Building blocks for vibrant media

Highlights of the NXP product portfolio

NXP
founded by Philips

Building blocks for vibrant media

At NXP Semiconductors, we develop vibrant media technologies that help bring your ideas to life. Our innovative solutions enhance images, sharpen sound, and make information easier to share.

Our portfolio builds on more than 50 years of experience in technology, and is carefully crafted to take your designs to the next level. We're known for our selection, performance, and flexibility, and have earned top rankings in key market sectors like mobile and portable, connected home, identification, automotive, and multimarket semiconductors.

Selection, performance, flexibility
We constantly look for fresh ways to save space, extend battery life, and make it easy to implement last-minute changes. All our products are optimized for performance, so they maximize integration while minimizing footprint and power consumption.

We offer one of the largest selections in the industry, so you always have a wide range of options to choose from. You get everything you need, from basic components like logic and discretes to sophisticated ICs that improve media processing, wireless connectivity, and broadband communications. Programmable features extend your options, so you can use a standard, off-the-shelf product yet deliver customized functionality.

That means less time spent looking for solutions and more time designing next-generation features.

It also means your designs are more engaging, more interactive, more portable, and just plain fun to use.

NXP at a glance
- Founded in 2006 by Philips
- 50+ years of experience in semiconductors
- Net sales of €4.96 billion in 2006
- R&D investments of more than €995 million in 2006
- 5,300+ patent families
- Roughly 37,000 employees in more than twenty countries
- Nine wafer fabs and eight test and assembly sites worldwide
- Top rankings in mobile and portable, connected home, identification, automotive, and multimarket semiconductor sectors

NXP holds number-one positions worldwide in:
- 32-bit ARM-based microcontrollers
- Automotive in-vehicle networking
- Car radio
- DSPs for car radios
- E-passports
- FM radio ICs for portable applications
- I^2C-bus logic
- Industrial UARTs
- NFC (Near Field Communication)
- RF front-end modules for digital terrestrial set-top boxes
- RFID solutions
- Speakers for mobile phones
- System solutions for automotive immobilizers and keyless entry/go
- Tuners for automotive
- Tuners for TV reception
- USB for mobile and portable applications

Highlights of the NXP product portfolio

Media processors	Advanced, highly integrated processors for streaming audio and video, graphics, and control. Options include LCD and Ethernet interfaces, HD video, MPEG-2 encoding, and scaling software for LCD TV. Special versions for portable applications are also available.
Video encoders/decoders	Multi-standard video products made to interface with popular bus architectures, such as PCI and PCI Express. Includes standalone 9-bit video decoders and encoders.
Audio DACs and CODECs	Dual-channel stereo audio DACs for low-power applications and IEC958 audio, plus dual- and multi-channel stereo audio CODECs with options for SSA audio, low-voltage operation, DSP features, and SPDIF interfaces.
USB, serial-protocol bridges, and 1394	A comprehensive array of USB devices (including Hi-Speed USB and USB OTG functionality), a series of serial-protocol bridges that bring UARTs, I²C-bus and SPI interfaces together onto a single chip, and solutions for 1394.
Wireless connectivity	Highly integrated modules for Bluetooth® that support seamless co-existence, plus receiver and transmitter ICs for Near Field Communication (NFC), the wireless technology, co-created by NXP, that initiates a peer-to- peer connection by simply bringing two devices close to each other.
Audio amplifiers	An extensive array of high-efficiency amplifiers, including Class-AB and Class-D amplifiers, in a range of power ratings for a wide variety of applications, from high-end home entertainment systems and TVs to low-power headphones and speakers for multimedia PCs and portable products.
I²C-bus devices	An industry-leading portfolio of highly integrated ICs that provide advanced control functions, offload the CPU, and save space in today's complex systems. Solutions include general-purpose I/O expansion, temperature sensing, I²C-bus switching, I²C-bus buffering, LED control, real-time clocks, and more.

PCI Express PHYs and channel switches	PCI Express physical layer interfaces (PHYs), suitable for use with FPGAs and ASICs, that provide a cost-effective solution for migrating to PCI Express, plus a PCI Express channel switch that supports architectural flexibility when switching PCI Express signals.
Power management	Advanced options for power management, ranging from complete power management units (PMUs) for mobile and cellular to PIP212 integrated powertrains and the innovative μTrenchMOS portfolio of small MOSFETs.
Logic devices	State-of-the-art solutions for virtually any system, with options for low-voltage applications that offer higher switching speeds and live-insertion capability. Miniature packaging, including PicoGate and MicroPak, significantly reduces board space and simplifies PCB routing.
Microcontrollers	Several families of highly integrated, cost-effective, 32-bit devices that meet a wide range of performance requirements. Features include ARM7- and ARM9-based architectures, high-performance Flash memory, special options for LCD control, very small footprints, low pin-count, low power consumption, comprehensive serial interfaces, and many 8-bit devices with enhanced 80C51 capabilities.
UARTs	Single- to eight-channel industrial UARTs with higher baud rates, deeper FIFOs, improved character recognition, and very fast host-bus cycle times. Single- to quad-channel 16C UARTs that are pin-compatible with industry-standard devices and include added features, like extended temperature range and programmable options, without a price premium.
RF	Hundreds of RF discretes and ICs in a wide variety of categories, from diodes, MMIC devices, and wideband transistors to RF/IF mixers, RF/IF systems, LNAs, and RF switches. The RF portfolio also includes RF power devices for broadcast, microwave, basestation, and WiMAX applications.
Small-signal discretes	A very broad range of small-signal devices, including low-V_F (MEGA) Schottky rectifiers, single and double resistor-equipped transistors (RETs), single and double low-V_{CEsat} (BISS) transistors, and ESD protection diodes with up to 18 lines.

This brochure includes a sampling of our key technologies. To view our complete portfolio, please visit www.nxp.com.

MEDIA PROCESSORS

Nexperia media processors

Features and specifications for PNX1300, PNX1500, and PNX1700 families

Product	TriMedia CPU core	Clock speed (MHz)	Process	Functional units	Memory system (max/type)	Video output	PCI/ XIO	LCD controller	Ethernet 10/100	De-interlacing	DVD	V2F support	HD support
PNX1700 family													
PNX1700EH	TM5250	400	0.13 CMOS	30	400-MHz DDR	Up to W-XGA TFT LCD (1280 x 768 60I) HD (1920 x 1080 60I)	•	•	•	•	•	•	•
PNX1701EH	TM5250	450	0.13 CMOS	30	400-MHz DDR	Up to W-XGA TFT LCD (1280 x 768 60I) HD (1920 x 1080 60I)	•	•	•	•	•	•	•
PNX1702EH	TM5250	500	0.13 CMOS	30	400-MHz DDR	Up to W-XGA TFT LCD (1280 x 768 60I) HD (1920 x 1080 60I)	•	•	•	•	•	•	•
PNX1500 family													
PNX1500E	TM3260	240	0.13 CMOS	31	400-MHz DDR	Up to W-XGA TFT LCD (1280 x 768 60I) HD (1920 x 1080 60I)	•	•	•	•	•	•	
PNX1501E	TM3260	266	0.13 CMOS	31	400-MHz DDR	Up to W-XGA TFT LCD (1280 x 768 60I) HD (1920 x 1080 60I)	•	•	•	•	•	•	
PNX1502E	TM3260	300	0.13 CMOS	31	400-MHz DDR	Up to W-XGA TFT LCD (1280 x 768 60I) HD (1920 x 1080 60I)	•	•	•	•	•	•	
PNX1300 family													
PNX1300EH	TM-DSPCPU	143	0.25 CMOS	27	143-MHz SDRAM	Up to D1 (720 x 480)	•						
PNX1301EH	TM-DSPCPU	190	0.25 CMOS	27	190-MHz SDRAM	Up to D1 (720 x 480)	•						
PNX1302EH	TM-DSPCPU	200	0.25 CMOS	27	190-MHz SDRAM	Up to D1 (720 x 480)	•						
PNX1311EH	TM-DSPCPU	166 (low V)	0.25 CMOS	27	166-MHz SDRAM	Up to D1 (720 x 480)	•						

Nexperia media processors

Codec performance and availability (decoding)

Product	Video decoding								Audio decoding			
	MPEG-1, MPEG-2	MPEG-4	WM9	H.264	DivX	DV	H.32x	H.263	MP3	AAC	Dolby Pro Logic	Dolby AC-3
PNX1700 family												
PNX1700EH	720P	SP, MVP, ASP	480P	Main profile, D1	3/4/5/6/HD	•	•	•	•	•	•	•
PNX1701EH	720P	SP, MVP, ASP	480P	Main profile, D1	3/4/5/6/HD	•	•	•	•	•	•	•
PNX1702EH	720P	SP, MVP, ASP	480P	Main profile, D1	3/4/5/6/HD	•	•	•	•	•	•	•
PNX1500 family												
PNX1500E	480P	SP, MVP, ASP	480P	Baseline, D1	3/4/5/6	•	•	•	•	•	•	•
PNX1501E	480P	SP, MVP, ASP	480P	Baseline, D1	3/4/5/6	•	•	•	•	•	•	•
PNX1502E	480P	SP, MVP, ASP	480P	Baseline, D1	3/4/5/6	•	•	•	•	•	•	•
PNX1300 family												
PNX1300EH	480P	SP, MVP			3/4/5	•	•	•	•		•	
PNX1301EH	480P	SP, MVP			3/4/5	•	•	•	•		•	
PNX1302EH	480P	SP, MVP			3/4/5	•	•	•	•		•	
PNX1311EH	480P	SP, MVP			°	•	•	•	•		•	

Codec performance and availability (encoding)

Product	Video encoding								Audio encoding			
	MPEG-1, MPEG-2	MPEG-4	WM9	H.264	DivX	DV	H.32x	H.263	MP3	AAC	Dolby Pro Logic	Dolby AC-3
PNX1700 family												
PNX1700EH	D1	Simultaneous D1 encode/decode	480P	Simultaneous 1/2 D1 encode/decode	3/4/5/6	•	•	•	•	•	•	•
PNX1701EH	D1	Simultaneous D1 encode/decode	480P	Simultaneous 1/2 D1 encode/decode	3/4/5/6	•	•	•	•	•	•	•
PNX1702EH	D1	Simultaneous D1 encode/decode	480P	Simultaneous 1/2 D1 encode/decode	3/4/5/6	•	•	•	•	•	•	•
PNX1500 family												
PNX1500E	D1	D1		Simultaneous CIF encode/decode	3/4/5/6	•	•	•	•	•	•	•
PNX1501E	D1	D1		Simultaneous CIF encode/decode	3/4/5/6	•	•	•	•	•	•	•
PNX1502E	D1	D1		Simultaneous CIF encode/decode	3/4/5/6	•	•	•	•	•	•	•
PNX1300 family												
PNX1300EH	D1	SP				•	•	•	•		•	
PNX1301EH	D1	SP				•	•	•	•		•	
PNX1302EH	D1	SP				•	•	•	•		•	
PNX1311EH	D1	SP				•	•	•	•		•	

VIDEO ENCODERS/DECODERS

Video encoders and decoders

Digital video encoders

Product	SAA7128/ SAA7129	SAA7102/ SAA7103	Recommended for new designs		
			SAA7120/ SAA7121	SAA7128A/ SAA7129A	SAA7104/ SAA7105
Input					
8-bit ITU-656	•	•	•	•	•
Dual input streams	•			•	
12-bit multi-format (VGA)	•	•		•	Including DVO
Video resolution	Standard definition	Up to 800 x 600 VGA	Standard definition	Standard definition	Up to 1280 x 1024 VGA, 1080i and 720p HD
Output					
Number of DACs	6	3	3	6	3
DAC resolution	10-bit	10-bit	10-bit	10-bit	10-bit
Type of DAC	Voltage	Current	Voltage	Current	Current
TV detect					•
2 x luma over-sampling rate	•	•	•	•	•
Analog CVBS and S-video	•	•	•	•	•
Analog component RGB and YPbPr	•	•		•	•
Programmable RGB output levels	•			•	
Cross-color reduction filter	•	•	•	•	•
HD output 1080i, 720p					•
Pixel-accurate H/V scaler		•			•
High-performance flicker filter		•			Enhanced
Video standards					
NTSC	•	•	•	•	•
PAL	•	•	•	•	•
SECAM	•			•	

Continued next page

Video encoders and decoders

Digital video encoders (continued)

Product	SAA7128/ SAA7129	SAA7102/ SAA7103	Recommended for new designs		
			SAA7120/ SAA7121	SAA7128A/ SAA7129A	SAA7104/ SAA7105
Macrovision [1] copy protection					
Version 7.1 and 6.1	SAA7128	SAA7102	SAA7120	SAA7128A	SAA7104
Version 1.03 (525p/625p)					SAA7104
Text and graphics					
Teletext insertion	•	•	•	•	•
Closed caption (Line 21)	•	•	•	•	•
Color-bar generator	•	•	•	•	•
Widescreen signalling	•	•	•	•	•
VPS (Video Program Service)	•	•		•	•
General					
Supply voltage	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V
Fast I²C-bus (400 kHz)	•	•	•	•	•
Remote Genlock via RTC input	•		•	•	•
Package	QFP44	QFP44, BGA156	QFP44	QFP44	QFP64, BGA156
Availability					
Extended temperature version				SAF7129A	
Status	Production	Production	Production	Production	Production

[1] *License required*

Video encoders and decoders

Digital video decoders

Product	SAA7110A	SAA7111A	SAA7112	SAA7114	Recommended for new designs						
					SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
Clock											
Sample rate	Square pixels	ITU-601	ITU-601	ITU-601	ITU-601	2xITU-601	2xITU-601	2xITU-601	2xITU-601	2xITU-601	2xITU-601
Line-locked clock	•	•	•	•	•	•	•	•	•	•	•
MPEG-compatible clock		•	•	•	•	•	•	•	•	•	•
Real-time clock (RTC)	•	•	•	•	•	•	•	•	•	•	•
Audio clock			Field locked	Field locked		Frame, field locked	Field locked		Frame locked	Frame locked	Frame locked
Input											
Analog inputs	6	4	6	6	4	6	16	5	5	5	5
Analog-to-digital converters (ADCs)	2	2	2	2	2	2 Low noise	4 Low noise	2 Low noise	2 Low noise	2 Low noise	2 Low noise
Anti-alias filter								•	•	•	•
ADC resolution	8-bit	8-bit	8-bit	9-bit	9-bit	9-bit, over-sampled	9-bit, over-sampled	9-bit	9-bit	9-bit	9-bit
Analog RGB/YPbPr component video input							•				
Video standards											
NTSC/PAL/SECAM	•	•	•	•	•	•	•	•	•	•	•
Standard detection	•	•	•	•	•	Fully automatic	Fully automatic	Fully automatic	Fully automatic	Fully automatic	Fully automatic
Processing features											
Adaptive 2/4-line NTSC/PAL comb filter				•		Enhanced	•	•	•	•	•
Raw VBI data capture								•	•	•	•
Digital transport stream capture								Serial & parallel	Serial & parallel	Serial & parallel	Serial & parallel
Digital program stream capture									Serial & parallel		Serial & parallel

Video encoders and decoders

Digital video decoders (continued)

						Recommended for new designs					
Product	SAA7110A	SAA7111A	SAA7112	SAA7114	SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
Universal VBI data slicer		CC only	•	•	•	Including CGMS, Gemstar	•				
I²C-bus VBI read-back		•				•					
Square pixel output rate	•					Optional					
Fast field lock			•	•		Ultra	•				
Automatic VCR detection						•					
Scaler											
Pixel-accurate H/V scaler			•	•		•	•	•	•	•	•
Output											
Color format	YUV	YUV, 16/24-bit RGB	YUV	YUV	YUV	YUV including 10-bit	YUV	YUV, RGB	YUV, RGB	YUV, RGB	YUV, RGB
Format 8-bit VMI								•	•	•	•
Format ITU-656								•	•	•	•
Format VIP 1.1/2.0								•	•	•	•
Format 16-bit ZV								•	•	•	•
Peripheral video port								•	•	•	•
Output port	16-bit 24-bit	8-bit 16-bit	8-bit 16-bit	8-bit 16-bit	8-bit	8-bit 16-bit	8-bit 16-bit				
Expansion X-port			•	•		•	•				
Audio											
Separate ADC for sound IF conversion									•	•	•
Stereo ADC and stereo DAC									2x16-bit	2x16-bit	2x16-bit
NICAM & dual FM stereo										•	
BTSC & SAP, EIAJ									•		•

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Digital video decoders (continued)

Product	SAA7110A	SAA7111A	SAA7112	SAA7114	Recommended for new designs						
					SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
DBX expander for BTSC/SAP									•		•
Mono sound loop-thru (tuner)								•	•	•	•
Incredible Sound									•		•
Virtual Dolby											•
Dolby Pro Logic											•
I²S digital-audio output									2x	2x	2x
2-to-1 analog stereo crossbar								•	•	•	•
Master/sample clock ratio 768, 512, 384, 256									•	•	•
Sample clock									32 kHz, 44.1 kHz, 48 kHz	32 kHz, 44.1 kHz, 48 kHz	32 kHz, 44.1 kHz, 48 kHz
Software											
Windows 95 SDK								•	•	•	•
Windows 98 SDK								•	•	•	•
Windows NT								•	•	•	•
Windows 2000								•	•	•	•
WHQL								•	•	•	•
PCI interface											
Video capture over PCI								•	•	•	•
VBI capture over PCI								•	•	•	•
Audio capture over PCI									•	•	•
ACPI-compliant power management								•	•	•	•
Configurable DMA channels								6	6	6	6
General											
Support for 3D comb filters and stereo								•	•	•	•

Video encoders and decoders

Digital video decoders (continued)

Product	SAA7110A	SAA7111A	SAA7112	SAA7114	Recommended for new designs						
					SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
Supply voltage	5 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V
JTAG boundary scan								•	•	•	•
I^2C master to program peripheral devices								•	•	•	•
I^2C status interrupt pin							•				
Macrovision detection				•	•	Enhanced	Enhanced	•	•	•	•
Package	PLCC68	QFP64, LQFP64	LQFP100	LQFP100	QFP44	LQFP100	BGA156, QFP160	LQFP128	LQFP128	LQFP128	LQFP128
Pin-to-pin compatible						SAA7114		All compatible	All compatible	All compatible	All compatible
Reference design											
Analog								Reference design "Proteus"	Reference design "Antigua"	Reference design "Proteus Pro"	
Analog and DVB										Reference design "Europa"	
Availability											
Extended temperature version					SAF7113		SAF7118				
Status	Production	Production	Production	Production	Production	Production	Production	Production	Production	Production	Production

AUDIO DACS AND CODECS

Audio DACs and CODECs

Stereo audio digital-to-analog converters (DACs)

Product	Description	Typical supply voltage	Number of channels	Data formats	Typical THD+N @ 0 dB (dB)	Typical S/N (dB)	System clock	Output (V)	Encapsulation	Power supply (V)	Sound features	Power dissipation (mW)	Operating temp range (°C)[1]	De-emphasis (kHz)
UDA1330ATS	Low-cost stereo filter DAC	5 V	2	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18-, and 20-bit formats, $1f_s$ input format	-90	100	$256f_s$, $384f_s$, $512f_s$	1.45	SSOP16	2.7 to 5.5	8- to 55-kHz SRF; cntrl via L3 mode or static pin cntrl; digital vol cntrl; digital sil. detect; mute	75	-40 to +85	32, 44.1, and 48
		3 V			-85	100		1				33		
UDA1334TS	Low-power audio DAC	3 V	2	I^2S, LSB-justified, compatible with 16-, 20-, and 24-bit formats, $1f_s$ input format	-90	100	Automatic system clock vs. sample rate detection	0.75	SSOP16	1.8 to 3.6	8- to 100-kHz SRF	17.0	-40 to +85	44.1
		2 V			-80	97		0.5				7.0		
UDA1334ATS	Low-power audio DAC including PLL	audio mode	2	I^2S, LSB-justified, compatible with 16-, 20-, and 24-bit formats, $1f_s$ input format	-90	100	Automatic system clock vs. sample rate detection	0.9	SSOP16	2.4 to 3.6	16- to 100-kHz SRF	18	-40 to +85	44.1
		video mode					$256f_s$, $384f_s$					24		
UDA1334BTS	Low-power audio DAC	3 V	2	I^2S, LSB-justified, compatible with 16-, 20-, and 24-bit formats, $1f_s$ input format	-90	100	$128f_s$, $192f_s$, $256f_s$, $384f_s$, $512f_s$, $768f_s$	0.9	SSOP16	1.8 to 3.6	8- to 100-kHz SRF	17.0	-40 to +85	44.1
		2 V			-80	97		0.6				7.4		
UDA1334BT	Low-power audio DAC	3 V	2	I^2S, LSB-justified, compatible with 16-, 20-, and 24-bit formats, $1f_s$ input format	-90	100	$128f_s$, $192f_s$, $256f_s$, $384f_s$, $512f_s$, $768f_s$	0.9	SO16	1.8 to 3.6	8- to 100-kHz SRF	17.0	-40 to +85	44.1
		2 V			-80	97		0.6				7.4		
UDA1351TS	IEC958 audio DAC	3 V	2	IEC958	-90	100	$256f_s$ out	0.9	SSOP28	2.7 to 3.6	Cntrl via static pin or L3; 28- to 100-kHz SRF; 5-V-tolerant inputs; output polarity cntrl; volume cntrl; tone cntrl; lock pin	80	-40 to +85	Auto-select 32, 44.1, 48, and 96
UDA1352TS	IEC958 audio DAC	3 V	2	IEC958	-90	100	$256f_s$ out	0.9	SSOP28	2.4 to 3.6	Cntrl via static pin, L3, or I^2C; 28- to 100-kHz SRF; 5-V-tolerant inputs; output polarity cntrl; volume cntrl; tone cntrl; lock pin	38	-40 to +85	Auto-select 32, 44.1, and 48

[1] *Characteristics only guaranteed at Tamb = 25 °C*

Audio DACs and CODECs

Stereo audio coder/decoders (CODECs)

Product	Description		Number of channels	Data formats	Typical THD+N @ 0 dB (dB)	Typical S/N (dB)	System clock	Input (V)	Output (V)	Encapsulation	Power supply (V)	Sound features	Power dissipation (mW)	Operating temp range (°C) [1]	De-emphasis (kHz)
UDA1341TS	Low-voltage, low-cost stereo filter ADC/DAC with AGC	ADC	2 (with mux)	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18- and 20-bit formats, $1f_s$ input format	-90	100	$256f_s$, $384f_s$, $512f_s$	1.0		SSOP28	2.4 to 3.6	L3 control; 8- to 48-kHz SRF; overload detector; digital AGC; vol/tone cntrl; soft mute; peak level detector; digital mixer; double diff. input mode; output polarity cntrl; power cntrl	80	-20 to +85	32, 44.1, and 48
		DAC	2		-91	100			0.9						
UDA1342TS	Audio CODEC for MD	ADC	2 (with mux)	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18-, and 20-bit formats, $1f_s$, $4f_s$ input format	-90	100	$256f_s$, $384f_s$, $512f_s$, $768f_s$	0.9		SSOP28	2.7 to 3.6	Control via static pin, L3 or I^2C-bus interface; 16- to 110-kHz SRF, 4 analog inputs with PGA; 2 digital mixers; double diff. input mode; 5-V-tolerant digital inputs; digital vol/tone cntrl; soft or quick mute; output polarity cntrl	105	-20 to +85	32, 44.1, 48, and 96
		DAC	2		-90	100			0.9						
UDA1344TS	Low-voltage, low-power stereo audio CODEC with DSP features	ADC	2	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18-, 20-, and 24-bit formats, $1f_s$ input format	-85	95	$256f_s$, $384f_s$, $512f_s$	1.0		SSOP28	2.7 to 3.6	Static or L3 cntrl; 8- to 48-kHz SRF; overload detector; digital vol/tone cntrl; soft mute; power cntrl	69	-20 to +85	32, 44.1, and 48
		DAC	2		-90	100			0.9						
UDA1345TS	Economy audio CODEC	ADC	2	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18-, 20-, and 24-bit formats, $1f_s$ input format	-83	95	$256f_s$, $384f_s$, $512f_s$	1.0		SSOP28	2.4 to 3.6	Static or L3 cntrl; 8- to 100-kHz SRF; 5-V-tolerant inputs; output polarity cntrl; volume cntrl; power cntrl	65	-20 to +85	32, 44.1, 48, and 96
		DAC	2		-85	100			0.9						
UDA1380TT	SSA-audio CODEC	ADC	2	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18-, 20-, and 24-bit formats, $1f_s$ input format	-85	97	$256f_s$, $384f_s$, $512f_s$, $768f_s$	1.0		TSSOP32	2.4 to 3.6	L3 or I^2C cntrl; 8- to 100-kHz SRF; 5-V-tolerant inputs; mic input with AGC; headphone driver; soft mute; digital vol/tone cntrl; output polarity cntrl; power cntrl	65	-20 to +85	32, 44.1, 48, and 96
		DAC	2		-88	100			0.9						
UDA1380HN	SSA-audio CODEC	ADC	2	I^2S, MSB-justified, LSB-justified, compatible with 16-, 18-, 20-, and 24-bit formats, $1f_s$ input format	-85	97	$256f_s$, $384f_s$, $512f_s$, $768f_s$	1.0		HVQFN32	2.4 to 3.6	L3 or I^2C cntrl; 8- to 100-kHz SRF; 5-V-tolerant inputs; mic input with AGC; headphone driver; soft mute; digital vol/tone cntrl; output polarity cntrl; power cntrl	65	-20 to +85	32, 44.1, 48, and 96
		DAC	2		-88	100			0.9						
UDA1338H	Multi-channel audio CODEC	ADC	4	I^2S audio and voice interfaces, MSB-justified, LSB-justified	-90	100	$256f_s$, $384f_s$, $512f_s$, or $768f_s$	1.0		QFP44	2.7 to 3.6	Channel-independent logarithmic volume; soft or quick mute; output signal polarity cntrl	270	-20 to +85	32, 44.1, 48, or 96
		DAC	6		-100	114			DM 2.0 SE 1.0						

Stereo analog-to-digital conveter (ADC)

Product	Description		Number of channels	Data formats	Typical THD+N @ 0 dB (dB)	Typical S/N (dB)	System clock	Input (V)	Output (V)	Encapsulation	Power supply (V)	Sound features	Power dissipation (mW)	Operating temp range (°C) [1]	De-emphasis (kHz)
UDA1361TS	96-kHz sampling, 24-bit stereo audio ADC		2	I^2S, MSB-justified, format compatible	-88	100	$256f_s$, $384f_s$, $512f_s$, $768f_s$	1.1		SSOP16	2.4 to 3.6	Power-down mode; input gain switch	42	-20 to +85	

[1] Characteristics only guaranteed at Tamb = 25 °C

USB, serial-protocol bridges, and 1394

USB solutions

Product	Description	Target applications	Reference kits	Application notes	Package(s)
All				‣ USB throughput optimization ‣ Selecting a crystal oscillator for USB designs	
USB On-The-Go transceivers					
ISP1301	‣ [FS, LS] USB OTG transceiver ‣ Dual supply voltages: main 2.7 to 4.5 V, digital I/O interface 1.65 to 3.6 V ‣ Charge pump regulator: output V_{BUS} voltage 4.4 to 5.25 V at current > 8 mA, tunable by external capacitor	Digital camera, PDA, mobile phone, web appliance, portable digital audio player, printer	‣ ISP1301 eval kit		HVQFN24 (SOT616-1)

ISP1302	‣ [FS, LS] USB OTG transceiver with carkit support
	‣ Supports carkit standard CEA-936-A (Nov 2005)
	‣ Supports both 4-wire and 5-wire signaling protocol for carkit application
	‣ Supports I²C-bus (up to 400 kHz) to access control and status registers
	‣ On DP, DM lines support:
	   – UART pass-through
	   – Service mode with 2.8 V UART signaling
	‣ Supports OTG HNP and SRP: power-down mode ≤ 25 µA
	‣ Dual supply voltages: main 3.0 to 4.5 V, digital I/O interface 1.4 to 3.6 V
	‣ Charge pump regulator: output V_{BUS} voltage 4.4 to 5.25 V at current ≤ 50 mA
		Mobile phone, digital camera, PDA, DVR	‣ ISP1302 eval kit		WLCSP25
					
					HVQFN24 (SOT616-3)

USB On-The-Go (host/peripheral) controllers					
ISP1362	‣ [FS, LS] USB OTG single-chip controller ‣ Complies to Ver 1.0a of OTG specification ‣ Built-in charge pump for V_{BUS} generation ‣ Optional support for external V_{BUS} source ‣ Output current adjustable with external capacitor ‣ Core operating voltage 3.3 V ‣ Single supply voltage 3.0 to 3.6 V	Digital camera, PDA, mobile phone, web appliance, portable digital audio player, printer	‣ ISP1362 eval kit ... PCI/DOS OTG ... PCI/Linux OTG ... PCI/WinCE ... PXA25x/Linux OTG ... PXA25x/WinCE	‣ Simultaneous DMA and PIO Access in the ISP116x, ISP118x and ISP136x Device Controller ‣ ISP1362 Linux Stack User's Guide	LQFP64 (SOT314-2) TFBGA64 (SOT543-1)
ISP1761 (for the peripheral controller portion)	‣ [HS, FS, LS] Hi-Speed USB OTG host and peripheral controller, memory-mapped CPU interface to any 32- or 16-bit interface ‣ One OTG port and two downstream ports ‣ Dual supply voltages: main 3.0 to 3.6 V, digital I/O interface 1.65 to 3.6 V ‣ Core operating voltage 1.8 V ‣ Integrated patent-pending Transaction Translator supports single EHCI for HS, FS, and LS transfers	STB, DVD recorder, DTV, media player, printer, PDA, DSC, DVC, mobile phone	‣ FlexiUSB™ stack for HS host + device ‣ ISP1761 eval kit ... PCI/Linux OTG ... PCI/WinCE ... PXA25x/Linux	‣ Interfacing the ISP176x to the Intel PXA25x Processor ‣ Embedded Systems Design with the ISP176x ‣ ISP1761 Peripheral DMA Initialization ‣ ISP176x Linux Programming Guide ‣ ISP176x Windows CE 5.0 User Installation Guide ‣ ISP176x Windows CE 5.0 Software Programming Reference ‣ ISP1761 V_{BUS} Capacitance on Dual-role Ports ‣ ISP1760/1 Frequently Asked Questions ‣ ISP1582/83 and ISP1761 clearing an IN buffer	LQFP128 (SOT425-1) TFBGA128 (SOT857-1)

HS, FS, and LS denote high-speed, full-speed, and low-speed data transfer rates, respectively

USB, serial-protocol bridges, and 1394

USB solutions (continued)

Product	Description	Target applications	Reference kits	Application notes	Package(s)
USB transceivers					
ISP110x ISP111x	▸ Advanced USB transceiver for system-on-chip applications ▸ Low power, integrated 5.0-to-3.3-V voltage regulator ▸ Dual supply voltages: main 3.0 to 3.6 V, digital I/O interface 1.65 to 3.6 V	Mobile phone, PDA, digital camera		▸ ISP110x Product Selection Guide ▸ ISP110x Interfacing	
ISP1102A *CERTIFIED USB*	▸ [FS] Bidirectional input mode only ▸ V_{BUS} detection input, but not in 'suspend' mode ▸ Very good for 3.3-V supply voltage		▸ ISP1102BS eval kit ▸ ISP1102AW eval kit		HBCC16 (SOT639-2) HVQFN14 (SOT773-1)
ISP1104 *CERTIFIED USB*	▸ [FS] Allows selectable differential or single-ended input mode ▸ V_{BUS} detection input		▸ ISP1102W eval kit		HBCC16 (SOT639-2)
ISP1105 *CERTIFIED USB*	▸ [FS, LS] Allows selectable differential or single-ended input mode		▸ ISP1105BS eval kit ▸ ISP1105W eval kit		HBCC16 (SOT639-2) HVQFN16 (SOT758-1)
ISP1106 *CERTIFIED USB*	▸ [FS, LS] Allows differential input mode only		▸ ISP1106DH eval kit ▸ ISP1106W eval kit		TSSOP16 (SOT403-1) HBCC16 (SOT639-2)
ISP1110 *CERTIFIED USB*	▸ [FS] Peripheral transceiver bidirectional input mode only ▸ Low power, integrated 5.0-to-3.3 V voltage regulator ▸ V_{BUS} detection input ▸ USB mode: 3.3-V signaling ▸ Supports 2.8-V UART signaling on DP, DM lines ▸ Supply voltages: main 4.0 to 5.5 V, digital I/O interface 1.65 to 2.85 V, UART 2.7 to 4.5 V ▸ Low power: < 20 µA USB suspend current, < 3 µA in power-off mode	Mobile phone	▸ ISP1110 eval kit		HBCC16 (SOT639-2)
USB peripheral controllers					
PDIUSBD12 *CERTIFIED USB*	▸ [FS] USB interface peripheral with 8-bit parallel bus, 6 endpoints, 320-byte FIFO, bus-powered ▸ 2 MB/s transfer rate: 1 MB/s in Bulk mode, 1 Mb/s in ISO mode ▸ Supply voltage 3.0 to 3.6 V, or 4.0 to 5.5 V	Digital camera, printer, STB, FDD, PDA, MP3 player, router, modem, USB dongle	▸ D12 ISA PC eval kit ▸ D12 Smart eval kit ▸ D12 USB-EPP eval kit ▸ D12 USB Mass Storage eval kit	▸ Using PDIUSBD12 in DMA Mode ▸ Interfacing D12 to Hitachi H8S/2357 ▸ PDIUSBD12 Frequently Asked Questions	SO28 (SOT136-1) TSSOP28 (SOT361-1)
ISP1181B *CERTIFIED USB*	▸ [FS] USB interface peripheral with 16-bit parallel bus, 16 endpoints, 2462-byte FIFO for ISO transfer, bus-powered, max 11.1-MB/s transfer rate to µC or µP ▸ Supply voltage 3.0 to 3.6 V, or 4.0 to 5.5 V ▸ Integrated 5.0-to-3.3-V voltage regulator for bus-power support	Digital camera, printer, router, modem, CD-RW drive, FDD, MP3 player, STB, PDA, USB dongle	▸ ISP1181B PC eval kit ▸ ISP1181B MCU eval kit ▸ ISP1181B R232 USB eval kit	▸ Interfacing ISP1181 to Hitachi SH7709 RISC Processor ▸ Interrupt Control in ISP1181x ▸ Simultaneous DMA and PIO Access in the ISP116x, ISP118x and ISP136x Device Controller	TSSOP48 (SOT362-1) HVQFN48 (SOT619-2)

HS, FS, and LS denote high-speed, full-speed, and low-speed data transfer rates, respectively

USB solutions (continued)

