

INTEGRATED CIRCUITS

Semiconductors for Television and Video Systems



1997

Data Handbook IC02

**Philips
Semiconductors**



Let's make things better.

PHILIPS

QUALITY ASSURED

Our quality system focuses on the continuing high quality of our components and the best possible service for our customers. We have a three-sided quality strategy: we apply a system of total quality control and assurance; we operate customer-oriented dynamic improvement programmes; and we promote a partnering relationship with our customers and suppliers.

PRODUCT SAFETY

In striving for state-of-the-art perfection, we continuously improve components and processes with respect to environmental demands. Our components offer no hazard to the environment in normal use when operated or stored within the limits specified in the data sheet.

Some components unavoidably contain substances that, if exposed by accident or misuse, are potentially hazardous to health. Users of these components are informed of the danger by warning notices in the data sheets supporting the components. Where necessary the warning notices also indicate safety precautions to be taken and disposal instructions to be followed. Obviously users of these components, in general the set-making industry, assume responsibility towards the consumer with respect to safety matters and environmental demands.

All used or obsolete components should be disposed of according to the regulations applying at the disposal location. Depending on the location, electronic components are considered to be 'chemical', 'special' or sometimes 'industrial' waste. Disposal as domestic waste is usually not permitted.

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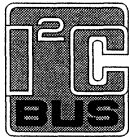
DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Short-form specification	The data in this specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

PURCHASE OF PHILIPS I²C COMPONENTS



Purchase of Philips I²C components conveys a license under the Philips' I²C patent to use the components in the I²C system provided the system conforms to the I²C specification defined by Philips. This specification can be ordered using the code 9398 393 40011.

PREFACE

The audio/video market is characterized by a continuing demand for innovation to increase the functionality of ICs by achieving ever higher levels of integration, reducing power consumption, minimizing the number of peripheral components and reducing the need for circuit alignment during assembly. We achieve these goals by extensive use of computer control via the I2C-bus, and by designing analog, digital and mixed signal circuits using the very latest signal processing techniques. We then fabricate the ICs with state-of-the-art production processes so we can offer you complete 'systems-on-silicon' which help you maintain your competitive edge by staying one step ahead of the competition.

An innovative and reliable supplier

A total systems approach, embracing both hardware and software, is the foundation on which we have built our unrivalled reputation as an innovative and reliable supplier of high quality semiconductors for the audio/video segments of the consumer electronics market.

Our strengths in this field stem not only from being a large multinational organization with the resources to stay the course, but also from our dedication to research and to forming true and lasting partnerships with our customers.

World-class manufacturing, resources and customer support

Philips Semiconductors is a global supplier. We employ some 20,000 people, have more than 100 sales offices worldwide, are represented in 44 countries, and manufacture over 14,000 different products. Philips also has a level of commitment to research matched by very few companies, not just in terms of resources but in their focus on researching solutions for customers. Philips Semiconductors collaborates very closely with Philips Corporate Research Laboratories, one of the largest privately funded research organisations in the world. Five major research laboratories serve the whole group, in the Netherlands, UK, France, Germany and the USA.

As you would expect from a worldwide organization, our support doesn't end with the timely delivery of ICs and discrete to our audio/video customers. We are also dedicated to the aim of zero-defects quality for our semiconductors, and to offering unequalled service. There are Philips customer support and application centres in every major market area (Europe, Asia-Pacific, North America) to ensure that you can take full advantage of our extensive applications know-how and broad product range. Five System Laboratories are involved in programs and activities relevant to audio/video: Eindhoven, the Netherlands (TV, monitors and radio/audio); Hamburg, Germany (TV and radio/audio); Southampton, UK (teletext and digital audio, including CD technology); Taipei, Taiwan (TV, monitors and radio/audio).

They support all audio/video applications and work closely with customers, meeting and often anticipating their needs.

Many key developments have come from Philips laboratories - one-chip TV signal processors, ICs for memory-based TV features, a TV microcontroller with on-chip teletext, a two-chip receiver module for car radio, and a one-chip self-tuned radio are just a few examples. In addition, there are also Product Development groups in all the above locations.

Partnership

Since the spur for many of the ICs and discrete semiconductors in this databook have come from a cross-fertilisation of ideas with customers, we are fully aware that we need to be not only semiconductor suppliers, but also partners who are willing to work with customers to find solutions and help keep them at the leading edge of their field. At Philips Semiconductors, we work very closely with our audio/video customers and are determined to maintain a reputation for being the world's most customer-oriented supplier.

WHAT THIS BOOK AND CD-ROM CONTAIN

This book is a supplement to the existing databook IC02 - Semiconductors for Television and Video Systems, and contains the functional and alphanumeric indices for all data sheets contained on the accompanying CD-ROM. The data sheet files on the CD-ROM are in Adobe's Portable Document Format (PDF) - a cross-platform file format that requires Acrobat Reader to view (we have also supplied Acrobat Reader on the CD-ROM). Acrobat Reader enables you to view and print pages, and perform basic searches. Please refer to the README.1st file on the CD-ROM to find information on the CD's contents and organization, as well as instructions on how to install and use Acrobat Reader.

FOR MORE INFORMATION

Although the information in this databook is up-to-date at the time of going to press, the world of audio/video is so fast moving it is possible that some very recent developments may not have made it into this edition. For the latest information contact your local Philips organization (see the back page of this databook for addresses), or visit our Internet home page at: <http://www.semiconductors.philips.com/ps/>

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Types added to the range since the last issue of data handbook IC02 (1995 issue) are shown in bold print

80C528; 83C528	CMOS single-chip 8-bit microcontroller; I ² C-bus
80C652; 83C652	CMOS single-chip 8-bit microcontroller; I ² C-bus
83C145; 83C845; 83C055; 87C055	Microcontrollers for TV and video (MTV)
83C654	CMOS single-chip 8-bit microcontroller; I ² C-bus
83CE654	CMOS single-chip 8-bit microcontroller with Electromagnetic Compatibility improvements
84C44X; 84C64X; 84C84X	8-bit microcontrollers with OSD and VST; I ² C-bus
87C528	CMOS single-chip 8-bit microcontroller; I ² C-bus
87C652	CMOS single-chip 8-bit microcontroller; I ² C-bus
87C654	CMOS single-chip 8-bit microcontroller; I ² C-bus
BA481	UHF mixer diode
BA482; BA483; BA484	Band-switching diodes; leaded
BA682; BA683	Band-switching diodes; SMD
BA792	Band-switching diode; SMD
BAT17	Schottky barrier mixer diode; SMD
BAT18	Band-switching diode
BB119	Variable capacitance diode; AFC
BB131	VHF variable capacitance diode; coupling; SMD
BB132	VHF variable capacitance diode; tuning; SMD
BB133	VHF variable capacitance diode; tuning; SMD
BB134	UHF variable capacitance diode; tuning
BB135	UHF variable capacitance diode; coupling; SMD
BB148	VHF variable capacitance diode; tuning
BB149	UHF variable capacitance diode; tuning
BB150	VHF variable capacitance diode; coupling; SMD
BB158	VHF variable capacitance diode; tuning; SMD
BB159	UHF variable capacitance diode; tuning
BB215	UHF variable capacitance diode; tuning
BB405B	UHF variable capacitance diode; tuning
BB417	UHF variable capacitance diode; AFC
BB809	VHF variable capacitance diode; tuning; Leaded
BB901	VHF variable capacitance diode; coupling; SMD
BB909A; BB909B	VHF variable capacitance diodes; leaded
BB910	VHF variable capacitance diode; leaded
BB911/A	VHF variable capacitance diode; leaded
BBY31	UHF variable capacitance diode; satellite
BBY39	UHF variable capacitance diode; tuning
BBY40	VHF variable capacitance diode; tuning
BBY42	VHF variable capacitance diode; tuning

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BBY62	UHF variable capacitance diode; tuning
BF420; BF422	Silicon epitaxial transistors; NPN; leaded
BF421; BF423	Silicon epitaxial transistors; PNP; leaded
BF457; BF458; BF459	Silicon planar transistors; PNP; leaded
BF469; BF471	Silicon planar epitaxial transistors; PNP; leaded
BF470; BF472	Silicon planar epitaxial transistors; PNP; leaded
BF483; BF485; BF487	Silicon planar epitaxial transistors; NPN; leaded
BF486; BF488	Silicon planar epitaxial transistors; PNP; leaded
BF547	NPN 1 GHz wideband transistor
BF583; BF585; BF587	Silicon planar epitaxial transistors; NPN; leaded
BF588	Silicon planar epitaxial transistors; PNP; leaded
BF720; BF722	Silicon epitaxial transistors; NPN; SMD
BF721; BF723	Silicon epitaxial transistors; PNP; SMD
BF747	NPN 1 GHz wideband transistor
BF857; BF858; BF859	Silicon planar video output transistors: NPN; Leaded
BF869; BF871	Silicon planar video output transistors: NPN; Leaded
BF870; BF872	Silicon planar video output transistors: PNP; Leaded
BF904; BF904R	Silicon N-channel dual gate MOS-FETs; VHF/UHF
BF989	Silicon N-channel dual gate MOS-FET; UHF
BF990A	Silicon N-channel dual gate MOS-FET; UHF
BF991	Silicon N-channel dual gate MOS-FET; VHF
BF992; BF992R	Silicon N-channel dual gate MOS-FETs; VHF
BF994S	Silicon N-channel dual gate MOS-FET; VHF
BF996S	Silicon N-channel dual gate MOS-FET; UHF
BF997	Silicon N-channel dual gate MOS-FET; VHF
BF998; BF998R	Silicon N-channel dual gate MOS-FETs; VHF/UHF
BFS17	NPN 1 GHz wideband transistor
BFS17A	NPN 3 GHz wideband transistor
BY228	Damper diode
BY328	Damper diode
BY8000 series	Fast high-voltage soft-recovery controlled avalanche rectifiers
BY8100 series	Very fast high-voltage soft-recovery controlled avalanche rectifiers
BY8400 series	Fast high-voltage soft-recovery rectifiers
BYD33 series	Fast soft-recovery controlled avalanche rectifiers
BYV95 series	Fast soft-recovery controlled avalanche rectifiers
BYW54; BYW55; BYW56	Controlled avalanche rectifiers
NE/SA/SE5205A	Wide-band high-frequency amplifier
NE/SA5204A	Wide-band high-frequency amplifier
NE/SA5209	Wide-band variable gain amplifier
NE/SE5539	High frequency operational amplifier
NE5592	Video amplifier
NE592	Video amplifier

