega$, $\Delta V \pm 5.0V$ | 74 | | | 74 | | | dB |
| Power Supply Rejection Ratio | $R_S \leq 10k\Omega$, $\Delta V \pm 5.0V$ | 80 | | | 80 | | | dB |

Typical Performance Characteristics



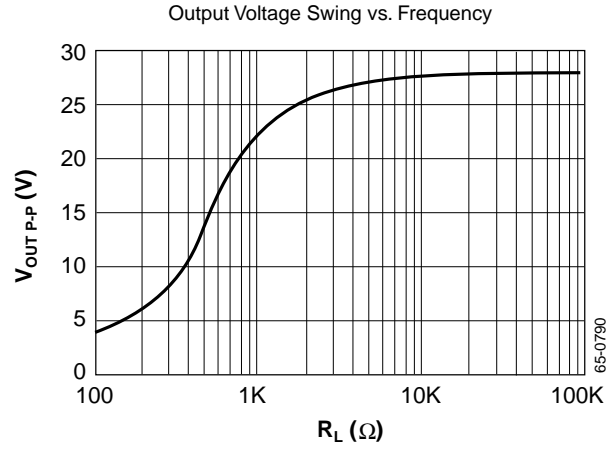
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Typical Performance Characteristics (continued)

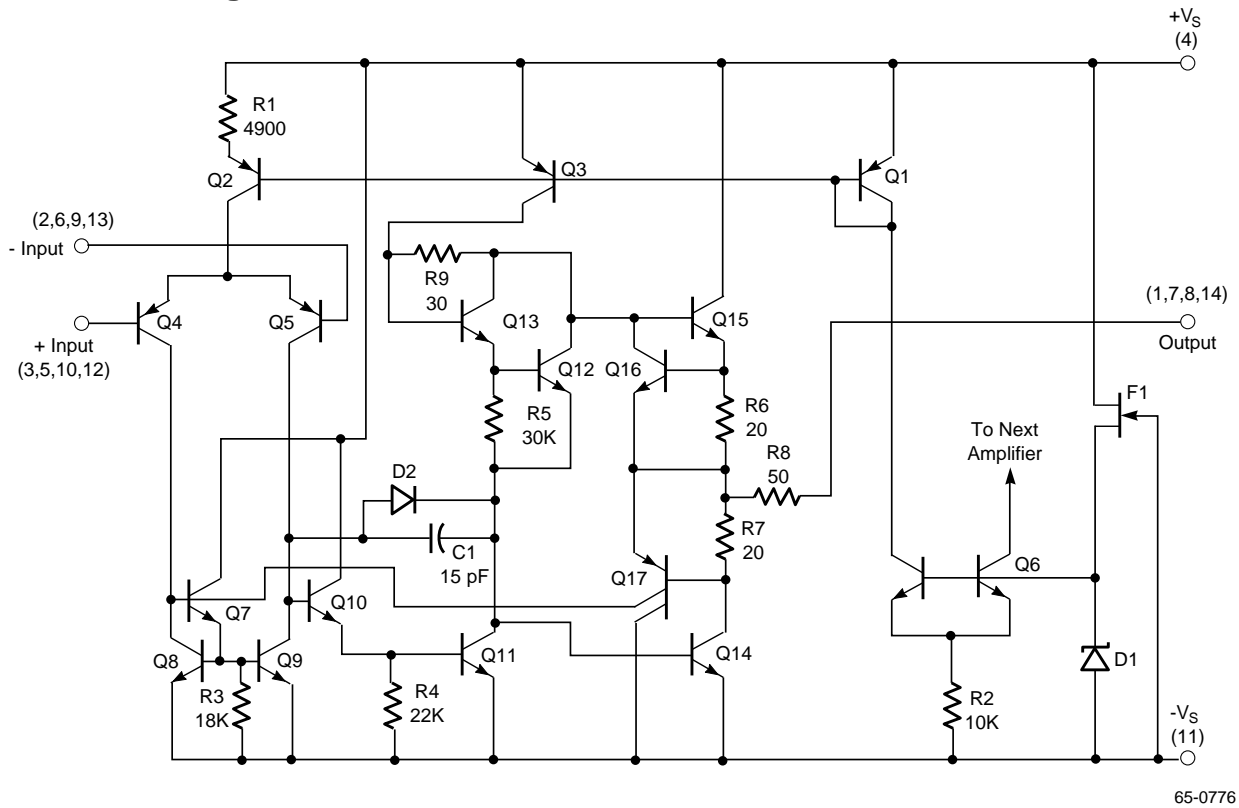


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Typical Performance Characteristics (continued)



Schematic Diagram (1/4 shown)



Ordering Information

| Product Number | Temperature Range | Screening | Package | Package Marking |
|----------------|-------------------|------------|-------------------------|-----------------|
| RC4741M | 0°C to +70°C | Commercial | 14 pin Small Outline IC | |
| RC4741N | 0°C to +70°C | | 14 pin Plastic DIP | |
| RM4741D | -55°C to +125°C | | 14 pin Ceramic DIP | |
| RM 4741D/883B | -55°C to +125°C | Military | 14 pin Ceramic DIP | |

Note: /883B suffix denotes Mil-Std-883, Level B processing.