Product	Description	Target applications	Reference kits	Application notes	Package(s)
ISP1183 *CERTIFIED USB*	▸ [FS] USB interface peripheral with 8-bit parallel data bus, 16 endpoints, 2462-byte FIFO for ISO transfer, bus-powered, max 11.1-MB/s transfer rate to µC or µP ▸ Integrated 5.0-to-3.3-V voltage regulator for bus-power support ▸ Operating voltage 3.0 to 3.6 V, or 4.0 to 5.5 V ▸ Dual supply voltages: main 3.0 to 3.6 V, digital I/O interface 1.65 to 3.6 V, enabling direct interface to battery-operated devices e.g., mobile phones	Digital camera, mobile phone, printer, STB, FDD, PDA, MP3 player, router, modem, USB dongle	▸ ISP1183 PC eval kit ▸ ISP1183 MCU eval kit	▸ Simultaneous DMA and PIO Access in the ISP116x, ISP118x and ISP136x Device Controller	HVQFN32 (SOT617-1)
USB host controllers					

ISP1160/01	▸ [FS, LS] USB host controller, 2 downstream ports, host stack written in C
	▸ Supply voltage 3.3 or 5 V
	▸ Integrated 5.0-to-3.3-V voltage regulator for bus-power support
	▸ Parallel interface between system µP and HC, data transfer rate up to 15 MB/s
	▸ Glueless interface to various µC and RISC processors
		Digital camera, STB, PDA, mobile phone, web appliance, digital audio jukebox	▸ ISP1160 eval kit
			    ... ISA/Linux
			    ... ISA/DOS
			    ... PCI/DOS
			▸ ISP1160 PXA25x/WinCE ref code
				▸ Handling Reset in the ISP116x
				▸ Interrupt Control in the ISP116x
				▸ Interfacing ISP1160x to
				    ... Fujitsu SPARClite® RISC
				    ... Intel StrongARM® SA-1110
				    ... Hitachi SH7709 RISC Processor
				    ... Freescale DragonBall™ EZ RISC
				    ... NEC V832® RISC Processor
				▸ ISP1160x Embedded Programming Guide
				▸ ISP1160x Low Power Consumption
				▸ ISP116x PTD Programming Guide
					LQFP64 (SOT314-2, SOT414-1)

USB host/peripheral controllers					

ISP1161A1 *CERTIFIED USB*
 	
(for the peripheral controller portion)
	▸ Industry's first USB point-to-point IC
	▸ Supply voltage 3.3 or 5.0 V
	▸ Integrated 5.0-to-3.3-V voltage regulator for bus-power support
	▸ Single-chip USB host/peripheral controller: can act as peripheral controller (DC) only, host controller (HC) only, or DC+HC simultaneously
	▸ DC [FS]: 1 upstream port, 14 programmable endpoints, max 11.1 MB/s transfer rate between µP and DC
	▸ HC [FS, LS]: 2 downstream ports, host stack written in C, max 15 MB/s transfer rate between µP and HC
		Digital camera, STB, PDA, mobile phone, web appliance, digital audio jukebox	▸ ISP1161A1 eval kit
			    ...ISA/Linux
			    ...ISA/DOS
			    ...PCI/DOS
			▸ ISP1161A1 PXA25x/WinCE ref code
				▸ Handling Reset in the ISP116x
				▸ Interrupt Control in the ISP116x
				▸ ISP116x PTD Programming Guide
				▸ Interfacing ISP1161x to
				    ... Fujitsu SPARClite RISC
				    ... Intel StrongARM SA-1110
				    ... Hitachi SH7709 RISC Processor
				    ... Freescale DragonBall EZ RISC
				    ... NEC V832 RISC Processor
				▸ ISP1161x Embedded Programming Guide
				▸ Odd or Even Byte Indicator in the ISP1161A1
				▸ Simultaneous DMA and PIO Access in the ISP116x, ISP118x and ISP136x Device Controller
					LQFP64 (SOT314-2, SOT414-1)

Hi-Speed USB peripheral controllers					
ISP158x	▸ [HS, FS] Peripheral controller ▸ 16-bit parallel bus with 16 endpoints, 8 kbyte FIFO ▸ Operating voltage 1.8 V ▸ Can be bus-powered (with external voltage regulator): supports current < 100 mA ▸ Low power consumption very suitable for portable devices				

HS, FS, and LS denote high-speed, full-speed, and low-speed data transfer rates, respectively

USB, serial-protocol bridges, and 1394

USB solutions (continued)

Product	Description	Target applications	Reference kits	Application notes	Package(s)
ISP1582	▸ Supports only generic-mode CPU interface ▸ Main supply and digital I/O interface voltage 3.0 to 3.6 V	Portable applications: PDA, DSC, DVC, MP3 player, external storage, printer, scanner, STB	▸ ISP1582 PCI eval kit	▸ Special Function Registers: Differences Between ISP1581 and ISP1582/83 ▸ ISP1582/83 Control Pipe ▸ Interfacing the ISP1582 to the Intel PXA250 Processor ▸ ISP1582/83 and ISP1761 clearing an IN buffer ▸ ISP1581/2/3 Frequently Asked Questions ▸ Handheld Devices Using the ISP1582/83 ▸ Interfacing the ISP1582/3 to the MCF5249 ColdFire Processor	HVQFN56 (SOT684-1)
ISP1583	▸ Supports Generic Mode and Split Bus mode CPU interfaces ▸ Supports direct interface to any ATA/ATAPI device ▸ Dual supply voltages: main 3.0 to 3.6 V, digital I/O interface 1.65 to 3.6 V	Portable applications with embedded HDD: PDA, DSC, DVC, MP3 player, external storage, printer, scanner, STB	▸ ISP1583 eval kit ... Split Bus ... Mass Storage	▸ Special Function Registers: Differences Between ISP1581 and ISP1582/83 ▸ ISP1582/83 Control Pipe ▸ ISP1582/83 and ISP1761 clearing an IN buffer ▸ ISP1581/2/3 Frequently Asked Questions ▸ Handheld Devices Using the ISP1582/83 ▸ Interfacing the ISP1582/3 to the MCF5249 ColdFire Processor ▸ HDD PIO access and Media Transfer Protocol implementation in the ISP1583	HVQFN64 (SOT804-1) TFBGA64 (SOT543-1) = 6 x 6 mm TFBGA64 (SOT969-1) = 4 x 4 mm
Hi-Speed USB host controllers					
ISP1562 ISP1563 ISP1564	▸ [HS, FS, LS] PCI-based Hi-Speed USB host, direct interface to any 32-bit, 33-MHz interface ▸ Single supply voltage 3.0 to 3.6 V ▸ Integrates two Original USB OHCI and one Hi-Speed USB EHCI host controllers ▸ 2 downstream ports for ISP1562 and ISP1564; 4 for ISP1563 ▸ Core operating voltage 1.8 V	PC motherboard, notebook, PCI host add-on card, STB, web appliance	▸ ISP1562 PCI eval kit ▸ ISP1563 PCI eval kit ▸ ISP1564 LQFP PCI eval kit ▸ ISP1564 TFBGA PCI eval kit	▸ Designing a Hi-Speed USB Host PCI Adapter Using the ISP1562, ISP1563 ▸ Designing a Hi-Speed USB Host PCI Adapter Using the ISP1564	For ISP1562: LQFP100 (SOT407-1) For ISP1563: LQFP128 (SOT420-1) For ISP1564: LQFP100 (SOT407-1) TFBGA100 (SOT926-1)
ISP1760	▸ [HS, FS, LS] Embedded Hi-Speed USB host, memory-mapped CPU interface to any 32-bit or 16-bit interface ▸ Three downstream ports ▸ Dual supply voltages: main 3.0 to 3.6 V, digital I/O interface 1.65 to 3.6 V ▸ Core operating voltage 1.8 V ▸ Integrated patent-pending Transaction Translator supports single EHCI for HS, FS, and LS transfers	Printer, STB, DVD recorder, DTV, media player, PDA	▸ FlexiUSB stack for HS host ▸ ISP1760 eval kit ... PCI/Linux ... PCI/WinCE ... PXA25x/Linux	▸ Interfacing the ISP176x to the Intel PXA25x processor ▸ Embedded Systems Design with the ISP176x ▸ ISP176x Linux Programming Guide ▸ ISP176x Windows CE 5.0 User Installation Guide ▸ ISP176x Windows CE 5.0 Software Programming Reference ▸ ISP1760/1 Frequently Asked Questions ▸ Suspend and Wake-up for the ISP1760 Host Controller	LQFP128 (SOT425-1) TFBGA128 (SOT857-1)

HS, FS, and LS denote high-speed, full-speed, and low-speed data transfer rates, respectively

USB solutions (continued)

Product	Description	Target applications	Reference kits	Application notes	Package(s)
Hi-Speed USB hub controllers					
ISP152x	▸ [HS, FS, LS] Standalone single-chip pure hardware hub ▸ Dual supply voltages 3.3 and 5.0 V	Monitor, device bay, docking station, hub box			
ISP1520	4 downstream ports		ISP1520 eval kit		LQFP64 (SOT314-2)
ISP1521	7 downstream ports		ISP1521 eval kit		LQFP80 (SOT315-1)
Hi-Speed USB transceivers (ULPI)					
ISP1504/5/6	▸ [HS, FS, LS] UTMI+ Low Pin Interface (ULPI)-based transceiver ▸ Main supply input voltage 3.0 to 3.6 V ▸ Low-power mode current 35 µA ▸ V_{BUS} impedance: 40 to 100 kΩ ▸ "Interface Protect" feature			▸ ULPI White Paper ▸ Interfacing to the ISP1504/5/6	
ISP1504	▸ 8-bit single data rate (SDR) data bus ▸ Peripheral, Host and OTG capability ▸ Chip select pin polarity: active LOW ▸ ULPI bus can be placed in 3-state mode ▸ Supports 60-MHz input clock ▸ Digital I/O interface 1.65 to 3.6 V ▸ Charge pump: embedded (50 mA) and external supported ▸ ISP1504ABS: clock frequency 19.2 MHz ▸ ISP1504CBS: clock frequency 26 MHz	Mobile apps or standalone host and peripheral apps	ISP1504ABS T&MT kit ISP1504CBS T&MT kit		HVQFN32 (SOT617-1)
ISP1505	▸ 8-bit SDR data bus ▸ Peripheral, Host capability ▸ OTG support: SRP ▸ Supports 60-MHz input clock ▸ Digital I/O interface 1.65 to 3.6 V ▸ Charge pump: external supported ▸ ISP1505ABS: clock frequency 19.2 MHz ▸ ISP1505CBS: clock frequency 26 MHz	Standalone host and peripheral apps, e.g., STB	ISP1505ABS T&MT kit ISP1505CBS T&MT kit		HVQFN24 (SOT616-1)
ISP1506	▸ 4-bit double data rate (DDR) data bus ▸ Peripheral, Host and OTG capability ▸ Digital I/O interface 1.65 to 1.95 V ▸ Embedded charge pump (50 mA) and external supported ▸ ISP1506ABS: clock frequency 19.2 MHz ▸ ISP1506BBS: clock frequency 26 MHz	Mobile apps	ISP1506ABS T&MT kit ISP1506BBS T&MT kit		HVQFN24 (SOT616-1)

HS, FS, and LS denote high-speed, full-speed, and low-speed data transfer rates, respectively

USB, serial-protocol bridges, and 1394

USB solutions (continued)

Product	Description	Target applications	Reference kits	Application notes	Package(s)
ISP1504x1/ ISP1508	▸ [HS, FS, LS] ULPI-based transceiver for mobile phone ▸ Peripheral, Host and OTG capability ▸ Main supply input voltage 3.0 to 4.5 V ▸ Charge pump: external supported ▸ Power-down mode current 0.5 µA ▸ Low-power mode current 50 µA ▸ ULPI bus can be placed in 3-state mode ▸ "Interface Protect" feature				
ISP1504A1 ISP1504C1	▸ 0.5-mm pitch ▸ 8-bit SDR data bus ▸ Chip select pin polarity: active LOW ▸ Digital I/O interface 1.65 to 3.6 V ▸ V_{BUS} impedance: 40 to 100 kΩ ▸ ISP1504A1ET: clock frequency 19.2 MHz ▸ ISP1504C1ET: clock frequency 26 MHz	Mobile apps or standalone host and peripheral apps	ISP1504A1ET T&MT kit ISP1504C1ET T&MT kit		TFBGA36 (SOT912-1)
ISP1508	▸ 0.5-mm pitch ▸ 8-bit SDR or 4-bit DDR data bus, selectable ▸ Transparent UART mode ▸ Supports 60-MHz input clock ▸ Clock frequency 13, 19.2, 24 or 26 MHz ▸ Digital I/O interface 1.4 to 1.95 V ▸ V_{BUS} impedance: 40 to 100 kΩ ▸ ISP1508AET: chip select pin polarity is active HIGH ▸ ISP1508BET: chip select pin polarity is active LOW	Mobile and portable apps	ISP1508AET T&MT kit ISP1508BET T&MT kit		TFBGA36 (SOT912-1)
ESD protection					
PRTR5V0U2X	▸ ESD protection array for Hi-Speed USB and USB ports ▸ Ultra-low line capacitance (1 pF) ▸ IEC 61000-4-2, level 4 (8-kV contact discharge) compliant	Notebook, PC, printer, digital still camera, PDA, MP3 player	PRTR5V0U2X demo board		SOT143B
PRTR5V0U2AX	▸ ESD protection array for USB 2.0/USB 1.1 ports ▸ Ultra-low line capacitance (1.8 pF) ▸ IEC 61000-4-2, level 4 (12-kV contact discharge) compliant	Notebook, PC, printer, digital still camera, PDA, MP3 player			SOT143B

HS, FS, and LS denote high-speed, full-speed, and low-speed data transfer rates, respectively

USB, serial-protocol bridges, and 1394

Bridge/protocol converters

Product	Description	SPI speed	UART speed	I²C-bus	Number of GPIO	Quasi-bidirectional I/O	SPI chip-select pins	Clock	Package	Dimensions
SC18IS600IPW	SPI slave to I²C master with GPIO	1 Mbps	N/A	400 kHz	4	2		Internal	TSSOP16	5.0 x 4.4 x 1.1 mm
SC18IS601IPW	SPI slave to I²C master with GPIO	3 Mbps	N/A	400 kHz	3	2		External	TSSOP16	5.0 x 4.4 x 1.1 mm
SC18IS602IPW	I²C slave to SPI master with GPIO	1.8 Mbps	N/A	400 kHz	4		4	Internal	TSSOP16	5.0 x 4.4 x 1.1 mm
SC18IS603IPW	I²C slave to SPI master with GPIO	4 Mbps	N/A	400 kHz	3		3	External	TSSOP16	5.0 x 4.4 x 1.1 mm
SC18IM700IPW	UART to I²C master with GPIO	N/A	460.8 kbps	400 kHz	8			Internal	TSSOP16	5.0 x 4.4 x 1.1 mm

Serial-protocol bridges for I²C/SPI to UART applications

Product	UART channels	GPIO	IrDA SIR speed	SPI speed up to	Package	Package dimensions
SC16IS740IPW	1	N/A	115 kbps	4 Mbps	TSSOP16	5.1 x 4.5 x 1.1 mm
SC16IS750IBS	1	8	115 kbps	4 Mbps	HVQFN24	4.1 x 4.1 x 1.0 mm
SC16IS750IPW	1	8	115 kbps	4 Mbps	TSSOP24	7.9 x 4.5 x 1.1 mm
SC16IS752IBS	2	8	115 kbps	4 Mbps	HVQFN32	5.1 x 5.1 x 1.0 mm
SC16IS752IPW	2	8	115 kbps	4 Mbps	TSSOP28	9.8 x 4.5 x 1.1 mm
SC16IS760IBS	1	8	1.152 Mbps	15 Mbps	HVQFN24	4.1 x 4.1 x 1.0 mm
SC16IS760IPW	1	8	1.152 Mbps	15 Mbps	TSSOP24	7.9 x 4.5 x 1.1 mm
SC16IS762IBS	2	8	1.152 Mbps	15 Mbps	HVQFN32	5.1 x 5.1 x 1.0 mm
SC16IS762IPW	2	8	1.152 Mbps	15 Mbps	TSSOP28	9.8 x 4.5 x 1.1 mm

USB, serial-protocol bridges, and 1394

Wired connectivity: 1394

Product	Description	1394-1995 & 1394a compliance	Operation	Ports	Open HCI	IEC61883	Package
PDI1394P25	Physical layer interface (PHY)	•	400 Mbps	1	•		LQFP64
PDI1394L40	A/V link	•				•	LQFP144

Wireless connectivity

Wireless connectivity: Bluetooth

Product	Description	Function(s)	Bluetooth core	ARM7 core	On-chip memory	Low power consumption	Package	Dimensions	Comment
BGB204	Bluetooth SiP with embedded ROM	Baseband, embedded memory, and full radio	2.0	•	268-kB ROM	•	HVQFN	49 mm^2	Coexists with Wi-Fi (802.11)
BGB203	Bluetooth SiP with embedded Flash	Baseband, embedded memory, and full radio	2.0	•	268-kB Flash	•	HVQFN	56 mm^2	Coexists with Wi-Fi (802.11)
BGB208	Bluetooth 2.0	Baseband, embedded memory, and full radio	2.0	•	268-kB ROM	•	HVQFN	25 mm^2	Coexists with Wi-Fi (802.11)
BGB210S	Miniature, low-power Bluetooth 2.0 + EDR	Baseband, embedded memory, and full radio	2.0+EDR	•	268-kB ROM	•	HVQFN	15 mm^2	Coexists with Wi-Fi (802.11)

Wireless connectivity

Wireless connectivity: Near Field Communication (NFC)

Product	Decription	RF protocols	Host interface	Power supply (V)	Microcontroller	Package	Design-in kit
PN511	NFC transceiver	ISO 14443-A Peer-to-peer (NFC-IP1, ISO 18092) FeliCa™ Mifare™	Serial UART, I²C-bus, SPI, 8-bit parrallel	2.5 - 3.6		HVQFN32	OM5561
PN512	NFC transceiver	ISO 14443-A, -B Peer-to-peer (NFC-IP1, ISO 18092) FeliCa Mifare	Serial UART, I²C-bus, SPI, 8-bit parrallel	2.5 - 3.6		HVQFN32	OM5571
PN531	NFC controller	ISO 14443-A Peer-to-peer (NFC-IP1, ISO 18092) FeliCa Mifare	Serial UART, I²C-bus, SPI, USB 2.0	2.5 - 4.0	80C51	HVQFN40	OM5555
PN532	NFC controller	ISO 14443-A, -B Peer-to-peer (NFC-IP1, ISO 18092) FeliCa Mifare	Serial UART, I²C-bus, SPI,	2.7 - 5.5	80C51	HVQFN40	OM5581
PN533	NFC controller	ISO 14443-A, -B Peer-to-peer (NFC-IP1, ISO 18092) FeliCa Mifare	Serial UART, USB 2.0	2.5 - 3.6	80C51	HVQFN40	OM5588

AUDIO AMPLIFIERS

Audio amplifiers

Audio amplifiers

Product	Package	Package thermal resistance (°C/W)	Description	Operating temperature range (°C)	Channels	Single supply (V$_{DC}$)	Dual supply (±V$_{DC}$)	Quiescent current max/min (mA)	Max power dissipation (mW)	Slew rate (V/µs)	GBW product (MHz)	Closed loop gain min/max (dB)	Input offset voltage vio (mV)	Input bias current IB (nA)	SVRR (dB)	Max output power @ (THD+N)/S	(THD+N)/S @ VDD = 5 V; VO(P-P) = 3.5 V (0 dbV) (dB/%)	Channel output power 10% (Watts)	THD typ/max (%)
TDA1308/N2	N (DIP8)	100	Class-AB stereo headphone driver	-40 to +85	2	3 – 7	1.5 – 3.5	3/5	25	5	5.5	70 (typ)	10	0.01	90	60	-70/0.03		
TDA1308A	UK (WL-CSP8)		Class-AB stereo headphone driver	-40 to +85	2	3 – 7	1.5 – 3.5	2.4/5	25	5	5.5	70 (typ)	10	0.01	90	60	-70/0.03		
TDA1308A/N2	T (SO8)	160	Class-AB stereo headphone driver	-40 to +85	2	2.4 – 7	1.5 – 3.5	3/5	25	5	5.5	70 (typ)	10	0.01	90	60	-70/0.03		
TDA1308/N2	T (SO8)	160	Class-AB stereo headphone driver	-40 to +85	2	3 – 7	1.5 – 3.5	3/5	25	5	5.5	70 (typ)	10	0.01	90	60	-70/0.03		
TDA1308/N2	TT (TSSOP8)	220	Class-AB stereo headphone driver	-40 to +85	2	3 – 7	1.5 – 3.5	3/5	25	5	5.5	70 (typ)	10	0.01	90	60	-70/0.03		
TDA8541/N1	T (SO8)	160	1.0-W BTL audio amplifier	-40 to +85	1	2.2 – 18		8/12	900			6/30		500 (max)	50 (min)			1	0.15/0.3 @ P_O = 0.5 W
TDA8542A/N1	T (SO20)	60	2 x 1.5-W BTL audio amplifier	-40 to +85	2	2.2 – 18		15/22	2200			6/30		500 (max)	50 (min)			1.5	0.15/0.3 @ P_O = 0.4 W
TDA8542/N1	TS (SSOP20)	110	2 x 0.7-W BTL audio amplifier	-40 to +85	2	2.2 – 18		15/22	1120			6/30		500 (max)	50 (min)			0.7	0.15/0.3 @ P_O = 0.4 W
TDA8543/N1	T (SO16)	100	1.4-W BTL audio amplifier	-40 to +85	1	2.2 – 18		8/12	1200			6/30		500 (max)	50 (min)			1.4	0.15/0.3 @ P_O = 0.5 W
TDA8547/N1	TS (SSOP20)	110	2 x 0.7-W BTL audio amplifier	-40 to +85	2	2.2 – 18		15/22	1100			6/30		500 (max)	50 (min)			0.7	0.15/0.3 @ P_O = 0.4 W
SA58631	TK (HVSON8)	30	3-W Class-AB BTL audio amplifier	-40 to +85	1	2.2 – 18		8/12	4500			6/30		500 (max)	50 (min)			3	0.15/0.3 @ P_O = 0.4 W
SA58633	BS (HVQFN20)	22	2 x 2.2-W BTL audio amplifier	-40 to +85	2	2.2 – 18		15/22	5500			6/30		500 (max)	50 (min)			2.2	0.15/0.3 @ P_O = 0.4 W
SA58670	BS (HVQFN20)	24	2 x 2.1-W Class-D with sel gain	-40 to +85	2	2.2 – 18		8.5							77			2.1	0.11 @ P_O = 0.5 W, 8 Ω
SA58671	(UK) WL-CSP16	110	2 x 1.3-W Class-D with sel gain	-40 to +85	2	2.5 – 5.5		8.5							77			1.3	0.11 @ P_O = 0.5 W, 8 Ω

All audio amplifiers have short-circuit protection

Audio amplifiers

Class-D audio amplifiers

Product	Description	Output stage	Vp (V)	Po (W) 10% THD	THD 1 kHz	Iq (mA) @ Vp typ	Gain (dB)	SVRR (dB)	X-talk (dB)	DC offset (mV)	Vnoise (µV) AES17-brick	Rth j-c (k/W)	Mute	Package	Remarks
TDA8920BTH	Single-chip 2 x 50/100-W	SE/BTL	± 12.5 – 30	2 x 90 (4 Ω, ±27 V)	0.02%	50	30/36	55	75	< 150	210	2	•	HSOP24	Eff=90%
TDA8920BJ	Single-chip 2 x 50/100-W	SE/BTL	± 12.5 – 30	2 x 90 (4 Ω, ±27 V)	0.02%	50	30/36	55	75	< 150	210	1.3	•	SIL23P	Eff=90%
TDA8922BTH	Single-chip 2 x 25/50-W	SE/BTL	± 12.5 – 30	2 x 50 (6 Ω, ±26 V)	0.02%	50	30/36	55	75	< 150	210	2	•	HSOP24	Eff=90%
TDA8922BJ	Single-chip 2 x 25/50-W	SE/BTL	± 12.5 – 30	2 x 50 (6 Ω, ±26 V)	0.02%	50	30/36	55	75	< 150	210	1.3	•	SIL23P	Eff=90%
TDA8932BT	Single-chip 2 x 15/25-W	SE	10 – 36	2 x 15 W (4 Ω, 22 V) 2 x 15 W (8 Ω, 29 V)	0.01%	30	30	55	80	< 100	100	44	•	SO32L	Eff=92%
TDA8932BTW	Single-chip 2 x 15/25-W	SE	10 – 36	2 x 19 W (4 Ω, 25 V) 2 x 17 W (8 Ω, 31 V)	0.01%	30	30	55	80	< 100	100	44	•	HTSSOP32	Eff=92%
TDA8933T	Single-chip 2 x 10-W	SE	10 – 36	2 x 8 W (4 Ω, 17 V) 2 x 9 W (8 Ω, 24 V)	0.01%	30	30	55	80	< 100	100	44	•	SO32L	Eff=90%
TDA8933BTW	Single-chip 2 x 12-W	SE	10 – 36	2 x 12 W (4 Ω, 20 V) 2 x 12 W (8 Ω, 27 V)	0.01%	30	30	55	80	< 100	100	44	•	SO32L	Eff=90%
TFA9810T	2 x 12-W	BTL	8 – 20	2 x 9 W (8 Ω,12 V)	0.08%	35	20	45	70	< 20	150	30	Sleep mode	SO32L	Eff=89%
TFA9810TW	Single-chip 2 x 15-W	BTL	8 – 20	2 x 12 W (8 Ω,14 V)	0.08%	35	20	45	70	< 20	150	30	Sleep mode	SO32L	Eff=89%
TFA9815T	2 x 15-W	BTL	8 – 20	2 x 10 W (8 Ω,12 V) 2 x 15 W (8 Ω,16 V)	0.05%	40	20	45	70	< 20	150	44	Sleep mode	SO32L	Eff=91%

Audio amplifiers

Class-AB audio amplifiers

Product	Description	Output stage	Vp (V)	Po (W) 10% THD	DC Vol	THD 1 kHz	Iq (mA) @ Vp typ	Gain (dB)	SVRR (dB)	X-talk (dB)	DC offset (mV)	Vnoise (µV) (20 - 20 kHz)	Rth j-c (k/W)	Mute	Package	Remarks
TDA1517(P)	2 x 6-W	SE	8.5 – 18	2 x 6 W (4 Ω,14.4 V)		0.10%	40	20	> 48	> 40		50	> 52	•	SIL9MPF HDIP18	Equal phase
TDA1517ATW	2 x 3-W	SE/BTL	6.0 – 18	2 x 3 W (8 Ω,14.4 V)		0.10%	40	26/20	> 50	> 40	< 150	50/70	37	•	HTSSOP20	Inv. phase
TDA2614	6-W	SE	15 – 42	8.5 W (±12 V, 8 Ω)		0.15%	20	30	45			70	8	•	SIL9MPF	Sym. supply
TDA2615	2 x 6-W	SE	7.5 – 21	8 W (±12 V, 8 Ω)		0.15%	40	30	60	70		70	6	•	SIL9MPF	Sym. supply
TDA2616	2 x 12-W	SE	7.5 – 21	15 W (±16 V, 8 Ω)		0.15%	40	30	60	70		70	2.5	•	SIL9P	Sym. supply
TDA2616Q	2 x 12-W HIFI	SE	7.5 – 21	15 W (±16 V, 8 Ω)		0.15%	40	30	60	70		70	2.5	•	DBS9P	Sym. supply
TDA7050T	2 x 75-mW	SE	1.6 – 6.0				3.2 (Vp = 24 V)	32		110 (160)			110 (160)		DIL/SO8	
TDA7056A(T)	3-W	BTL	4.5 – 18	5.2 W (12 V, 8 Ω)	120 dB	0.30%	8	36	46		< 150	210	10	•	SIL9MPF/ SO20	Rail-to-rail
TDA7056B	5-W	BTL	4.5 – 18	5 W (12 V, 8 Ω)	73.5 dB	0.30%	9.2	40	38		< 200	210	10	•	SIL9MPF	
TDA7057AQ	2 x 5-W	BTL	4.5 – 18	2 x 5 W (12 V, 8 Ω)	73.5 dB	0.20%	15	40	38	> 40	< 200	210	4	•	SIL13P	
TDA8551T	1-W	BTL	2.7 – 5.5	1.4 W (5 V, 8 Ω)	Digital	0.15%	6 (Vp = 5 V)	20	> 48			60	160	•	SO8	
TDA8552T(S)	2 x 1.4-W	BTL	2.7 – 5.5	1.4 W (5 V, 8 Ω)	Digital	0.10%	BTL:10 (Vp = 3.3 V) SE: 5 (Vp = 3.3 V)	20 - 30	>50			60	60 (110)	•	SO/ SSOP20	
TDA8941P	1.5-W	BTL	4.5 – 18	1.5 W (9 V, 16 Ω)		0.03%	14	32	65		< 200	90	100	•	DIP8	
TDA8942P	2 x 1.5-W	BTL	6 – 18	2 x 1.5 W (9 V, 16 Ω)		0.03%	22	32	65	75	< 150	90	10	•	SIL9MPF/ SO20	Rail-to-rail
TDA8943SF	6-W	BTL	6 – 18	6 W (12 V, 8 Ω)		0.03%	15	32	65		< 200	90	18	•	SIL9MPF	
TDA8944J	2 x 7-W	BTL	6 – 18	2 x 7 W (8 Ω, 12 V)		0.03%	24	32	65	75	< 200	90	6.9	•	SIL13P	

Audio amplifiers

Class-AB audio amplifiers (continued)

Product	Description	Output stage	Vp (V)	Po (W) 10% THD	DC Vol	THD 1 kHz	Iq (mA) @ Vp typ	Gain (dB)	SVRR (dB)	X-talk (dB)	DC offset (mV)	Vnoise (µV) (20 - 20 kHz)	Rth j-c (k/W)	Mute	Package	Remarks
TDA8944AJ	2 x 7.5-W	BTL	6 – 18	2 x 7 W (8 Ω, 12 V)	80 dB floating: 24 dB	0.10%	40	32	65	70	< 200	120	6.9	•	SIL17P	
TDA8945S	15-W	BTL	6 – 18	15 W (8 Ω, 18 V)		0.03%	18	32	65		< 200	90	9	•	SIL13P	
TDA8946J	2 x 15-W	BTL	6 – 18	2 x 15 W (8 Ω, 18 V)		0.03%	28	32	65	75	< 200	90	4.5	•	SIL17P	
TDA8946AJ	2 x 15-W	BTL	6 – 18	2 x 15 W (8 Ω, 18 V)	80 dB floating: 24 dB	0.10%	40	32	55	75	< 200	120	2.5	•	SIL17P	
TDA8947J	SE 4 x 15-W or BTL 2 x 30/50-W	SE/BTL	9 – 28	4 x 15 W (20 V, 4 Ω)		0.07%	100	26/32	60	60	< 170	150/200	1.8	•	SIL17P	
TDA8948J	SE 4 x 10-W or BTL 2 x 20/30-W	SE/BTL	9 – 28	4 x 8 W (18 V, 4 Ω)		0.07%	100	26/32	60	60	< 170	150	2	•	SIL17P	
TFA9800J	2 x 6-W	SE	8.5 – 18	2 x 6 W (4Ω,15V)		0.10%	40	20	> 48	> 40		50	> 52	•	SIL9LC	
TFA9841J	SE 7-W	SE/BTL	9 – 26	7.5 W (4 Ω, 16 V)		0.10%	40	26	60			150	3.8	•	SIL9LC	
TFA9842J	SE 2 x 7-W	SE/BTL	9 – 26	2 x 7.5 W (4 Ω,16V)		0.1/ 0.05%	60	26/32	60	60	< 200	150/200	2	•	SIL9LC	
TFA9842AJ	SE 2 x 7-W	SE	9 – 28	2 x 7.5 W (4Ω,16V)	80 dB	0.1/ 0.05%	60	26	60	60		150	2	•	SIL9LC	
TFA9842BJ	SE 2 x 7-W	SE	9 – 26	2 x 7.5 W (4Ω,16V)		0.10%	60	26	60	60		150	2	•	SIL9LC	Equal phase
TFA9843J	SE 2 x 15-W	SE/BTL	9 – 26	2 x 15 W (4 Ω, 22 V)		0.1/ 0.05%	60	26/32	60	60	< 200	150/200	2	•	SIL9LC	
TFA9843BJ	SE 2 x 15-W	SE/BTL	9 – 26	2 x 15 W (4 Ω, 22 V)		0.1/ 0.05%	60	26/32	60	60	< 200	150/200	2	•	SIL9LC	Equal phase
TFA9843AJ	SE 2 x 15-W	SE	9 – 28	2 x 15 W (4 Ω, 22 V)	80 dB	0.1/ 0.05%	60	26	60	60		150	2	•	SIL9LC	

Audio amplifiers

Amplifiers by power rating

Product	Description	Number of channels	Supply voltage (V)	Po (W) @ 10% (SE)	Po (W) @ 10% (BTL)	Mute/standby	Diff. inputs	Packages
TDA8920BTH	Single-chip 2 x 100-W Class-D	2 x SE 1 x BTL	± 12.5 – 30	100	150	1-pin	•	HSOP24
TDA8922BTH	Single-chip 2 x 50-W Class-D	2 x SE 1 x BTL	± 12.5 – 30	50	88	1-pin	•	HSOP24
TDA8947J	SE 4 x 15-W or BTL 2 x 30-W	2 x SE 1 x BTL 2 x BTL, 4 x SE	9 – 28	13 (22 V)	29 (22 V)	Mute/standby	BTL/SE: Quasi	SIL17P
TDA2616	2 x 12 W	2 x SE 1 x BTL	7.5 – 21	15	26	Mute	•	SIL9P
TDA2616Q	2 x 12 W	2 x SE 1 x BTL	7.5 – 21	15	26	Mute	•	DBS9P
TDA8932BT	Single-chip 2 x 15-W Class-D	2 x SE	10 – 36 V	15	32	Mute	•	SO20L
TDA8932BTW	Single-chip 2 x 15-W Class-D	2 x SE	10 – 36 V	15	32	Mute	•	HTSSOP32
TFA9815T	Powerstage 2 x 15-W Class-D	2 x BTL	8 – 20 V		15	Mute		SO32L
TDA8931T	Powerstage 1 x 20-W Class-D	1 x SE	12 – 35 V	20		Mute		SO20SIL
TDA8933T	Single-chip 2 x 10-W Class-D	2 x SE	10 – 36 V	10	20	Mute	•	SO32L
TFA9843J	2 x 15-W	2 x SE 1 x BTL 2 x BTL, 4 x SE	9 – 28 V	8.5	17	Mute/standby	BTL/SE: Quasi	SIL9C
TDA8948J	SE 4 x 10-W or BTL 2 x 20-W	4 x SE 2 x BTL	9 – 28 V	8	16	Mute/standby	BTL/SE: Quasi	SIL17P
TDA8945S	1 x 15-W	1 x BTL	6 – 18 V		15	Mute/standby	•	SIL9P
TDA8946AJ	2 x 15-W with DC volume control	2 x BTL	4.5 – 18 V		15	Mute/standby	•	SIL17P
TDA8946J	2 x 15-W	2 x BTL	6 – 18 V		15	Mute/standby	•	SIL17P
TFA9810	Powerstage 2 x 12-W Class-D	2 x BTL	8 – 20 V		12	Mute	•	SO32L
TFA9842J	2 x 7-W	2 x SE 1 x BTL	9 – 26 V	7	15	Mute/standby	BTL/SE: Quasi	SIL9C
TDA2614	6-W	1 x SE	15 – 42 V	8.5		Mute	•	SIL9MPF
TDA1517ATW	2 x 3-W	1 x BTL 2 x SE	6.0 – 18 V	4	8			HTSSOP20
TDA2615	2 x 6-W	2 x SE	7.5 – 21 V	8		Mute	•	SIL9MPF
TDA7057AQ	2 x 5-W with DC volume control	2 x BTL	4.5 – 18 V		8	NA		SIL13P
TDA8944AJ	2 x 7.5-W with DC volume control	2 x BTL	4.5 – 18 V		7.5	Mute/standby	•	SIL17P
TDA8944J	2 x 7-W	2 x BTL	6 – 18 V		7	Mute/standby	•	SIL17P