P8xCE528	8-bit microcontroller with EMC; I ² C-bus
PCA84C122; PCA84C222; PCA84C422; PCA84C622; PCA84C822	8-bit microcontrollers for remote control transmitters
PCA84C646; PCA84C846	Microcontrollers for TV tuning control and OSD applications; I ² C-bus
PCA84C922; PCA84C923	Microcontrollers for universal infrared remote transmitter applications
PCA8514	Stand-alone OSD; 4 - 14 MHz systems
PCA8515	Stand-alone OSD; High speed serial I/O or I ² C-bus
PCA8516	Stand-alone OSD; High speed serial I/O or I ² C-bus; half tone effect
PCA8521	Infrared remote control transmitter RC-5
PCA8581; PCA8581C	128 x 8-bit EEPROM with I ² C-bus interface
PCE84C486; PCE84C487	Microcontrollers for digital auto-sync and VST TV controller applications
PCE84C882	Microcontroller for monitor OSD and auto-sync applications
PCE84C886	Microcontroller for monitor OSD and auto-sync applications
PCF1303T	18-element bar graph LCD driver
PCF2116 family (PCF2114X; PCF2116X)	LCD controller/drivers; I ² C-bus
PCF84C12A; PCF84C22A; PCF84C42A	8-bit microcontrollers
PCF84C21A; PCF84C41A; PCF84C81A	Telecom microcontrollers; I ² C-bus
PCF84C85A	Microcontroller with extended I/O; I ² C-bus
PCF84CXXXA family	8-bit microcontrollers; I ² C-bus
PCF8522E	256 x 8-bit CMOS EEPROM with I ² C-bus interface
PCF8524	512 x 8-bit CMOS EEPROM with I ² C-bus interface
PCF8566	Universal LCD driver for low multiplex rates; I ² C-bus
PCF8570	256 x 8-bit static low-voltage RAM with I ² C-bus interface
PCF8573	Clock/calendar with serial I/O; I ² C-bus
PCF8574	Remote 8-bit I/O expander for I ² C-bus
PCF8576C	Universal LCD driver for low multiplex rates; I ² C-bus
PCF8577C	LCD direct/duplex driver with I ² C-bus interface
PCF8578	LCD row/column driver for dot matrix graphic displays; I ² C-bus
PCF8579	LCD column driver for dot matrix graphic displays; I ² C-bus
PCF8583	Clock calendar with 256 x 8-bit static RAM; I ² C-bus
PCF8584	I ² C-bus controller
PCF8591	8-bit A/D and D/A converter; I ² C-bus
PCF8593	Low power clock calendar; I ² C-bus
PCx8582X-2 family	256 x 8-bit CMOS EEPROMS with I ² C-bus interface
PCx8594X-2 family	512 x 8-bit CMOS EEPROMS with I ² C-bus interface
PCx8598X-2 family	1024 x 8-bit CMOS EEPROMS with I ² C-bus interface
SAA1064	4-digit LED-driver with I ² C-bus interface
SAA1101	Universal sync generator (USG)
SAA1300	Tuner switching circuit; I ² C-bus

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SAA1310	Control interface for VHS video recorders
SAA2510	Video CD (VCD) decoder; I ² C-bus
SAA3004	Remote control transmitter
SAA3008	Infrared remote control transmitter (RECS 80 low voltage)
SAA3010	Infrared remote control transmitter RC-5
SAA4700	VPS dataline processor
SAA4700T	VPS dataline processor
SAA4951	Memory controller
SAA4970T	Economical video processing IC (ECOBENDIC)
SAA4981	Monolithic integrated 16 : 9 compressor
SAA4990H	Progressive scan-Zoom and Noise reduction IC (PROZONIC)
SAA4996H	Motion Adaptive Colour Plus And Control IC (MACPACIC) for PALplus
SAA4997H	Vertical Reconstruction IC (VERIC) for PALplus
SAA5191	Teletext video processor
SAA5231	Teletext video processor
SAA5246A	Integrated VIP and Teletext (IVT1.0); I ² C-bus
SAA5249	Integrated VIP and Teletext with Background Memory Controller (IVT1.1BMCX); I ² C-bus
SAA5250	Interface for data acquisition and control (for multi-standard Teletext systems)
SAA5252	Line twenty-one acquisition and display (LITOD); I ² C-bus
SAA5254	Integrated VIP and Teletext decoder (IVT1.1X); I ² C-bus
SAA5281	Integrated video input processor and Teletext decoder (IVT1.8*); I ² C-bus
SAA5290	One-page Economy Teletext and TV microcontroller; I ² C-bus
SAA5355	Single-chip colour CRT controller (FTFROM)
SAA7110; SAA7110A	One chip Front-end 1 (OCF1)
SAA7111	Video Input Processor (VIP); I ² C-bus
SAA7111A	Enhanced Video Input Processor (EVIP); I ² C-bus
SAA7140A; SAA7140B	High Performance Scaler (HPS); I ² C-bus
SAA7151B	Digital multistandard colour decoder with SCART interface (DMSD2-SCART)
SAA7152	Digital video comb filter (DCF)
SAA7157	Clock signal generator circuit for digital TV systems (SCGC)
SAA7158	Back END IC
SAA7165	Video Enhancement and Digital-to-Analog processor (VEDA2); I ² C-bus
SAA7167A	YUV-to-RGB Digital-to-analog Converter (DAC); I ² C-bus
SAA7182A; SAA7183A	Digital Video Encoders (EURO-DENC2); I ² C-bus
SAA7184; SAA7185B	Digital Video Encoders (DENC2-M6); I ² C-bus
SAA7185	Digital Video Encoder (DENC2); I ² C-bus
SAA7187	Digital Video Encoder (DENC2-SQ); I ² C-bus
SAA7196	Digital Video Decoder, Scaler, and Clock generator circuit (DESCPro); I ² C-bus
SAA7199B	Digital Video Encoder (DENC) GENLOCK-capable; I ² C-bus
SAA7206H	DVB compliant descrambler

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SAA7207H	Reed Solomon decoder IC; I ² C-bus
SAA7282	Terrestrial Digital Sound Decoder (TDSD2); I ² C-bus
SAA7283	Terrestrial Digital Sound Decoder (TDSD3); I ² C-bus
SAA7284	Terrestrial digital sound decoder for conventional intercarrier PLL-IF systems; I ² C-bus
SAA9740H	Advanced Auto Control Function (A2CF)
SAA9750H	Camera Digital Signal Processor (CAMDSP)
SAB6456; SAB6456T	Sensitive 1 GHz divide-by-64/divide-by-256 switchable prescaler
SAB9075H	Picture-In-Picture (PIP) controller for NTSC; I ² C-bus
SAB9076H	Picture-In-Picture (PIP) controller; I ² C-bus
SAD1009	Universal DAC (UDAC)
SAF1135	Dataline decoder; I ² C-bus
TBA120U	Sound IF amplifier/demodulator for TV
TDA1013B	4 W audio power amplifier with DC volume control
TDA1015	1 to 4 W audio power amplifier
TDA1015T	0.5 W audio power amplifier
TDA1023; TDA1023T	Proportional-control triac triggering circuit
TDA1029	Signal-sources switch
TDA1082	East-west correction driver circuit
TDA1514A	50 W high-performance hi-fi amplifier
TDA1521; TDA1521Q	2 x 12 W hi-fi audio power amplifier
TDA1521A	2 x 6 W hi-fi audio power amplifier
TDA1524A	Stereo-tone/volume control circuit
TDA1526	Stereo-tone/volume control circuit
TDA2545A	Quasi-split-sound circuit
TDA2546A	Quasi-split-sound circuit with 5.5 MHz demodulation
TDA2549	IF amplifier and demodulator for multistandard TV receivers
TDA2555; TDA2557	Dual TV sound demodulator circuits
TDA2579B	Horizontal/vertical synchronization circuit
TDA2579C	Synchronization circuit with synchronized vertical divider system for 60 Hz
TDA2595	Horizontal combination
TDA2611A	5 W audio power amplifier
TDA2613	6 W hi-fi audio power amplifier
TDA2614	6 W hi-fi audio power amplifier
TDA2615	2 x 6 W hi-fi audio power amplifier
TDA2616; TDA2616Q	2 x 12 W hi-fi audio power amplifier with mute
TDA2653A	Vertical deflection circuit; large screen colour TV
TDA2654	Vertical deflection circuit
TDA3504	Video control combination circuit
TDA3505; TDA3506	Video control combination circuit with automatic cut-off control
TDA3507	Video control combination circuit with automatic cut-off control
TDA3508	Video control combination circuit with automatic cut-off control

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TDA3561A	PAL decoder
TDA3565	PAL decoder
TDA3566	PAL/NTSC decoder
TDA3566A	PAL/NTSC decoder
TDA3567	NTSC decoder
TDA3592A	SECAM-PAL transcoder
TDA3653B; TDA3653C	Vertical deflection and guard circuit (90 degrees)
TDA3654; TDA3654Q	Vertical deflection and guard circuit (110 degrees)
TDA3755	PAL/NTSC/SECAM synchronization processor for video recorders
TDA3803A	Stereo/dual TV sound decoder circuit
TDA3810	Spatial, stereo and pseudo-stereo sound circuit
TDA3825	Single FM TV-sound demodulator circuit
TDA3826	Single FM TV-sound demodulator circuit
TDA3827	TV-sound demodulator circuit with SCART switches and AF control
TDA3833	BTSC-stereo/SAP/DBX decoder and DBX expander
TDA3840	TV IF amplifier and demodulator with TV signal identification
TDA3842	Multistandard TV IF amplifier and demodulator with TV signal identification
TDA3843	Sound-IF circuit for TV AM-sound standard L and L
TDA3845; TDA3845T	Quasi-split sound circuit and AM demodulator
TDA3853T	TV IF amplifier and demodulator with TV-identification
TDA3856	Quasi-split sound processor for all standards
TDA3857	Quasi-split sound processor with two FM demodulators
TDA3858	Quasi-split sound processor for all standards
TDA3866	Quasi-split sound processor for all standards; two FM demod.; AM demod.; IF switch
TDA3867T	Quasi-split sound processor with two FM demodulators
TDA3868T	Quasi-split sound processor for all standards; two FM demod.; AM demod.; IF switch
TDA4504B	Small signal combination multistandard colour TV
TDA4510	PAL decoder
TDA4555; TDA4556	Multistandard decoder
TDA4557	Multistandard decoder
TDA4560	Colour transient improvement circuit; switchable delay from 720 to 1035ns
TDA4565	Colour transient improvement circuit; switchable delay from 730 to 1000ns
TDA4566	Colour transient improvement circuit; switchable delay from 550 to 820ns
TDA4568	Luminance signal delay circuit
TDA4570	NTSC decoder
TDA4580	Video control combination circuit with automatic cut-off control
TDA4650	Multistandard colour decoder, with negative colour difference output signals
TDA4651	Multistandard colour decoder, with negative colour difference output signals
TDA4655	Generic multi-standard decoder
TDA4657	Generic multi-standard decoder; no NTSC with 3.58MHz

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TDA4661	Baseband delay line; PAL, NTSC, SECAM
TDA4662	Baseband delay line PAL, NTSC
TDA4663T	Baseband delay line PAL, NTSC/1 H delay line only
TDA4665	Baseband delay line; PAL, NTSC, SECAM
TDA4670	Picture Signal Improvement circuit (PSI); I ² C-bus
TDA4671	Picture Signal Improvement (PSI) circuit
TDA4672	Picture Signal Improvement (PSI) circuit with enhanced peaking function
TDA4680	Video processor with automatic cut-off and white-level control; I ² C-bus
TDA4685	Video processor with automatic cut-off control; I ² C-bus
TDA4686	Video processor with automatic cut-off control; double line frequency; I ² C-bus
TDA4688	Video processor with automatic cut-off control; NTSC matrix (JAPAN); I ² C-bus
TDA4691	Sync processor with clock (SPC)
TDA4780	RGB video processor with automatic cut-off control and gamma adjust; I ² C-bus
TDA4800	Vertical deflection circuit for monitor applications
TDA4820T	Sync separation circuit for video applications
TDA4850	Horizontal and vertical deflection controller for VGA/XGA and multi-frequency monitors
TDA4851	Horizontal and vertical deflection controller for VGA/XGA and autosync monitors
TDA4852	Horizontal and vertical deflection controller for autosync monitors
TDA4855	Autosync Deflection Controller (ASDC)
TDA4858	Economy Autosync Deflection Controller (EASDC)
TDA4860	Vertical deflection power amplifier for monitors
TDA4861	Vertical deflection power amplifier for monitors
TDA4866	Full bridge current driven vertical deflection booster
TDA4881	Advanced monitor video controller
TDA4882	Advanced monitor video controller for OSD
TDA4884	Three-gain control video preamplifier for OSD
TDA5140A	Brushless DC motor drive circuit; 0.8 A drive
TDA5141	Brushless DC motor drive circuit; 1.9 A drive
TDA5142T	Brushless DC motor drive circuit; 0.2 A drive
TDA5143T	Brushless DC motor drive circuit; 0.85 A drive
TDA5144T; TDA5144AT	Brushless DC motor drive circuit; 2.0 A drive
TDA5145	Brushless DC motor drive circuit; 2.0 A drive
TDA5330T	VHF, UHF and Hyperband mixer/oscillator for TV and VCR 3-band tuners
TDA5332T	Double mixer/oscillator for TV and VCR tuners
TDA5630; TDA5631	9 V VHF, hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA5630BT	9 V VHF and UHF mixer/oscillator for TV and VCR cable tuners
TDA5632; TDA5633	9 V VHF and UHF mixer/oscillators for TV and VCR cable tuners
TDA5634T	9 V UHF mixer/oscillator for TV and VCR tuners
TDA5636; TDA5637	9 V VHF and UHF hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA5636B; TDA5637B	9 V VHF hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners

TDA5731M	Low-power VHF, UHF and hyperband mixer/oscillator for TV and VCR 3-band tuners
TDA5736; TDA5737	5 V VHF hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA6101Q	Video output amplifier
TDA6103Q	Triple video output amplifier
TDA6111Q	Video output amplifier
TDA6402; TDA6403	5 V mixer/oscillator and synthesizer for cable TV and VCR 2-band tuners
TDA6800; TDA6800T	Video modulator circuit
TDA7050	Low-voltage mono/stereo power amplifier
TDA7050T	Low-voltage mono/stereo power amplifier
TDA7052	1 W BTL mono audio amplifier
TDA7052A; TDA7052AT	1 W BTL mono audio amplifier with DC volume control
TDA7052B	Mono BTL audio amplifier with DC volume control
TDA7053	2 x 1 W portable/mains-fed stereo power amplifier
TDA7053A	Stereo BTL audio amplifier with DC volume control
TDA7056	3 W mono BTL audio output amplifier
TDA7056A	3 W mono BTL audio output amplifier with DC volume control
TDA7056B	5 W mono BTL audio output amplifier with DC volume control
TDA7057AQ	2 x 5 W stereo BTL audio output amplifier with DC volume control
TDA7057Q	2 x 3 W stereo BTL audio output amplifier
TDA8000; TDA8000T	Smart card interface
TDA8001	Smart card interface
TDA8002	IC card interface
TDA8005	Low-power smart card coupler
TDA8010M; TDA8010AM	Low-power mixer/oscillators for satellite tuners
TDA8012M	Low-power PLL FM demodulator for satellite TV receivers
TDA8040T	Quadrature demodulator
TDA8041H	Quadrature demodulator controller
TDA8046H	Multi-mode QAM demodulator; I ² C-bus
TDA8303; TDA8303A	Small signal combination IC for black/white TV
TDA8304	Small signal combination IC for colour TV
TDA8310	PAL/NTSC colour processor for Picture-In-Picture (PIP) applications
TDA8310A	PAL/NTSC colour processor for Picture-In-Picture (PIP) applications
TDA8315T	Integrated NTSC decoder and sync processor
TDA8340; TDA8341	Television IF amplifier and demodulator
TDA8349A	Multistandard IF amplifier and demodulator
TDA8350Q	DC-coupled vertical deflection and East-West output circuit
TDA8351	DC-coupled vertical deflection circuit
TDA8351A	DC-coupled vertical deflection output circuit
TDA8356	DC-coupled vertical deflection circuit
TDA8360; TDA8361; TDA8362	Integrated PAL and PAL/NTSC TV processors
TDA8366	I ² C-bus controlled PAL/NTSC TV processor

Semiconductors for Television and Video Systems

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TDA8376; TDA8376A	I ² C-bus controlled PAL/NTSC TV processors
TDA8380A	Control circuit for Switched Mode Power Supplies (SMPS)
TDA8385	Control circuit for a Self-Oscillating Power Supply (SOPS)
TDA8395	SECAM decoder
TDA8415	TV and VTR stereo/dual sound processor with integrated filters and I ² C-bus control
TDA8416	TV and VTR stereo/dual sound processor with integrated filters and I ² C-bus control; two slave addresses
TDA8417	TV and VTR stereo/dual sound processor with integrated filters and I ² C-bus control
TDA8421	Hi-fi stereo audio processor; I ² C-bus; input selector
TDA8424	Hi-fi stereo audio processor; I ² C-bus; mode selector
TDA8425	Hi-fi stereo audio processor; I ² C-bus; source and mode selector
TDA8426	Hi-fi stereo audio processor; I ² C-bus; source and mode selector
TDA8433	Deflection processor for computer controlled TV receivers; I ² C-bus
TDA8440	Switch for CTV receivers; I ² C-bus
TDA8442	I ² C-bus interface for colour decoders
TDA8443A	I ² C-bus controlled YUV/RGB switch
TDA8444	Octuple 6-bit DAC with I ² C-bus
TDA8446	Fast RGB/YC switch for digital decoding
TDA8501	PAL/NTSC encoder
TDA8505	SECAM encoder
TDA8540	4 x 4 video switch matrix
TDA8601	RGB/YUV and fast blanking switch
TDA8702	8-bit video digital-to-analog converter
TDA8703	8-bit high-speed analog-to-digital converter
TDA8705	6-bit high-speed dual Analog-to-Digital Converter (ADC)
TDA8705A	6-bit high-speed dual Analog-to-Digital Converter (ADC)
TDA8706	6-bit high-speed dual analog-to-digital converter with multiplexer and clamp
TDA8706A	6-bit analog-to-digital converter with multiplexer and clamp
TDA8707	Triple RGB 6-bit video analog-to-digital interface
TDA8708A	Video analog input interface
TDA8708B	Video analog input interface
TDA8709A	Video analog input interface
TDA8712; TDF8712	8-bit digital-to-analog converters
TDA8714	8-bit high-speed analog-to-digital converter
TDA8716	8-bit high-speed analog-to-digital converter
TDA8718	8-bit high-speed analog-to-digital converter
TDA8722	I ² C-bus programmable modulator for negative video modulation and FM sound
TDA8725T	Antenna signal processor
TDA8730	PLL FM demodulator for DBS signals
TDA8732	NICAM-728 demodulator (NIDEM)
TDA8735	PLL frequency synthesizer; I ² C-bus
TDA8740; TDA8740H	Satellite sound circuit with noise reduction

TDA8741; TDA8741H	Satellite sound circuit with noise reduction
TDA8742; TDA8742H	Satellite sound circuit with noise reduction; HF input selection
TDA8745	Satellite sound circuit with I ² C-bus control
TDA8752	Triple high speed Analog-to-Digital Converter (ADC) for LCD drive; I ² C-bus
TDA8753A	YUV 8-bit analog-to-digital interface
TDA8755	YUV 8-bit video low-power analog-to-digital interface
TDA8758	YC 8-bit low-power analog-to-digital video interface
TDA8760	10-bit high-speed analog-to-digital converter
TDA8761A	9-bit analog-to-digital converter for digital video
TDA8762	10-bit high-speed analog-to-digital converter
TDA8762A	10-bit high-speed low-power analog-to-digital converter
TDA8763	10-bit high-speed low-power ADC with internal reference regulator
TDA8763A	10-bit high-speed low-power ADC
TDA8766	10-bit high-speed 2.7 to 5.25 V analog-to-digital converter
TDA8771A	Triple 8-bit video Digital-to-Analog Converter (DAC)
TDA8772; TDA8772A	Triple 8-bit video digital-to-analog converter
TDA8775	Triple 10-bit video Digital-to-Analog Converter (DAC)
TDA8776	10-bit, 500 Msps Digital-to-Analog Converter (DAC)
TDA8776A	10-bit, 1000 Msps Digital-to-Analog Converter (DAC)
TDA8779H	10-bit converter interface (ADC/DAC) for quadrature transceiver
TDA8785	8-bit high-speed analog-to-digital converter with gain and offset controls
TDA8786; TDA8786A	10-bit analog-to-digital interface for CCD cameras
TDA8790	8-bit, 40 Msps 2.7 to 5.5 V universal analog-to-digital converter
TDA8792	3.3 V, 25 MHz Analog-to-Digital Converter (ADC)
TDA9141	PAL/NTC/SECAM decoder/sync processor; I ² C-bus
TDA9143	I ² C-bus controlled, alignment-free PAL/NTSC/SECAM decoder/sync processor
TDA9144	I ² C-bus controlled, alignment-free PAL/NTSC/SECAM decoder/sync processor with PALplus helper demodulator
TDA9150B	Programmable deflection controller; I ² C-bus
TDA9151B	Programmable deflection controller; I ² C-bus
TDA9160	PAL/NTSC/SECAM decoder/sync processor; I ² C-bus
TDA9170	YUV picture improvement processor based on histogram modification; I ² C-bus
TDA9171	YUV picture improvement processor based on histogram modification and blue stretch
TDA9176	Luminance Transient Improvement (LTI) IC
TDA9177	YUV transient improvement processor; I ² C-bus
TDA9614H	Audio processor for VHS hi-fi and linear audio; I ² C-bus
TDA9715H; TDA9715A	Y/C one-chip processor (VHS standard)
TDA9725	Y/C automatic adjustment processor (VHS standard)
TDA9800	VIF-PLL demodulator and FM-PLL detector
TDA9802	Multistandard VIF-PLL demodulator and FM-PLL detector
TDA9803	Multistandard VIF-PLL demodulator

TDA9804	VIF-PLL demodulator with internal or external AGC and FM-PLL detector
TDA9806	Multistandard VIF-PLL and FM-PLL demodulator
TDA9808	Single standard VIF-PLL with QSS-IF and FM-PLL demodulator
TDA9811	Multistandard VIF-PLL with QSS-IF and AM demodulator
TDA9812; TDA9812T	Multistandard VIF-PLL and FM-PLL/AM demodulator
TDA9813T	VIF-PLL with QSS-IF and dual FM-PLL demodulator
TDA9814T	Multistandard VIF-PLL with QSS-IF and dual FM-PLL/AM demodulator
TDA9815	Multistandard/MAC VIF-PLL with QSS-IF and dual FM-PLL/AM demodulator
TDA9820	Multistandard/dual channel TV FM intercarrier sound demodulator
TDA9821	Dual channel TV FM intercarrier sound demodulator
TDA9830	TV sound AM-demodulator and audio source switch
TDA9840	TV and VTR stereo/dual sound processor with I ² C-bus control and digital identification
TDA9845	TV and VTR stereo/dual sound processor with integrated filters
TDA9847	TV and VTR stereo/dual sound processor with digital identification
TDA9850	I ² C-bus controlled BTSC stereo/SAP decoder
TDA9852	I ² C-bus controlled BTSC stereo/SAP decoder and audio processor
TDA9855	I ² C-bus controlled BTSC stereo/SAP decoder and audio processor
TDA9860	Universal hi-fi audio processor for TV; I ² C-bus
TDA9861	Universal hi-fi audio processor for TV; I ² C-bus
TDF8704	8-bit high-speed analog-to-digital converter
TEA1039	Control circuit for Switched Mode Power Supplies (SMPS)
TEA5582	PLL stereo decoder (BTSC system)
TEA7650H	Video signal processor for CD-video/laser vision
TSA5055T	2.5 GHz bi-directional I ² C-bus controlled synthesizer
TSA5511	1.3 GHz bi-directional I ² C-bus controlled frequency synthesizer; 8-bus controlled ports
TSA5512	1.3 GHz bi-directional I ² C-bus controlled synthesizer
TSA5514	1.3 GHz bi-directional I ² C-bus controlled synthesizer; 7-bus controlled ports
TSA5515T	1.3 GHz bi-directional I ² C-bus controlled frequency synthesizer; 6-bus controlled ports
TSA5520; TSA5521	1.3 GHz universal bus-controlled frequency TV synthesizers; I ² C-bus; 3-wire
TSA5522	1.4 GHz I ² C-bus controlled synthesizer
TSA5526; TSA5527	1.3 GHz I ² C-bus/3-wire controlled frequency synthesizers
μA733; 733C	Differential video amplifier