Audio amplifiers

Amplifiers by power rating (continued)

Product	Description	Number of channels	Supply voltage (V)	Po (W) @ 10% (SE)	Po (W) @ 10% (BTL)	Mute/standby	Diff. inputs	Packages
TDA1517(P)	2 x 6-W	2 x SE	8.5 – 18	6				SIL9MPF/HDIP18
TDA8943SF	1 x 6-W	1 x BTL	6 – 18		6	Mute/standby	•	SIL9MP
TFA9800	2 x 6-W	2 x SE	8.5 – 18	6		Mute/standby		SIL9C
TDA7056A(T)	1 x 3-W with DC volume control	1 x BTL	4.5 – 18		5	NA		SIL9MPF/SO20
TDA7056B	1 x 5-W with DC volume control	1 x BTL	4.5 – 18		5	NA		SIL9MPF
TDA7056	1 x 3-W	1 x BTL	3.0 – 18		3	NA		SIL9MPF
SA58631TK	BTL 3-W Class-AB	1 x BTL	2.2 – 18		3.0	Mute/standby	•	HVSON8
SA58632BS	BLT 2 x 2.2-W Class-AB	2 x BTL	2.2 – 18		2.2	Mute/standby	•	HVQFN20
SA58670BS	2 x 2.1-W Class-D with sel gain	2 x BTL	2.5 – 5.5		2.1	Mute/standby	•	HVQFN20
TDA8551T	1-W with digital volume control	1 x BTL	2.7 – 5.5		1	1-pin		SO8
TDA8552T(S)	2 x 1.4-W with digital volume control	2 x BTL	2.7 – 5.5		1.4	1-pin		SO/SSOP20
TDA8941P	1 x 1.5-W	1 x BTL	6 – 18		1.5	Mute/standby	•	DIP8
TDA8942P	2 x 1.5-W	2 x BTL	6 – 18		1.5	Mute/standby	•	DIP16
TDA8542AT/N1	2 x 1.5-W	2 x BTL	2.2 – 18		1.5	Mute/standby	•	SO20
TDA8543TD	BTL 1.4-W	1 x BTL	2.2 – 18		1.4	Mute/standby	•	SO16
SA58671UK	2 x 1.3-W Class-D with sel gain	2 x BTL	2.5 – 5.5		1.3	Mute/standby	•	WL-CSP16
TDA8541TD	BTL 1.0-W	1 x BTL	2.2 – 18		1.0	Mute/standby	•	SO8
TDA8542TS	2 x 0.7-W	2 x BTL	2.2 – 18		0.7	Mute/standby	•	SSOP20
TDA8547TS	BTL 2 x 0.7-W	2 x BTL	2.2 – 18	1.2	0.7	Mute/standby	•	SSOP20
TDA7050(T)	2 x 75-mW headphone amplifier	2 x SE 1 x BTL	1.6 – 6.0	0.075	0.15		•	DIL/SO8
TDA1308/N2	Class-AB stereo headphone driver	2 x SE	3 – 7, ± 1.5 – ± 3.5	0.060			•	DIP8
TDA1308T/N2	Class-AB stereo headphone driver	2 x SE	3 – 7, ± 1.5 – ± 3.5	0.060			•	SO8
TDA1308TT/N2	Class-AB stereo headphone driver	2 x SE	3 – 7, ± 1.5 – ± 3.5	0.060			•	SSOP8
TDA1308AT/N2	Class-AB stereo headphone driver	2 x SE	2.4 – 7, ± 1.5 – ± 3.5	0.060			•	SO8
TDA1308AUK	Class-AB stereo headphone driver	2 x SE	2.4 – 7, ± 1.5 – ± 3.5	0.060			•	WL-CSP8

I²C-BUS DEVICES

I²C-bus devices

I²C-bus devices

Product	I/O expander (bits)	LED blinker (bits)	MUX/latch/EEPROM (bits-lahed bits-register)	MUX/switch (in/out channels)	Repeater hub (in/out segment)	Bus controller	Temperature sensor	Voltage measurment	RAM/EEPROM (kbits)	Real time clock/calender	Analog/digital converter	LCD driver	Number of addresses	Interrupt (I/O)	Hardware reset	Current (per bit/total mA)	1.0	1.8	2.5	3.3	5	5-V tolerant	100	400	1000	0 – 70	-40 – 85	-55 – 125	Pin count	DIP	SO (narrow)	SO (wide)	SSOP	QSOP	TSSOP	HVQFN
GTL2000																	•	•	•	•	•	•	•	•	•		•		48			DL			DGG	
GTL2002													NA				•	•	•	•	•	•	•	•	•		•		8						DP	DC/GM
GTL2010													NA				•	•	•	•	•	•	•	•	•		•		24		D				PW	BS
LM75A							2 °C						8	0/1				2.8	•	•	•	•		•				•	8		D				DP	
NE1617A							2 °C						9	0/1					•	•	•	•				0 – 125			16				DS			
NE1619							2 °C	•					2						•	•	•	•				0 – 125			16				DS			
P82B715					1 – 1								NA							•	•	•					•		8	PN	TD					
P82B96					1 – 1								NA						•	•	•	•				-40 – 125			8	PN	TD				DP	
PCA24S08				8									1						•	•				•			•		8		D				DP	
PCA8550		4 – 1 – 1											1						•	•	•	•		•		•			16		D		DB		PW	
PCA8565										•			1	0/1			•	•	•	•	•	•				-40 – 125			8						DP	
PCA8581/81C									1				8						•	•	•	•				-25 – 85			8	PN	TD					
PCA9306													NA				•	•	•	•	•	•	•	•	•		•		8		D				DP	DC/GM
PCA9500	8								2				2 – 8			25 – 100			•	•	•	•					•		16			D			PW	BS
PCA9501	8								2				2 – 64	0/1		25 – 100			•	•	•	•					•		20			D			PW	BS
PCA9502	8												8	0/1	•	10 – 80			•	•	•	•					•		16							BS
PCA9506	40												8	0/1	•	15 – 600			•	•	•	•					•		56						DGG	BS
PCA9508					1 – 1								NA				•	•	•	•	•	•					•		8		D				DP	
PCA9509					1 – 1								NA				•	•	•	•	•	•					•		8		D				DP	
PCA9510(A), 11(A),12(A), 13(A), 14(A)					1 – 1								NA						•		•	•					•		8		D				DP	
PCA9515/15A					1 – 1								NA						•	•	•	•					•		8		D				DP	
PCA9516/16A					1 – 4								NA						•	•	•	•					•		16		D				DP	
PCA9517					1 – 1								NA				•	•	•	•	•	•					•		8		D				DP	
PCA9518/18A					1 – 4								NA						•	•	•	•					•		20			D			PW	
PCA9519					4 – 4								NA				•	•	•	•	•	•					•		20/24						PW	BS
PCA9530		2											2		•	25 – 50			•	•	•	•					•		8		D				DP	

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I²C-bus devices

I²C-bus devices

Product	I/O expander (bits)	LED blinker (bits)	MUX/latch/EEPROM (bits-lahed bits-register)	MUX/switch (in/out channels)	Repeater hub (in/out segment)	Bus controller	Temperature sensor	Voltage measurment	RAM/EEPROM (kbits)	Real time clock/calender	Analog/digital converter	LCD driver	Number of addresses	Interrupt (I/O)	Hardware reset	Current (per bit/total mA)	V_{CC} 1.0	V_{CC} 1.8	V_{CC} 2.5	V_{CC} 3.3	V_{CC} 5	5-V tolerant	Freq 100	Freq 400	Freq 1000	Temp 0 – 70	Temp -40 – 85	Temp -55 – 125	Pin count	DIP	SO (narrow)	SO (wide)	SSOP	QSOP	TSSOP	HVQFN
PCA9531		8											8		•	25 – 100		•	•	•	•	•	•	•			•		16	D					PW	BS/BS3
PCA9532		16											8		•	25 – 200		•	•	•	•	•	•	•			•		24			D			PW	BS
PCA9533		4											2			25 – 100		•	•	•	•	•	•	•			•		8	D					DP	
PCA9534	8												8	0/1		25 – 100		•	•	•	•	•	•	•			•		16			D			PW	BS/BS3
PCA9535	16												8	0/1		25 – 200		•	•	•	•	•	•	•			•		24			D			PW	BS
PCA9536	4												1			25 – 50		•	•	•	•	•	•	•			•		8	D					DP	
PCA9537	4												1	0/1	•	25 – 50		•	•	•	•	•	•	•			•		10						DP	
PCA9538	8												4	0/1		25 – 100		•	•	•	•	•	•	•			•		16			D			PW	BS
PCA9539	16												4	0/1		25 – 200		•	•	•	•	•	•	•			•		24			D			PW	BS
PCA9540B				1 – 2									1					•	•	•	•	•	•	•			•		8		D				DP	
PCA9541				2 – 1									16	1/2	•			•	•	•	•	•	•	•			•		16			D			PW	BS
PCA9542A				1 – 2									8	2/1				•	•	•	•	•	•	•			•		14			D			PW	
PCA9543A				1 – 2									4	2/1	•			•	•	•	•	•	•	•			•		14			D			PW	
PCA9544A				1 – 4									8	4/1				•	•	•	•	•	•	•			•		20			D			PW	BS
PCA9545A				1 – 4									4	4/1	•			•	•	•	•	•	•	•			•		20			D			PW	BS
PCA9546A				1 – 4									8		•			•	•	•	•	•	•	•			•		16			D			PW	BS
PCA9547/48A/49				1 – 8									8		•			•	•	•	•	•	•	•			•		24			D			PW	BS
PCA9550		2											2		•	25 – 50		•	•	•	•	•	•	•			•		8	D					DP	
PCA9551		8											8		•	25 – 100		•	•	•	•	•	•	•			•		16			D			PW	BS/BS3
PCA9552		16											8		•	25 – 200		•	•	•	•	•	•	•			•		24			D			PW	BS
PCA9553		4											2			25 – 100		•	•	•	•	•	•	•			•		8	D					DP	TK
PCA9554/54A	8												8	0/1		25 – 100		•	•	•	•	•	•	•			•		16	N		D	TS		PW	BS/BS3
PCA9555	16												8	0/1		25 – 200		•	•	•	•	•	•	•			•		24	N		D	DB		PW	BS
PCA9557	8												8		•	25 – 100		•	•	•	•	•	•	•			•		16			D			PW	BS
PCA9558	8		5 – 1 – 1							2				2			25 – 100		•		•	•	•				•			28						PW	
PCA9559			5 – 1 – 1											4			20 – 80		•		•	•	•				•			20						PW	

I²C-bus devices

Product	I/O expander (bits)	LED blinker (bits)	MUX/latch/EEPROM (bits-lahed bits-register)	MUX/switch (in/out channels)	Repeater hub (in/out segment)	Bus controller	Temperature sensor	Voltage measument	RAM/EEPROM (kbits)	Real time clock/calender	Analog/digital converter	LCD driver	Number of addresses	Interrupt (I/O)	Hardware reset	Current (per bit/total mA)	1.0	1.8	2.5	3.3	5	5-V tolerant	100	400	1000	0–70	-40–85	-55–125	Pin count	DIP	SO (narrow)	SO (wide)	SSOP	QSOP	TSSOP	HVQFN
																	Type of function in device →							Vcc range (V)				Freq (kHz)			Temp (°C)	Features → Packages								
PCA9560		5 – 1 – 2											4			25 – 100		•		•	•	•	•					•		20			D			PW	
PCA9561		6 – 0 – 4											4			25 – 100		•		•	•	•	•					•		20			D			PW	
PCA9564						•							128	0/1	•				•	•	•	•	•					•		20	N		D			PW	BS
PCA9633		4											126			25 – 100		•	•	•	•	•	•	•				•		8/10/16	D					DP/PW	TK/BS
PCA9634		8											126			25 – 200		•	•	•	•	•	•	•				•		20			D			PW	BS
PCA9635		16											126			25 – 400		•	•	•	•	•	•	•				•		28			D			PW	BS
PCA9665						•							128	0/1	•				•	•	•	•	•	•				•		20	N		D			PW	BS
PCA9670	8												64		•	25 – 200			•	•	•	•	•	•				•		16			D			PW	BS
PCA9671	16												64		•	25 – 400			•	•	•	•	•	•				•		24			D	DB	DK	PW	BS/BQ
PCA9672	8												64	0/1	•	25 – 200			•	•	•	•	•	•				•		16			D			PW	BS
PCA9673	16												64	0/1	•	25 – 400			•	•	•	•	•	•				•		24			D	DB	DK	PW	BS/BQ
PCA9674/74A	8												64	0/1		25 – 200			•	•	•	•		•				•		16/20		TS	D			PW	BS
PCA9675	16												64	0/1		25 – 400			•	•	•	•		•				•		24			D	DB	DK	PW	BS/BQ
PCA9691											8		64						•	•	•	•	•	•	•			•		16	PN	TD					BS
PCA9698	40												64	0/1	•	25 – 1000			•	•	•	•	•	•				•		56						DGG	BS
PCF2113												24-ch	2						•	•	•	•	•					•		100			LQFP100				
PCF2116												48-ch	2						•	•	•	•	•					•					DIE				
PCF2119												32-ch	2						•	•	•	•	•					•					DIE				
PCF85116-3									16				1							•	•	•	•					•		8	N	D					
PCF8531												Graphic	8				•	•	•	•	•	•					•					DIE				
PCF8533												Graphic	8				•	•	•	•							•					DIE				
PCF8534												Graphic	8					•	•	•	•						•					LQFP80				
PCF8535												Graphic	4						•	•	•	•					•					DIE				
PCF8562												128	3						•	•	•	•					•		48			LQFP48				
PCF8563										•			1	0/1			•	•	•	•	•	•					•		8	PN	TD				DP	
PCF8566												96	16						•	•	•	•					•		40	PN		VSO40				
PCF8570							2						8						•	•	•	•					•		8	PN	TD					

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I²C-bus devices

I²C-bus devices

Product	Type of function in device																Vcc range (V)						Freq (kHz)			Temp (°C)			Packages							
	I/O expander (bits)	LED blinker (bits)	MUX/latch/EEPROM (bits-lahed bits-register)	MUX/switch (in/out channels)	Repeater hub (in/out segment)	Bus controller	Temperature sensor	Voltage measument	RAM/EEPROM (kbits)	Real time clock/calender	Analog/digital converter	LCD driver	Number of addresses	Interrupt (I/O)	Hardware reset	Current (per bit/total mA)	1.0	1.8	2.5	3.3	5	5-V tolerant	100	400	1000	0 – 70	-40 – 85	-55 – 125	Pin count	DIP	SO (narrow)	SO (wide)	SSOP	QSOP	TSSOP	HVQFN
PCF8574/74A	8												4	0/1		20 – 100		•	•	•	•	•	•					•		16	PN	TD		TS			
PCF8575/75C	16												8	0/1		20 – 100		•	•	•	•	•	•	•				•		24			D	TSDB	DK	PW	BS/BQ
PCF8576C/D												160	16					•	•	•	•	•		•				•		56/64			VSO56/LQFP64				
PCF8577C												64	16						•	•	•	•		•				•		40	PN		VSO40				
PCF8578/79									2			384	2						•	•	•	•		•				•		56/64			VSO56/LQFP64				
PCF8582C-2/ 102C-2/103C-2									2				8						•	•	•	•		•				•		8	N	D					
PCF8583										•			2	0/1			•	•	•	•	•	•		•				•		8	PN	TD					
PCF8584						•							128	0/1	•				•	•	•			•				•		20	PN	TD					
PCF8591											8		8						•	•	•	•		•				•		16	PN	TD					
PCF8593										•			1	0/1	•		•	•	•	•	•	•		•				•		8	N	TD					
PCF8594C-2									4				4						•	•	•	•		•				•		8	N	D					
PCF8598C-2									8				2						•	•	•	•		•				•		8	N		D				
PCF8811												G	4					•	•	•				•	•			•					DIE				
SA56004							1 °C						8	0/2						•	•		•	•				-40 – 125		24			D				DP
SAA1064												4 x 8	4			21			•	•	•			•				•		24	P	T					
SC16IS750	8												1		•	10 – 80		•	•	•	•	•		•				•		28/32						PW	BS
SC16IS752	8												1		•	10 – 80		•	•	•	•	•		•				•		24						PW	BS
SC16IS760	8												1		•	10 – 80		•	•	•	•	•		•				•		28/32						PW	BS
SC16IS762	8												1		•	10 – 80		•	•	•	•	•		•				•		24						PW	BS
SC18IM700						•							1	0/1	•				•	•	•	•		•				•		16						PW	
SC18IS600	5												1		•	10 – 50			•	•	•	•		•				•		16						PW	
SC18IS601	5														•	10 – 50			•	•	•	•		•				•		16						PW	
SE95							1 °C						8	0/1				2.8	•	•				•	•				•	8			D				DP
SE97							2 °C		2				8	0/1				•	•	•				•	•			-20 – 125		8						PW	TK
SE98							2 °C						8	0/1						•				•	•			-20 – 125		8						PW	TK
TDA8444											6		8			12					•	•		•			-20 – 70			16	P	T					

PCI Express PHYs and channel switches

PCI Express solutions

Product	Description	Target applications	Package	Power	Availability
PX1011A-EL1	x1 PCI Express physical layer device, compliant with PCI Express Specification v1.0a and v1.1	PC plug-in cards, embedded systems, ExpressCards	LFBGA81, leaded	< 300 mW	Sampling
PX1011A-EL1/G	x1 PCI Express physical layer device, compliant with PCI Express Specification v1.0a and v1.1	PC plug-in cards, embedded systems, ExpressCards	LFBGA81, lead-free	< 300 mW	Sampling
PX1012A-EL1	x1 PCI Express physical layer device, compliant with PCI Express Specification v1.0a and v1.1, for use with PLDA PCI Express IP core	PC plug-in cards, embedded systems, ExpressCards	LFBGA81, leaded	< 300 mW	Sampling
PX1012A-EL1/G	x1 PCI Express physical layer device, compliant with PCI Express Specification v1.0a and v1.1, for use with PLDA PCI Express IP core	PC plug-in cards, embedded systems, ExpressCards	LFBGA81, lead-free	< 300 mW	Sampling
CBTU0808	PCI Express channel switch	Motherboards and notebooks	TFBGA-48, lead-free		Sampling

Power management

PMUs for mid-range cellular terminals

Product	DC/DC converter	Programmable power supplies	Charging current	ECO mode	USB charging	Charge pump	USIM interface	Serial interface	RTC	Battery-management functions	Display support	(Audio) peripherals	Package (dimensions)
PCF50611	500 mA	11	850 mA	•	•	75 mA	1.8/3 V	I²C-bus	32 kHz	Integrated battery charger, battery voltage supervisor, backup battery charger	Backlight dimming in 256 steps	3 PWM/LED drivers, 2 accessory-recognition pins, microphone bias supply	HVQFN52 (6 x 6 mm)
PCF50613	500 mA	14	850 mA	•	•		1.8/3 V	I²C-bus	32 kHz	Integrated battery charger, battery voltage supervisor, backup battery charger	Backlight dimming in 256 steps	3 PWM/LED drivers, 2 accessory-recognition pins, microphone bias supply	HVQFN52 (6 x 6 mm)

PMUs for high-end cellular terminals

Product	DC/DC converters	LDOs	I/O	Serial interface	Battery-management functions	Display support	(Audio) peripherals	Package (dimensions)
PCF50626	2 x step-down (900 and 600 mA) 1 x step-up (300 mA) or step-down (600 mA) 1 x step-up (25 mA) for up to 5 white LEDs	2 x 150-mA (1.2 – 3.0 V) for voltage regulation 2 x 100-mA (1.2 – 3.0 V) for voltage regulation 8 x 150-mA (1.2 – 3.3 V) for general purposes 1 x 250-mA (2.6 – 3.2 V) for high-current regulator 1 x 150-mA (1.2 – 3.3 V) for I/O pads 1 x 70-mA (1.8 or 3.0 V) for USIM card 1 x 50-mA (1.2 – 3.3 V) for USB controller 1 x 5-mA (0.6 – 2.9 V) for low-current regulator	8 GPIO 4 GPO	I²C-bus	Integrated battery charger up to 1A, battery voltage supervisor, backup battery charger	LED booster with manual and automatic backlight-controlled dimming, resistive touchscreen interface	3 PWM/LED drivers, 2 accessory-recognition pins, microphone bias supply	HVQFN112 (7 x 7 mm)

PMUs for portable media players and portable navigation devices

Product	DC/DC converters	LED boost converter	LDOs	GPIO	USB charging	Serial interface	ADC	Battery-management functions	Display support	Integrated audio codec	Package (dimensions)
PCF50633	2 x step-down (up to 500 mA) 1 x up/down (up to 1.1 A)	1 (up to 20 V)	4 x 50-mA (1.3 – 3.6 V) 2 x 150-mA (1.3 – 3.6 V) 1 x 200-mA (1.3 – 3.6 V)	Up to 4	•	I²C-bus	10-bit	Battery charge-and-play (1 A), backup battery charging	LED booster with ambient light-controlled dimming		HVQFN68 (8 x 8 mm)
PCF50634	2 x step-down (up to 500 mA) 1 x up/down (up to 1.1 A)	1 (up to 20 V)	4 x 50-mA (1.3 – 3.6 V) 2 x 150-mA (1.3 – 3.6 V) 1 x 200-mA (1.3 – 3.6 V)	Up to 4	•	I²C-bus	10-bit	Battery charge-and-play (1 A), backup battery charging, undervoltage lockout detectors	LED booster with ambient light-controlled dimming		HµQFN88 (6 x 6 mm)
PCF50636	2 x step-down (up to 500 mA) 1 x up/down (up to 1.1 A)	1 (up to 20 V)	4 x 50-mA (1.3 – 3.6 V) 2 x 150-mA (1.3 – 3.6 V) 1 x 200-mA (1.3 – 3.6 V)	Up to 4	•	I²C-bus	10-bit	Battery charge-and-play (1 A), backup battery charging	LED booster with ambient light-controlled dimming	11 mW during playback, SNR 98 dB	HVQFN112 (7 x 7 mm)

Power management

µTrenchMOS in SOT-23

Product	max V_{DS} (V)	$R_{DS(ON)}$ @ V_{GS} =			
		10 V typ (mΩ)	4.5 V typ (mΩ)	2.5 V typ (mΩ)	1.8 V typ (mΩ)
PMV213SN	100	213			
PMV117EN	30	75	115		
PMV60EN	30	47	60		
PMV45EN	30	35	45		
PMV56XN	20		56	77	
PMV31XN	20		31	44	
PMV40UN	30		40	45	55
PMV30UN	20		30	36	44

µTrenchMOS in TSOP-6

Product	max V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)				V_{GS}	I_D max
		V_{GS} = 10 V	V_{GS} = 4.5 V	V_{GS} = 2.5 V	V_{GS} = 1.8 V		
PMN34UN	30		38	45	54	8	4.9
PMN45EN	30	32	42			20	5.2
PMN40LN	30	32	40			15	5.4
PMN55LN	20	55	70			15	4.1
PMN34LN	20	28	34			15	5.7
PMN23UN	20		23	28	36.4	8	6.4
PMN27UN	20		27	32	39	8	5.7
PMN28UN	12		28	32	39	8	5.7

LFPAK MOSFETs

Product	V_{DS} (V)	Max R_{DS}(on) mΩ			Qgd (nC)
		V_{GS} = 10 V	V_{GS} = 4.5 V	V_{GS} = 2.5 V	
PH2520U	20		2.7	3.9	18
PH3120L	20	2.65	3.7		13
PH2925U	25		3	4.2	20
PH2525L	25	2.5	3.9		6.8
PH4025L	25	4	6.2		5
PH5525L	25	5.5	8.2		3.3
PH9025L	25	9	13		2.7
PH3330L	30	3.3	4.5		6.9
PH4530L	30	5.7	7.2		6.5
PH4830L	30	4.8	7		5.4
PH8030L	30	5.9	9.7		3.1
PH9930L	30	9.9	13.5		3.2
PH4840S	40	4.1	4.8 (@ 7 V)		16
PH955L	55	8.3	9.9		16
PH1955L	55	17.3	21		8
PH3855L	55	36	45		5.5
PH1875L	75	16.5	20		15
PH3075L	75	28.0	34		9
PH3475S	75	34			8.6
PH20100S	100	23			8.9

µTrenchMOS in SOT883

Product	Package	Description	Max V_{DS} (V)	Max V_{GS} (V)	Max I_D (A)		Max P_D (W)	Typical RDSon (mΩ)				Typical Qg nC	Qgd nC	Ciss pF
					25 °C	100 °C		10 V	4.5 V	2.5 V	1.8 V			
PMZ250UN	SOT883	Single N	20	8	1.6	1	1.25		250	320	420	0.89	0.18	45
PMZ270XN	SOT883	Single N	20	12	1.26	0.8	1.25		270	340		0.89	0.18	45
PMZ350XN	SOT883	Single N	30	12	0.85	0.55	1.25		350	570		0.65	0.16	37
PMZ390UN	SOT883	Single N	30	8	1.04	0.65	1.25		390	460	550	0.89	0.2	43
PMZ760SN	SOT883	Single N	60	20	1.03	0.65	1.25	760	1100			1.05	0.22	23

Power management

40-V-range MOSFETs

$R_{DS\,(on)}$ (mΩ) V_{GS} = 10 V	TO220	D²PAK
2.8	PHP222NQ04LT	PHB222NQ04LT
3.1	PHP225NQ04T	PHB225NQ04T
4.0	PHP174NQ04LT	PHB174NQ04LT
4.3	PHP176NQ04T	PHB176NQ04T
5.0	PHP129NQ04LT	PHB129NQ04LT
5.2	PHP143NQ04T	PHB143NQ04T
7.0	PHP95NQ04LT	PHB95NQ04LT
8.0	PHP101NQ04T	PHB101NQ04T

55-V-range MOSFETs

$R_{DS\,(on)}$ (mΩ) V_{GS} = 10 V	TO220	D²PAK
3.7	PHP191NQ06LT	PHB191NQ06LT
4.0	PHP193NQ06T	PHB193NQ06T
5.4		PHB146NQ06LT
6.0		PHB145NQ06T
7.0	PHP110NQ06LT	PHB110NQ06LT
7.1	PHP119NQ06T	PHB119NQ06T

75-V-range MOSFETs

$R_{DS\,(on)}$ (mΩ) V_{GS} = 10 V	TO220	D²PAK
5.0	PSMN005-75P	PSMN005-75B
5.6	PHP160NQ08T	PHB160NQ08T
5.5	PHP153NQ08LT	PHB153NQ08LT
8.5	PHP110NQ08LT	PHB110NQ08LT
9.0	PHP110NQ08T	PHB110NQ08T

100-V-range MOSFETs

$R_{DS\,(on)}$ (mΩ) V_{GS} = 10 V	TO220	D²PAK
8.8	PSMN009-100P	PSMN009-100B
15.0	PSMN015-100P	PSMN015-100B

Intelligent power

Product	V_{in}/V_{out} min	V_{in}/V_{out} max	I_O (A)	I_O m (A)	V_{in}/V_{out} @ 25 A (mV)	t off (ns)	Package
PIP401	1.3	12	75	400	60	400	SOT427

Product	V_{in} (V)	V_{out} (V)	$f_{in\,(typical)}$ (kHz)	$I_{O(avg)}$ (A)	System efficiency 15A (%)	Package(s)
PIP212-12M	5 – 16	0.8 – 6	500	35	90	HVQFN56 8 x 8 MLF
PIP213-12M	5 – 16	0.8 – 6	500	25	88	HVQFN56

Power management

Switched-mode power supply (SMPS) ICs for high-power systems

Product	Description	Package(s)	Intended applications	Standby power	High-voltage startup source	0% duty cycle/ cycle skipping	Overvoltage protection	Valley switching
TEA1506	TV flyback SMPS IC	SOT97-1 (DIP8)	CRT TV, monitor	< 3 W		•	•	•
TEA1507	TV flyback SMPS IC	SOT97-1 (DIP8)	CRT TV, monitor	< 1 W	•		•	•
TEA1530	Consumer SMPS IC	SOT96-1 (SO8)	LCD monitor, printer, and set-top-box adapters/ chargers	< 0.5 W	•	•		
TEA1532	Consumer SMPS IC	SOT96-1 (SO8)	Consumer equipment: printer, fax, set-top-box, LCD TV, monitor	< 0.5 W	•	•		• (DCM mode)
TEA1533	Consumer SMPS IC	SOT97-1 (DIP8) SO108-1 (SO14)	Consumer equipment: printer, fax, set-top-box, LCD TV, monitor	< 1 W	•	•	•	•
TEA1552	Laptop and notebook adapter SMPS IC	SOT108-1 (SO14)	(Notebook) adapter	< 0.5 W	•	•	•	•
TEA1553	Consumer SMPS IC	SOT109-1 (SO16)	Power supply solutions to 250 W (consumer equipment: notebook adapters, chargers)	< 1 W	•	•	•	•
TEA1750	Combined PFC and flyback SMPS IC	SOT109-1 (SO16)	Power supply solutions to 75 W (consumer equipment: notebook adapters, LCD TV)	< 0.35 W	•	•	•	•
TEA1611	Zero-voltage-switching resonant converter controller	SOT163 (SO20)	LCD TV	n/a	•	n/a	•	n/a

Switched-mode power supply (SMPS) ICs for synchronous rectification

Product	Description	Package	Intended applications	High-drive output voltage	Wide V_{CC} range	Accurate internal voltage reference	Reference output
TEA1761	Synchronous Rectifier (SR) SMPS IC	SOT96-1 (SO8)	Adapters, LCD TV	•	•	•	
TEA1762	Synchronous Rectifier (SR) SMPS IC	SOT108-1 (SO14)	Adapters, LCD TV	•	•	•	•

Display power management

Product	Description	Package	Type of light	Power topology	Supply voltage (V)	Intended applications
UBA2070	600-V CCFL ballast driver IC	SOT38-1 (DIP16) SOT109-1 (SO16)	CCFL/ EEFL	Half-bridge	600	MV/HV (LIPS)
UBA2072	Full-bridge control IC for CCFL backlighting	SOT136-1 (SO28) SOT341 (SSOP28)	CCFL/ EEFL	Full-bridge	9 – 30	Larger LCD monitors and LCD TVs
UBA2074	High-voltage, full-bridge control IC for CCFL backlighting	SOT136-1 (SO28) SOT341 (SSOP28)	CCFL/ EEFL	Full-bridge	9 – 550	MV/HV (LIPS)

LOGIC

Logic cross-reference

Logic competitive cross-reference

Family	Package	NXP	Texas Instrument	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
CMOS							
HEF4000B	DIP	HEF4xxxP	CD4xxxE(E4)	CD4xxxCN	MC14xxxCP	TC4xxxBP	HCF4xxxEY
	SOIC	HEF4xxxT	CD4xxxM(96/96E4/E4)	CD4xxxC(W)M(X)	MC14xxxD	TC4xxxBFN	HCF4xxxM1/M013TR
	SSOP I						
	SSOP II	HEF4xxxTS			MC14xxxCP		
	TSSOP	HEF4xxxTT	CD4xxxPW(E4/R/RE4)	CD4xxxCMTC(X)	MC14xxxDT	TC4xxxBFT	
HC(T) T = TTL	DIP	74HC(T)xxxN	SN74HC(T)xxxN CD74HC(T)xxxE(E4)	MM74HC(T)xxxN	MC74HC(T)xxxN	TC74HC(T)xxxAP	M74HCxxxB1R
	SOIC	SOIC 74HC(T)xxxD	SN74HC(T)xxxD(W)(E4/G4/R/RE4/RG4/T/TE4) CD/74HC(T)xxxM(96/96E4/E4/T/TE)	MM74HC(T)xxx(W)M(X)	MC74HC(T)xxxD(W)	TC74HC(T)xxxAFN/W	M74HCxxxM1R/RM13TR
	SSOP II	SSOP II 74HC(T)xxxDB					
	TSSOP	TSSOP 74HC(T)xxxPW	CD/SN74HC(T)xxxPW(E4/R/RE4/T/TE4)	MM74HC(T)xxxMTC(X)	MC74HC(T)xxxDT	TC74HCxxxAFT	M74HCxxxTTR
	DQFN	DQFN 74HC(T)xxxBQ		MM74HC(T)xxxBQ			
AHC(T) T = TTL	SOIC	SOIC 74AHC(T)xxxD	SN74AHC(T)xxxD(W)(E4/R/RE4)	74VHCxxx(W)M(X)	MC74VHC(T)xxxD(W)	TC74VHC(T)xxx(A)FN/W	74VHC(T)xxxMTR
	TSSOP	TSSOP 74AHC(T)xxxPW	SN74AHC(T)xxxPW(E4/LE/R/RE4)	74VHCxxxMTC(X)	MC74VHC(T)xxxDT	TC74VHC(T)xxx(A)FT	74VHC(T)xxxTTR
	DQFN	DQFN 74AHC(T)xxxBQ		74VHCxxxBQ(X)			
Low-voltage CMOS							
LVC(H) H = bus hold feature	SOIC	74LVC(H)xxxD(W)	SN74LVC(H)xxxD(W)(E4/R/RE4/G4/T/TE4)	74LCXxxx(W)M(X)	MC74LCXxxxD(W)	TC74LCXxxxFN/W	74LVCxxxMTR 74LCXxxxMTR
	SSOP II	74LVC(H)xxxDB	SN74LVC(H)xxxDB(R/RE4)	74LCXxxxMSA(X)			
	TSSOP I	74LVC(H)xxxPW	SN74LVC(H)xxxPW(E4/R/RE4/T/TE4)	74LCXxxxMTC(X)	MC74LCXxxxDT	TC74LCXxxxFT	74LVCxxxTTR 74LCXxxxTTR
	DQFN	74LVC(H)xxxBQ		74LCXxxxBQ			
	SSOP II	74LVC(H)16xxxDL	SN74LVC(H)xxxDL(G4/R/RG4)	74LCX16xxxMEA(X)			
	TSSOP II	74LVC(H)16xxxDGG	SN74LVC(H)xxxDGGR(E4)	74LCX16xxxMTD(X)	MC74LCX16xxxDT	TC74LCX16xxxFT	74LVC(Z)16xxxTTR/ 74LCX(H)16xxxTTR
	LFBGA	74LVC(H)32xxxEC	SN74LVC(H)32xxxGKER				
	VFBGA	74LVC(H)32xxxEV	SN74LVC(H)32xxxGQL				
ALVC(H) H = bus hold feature	SOIC	74ALVCxxxD	SN74ALVCxxxD(W)(E4/R/RE4/W/WR/WRE4)	74VCXxxxM(X)			
	TSSOP	74ALVCxxxPW	SN74ALVCxxxPW(E4/G4/LE/R/RE4/GG4)	74VCXxxxMTC(X)		TC74VCXxxxFT	
	DQFN	74ALVCxxxBQ		74VCXxxxBQX			
	TSSOP II	74ALVC(H)16xxxDGG	SN74ALVC(H)16xxxDGGR(G4)	74VCX16xxxMTD(X)		TC74VCX(H)(R)16xxxFT	74ALVCH16xxxTTR 74VCX(H)16xxxTTR
	LFBGA	74ALVC(H)32xxxEC	SN74ALVC(H)32xxxKR SN74ALVC(H)32xxxZKER				

Texas Instruments changes package suffix from D to DW when part is 20-28 pins

Continued next page

Logic cross-reference

Logic competitive cross-reference (continued)

Family	Package	NXP	Texas Instrument	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
Low-voltage CMOS (continued)							
LV series	SOIC	74LVxxxD	SN74LVxxxD(W)(E4/G4/R/RE4)	74LVXxxxM/WM	MC74LVXxxxD	TC74LVCxxxFN/W	
	SSOP II	74LVxxxDB	SN74LVxxxDBR(E4)	74LVXxxxMSA(X)		TC74LVCxxxFS	
	TSSOP I	74LVxxxPW	SN74LVxxxPW(E4/G4/LE/R/RE4/RG4/T/TE4)	74LVXxxxMTC(X)	MC74LVXxxxDT	TC74LVCxxxFT	
5-volt BiCMOS							
ABT(H) H = bus hold feature	DIP	74ABTxxxN	SN74ABTxxxN				
	SOIC	74ABTxxxD	SN74ABTxxxD(W)(E4/R/RE4)	74ABTxxxSC(X)			
	SSOP II	74ABTxxxDB	SN74ABTxxxDBR(G4)	74ABTxxxMSA(X)			
	TSSOP	74ABTxxxPW	SN74ABTxxxPW(E4/R)	74ABTxxxMTC(X)			
	SSOP III	74ABT(H)16xxxDL	SN74ABT(H)16xxxDL(G4/R)	74ABT16xxxSSC(X)			
	TSSOP II	74ABT(H)16xxxDGG	SN74ABT(H)16xxxDGGR(E4)	74ABT16xxxMTD(X)			
Low-voltage BiCMOS							
LVT series Built-in bus hold feature	SOIC	74LVTxxxD	SN74LVTHxxxD(W)(E4/R/RE4)	74LVTHxxxM/WM			
	SSOP II	74LVTxxxDB	SN74LVTHxxxDBR(E4/G4)	74LCTHxxxMSA(X)			
	TSSOP	74LVTxxxPW	SN74LVTHxxxPW(E4/R/RE4)	74LVTHxxxMTC(X)			
	DQFN	74LVTxxxBQ					
	SSOP III	74LVT16xxxDL	SN74LVTH16xxxDL(G4/R/RG4)	74LVTH16xxxMEA(X)			
	TSSOP II	74LVT16xxxDGG	SN74LVTH16xxxDGGR(E4)	74LVTH16xxxMTD(X)			
	VFBGA	74LVT16xxxEV	SN74LVTH16xxxGQLR				
	LFBGA	74LVT16xxxEC	SN74LVTH16xxxGKER SN74LVTH16xxxZKER				
ALVT series Built-in bus hold feature	SSOP II	74ALVT16xxxDL	SN74ALV16xxxDL(G4/R/RG4)				
	TSSOP II	74ALVT16xxxDGG	SN74ALV16xxxGR(E4)				
Bipolar							
FAST	FAST DIP	N74FxxxN	SN74FxxxN	74Fxxx(S)PC			
	SOIC	N74FxxxD	SN74FxxxD(W)(E4/G4/R/RE4/RG4)	74FxxxSC			
	SSOP II	N74FxxxDB	SN74FxxxDBR(E4)	74FxxxMSA(X)			

Texas Instruments changes package suffix from D to DW when part is 20-28 pins

Logic cross-reference

PicoGate and MicroPak competitive cross-reference

Package	NXP	Texas Instruments	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
HC series						
SOT353	74HC1GxxxGW		NC7SxxxP5X	MC74HC1GxxxDFT	TC7SxxxFU	74H1GxxxCTR
SOT753	74HC1GxxxGV		NC7SxxxM5X	MC74HC1GxxxDTT	TC7SxxxF	74H1GxxxSTR
SOT363	74HC2GxxxGW					
SOT457	74HC2GxxxGV					
SOT505-2	74HC2GxxxDP				TC7WxxxFU	
SOT765	74HC2GxxxDC					
SOT505-2	74HC3GxxxDP				TC7WxxxFU	
SOT765	74HC3GxxxDC					
HCT series						
SOT353	74HCT1GxxxGW		NC7STxxxP5X			
SOT753	74HCT1GxxxGV		NC7STxxxM5X			
SOT363	74HCT2GxxxGW					
SOT457	74HCT2GxxxGV					
SOT505-2	74HCT2GxxxDP				TC7WTxxxFU	
SOT765	74HCT2GxxxDC					
SOT505-2	74HCT3GxxxDP					
SOT765	74HCT3GxxxDC					
AHC series						
SOT353	74AHC1GxxxGW	SN74AHC1GxxxDCK		MC74VHC1GxxxDFT	TC7SHxxxFU	74V1GxxxCTR
SOT753	74AHC1GxxxGV	SN74AHC1GxxxDBV		MC74VHC1GxxxDTT	TC7SHxxxF	74V1GxxxSTR
SOT505-2	74AHC2GxxxDP				TC7WHxxxFU	74V2GxxxSTR
SOT765	74AHC2GxxxDC					
SOT505-2	74AHC3GxxxDP				TC7WHxxxFU	
SOT765	74AHC3GxxxDC					

Logic cross-reference

PicoGate and MicroPak competitive cross-reference (continued)

Package	NXP	Texas Instruments	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
AHCT series						
SOT353	74AHCT1GxxxGW	SN74AHCT1GxxxDCK		MC74VHC1GTxxxDFT	TC7SETxxxFU	74V1GTxxxCTR
SOT753	74AHCT1GxxxGV	SN74AHCT1GxxxDBV		MC74VHC1GTxxxDTT	TC7SETxxxF	74V1GTxxxSTR
SOT505-2	74AHCT2GxxxDP					
SOT765	74AHCT2GxxxDC					
SOT505-2	74AHCT3GxxxDP					
SOT765	74AHCT3GxxxDC					
LVC series						
SOT353	74LVC1GxxxGW	SN74LVC1GxxxDCK	NC7SZxxxP5X	NL17SZxxxDFT2(G)	TC7SZxxxFU	74LX1GxxxCTR
SOT753	74LVC1GxxxGV	SN74LVC1GxxxDBV	NC7SZxxxM5X		TC7SZxxxF	74LX1GxxxSTR
SOT886	74LVC1GxxxGM	SN74LVC1GxxxYZP	NC7SZxxxL6X			
SOT363	74LVC1GxxxGW	SN74LVC1GxxxDCK	NC7SZxxxP6X	NL17SZxxxDFT2(G)		
SOT457	74LVC1GxxxGV	SN74LVC1GxxxDBV				
SOT891	74LVC1GxxxGF					
SOT505-2	74LVC1GxxxDP	SN74LVC1GxxxDCT SN74LVC2GxxxDCT				
SOT765	74LVC1GxxxDC	SN74LVC1GxxxDCU SN74LVC2GxxxDCU	NC7SZxxxK8	NL17SZxxxUS		
SOT883	74LVC1GxxxGT	SN74LVC1GxxxYZP SN74LVC2GxxxYZP				
SOT902	74LVC1GxxxGM		NC7SZxxxL8			
SOT886	74LVC2GxxxGM	SN74LVC2GxxxYZP	NC7WZxxxL6			
SOT363	74LVC2GxxxGW	SN74LVC2GxxxDBV/DCK	NC7WZxxxP6	NL27SZxxxDFT		
SOT457	74LVC2GxxxGV	SN74LVC1GxxxDCT SN74LVC2GxxxDCT		NL27SZxxxDTT		
SOT891	74LVC2GxxxGF					
SOT505-2	74LVC2GxxxDP	SN74LVC2GxxxDCT			TC7WZxxxFU	

Logic cross-reference

PicoGate and MicroPak competitive cross-reference (continued)

Package	NXP	Texas Instruments	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
SOT765	74LVC2GxxxDC	SN74LVC2GxxxDCU	NC7SZxxxK8	NL27SZxxxUS		
SOT883	74LVC2GxxxGT	SN74LVC2GxxxYZP				
SOT902	74LVC2GxxxGM		NC7SZxxxL8			
SOT505-2	74LVC3GxxxDP	SN74LVC3GxxxDCT				
SOT765	74LVC3GxxxDC	SN74LVC3GxxxDCU	NC7NZxxxK8	NL37SZxxxUS		
SOT883	74LVC3GxxxGT	SN74LVC3GxxxYZP				
SOT902	74LVC3GxxxGM		NC7NZxxxL8			
AUP series						
SOT353	74AUP1GxxxGW	SN74AUP1GxxxDCK	NC7SPxxxP5		TC7SGxxxFU	
SOT886	74AUP1GxxxGM	SN74AUP1GxxxYZP	NC7SPxxxL6			
SOT363	74AUP1GxxxGW	SN74AUP1GxxxDCK	NC7SPxxxP6			
SOT891	74AUP1GxxxGF					
SOT765	74AUP1GxxxDC		NC7SPxxxK8			
SOT833	74AUP1GxxxGT					
SOT902	74AUP1GxxxGM		NC7WPxxxL8			
SOT886	74AUP2GxxxGM		NC7SPxxxL6			
SOT363	74AUP2GxxxGW		NC7WPxxxP6			
SOT891	74AUP2GxxxGF					
SOT765	74AUP2GxxxDC		NC7WPxxxK8		TC7WGxxxFK	
SOT833	74AUP2GxxxGT					
SOT902	74AUP2GxxxGM		NC7WPxxxL8			

Logic cross-reference

HEF4000 family
- All parts available in DIP and SO
- Compatible with CD4000
- Committed to supply well into the next decades
- Low power, low speed
- Power supply 3 to 15 V
- Easy to design

HC/T family
- All parts available in HC and HCT (TTL input)
- 74HCTxxx replaces LS-TTL (74LSxxx)
- Low power, high speed
- Power supply 2.0 to 6.0 V
- Analog switches 2.0 to 10 V
  - 74HC4051, 4052, 4053
  - 74HC4351, 4352, 4353
  - 74HC4066, 4067, 4316
- Phase-Locked-Loop (PLL) experts
  - 74HC4046A, 7046A 9046A
  - Free design software
  - Extensive application notes
- Available in 1-, 2-, and 3-gate functions

AHC/T family
- 4-ns propagation delays
- 2x faster than HCMOS
- Operation 2.0 to 5.0 V
- 16% less signal noise
- Low static power
- Full selection of functions available
- All parts available in SO and TSSOP
- Available in 1-, 2-, and 3-gate functions

PicoGate Logic families
- All parts available in HC/T, AHC/T, and LVC
- Low power, high speed
- Power supply 2.0 to 6.0 V HC/AHC
- Analog switches 2.0 to 10 V
  - 74HC1G66/74HCT1G66
- Extended temperature range (–40 to +125 °C)
- Great for ASIC repairs
- Ideal selection when space is a concern
- Multiple package options
- LVC PicoGate Logic operates up to 5.5 V

AVC family
- 1.0-ns performance
- Optimized for 2.5-V output
- -8/8-mA static output drive
- High dynamic drive
- 20-µA standby current
- V_{CC}: 1.2 to 3.3 V
- I/O tolerant to 3.6 V
- Live insertion
- Bus hold option

LVC family
- Low-voltage CMOS
- 74LVCxxx 3.3-V equivalent of FAST
- High speed, medium drive
- I/O tolerant to 5 V
- Direct interface with TTL levels
- Power supply 1.2 to 3.6 V
- PicoGate Logic to 5.5 V
- Live insertion
- Bus hold option
- Damping resistor option
- Many functions support partial power-down
- Analog switches 1.65 to 5.5 V

ALVC family
- Fastest CMOS-based family
- 2-ns propagation delays
- Power supply 1.2 to 3.6 V
- -24/24-mA drive capability
- 40-µA standby current
- Bus hold option
- Termination resistor option
- Bus interface functions
- Supports memory interfacing
- Frequently used in high-speed telecom applications

LV family
- 74LVxxx replaces 74HCxxx at V_{CC} = 3.3 V
- Low power, high speed
- Low EMI (radiation)
- Power supply 1.0 to 5.5 V
- Operates @ V_{CC} = 5 V
  - Speed 2x HCMOS
  - Drive 2x HCMOS
- Analog switches 1.0 to 6.0 V
  - At V_{CC} = 5 V R-ON 50% of HCMOS
  - 74LV4051, 4052, 4053
  - 74LV4066, 4067, 4316

ABT/ABT-16 5-V family
- 3-ns performance
- 32- to 64-mA drive
- 250-µA standby current
- Power supply 4.5 to 5.5 V
- Live insertion
- Power-up 3-state
- Bus hold option
- Termination resistor option

LVT/LVT-16 3-V family
- Power-up 3-state
- Clock speeds to 125 MHz
- High drive (64-mA) output drive
- Standard TTL functions and pin outs
- Operating range of -45 to 85 °C
- Live insertion
- Bus hold standard
- Termination resistor option
- Pin-compatible with existing ABT
- Mixed I/O compatible from 2.5 to 5 V
- Same as TI's LVTH
- 16/32-bit functions available

ALVT16 family
- World's fastest LVTTL logic
- 64-mA drive
- 2.3 to 3.6 V_{CC}
- Power up 3-state
- 250-MHz (min) clock speeds
- I/O capable of 5 V
- Same as TI's ALVTH family

FAST family
- More than 90 functions available
- Standard TTL functions and pinouts
- High-speed (3-ns) propagation delay
- Power supply 5 V ±10%

MICROCONTROLLERS

Microcontrollers

LPC3000 series

Product	Memory				Timers		Serial interfaces				ADC (10-bit) No. of channels	I/O pins	External bus interface	PLL	Max freq (MHz)	CPU voltage (V)	I/O voltage (V)	Temp range options	Package	Comments/special features
	FLASH	RAM	Instruction cache	Data cache	No. of timers	PWM channels	USB	UART	I²C-bus	SPI										
LPC3180		64 K	32 K	32 K	4	2	1	7	2	2	3	55	•	•	208	1.2	3/1.8	F	LFBGA320	90-nm process, NAND Flash, SDRAM/DDR (1.8V), (1) USB 2.0 FS OTG, VFP unit, and SD card

LH7A series

Product	Memory				Timers		Serial interfaces				ADC (10-bit) No. of channels	I/O pins	External bus interface	PLL	Max freq (MHz)	CPU voltage (V)	I/O voltage (V)	Temp range options	Package(s)	Comments/special features
	FLASH	RAM	Instruction cache	Data cache	No. of timers	PWM channels	USB	UART	I²C-bus	SPI										
LH7A400		80 K Frame buffer	8 K	8 K	5	0	1	3	0	1		60	•	•	245	1.8	3.3	F	BGA256 LFBGA256	Integrated LCD controller. IrDA. MMU. USB 2.0 FS device. 32-bit external data bus. CompactFlash. SDRAM controller. MMC, PCMCIA, BMI.
LH7A404		80 K Frame buffer	8 K	8 K	5	2	1	3	0	1	10	64	•	•	266	1.8	3.3	F	LFBGA324	Integrated LCD controller. IrDA touchscreen interface. Touchscreen controller. MMU. USB 2.0 FS host/device. 32-bit external data bus. CompactFlash. SDRAM controller. DMA controller. PCMCIA, BMI, PS/2, MMC/SD/SDIO.

LPC2000 and LH7 series

Product	Memory		Timers		Serial interfaces								Analog		SD/MMC	I/O pins	External bus interface	PLL	Max freq (MHz)	CPU voltage (V)	I/O voltage (V)	Temp range options	Package(s)	Comments/special features
	FLASH	RAM	No. of timers	PWM channels	Ethernet	USB	UART	I²C-bus	CAN	SPI	SSP	I²S	ADC (10-bit) No. of channels	DAC (10-bit) No. of channels										
LPC2900 devices																								
LPC2919	768 K	48 K	5	24			2		2	3			16			108	•	•	80	1.8	3.3	F	LQFP144	ARM968E-S MCU with 2 LIN master controllers, 16-KB I-TCM, 16-KB D-TCM
LPC2917	512 K	48 K	5	24			2		2	3			16			108	•	•	80	1.8	3.3	F	LQFP144	ARM968E-S MCU with 2 LIN master controllers, 16-KB I-TCM, 16-KB D-TCM
LPC2915	512 K	32 K	5	24			2		2	3			16			76		•	80	1.8	3.3	F	LQFP100	ARM968E-S MCU with 16-KB I-TCM, 16-KB D-TCM

Microcontrollers

LPC2000 and LH7 series (continued)

Product	FLASH	RAM	No. of timers	PWM channels	Ethernet	USB	UART	I²C-bus	CAN	SPI	SSP	I²S	ADC (10-bit) No. of channels	DAC (10-bit) No. of channels	SD/MMC	I/O pins	External bus interface	PLL	Max freq (MHz)	CPU voltage (V)	I/O voltage (V)	Temp range options	Package(s)	Comments/special features
LPC2800 devices																								
LPC2888	1M	64 K	4			1[1]	1[2]	1				1	5		•	85	•	•	60	1.8	3.3	F	TBGA180	[1] USB 2.0 high speed; [2] IrDA configurable; LCD interface logic
LPC2880		64 K	4			1[1]	1[2]	1				1	5		•	85	•	•	60	1.8	3.3	F	TBGA180	LPC2880 is the ROMless version of the LPC2888
LPC2400 devices																								
LPC2478	512 K	98 K	6	12[1]	1	1[2]	4[3]	3	2	1	2	1	8	1	•	160	•[4]	•	72	3.3		F	LQFP208 TFBGA208	LPC2468 with QVGA LCD controller
LPC2470		98 K	6	12[1]	1	1[2]	4[3]	3	2	1	2	1	8	1	•	160	•[4]	•	72	3.3		F	LQFP208 TFBGA208	LPC2468 with QVGA LCD controller
LPC2468	512 K	98 K	6	12[1]	1	1[2]	4[3]	3	2	1	2	1	8	1	•	160	•[4]	•	72	3.3		F	LQFP208 TFBGA208	On-chip 4-MHz RC-Osc, GP DMA, RTC with 2-K batt. RAM [1] 2 PWM blocks; [2] USB 2.0 FS host/OTG/device, DMA and 4-K RAM; [3] UART 3 with IrDA; [4] 32-bit ext. bus
LH7 devices																								
LH75401		32 K	5	3			3			1	1	1	8			76	•	•	84	1.8	3.3	F	LQFP144	Color LCD controller. Touchscreen interface. DMA controller. 5-V-tolerant I/O. 16-bit external data bus.
LH75411		32 K	5	3			3			1	1		8			76	•	•	84	1.8	3.3	F	LQFP144	Color LCD controller. Touchscreen interface. DMA controller. 5-V-tolerant I/O. 16-bit external data bus.
LH79520		32 K + 8 K cache	6	2			3			1	1					64	•	•	77	1.8	3.3	F	LQFP176	ARM720T MCU with color LCD controller. IrDA. SDRAM controller. MMU. 32-bit external data bus.
LH79524		16 K + 8 K cache	5	3	1	1	3	1		1	1	1	10			104	•	•	76	1.8	3.3	F	LFBGA208	ARM720T MCU with color LCD controller. Touchscreen interface. USB 2.0 device. IrDA. SDRAM controller. MMU. DMA. NAND Flash boot. 32-bit external data bus.
LH79525		16 K + 8 K cache	5	3	1	1	3	1		1	1	1	10			86	•	•	76	1.8	3.3	F	LQFP176	ARM720T MCU with color LCD controller. Touchscreen interface. USB 2.0 device. IrDA. SDRAM controller. MMU. DMA. NAND Flash boot. 16-bit external data bus.
LPC2300 devices																								
LPC2378	512 K	58 K	6	6	1	1[1]	4[2]	3	2	1	2	1	8	1	•	104	•[3]	•	72	3.3		F	LQFP144	On-chip 4-MHz RC oscillator, GP DMA, RTC with 2-K batt. RAM [1] USB 2.0 FS device with PHY, DMA and 4-K RAM; [2] UART 3 with IrDA; [3] MiniBus (8-bit)
LPC2368	512 K	58 K	6	6	1	1[1]	4[2]	3	2	1	2	1	6	1	•	70		•	72	3.3		F	LQFP100	100-pin version of LPC2378, no external bus
LPC2366	256 K	58 K	6	6	1	1[1]	4[2]	3	2	1	2	1	6	1		70		•	72	3.3		F	LQFP100	256-K Flash version of LPC2368, no SD/MMC
LPC2364	128 K	34 K	6	6	1	1[1]	4[2]	3	2	1	2	1	6	1		70		•	72	3.3		F	LQFP100	128-K Flash/34-K RAM version of LPC2368, no SD/MMC

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LPC2000 and LH7 series (continued)

Product	Memory		Timers		Serial interfaces								Analog		SD/MMC	I/O pins	External bus interface	PLL	Max freq (MHz)	CPU voltage (V)	I/O voltage (V)	Temp range options	Package(s)	Comments/special features
	FLASH	RAM	No. of timers	PWM channels	Ethernet	USB	UART	I²C-bus	CAN	SPI	SSP	I²S	ADC (10-bit) No. of channels	DAC (10-bit) No. of channels										
LPC2200 devices																								
LPC2294/01	256 K	16 K	5	6			2	1	4	2			8			112	•	•	60	1.8	3.3	H	LQFP144	LPC2214/01 upgrade with 4x CAN
LPC2292/01	256 K	16 K	5	6			2	1	2	2			8			112	•	•	60	1.8	3.3	F	LQFP144, TFBGA144	LPC2214/01 upgrade with 2x CAN
LPC2290/01		64 K	5	6			2	1	2	2			8			76	•	•	60	1.8	3.3	F	LQFP144	ROMless version of LPC2292/01
LPC2220		64 K	5	6			2	1		2			8			76	•	•	75	1.8	3.3	F	LQFP144, TFBGA144	64-K RAM version of LPC2210/01
LPC2214/01	256 K	16 K	5	6			2	1		2			8			112	•	•	60	1.8	3.3	F	LQFP144	External Bus, 4 Chip Selects, 10-bit SA ADC, 256-K Flash
LPC2212/01	128 K	16 K	5	6			2	1		2			8			112	•	•	60	1.8	3.3	F	LQFP144	128-K Flash version of LPC2214/01
LPC2210/01		16 K	5	6			2	1		2			8			76	•	•	60	1.8	3.3	F	LQFP144	ROMless version of LPC2214/01
LPC2100 devices																								
LPC2194/01	256 K	16 K	5	6			2	1	4	2			4			46		•	60	1.8	3.3	H	LQFP64	LPC2124/01 upgrade with 4x CAN
LPC2158	512 K	40 K	5	6		1	2	1		1	1		8+6	1		32		•	60		3.3	F	LQFP64	LPC2148 with 32 x 4 LCD driver
LPC2157	512 K	32 K	5	6			2	1		1	1		2x8	1		32		•	60		3.3	F	LQFP64, HVQFN64	LPC2138/01 with 32 x 4 LCD driver
LPC2148	512 K	40 K	5	6		1	2	2		1	1		8+6	1		45		•	60		3.3	F	LQFP64	LPC2138 plus USB 2.0 FS
LPC2146	256 K	40 K	5	6		1	2	2		1	1		8+6	1		45		•	60		3.3	F	LQFP64	LPC2136 plus USB 2.0 FS
LPC2144	128 K	16 K	5	6		1	2	2		1	1		8+6	1		45		•	60		3.3	F	LQFP64	LPC2134 plus USB 2.0 FS
LPC2142	64 K	16 K	5	6		1	2	2		1	1		6	1		45		•	60		3.3	F	LQFP64	LPC2132 plus USB 2.0 FS
LPC2141	32 K	8 K	5	6		1	2	2		1	1		6			45		•	60		3.3	F	LQFP64	LPC2131 plus USB 2.0 FS
LPC2138/01	512 K	32 K	5	6			2	2		1	1		2x8	1		47		•	60		3.3	F	LQFP64, HVQFN64	Dual 8-ch. 10-bit ADC, BOD, POR, 32-kHz XTAL input, VBAT, Fast I/O
LPC2136/01	256 K	32 K	5	6			2	2		1	1		2x8	1		47		•	60		3.3	F	LQFP64	256-K Flash version of LPC2138/01
LPC2134/01	128 K	16 K	5	6			2	2		1	1		2x8	1		47		•	60		3.3	F	LQFP64	128-K Flash, 16-K RAM version of LPC2138/01
LPC2132/01	64 K	16 K	5	6			2	2		1	1		8	1		47		•	60		3.3	F	LQFP64, HVQFN64	64-K Flash, 16-K RAM version of LPC2138/01
LPC2131/01	32 K	8 K	5	6			2	2		1	1		8			47		•	60		3.3	F	LQFP64	32-K Flash, 8-K RAM version of LPC2138/01
LPC2129/01	256 K	16 K	5	6			2	1	2	2			4			46		•	60	1.8	3.3	F	LQFP64	LPC2124/01 upgrade with 2x CAN

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Microcontrollers

LPC2000 and LH7 series (continued)

Product	Memory		Timers		Serial interfaces								Analog		SD/MMC	I/O pins	External bus interface	PLL	Max freq (MHz)	CPU voltage (V)	I/O voltage (V)	Temp range options	Package(s)	Comments/special features
	FLASH	RAM	No. of timers	PWM channels	Ethernet	USB	UART	I²C-bus	CAN	SPI	SSP	I²S	ADC (10-bit) No. of channels	DAC (10-bit) No. of channels										
LPC2119/01	128 K	16 K	5	6			2	1	2	2			4			46	•		60	1.8	3.3	F	LQFP64	LPC2114/01 upgrade with 2x CAN
LPC2109/01	64 K	8 K	5	6			2	1	1	2			4			46	•		60	1.8	3.3	F	LQFP64	LPC2119/01 with 64-KB Flash, 8-KB RAM, and 1x CAN
LPC2124/01	256 K	16 K	5	6			2	1		2			4			46	•		60	1.8	3.3	F	LQFP64	10-bit SA ADC, 2x SPI and 256-K Flash
LPC2114/01	128 K	16 K	5	6			2	1		2			4			46	•		60	1.8	3.3	F	LQFP64	128-K Flash version of the LPC2124/01
LPC2106/01	128 K	64 K	5	6			2	1		1						32	•		60	1.8	3.3	B, F	LQFP48	64-K RAM, 128-K Flash
LPC2105/01	128 K	32 K	5	6			2	1		1						32	•		60	1.8	3.3	B	LQFP48	32-K RAM version of LPC2106
LPC2104/01	128 K	16 K	5	6			2	1		1						32	•		60	1.8	3.3	B	LQFP48	16-K RAM version of LPC2106
LPC2103/01	32 K	8 K	6	14			2	2		1	1		8			32	•		70	1.8	3.3	F	LQFP48	Lowest cost, lowest power, ADC
LPC2102/01	16 K	4 K	6	14			2	2		1	1		8			32	•		70	1.8	3.3	F	LQFP48	16-K Flash, 4-K RAM version of LPC2103
LPC2101/01	8 K	2 K	6	14			2	2		1	1		8			32	•		70	1.8	3.3	F	LQFP48	8-K Flash, 2-K RAM version of LPC2103

LPC900 series

Product	Memory			Timers			Serial interfaces			Analog			I/O pins	Frequency range (MHz) at 3 V	Temp range options	Package(s)	Comments/special features
	FLASH/EEPROM (program/data)	EEPROM (data)	RAM	No. of timers	PWM	RTC/system timer/WD	UART	I²C-bus	SPI	ADC channels resolution	DAC channels resolution	Comparators					
LPC95x devices																	
P89LPC954	16 K		512 B	4	2 ch	1	2	1	1	8/10b		2	40	0 – 18	F	PLCC44, LQFP44	LPC952 with 16-KB Flash
P89LPC952	8 K		512 B	4	2 ch	1	2	1	1	8/10b		2	40	0 – 18	F	PLCC44, LQFP44	LPC900 in 44/48-pin package; 2 UARTs; 2-wire debug interface
LPC940x devices																	
P89LPC9408	8 K	512 B	768 B	5	CCU	1	1	1	1	8/10b		2	23	0 – 18	F	LQFP64	LPC938 with integrated PCF8576D universal LCD driver
P89LPC9401	8 K		256 B	4	2 ch	1	1	1	1			2	23	0 – 18	F	LQFP64	LPC931 with integrated PCF8576D universal LCD driver

LPC900 series (continued)

Product	Memory			Timers			Serial interfaces			Analog							
	FLASH/EEPROM (program/data)	EEPROM (data)	RAM	No. of timers	PWM	RTC/system timer/WD	UART	I²C-bus	SPI	ADC channels resolution	DAC channels resolution	Comparators	I/O pins	Frequency range (MHz) at 3 V	Temp range options	Package(s)	Comments/special features
LPC93x devices																	
P89LPC938	8 K	512 B	768 B	5	CCU	1	1	1	1	8/10b		2	26	0 – 18	F	TSSOP28, HVQFN28, PLCC28	LPC935 with 10-bit ADC
P89LPC936	16 K	512 B	768 B	5	CCU	1	1	1	1	2x4/8b	2x8b	2	26	0 – 18	F	TSSOP28	LPC935 with 16-K Flash
P89LPC935	8 K	512 B	768 B	5	CCU	1	1	1	1	2x4/8b	2x8b	2	26	0 – 18	F	TSSOP28, PLCC28, HVQFN28	LPC932A1 + two 4-ch 8-bit ADCs/two 8-bit DACs
P89LPC934	8 K		256 B	4	2 ch	1	1	1	1	4/8b	2x8b	2	26	0 – 18	F	TSSOP28	LPC930/931 + 4-ch 8-bit ADC/two 8-bit DACs
P89LPC933	4 K		256 B	4	2 ch	1	1	1	1	4/8b	2x8b	2	26	0 – 18	F	TSSOP28	LPC930/931 + 4-ch 8-bit ADC/two 8-bit DACs
P89LPC932A1	8 K	512 B	768 B	5	CCU	1	1	1	1			2	26	0 – 18	F	TSSOP28, PLCC28, HVQFN28	LPC935 with ADCs and DACs
P89LPC9311	8 K		256 B	4	2 ch	1	1	1	1			2	26	0 – 18	F	TSSOP28	LPC931 with 8 high-drive pins (20 mA)
P89LPC931	8 K		256 B	4	2 ch	1	1	1	1			2	26	0 – 18	F	TSSOP28	4-K/8-K Flash versions of LPC932A1 without EEPROM, CCU, and XRAM
P89LPC930	4 K		256 B	4	2 ch	1	1	1	1			2	26	0 – 18	F	TSSOP28	4-K/8-K Flash versions of LPC932A1 without EEPROM, CCU, and XRAM
LPC92x devices																	
P89LPC925	8 K		256 B	4	2 ch	1	1	1		4/8b	1/8b	2	18	0 – 18	F	TSSOP20	LPC921/922 + 4-ch 8-bit ADC/8-bit DAC; runs up to 18 MHz
P89LPC924	4 K		256 B	4	2 ch	1	1	1		4/8b	1/8b	2	18	0 – 18	F	TSSOP20	LPC921/922 + 4-ch 8-bit ADC/8-bit DAC; runs up to 18 MHz
P89LPC9221	8 K		256 B	4	2 ch	1	1	1				2	18	0 – 18	F	TSSOP20, DIP20	LPC922 with 8 high-drive pins (20 mA)
P89LPC922	8 K		256 B	4	2 ch	1	1	1				2	18	0 – 18	F	TSSOP20, DIP20	20-pin versions of LPC930/931 without SPI; LPC76x pin-compatible upgrade
P89LPC921	4 K		256 B	4	2 ch	1	1	1				2	18	0 – 18	F	TSSOP20	20-pin versions of LPC930/931 without SPI; LPC76x pin-compatible upgrade
P89LPC920	2 K		256 B	4	2 ch	1	1	1				2	18	0 – 18	F	TSSOP20	2-K Flash version of 921/922
LPC91x devices																	
P89LPC917	2 K		256 B	4	2 ch	1	1	1		4/8b	1/8b	2	14	0 – 18	F	TSSOP16	4-ch 8-bit ADC/8-bit DAC; 2 serial channels; 2-ch 8-bit PWM
P89LPC916	2 K		256 B	4	1 ch	1	1	1	1	4/8b	1/8b	2	14	0 – 18	F	TSSOP16	4-ch 8-bit ADC/8-bit DAC; 3 serial channels; 1-ch 8-bit PWM
P89LPC915	2 K		256 B	4	1 ch	1	1	1		4/8b	1/8b	2	12	0 – 18	F, H	TSSOP14, DIP14	4-ch 8-bit ADC/8-bit DAC; 2 serial channels; 1-ch 8-bit PWM
P89LPC914	1 K		128 B	4	1 ch	1	1		1			2	12	0 – IRC	F	TSSOP14	1-ch 8-bit PWM; UART; SPI; 12 I/O pins

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Microcontrollers

LPC900 series (continued)