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TUNING/TUNER

Tuning

SAB6456; SAB6456T	Sensitive 1 GHz divide-by-64/divide-by-256 switchable prescaler
TDA8725T	Antenna signal processor
TSA5511	1.3 GHz bi-directional I ² C-bus controlled frequency synthesizer; 8-bus controlled ports
TSA5512	1.3 GHz bi-directional I ² C-bus controlled synthesizer
TSA5514	1.3 GHz bi-directional I ² C-bus controlled synthesizer; 7-bus controlled ports
TSA5515T	1.3 GHz bi-directional I ² C-bus controlled frequency synthesizer; 6-bus controlled ports
TSA5520; TSA5521	1.3 GHz universal bus-controlled frequency TV synthesizers; I ² C-bus; 3-wire
TSA5522	1.4 GHz I ² C-bus controlled synthesizer
TSA5526; TSA5527	1.3 GHz I ² C-bus/3-wire controlled frequency synthesizers

Tuner

BA481	UHF mixer diode
BA482; BA483; BA484	Band-switching diodes; leaded
BA682; BA683	Band-switching diodes; SMD
BA792	Band-switching diode; SMD
BAT17	Schottky barrier mixer diode; SMD
BAT18	Band-switching diode
BF547	NPN 1 GHz wideband transistor
BF747	NPN 1 GHz wideband transistor
BFS17	NPN 1 GHz wideband transistor
BFS17A	NPN 3 GHz wideband transistor
SAA1300	Tuner switching circuit; I ² C-bus
TDA5330T	VHF, UHF and Hyperband mixer/oscillator for TV and VCR 3-band tuners
TDA5332T	Double mixer/oscillator for TV and VCR tuners
TDA5630; TDA5631	9 V VHF, hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA5630BT	9 V VHF and UHF mixer/oscillator for TV and VCR cable tuners
TDA5632; TDA5633	9 V VHF and UHF mixer/oscillators for TV and VCR cable tuners
TDA5634T	9 V UHF mixer/oscillator for TV and VCR tuners
TDA5636; TDA5637	9 V VHF and UHF hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA5636B; TDA5637B	9 V VHF hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA5731M	Low-power VHF, UHF and hyperband mixer/oscillator for TV and VCR 3-band tuners
TDA5736; TDA5737	5 V VHF hyperband and UHF mixer/oscillators for TV and VCR 3-band tuners
TDA6402; TDA6403	5 V mixer/oscillator and synthesizer for cable TV and VCR 2-band tuners

Varicap

BB119	Variable capacitance diode; AFC
BB131	VHF variable capacitance diode; coupling; SMD
BB132	VHF variable capacitance diode; tuning; SMD
BB133	VHF variable capacitance diode; tuning; SMD
BB134	UHF variable capacitance diode; tuning
BB135	UHF variable capacitance diode; coupling; SMD
BB148	VHF variable capacitance diode; tuning
BB149	UHF variable capacitance diode; tuning
BB150	VHF variable capacitance diode; coupling; SMD
BB158	VHF variable capacitance diode; tuning; SMD
BB159	UHF variable capacitance diode; tuning
BB215	UHF variable capacitance diode; tuning
BB405B	UHF variable capacitance diode; tuning
BB417	UHF variable capacitance diode; AFC
BB809	VHF variable capacitance diode; tuning; Leaded
BB901	VHF variable capacitance diode; coupling; SMD
BB909A; BB909B	VHF variable capacitance diodes; leaded
BB910	VHF variable capacitance diode; leaded
BB911/A	VHF variable capacitance diode; leaded
BBY31	UHF variable capacitance diode; satellite
BBY39	UHF variable capacitance diode; tuning
BBY40	VHF variable capacitance diode; tuning
BBY42	VHF variable capacitance diode; tuning
BBY62	UHF variable capacitance diode; tuning

Dual gate n-channel MOSFET

BF904; BF904R	Silicon N-channel dual gate MOS-FETs; VHF/UHF
BF989	Silicon N-channel dual gate MOS-FET; UHF
BF990A	Silicon N-channel dual gate MOS-FET; UHF
BF991	Silicon N-channel dual gate MOS-FET; VHF
BF992; BF992R	Silicon N-channel dual gate MOS-FETs; VHF
BF994S	Silicon N-channel dual gate MOS-FET; VHF
BF996S	Silicon N-channel dual gate MOS-FET; UHF
BF997	Silicon N-channel dual gate MOS-FET; VHF
BF998; BF998R	Silicon N-channel dual gate MOS-FETs; VHF/UHF

Modulators

TDA6800; TDA6800T	Video modulator circuit
TDA8722	I ² C-bus programmable modulator for negative video modulation and FM sound

IF

Vision IF

TDA2549	IF amplifier and demodulator for multistandard TV receivers
TDA3840	TV IF amplifier and demodulator with TV signal identification
TDA3842	Multistandard TV IF amplifier and demodulator with TV signal identification
TDA3843	Sound-IF circuit for TV AM-sound standard L and L'
TDA3853T	TV IF amplifier and demodulator with TV-identification
TDA8340; TDA8341	Television IF amplifier and demodulator
TDA8349A	Multistandard IF amplifier and demodulator
TDA9800	VIF-PLL demodulator and FM-PLL detector
TDA9802	Multistandard VIF-PLL demodulator and FM-PLL detector
TDA9803	Multistandard VIF-PLL demodulator
TDA9804	VIF-PLL demodulator with internal or external AGC and FM-PLL detector
TDA9806	Multistandard VIF-PLL and FM-PLL demodulator
TDA9808	Single standard VIF-PLL with QSS-IF and FM-PLL demodulator
TDA9811	Multistandard VIF-PLL with QSS-IF and AM demodulator
TDA9812; TDA9812T	Multistandard VIF-PLL and FM-PLL/AM demodulator
TDA9813T	VIF-PLL with QSS-IF and dual FM-PLL demodulator
TDA9814T	Multistandard VIF-PLL with QSS-IF and dual FM-PLL/AM demodulator
TDA9815	Multistandard/MAC VIF-PLL with QSS-IF and dual FM-PLL/AM demodulator

Sound IF

TDA2545A	Quasi-split-sound circuit
TDA2546A	Quasi-split-sound circuit with 5.5 MHz demodulation
TDA3845; TDA3845T	Quasi-split sound circuit and AM demodulator
TDA3856	Quasi-split sound processor for all standards
TDA3857	Quasi-split sound processor with two FM demodulators
TDA3858	Quasi-split sound processor for all standards
TDA3866	Quasi-split sound processor for all standards; two FM demod.; AM demod.; IF switch
TDA3867T	Quasi-split sound processor with two FM demodulators
TDA3868T	Quasi-split sound processor for all standards; two FM demod.; AM demod.; IF switch

AM demodulator

TDA9830 TV sound AM-demodulator and audio source switch

FM demodulator

TBA120U Sound IF amplifier/demodulator for TV
 TDA2555; TDA2557 Dual TV sound demodulator circuits
 TDA3825 Single FM TV-sound demodulator circuit
 TDA3826 Single FM TV-sound demodulator circuit
 TDA3827 TV-sound demodulator circuit with SCART switches and AF control
 TDA9820 Multistandard/dual channel TV FM intercarrier sound demodulator
 TDA9821 Dual channel TV FM intercarrier sound demodulator

NICAM

TDA8732 NICAM-728 demodulator (NIDEM)

SOUND

Sound decoding - Stereo decoder/dual language

TDA3803A Stereo/dual TV sound decoder circuit
 TDA3833 BTSC-stereo/SAP/DBX decoder and DBX expander
 TDA8415 TV and VTR stereo/dual sound processor with integrated filters and I²C-bus control
 TDA8416 TV and VTR stereo/dual sound processor with integrated filters and I²C-bus control; two slave addresses
 TDA8417 TV and VTR stereo/dual sound processor with integrated filters and I²C-bus control
 TDA9840 TV and VTR stereo/dual sound processor with I²C-bus control and digital identification
 TDA9845 TV and VTR stereo/dual sound processor with integrated filters
 TDA9847 TV and VTR stereo/dual sound processor with digital identification
 TDA9850 I²C-bus controlled BTSC stereo/SAP decoder
 TDA9852 I²C-bus controlled BTSC stereo/SAP decoder and audio processor
 TDA9855 I²C-bus controlled BTSC stereo/SAP decoder and audio processor
 TEA5582 PLL stereo decoder (BTSC system)

NICAM

SAA7282 Terrestrial Digital Sound Decoder (TDSD2); I²C-bus
 SAA7283 Terrestrial Digital Sound Decoder (TDSD3); I²C-bus
 SAA7284 Terrestrial digital sound decoder for conventional intercarrier PLL-IF systems; I²C-bus

Sound control

TDA1524A	Stereo-tone/volume control circuit
TDA1526	Stereo-tone/volume control circuit
TDA3810	Spatial, stereo and pseudo-stereo sound circuit
TDA8421	Hi-fi stereo audio processor; I ² C-bus; input selector
TDA8424	Hi-fi stereo audio processor; I ² C-bus; mode selector
TDA8425	Hi-fi stereo audio processor; I ² C-bus; source and mode selector
TDA8426	Hi-fi stereo audio processor; I ² C-bus; source and mode selector
TDA9860	Universal hi-fi audio processor for TV; I ² C-bus
TDA9861	Universal hi-fi audio processor for TV; I ² C-bus

Sound ADC

PCF8591	8-bit A/D and D/A converter; I ² C-bus
SAD1009	Universal DAC (UDAC)

Sound output

TDA1013B	4 W audio power amplifier with DC volume control
TDA1015	1 to 4 W audio power amplifier
TDA1015T	0.5 W audio power amplifier
TDA1514A	50 W high-performance hi-fi amplifier
TDA1521; TDA1521Q	2 x 12 W hi-fi audio power amplifier
TDA1521A	2 x 6 W hi-fi audio power amplifier
TDA2611A	5 W audio power amplifier
TDA2613	6 W hi-fi audio power amplifier
TDA2614	6 W hi-fi audio power amplifier
TDA2615	2 x 6 W hi-fi audio power amplifier
TDA2616; TDA2616Q	2 x 12 W hi-fi audio power amplifier with mute
TDA7050	Low-voltage mono/stereo power amplifier
TDA7050T	Low-voltage mono/stereo power amplifier
TDA7052	1 W BTL mono audio amplifier
TDA7052A; TDA7052AT	1 W BTL mono audio amplifier with DC volume control
TDA7052B	Mono BTL audio amplifier with DC volume control
TDA7053	2 x 1 W portable/mains-fed stereo power amplifier
TDA7053A	Stereo BTL audio amplifier with DC volume control
TDA7056	3 W mono BTL audio output amplifier
TDA7056A	3 W mono BTL audio output amplifier with DC volume control
TDA7056B	5 W mono BTL audio output amplifier with DC volume control
TDA7057AQ	2 x 5 W stereo BTL audio output amplifier with DC volume control
TDA7057Q	2 x 3 W stereo BTL audio output amplifier

VISION

Colour decoding

SAA2510	Video CD (VCD) decoder; I ² C-bus
SAA4970T	Economical video processing IC (ECOBENDIC)
SAA4981	Monolithic integrated 16 : 9 compressor
SAA4996H	Motion Adaptive Colour Plus And Control IC (MACPACIC) for PALplus
SAA4997H	Vertical Reconstruction IC (VERIC) for PALplus
TDA3504	Video control combination circuit
TDA3505; TDA3506	Video control combination circuit with automatic cut-off control
TDA3507	Video control combination circuit with automatic cut-off control
TDA3508	Video control combination circuit with automatic cut-off control
TDA3561A	PAL decoder
TDA3565	PAL decoder
TDA3566	PAL/NTSC decoder
TDA3566A	PAL/NTSC decoder
TDA3567	NTSC decoder
TDA3592A	SECAM-PAL transcoder
TDA4510	PAL decoder
TDA4555; TDA4556	Multistandard decoder
TDA4557	Multistandard decoder
TDA4560	Colour transient improvement circuit; switchable delay from 720 to 1035ns
TDA4565	Colour transient improvement circuit; switchable delay from 730 to 1000ns
TDA4566	Colour transient improvement circuit; switchable delay from 550 to 820ns
TDA4568	Luminance signal delay circuit
TDA4570	NTSC decoder
TDA4580	Video control combination circuit with automatic cut-off control
TDA4650	Multistandard colour decoder, with negative colour difference output signals
TDA4651	Multistandard colour decoder, with negative colour difference output signals
TDA4655	Generic multi-standard decoder
TDA4657	Generic multi-standard decoder; no NTSC with 3.58MHz
TDA4661	Baseband delay line; PAL, NTSC, SECAM
TDA4662	Baseband delay line PAL, NTSC
TDA4663T	Baseband delay line PAL, NTSC/1 H delay line only
TDA4665	Baseband delay line; PAL, NTSC, SECAM
TDA4670	Picture Signal Improvement circuit (PSI); I ² C-bus
TDA4671	Picture Signal Improvement (PSI) circuit
TDA4672	Picture Signal Improvement (PSI) circuit with enhanced peaking function
TDA4680	Video processor with automatic cut-off and white-level control; I ² C-bus
TDA4685	Video processor with automatic cut-off control; I ² C-bus
TDA4686	Video processor with automatic cut-off control; double line frequency; I ² C-bus

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Selection guide

TDA4688	Video processor with automatic cut-off control; NTSC matrix (JAPAN); I ² C-bus
TDA4780	RGB video processor with automatic cut-off control and gamma adjust; I ² C-bus
TDA8376; TDA8376A	I ² C-bus controlled PAL/NTSC TV processors
TDA8395	SECAM decoder
TDA8440	Switch for CTV receivers; I ² C-bus
TDA8443A	I ² C-bus controlled YUV/RGB switch
TDA8446	Fast RGB/YC switch for digital decoding
TDA8540	4 x 4 video switch matrix
TDA8601	RGB/YUV and fast blanking switch
TDA9141	PAL/NTC/SECAM decoder/sync processor; I ² C-bus
TDA9143	I ² C-bus controlled, alignment-free PAL/NTSC/SECAM decoder/sync processor
TDA9144	I ² C-bus controlled, alignment-free PAL/NTSC/SECAM decoder/sync processor with PALplus helper demodulator
TDA9160	PAL/NTSC/SECAM decoder/sync processor; I ² C-bus
TDA9170	YUV picture improvement processor based on histogram modification; I ² C-bus
TDA9171	YUV picture improvement processor based on histogram modification and blue stretch
TDA9176	Luminance Transient Improvement (LTI) IC
TDA9177	YUV transient improvement processor; I ² C-bus
TEA7650H	Video signal processor for CD-video/laser vision

DVB Channel decoding

SAA7207H	Reed Solomon decoder IC; I ² C-bus
TDA8040T	Quadrature demodulator
TDA8041H	Quadrature demodulator controller
TDA8046H	Multi-mode QAM demodulator; I ² C-bus
SAA7206H	DVB compliant descrambler

Video decoding

SAA7110; SAA7110A	One chip Front-end 1 (OCF1)
SAA7111	Video Input Processor (VIP); I ² C-bus
SAA7111A	Enhanced Video Input Processor (EVIP); I ² C-bus
SAA7151B	Digital multistandard colour decoder with SCART interface (DMSD2-SCART)
SAA7152	Digital video comb filter (DCF)
SAA7157	Clock signal generator circuit for digital TV systems (SCGC)

Video scaling

SAA7140A; SAA7140B	High Performance Scaler (HPS); I ² C-bus
SAA7196	Digital Video Decoder, Scaler, and Clock generator circuit (DESCPro); I ² C-bus

Video encoding

SAA7182A; SAA7183A	Digital Video Encoders (EURO-DENC2); I ² C-bus
SAA7184; SAA7185B	Digital Video Encoders (DENC2-M6); I ² C-bus
SAA7185	Digital Video Encoder (DENC2); I ² C-bus
SAA7187	Digital Video Encoder (DENC2-SQ); I ² C-bus
SAA7199B	Digital Video Encoder (DENC) GENLOCK-capable; I ² C-bus

Output processing

SAA7165	Video Enhancement and Digital-to-Analog processor (VEDA2); I ² C-bus
SAA7167A	YUV-to-RGB Digital-to-analog Converter (DAC); I ² C-bus

Video and high-speed ADC and DAC

SAA7165	Video Enhancement and Digital-to-Analog processor (VEDA2); I ² C-bus
TDA8702	8-bit video digital-to-analog converter
TDA8703	8-bit high-speed analog-to-digital converter
TDA8705	6-bit high-speed dual Analog-to-Digital Converter (ADC)
TDA8705A	6-bit high-speed dual Analog-to-Digital Converter (ADC)
TDA8706	6-bit high-speed dual analog-to-digital converter with multiplexer and clamp
TDA8706A	6-bit analog-to-digital converter with multiplexer and clamp
TDA8707	Triple RGB 6-bit video analog-to-digital interface
TDA8708A	Video analog input interface
TDA8708B	Video analog input interface
TDA8709A	Video analog input interface
TDA8712; TDF8712	8-bit digital-to-analog converters
TDA8714	8-bit high-speed analog-to-digital converter
TDA8716	8-bit high-speed analog-to-digital converter
TDA8718	8-bit high-speed analog-to-digital converter
TDA8752	Triple high speed Analog-to-Digital Converter (ADC) for LCD drive; I ² C-bus
TDA8753A	YUV 8-bit analog-to-digital interface
TDA8755	YUV 8-bit video low-power analog-to-digital interface
TDA8758	YC 8-bit low-power analog-to-digital video interface
TDA8760	10-bit high-speed analog-to-digital converter
TDA8761A	9-bit analog-to-digital converter for digital video
TDA8762	10-bit high-speed analog-to-digital converter
TDA8762A	10-bit high-speed low-power analog-to-digital converter
TDA8763	10-bit high-speed low-power ADC with internal reference regulator
TDA8763A	10-bit high-speed low-power ADC
TDA8766	10-bit high-speed 2.7 to 5.25 V analog-to-digital converter

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TDA8771A	Triple 8-bit video Digital-to-Analog Converter (DAC)
TDA8772; TDA8772A	Triple 8-bit video digital-to-analog converter
TDA8775	Triple 10-bit video Digital-to-Analog Converter (DAC)
TDA8776	10-bit, 500 Msps Digital-to-Analog Converter (DAC)
TDA8776A	10-bit, 1000 Msps Digital-to-Analog Converter (DAC)
TDA8779H	10-bit converter interface (ADC/DAC) for quadrature transceiver
TDA8785	8-bit high-speed analog-to-digital converter with gain and offset controls
TDA8786; TDA8786A	10-bit analog-to-digital interface for CCD cameras
TDA8790	8-bit, 40 Msps 2.7 to 5.5 V universal analog-to-digital converter
TDA8792	3.3 V, 25 MHz Analog-to-Digital Converter (ADC)
TDF8704	8-bit high-speed analog-to-digital converter

Memory based features

SAB9075H	Picture-In-Picture (PIP) controller for NTSC; I ² C-bus
SAB9076H	Picture-In-Picture (PIP) controller; I ² C-bus
TDA8310A	PAL/NTSC colour processor for Picture-In-Picture (PIP) applications

Scan conversion

PCF8570	256 x 8-bit static low-voltage RAM with I ² C-bus interface
SAA4990H	Progressive scan-Zoom and Noise reduction IC (PROZONIC)
SAA7158	Back END IC

Video output

TDA6101Q	Video output amplifier
TDA6103Q	Triple video output amplifier
TDA6111Q	Video output amplifier

High voltage transistors

BF420; BF422	Silicon epitaxial transistors; NPN; leaded
BF421; BF423	Silicon epitaxial transistors; PNP; leaded
BF457; BF458; BF459	Silicon planar transistors; PNP; leaded
BF469; BF471	Silicon planar epitaxial transistors; PNP; leaded
BF470; BF472	Silicon planar epitaxial transistors; PNP; leaded
BF483; BF485; BF487	Silicon planar epitaxial transistors; NPN; leaded
BF486; BF488	Silicon planar epitaxial transistors; PNP; leaded
BF583; BF585; BF587	Silicon planar epitaxial transistors; NPN; leaded
BF588	Silicon planar epitaxial transistors; PNP; leaded
BF720; BF722	Silicon epitaxial transistors; NPN; SMD

BF721; BF723	Silicon epitaxial transistors; PNP; SMD
BF857; BF858; BF859	Silicon planar video output transistors: NPN; Leaded
BF869; BF871	Silicon planar video output transistors: NPN; Leaded
BF870; BF872	Silicon planar video output transistors: PNP; Leaded

SYNC/DEFLECTION

Sync/deflection

BY228	Damper diode
BY328	Damper diode
BY8000 series	Fast high-voltage soft-recovery controlled avalanche rectifiers
BY8100 series	Very fast high-voltage soft-recovery controlled avalanche rectifiers
BY8400 series	Fast high-voltage soft-recovery rectifiers
BYD33 series	Fast soft-recovery controlled avalanche rectifiers
BYW54; BYW55; BYW56	Controlled avalanche rectifiers
TDA1082	East-west correction driver circuit
TDA2579B	Horizontal/vertical synchronization circuit
TDA2579C	Synchronization circuit with synchronized vertical divider system for 60 Hz
TDA2595	Horizontal combination
TDA2653A	Vertical deflection circuit; large screen colour TV
TDA2654	Vertical deflection circuit
TDA3653B; TDA3653C	Vertical deflection and guard circuit (90 degrees)
TDA3654; TDA3654Q	Vertical deflection and guard circuit (110 degrees)
TDA4691	Sync processor with clock (SPC)
TDA4800	Vertical deflection circuit for monitor applications
TDA4820T	Sync separation circuit for video applications
TDA4858	Economy Autosync Deflection Controller (EASDC)
TDA4866	Full bridge current driven vertical deflection booster
TDA8350Q	DC-coupled vertical deflection and East-West output circuit
TDA8351	DC-coupled vertical deflection circuit
TDA8351A	DC-coupled vertical deflection output circuit
TDA8356	DC-coupled vertical deflection circuit
TDA8433	Deflection processor for computer controlled TV receivers; I ² C-bus
TDA9150B	Programmable deflection controller; I ² C-bus
TDA9151B	Programmable deflection controller; I ² C-bus