Product	Memory			Timers			Serial interfaces			Analog			I/O pins	Frequency range (MHz) at 3 V	Temp range options	Package(s)	Comments/special features
	FLASH/EEPROM (program/data)	EEPROM (data)	RAM	No. of timers	PWM	RTC/system timer/WD	UART	I²C-bus	SPI	ADC channels resolution	DAC channels resolution	Comparators					
P89LPC913	1 K		128 B	4		1	1		1			2	12	0 – 18	F	TSSOP14	UART; SPI; 12 I/O pins; external crystal pins
P89LPC912	1 K		128 B	4	1 ch	1			1			2	12	0 – 18	F	TSSOP14	1-ch 8-bit PWM; SPI; 12 I/O pins; external crystal pins
LPC910x devices																	
P89LPC9107	1 K		128 B	4	2 ch	1	1			4/8b	1/8b	1	10	0 – 18	F	TSSOP14, DIP14	Clock doubler for internal RC oscillator
P89LPC9103	1 K		128 B	4		1	1			4/8b	1/8b	1	8	0 – 18	F	HVSON10	Smallest available package 3 x 3 mm
P89LPC9102	1 K		128 B	4	2 ch	1				4/8b	1/8b	1	8	0 – 18	F	HVSON10	Smallest available package 3 x 3 mm
LPC90x devices																	
P89LPC908	1 K		128 B	4		1	1					1	6	0 – IRC	F	SO8	UART; 6 I/O pins
P89LPC907	1 K		128 B	4		1	1[1]					1	6	0 – IRC	F	SO8	UART ([1] Transmit function only); 6 I/O pins
P89LPC906	1 K		128 B	4	1 ch	1						1	6	0 – 18	F	SO8	1-ch 8-bit PWM; 6 I/O pins; external crystal pins
P89LPC903	1 K		128 B	4		1	1					2	6	0 – IRC	F	SO8	Industry-standard pinout; 6 I/O pins; 2 analog comparators; UART
P89LPC902	1 K		128 B	4		1						2	6	0 – IRC	F	SO8, DIP8	Industry-standard pinout; 6 I/O pins; 2 analog comparators. 5 external interrupt inputs
P89LPC901	1 K		128 B	4	1 ch	1						1	6	0 – 18	F	SO8, DIP8	Industry-standard pinout; 6 I/O pins; 1-ch 8-bit PWM; external crystal pins

LPC700 series

Product	Memory			Timers			Serial interfaces		Analog		I/O pins	Max freq (MHz)	Temp range options	Package(s)	Comments/special features
	OTP/ROM	RAM	ICP/PP	No. of timers	PWM	WD	UART	I²C-bus	ADC ch./bits	Comparators					
LPC76x/LPC77x devices															
P87LPC779	8 K	128 B	ICP	2		•	1	1 (bit)	4/8	2	18	20	F	TSSOP20	LPC769 upgrade with 8-K OTP; additional 128 B of RAM not supported by emulators
P87LPC778	8 K	128 B	ICP	2	•	•	1	1 (bit)	4/8	2	18	20	F	TSSOP20	LPC768 upgrade with 8-K OTP; additional 128 B of RAM not supported by emulators
P87LPC769	4 K	128 B	ICP	2		•	1	1 (bit)	4/8	2	18	20	H	SO20	2 AC, BOD, POR, 8 KBIs, IRC (6 MHz ± 25%), 4-ch 8-bit ADC, 2-ch 8-bit DAC
P87LPC768	4 K	128 B	ICP	2	•	•	1	1 (bit)	4/8	2	18	20	B, F	DIP20, SO20	2 AC, BOD, POR, 8 KBIs, IRC (6 MHz ± 25%), 4-ch 8-bit ADC, PWM
P87LPC767	4 K	128 B	ICP	2		•	1	1 (bit)	4/8	2	18	20	B, F	DIP20, SO20	2 AC, BOD, POR, 8 KBIs, IRC (6 MHz ± 25%), 4-ch 8-bit ADC
P87LPC764	4 K	128 B	ICP	2		•	1	1 (bit)		2	18	20	B, F, H	TSSOP20, DIP20, SO20	2 AC, BOD, POR, 8 KBIs, IRC (6 MHz ± 10%/± 25%)
P87LPC762	2 K	128 B	ICP	2		•	1	1 (bit)		2	18	20	B, F	TSSOP20, DIP20, SO20	2 AC, BOD, POR, 8 KBIs, IRC (6 MHz ± 10%/± 25%)
P87LPC761	2 K	128 B	ICP	2		•	1	1 (bit)		2	14	20	B	TSSOP16, DIP16	16-pin LPC derivative; ± 2.5% internal RC oscillator (0 – 50 °C)
P87LPC760	1 K	128 B	ICP	2		•	1	1 (bit)		2	12	20	B	TSSOP14, DIP14	14-pin LPC derivative; ± 2.5% internal RC oscillator (0 – 50 °C)

80C51 series

Product	Memory			Timers			Serial interfaces			I/O Pins	Max freq (MHz)	Temp range options	Package(s)	Comments/special features
	FLASH	OTP/ROM	RAM	No. of timers	PWM	WD	UART	I²C-bus	SPI					
66x devices														
P89V664	64 K		2 K	4	•	•	1	2	1	36	40	F	PLCC44, LQFP44	Fast erase times and more I/O
P89V662	32 K		1 K	4	•	•	1	2	1	36	40	F	PLCC44, LQFP44	Fast erase times and more I/O
P89V660	16 K		512 B	4	•	•	1	2	1	36	40	F	PLCC44, LQFP44	Fast erase times and more I/O
66xX2 devices														
P87C661X2		16 K	512 B	4	•	•	1	2		32	33	B	PLCC44, LQFP44	87C660X2 with two I²C-bus interfaces
P87C660X2		16 K	512 B	4	•	•	1	1		32	33	B, F	PLCC44, LQFP44	OTP version of 89C660; 12-clk default, 6-clk option
Mx2 devices														
P87C51MC2/02		96 K	3 K	4	•	•	2		1	34	24	B	PLCC44	16-MB data/code addr. range; 2 UARTs, SPI , P4 I/O
P87C51MB2/02		64 K	2 K	4	•	•	2		1	34	24	B	PLCC44	16-MB data/code addr. range; 2 UARTs, SPI, P4 I/O

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Microcontrollers

80C51 series (continued)

Product	Memory			Timers			Serial interfaces			I/O Pins	Max freq (MHz)	Temp range options	Package(s)	Comments/special features
	FLASH	OTP/ROM	RAM	No. of timers	PWM	WD	UART	I²C-bus	SPI					
Rx2 devices														
P89CV51RD2	64 K		1 K	4	•	•	1		1	32	33	B, F	PLCC44, TQFP44	
P89LV51RD2	64 K		1 K	4	•	•	1		1	32	33	B, F	DIP40, PLCC44, LQFP44	
P89LV51RC2	32 K		1 K	4	•	•	1		1	32	33	B, F	DIP40, PLCC44, LQFP44	
P89LV51RB2	16 K		1 K	4	•	•	1		1	32	33	B, F	PLCC44, LQFP44	
P89V51RD2	64 K		1 K	4	•	•	1		1	32	40	B, F	DIP40, PLCC44, LQFP44	
P89V51RC2	32 K		1 K	4	•	•	1		1	32	40	B, F	DIP40, PLCC44, LQFP44	
P89V51RB2	16 K		1 K	4	•	•	1		1	32	40	B, F	DIP40, PLCC44, LQFP44	
P89V52X2	8 K		256 B	4	•		1			32	33	B, F	DIP40, PLCC44, TQFP44	192-B EEPROM

ACRONYM LEGEND:

IAP = In-Application Programmable Flash
ISP = In-System Programmable Flash
PP = Parallel Programmable Flash
(via parallel programmer)
OTP = One-Time Programmable (EPROM)
ICP = In-Circuit Programmable (using off-board programmer)
POR = Power-On Reset
KBI = Keyboard Interrupt Inputs

BOD = Brown-out Detect
I²C-bus = Inter-Integrated Circuit Bus
CAN = Controller Area Network
PCA = Programmable Counter Array
ADC = Analog-to-Digital Converter
DAC = Digital-to-Analog Converter
PWM = Pulse Width Modulation
AC = Analog Comparator

TEMPERATURE LEGEND:

Temperature range options:
B = 0 to +70 °C
F = -40 to +85 °C
H = -40 to +125 °C
J = -40 to +105 °C

Not all package/temperature/voltage/frequency combinations are available. For most parts "3 V" voltage range is 2.7 – 5.5 V and "5 V" voltage range is 4.5 – 5.5 V. Check datasheet for details.

UARTS

UARTs

Industrial UARTs

Product	Comment	Number of channels	V_{CC} (± 10%) (V)	Data rate at V_{CC} (kbps)	Rx/Tx FIFO bytes	Arbitrating interrupt	I/O pins	16-bit counter/timer	Rx/Tx FIFO counters	Rx/Tx FIFO INT trigger	Software flow control	Intel or Motorola databus interface	Power-down mode	Package(s)	Part number(s) (temp range 0 to 70 °C)	Part number(s) (temp range -40 to 85 °C)
SCC2691	Single-channel version of SCC2692	1	5	125	3/1	Normal	2	1		3/1 level		Intel	•	DIL24 SOT24 PLCC28	SCC2691AC1N24 SCC2691AC1D24 SCC2691AC1A28	SCC2691AE1N24 SCC2691AE1A28
SC28L91	Low-power, single-channel version of SC28L92	1	3.3 or 5	1000	16/16 or 8/8	Normal multi-level vectored IACK/DACK	15	1	•	All		Intel or Motorola (pin select)	•	PLCC44 QFP44		SC28L91A1A SC28L91A1B
SC28L201	Single-channel version of SC28L202. Enhanced, faster version of SC28L91	1	3.3 or 5	3125	256/256	Normal multi-level IACK/DACK I2A	16	2	•	All	Auto	Intel or Motorola (pin select)	•	TSSOP48		SC28L201A1DGG
SCC2681	CMOS version of SCN2681	2	5	125	3/1	Normal	15	1		3/1 level		Intel		DIL28 DIL40 PLCC44	SCC2681AC1N28 SCC2681AC1N40 SCC2681AC1A44	SCC2681AE1N28 SCC2681AE1N40 SCC2681AE1A44
SCC68681	CMOS version of SCN68681	2	5	125	3/1	Normal vectored	14	1		3/1 level		Motorola		DIL40 PLCC44	SCC68681AC1N40 SCC68681AC1A44	SCC68681AE1N40 SCC68681AE1A44
SCC2681T	CMOS version of SCN2681T	2	5	500	3/1	Normal	15	1		3/1 level		Intel	•	PLCC84	SCC2681TC1A44	
SCC2692	CMOS version of SCN2681	2	5	125	3/1	Normal	15	1		3/1 level		Intel	•	DIL28 DIL40 PLCC44 QFP44	SCC2692AC1N28 SCC2692AC1N40 SCC2692AC1A44 SCC2692AC1B44	SCC2692AE1N28 SCC2692AE1N40 SCC2692AE1A44 SCC2692AE1B44
SCC68692	CMOS version of SCN68681	2	5	125	3/1	Normal vectored IACK/DACK	14	1		3/1 level		Motorola	•	DIL40 PLCC44	SCC68692AC1N40 SCC68692AC1A44	SCC68692AE1N40 SCC68692AE1A44
SCC26C92	High-speed version of SCC2692	2	5	1000	8/8	Normal multi-level	15	1	•	All		Intel	•	DIL40 PLCC44 QFP44		SCC26C92A1N SCC26C92A1A SCC26C92A1B
SC28L92	Low-power, faster version of SC26C92	2	3.3 or 5	1000	16/6 or 8/8	Normal multi-level vectored IACK/DACK	15	1	•	All		Intel or Motorola	•	PLCC44 QFP44		SC28L92A1A SC28L92A1B

UARTs

Industrial UARTs (continued)

Product	Comment	Number of channels	V_{CC} (± 10%) (V)	Data rate at V_{CC} (kbps)	Rx/Tx FIFO bytes	Arbitrating interrupt	I/O pins	16-bit counter/timer	Rx/Tx FIFO counters	Rx/Tx FIFO INT trigger	Software flow control	Intel or Motorola databus interface	Power-down mode	Package(s)	Part number(s) (temp range 0 to 70 °C)	Part number(s) (temp range -40 to 85 °C)
SC28L202	Enhanced, faster version of SC28L92	2	3.3 or 5	3125	256/256	Normal multi-level IACK/DACK I2A	16	2	•	All	Auto	Intel or Motorola (pin select)	•	TSSOP56		SC28L202A1DGG
SC28C94	Enhanced, quad version of SC26C92	4	5	1000	8/8	Normal multi-level IACK/DACK I2A	16	2	•	All		Intel or Motorola	•	PLCC52		SC28C94A1A
SC28L194	Enhanced version of SC28C94	4	3.3 or 5	1000	16/16	Normal multi-level IACK/DACK I2A	16	2	•	All	Auto	Intel or Motorola	•	PLCC68 LQFP80		SC28L194A1A SC28L194A1BE
SCC2698B	Quad version of SCC2692	8	5	125	3/1	Normal	32	4		3/1 level		Intel	•	PLCC84	SCC2698BC1A84	SCC2698BE1A84
SC28L198	Enhanced version of SCC2698B	8	3.3 or 5	1000	16/16	Normal multi-level IACK/DACK I2A	32	2	•	All	Auto	Intel or Motorola	•	PLCC84 LQFP100		SC28L198A1A SC28L198A1BE

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High-speed 16C UARTs with Intel databus interface

Product	Number of channels	V_{CC} (± 10%) (V)	Data rate at 5/3.3/2.5 V (Mbps)	Rx/Tx FIFO bytes	IrDa	I/O pins	Rx/Tx FIFO INT trigger	RTS/CTS flow control	Software flow control	Power-down mode	Package(s)	Part number(s) (temp range -40 to 85 °C
SC16C550B	1	2.5 – 5.5	3.0/2.0/1.0	16		81	Four levels/none	•			PLCC44 LQFP48 DIP40 HVQFN32	SC16C550BIA44 SC16C550BIB48 SC16C550BIN40 SC16C550BIBS
SC16C650B	1	2.5 – 5.5	3.0/2.0/1.0	32	•	81	Four levels/four levels	•	•	•	PLCC44 LQFP48 HVQFN32 DIP40	SC16C650BIA44 SC16C650BIB48 SC16C650BIBS SC16C650BIN40
SC16C750B	1	2.5 – 5.5	3.0/2.0/1.0	16/64		81	Four levels/none	•		•	PLCC44 LQFP64 HVQFN32	SC16C750BIA44 SC16C750BIB64 SC16C750BIBS
SC16C2550B	2	2.5 – 5.5	5.0/5.0/3.0	16		142	Four levels/none				PLCC44 LQFP48 DIP40 HVQFN32	SC16C2550BIA44 SC16C2550BIB48 SC16C2550BIN40 SC16C2550BIBS
SC16C2552B	2	2.5 – 5.5	5.0/5.0/3.0	16		142	Four levels/none				PLCC44	SC16C2552BIA44
SC16C652B	2	2.5 – 5.5	5.0/5.0/3.0	32	•	142	Four levels/four levels	•	•	•	LQFP48 HVQFN32	SC16C652BIB48 SC16C652BIBS
SC16C752B	2	2.5 – 5.5	5.0/5.0/3.0	64		142	Programmable	•	•	•	LQFP48 HVQFN32	SC16C752BIB48 SC16C752BIBS
SC16C754B	4	2.5 – 5.5	5.0.5.0/3.0	64		243	Programmable	•	•	•	PLCC68 LQFP80 LQFP644	SC16C754BIA68 SC16C754BIB80 SC16C754IBIBM
SC16C554B	4	2.5 – 5.5	5.0/5.0/3.0	16		243	Four levels/none	•			LQFP64 LQFP64 LQFP80 HVQFN48 LQFP644	SC16C554BIA68 SC16C554BIB64 SC16C554BIB80 SC16C554BIBS SC16C554BIBM
SC16C654B	4	2.5 – 5.5	5.0.5.0/3.0	64	•	243	Four levels/four levels	•	•	•	LQFP64 LQFP64 LQFP644 LFBGA64 HVQFN48	SC16C654BIB64 SC16C654BIB64 SC16C654BIBM SC16C654BIEC SC16C654BIBS

UARTs

High-speed 16C UARTs with Motorola databus interface

Product	Number of channels	V_{CC} (± 10%)	Data rate at 5/3.3/2.5 V (Mbps)	Rx/Tx FIFO bytes	IrDa	I/O pins	Rx/Tx FIFO INT trigger	RTS/CTS flow control	Software flow control	Power-down mode	Package	Part number (temp range -40 to 85 °C)
SC68C2550B	2	2.5 – 5.5	5.0/5.0/3.0	16		142	Four levels/none				LQFP48	SC68C2550BIB48
SC68C652B	2	2.5 – 5.5	5.0/5.0/3.0	32	•	142	Four levels/four levels	•	•	•	LQFP48	SC68C652BIB48
SC68C752B	2	2.5 – 5.5	5.0/5.0/3.0	64		142	Programmable	•	•	•	LQFP48	SC68C752BIB48
SC16C554B	4	2.5 – 5.5	5.0/5.0/3.0	16		243	Four levels/none	•			PLCC68	SC16C554DBIA68
SC16C654B	4	2.5 – 5.5	5.0.5.0/3.0	64	•	243	Four levels/four levels	•	•	•	PLCC68	SC16C654BIA68

Note 1: Six of these pins might be used for control signaling, such as RTS, DTR, CTS, DSR, RI, CD. HVQFN package has only 5 I/O pins
Note 2: Twelve of these pins might used for control signaling, such as RTS, DTR, CTS, DSR, RI, CD. HVQFN package has only 6 I/O pins
Note 3: All of these pins might be used for control signaling, such as RTS, DRT, CTS, DSR, RI, CD. HVQFN package has only 12 I/O pins
Note 4: "LQFP64 small" is 7 x 7 mm versus conventional LQFP 10 x 10 mm

RF

Post amplifiers

Product	Package	Description	Power dissipation (mW)	Operating temperature range (°C)	Operating frequency (MHz)	Analog supply voltage range (V)	Digital supply voltage range (V)	Analog supply current typ/ max (mA)	Digital supply current typ/ max (mA)	Differential input resistance at IN1 (Ω)	Differential input resistance at IN2 (Ω)	Hysteresis voltage single-ended output (mVp-p)
SA5214	D (SO20)	Post amplifier with link status indicator	250	-40 to +85	75	4.75 – 5.25	4.75 – 5.25	30/41.2	10/13.5	1200	1200	3
SA5214/01	D (SO20)	Post amplifier with link status indicator	250	-40 to +85	75	4.75 – 5.25	4.75 – 5.25	30/41.2	10/13.5	1200	1200	3
SA5217	D (SO20)	Post amplifier with link status indicator	300	-40 to +85	75	4.5 – 5.5	4.5 – 5.5	30/41.2	10/13.5	1200	2000	10
SA5217/01	D (SO20)	Post amplifier with link status indicator	300	-40 to +85	75	4.5 – 5.5	4.5 – 5.5	30/41.2	10/13.5	1200	2000	10

Wideband variable gain amplifiers

Product	Package	Operating temperature range (°C)	VCC supply voltage range (V)	ICC supply current min/ max (mA)	Max power dissipation (mW)	GBW product (MHz)	Voltage gain (single-ended in/single-ended out) RL = 10 kΩ (dB)	Voltage gain (single-ended in/differential) RL = 10 kΩ (dB)	PSRR min/typ (mV/V)	Noise figure f = 50 MHz, Rs = 50 Ω typ (dB)	S21 reverse isolation f = 100 MHz typ (dB)	P1-1dB f = 100 MHz, VAGC = 0.1 V typ (dBm)	PO-1dB f = 100 MHz typ (dBm)	IP3IN f = 100 MHz, VAGC typ (dBm)	IP3OUT f = 100 MHz, VAGC > 0.5 V typ (dBm)
SA5209	D (SO16)	-40 to +85	4.5 – 7.0	38/48	1100	850	17/21	16/22	20/45	9.3	-60	-10	-3	+5	+13
SA5209/01	D (SO16)	-40 to +85	4.5 – 7.0	38/48	1100	850	17/21	16/22	20/45	9.3	-60	-10	-3	+5	+13
SA5219	D (SO16)	-40 to +85	4.5 – 7.0	36/50	1100	700	18/22	22/28	18/45	9.3	-60	-10	-3	+5	+13
SA5219/01	D (SO16)	-40 to +85	4.5 – 7.0	36/50	1100	700	18/22	22/28	18/45	9.3	-60	-10	-3	+5	+13

RF

VCO varicap diodes

Product	Package	Cd @ Vr (pF)			Cd @ Vr (pF)			Tuning range Cd over voltage range (V)			RS (Ω)
		Min	Max	(V)	Min	Max	(V)	Ratio (min)	V1 to V2		Typ
BB145B	SOD523	6.4	7.4	1	2.55	2.95	4	2.2	1	4	0.6
BB202 [1]	SOD523	28.2	33.5	0.2	7.2	11.2	2.3	2.5	0.2	2.3	0.35
BB202LX [1]	SOD882T	28	33.5	0.2	7.2	11.2	2.3	2.5	0.2	2.3	0.4
BB156	SOD323	14.4	17.6	1	7.6	9.6	4	1.86	1	4	0.4
BB198	SOD523	25	28.5	0.5	4.8	6.8	2				0.8 max
BB199	SOD523	36.5	42.5	0.5	11.8	13.8	2				0.25
BB208-02 [2]	SOD523	19.9	23.2	1	4.5	5.4	7.5	4.3	1	7.5	0.35
BB208-03 [2]	SOD323	19.9	23.2	1	4.5	5.4	7.5	4.3	1	7.5	0.35

Radio varicap diodes: FM radio tuning

Product	Package	Cd @ Vr (pF)			Cd @ Vr (pF)			Tuning range Cd over voltage range (V)			RS (Ω)
		Min	Max	(V)	Min	Max	(V)	Ratio (min)	V1 to V2		Typ
BB201	SOT23	89	102	1	25.5	29.7	7.5	3.1	1	7.5	0.3
BB202 [1]	SOD523	28.2	33.5	0.2	7.2	11.2	2.3	2.5	0.2	2.3	0.35
BB202LX [1]	SOD882T	28	33.5	0.2	7.2	11.2	2.3	2.5	0.2	2.3	0.4
BB207 [2]	SOT23	76	86	1	25.5	29.7	7.5	2.6	1	7.5	0.2

[1] Includes special design for mobile-phone tuner ICs
[2] Includes special design for FM car radio (CREST-IC: TEF6860)

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TV and satellite varicap diodes: UHF tuning

Product	Package	Cd @ Vr (pF)			Tuning range Cd over voltage range (V)			RS (Ω)	Matched sets	Typical applications			
		Min	Max	(V)	Ratio	V1 to V2		Max	%	TV	V_{CO}	SAT	STB
Matched													
BB149	SOD323	1.9	2.25	28	9	1	28	0.75	1	•			•
BB149A	SOD323	1.95	2.22	28	9.7	1	28	0.75	2	•			•
BB179	SOD523	1.95	2.22	28	9.7	1	28	0.75	2	•	•		•
BB179LX	SOD882T	1.95	2.22	28	9.7	1	28	0.75	2	•	•		•
BB179B	SOD523	1.9	2.25	28	9.2	1	28	0.75	2	•			•
BB179BLX	SOD882T	1.9	2.25	28	9.2	1	28	0.75	2	•			•
BB184	SOD523	1.87	2.13	10	6	1	10	0.65 typ	2	•	•		
BB184LX	SOD882T	1.87	2.13	10	6	1	10	0.65 typ	2	•	•		
BB135	SOD323	1.7	2.1	28	10	0.5	28	0.75		•	•		

TV and satellite varicap diodes: VHF tuning

Product	Package	Cd @ Vr (pF)			Tuning range Cd over voltage range (V)			RS (Ω)	Matched sets	Typical applications			
		Min	Max	(V)	Ratio	V1 to V2		Max	%	TV	V_{CO}	SAT	STB
Matched													
BB148	SOD323	2.4	2.75	28	15	1	28	0.9	1	•			•
BB152	SOD323	2.48	2.89	28	> 20.6	1	28	1.2	2	•			•
BB153	SOD323	2.36	2.75	28	> 13.5	1	28	0.8	2	•			•
BB178	SOD523	2.36	2.75	28	> 13.5	1	28	0.8	2	•			•
BB178LX	SOD882T	2.36	2.75	28	> 13.5	1	28	0.8	2	•			•
BB182	SOD523	2.48	2.89	28	> 20.6	1	28	1.2	2	•			•
BB182LX	SOD882T	2.48	2.89	28	> 20.6	1	28	1.2	2	•			•
BB185LX	SOD882T	2.45	2.97	10	12	1	10	0.75	2	•	•		
BB187	SOD523	2.57	2.92	25	11	2	25	0.75	2	•			•
BB187LX	SOD882T	2.57	2.92	25	11	2	25	0.9	2	•			•
Unmatched													
BB181	SOD523	0.7	1.055	28	14	0.5	28	3				•	
BB181LX	SOD882T	0.7	1.055	28	14	0.5	28	3				•	

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RF

Pin diodes

Product	Package	Limits		RD (Ω) typ @			Cd (pF) typ @		
		Vr (V)	If (mA)	0.5 mA	1 mA	10 mA	0 V	1 V	20 V
BAP50	Various	50	50	25	14	3	0.4	0.3	0.22 @ 5 V
BAP51	Various	60	50	5.5	3.6	1.5	0.4	0.3	0.2 @ 5 V
BAP55	Various	50	100	3.3	2.4	1	0.26	0.23	0.15
BAP63	Various	50	100	2.5	1.95	1.17	0.36	0.32	0.25
BAP64	Various	175	100	20	10	2	0.48	0.35	0.23
BAP65	Various	30	100		1	0.56	0.65	0.55	0.375
BAP70	Various	50	100	77	40	5.4	0.57	0.4	0.2
BAP142	Various	50	100	3.4	2.3	1	0.27	0.23	0.18 @ 5 V
BAP1321	Various	60	100	3.4	2.4	1.2	0.4	0.35	0.25

Pin-diode packaging

Single			Series		Common cathode		Common anode		Anti-parallel
SOD323	SOD523	SOD882T	SOT23	SOT323	SOT23	SOT323	SOT23	SOT323	SOT363
BAP50-03	BAP50-02	BAP50LX	BAP50-04	BAP50-04W	BAP50-05	BAP50-05W			
BAP51-03	BAP51-02	BAP51LX		BAP51-04W		BAP51-05W		BAP51-06W	
BAP55-03		BAP55LX							
BAP63-03	BAP63-02	BAP63LX				BAP63-05W			
BAP64-03	BAP64-02	BAP64LX	BAP64-04	BAP64-04W	BAP64-05	BAP64-05W	BAP64-06	BAP64-06W	
BAP65-03	BAP65-02	BAP65LX			BAP65-05	BAP65-05W			
BAP70-03	BAP70-02			BAP70-04W	BAP70-05				BAP70AM
BAP142-03		BAP142LX							
BAP1321-03	BAP1321-02	BAP1321LX	BAP1321-04						

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MMIC: General-purpose medium-power amplifiers, 50-Ω blocks

Product	Package	@		@ 900 MHz				@ 1800 MHz				Gain (2)	Limits		
		VS (1) (V)	Is (mA)	NF (dB)	Gain(2) (dB)	OIP3 (dBm)	P1dB (dBm)	NF (dB)	Gain(2) (dB)	OIP3 (dBm)	P1dB (dBm)	2.5 GHz	VS (1) (V)	Is (mA)	Ptot (mW)
BGA6289	SOT89	4.1	84	3.5	15	31	17	3.7	13	28	15	12	6	120	480
BGA6489	SOT89	5.1	78	3.1	20	33	20	3.3	16	30	17	15	6	120	480
BGA6589	SOT89	4.8	81	3.0	22	33	21	3.3	17	32	20	15	6	120	480

(1) Device voltage without bias resistor
(2) Gain = $|S_{21}|^2$

MMIC: Two-stage, variable-gain linear amplifier

Product	Package	@		Frequency range (MHz)	@ 900 MHz				@ 1900 MHz				Limits		
		VS (V)	Is (mA)		Gain (1) (dB)	DG(2) (dB)	P1dB (dBm)	ACPR (dBc)	Gain (1) (dB)	DG(2) (dB)	P1dB (dBm)	ACPR (dBc)	Vs (V)	Is (mA)	Ptot (mW)
BGA2031/1	SOT363	3	51	800 – 2500	24	62	11	49	23	56	13	49	3.3	77	200

(1) Gain = Gp, power gain
(2) DG = Gain control range

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MMIC: General-purpose wideband amplifiers, 50-Ω gain blocks

Product	Package	@		f_U [1]	@ 1 GHz						Gain [3] (dB) @				Limits		
		VS (V)	Is (mA)	@ -3 dB (GHz)	NF (dB)	Psat (dBm)	Gain[3] (dB)	P1dB (dBm)	OIP3 (dBm)	100 MHz	2.2 GHz	2.6 GHz	3.0 GHz	Vs (V)	Is (mA)	Ptot (mW)
BGA2711	SOT363	5	12.6	3.6 [2]	4.8	2.8	13.1	-0.7	8.3	13.0	14.1	13.8	12.8	6	20	200
BGA2748	SOT363	3	5.7	1.9	1.9 [2]	-2.3	21.8	-9.2	-1.9	14.8	17.6	15.0	11.9	4	15	200
BGA2771	SOT363	3	33.3	2.4	4.5	13.2 [2]	21.4	12.1	21.9	20.3	20.4	17.9	15.5	4	50	200
BGA2776	SOT363	5	24.4	2.8	4.9	10.5	23.2 [2]	7.2	18.6	22.4	23.2	21.8	19.3	6	34	200
BGA2709	SOT363	5	23.5	3.6	4.0	12.5	22.7	8.3	22.0	22.2	23.0	22.1	21.1	6	35	200
BGA2712	SOT363	5	12.3	3.2	3.9	4.8	21.3	0.2	11.0	20.8	21.9	21.2	19.3	6	25	200
BGM1011	SOT363	5	25.5		4.7	13.8	30.0 [2]	12.2	23.0	25.0	37.0	32.0	28.0	6	35	200
BGM1012	SOT363	3	14.6 [2]	3.6	4.8	9.7	20.1	5.6	18.0	19.5	20.4	19.9	18.7	4	50	200
BGM1013	SOT363	5	27.5	2.1	4.6	14.0	35.5 [2]	12.0	22.7	35.2	31.8	29.7	26.1	6	35	200
BGM1014	SOT363	5	21 [2]	2.5	4.2	12.9	32.3	11.2	20.5	30.0	34.1	30.5	26.4	6	30	200
BGA2714	SOT363	3	4.6	2.7	2.2	-3.4	20.4	-8	2	20.8	20.8	19.0	16.8	4	10	200
BGA2715	SOT363	5	4.3 [2]	3.3	2.6	-4.0	21.7	-8.0	2.3	13.3	23.3	22.1	20.1	6	8	200
BGA2716	SOT363	5	15.9 [2]	3.2	5.3	11.6	22.9	8.9	22.2	22.1	22.8	22.1	20.8	6	25	200
BGA2717	SOT363	5	8	3.2	2.3 [2]	1.4	23.9	-2.6	10	18.6	25.1	24	22.1	6	15	200

[1] *Upper -3 dB point, to gain at 1 GHz*
[2] *Optimized parameter*
[3] *Gain = $|S_{21}|^2$*

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Wideband linear mixer

Product	Package	@		RF input freq range	IF ouput freq range	@ 880 MHz			@ 2450 MHz			Limits		
		VS (V)	Is (mA)			NF (dB)	Gain [1] (dB)	OIP3 (dBm)	NF (dB)	Gain [1] (dB)	OIP3 (dBm)	Vs (V)	Is (mA)	Ptot (mW)
BGA2022	SOT363	3	6	800 – 2500	50 – 500	9	5	4	9	6	10	4	10	40

[1] Gain = G_C conversion gain

MMIC: low-noise wideband amplifiers

Product	Package	@		@ 900 MHz			@ 1800 MHz			Gain [3] (dB) @				Limits		
		VS (V)	Is (mA)	NF (dB)	Gain (dB)	IIP3 (dBm)	NF (dB)	Gain (dB)	IIP3 (dBm)	100 MHz	1.0 GHz	2.6 GHz	3.0 GHz	Vs (V)	Is (mA)	Ptot (mW)
BGA2001	SOT343R	2.5	4	1.3	22 [1]	-7.4	1.3	19.5 [1]	-4.5	20	17.1	11.6	10.7	4.5	30	135
BGA2003	SOT343R	2.5	10 [2]	1.8	24 [1]	-6.5	1.8	16 [1]	-4.8	26	18.6	11.1	10.7	4.5	30	135
BGA2011	SOT363	3	15	1.5	19 [3]	10				24	14.8	8	6.5	4.5	30	135
BGA2012	SOT363	3	7				1.7	16 [3]	10	22	18.2	11.6	10.5	4.5	15	70

[1] MSG
[2] Adjustable bias
[3] $|S_{21}|^2$

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Wideband transistors [RF small-signal]

Product	Package	Typ	Maximum values			Polarity	G_{UM} (dB)	NF (dB)	@ (MHz)	G_{UM} (dB)	NF (dB)	@ (MHz)	V_O (mV)	P1 (1 dB) (dBm)	ITO (dBm)	@ I_C & V_{ce} (mA)	@ I_C & V_{ce} (V)
		f_T (GHz)	V_{ceo} (V)	I_C (mA)	P_{tot} (mW)												
BFS17	SOT23	1	15	25	300	NPN		4.5	500								
BFS17W	SOT323	1.6	15	50	300	NPN		4.5	500								
BFS17A	SOT23	2.8	15	25	300	NPN	13.5	2.5	800				150			14	10
BFR92A	SOT23	5	15	25	300	NPN	14	2.1	1000	8	3	2000	150			14	10
BFR92AW	SOT323	5	15	25	300	NPN	14	2	1000	8	3	2000					
BFR93AW	SOT323	5	12	35	300	NPN	13	1.5	1000	8	2.1	2000					
BFG591	SOT223	7	15	200	2000	NPN	13		900	7.5		2000	700			70	10
BFG67(/X)	SOT143	8	10	50	380	NPN	17	1.7	1000	10	2.5	2000					
BFQ67W	SOT323	8	10	50	300	NPN	13	1.3	1000	8	2.7	2000					
PBR941	SOT23	8	10	50	360	NPN	15	1.4	1000	9.5	2	2000					
PBR951	SOT23	8	10	100	365	NPN	14	1.3	1000	8	2	2000					
PRF957	SOT323	8.5	10	100	270	NPN	15	1.3	1000	9.2	1.8	2000					
BFG520(/X)	SOT143	9	15	70	300	NPN	19	1.6	900	13	1.9	2000	275	17	26	20	6
BFG520W(/X)	SOT343	9	15	70	500	NPN	17	1.1	900	11	1.85	2000	275	17	26	20	6
BFG540(/X)	SOT143	9	15	120	500	NPN	18	1.3	900	11	2.1	2000	500	21	34	40	8
BFG540W(/X)	SOT343	9	15	120	500	NPN	16	1.3	900	10	2.1	2000	500	21	34	40	8
BFG541	SOT223	9	15	120	650	NPN	15	1.3	900	9	2.1	2000	500	21	34	40	8
BFM505	SOT363	9	8	18	500	NPN	17	1.1	900	10	1.9	2000					
BFM520	SOT363	9	8	70	1000	NPN	15	1.2	900	9	1.9	2000					
BFQ540	SOT89	9	15	120	1200	NPN		1.9	900				500			40	8
BFR505	SOT23	9	15	18	150	NPN	17	1.2	900	10	1.9	2000		4	10	5	6
BFR505T	SOT416	9	15	18	150	NPN	17	1.2	900								