Power supply

BYV95 series	Fast soft-recovery controlled avalanche rectifiers
TDA1023; TDA1023T	Proportional-control triac triggering circuit
TDA8380A	Control circuit for Switched Mode Power Supplies (SMPS)

TDA8385	Control circuit for a Self-Oscillating Power Supply (SOPS)
TEA1039	Control circuit for Switched Mode Power Supplies (SMPS)

COMBI ICs

TDA4504B	Small signal combination multistandard colour TV
TDA8303; TDA8303A	Small signal combination IC for black/white TV
TDA8304	Small signal combination IC for colour TV
TDA8310	PAL/NTSC colour processor for Picture-In-Picture (PIP) applications
TDA8315T	Integrated NTSC decoder and sync processor
TDA8360; TDA8361; TDA8362	Integrated PAL and PAL/NTSC TV processors
TDA8366	I ² C-bus controlled PAL/NTSC TV processor

CONTROL

Clock/calendar

PCF8573	Clock/calendar with serial I/O; I ² C-bus
PCF8583	Clock calendar with 256 x 8-bit static RAM; I ² C-bus
PCF8593	Low power clock calendar; I ² C-bus

Display drivers

PCF1303T	18-element bar graph LCD driver
PCF2116 family (PCF2114X; PCF2116X)	LCD controller/drivers; I ² C-bus
PCF8566	Universal LCD driver for low multiplex rates; I ² C-bus
PCF8576C	Universal LCD driver for low multiplex rates; I ² C-bus
PCF8577C	LCD direct/duplex driver with I ² C-bus interface
PCF8578	LCD row/column driver for dot matrix graphic displays; I ² C-bus
PCF8579	LCD column driver for dot matrix graphic displays; I ² C-bus

LED driver

SAA1064	4-digit LED-driver with I ² C-bus interface
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On Screen Display (OSD)

PCA84C646; PCA84C846	Microcontrollers for TV tuning control and OSD applications; I ² C-bus
PCA8514	Stand-alone OSD; 4 - 14 MHz systems
PCA8515	Stand-alone OSD; High speed serial I/O or I ² C-bus

PCA8516	Stand-alone OSD; High speed serial I/O or I ² C-bus; half tone effect
PCE84C882	Microcontroller for monitor OSD and auto-sync applications
PCE84C886	Microcontroller for monitor OSD and auto-sync applications
SAA5252	Line twenty-one acquisition and display (LITOD); I ² C-bus
Memories - SRAM	
PCF8570	256 x 8-bit static low-voltage RAM with I ² C-bus interface
EEPROM	
PCA8581; PCA8581C	128 x 8-bit EEPROM with I ² C-bus interface
PCF8522E	256 x 8-bit CMOS EEPROM with I ² C-bus interface
PCF8524	512 x 8-bit CMOS EEPROM with I ² C-bus interface
PCx8582X-2 family	256 x 8-bit CMOS EEPROMS with I ² C-bus interface
PCx8594X-2 family	512 x 8-bit CMOS EEPROMS with I ² C-bus interface
PCx8598X-2 family	1024 x 8-bit CMOS EEPROMS with I ² C-bus interface
Microcontrollers	
80C528; 83C528	CMOS single-chip 8-bit microcontroller; I ² C-bus
80C652; 83C652	CMOS single-chip 8-bit microcontroller; I ² C-bus
83C145; 83C845; 83C055; 87C055	Microcontrollers for TV and video (MTV)
83C654	CMOS single-chip 8-bit microcontroller; I ² C-bus
83CE654	CMOS single-chip 8-bit microcontroller with Electromagnetic Compatibility improvements
84C44X; 84C64X; 84C84X	8-bit microcontrollers with OSD and VST; I ² C-bus
87C528	CMOS single-chip 8-bit microcontroller; I ² C-bus
87C652	CMOS single-chip 8-bit microcontroller; I ² C-bus
87C654	CMOS single-chip 8-bit microcontroller; I ² C-bus
P8xCE528	8-bit microcontroller with EMC; I ² C-bus
PCA84C646; PCA84C846	Microcontrollers for TV tuning control and OSD applications; I ² C-bus
PCA84C922; PCA84C923	Microcontrollers for universal infrared remote transmitter applications
PCA8515	Stand-alone OSD; High speed serial I/O or I ² C-bus
PCA8516	Stand-alone OSD; High speed serial I/O or I ² C-bus; half tone effect
PCE84C486; PCE84C487	Microcontrollers for digital auto-sync and VST TV controller applications
PCE84C882	Microcontroller for monitor OSD and auto-sync applications
PCE84C886	Microcontroller for monitor OSD and auto-sync applications
PCF84C12A; PCF84C22A; PCF84C42A	8-bit microcontrollers
PCF84C21A; PCF84C41A; PCF84C81A	Telecom microcontrollers; I ² C-bus

PCF84C85A	Microcontroller with extended I/O; I ² C-bus
PCF84CXXXA family	8-bit microcontrollers; I ² C-bus
Digital Control	
PCE84C486; PCE84C487	Microcontrollers for digital auto-sync and VST TV controller applications
PCE84C882	Microcontroller for monitor OSD and auto-sync applications
PCE84C886	Microcontroller for monitor OSD and auto-sync applications
Remote I/O expanders	
PCF8574	Remote 8-bit I/O expander for I ² C-bus
PCF8584	I ² C-bus controller
Remote control transmitter	
PCA84C122; PCA84C222; PCA84C422; PCA84C622; PCA84C822	8-bit microcontrollers for remote control transmitters
PCA8521	Infrared remote control transmitter RC-5
SAA3004	Remote control transmitter
SAA3008	Infrared remote control transmitter (RECS 80 low voltage)
SAA3010	Infrared remote control transmitter RC-5
TELETEXT	
SAA5191	Teletext video processor
SAA5231	Teletext video processor
SAA5246A	Integrated VIP and Teletext (IVT1.0); I ² C-bus
SAA5249	Integrated VIP and Teletext with Background Memory Controller (IVT1.1BMCX); I ² C-bus
SAA5250	Interface for data acquisition and control (for multi-standard Teletext systems)
SAA5254	Integrated VIP and Teletext decoder (IVT1.1X); I ² C-bus
SAA5281	Integrated video input processor and Teletext decoder (IVT1.8*); I ² C-bus
SAA5290	One-page Economy Teletext and TV microcontroller; I ² C-bus
SAA5355	Single-chip colour CRT controller (FTFROM)
SATELLITE TV	
BB901	VHF variable capacitance diode; coupling; SMD
TDA8010M; TDA8010AM	Low-power mixer/oscillators for satellite tuners

TDA8012M	Low-power PLL FM demodulator for satellite TV receivers
TDA8722	I ² C-bus programmable modulator for negative video modulation and FM sound
TDA8730	PLL FM demodulator for DBS signals
TDA8735	PLL frequency synthesizer; I ² C-bus
TDA8740; TDA8740H	Satellite sound circuit with noise reduction
TDA8741; TDA8741H	Satellite sound circuit with noise reduction
TDA8742; TDA8742H	Satellite sound circuit with noise reduction; HF input selection
TDA8745	Satellite sound circuit with I ² C-bus control
TSA5055T	2.5 GHz bi-directional I ² C-bus controlled synthesizer

PAY TV

TDA8000; TDA8000T	Smart card interface
TDA8001	Smart card interface
TDA8002	IC card interface
TDA8005	Low-power smart card coupler

VCR/CAMERA/RECORDER

SAA1101	Universal sync generator (USG)
SAA1310	Control interface for VHS video recorders
SAA4700	VPS dataline processor
SAA4700T	VPS dataline processor
SAA9740H	Advanced Auto Control Function (A2CF)
SAA9750H	Camera Digital Signal Processor (CAMDSP)
SAD1009	Universal DAC (UDAC)
SAF1135	Dataline decoder; I ² C-bus
TDA3755	PAL/NTSC/SECAM synchronization processor for video recorders
TDA5140A	Brushless DC motor drive circuit; 0.8 A drive
TDA5141	Brushless DC motor drive circuit; 1.9 A drive
TDA5142T	Brushless DC motor drive circuit; 0.2 A drive
TDA5143T	Brushless DC motor drive circuit; 0.85 A drive
TDA5144T; TDA5144AT	Brushless DC motor drive circuit; 2.0 A drive
TDA5145	Brushless DC motor drive circuit; 2.0 A drive
TDA8722	I ² C-bus programmable modulator for negative video modulation and FM sound
TDA9614H	Audio processor for VHS hi-fi and linear audio; I ² C-bus
TDA9715H; TDA9715A	Y/C one-chip processor (VHS standard)
TDA9725	Y/C automatic adjustment processor (VHS standard)

MONITOR CIRCUITS

Sync

TDA2595	Horizontal combination
TDA4820T	Sync separation circuit for video applications
TDA4850	Horizontal and vertical deflection controller for VGA/XGA and multi-frequency monitors
TDA4851	Horizontal and vertical deflection controller for VGA/XGA and autosync monitors
TDA4852	Horizontal and vertical deflection controller for autosync monitors

Deflection

TDA2653A	Vertical deflection circuit; large screen colour TV
TDA2654	Vertical deflection circuit
TDA4800	Vertical deflection circuit for monitor applications
TDA4855	Autosync Deflection Controller (ASDC)
TDA4858	Economy Autosync Deflection Controller (EASDC)
TDA4860	Vertical deflection power amplifier for monitors
TDA4861	Vertical deflection power amplifier for monitors
TDA4866	Full bridge current driven vertical deflection booster

SMPS

TDA8380A	Control circuit for Switched Mode Power Supplies (SMPS)
TEA1039	Control circuit for Switched Mode Power Supplies (SMPS)

Video control

TDA3507	Video control combination circuit with automatic cut-off control
TDA3508	Video control combination circuit with automatic cut-off control
TDA4881	Advanced monitor video controller
TDA4882	Advanced monitor video controller for OSD
TDA4884	Three-gain control video preamplifier for OSD

MISCELLANEOUS

NE/SA/SE5205A	Wide-band high-frequency amplifier
NE/SA5204A	Wide-band high-frequency amplifier
NE/SA5209	Wide-band variable gain amplifier
NE/SE5539	High frequency operational amplifier
NE5592	Video amplifier

Functional index

Selection guide

NE592	Video amplifier
SAA4951	Memory controller
TDA8442	I ² C-bus interface for colour decoders
TDA8444	Octuple 6-bit DAC with I ² C-bus
TDA8501	PAL/NTSC encoder
TDA8505	SECAM encoder
μA733; 733C	Differential video amplifier

Replacement list

Selection guide

REPLACEMENT/WITHDRAWAL TYPES

The following type numbers were in the previous issue of this data handbook, but not in the current version:

TYPE NUMBER	REASON FOR DELETION
BB515	Discontinued
BA582	Replaced by BA792
BB619	Discontinued
BB620	Discontinued
BB811	Discontinued
BF960	Discontinued
BF964S	Discontinued
BF966S	Discontinued
BF980A	Discontinued
BF981	Discontinued
BF982	Discontinued
BY 229 series	In SC02
BY329 series	In SC02
BY359F-1500	In SC02
BY359X-1500	In SC02
P83CL168/268/167/267	To be discontinued soon
P90CE201	Removed from handbook
PCF29F64	Discontinued
PCF84C430	Discontinued
PCF8568	Discontinued
PCF8569	Discontinued
SAA1760	Discontinued
SAA1770	Discontinued
SAA3049A	Discontinued
SAA4940H	Discontinued
SAA5232	Discontinued
SAA5233	Discontinued
SAA5243 series	Discontinued
SAA5244A	Removed from handbook
SAA5245	Removed from handbook
SAA5247	Discontinued
SAA5248	Discontinued
SAA5260	Removed from handbook
SAA5280	Removed from handbook
SAA7167	Discontinued
SAA7169	Discontinued
SAA7186	Discontinued
SAA7191B	Discontinued
SAA7192	Discontinued

Replacement list

Selection guide

TYPE NUMBER	REASON FOR DELETION
SAA7197	Discontinued
SAA9042	will be pruned soon
SAA9051	Discontinued
SAA9056	Discontinued
SAA9057B	Discontinued
SAA9058	Discontinued
SAA9065	Discontinued
SAA9079	Discontinued
SAB8726	Discontinued
SAD1019	Discontinued
TDA1541A	In IC01
TDA1543	In IC01
TDA1545A	In IC01
TDA1546T	Discontinued
TDA2578A	Discontinued
TDA2593	Discontinued
TDA2658	Discontinued
TDA3791	Discontinued
TDA4301	Discontinued
TDA4301T	Discontinued
TDA4306	Discontinued
TDA4632	Discontinued
TDA4710H	Discontinued
TDA4720	Discontinued
TDA4725T	Discontinued
TDA4810	Discontinued
TDA4865	Discontinued
TDA4880	Discontinued
TDA4883	Discontinued
TDA5630CT	Discontinued
TDA6101BQ	Discontinued
TDA8302	Discontinued
TDA8451A	Discontinued
TDA8452A	Discontinued
TDA8453A	Discontinued
TDA8480T	Discontinued
TDA8490	Discontinued
TDA8761	Removed from handbook
TDA8771	Removed from handbook

GENERAL

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TOTAL QUALITY MANAGEMENT

Philips Semiconductors is a Quality Company, renowned for the high quality of our products and service. We keep alive this tradition by constantly aiming towards one ultimate standard, that of zero defects. This aim is guided by our Total Quality Management (TQM) system, the basis of which is described in the following paragraphs.

Quality assurance

Based on ISO 9000 standards, customer standards such as Ford TQE and IBM MDQ. Our factories are certified to ISO 9000 by external inspectorates.

Partnerships with customers

PPM co-operations, design-in agreements, ship-to-stock, just-in-time and self-qualification programmes, and application support.

Partnerships with suppliers

Ship-to-stock, statistical process control and ISO 9000 audits.

Quality improvement programme

Continuous process and system improvement, design improvement, complete use of statistical process control, realization of our final objective of zero defects, and logistics improvement by ship-to-stock and just-in-time agreements.

ADVANCED QUALITY PLANNING

During the design and development of new products and processes, quality is built-in by advanced quality planning. Through failure-mode-and-effect analysis the critical parameters are detected and measures taken to ensure good performance on these parameters. The capability of process steps is also planned in this phase.

PRODUCT CONFORMANCE

The assurance of product conformance is an integral part of our quality assurance (QA) practice. This is achieved by:

- Incoming material management through partnerships with suppliers.
- In-line quality assurance to monitor process reproducibility during manufacture and initiate any necessary corrective action. Critical process steps are 100% under statistical process control.
- Acceptance tests on finished products to verify conformance with the device specification. The test results are used for quality feedback and corrective actions. The inspection and test requirements are detailed in the general quality specifications.
- Periodic inspections to monitor and measure the conformance of products.

PRODUCT RELIABILITY

With the increasing complexity of Original Equipment Manufacturer (OEM) equipment, component reliability must be extremely high. Our research laboratories and development departments study the failure mechanisms of semiconductors. Their studies result in design rules and process optimization for the highest built-in product reliability. Highly accelerated tests are applied to the products reliability evaluation. Rejects from reliability tests and from customer complaints are submitted to failure analysis, to result in corrective action.

CUSTOMER RESPONSES

Our quality improvement depends on joint action with our customer. We need our customer's inputs and we invite constructive comments on all aspects of our performance. Please contact our local sales representative.

RECOGNITION

The high quality of our products and services is demonstrated by many Quality Awards granted by major customers and international organizations.

General

Pro electron type numbering

DISCRETE SEMICONDUCTORS

Basic type number

This type designation code applies to discrete semiconductor devices (not integrated circuits), multiples of such devices, semiconductor chips and Darlington transistors.

FIRST LETTER

The first letter gives information about the material for the active part of the device.

- A Germanium or other material with a band gap of 0.6 to 1 eV
- B Silicon or other material with a band gap of 1 to 1.3 eV
- C Gallium arsenide (GaAs) or other material with a band gap of 1.3 eV or more
- R Compound materials, e.g. cadmium sulphide.

SECOND LETTER

The second letter indicates the function for which the device is primarily designed. The same letter can be used for multi-chip devices with similar elements.

In the following list low power types are defined by $R_{th\ j-mb} > 15\ K/W$ and power types by $R_{th\ j-mb} \leq 15\ K/W$.

- A Diode; signal, low power
- B Diode; variable capacitance
- C Transistor; low power, audio frequency
- D Transistor; power, audio frequency
- E Diode; tunnel
- F Transistor; low power, high frequency
- G multiple of dissimilar devices/miscellaneous devices; e.g. oscillators. Also with special third letter, see under "Serial number/special third letter"
- H Diode; magnetic sensitive
- L Transistor; power, high frequency
- N Photocoupler
- P Radiation detector; e.g. high sensitivity photo-transistor; with special third letter
- Q Radiation generator; e.g. LED, laser; with special third letter
- R Control or switching device; e.g. thyristor, low power; with special third letter
- S Transistor; low power, switching
- T Control and switching device; e.g. thyristor, power; with special third letter

- U Transistor; power, switching
- W Surface acoustic wave device
- X Diode; multiplier, e.g. varactor, step recovery
- Y Diode; rectifying, booster
- Z Diode; voltage reference or regulator, transient suppressor diode; with special third letter.

SERIAL NUMBER/SPECIAL THIRD LETTER

The number comprises three figures running from 100 to 999 for devices primarily intended for consumer equipment, or one letter (Z, Y, X, etc.) and two figures running from 10 to 99 for devices primarily intended for industrial or professional equipment.⁽¹⁾ The letter has no fixed meaning, except in the following cases:

- A For triacs, after second letter 'R' or 'T'
- F For emitters and receivers in fibre-optic communication, after second letter 'G', 'P' or 'Q'. When the second letter is 'G', the first letter should be defined in accordance with the material of the main optical device.
- L For lasers in non-fibre-optic applications, after second letter 'G' or 'Q'. When the second letter is 'G', the first letter should be defined in accordance with the material of the main optical device.
- O For opto-triacs, after second letter 'R'
- T For 3-state bicolour LEDs, after second letter 'Q'
- W For transient voltage suppressor diodes, after second letter 'Z'.

EXAMPLES OF BASIC TYPE NUMBERS

- AA112 Germanium, low power signal diode (consumer type)
- ACY32 Germanium, low power AF transistor (industrial type)
- BD232 Silicon, power AF transistor (consumer type)
- CQY17 GaAs, light-emitting diode (industrial type)
- RPY84 CdS, photo-conductive cell (industrial type).

Version letter(s)

One or two letters may be added to the basic type number to indicate minor electrical or mechanical variants of the basic type. The letters never have a fixed meaning, except that the letter 'R' indicates reverse polarity and the letter 'W' indicates a surface mounted device (SMD).

(1) When the supply of these serial numbers is exhausted, the serial number may be expanded to three figures for industrial types and four figures for consumer types.

General

Suffix

Sub-classification can be used for devices supplied in a wide range of variants, called associated types. The following sub-coding suffixes are in use:

VOLTAGE REFERENCE AND VOLTAGE REGULATOR DIODES

One letter and one number, preceded by a hyphen (-). The letter, if required, indicates the nominal tolerance of the Zener voltage.

- A 1%
- B 2%
- C 5%
- D 10%
- E 20%.

In the case of a 3% tolerance, the letter 'F' is used.

The number denotes the typical operating (Zener) voltage, related to the nominal current rating for the entire range. The letter 'V' is used in place of the decimal point.

Example: BZY74-C6V3 or -C10.

TRANSIENT VOLTAGE SUPPRESSOR DIODES

One number, preceded by a hyphen (-). The number indicates the maximum recommended continuous reversed (stand-off) voltage, V_R . The letter 'V' is used in place of the decimal point.

Example: BZW70-9V1 or -39.

The letter 'B' may be used immediately after the last number, to indicate a bidirectional suppressor diode.

Example: BZW10-15B.

CONVENTIONAL AND CONTROLLED AVALANCHE RECTIFIER DIODES AND THYRISTORS

One number, preceded by a hyphen (-). The number indicates the rated maximum repetitive peak reverse voltage, V_{RRM} , or the rated repetitive peak off-state voltage, V_{DRM} , whichever is the lower. Reversed polarity with respect to the case is indicated by the letter 'R' immediately after the number.

Example: BYT-100 or -100R.

RADIATION DETECTORS

One number, preceded by a hyphen (-). The number indicates the depletion layer in micrometres (μm). The resolution is indicated by a version letter.

Pro electron type numbering

Example: BPX10-2A.

ARRAY OF RADIATION DETECTORS AND GENERATORS

One number, preceded by a hyphen (-). The number indicates the number of basic devices assembled into the array.

Examples: BPW50-6, BPW50-9, BPW50-12.

HIGH FREQUENCY POWER TRANSISTORS

One number, preceded by a hyphen (-). The number indicates the supply voltage.

Example: BLU80-24.

INTEGRATED CIRCUITS

Basic type number

This type designation code applies to semiconductor monolithic, semiconductor multi-chip, thin film, thick film and hybrid integrated circuits. The basic type number comprises three letters followed by a serial number.

FIRST AND SECOND LETTERS

Digital family circuits

The first two letters identify the family.⁽¹⁾

Solitary circuits

The first letter divides solitary circuits into:

- S Solitary digital circuits
- T Analog circuits
- U Mixed analog/digital circuits.

The second letter is a serial letter without any further significance except 'H' which stands for hybrid circuits.⁽²⁾

Microprocessors

The first two letters identify microprocessors and related circuits:

- MA Microcomputer or central processing unit
- MB Slice processor (functional slice of microprocessor)

(1) A logic family is an assembly of digital circuits designed to be interconnected and defined by its base electrical characteristics, such as supply voltage, power consumption, propagation delay, noise immunity.

(2) The first letter 'S' should be used for all solitary memories, to which, in the event of hybrids, the second letter 'H' should be added, for example, SH for bubble memories.

General

Pro electron type numbering

- MD Related memories
 ME Other related circuits such as interfaces, clocks, peripheral controllers, etc.

Charge-transfer devices and switched capacitors

The first two letters identify:

- NH Hybrid circuits
 NL Logic circuits
 NM Memories
 NS Analog signal processing using switched capacitors
 NT Analog signal processing using charge-transfer devices
 NX Imaging devices
 NY Other related circuits.

THIRD LETTER

The third letter indicates the operating ambient temperature range:

- A temperature range not specified below
 B 0 to + 70 °C
 C -55 to +125 °C
 D -25 to + 70 °C
 E -25 to + 85 °C
 F -40 to + 85 °C
 G -55 to + 85 °C.