G_{UM} = Maximum Unilateral Gain

Wideband transistors [RF small-signal] (continued)

Product	Package	Typ	Maximum values			Polarity	G_{UM} (dB)	NF (dB)	@ (MHz)	G_{UM} (dB)	NF (dB)	@ (MHz)	V_O (mV)	P1 (1 dB) (dBm)	ITO (dBm)	@ I_C & V_{ce} (mA)	@ I_C & V_{ce} (V)
		f_T (GHz)	V_{ceo} (V)	I_C (mA)	P_{tot} (mW)												
BFR520	SOT23	9	15	70	300	NPN	15	1.1	900	9	1.9	2000		17	26	20	6
BFR520T	SOT416	9	15	70	150	NPN	15	1.1	900	9	1.9	2000		17	26	20	6
BFR540	SOT23	9	15	120	500	NPN	14	1.3	900	7	2.1	2000	550	21	34	40	8
BFS505	SOT323	9	15	18	150	NPN	17	1.2	900	10	1.9	2000		4	10	5	6
BFS520	SOT323	9	15	70	300	NPN	15	1.1	900	9	1.9	2000		17	26	20	6
BFS540	SOT323	9	15	120	500	NPN	14	1.3	900	8	2.1	2000		21	34	40	8
PRF949	SOT416	9	10	50	150	NPN	16	1.5	1000	10	2.1	2000					
BFG21W	SOT343	18	4.5	500	360	NPN		1.2	900	16	1.8	2000		20	28	80	2
BFG310W/XR	SOT343XR	14	6	10	60	NPN	18	1.0	1000					1.8	8.5	5	3
BFG310/XR	SOT143XR	14	6	10	60	NPN	18	1.0	1000					1.8	8.5	5	3
BFG325W/XR	SOT343XR	14	6	35	210	NPN	18.3	1.1	3000					8.7	19.4	15	3
BFG325/XR	SOT143XR	14	6	35	210	NPN	18.3	1.1	3000					8.7	19.4	15	3
BFG480W	SOT343	21	4.5	250	360	NPN		1.2	900	16	1.8	2000		20	28	80	2
BFG410W	SOT343	22	4.5	12	54	NPN		0.9	900	21	1.2	2000		5	15	10	2
BFG424F	SOT343F	25	4.5	30	135	NPN		0.8	900	23	1.2	2000		12	22	25	2
BFG424W	SOT343	25	4.5	30	135	NPN		0.8	900	22	1.2	2000		12	22	25	2
BFG425W	SOT343	25	4.5	30	135	NPN		0.8	900	20	1.2	2000		12	22	25	2
BFU725F	SOT343F	70	2.9	40		NPN	17	0.7	2400	17	0.7	5800		8	19	25	2

G_{UM} = Maximum Unilateral Gain

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N-channel junction field-effect transistors (FETs)

Product	Package	Characteristics										
		V_{DS}	I_G	I_{DSS} (mA)		$V_{(p)GS}$ (V)		|Yfs| (mS)		Crs (pF)	
		(V)	(mA)	Min	Max	Min	Max	Min	Max	Min	Max
Preamplifiers for AM tuners in car radios											
BF861A	SOT23	25	10	2	6.5	0.2	1	12	20	2.1	2.7
BF861B	SOT23	25	10	6	15	0.5	1.5	16	25	2.1	2.7
BF861C	SOT23	25	10	12	25	0.8	2	20	30	2.1	2.7
BF862	SOT23	20	10	10	25	< 20		35		1.9 typ	
AM input stages for UHF/VHF amplifiers											
PMBFJ310	SOT23	25	50	24	60	2	6.5	> 10		1.3	2.5
PMBFJ620	SOT363	25	50	24	60	2	6.5	> 10		1.3	2.5

N-channel, single MOSFETs for switching

Product	Package	Characteristics													
		V_{DS}	I_D	I_{DSS} (mA)		$V_{(p)GS}$		R_{DSON} (Ω)	Crs (pF)		t_{on} (ns)		t_{off} (ns)		|S$_{21(on)}$|^2 (dB)	|S$_{21(off)}$|^2 (dB)	Mode
		(V)	mA	Min	Max	Min	Max	Max	Min	Max	Typ	Max	Typ	Max	Max	Min	
BSS83	SOT143	10	50			0.1 [1]	2	45	typ 0.6			1		5			Enhanced
Silicon RF switches																	
BF1107	SOT23	3	10	100 [2]		7 [3]	20								2.5	30	Depletion
BF1108 [4]	SOT143B	3	10	100 [2]		7 [3]	20								3	30	Depletion
BF1108R [4]	SOT143R	3	10	100 [2]		7 [3]	20								3	30	Depletion

[1] $V_{GS (th)}$
[2] I_D
[3] V_{SG}
[4] Depletion FET plus diode in one package

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N-channel, dual-gate MOSFETs for switching

Product	Package	Characteristics											VHF	UHF
		V_{DS}	I_D	I_{DSS} (mA)		$V_{(p)GS}$ (V)		lYfsl (mS)		Cis (pF)	Cos (pF)	F @ 800 MHz		
		(V)	(mA)	Min	Max	Min	Max	Min	Max	Typ	Typ	Typ		
With external bias														
BF998	SOT143	12	30	2	18		-2.0	21		2.1	1.05	1	•	•
BF998R	SOT143R	12	30	2	18		-2.0	21		2.1	1.05	1	•	•
BF998WR	SOT343R	12	30	2	18		-2.5	22		2.1	1.05	1	•	•
Fully internal bias														
BF1105	SOT143	7	30	8	16	0.3	1.2 [1]	25		2.2 [3]	1.2 [2]	1.7	•	•
BF1105R	SOT143R	7	30	8	16	0.3	1.2 [1]	25		2.2 [3]	1.2 [2]	1.7	•	•
BF1105WR	SOT343R	7	30	8	16	0.3	1.2 [1]	25		2.2 [3]	1.2 [2]	1.7	•	•
Partly internal bias														
BF904(A)	SOT143	7	30	8	13	0.3	1 [1]	22	30	2.2	1.3	2	•	•
BF904(A)R	SOT143R	7	30	8	13	0.3	1 [1]	22	30	2.2	1.3	2	•	•
BF904(A)WR	SOT343R	7	30	8	13	0.3	1 [1]	22	30	2.2	1.3	2	•	•
BF909(A)	SOT143	7	40	12	20	0.3	1 [1]	36	50	3.6	2.3	2	•	•
BF909(A)R	SOT143R	7	40	12	20	0.3	1 [1]	36	50	3.6	2.3	2	•	•
BF909(A)WR	SOT343R	7	40	12	20	0.3	1 [1]	36	50	3.6	2.3	2	•	•
BF1102(R)	SOT343	7	40	12	20	0.3	1.2 [1]	36		2.8 [3]	1.6 [2]	2		[4]
BF1201	SOT143	10	30	11	19	0.3	1.2 [1]	23	35	2.6	0.9	1.9	•	•
BF1201R	SOT143R	10	30	11	19	0.3	1.2 [1]	23	35	2.6	0.9	1.9	•	•
BF1201WR	SOT343R	10	30	11	19	0.3	1.2 [1]	23	35	2.6	0.9	1.9	•	•
BF1202	SOT143	10	30	8	16	0.3	1.2 [1]	25	40	1.7	0.85	1.1	•	•
BF1202R	SOT143R	10	30	8	16	0.3	1.2 [1]	25	40	1.7	0.85	1.1	•	•
BF1202WR	SOT343R	10	30	8	16	0.3	1.2 [1]	25	40	1.7	0.85	1.1	•	•
BF1203 [5]	SOT363	10	30	11	19	0.3	1.2 [1]	23	35	2.6	0.9	1.9	•	•
		10	30	8	16	0.3	1.2 [1]	25	40	1.7	0.85	1.1		•

N-channel, dual-gate MOSFETs for switching (continued)

Product	Package	Characteristics											VHF	UHF
		V_{DS}	I_D	I_{DSS} (mA)		$V_{(p)GS}$ (V)		|Yfs| (mS)		Cis (pF)	Cos (pF)	F @ 800 MHz		
		(V)	(mA)	Min	Max	Min	Max	Min	Max	Typ	Typ	Typ		
BF1204 [5]	SOT363	10	30	8	16	0.3	1.2 [1]	25		1.7	0.85	1.1	•	•
BF1205C [5] [6] [7]	SOT363	6 6	30 30	14 9	24 17	0.3 0.3	1 1	26 28	41 43	2.2 2	0.9 0.85	1.4 1.4	•	•
BF1205 [5] [6] [7]	SOT363	10 7	30 30	8 8	16 16	0.3 0.3	1 1	26 26	40 40	1.8 2	0.75 0.85	1.2 1.4	•	•
BF1206 [5]	SOT363	6 6	30 30	14 9	23 17	0.3 0.3	1 1	33 29	48 44	2.4 1.7	1.1 0.85	1.6 1.4	•	•
BF1206F [5]	SOT666	6 6	30 30	3 3	6.5 6.5	0.3 0.3	1 1	17 17	32 32	2.4 1.7	1.1 0.85	1.1 1.0	•	•
BF1207 [5] [7] [8]	SOT363	6 6	30 30	13 8	23 18	0.3 0.3	1 1	30 typ 32 typ		2.2 2	0.9 0.85	1.4 1.4	•	•
BF1208 [5] [6] [7]	SOT666	6 6	30 30	14 9	24 17	0.3 0.3	1 1	26 28	41 43	2.2 2	0.75 0.85	1.4 1.4	•	•
BF1208D [5] [6] [7]	SOT666	6 6	30 30	14 10	24 20	0.3 0.3	1 1	26 25	41 40	2.1 2.1	0.8 0.85	1.1 1.4	•	•
BF1210	SOT363	6 6	30 30	14 9	24 17	0.3 0.3	1 1	26 28	41 43	2.2 2	0.9 0.85	1.4 1.4	•	•
BF1211	SOT143	6	30	11	19	0.3	1	25	40	2.1	0.9	1.3	•	
BF1211R	SOT143R	6	30	11	19	0.3	1	25	40	2.1	0.9	1.3	•	
BF1211WR	SOT343	6	30	11	19	0.3	1	25	40	2.1	0.9	1.3	•	
BF1212	SOT143	6	30	8	16	0.3	1	28	43	1.7	0.9	1.1		•
BF1212R	SOT143R	6	30	8	16	0.3	1	28	43	1.7	0.9	1.1		•
BF1212WR	SOT343	6	30	8	16	0.3	1	28	43	1.7	0.9	1.1		•
BF1214	SOT363	6	30	13	23	0.3	1.0	25	35	2.2	0.9	1.4	•	•

[1] $V_{GS (th)}$
[2] Coss
[3] Cig

[4] Two equal dual-gate MOSFETs in one package
[5] Two low-noise gain amplifiers in one package

[6] Transistor A: fully internal bias, transistor B: partly internal bias
[7] Internal switching function

[8] Transistor A: partly internal bias, transistor B: fully internal bias

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CATV RF amplifiers

Product	Description	Freq range	Gain (dB)	Slope (dB)	FL (dB)	RL_{IN}/ RL_{OUT}	CTB	XMOD	CSO	@ Ch	@ Vo (dBmv)	F @ fmax	I_{tot} (mA)
Reverse hybrids													
BGY68	75-MHz, 30-dB gain reverse amplifier	5 – 75	29.2 – 30.8	–0.7	± 0.2	20/20	-68	-60		4	50	3.5	135
BGY66B	120-MHz, 25-dB gain reverse amplifier	5 – 120	24.5 – 25.5	–0.7	± 0.2	20/20	-66	-54		14	48	5	135
BGY67	200-MHz, 22-dB gain reverse amplifier	5 – 200	21.5 – 22.5	–0.7	± 0.2	20/20	-67	-60		22	50	5.5	230
40-to-550-MHz push-pulls													
BGY587B	550-MHz, 27-dB gain push-pull	40 – 550	26.2 – 27.8	0.5 – 2.5	± 0.4	20/20	-57	-60	-57	77	44	6.5	340
OM7650	550-MHz, 35.5-dB gain push-pull	40 – 550	33.2 – 35.5	0.2 – 2		10/10	-45		-57	77	44	8	340
BGY588C	550-MHz, 35.5-dB gain push-pull	40 – 550	33.2 – 35.5	0.2 – 1.7	± 0.5	16/16	-57		-62	77	44	8	345
BGY588N	550-MHz, 35.5-dB gain push-pull	40 – 550	33.5 – 35.5	0.5 – 1.5	± 0.4	20/20	-57	-59	-62	77	44	6	340
40-to-550-MHz power doubler													
BGD502	550-MHz, 18.5-dB gain power doubler	40 – 550	18 – 19	0.2 – 2.2	± 0.3	20/20	-65	-68	-62	77	44	8	435
40-to-600-MHz push-pulls													
BGY687	600-MHz, 21.5-dB gain push-pull	40 – 600	21 – 22	0.8 – 2.2	± 0.2	20/20	-54	-54	-52	85	44	6.5	240
40-to-750-MHz push-pulls													
BGY785A	750-MHz, 18.5-dB gain push-pull	40 – 750	18 – 19	0 – 2	± 0.3	20/20	-53	-56	-53	110	44	7	240
BGY787	750-MHz, 21.5-dB gain push-pull	40 – 750	21 – 22	0 – 1.5	± 0.5	20/20	-53	-52	-53	110	44	6.5	240
OM7670	750-MHz, 34.5-dB gain push-pull	40 – 750	33.2 – 35.2	0.1 – 4		10/8	-43		-54	110	44	8	340
BGE788	750-MHz, 34.5-dB gain push-pull	40 – 750	33.5 – 34.5	0.5 – 2.5	± 0.5	20/20	-49	-51	-52	110	44	7	320
BGE788C	750-MHz, 35.5-dB gain push-pull	40 – 750	33.2 – 35.2	0.3 – 2.3	± 0.6	16/16	-49		-52	110	44	8	325
40-to-750-MHz power doublers													
BGD712C	750-MHz, 18.5-dB gain power doubler	40 – 750	18.2 – 18.8	0.5 – 1.5	± 0.4	17/17	-62		-63	112	44	7	410
BGD712	750-MHz, 18.5-dB gain power doubler	40 – 750	18.2 – 18.8	0.5 – 1.5	± 0.35	23/23	-62	-63	-63	112	44	7	410
BGD704	750-MHz, 20-dB gain power doubler	40 – 750	19.5 – 20.5	0 – 2	± 0.5	20/20	-57	-61	-56	110	44	8.5	435
BGD714	750-MHz, 20.3-dB gain power doubler	40 – 750	20 – 20.6	0.5 – 1.5	± 0.35	23/23	-61	-62	-62	112	44	7	410
40-to-870-MHz push-pulls													
BGY885A	870-MHz, 18.5-dB gain push-pull	40 – 870	18 – 19	0 – 2	± 0.3	20/20	-61	-61	-61	49	44	8	240
BGY887	870-MHz, 21.5-dB gain push-pull	40 – 870	21 – 22	0.2 – 2	± 0.3	20/20	-55	-61	-57	129	40	6.5	235
CGY887A	870-MHz, 25.5-dB gain push-pull	40 – 870	25.2 – 25.8	0.5 – 1.4	± 0.5	20/21	-62	-56	-59	129	40	5	240

CATV RF amplifiers (continued)

Product	Description	Freq range	Gain (dB)	Slope (dB)	FL (dB)	RL_{IN}/RL_{OUT}	CTB	XMOD	CSO	@ Ch	@ Vo (dBmv)	F @ fmax	I_{tot} (mA)
BGY888	870-MHz, 34-dB gain push-pull	40 – 870	33.5 – 34.5	0.5 – 2.5	± 0.5	20/20	-60	-59	-55	49	44	7	340
CGY888C	870-MHz, 35-dB gain push pull	40 – 870	33.5 – 35.5	0.5 – 2.5	± 0.5	18/18	-66		-64	112	44	5	280
40-to-870-MHz power doublers													
BGD802	870-MHz, 18.5-dB gain power doubler	40 – 870	18 – 19	0.2 – 2	± 0.5	20/20	-54	-59	-56	129	44	9	410
BGD812	870-MHz, 18.5-dB gain power doubler	40 – 870	18.2 – 18.8	0.4 – 1.4	± 0.5	23/23	-58	-62	-60	132	44	7.5	410
BGD902	870-MHz, 18.5-dB gain power doubler	40 – 870	18.2 – 18.8	0.4 – 1.4	± 0.3	21/25	-58	-62	-58	129	44	8	435
CGD923	870-MHz, 19.5-dB gain power doubler	40 – 870	19.25 – 19.75	0 – 1	± 0.6	20/20	-56	-57	-54	132	48	5.5	475
BGD814	870-MHz, 20-dB gain power doubler	40 – 870	19.7 – 20.3	0.4 – 1.4	± 0.5	22/25	-57.5	-62	-59	132	44	7.5	410
BGD904	870-MHz, 20-dB gain power doubler	40 – 870	19.7 – 20.3	0.4 – 1.4	± 0.3	21/25	-57.5	-61	-58	129	44	7.5	435
CGD914	870-MHz, 20-dB gain power doubler	40 – 870	19.75 – 20.25	0.2 – 1.5	± 0.45	20/21	-59.5	-64	-50	132	44	4	375
BGD906	870-MHz, 21.5-dB gain power doubler	40 – 870	21.2 – 21.8	0.5 – 1.5	± 0.35	22/22	-57	-60	-54	129	44	7.5	435
CGD942C	870-MHz, 22-dB gain power doubler	40 – 870	20.5 – 22.5	1 – 2	± 0.5	18/18	-66	-58	-68	132	48	5	450
CGD944C	870-MHz, 24-dB gain power doubler	40 – 870	23 – 25	1 – 2	± 0.5	18/18	-66	-58	-68	132	48	5	450
CGD1042	1000-MHz, 22-dB gain power doubler	40 – 1000	20.5 – 22.5	1.5 – 2.5	± 0.3	17/17	-68	-64	-68	79	56.9	5	450
CGD1044	1000-MHz, 24-dB gain power doubler	40 – 1000	22.5 – 24.5	1.5 – 2.5	± 0.3	17/17	-68	-64	-68	79	56.9	5	450
CGD1042H	1000-MHz, 22-dB gain power doubler	40 – 1000	20.5 – 22.5	0 – 1	± 0.3	14/17	-65	-65	-65	79 + 75 [1]	59	7	450
CGD1044H	1000-MHz, 24-dB gain power doubler	40 – 1000	22.5 – 24.5	0 – 1	± 0.3	14/17	-65	-65	-65	79 + 75 [1]	59	7	450
40-to-1000-MHz push-pull													
BGY1085A	1000-MHz, 18.5-dB gain push-pull	40 – 1000	18 – 19	0 – 2	± 0.3	20/20	-53	-54	-56	150	44	7.5	240
CGY888C	1000-MHz, 34.5-dB gain push-pull	40 – 1000	33.5 – 35.5	0.5 – 2.5	± 0.5	18/18	-66		-64	112	44	50	280

This table is for reference only. For full data please refer to the latest datasheet. For availability please check the NXP sales office.

Description:
Freq range: Minimum and maximum frequencies in MHz at which data are characterized

@ Ch/@ Vo: Number of channels and the output voltage at which CTB, XM, CSO and d2 are characterized
@ fm: Measurement frequency
F: Noise figure in dB or noise in pA/Sqrt(Hz)
FL: Flatness

[1] Digital channels

These are NXP preferred types only. For a complete overview of our portfolio please visit: www.nxp.com/catv

CATV optical receivers

Product	Description	Freq range	Rmin (V/W)	Slope (dB)	FL (dB)	S22 (dB)	d3	d2	@ fm (MHz)	@ Pi (mW)	F @ fmax	I_{tot} (mA)
40-to-870-MHz forward path receivers												
BGO807	870-MHz optical receiver	40 – 870	800	0 – 2	1	11	-71	-55	854.5	1	8.5	205
BGO827	870-MHz optical receiver	40 – 870	800	0 – 2	1	11	-73	-57	854.5	1	9	205

This table is for reference only. For full data please refer to the latest datasheet. For availability please check the NXP sales office.

Description:
Freq range: Minimum and maximum frequencies in MHz at which data are characterized
@ fm: Measurement frequency

F: Noise figure in dB or noise in pA/Sqrt (Hz)
FL: Flatness

Optical networking

Product	Description	Data rate (Mbps)	Package	Bare die	Features			V_{CC}	Power dissipation
					Imod/Bias (mA)	Dual loop	Input		
TZA3047A	Laser driver	30 – 1250	HBCC32	•	100 – 100	•	CML/PECL	3.3 [1]	420
TZA3047B	Laser driver	30 – 1250	HBCC32	•	100 – 100	•	CML/PECL	3.3 [1]	420
TZA3050	Laser driver, burst mode	30 – 1250	HBCC32	•	100 – 100		CML/PECL	3.3 [1]	420
TZA3036	Transimpedance amplifier	0 – 155	die only	•	10	-40	50 Ω	3.3 [1]	50
TZA3026	Transimpedance amplifier	0 – 622	die only	•	67	-32	50 Ω	3.3 [1]	60
TZA3046	Transimpedance amplifier	0 – 1250	die only	•	130	-29	50 Ω	3.3 [1]	70
TZA3013	Transimpedance amplifier	0 – 2488	die only	•	425	-24	50 Ω	3.3 [1]	86

All figures given are typical at 25 °C.
Power dissipation is given for Vcc = 3.3 V.
Eq. sensitivity conditions: extinction ratio 10.
Responsivity diode = 0.85 A/W.

Bandwidth = 60% of data rate.
3.3 [1] means the output stage can drive 5-V laser applications.

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RF/IF mixers with VCO

Product	Package(s)	V_{CC} operating range (V)	I_{CC} max (mA)	RF input frequency typ (MHz)	LO frequency typ (MHz)	Mixer gain min/typ/max (dB)	LNA gain S21 typ (dB)	LNA input third-order intercept IIP3 typ/max (dBm)	LNA noise figure typ/max (dB)
SA601	DK (SSOP20)	2.7 – 5.5	7.4	800 – 1200	1200	18/19.5/21	11.5	-2.0/-0.5	1.6/1.9
SA620	DK (SSOP20)	2.7 – 5.5	10.4	800 – 1200	1200	14.5/16/17.5	11.5	-3.0/-1.5	1.6/1.9
SA612A/01	D (SO8) N (DIP8)	4.5 – 8.0	2.8	500	200	14/17/ –	No LNA	No LNA	No LNA
SA602A/01	D (SO8) N (DIP8)	4.5 – 8.0	2.8	500	200	14/17/ –	No LNA	No LNA	No LNA

Dual fractional-N PLL synthesizer

Product	Package	VDD operating range (analog & digital) (V)	IDD operating supply current typ (mA)	IDD (power-down mode) typ (µA)	Main VCO				Auxiliary VCO						Synthesizer phase noise			
					Input frequency range min/max (MHz)	Input signal level (AC-coupled) min/max (dBm) mVp-p	Nmain main divider ratio min/max	Phase comparator frequency max (MHz)	VCO input frequency range min/max (MHz)	Input signal level (AC-coupled) min/max (dBm) mVp-p	NAUX auxiliary divider ration min/max	Input frequency range min/max (MHz)	Input signal level (AC-coupled) min/max mVp-p	RREF reference divider ratio min/max	GSM [1]		TDMA [2]	
															f_{RF} = 1800 MHz 1-kHz offset (dBc/Hz)		f_{RF} = 800 MHz 1-kHz offset (dBc/Hz)	f_{RF} = 2100 MHz 1-kHz offset (dBc/Hz)
SA8027	DH (TSSOP20)	2.7 to 3.6	7.7	1	350/2500	-18/0	512/65535	4	100/550	-15/0	128/16383	5/40	360/1300	4/1023	-90	-83	-85	-77

[1] GSM f_{REF} = 13 MHz (TCXO), fCOMP = 1 MHz, f_{RF} = 900 MHz, 1-kHz offset (dBc/Hz)
[2] TDMA f_{REF} = 19.44 MHz (TCXO), fCOMP = 240 kHz

These are NXP preferred types only. For a complete overview of our portfolio please visit: www.nxp.com/rf

RF/IF systems

Product	Package	V_{CC} operating range (V)	IF 3-dB bandwidth (MHz)	-3 dB limiting	Fast RSSI	Muted and unmuted	Two audio outputs	RSSI dynamic range (dB)	RSSI accuracy (dB)	RSSI output at input of -68 dBm
SA604A/01	D (SO16)	4.5 – 8.0	41	-92 dBm	• [1]	•	•	90	±1.5	1.9/3.1
SA614A/01	D (SO16)	4.5 – 8.0	41	-92 dBm	• [1]	•	•	80	±2.0	1.7/3.3

[1] At 455-kHz IF: tr = 1.4 μs (typ), tf = 21.3 μs (typ), at 10.7-MHz IF: tr = 1.5 μs (typ), tf = 19.4 μs (typ)

Single pole double throw (SPDT) RF switches

Product	Package(s)	V_{DD} operating range (V)	I_{DD} max (μA)	Channel enable		Insertion loss, S21, S12 (ON channel)			Isolation S21, S12 (OFF channel)				Return loss S11, S22 (ON channel)		Return loss S11, S22 (OFF channel)		ON switching time (ns)	OFF switching time (ns)	P-1 dB DC - 1 GHz typ (dBm)	IP3 100 MHz typ (dBm)	IP2 100 MHz typ (dBm)	$Z_O = 50\ \Omega$	
				Logic 1 level (VIH)	Logic 0 level (VIL)	DC -100 MHz typ/max (dB)	500 MHz typ/max (dB)	900 MHz typ/max (dB)	10 MHz min/typ (dB)	100 MHz min/typ (dB)	500 MHz min/typ (dB)	900 MHz min/typ (dB)	DC - 400 MHz typ (dB)	900 MHz typ (dB)	DC - 400 MHz typ (dB)	900 MHz typ (dB)						100 MHz typ (dB)	900 MHz typ (dB)
SA630	D (SO8) UK (CSP8)	3.0 – 5.5	40/300	2.0/VDD	-0.3/0.8	1/–	1.4/–	2/2.8	70/80	–/60	–/50	–/30	20	12	17	13	20	20	18	+33	+52	1	2
SA58643 [1]	DP (TSSOP8)	3.0 – 5.5	40/300	2.0/VDD	-0.3/0.8	1/–	1.4/–	2/2.8	70/80	–/60	–/50	–/30	20	12	17	13	20	20	18	+33	+52	1	2

[1] Pin-compatible with Peregrine PE4231

UHF/900-MHz wireless transceiver

Product	Package	Supply voltage range (V)	Standby current (typ)(mA)	Receiver enabled supply current typ (mA)	Receiver/transmitter supply current typ (mA)	LNA/mixer voltage grain typ (dB)	IF/limiter gain typ (dB)	RSSI dynamic range typ (dB)	Coilless detector frequency range (MHz)	RF frequency range (MHz)	Reference oscillator frequency range (MHz)	Programmable clock divider with buffered output divide ratios	Image reject mixer	Tx & Rx VCOs use external inductors	Compander	Carrier detect/battery detect	Programmable data amplifier (slicer)	Microphone preamp	Modulation input	3-wire serial bus
SA58646	LQFP64 (BD)	2.9 – 5.5	1	55	72	22	90	68	7.0 – 15	300 – 1200	4.0 – 20	2, 2.5, 4, 1, 128	•	•	•	•	•	•	•	•

RF

Full single-conversion FM receivers

Product	Package(s)	V_{CC} operating range (V)	I_{CC} max (mA)	RF input frequency typ (MHz)	LO frequency typ (MHz)	RSSI dynamic range (dB)	IF 3-dB bandwidth (MHz)	12-dB SINAD sensitivity (dBm)	Audio amp feedback	Differential limiter outputs	Fast RSSI	Muted and unmuted	Power-down control	RSSI amp feedback	Two audio outputs
SA605/01	D (SO20) DK (SSOP20)	4.5 – 8.0	6.6	500	150	90	41	-120 [1]				•			•
SA606/01	D (SO20) DK (SSOP20)	2.7 – 6.0	4.2	150	150	90	5.5	-117 [1]	•					•	
SA607/01	DK (SSOP20)	2.7 – 6.0	4.2	150	150	90	5.5	-117 [1]		•				•	
SA608/01	DK (SSOP20)	2.7 – 6.0	4.2	150	150	90	5.5	-117 [1]		•			•		
SA615/01	D (SO20) DK (SSOP20)	4.5 – 8.0	7.4	500	150	80	41	-118 [1]				•			•
SA616/01	D (SO20) DK (SSOP20)	2.7 – 6.0	5	150	150	80	5.5	-117 [1]							
SA636/01	DK (SSOP20)	2.7 – 5.5	7.5	500	500	90	41	-106 [2]			• [5]		•		
SA639/01	DH (TSSOP24)	2.7 – 5.5	10	500	500	80	41	-85 [2]							
SA647	DH (TSSOP20)	2.7 – 5.5	7	200 max	200 max	85	2	N/A			• [4]		•		
SA676/01	D (SO20) DK (SSOP20)	2.7 – 6.0	5	100	100	70	5.5	-114 [1]							
SA58640	DK (SSOP20)	4.5 – 6.0	6	100	100	60	5.5	-110 [1]	•	•					
SA58641	DK (SSOP20)	4.5 – 5.5	8.5	500	500	70	41	-95 [3]			• [5]		•		
SA58670	HVQFN20	2.5 – 5.5	8.5	500	500	70	41	-95			•		•		
SA58671	CSP16	2.5 – 5.5	8.5	500	500	70	41	-95			•		•		

[1] 12-dB SINAD sensitivity (f_{RF} = 45 MHz, f_{IF} = 455 kHz, 1 kHz, ± 8 kHz Dev)

[2] 12-dB SINAD sensitivity (f_{RF} = 240 MHz, f_{IF} = 10.7 MHz, 1 kHz, ± 125 kHz Dev)

[3] 12-dB SINAD sensitivity (f_{RF} = 110.592 MHz, f_{IF} = 9.8 MHz)

[4] Fast RSSI @ -56-dBm RF level: tr = 1.2 us (typ), tf = 2.0 us (typ)

[5] Fast RSSI @ -45-dBm RF level: tr = 0.8 us (typ), tf = 2.0 us (typ)

RF POWER

RF power

HF, VHF, and UHF power transistors

Product	Package	Frequency band (MHz)	IMD3 intermodulation distortion (dBc)	Output power (W)	Voltage (V)	Power gain (dB)	Drain efficiency (%)	Application
UHF LDMOS (470 – 680 MHz)								
BLF878	SOT979A	470 – 860	-30	300	42	18	45	TV transmitter
BLF871	SOT467C	470 – 860	-30	100	42	18	45	TV transmitter
BLF872	SOT800A	470 – 860	-28	300	32	16.5	55	TV transmitter
BLF861A	SOT540A	470 – 860	-25	150	32	15	55	TV transmitter
BLF647	SOT540A	0 – 600	-30	150	32	16	55	Various, eg. military comms
BLF2045	SOT467C	0 – 2000	-25	30	26	> 10	> 30	Various
BLF1822-10	SOT467C	0 – 2200	-33	10	26	> 11	> 30	Various
BLF1043	SOT538A	0 – 960	-31	10	26	> 16	> 45	Various
UHF VDMOS (470 – 680 MHz)								
BLF548	SOT262A	500		150	28	11	55	Various, eg. PMR
BLF546	SOT268A	500		80	28	13	60	Various, eg. PMR
BLF544	SOT171A	500 – 960		20	28	14	60	Various, eg. PMR
BLF542	SOT171A	500		5	28	16.5	60	Various, eg. PMR
BLF404	SOT409	500		4	12.5	11.5	55	Various, eg. PMR
BLF521	SOT172D	500		2	12.5	13	60	Various, eg. PMR
VHF LDMOS (< 500 MHz)								
BLF574	SOT539A	170 – 230	-30	400	50	28	45	ISM, broadcast VHF transmitter
BLF573	SOT895A	225		300	50	28	68	ISM, broadcast VHF transmitter
BLF571	SOT467C	225		10	50	28	62	ISM, broadcast VHF transmitter
BLF647	SOT540A	600	-30	150	32	16	55	VHF transmitter
BLF369	SOT800A	500	-28	500	32	20	60	VHF transmitter

RF power

HF, VHF, and UHF power transistors (continued)

Product	Package	Frequency band (MHz)	IMD3 intermodulation distortion (dBc)	Output power (W)	Voltage (V)	Power gain (dB)	Drain efficiency (%)	Application
VHF VDMOS (< 500 MHz)								
BLF368	SOT262A	225		300	32	13.5	62	VHF transmitter
BLF278	SOT262A	225		250	50	16	55	VHF transmitter
BLF248	SOT262A	225		300	28	13	67	VHF transmitter
BLF177	SOT121B	28 – 108	-30	150	50	19	70	VHF transmitter
BLF147	SOT121B	28 – 108	-30	150	28	18	70	VHF transmitter
BLF246	SOT121B	108		80	28	18	65	VHF transmitter
BLF246B	SOT161A	175		60	28	19	65	VHF transmitter
BLF346	SOT119A	225	-52	30	28	16.5		VHF transmitter
BLF245B	SOT279A	175		30	28	18	65	VHF transmitter
BLF245	SOT123A	175		30	28	15.5	65	VHF transmitter
BLF175	SOT123A	28 – 108	-35	30	50	20	65	VHF transmitter
BLF244	SOT123A	175		15	28	17	65	VHF transmitter
BLF242	SOT123A	175		5	28	16	60	VHF transmitter
BLF404	SOT409A	500		4	12.5	11.5	55	VHF transmitter
BLF202	SOT409A	175		2	12.5	13	55	VHF transmitter
HF LDMOS (10 – 108 MHz)								
BLF647	SOT540A	600	-30	150	32	16	55	VHF transmitter
BLF369	SOT800A	500		500	32	20	60	VHF transmitter
HF VDMOS (10 – 108 MHz)								
BLF177	SOT121B	28 – 108	-30	150	50	19	70	HF transmitter
BLF175	SOT123A	28 – 108	-35	30	50	20	65	HF transmitter
BLF145	SOT123A	28	-35	30	28	27	40	HF transmitter
BLF242	SOT123A	175		5	28	16	60	HF transmitter
BLF202	SOT409A	175		2	12.5	13	55	HF transmitter