If a device has another temperature range, the letter 'A' or a letter indicating a narrower temperature may be used, for example, the range of 0 to +75 °C can be indicated by 'A' or 'B'. Should two devices with the same basic type number both have temperature ranges other than those specified, one would use the letter 'A' and the other the letter 'X'.

Serial number

This may be a four-digit number assigned by Pro Electron, or the serial number (which may be a combination of figures and letters) of an existing company type designation of the manufacturer.

Version letter

A single version letter may be added to the basic type number. This indicates a minor variant of the basic type or the package. The version letter has no fixed meaning except for 'Z' which means customized wiring. The following letters are recommended for package variants:

- C Cylindrical
 D Ceramic dual in-line (CERDIL, CERDIP)
 F Flat pack (two leads)
 G Flat pack (four leads)
 H Quad flat pack (QFP)
 L Chip on tape (foil)
 P Plastic dual in-line (DIL)
 Q Quad in-line (QUIL)
 T Mini pack (SOL, SO, VSO)
 U Uncased chip.

Two-letter suffix

A two-letter suffix may be used instead of a single package version letter to give more information. To avoid confusion with serial numbers that end with a letter, a hyphen should precede the suffix.

FIRST LETTER (GENERAL SHAPE)

- C Cylindrical
 D Dual in-line (DIL)
 E Power DIL (with external heatsink)
 F Flat pack (leads on two sides)
 G Flat pack (leads on four sides)
 H Quad flat pack (QFP)
 K Diamond (TO-3 family)
 M Multiple in-line (except dual, triple and quad)
 Q Quad in-line (QUIL)
 R Power QUIL (with external heatsink)
 S Single in-line (SIL)
 T Triple in-line
 W Leaded chip carrier (LCC)
 X Leadless chip carrier (LLCC)
 Y Pin grid array (PGA).

SECOND LETTER (MATERIAL)

- C Metal-ceramic
 G Glass-ceramic
 M Metal
 P Plastic.

Examples

PCF1105WP: digital IC; PC family; operating temperature range -40 to $+85$ °C; serial number 1105; plastic leaded chip carrier.

GMB74LS00A-DC: digital IC; GM family; operating temperature range 0 to $+70$ °C; company number 74LS00A; ceramic DIL package.

TDA1000P: analog IC; operating temperature range non-standard; serial number 1000; plastic DIL package.

SAC2000: solitary digital circuit; operating temperature range -55 to $+125$ °C; serial number 2000.

RATING SYSTEMS

The rating systems described are those recommended by the IEC in its publication number 134.

Definitions of terms used**ELECTRONIC DEVICE**

An electronic tube or valve, transistor or other semiconductor device. This definition excludes inductors, capacitors, resistors and similar components.

CHARACTERISTIC

A characteristic is an inherent and measurable property of a device. Such a property may be electrical, mechanical, thermal, hydraulic, electro-magnetic or nuclear, and can be expressed as a value for stated or recognized conditions. A characteristic may also be a set of related values, usually shown in graphical form.

BOGEY ELECTRONIC DEVICE

An electronic device whose characteristics have the published nominal values for the type. A bogey electronic device for any particular application can be obtained by considering only those characteristics that are directly related to the application.

RATING

A value that establishes either a limiting capability or a limiting condition for an electronic device. It is determined for specified values of environment and operation, and may be stated in any suitable terms. Limiting conditions may be either maxima or minima.

RATING SYSTEM

The set of principles upon which ratings are established and which determine their interpretation. The rating system indicates the division of responsibility between the device manufacturer and the circuit designer, with the object of ensuring that the working conditions do not exceed the ratings.

Absolute maximum rating system

Absolute maximum ratings are limiting values of operating and environmental conditions applicable to any electronic device of a specified type, as defined by its published data, which should not be exceeded under the worst probable conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking no responsibility for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the device under consideration and of all other electronic devices in the equipment.

The equipment manufacturer should design so that, initially and throughout the life of the device, no absolute maximum value for the intended service is exceeded with any device, under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, equipment control adjustment, load variations, signal variation, environmental conditions, and variations in characteristics of the device under consideration and of all other electronic devices in the equipment.

Design maximum rating system

Design maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electronic device of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking responsibility for the effects of changes in operating conditions due to variations in the characteristics of the electronic device under consideration.

The equipment manufacturer should design so that, initially and throughout the life of the device, no design maximum value for the intended service is exceeded with a bogey electronic device, under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, variation in characteristics of all other devices in the equipment, equipment control adjustment, load variation, signal variation and environmental conditions.

Design centre rating system

Design centre ratings are limiting values of operating and environmental conditions applicable to a bogey electronic device of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device in average applications, taking responsibility for normal changes in operating conditions due to rated supply voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all electronic devices.

The equipment manufacturer should design so that, initially, no design centre value for the intended service is exceeded with a bogey electronic device in equipment operating at the stated normal supply voltage.

General

Handling MOS devices

ELECTROSTATIC CHARGES

Electrostatic charges can exist in many things; for example, man-made-fibre clothing, moving machinery, objects with air blowing across them, plastic storage bins, sheets of paper stored in plastic envelopes, paper from electrostatic copying machines, and people. The charges are caused by friction between two surfaces, at least one of which is non-conductive. The magnitude and polarity of the charges depend on the different affinities for electrons of the two materials rubbing together, the friction force and the humidity of the surrounding air.

Electrostatic discharge is the transfer of an electrostatic charge between bodies at different potentials and occurs with direct contact or when induced by an electrostatic field. All of our MOS devices are internally protected against electrostatic discharge but they **can** be damaged if the following precautions are not taken.

WORK STATION

Figure 1 shows a working area suitable for safely handling electrostatic sensitive devices. It has a work bench, the surface of which is conductive or covered by an antistatic sheet. Typical resistivity for the bench surface is between 1 and 500 k Ω per cm². The floor should also be covered with antistatic material. The following precautions should be observed:

- Persons at a work bench should be earthed via a wrist strap and a resistor.
- All mains-powered electrical equipment should be connected via an earth leakage switch.
- Equipment cases should be earthed.
- Relative humidity should be maintained between 50 and 65%.
- An ionizer should be used to neutralize objects with immobile static charges.

RECEIPT AND STORAGE

MOS devices are packed for dispatch in antistatic/conductive containers, usually boxes, tubes or blister tape. The fact that the contents are sensitive to electrostatic discharge is shown by warning labels on both primary and secondary packing.

The devices should be kept in their original packing whilst in storage. If a bulk container is partially unpacked, the unpacking should be performed at a protected work station. Any MOS devices that are stored temporarily should be packed in conductive or antistatic packing or carriers.

ASSEMBLY

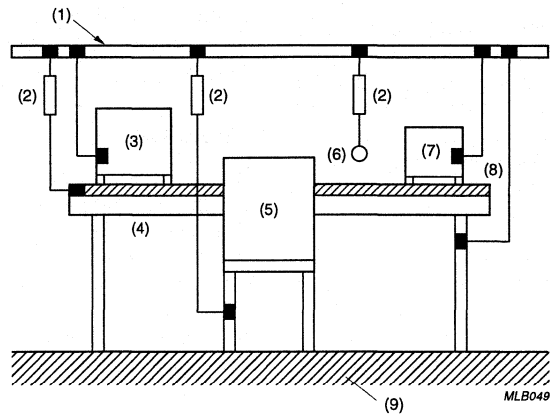
MOS devices must be removed from their protective packing with earthed component pincers or short-circuit clips. Short-circuit clips must remain in place during mounting, soldering and cleansing/drying processes. Do not remove more devices from the storage packing than are needed at any one time. Production/assembly documents should state that the product contains electrostatic sensitive devices and that special precautions need to be taken.

During assembly, ensure that the MOS devices are the last of the components to be mounted and that this is done at a protected work station.

All tools used during assembly, including soldering tools and solder baths, must be earthed. All hand tools should be of conductive or antistatic material and, where possible, should not be insulated.

Measuring and testing of completed circuit boards must be done at a protected work station. Place the soldered side of the circuit board on conductive or antistatic foam and remove the short-circuit clips. Remove the circuit board from the foam, holding the board only at the edges. Make sure the circuit board does not touch the conductive surface of the work bench. After testing, replace the circuit board on the conductive foam to await packing.

Assembled circuit boards containing MOS devices should be handled in the same way as unmounted MOS devices. They should also carry warning labels and be packed in conductive or antistatic packing.



- (1) Earthing rail.
- (2) Resistor ($500\text{ k}\Omega \pm 10\%$, 0.5 W).
- (3) Ionizer.
- (4) Work bench.
- (5) Chair.
- (6) Wrist strap.
- (7) Electrical equipment.
- (8) Conductive surface/antistatic sheet.
- (9) Antistatic floor.

Fig.1 Protected work station.

DATA HANDBOOK SYSTEM

Philips Semiconductors data handbooks contain all pertinent data available at the time of publication and each is revised and reissued regularly.

Loose data sheets are sent to subscribers to keep them up-to-date on additions or alterations made during the lifetime of a data handbook.

Catalogues are available for selected product ranges (some catalogues are also on floppy discs).

Our data handbook titles are listed here.

Integrated circuits

<i>Book</i>	<i>Title</i>
IC01	Semiconductors for Radio and Audio Systems
IC02	Semiconductors for Television and Video Systems
IC03	Semiconductors for Wired Telecom Systems
IC04	HE4000B Logic Family CMOS
IC05	Advanced Low-power Schottky (ALS) Logic
IC06	High-speed CMOS Logic Family
IC11	General-purpose/Linear ICs
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IC14	8048-based 8-bit Microcontrollers
IC15	FAST TTL Logic Series
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IC24	Low Voltage CMOS & BiCMOS Logic
IC25	16-bit 80C51XA Microcontrollers (eXtended Architecture)
IC26	IC Package Databook

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<i>Book</i>	<i>Title</i>
SC01	Small-signal and Medium-power Diodes
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SC03	Thyristors and Triacs
SC04	Small-signal Transistors
SC05	Video Transistors and Modules for Monitors
SC06	High-voltage and Switching NPN Power Transistors
SC07	Small-signal Field-effect Transistors
SC08a	RF Power Transistors for HF and VHF
SC08b	RF Power Transistors for UHF
SC09	RF Power Modules and Transistors for Mobile Phones
SC13a	PowerMOS Transistors including TOPFETs and IGBTs
SC13b	Small-signal and Medium-power MOS Transistors
SC14	RF Wideband Transistors
SC15	Microwave Transistors (new version planned)
SC16	Wideband Hybrid IC Modules
SC17	Semiconductor Sensors

Professional components

PC06	Circulators and Isolators
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Our sister product division, Philips Components, also has a comprehensive data handbook system to support their products. Their data handbook titles are listed here.

Display components

Book	Title
DC01	Colour Television Tubes
DC02	Monochrome Monitor Tubes and Deflection Units
DC03	Television Tuners, Coaxial Aerial Input Assemblies
DC04	Colour Monitor Tubes
DC05	Flyback Transformers, Mains Transformers and General-purpose FXC Assemblies

Magnetic products

MA01	Soft Ferrites
MA03	Piezoelectric Ceramics Specialty Ferrites
MA04	Dry-reed Switches

Passive components

PA01	Electrolytic Capacitors
PA02	Varistors, Thermistors and Sensors
PA03	Potentiometers
PA04	Variable Capacitors
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PA08	Fixed Resistors
PA10	Quartz Crystals
PA11	Quartz Oscillators

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Printed in The Netherlands

537011/25M/03

Date of release: 01-97

Document order number: 9397 750 0134

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