RF power

Avionics, L-band, and S-band radar power transistors

Product	Package	Frequency band (MHz)	Output power (W)	Voltage (V)	TP (us)	Duty cycle (%)	Power gain (dB)	Drain efficiency (N %)	Application(s)
Avionics LDMOS									
BLA0912-250	SOT502A	960 – 1215	250	36	100	10	13	45	TACAN, JTIDS, DME
BLA1011-300	SOT957A	1030 – 1090	300	32	50	2	16	55	TCAS, IFF, Mod-S
BLA1011-200	SOT502A	1030 – 1090	200	36	50	2	15	50	TCAS, IFF, Mod-S
BLA1011-10	SOT467C	1030 – 1090	10	36	50	2	18	50	TCAS, IFF, Mod-S
BLA1011-2	SOT538A	1030 – 1090	2	36	50	2	18		TCAS, IFF, Mod-S
Avionics bipolar									
MX0912B351Y	SOT439A	960 – 1215	375	50	10	10	7.5	45	TACAN, JTIDS, DME
MX0912B251Y	SOT439A	960 – 1215	275	50	10	10	7.5	45	TACAN, JTIDS, DME
MZ0912B100Y	SOT439A	960 – 1215	115	50	10	10	7.5	45	TACAN, JTIDS, DME
MZ0912B50Y	SOT439A	960 – 1215	60	50	10	10	8	45	TACAN, JTIDS, DME
L-band radar LDMOS									
BLL1214-250	SOT502A	1200 –1400	250	36	1000	10	13	50	L-band radar
BLL1214-35	SOT467C	1200 –1400	35	36	1000	10	14	45	L-band radar
L-band radar bipolar									
RX1214B300Y	SOT439A	1200 – 1400	250	50	150	5	8	40	L-band radar
S-band radar bipolar									
BLS2731-110	SOT423A	2700 – 3100	110	40	100	10	8	40	S-band radar
BLS2731-50	SOT422A	2700 – 3100	60	40	100	10	8	40	S-band radar
BLS2731-20	SOT445C	2700 – 3100	25	40	100	10	9	40	S-band radar
BLS3135-65	SOT422A	3100 – 3500	65	40	100	10	8	40	S-band radar
BLS3135-20	SOT422A	3100 – 3500	20	40	100	10	8	40	S-band radar
BLS3135-10	SOT445C	3100 – 3500	10	40	100	10	9	40	S-band radar
S-band radar LDMOS									
BLS6G2731(S)-120	SOT502A/B	2700 – 3100	120	32	200	10	13.5	48	S-band radar
BLS6G2731(S)-6G	SOT975C	2700 – 3100	6	32	200	10	15	45	S-band radar
BLS2933-100	SOT502A	2900 – 3300	100	32	200	12	7	37	S-band radar
BLS6G3135(S)-120	SOT502A/B	3100 – 3500	120	32	300	10	11	43	S-band radar
BLS6G3135(S)-20	SOT608A/B	3100 – 3500	20	32	300	10	15.5	45	S-band radar

RF power

1-GHz basestations

Product	Package	Matching (input/output)	Mode of operation	Frequency band (min – max) (MHz)	Output power (W)	Power gain (dB)	Efficiency (%)	Intermodulation distortion - IM3 (dBc)	Adjacent channel leakage ratio - ACLR (dBc)	Adjacent channel power ratio @ 400kHz - ACPR400 (dBc)	Adjacent channel power ratio @ 600kHz - ACPR600 (dBc)	Error vector magnitude - EVM (%)	Thermal resistance - Rth (K/W)
Finals													
BLF6G10LS-200	SOT502B	I	W-CDMA/UMTS	800 – 1000	40	20	27		-39				0.35
BLF6G10-200	SOT502A	I	W-CDMA/UMTS	800 – 1000	40	20	27		-39				
BLC6G10LS-200	SOT896-1	I	W-CDMA/UMTS	800 – 1000	40	20	27		-39				0.35
BLC6G10-200	SOT895-1	I	W-CDMA/UMTS	800 – 1000	40	20	27		-39				
BLF6G10LS-160	SOT502B	I	W-CDMA/UMTS	800 – 1000	32	23	28		-40				0.43
BLF6G10-160	SOT502A	I	W-CDMA/UMTS	800 – 1000	32	23	28		-40				0.55
BLC6G10LS-160	SOT896-1	I	W-CDMA/UMTS	800 – 1000	32	23	28		-40				0.43
BLC6G10-160	SOT895-1	I	W-CDMA/UMTS	800 – 1000	32	23	28		-40				0.55
BLF4G10LS-160	SOT502B	I	CW EDGE	800 – 1000	200 80	19.0 19.7	59 41.5			-61	-72	2.6	0.49
BLF4G10-160	SOT502A	I	CW EDGE	800 – 1000	200 80	19.0 19.7	59 41.5			-61	-72	3	0.55
BLF4G10LS-120	SOT502B	I	CW EDGE	800 – 1000	120 50	19	57 41			-64	-75	1.5	0.55
BLF4G10S-120	SOT502B	I	CW EDGE	800 – 1000	120 50	19	57 41			-64	-75	1.5	0.65
BLF4G10-120	SOT502A	I	CW EDGE	800 – 1000	120 50	19	57 41			-64	-75	1.5	0.76
Drivers													
BLF6G10S-45	SOT608B	I/O	CW W-CDMA	800 – 1000	45 1	20 21	60 6		-50				1.70
BLF6G10-45	SOT608A	I/O	CW W-CDMA	800 – 1000	45 1	16 17	60 16		-50				1.70
BLF6G21-15	SOT538A		CW	800 – 4000	15		10	-45	-48				

1-GHz basestations (continued)

Product	Package	Matching (input/output)	Mode of operation	Frequency band (min – max) (MHz)	Output power (W)	Power gain (dB)	Efficiency (%)	Intermodulation distortion - IM3 (dBc)	Adjacent channel leakage ratio - ACLR (dBc)	Adjacent channel power ratio @ 400kHz - ACPR400 (dBc)	Adjacent channel power ratio @ 600kHz - ACPR600 (dBc)	Error vector magnitude - EVM (%)	Thermal resistance - Rth (K/W)
BLF6G21-6	SOT538A		CW	800-4000	6		10	-45	-48				
BLF3G21-30	SOT467C		2-Tone PHS class A	HF – 2200	30 9	13.5 16	35 20	-26			-75		1.60
BLF3G21-6	SOT538A		2-Tone PHS class A	HF – 2200	6 2	13.5 16	35 20	-23			-75		10
BLF1046	SOT467C		CW	HF – 1000	50	16	60						1.87
BLF1822-10	SOT467C		CW	HF – 2200	12	13	40						5
BLF1043	SOT538A		CW	HF – 1000	10	18.5	55						9
BGF802-20	SOT365C		CW CDMA	869 - 894	25 3	30	50 18		-69				
BGF844	SOT365C		CW EDGE	869 - 894	23 2.5	30	50 16			-65		0.4	
BGF944	SOT365C		CW EDGE	920 - 960	17 2.5	30	50 16			-65		0.4	

RF power

2-GHz basestations

Product	Package	Matching (input/output)	Mode of operation	Frequency band (min – max) (MHz)	Output power (W)	Power gain (dB)	Efficiency (%)	Intermodulation distortion -IM3 (dBc)	Adjacent channel leakage ratio - ACLR (dBc)	Adjacent channel power ratio @ 400kHz - ACPR400 (dBc)	Adjacent channel power ratio @ 600kHz - ACPR600 (dBc)	Error vector magnitude - EVM (%)	Thermal resistance - Rth (K/W)
Finals													
BLF6G20-180P	SOT539A	I/O	W-CDMA/UMTS	1800 – 2000	50	17.5	27.5		-35				0.45
BLF6G20LS-180	SOT502B	I/O	IS-95	1800 – 2000	35.5	16.5	27						0.35
BLF6G20-180	SOT502A	I/O	IS-95	1800 – 2000	35.5	16.5	27						
BLF6G20LS-140	SOT896-1	I/O	W-CDMA/UMTS	1800 – 2000	35.5	16.5	31	-37	-40				0.43
BLF6G20-140	SOT895-1	I/O	W-CDMA/UMTS	1800 – 2000	35.5	16.5	31	-37	-40				
BLF6G20LS-110	SOT502B	I/O	W-CDMA/UMTS	1800 – 2000	25	18	32	-37	-40				0.45
BLF6G20-110	SOT502A	I/O	W-CDMA/UMTS	1800 – 2000	25	18	32	-37	-40				
BLC6G20LS-110	SOT896-1	I/O	W-CDMA/UMTS	1800 – 2000	25	18	32	-37	-40				0.45
BLC6G20-110	SOT895-1	I/O	W-CDMA/UMTS	1800 – 2000	25	18	32	-37	-40				0.55
BLF6G20LS-75	SOT502B	I/O	CW EDGE	1800 – 2000	63 29.5	19 19	52 38.5			-61.5	-73		0.75
BLF6G20-75	SOT502A	I/O	CW EDGE	1800 – 2000	63 29.5	19 19	52 38.5			-61.5	-73		
BLC6G20LS-75	SOT896-1	I/O	CW EDGE	1800 – 2000	63 29.5	19 19	52 38.5			-62.5	-72	1.5	
BLC6G20-75	SOT895-1	I/O	CW EDGE	1800 – 2000	63 29.5	19 19	52 38.5			-62.5	-72	1.5	
BLF4G20LS-130	SOT502B	I/O	CW EDGE	1800 – 2000	130 60	14.5 14.8	50 36			-62	-73	2.1	0.49
BLF4G20LS-110B	SOT502B	I/O	CW EDGE	1800 – 2000	110 48	13.4 13.8	49 38.5			-61	-74	2.1	0.62
BLF4G20-110B	SOT502A	I/O	CW EDGE	1800 – 2000	100 48	13.4 13.8	49 38.5			-61	-74	2.1	0.76

RF power

2-GHz basestations (continued)

Product	Package	Matching (input/output)	Mode of operation	Frequency band (min – max) (MHz)	Output power (W)	Power gain (dB)	Efficiency (%)	Intermodulation distortion -IM3 (dBc)	Adjacent channel leakage ratio - ACLR (dBc)	Adjacent channel power ratio @ 400kHz - ACPR400 (dBc)	Adjacent channel power ratio @ 600kHz - ACPR600 (dBc)	Error vector magnitude - EVM (%)	Thermal resistance - Rth (K/W)
Drivers													
BLF6G20S-45	SOT608B	I/O	W-CDMA/UMTS	1800 – 2000	2.5	18.5	13		-49				1.70
BLF6G20-45	SOT608A	I/O	W-CDMA/UMTS	1800 – 2000	2.5	18.5	13		-49				1.70
BLF6G20S-40	SOT608B	I/O	W-CDMA/UMTS	1800 – 2000	2.5	19	13		-49				1.70
BLF6G20-40	SOT608A	I/O	W-CDMA/UMTS	1800 – 2000	2.5	19	13		-49				1.70
BLF6G21-15	SOT538A		CW	800 – 4000	15		10	-45	-48				
BLF6G21-6	SOT538A		CW	800 – 4000	6		10	-45	-48				
BLF3G21-30	SOT467C		2-Tone PHS class A	HF – 2200	30 9	13.5 16	35 20	-26			-75		1.60
BLF3G21-6	SOT538A		2-Tone PHS class A	HF – 2200	6 2	13.5 16	35 20	-23			-75		10
BLF2045	SOT467C		CW	1800 – 2200	30	11	30						2.10
BLF1822-10	SOT467C		CW	HF – 2200	12	13	40						5
BLF2043	SOT538A		CW	HF – 2200	12	12	40						9
BLF2043F	SOT467C		CW	HF – 2200	10	12	30						5
BGF1801-10	SOT365C		CW EDGE	1805 – 1880	10 3.5	26	35 20			-63		1.2	

RF power

2.2-GHz basestations

Product	Package	Matching (input/output)	Mode of operation	Frequency band (min – max) (MHz)	Output power (W)	Power gain (dB)	Efficiency (%)	Intermodulation distortion - IM3 (dBc)	Adjacent channel leakage ratio - ACLR (dBc)	Adjacent channel power ratio @ 400kHz - ACPR400 (dBc)	Adjacent channel power ratio @ 600kHz - ACPR600 (dBc)	Error vector magnitude - EVM (%)	Thermal resistance - Rth (j-c)
Finals													
BLF6G22-180PN	SOT539A	I/O	W-CDMA/UMTS	2000 – 2200	50	17.5	27.5		-35				0.45
BLF6G22LS-180	SOT502B	I/O	IS-95	2000 – 2200	40	16	27						0.35
BLF6G22-180	SOT502A	I/O	IS-95	2000 – 2200	40	16	27						
BLF6G22LS-130	SOT502B	I/O	W-CDMA/UMTS	2000 – 2200	30	17	28.5	-37	-40				0.43
BLF6G22LS-100	SOT502B	I/O	W-CDMA/UMTS	2000 – 2200	25	18	32	-37	-40				0.45
BLF6G22-100	SOT502A	I/O	W-CDMA/UMTS	2000 – 2200	25	18	32	-37	-40				
BLF4G22LS-130	SOT502B	I/O	W-CDMA/UMTS	2000 – 2200	33	13.5	26	-37	-41				0.50
BLF4G22-130	SOT502A	I/O	W-CDMA/UMTS	2000 – 2200	33	13.5	26	-37	-41				0.56
BLF4G22S-100	SOT502B	I/O	W-CDMA/UMTS	2000 – 2200	26	13.5	26	-37	-41				0.76
BLF4G22-100	SOT502A	I/O	W-CDMA/UMTS	2000 – 2200	26	13.5	26	-37	-41				0.76
Drivers													
BLF6G22S-45	SOT608B	I/O	W-CDMA/UMTS	2000 – 2200	2.5	18.5	13		-49				1.70
BLF6G22-45	SOT608A	I/O	W-CDMA/UMTS	2000 – 2200	2.5	18.5	13		-49				1.70
BLM6G22-30G	SOT822-1	I/O	W-CDMA/UMTS	2100 – 2200	2	27	11	-50	-52				2
BLM6G22-30	SOT834-1	I/O	W-CDMA/UMTS	2100 – 2200	2	27	11	-50	-52				2
BLF6G21-15	SOT538A		CW	800 – 4000	15		10	-45	-48				
BLF3G22-30	SOT608A	I/O	2-Tone PHS class A W-CDMA/UMTS	2000 – 2200	30 10 6.5	14 16 15	34 20 21	-38	-42				1.85

Continued next page

RF power

2.2-GHz basestations (continued)

Product	Package	Matching (input/output)	Mode of operation	Frequency band (min – max) (MHz)	Output power (W)	Power gain (dB)	Efficiency (%)	Intermodulation distortion - IM3 (dBc)	Adjacent channel leakage ratio - ACLR (dBc)	Adjacent channel power ratio @ 400kHz - ACPR400 (dBc)	Adjacent channel power ratio @ 600kHz - ACPR600 (dBc)	Error vector magnitude - EVM (%)	Thermal resistance - Rth (j-c)
BLF3G21-30	SOT467C		2-Tone PHS class A	HF – 2200	30 9	13.5 16	35 20	-26			-75		1.60
BLF3G21-6	SOT538A		2-Tone PHS class A	HF – 2200	6 2	13.5 16	35 20	-23			-75		10
BLF1822-10	SOT467C		CW	HF – 2200	12	13	40						5
BLF2043	SOT538A		CW	HF – 2200	12	12	40						9
BLF2043F	SOT467C		CW	HF – 2200	10	12	30						5

Radio ICs for FM, RDS, AM/FM

Product	Description	Package(s)	Number of external components	Required PCB area	Clock frequency	Interface bus	Current consumption
TEA5767	FM radio	HVQFN40 (6 x 6 mm)	25	150 mm^2	32.768 kHz or 13 MHz	I^{2}C-bus or 3-wire	12 mA
TEA5761	FM radio	WL-CSP (3.5 x 3.5 mm)	14	45 mm^2	32.768 kHz	I^{2}C-bus	14 mA
TEA5763	FM radio	HVQFN32 (5 x 5 mm)	10	60 mm^2	32.768 kHz	I^{2}C-bus	15 mA
TEA5764	FM stereo + RDS	HVQFN40 (6 x 6 mm) and WL-CSP (4 x 4 mm)	22	70 mm^2	32.768 kHz	I^{2}C-bus	14 mA
TEA5777	FM stereo + AM	HVQFN48 (7 x 7 mm) and LQFP32 (9 x 9 mm)	25	200 mm^2	4 MHz or 13 MHz	I^{2}C-bus or 3-wire	10 mA (AM) 14 mA (FM)
TEA5760	FM radio	WL-CSP (3 x 2.9 mm)	10	32 mm^2	32.768 kHz	I^{2}C-bus	15 mA
TEA5766	FM stereo + RDS	WL-CSP (3.3 x 3.4 mm)	10	35 mm^2	32.768 kHz	I^{2}C-bus + 3-wire SPI	15 mA

RF power

WiMAX

Product	Package	Matching (I/O)	Mode of operation	Frequency band (min – max)	Output power	Power gain	Efficiency	Adjacent channel leakage ratio-ACLR
WiMAX 2500 - 2700 MHz								
BLC6G27LS-100	SOT896B	I/O	IS-95	2500 – 2700	14	17	24	-47
BLC6G27-100	SOT895A	I/O	IS-95	2500 – 2700	14	17	24	-47
BLF6G27LS-135	SOT502B	I/O	IS-95	2500 – 2700	19	16.5	24	-47
BLF6G27-135	SOT502A	I/O	IS-95	2500 – 2700	19	16.5	24	-47
BLF6G27S-45	SOT608B	I/O	IS-95	2500 – 2700	7	17	25	-47
BLF6G27-45	SOT608A	I/O	IS-95	2500 – 2700	7	17	25	-47
BLF6G27-10	SOT975B	I	IS-95	2500 – 2700	2	15	22	-47
BLF6G27-10G	SOT975C	I	IS-95	2500 – 2700	2	15	22	-47
WiMAX 3400 - 3800 MHz								
BLF6G38LS-100	SOT502B	I/O	IS-95	3400 – 3800	18.5	13	23	-47
BLF6G38-100	SOT502A	I/O	IS-95	3400 – 3800	18.5	13	23	-47
BLF6G38LS-50	SOT502B	I/O	IS-95	3400 – 3800	9	14	25	-47
BLF6G38-50	SOT502A	I/O	IS-95	3400 – 3800	9	14	25	-47
BLF6G38-10G	SOT975C	I	IS-95	3400 – 3800	2	13	20	-47
BLF6G38S-25	SOT608B	I/O	IS-95	3400 – 3800	5	15	27	-47
BLF6G38-25	SOT608A	I/O	IS-95	3400 – 3800	5	15	27	-47
BLF6G38-10	SOT975B	I	IS-95	3400 – 3800	2	13	20	-47

Note: IS-95 signal with pilot, paging, sync and 6 traffic channels (Walsh codes 8-13). PAR=9.7dB @ 0.01% probability on the CCDF

SMALL-SIGNAL

Small-signal discretes

BISS loadswitches

Package				SOT96 (SO8)	SOT457 (SC-74)	SOT363 (SC-88)	SOT666
Size (mm)				4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55
P_{tot} (mW)				1500 [1]	600 [1]	300 [2]	300 [2]
V_{CEO} (V)	I_C (A)	V_{CEsat} max (mV) @ I_C = 0.5 A	R1, R2 (kΩ)				
15	0.5	250	2.2			PBLS1501Y	PBLS1501V
			4.7			PBLS1502Y	PBLS1502V
			10			PBLS1503Y	PBLS1503V
			22			PBLS1504Y	PBLS1504V
40	0.5	350	2.2			PBLS4001Y	PBLS4001V
			4.7			PBLS4002Y	PBLS4002V
			10			PBLS4003Y	PBLS4003V
			22			PBLS4004Y	PBLS4004V
			47			PBLS4005Y	PBLS4005V
20	1	150	2.2		PBLS2001D		
			4.7		PBLS2002D		
			10		PBLS2003D		
			22		PBLS2004D		
40	1	170	2.2		PBLS4001D		
			4.7		PBLS4002D		
			10		PBLS4003D		
			22		PBLS4004D		
			47		PBLS4005D		
60	1	180	2.2		PBLS6001D		
			4.7		PBLS6002D		
			10		PBLS6003D		
			22		PBLS6004D		
			47		PBLS6005D		
20	3	75	2.2	PBLS2001S			
			4.7	PBLS2002S			
			10	PBLS2003S			

[1] Device mounted on a ceramic PCB, Al_2O_3, standard footprint
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint

Small-signal discretes

MEGA Schottky diodes/BISS transistor modules

Package							SOT457 (SC-74)	SOT353 (SC-88A)
Size (mm)							2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95
P_{tot} (mW)							500	250
Configuration								NPN
Transistor			Schottky rectifier					
V_{CEO} max (V)	I_C max (A)	V_{CEsat} max (mV)	I_F max (A)	V_R max (V)	V_F max (mV)			
15	0.5	250	0.5	20	390			PMEM1505NG
40	1.0	210	1	20	550		PMEM4010ND	
	2.0	400	1	20	550		PMEM4020ND	
				40	640		PMEM4020AND	
	3.0	370	1	40	500			
Configuration								PNP
15	0.5	250	0.5	20	390			PMEM1505PG
40	1.0	410	1	20	550		PMEM4010PD	
	2.0	530	1	20	550		PMEM4020PD	
				40	640		PMEM4020APD	
	3.0	390	1	40	500			

Matched-pair transistors

Package							SOT143B	SOT457 (SC-74)	SOT353 (SC-88A)	SOT363 (SC-88)	SOT666
Size (mm)							2.9 x 1.3 x 1.0	2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.6 x 1.2 x 0.55
P_{tot} (mW)							250	380	300	300	300
Polarity	V_{CEO} (V)	I_C (mA)	h_{FE} min	h_{FE} max	h_{FE1}/h_{FE2}	V_{BE1}-V_{BE2} (mV)					
NPN	30	100	110	800	0.7 [1]	n.a.	BCV61/A/B/C [1]				
	45	100	200	450	0.9 [1]	2	BCM61B [1]	BCM847DS		BCM847BS	BCM847BV
					0.95	2			PMP4501G	PMP4501Y	PMP4501V
					0.98	2			PMP4201G	PMP4201Y	PMP4201V
PNP	30	100	100	800	0.7 [1]	n.a.	BCV62/A/B/C [1]				
	45	100	200	450	0.9 [1]	2	BCM62B [1]	BCM857DS		BCM857BS	BCM857BV
					0.95	2			PMP5501G	PMP5501Y	PMP5501V
					0.98	2			PMP5201G	PMP5201Y	PMP5201V

[1] I_{C1}/I_{E2}

Small-signal discretes

MOSFET driver transistors

Package			SOT457 (SC-74)	SOT346 (SC-59A)	SOT457 (SC-74)		SOT457 (SC-74)
Size (mm)			2.9 x 1.5 x 1.0	2.9 x 1.5 x 1.15	2.9 x 1.5 x 1.0		2.9 x 1.5 x 1.0
P_{tot} (mW)			600	250	600		600
Contains	I_C (A)	I_{CM} (A)			R1 = R2 (kΩ)		
General-purpose transistors	0.1	0.2	PMD9050D	PMD4001K (NPN)		PMD9010D	BCV65 (SOT143B)
				PMD5001K (PNP)	2.2	PMD9001D	
					4.7	PMD9002D	
					10	PMD9003D	
Switching transistors: reduced storage time	0.6	1.0		PMD4002K (NPN)			PMD2001D
				PMD5002K (PNP)			
Low V_{CEsat} (BISS) transistors: Low V_{CEsat}, high h_{FE} and I_C	1.0	2.0		PMD4003K (NPN)			PMD3001D
				PMD5003K (PNP)			

Low-capacitance Schottky diodes

V_R max (V)	I_F max (mA)	V_F max (mV)	@ I_F (mA)	C_d max (pF) @ V_R = 0 V	Package	SOT23	SOT323 (SC-70)	SOT363 (SC-88)	SOD323 (SC-76)	SOT666	SOD523 (SC-79)	SOD882
						Plastic SMD	Plastic SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic flat lead SMD	Leadless micro package
					Size (mm)	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
4	30	450	1	1	Single	BAT17			1PS76SB17		1PS79SB17	
					Triple isolated					1PS66SB17		
					Dual series	PMBD353 PMBD354 [1]						
15	30	340	1	1	Single		1PS70SB82					1PS10SB82
					Triple isolated			1PS88SB82		1PS66SB82		
					Dual series		1PS70SB84					
					Dual c.c.		1PS70SB85					
					Dual c.a.		1PS70SB86					

[1] diodes have matched capacitance

Small-signal discretes

Medium-power Schottky rectifiers ≥ 200 mA

I_F max (A)	V_R max (V)	V_F max (mV) @ I_F max	I_R max (mA) @ V_R max	Optimization	Package	SOT223 (SC-73)	SOD87 (Melf)	SOT457 (SC-74)	SOT23	SOD123W	SOD123F	SOT323 (SC-70)	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	SOD882
						Plastic SMD	Glass SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic flat lead SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic SMD	Plastic flat lead SMD	Leadless micro package
					Size (mm)	6.5 x 3.5 x 1.65	3.5 x 2.05 x 2.05	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.6 x 1.7 x 1.0	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
					P_{tot} (mW)	1500	1000	500	250	900	830	250	400	830	300	500	250
0.2	30	480	0.05	Low V_F/ low I_R	Single											PMEG3002AEB	PMEG3002AEL
				Low V_F/ low I_R	Dual isolated										PMEG3002TV		
	40	600	0.01	Low V_F/ low I_R	Single											PMEG4002EB	PMEG4002EL
	60	600	0.1	Low V_F/ low I_R	Single											PMEG6002EB	
				Low V_F/ low I_R	Dual isolated										PMEG6002TV		
0.5	20	390	0.2	Low V_F/ low I_R	Single				PMEG2005ET		PMEG2005EH		PMEG2005AEA	PMEG2005EJ	PMEG2005AEV		
		440	1.5	Very low V_F	Single												PMEG2005AEL
		480	0.03	Low V_F/ low I_R	Single											PMEG2005EB	
		500	0.03	Very low I_R	Single												PMEG2005EL
	30	430	0.15	Low V_F/ low I_R	Single				PMEG3005ET		PMEG3005EH		PMEG3005AEA	PMEG3005EJ	PMEG3005AEV		
		500	0.5	Low V_F/ low I_R	Single											PMEG3005EB	PMEG3005EL
	40	470	0.1	Low V_F/ low I_R	Single				PMEG4005ET		PMEG4005EH		PMEG4005AEA	PMEG4005EJ	PMEG4005AEV		
		550	0.1	Low V_F/ low I_R	Single				BAT720			1PS70SB20					

Medium-power Schottky rectifiers ≥ 200 mA (continued)

I_F max (A)	V_R max (V)	V_F max (mV) @ I_F max	I_R max (mA) @ V_R max	Optimization	Package	SOT223 (SC-73)	SOD87 (Melf)	SOT457 (SC-74)	SOT23	SOD123W	SOD123F	SOT323 (SC-70)	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	SOD882
						Plastic SMD	Glass SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic flat lead SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic SMD	Plastic flat lead SMD	Leadless micro package
					Size (mm)	6.5 x 3.5 x 1.65	3.5 x 2.05 x 2.05	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.6 x 1.7 x 1.0	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
					P_{tot} (mW)	1500	1000	500	250	900	830	250	400	830	300	500	250
1.0	20	430	0.2	Very low V_F	Single				PMEG2010AET		PMEG2010AEH						
		450	1.0	Very low V_F	Single		PRLL5817										
		500	0.2	Low V_F/low I_R	Single				PMEG2010ET		PMEG2010EH		PMEG2010BEA	PMEG2010EJ	PMEG2010BEV		
		550	0.1	Very low I_R	Single								PMEG2010EA	PMEG2010AEJ	PMEG2010EV		
		620	1.5	Low V_F/low I_R	Single											PMEG2010AEB	
	25	450	1.0	Very low V_F	Single			1PS74SB23									
					Dual series	BAT120S											
					Dual c.c.	BAT120C											
					Dual c.a.	BAT120A											
	30	540	0.1	Very low I_R	Single						PMEG3010CEH			PMEG3010CEJ			
		550	1	Very low I_R	Single		PRLL5818										
		560	0.15	Low V_F/low I_R	Single				PMEG3010ET		PMEG3010EH		PMEG3010BEA	PMEG3010EJ	PMEG3010BEV		
		680	0.5	Low V_F/low I_R	Single											PMEG3010EB	
	40	510	0.1	Very low V_F	Single					PMEG4010ER							
		600	1.0	Very low V_F	Single		PRLL5819										
		640	0.1	Low V_F/low I_R	Single				PMEG4010ET		PMEG4010EH		PMEG4010BEA	PMEG4010EJ	PMEG4010BEV		
		600	0.1	Very low I_R	Single						PMEG4010CEH			PMEG4010CEJ			
	60	650	0.35	Low V_F/low I_R	Single			PMEG6010AED									
					Dual series	BAT160S											
					Dual c.c.	BAT160C											
					Dual c.a.	BAT160A											
		710	0.1	Very low I_R	Single						PMEG6010CEH			PMEG6010CEJ			
1.5	20	660	0.2	Low V_F/low I_R	Single						PMEG2015EH		PMEG2015EA	PMEG2015EJ	PMEG2015EV		
	30	500	1.0	Very low V_F	Single						PMEG3015EH			PMEG3015EJ	PMEG3015EV		

Continued next page

Small-signal discretes

Medium-power Schottky rectifiers ≥ 200 mA (continued)

I_F max (A)	V_R max (V)	V_F max (mV) @ I_F max	I_R max (mA) @ V_R max	Optimization	Package	SOT223 (SC-73)	SOD87 (Melf)	SOT457 (SC-74)	SOT23	SOD123W	SOD123F	SOT323 (SC-70)	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	SOD882
						Plastic SMD	Glass SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic flat lead SMD	Plastic SMD	Plastic SMD	Plastic flat lead SMD	Plastic SMD	Plastic flat lead SMD	Leadless micro package
					Size (mm)	6.5 x 3.5 x 1.65	3.5 x 2.05 x 2.05	2.9 x 1.5 x 1.0	2.9 x 1.3 x 1.0	2.6 x 1.7 x 1.0	2.6 x 1.6 x 1.1	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95	1.7 x 1.25 x 0.7	1.6 x 1.2 x 0.55	1.2 x 0.8 x 0.6	1.0 x 0.6 x 0.5
					P_{tot} (mW)	1500	1000	500	250	900	830	250	400	830	300	500	250
2.0	10	460	3.0	Low V_F/low I_R	Single						PMEG1020EH		PMEG1020EA	PMEG1020EJ	PMEG1020EV		
	20	525	0.2	Very low V_F	Single						PMEG2020EH		PMEG2020AEA	PMEG2020EJ			
	30	620	1.0	Very low V_F	Single						PMEG3020EH			PMEG3020EJ			
	40	500	0.1	Very low V_F	Single					PMEG4020ER							
3.0	10	530	3.0	Very low V_F	Single						PMEG1030EH			PMEG1030EJ			
	40	550	0.1	Very low V_F	Single					PMEG4030ER							

Small-signal discretes

ESD protection diodes, very low capacitance < 25 pF

Number of protected lines uni-	bi-directional	I_{RM} max (µA)	@ V_{RWM} (V)	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	Product	Package	Size (mm)
1		2	3.3	0.6	80	30	PESD3V3U1UT	SOT23	2.9 x 1.3 x 1.0
		1	5	0.6	80	30	PESD5V0U1UT		
		0.05	12	0.6	200	30	PESD12VU1UT		
		0.05	15	0.6	200	30	PESD15VU1UT		
		0.05	24	0.6	200	23	PESD24VU1UT		
	1	0.1	5	2.9	25	10	PESD5V0U1BA	SOD323 (SC-76)	1.7 x 1.25 x 0.95
		0.1	5	2.9	25	10	PESD5V0U1BB	SOD523 (SC-79)	1.2 x 0.8 x 0.6
		0.1	5	2.9	25	10	PESD5V0U1BL	SOD882	1.0 x 0.6 x 0.5
		0.05	15 (diode 1) / 24 (diode 2)	13	160	23	PESD1LIN	SOD323 (SC-76)	1.7 x 1.25 x 0.95
2	1	0.3	3.3	22	30	15	PESD3V3L2UM	SOT883 (SC-101)	1.0 x 0.6 x 0.5
		0.025	5	16	30	15	PESD5V0L2UM		
	2	0.1	5	2.8	25	10	PESD5V0U2BT	SOT23	2.9 x 1.3 x 1.0
		0.05	24	11	200	23	PESD1CAN		
		0.01	24	25	230	30	PESD2CAN		
		0.05	24	11 [3]	200	23	PESD1FLEX		

[1] 8/20-µs surge pulse according to IEC 61000-4-5
[2] according to IEC 61000-4-2 (contact discharge)
[3] $f = 5$ MHz; $V_R = 0$ V

Small-signal discretes

ESD protection diodes, very low capacitance < 25 pF (continued)

Number of protected lines uni-directional	bi-directional	I_{RM} max (µA)	@ V_{RWM} (V)	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	Product	Package	Size (mm)
4	3	0.3	3.3	22	30	20	PESD3V3L4UF	SOT886 (XSON6)	1.45 x 1.0 x 0.5
		0.025	5	16	30	20	PESD5V0L4UF		
		0.3	3.3	15	16	10	PESD3V3V4UF		
		0.025	5	12	16	10	PESD5V0V4UF		
		0.3	3.3	22	30	20	PESD3V3L4UG	SOT353 (SC-88A)	2.0 x 1.25 x 0.95
		0.025	5	16	30	20	PESD5V0L4UG		
		0.3	3.3	15	16	10	PESD3V3V4UG		
		0.025	5	12	16	10	PESD5V0V4UG		
		0.3	3.3	22	30	20	PESD3V3L4UW	SOT665	1.6 x 1.2 x 0.55
		0.025	5	16	30	20	PESD5V0L4UW		
		0.3	3.3	15	16	10	PESD3V3V4UW		
		0.025	5	12	16	10	PESD5V0V4UW		
	4	0.01	5	16		8	IP4043CX5/LF	5-ball CSP	1.12 x 1.12 x 0.65
5	4	0.3	3.3	22	25	20	PESD3V3L5UF	SOT886 (XSON6)	1.45 x 1.0 x 0.5
		0.025	5	16	25	20	PESD5V0L5UF		
		0.3	3.3	22	25	20	PESD3V3L5UY	SOT363 (SC-88)	2.0 x 1.25 x 0.95
		0.025	5	16	25	20	PESD5V0L5UY		
		0.3	3.3	22	25	20	PESD3V3L5UV	SOT666	1.6 x 1.2 x 0.55
		0.025	5	16	25	20	PESD5V0L5UV		
6	5	0.025	5	16	35	20	PESD5V0L6US	SOT96 (SO8)	4.9 x 3.9 x 1.75
		0.025	5	16	35	20	PESD5V0L6UAS	SOT505 (TSSOP8)	3.0 x 3.0 x 1.1
	7	0.025	5	7	35	20	PESD5V0L7BS	SOT96 (SO8)	4.9 x 3.9 x 1.75
							PESD5V0L7BAS	SOT505 (TSSOP8)	3.0 x 3.0 x 1.1
16	15	0.01	3	15		15	IP4080CX20/LF	WLCSP	2.51 x 2.01 x 0.65

[1] 8/20-µs surge pulse according to IEC 61000-4-5
[2] according to IEC 61000-4-2 (contact discharge)

ESD protection diodes, standard capacitance

Number of protected lines uni-directional	bi-directional	I_{RM} max (μA)	@ V_{RWM} (V)	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	Product	Package	Size (mm)
1		2	3.3	200	150	30	PESD3V3S1UL	SOD882	1.0 x 0.6 x 0.5
		1	5	150	150	30	PESD5V0S1UL		
		0.05	12	38	150	30	PESD12VS1UL		
		0.05	15	32	150	30	PESD15VS1UL		
		0.05	24	23	150	23	PESD24VS1UL		
		2	3.3	207	330	30	PESD3V3S1UB	SOD523 (SC-79)	1.2 x 0.8 x 0.6
		1	5	152	260	30	PESD5V0S1UB		
		0.05	12	38	180	30	PESD12VS1UB		
		0.05	15	32	160	30	PESD15VS1UB		
		0.05	24	23	160	23	PESD24VS1UB		
		6	2.5	229	260	30	PESD5Z2.5		
		0.05	3.3	172	260	30	PESD5Z3.3		
		0.05	5	89	180	30	PESD5Z5.0		
		0.01	6	78	180	30	PESD5Z6.0		
		0.01	7	69	180	30	PESD5Z7.0		
		0.01	12	35	200	30	PESD5Z12		
	1	0.1	5	35	120	30	PESD5V0S1BA	SOD323 (SC-76)	1.7 x 1.25 x 0.95
							PESD5V0S1BB	SOD523 (SC-79)	1.2 x 0.8 x 0.6
							PESD5V0S1BL	SOD882	1.0 x 0.6 x 0.5
		2	3.3	101	500	30	PESD3V3L1BA	SOD323 (SC-76)	1.7 x 1.25 x 0.95
		1	5	75	500	30	PESD5V0L1BA		
		0.05	12	19	200	30	PESD12VL1BA		
		0.05	15	16	200	30	PESD15VL1BA		
		0.05	24	11	200	23	PESD24VL1BA		

[1] 8/20-μs surge pulse according to IEC 61000-4-5
[2] according to IEC 61000-4-2 (contact discharge)

Small-signal discretes

ESD protection diodes, standard capacitance (continued)

Number of protected lines uni-directional	bi-	I_{RM} max (µA)	@ V_{RWM} (V)	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	Product	Package	Size (mm)
2	1	2	3.3	207	330	30	PESD3V3S2UAT	SOT23	2.9 x 1.3 x 1.0
		1	5	152	260	30	PESD5V0S2UAT		
		0.05	12	38	180	30	PESD12VS2UAT		
		0.05	15	32	160	30	PESD15VS2UAT		
		0.05	24	23	160	23	PESD24VS2UAT		
		3	3.3	200	150	30	PESD3V3S2UQ	SOT663	1.6 x 1.2 x 0.55
		0.3	5	150	150	30	PESD5V0S2UQ		
		0.03	12	38	150	30	PESD12VS2UQ		
		0.05	15	32	150	30	PESD15VS2UQ		
		0.05	24	23	150	23	PESD24VS2UQ		
		2	3.3	207	330	30	PESD3V3S2UT	SOT23	2.9 x 1.3 x 1.0
		1	5.25	152	260	30	PESD5V2S2UT		
		1	12	38	180	30	PESD12VS2UT		
		1	15	32	160	30	PESD15VS2UT		
		1	24	23	160	23	PESD24VS2UT		
	2	0.1	5	35	120	30	PESD5V0S2BT	SOT23	2.9 x 1.3 x 1.0
		2	3.3	101	350	30	PESD3V3L2BT		
		1	5	75	350	30	PESD5V0L2BT		
		0.05	12	19	200	30	PESD12VL2BT		
		0.05	15	16	200	30	PESD15VL2BT		
		0.05	24	11	200	23	PESD24VL2BT		

[1] *8/20-µs surge pulse according to IEC 61000-4-5*
[2] *according to IEC 61000-4-2 (contact discharge)*

ESD protection diodes, standard capacitance (continued)

Number of protected lines uni-directional	bi-directional	I_{RM} max (µA)	@ V_{RWM} (V)	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	Product	Package	Size (mm)
4	3	0.8	3.3	215	200	30	PESD3V3S4UF	SOT886 (XSON6)	1.45 x 1.0 x 0.5
		0.2	5	165	200	30	PESD5V0S4UF		
		2	3	200		8	BZA456A	SOT457 (SC-74)	2.9 x 1.5 x 1.0
		0.7	4	165		8	BZA462A		
		0.075	14	37		8	BZA418A		
		0.1	15	37		8	BZA420A		
		0.8	3.3	215	200	30	PESD3V3S4UD		
		0.2	5	165	200	30	PESD5V0S4UD		
		0.01	12	73	200	30	PESD12VS4UD		
		0.01	15	60	200	30	PESD15VS4UD		
		0.01	24	45	200	23	PESD24VS4UD		
		2	3	200		8	BZA856A	SOT353 (SC-88A)	2.0 x 1.25 x 0.95
		0.7	4	165		8	BZA862A		
		0.2	4.3	145		8	BZA868A		
		0.01	15	37		8	BZA820A		
		1	3	107		8	BZA856AL		
		0.5	4	90		8	BZA862AL		
		0.01	4.3	78		8	BZA868AL		
		1	3	107		8	BZA956A	SOT665	1.6 x 1.2 x 0.55
		0.5	4	90		8	BZA962A		
		0.01	4.3	78		8	BZA968A		
		0.01	3.3	30		15	IP4042CX5/LF	5 ball CSP	1.34 x 0.94 x 0.65

[1] 8/20-µs surge pulse according to IEC 61000-4-5
[2] according to IEC 61000-4-2 (contact discharge)

Small-signal discretes

ESD protection diodes, standard capacitance (continued)

Number of protected lines uni-directional		I_{RM} max (μA)	@ V_{RWM} (V)	C_{line} typ (pF)	P_{PP} [1] max (W)	ESD rating [2] max (kV)	Product	Package	Size (mm)
	4	0.01	5	48		15	BZA408B	SOT457 (SC-74)	2.9 x 1.5 x 1.0
		0.8	3.3	215	200	30	PESD3V3S5UD		
		0.2	5	165	200	30	PESD5V0S5UD		
5	4	0.01	12	73	200	30	PESD12VS5UD	SOT457 (SC-74)	2.9 x 1.5 x 1.0
		0.01	15	60	200	30	PESD15VS5UD		
		0.01	24	45	200	23	PESD24VS5UD		
18	17	1	5.2	100	100	8	BZA100	SOT163 (SO20)	12.8 x 7.5 x 2.65
							PESD5V2S18U	SOT339 (SSOP20)	7.2 x 5.3 x 2.0

[1] 8/20-μs surge pulse according to IEC 61000-4-5
[2] according to IEC 61000-4-2 (contact discharge)

Rail-to-rail ESD protection diodes, ultra-low capacitance < 5 pF

Number of protected lines	I_{RM} max (mA)	@ V_R (V)	C_{line} typ (pF)	ESD rating [1] max (kV)	Type	Package	Size (mm)
2	0.1	3	1	8	PRTR5V0U2X	SOT143B	2.9 x 1.3 x 1.0
	0.1	3	1.8	12	PRTR5V0U2AX		
3	0.1	3	4	8	IP4059CX5/LF	5 ball CSP	1.34 x 0.96 x 0.65
	0.1	3	1.3	15	IP4359CX4/LF	4 ball CSP	0.76 x 0.76 x 0.65
4	0.1	3	1	8	PRTR5V0U4Y	SOT363 (SC-88)	2.0 x 1.25 x 0.95
					PRTR5V0U4D	SOT457 (SC-74)	2.9 x 1.5 x 1.0
					IP4221CZ6-S	SOT886 (XSON6)	1.45 x 1.0 x 0.5
	1.0	3	0.7	8	IP4280CZ10	SOT552 (TSSOP10)	3.0 x 3.0 x 1.1
6	0.1	3	1	8	PRTR5V0U6S	SOT96 (SO8)	4.9 x 3.9 x 1.75
	0.1	3	1	8	PRTR5V0U6AS		
7	0.1	3	4	8	IP4067CX9/LF	9 ball CSP	1.52 x 1.46 x 0.65
8	0.1	3	1	8	PRTR5V0U8S	SOT552 (TSSOP10)	3.0 x 3.0 x 1.1

[1] according to IEC 61000-4-2 (contact discharge)

Small-signal discretes

EMI filter and ESD protection

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed	Remark	Product	Package	Size (mm)
		R_{line}	C_{line}					
Reverse battery	1		240 pF		Overvoltage and reverse battery protection	IP4085CX4/LF	4-ball CSP	0.91 x 0.91 x 0.65
			450 pF		Overvoltage and reverse battery protection	IP4385CX4/LF	4-ball CSP	0.76 x 0.76 x 0.61
Audio	2	0.9 Ω	290 pF		Low-ohmic speaker (< ~8 Ω)	IP4047CX6/LF	6-ball CSP	1.56 x 1.01 x 0.65
		10 Ω	200 pF		High-ohmic speaker (> ~8 Ω)	IP4048CX5/LF	5-ball CSP	0.91 x 1.28 x 0.65
		68 Ω	110 pF		Single-ended or differential microphone	IP4049CX5/LF	5-ball CSP	0.91 x 1.28 x 0.65
		470 Ω	35 pF		Single-ended or differential microphone	IP4055CX6/LF	6-ball CSP	1.56 x 1.03 x 0.65
		470 Ω	< 20 pF		Single-ended or differential microphone	IP4355CX6/LF	6-ball CSP	1.16 x 0.76 x 0.65
		50 Ω/2200 Ω	2000 pF		Single-ended to quasi-differential microphone channel with integrated biasing network	IP5002CX8/LF	8-ball CSP	1.67 x 1.67 x 0.65
		50 Ω	4000 pF		Differential microphone filter with integrated biasing network for ΣΔ ADC converters	IP5006CX11/LF	11-ball CSP	1.41 x 1.91 x 0.65
	5	15 Ω/95 Ω	65 pF/33 pF		Single-ended microphone and high-Ohmic speaker (> ~8 Ω) with integrated 2-kΩ pull-up resistor	IP4363CX10/LF	10-ball CSP	0.76 x 1.96 x 0.61
	6	40 Ω/ 1450 Ω/10 Ω	55 pF/ 20 pF/200 pF		Fully integrated audio interface protection for differential microphone and differential speaker, including EMI filtering and pull up resistors	IP4027CX20/LF	20-ball CSP	1.91 x 2.52 x 0.65
		50 Ω/10 Ω	50 pF/100 pF/ 1000 pF		Fully integrated audio interface protection for differential microphone and differential speaker, including EMI filtering and pull up resistors	IP4125CX20/LF	20-ball CSP	2.00 x 2.66 x 0.65

Small-signal discretes

EMI filter and ESD protection (continued)

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed	Remark	Product	Package	Size (mm)
		R_{line}	C_{line}					
USB	2	33 Ω/1.3 kΩ	30 pF	~5.5 MHz	Fully integrated USB 2.0 low/full-speed interface with EMI filter, ESD protection, pull-up resistors, and impedance matching	IP4056CX8/LF	8-ball CSP	1.27 x 1.83 x 0.65
		33 Ω/1.3 kΩ/ 10 kΩ	30 pF	~5.5 MHz	Fully integrated USB 2.0 low/full-speed interface with EMI filter, ESD protection, pull-up resistors, and impedance matching	IP4057CX10/LF	10-ball CSP	1.56 x 1.91 x 0.65
		33 Ω/1.3 kΩ/ 17 kΩ/15 kΩ	27 pF	~5.5 MHz	Fully integrated USB 2.0 low/full-speed interface with EMI filter, ESD protection, pull-up resistors, and impedance matching	IP4065CX11/LF	11-ball CSP	1.47 x 1.97 x 0.65
		33 Ω/1.5 kΩ	35 pF	~5.5 MHz	Fully integrated USB 2.0 low/full-speed interface with EMI filter, ESD protection, pull-up resistors, and impedance matching on NXP ISP110x, ISP130x, ISP136x	IP4058CX8/LF	8-ball CSP	0.91 x 1.91 x 0.65
		17 Ω/1.5 kΩ	35 pF	~5.5 MHz	Fully integrated USB 2.0 low/full-speed interface with EMI filter, ESD protection, pull-up resistors, and impedance matching on NXP ISP110x, ISP130x, ISP136x	IP4158CX8/LF	8-ball CSP	0.91 x 1.91 x 0.65
		33 Ω	35 pF	~5.5 MHz	Fully integrated USB 1.0 low/full-speed interface with EMI filter, ESD protection, and impedance matching on NXP ISP1110	IP4078CX6/LF	6-ball CSP	0.91 x 1.41 x 0.65
			1.4 pF	~1 GHz	USB 2.0 high-speed ESD protection on NXP ISP1504/01 HS transceiver	IP4359CX4/LF	4-ball CSP	0.76 x 0.76 x 0.61
	3		3 pF	~240 MHz	USB 2.0 high-speed ESD protection on NXP ISP176x and ISP1504	IP4059CX5/LF	5-ball CSP	0.96 x 1.34 x 0.65
			1.0 pF	~240 MHz	USB 2.0 high-speed ESD protection on NXP ISP1504/01 HS transceiver	IP4221CZ6-S	SOT886 (XSON6)	1.45 x 1.0 x 0.5
SIM card	3	47 Ω/100 Ω	35 pF	~12 MHz	EMI filter, ESD protection	IP4044CX8/LF	8-ball CSP	1.46 x 1.49 x 0.65
		47 Ω/100 Ω	< 20 pF	~20 MHz	EMI filter, ESD protection	IP4064CX8/LF	8-ball CSP	1.41 x 1.41 x 0.65
		47 Ω/100 Ω	< 20 pF	~20 MHz	EMI filter, ESD protection, extremely small size	IP4364CX8/LF	8-ball CSP	1.16 x 1.16 x 0.61
			1 pF	~240 MHz	ESD protection	IP4221CZ6-S	SOT886 (XSON6)	1.45 x 1.0 x 0.5

Small-signal discretes

EMI filter and ESD protection (continued)

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed	Remark	Product	Package	Size (mm)
		R_{line}	C_{line}					
Memory cards	4	47 Ω/13 kΩ/ 56 kΩ	25 pF		MMC ESD protection, pull-up resistors	IP4051CX11/LF	11-ball CSP	1.44 x 1.96 x 0.65
		50 Ω/75 kΩ/ 7 kΩ	18 pF	~ 25 MHz	High-speed MMC ESD protection, pull-up resistors	IP4060CX16/LF	16-ball CSP	1.96 x 1.97 x 0.65
	7	40 Ω/50 kΩ/ 25 kΩ	18 pF	~ 20 MHz	(Mini) SD/trans flash-card ESD protection, EMI filter, pull-up resistors	IP4052CX20/LF	20-ball CSP	2.54 x 1.96 x 0.65
			5 pF	~ 24 MHz	Memory stick PRO ESD protection	IP4067CX9/LF	9-ball CSP	1.46 x 1.52 x 0.65
	9	40 Ω/50 kΩ/ 15 kΩ	20 pF	> 52 MHz	(Mini) SD card/trans flash ESD protection, EMI filter, pull-up resistor	IP4352CX24/LF	24-ball CSP	2.02 x 2.01 x 0.61
				> 52 MHz	(Mini) SD/SDIO memory cardlevel shifter, can be combined with IP4352CX24/LF	IP4852CX24/LF	24-ball CSP	2.01 x 2.01 x 0.61
				> 52 MHz	(Mini) SD/SDIO memory cardlevel shifter and voltage regulator, incl. ESD and EMI filter	IP4853CX24/LF	24-ball CSP	2.01 x 2.01 x 0.61

Small-signal discretes

EMI filter and ESD protection (continued)

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed	Remark	Product	Package	Size (mm)
		R_{line}	C_{line}					
	4	100 Ω	45 pF	~30 MHz	EMI filter, ESD protection	IP4254CZ8	8-pin QFN	1.7 x 1.35 x 0.5
	6	100 Ω	45 pF	~30 MHz	EMI filter, ESD protection	IP4254CZ12	12-pin QFN	2.5 x 1.35 x 0.5
	8	100 Ω	45 pF	~30 MHz	EMI filter, ESD protection	IP4254CZ16	16-pin QFN	3.3 x 1.35 x 0.5
	4	200 Ω	45 pF	~30 MHz	EMI filter, ESD protection	IP4253CZ8	8-pin QFN	1.7 x 1.35 x 0.5
	6	200 Ω	45 pF	~30 MHz	EMI filter, ESD protection	IP4253CZ12	12-pin QFN	2.5 x 1.35 x 0.5
	8	200 Ω	45 pF	~30 MHz	EMI filter, ESD protection	IP4253CZ16	16-pin QFN	3.3 x 1.35 x 0.5
Multi-channel filters e.g.:	6	100 Ω	60 pF	~20 MHz	EMI filter, ESD protection	IP4053CX15/LF	15-ball CSP	2.98 x 1.33 x 0.65
	8	100 Ω	50 pF	~25 MHz	EMI filter, ESD protection	IP4088CX20/LF	20-ball CSP	3.91 x 1.28 x 0.65
Bottom connector	6	100 Ω	30 pF	~40 MHz	EMI filter, ESD protection	IP4153CX15/LF	15-ball CSP	2.91 x 1.28 x 0.65
LCD display		80 Ω	40 pF	~30 MHz	EMI filter, ESD protection	IP4032CX25/LF	25-ball CSP	2.41 x 2.41 x 0.65
Camera interface		80 Ω	40 pF	~30 MHz	EMI filter, ESD protection (higher tolerances as IP4032CX25/LF)	IP4033CX25/LF	25-ball CSP	2.41 x 2.41 x 0.65
Keypad connector	10	84 Ω	14 pF	~40 MHz	EMI filter, ESD protection	IP4040CX25/LF	25-ball CSP	2.41 x 2.46 x 0.65
		200 Ω	50 pF	~20 MHz	EMI filter, ESD protection	IP4041CX25/LF	25-ball CSP	2.41 x 2.41 x 0.65
		1 kΩ	50 pF	< 1 MHz	EMI filter, ESD protection	IP4035CX24/LF	24-ball CSP	2.46 x 2.44 x 0.65
		200 Ω	50 pF	~20 MHz	EMI filter, ESD protection, extremely small size	IP4341CX25/LF	25-ball CSP	2.01 x 2.01 x 0.61
	7	70 Ω	25 pF	~40 MHz	EMI filter, ESD protection, extremely small size	IP4337CX18/LF	18-ball CSP	1.96 x 1.61 x 0.61
	10	70 Ω	25 pF	~40 MHz	EMI filter, ESD protection, extremely small size	IP4338CX24/LF	24-ball CSP	1.96 x 2.01 x 0.61
	1	75 Ω	36 pF		EMI filter, ESD protection with common ground	IP4307CX4/LF	4-ball CSP	0.76 x 0.76 x 0.61

Small-signal discretes

EMI filter and ESD protection (continued)

Baseband interface	Number of protected lines	Line small-signal equivalents		Digital interface clock speed	Remark	Product	Package	Size (mm)
		R_{line}	C_{line}					
Generic ESD protection	4		30 pF	~30 MHz	4x single diode with one common ground	IP4042CX5/LF	5-ball CSP	0.94 x 1.34 x 0.65
			14 pF	~40 MHz	4x single diode with one common ground	IP4142CX5/LF	5-ball CSP	0.91 x 1.28 x 0.65
			16 pF	~40 MHz	4x back-to-back diode with one common ground	IP4043CX5/LF	5-ball CSP	1.12 x 1.12 x 0.65
	8		16 pF	~40 MHz	4x back-to-back diode with one common ground, extremely small size	IP4343CX5/LF	5-ball CSP	0.93 x 0.93 x 0.61
	2		10 pF	~40 MHz	2x back-to-back diode with one common ground, extremely small size	IP4303CX4/LF	4-ball CSP	0.76 x 0.26 x 0.61
	1		10 pF	~40 MHz	1x back-to-back diode with one common ground, extremely small size	IP4302CX2/LF	2-ball CSP	0.52 x 0.7 x 0.61

Small-signal discretes

Level shifter, buffer and EMI filter for consumer and computing applications

Interface	Number of protected lines	Buffer	Level shifter	C_{line}	Resistor	Remark	Product	Package	Size (mm)
VGA	7	•	•	5 pF	55 Ω	Sync buffer, DDC level shifter	IP4770CZ16	SOT519 (SSOP16)	4.9 x 3.9 x 1.73
		•	•	5 pF	65 Ω	Sync buffer, DDC level shifter	IP4771CZ16		
		•	•	5 pF	10 Ω	Sync buffer, DDC level shifter	IP4772CZ16		
IEEE1394	4			5 pF	55 Ω	Common mode filter	IP4224CZ6	SOT457 (SC-74)	2.9 x 1.5 x 1.0
LVDS	10			5 pF	100 Ω	100-Ω termination	IP4263CZ14	SOT108 (SO14)	8.65 x 3.9 x 1.75
USB	2			1 pF		ESD protection	PRTR5V0U2X	SOT143B	2.9 x 1.3 x 1.0
	4			1 pF		ESD protection	IP4220CZ6	SOT457 (SC-74)	2.9 x 1.5 x 1.0
				1 pF		ESD protection, as IP4220CZ6 but different bonding	PRTR5V0U4AD	SOT457 (SC-74)	2.9 x 1.5 x 1.0
				1 pF		ESD protection, as IP4220CZ6 but higher tolerances	IP4223CZ6	SOT457 (SC-74)	2.9 x 1.5 x 1.0
				1 pF		USB 2.0 high-speed SD card, SIM card	IP4221CZ6-S	SOT886 (XSON6)	1.45 x 1.0 x 0.5
				1 pF		USB 2.0 high-speed SD card, SIM card	IP4221CZ6-XS	SOT891 (XSON6)	1.0 x 1.0 x 0.5
				3 pF	1 Ω	> 15 kV contact ESD protection with pi-filter	IP4225CZ10	SOT457 (SC-74)	2.9 x 1.5 x 1.0
HDMI	4			1 pF		ESD protection	PRTR5V0U4D	SOT457 (SC-74)	2.9 x 1.5 x 1.0
				1 pF		ESD protection	PRTR5V0U4Y	SOT363 (SC-88)	2.0 x 1.25 x 0.95
				0.7 pF		ESD protection	IP4280CZ10	SOT552 (TSSOP10)	3.0 x 3.0 x 1.1
	8			1 pF		ESD protection	PRTR5V0U8S		
		•	•	0.7 pF		Level shifter, ESD protection	IP4776CZ38	SOT510 (TSSOP38)	9.7 x 4.4 x 1.1
		•	•	0.7 pF		I²C-bus buffer, level shifter, ESD protection, back drive protection, CEC buffer	IP4778CZ38		

Low-V$_{CEsat}$ (BISS) transistors, NPN

V$_{CEO}$ (V)	I$_C$ (A)	I$_{CM}$ (A)	h$_{FE}$ min/typ	@ I$_C$ (A)	@ V$_{CE}$ (V)	R$_{CEsat}$ typ (mΩ) @ I$_C$; I$_C$/I$_B$ = 10	V$_{CEsat}$ typ (mV) @ I$_C$ = 0.5 A; I$_B$ = 0.05 A	V$_{CEsat}$ max (mV)	@ I$_C$ (A)	@ I$_B$ (A)	Product	Package	Size (mm)	P$_{tot}$ (mW)
15	0.5	1.0	200/325	0.01	2	360	-	250	0.5	0.05	PBSS2515M	SOT883 (SC-101)	1.0 x 0.6 x 0.5	250 [1]
40	0.5	1.0	200/550	0.01	2	380	-	250	0.5	0.05	PBSS2540M			
20	2.0	4.0	220/480	0.5	2	150	70	350	2	0.2	PBSS4220V	SOT666	1.6 x 1.2 x 0.55	500 [1]
40	1.0	3.0	300/ -	0.5	5	150	70	440	2	0.2	PBSS4140V			
40	2.0	3.0	300/400	0.5	5	150	70	400	2	0.2	PBSS4240V			
60	1.0	2.0	200/400	0.5	5	200	110	250	1	0.1	PBSS4160V			
15	0.5	1.0	200/425	0.01	2	300	200	250	0.5	0.05	PBSS2515E	SOT416 (SC-75)	1.6 x 0.8 x 0.77	250 [1]
40	0.5	1.0	200/350	0.01	2	380	200	250	0.5	0.05	PBSS2540E			
40	2.0	3.0	350/470	0.1	2	120	70	320	2	0.2	PBSS4240Y	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [1]
100	1.0	3.0	150/400	0.25	10	160	80	200	1	0.1	PBSS8110Y			
40	1.0	2.0	300/440	0.5	5	240	120	500	1	0.1	PBSS4140U	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350 [1]
60	1.0	2.0	200/420	0.5	5	230	120	280	1	0.1	PBSS4160U			
20	1.0	3.0	350/470	0.1	2	220	110	250	1	0.05	PBSS4120T	SOT23	2.9 x 1.3 x 1.0	480 [1]
20	2.0	5.0	220/330	0.1	2	80	45	310	3	0.3	PBSS4320T			
30	1.0	3.0	300/450	0.5	2	240	120	270	1	0.05	PBSS4130T			
30	2.0	3.0	300/450	0.5	2	120	70	320	2	0.2	PBSS4230T			
40	1.0	2.0	300/510	0.5	5	230	120	500	1	0.1	PMMT491A			
40	1.0	2.0	300/420	0.5	5	150	130	500	1	0.1	PBSS4140T			
40	2.0	3.0	300/450	0.5	2	120	70	320	2	0.2	PBSS4240T			
50	2.0	5.0	300/495	0.5	2	100	60	260	2	0.2	PBSS4350T			
60	1.0	2.0	200/350	0.5	5	200	110	250	1	0.1	PBSS4160T			
100	1.0	3.0	150/300	0.25	10	165	70	200	1	0.1	PBSS8110T			

[1] *Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm^2*

Small-signal discretes

Low-V_{CEsat} (BISS) transistors, NPN, medium power

V_{CEO} (V)	I_C (A)	I_{CM} (A)	h_{FE} min/typ	@ I_C (A)	@ V_{CE} (V)	R_{CEsat} typ (mΩ) @ I_C; $I_C/I_B = 10$	V_{CEsat} typ (mV) @ I_C = 0.5 A; I_B = 0.05 A	V_{CEsat} max (mV)	@ I_C (A)	@ I_B (A)	Product	Package	Size (mm)	P_{tot} (mW)
20	4.0	15.0	300/450	0.5	2	50	30	280	4	0.4	PBSS301ND	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
40	4.0	15.0	300/520	0.5	2	55	35	300	4	0.4	PBSS302ND			
50	3.0	5.0	200/280	0.5	2	110	65	290	2	0.2	PBSS4350D			
60	3.0	6.0	345/570	0.5	2	65	40	260	3	0.3	PBSS303ND			
80	3.0	6.0	240/360	0.5	2	67	40	255	3	0.3	PBSS304ND			
100	1.0	3.0	150/290	0.25	10	160	75	200	1	0.1	PBSS8110D			
100	3.0	4.0	170/275	0.5	2	72	45	360	4	0.4	PBSS305ND			
12	5.3	10.6	300/530	0.5	2	27 [1]	18	200	5.3	0.265	PBSS301NX	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [2]
20	3.0	5.0	220/390	0.5	2	85	45	310	3	0.3	PBSS4320X			
20	5.0	10.0	300/450	0.5	2	32	35	220	5	0.5	PBSS4520X			
20	5.3	10.6	300/570	0.5	2	27 [1]	20	200	5.3	0.265	PBSS302NX			
30	3.0	5.0	300/490	0.5	2	80	45	300	3	0.3	PBSS4330X			
30	5.1	10.2	300/480	0.5	2	30 [1]	20	220	5.1	0.255	PBSS303NX			
40	4.0	10.0	300/500	0.5	2	40	21	355	5	0.5	PBSS4540X			
50	2.0	5.0	300/ –	0.5	2	160	90	320	2	0.2	PBSS4250X			
50	3.0	5.0	300/460	0.5	2	75	50	370	3	0.3	PBSS4350X			
60	4.7	9.4	300/520	0.5	2	37 [1]	25	245	4.7	0.235	PBSS304NX			
80	4.0	10.0	250/400	0.5	2	43 [1]	25	230	4	0.2	PBSS4480X			
80	4.6	9.2	300/470	0.5	2	37 [1]	25	240	4.6	0.23	PBSS305NX			
100	1.0	3.0	150/290	0.25	10	165	40	200	1	0.1	PBSS8110X			
100	4.5	9.0	200/330	0.5	2	38 [1]	27	245	4.5	0.225	PBSS306NX			
12	5.8	11.6	300/530	0.5	2	29 [1]	18	235	5.8	0.29	PBSS301NZ	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [2]
20	5.8	10.2	300/570	0.5	2	30 [1]	20	250	5.8	0.29	PBSS302NZ			
30	5.5	11.0	300/480	0.5	2	31 [1]	20	240	5.5	0.275	PBSS303NZ			
40	5.0	10.0	300/500	0.5	2	42	50	355	5	0.5	PBSS4540Z			
50	3.0	5.0	200/280	0.5	2	110	90	290	2	0.2	PBSS4350Z			
60	5.2	10.4	300/520	0.5	2	39 [1]	25	280	5.2	0.26	PBSS304NZ			
80	5.1	10.2	300/470	0.5	2	38 [1]	25	270	5.1	0.255	PBSS305NZ			
100	1.0	3.0	150/290	0.25	10	160	73	200	1	0.1	PBSS8110Z			
100	5.1	10.2	200/330	0.5	2	43 [1]	27	300	5.1	0.255	PBSS306NZ			

[1] $I_C/I_B = 20$
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm^2

Small-signal discretes

Low-V$_{CEsat}$ (BISS) transistors, PNP

V$_{CEO}$ (V)	I$_C$ (A)	I$_{CM}$ (A)	h$_{FE}$ min/typ	@ I$_C$ (A)	@ V$_{CE}$ (V)	R$_{CEsat}$ typ (mΩ) @ I$_C$ I$_C$/I$_B$ = 10	V$_{CEsat}$ typ (mV) @ I$_C$ = 0.5 A; I$_B$ = 0.05 A	V$_{CEsat}$ max (mV)	@ I$_C$ (A)	@ I$_B$ (A)	Product	Package	Size (mm)	P$_{tot}$ (mW)
15	0.5	1.0	200/260	0.01	2	300	150	250	0.5	0.05	PBSS3515M	SOT883 (SC-101)	1.0 x 0.6 x 0.5	250 [1]
40	0.5	1.0	200/380	0.01	2	440	220	350	0.5	0.05	PBSS3540M			
20	2.0	4.0	220/440	0.1	2	135	75	390	2	0.2	PBSS5220V	SOT666	1.6 x 1.2 x 0.55	500 [1]
40	1.0	2.0	300/ –	0.1	5	200	120	310	1	0.1	PBSS5140V			
40	1.8	3.0	300/450	0.1	5	185	100	530	2	0.2	PBSS5240V			
60	1.0	2.0	150/250	0.5	5	220	120	330	1	0.1	PBSS5160V			
15	0.5	1.0	200/325	0.01	2	300	130	250	0.5	0.05	PBSS3515E	SOT416 (SC-75)	1.6 x 0.8 x 0.77	250 [1]
40	0.5	1.0	200/380	0.01	2	440	230	350	0.5	0.05	PBSS3540E			
40	2.0	3.0	300/ –	0.1	2	200	110	350	2	0.2	PBSS5240Y	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [1]
100	1.0	3.0	150/ –	0.25	5	170	93	320	1	0.1	PBSS9110Y			
40	1.0	2.0	300/520	0.1	5	230	130	500	1	0.1	PBSS5140U	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350 [1]
60	1.0	2.0	150/250	0.5	5	255	135	340	1	0.1	PBSS5160U			
20	1.0	2.0	300/450	0.1	2	250	125	250	1	0.05	PBSS5120T	SOT23	2.9 x 1.3 x 1.0	480 [1]
20	2.0	3.0	225/ –	0.5	2	115	80	225	2	0.2	PBSS5220T			
20	2.0	5.0	220/420	0.5	2	75	50	210	2	0.2	PBSS5320T			
30	1.0	3.0	260/350	0.5	2	220	110	225	1	0.05	PBSS5130T			
30	2.0	3.0	300/450	0.1	2	160	80	350	2	0.2	PBSS5230T			
40	1.0	2.0	300/800	0.1	5	250	130	500	1	0.1	PMMT591A			
40	1.0	2.0	300/510	0.1	5	230	150	500	1	0.1	PBSS5140T			
40	2.0	3.0	300/450	0.1	2	150	80	350	2	0.2	PBSS5240T			
50	2.0	3.0	200/ –	0.5	2	150	90	300	2	0.1	PBSS5250T			
50	2.0	5.0	200/360	0.5	2	90	55	270	2	0.2	PBSS5350T			
60	1.0	2.0	150/250	0.5	5	220	120	330	1	0.1	PBSS5160T			
100	1.0	3.0	150/350	0.5	5	170	95	320	1	0.1	PBSS9110T			

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm²

Small-signal discretes

Low-V_{CEsat} (BISS) transistors, PNP, medium power

V_{CEO} (V)	I_C (A)	I_{CM} (A)	h_{FE} min/typ	@ I_C (A)	@ V_{CE} (V)	R_{CEsat} typ (mΩ) @ I_C; I_C/I_B = 10	V_{CEsat} typ (mV) @ I_C = 0.5 A; I_B = 0.05 A	V_{CEsat} max (mV)	@ I_C (A)	@ I_B (A)	Product	Package	Size (mm)	P_{tot} (mW)
20	4.0	15.0	250/400	0.5	2	50	35	280	4	0.4	PBSS301PD	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
20	3.0	5.0	200/ –	0.5	2	85	80	400	3	0.3	PBSS5320D			
40	4.0	15.0	200/310	0.5	2	55	46	300	4	0.4	PBSS302PD			
50	3.0	5.0	200/300	0.5	2	120	70	300	2	0.2	PBSS5350D			
60	3.0	6.0	180/265	0.5	2	70	55	290	3	0.3	PBSS303PD			
80	3.0	5.0	155/225	0.5	2	71	55	290	3	0.3	PBSS304PD			
100	1.0	3.0	150/350	0.5	5	170	100	320	1	0.1	PBSS9110D			
100	2.0	3.0	175/275	0.5	2	88	65	250	2	0.2	PBSS305PD			
12	5.3	10.6	250/400	0.5	2	28 [1]	20	210	5.3	0.265	PBSS301PX	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [2]
20	3.0	5.0	220/450	0.5	2	90	50	300	3	0.3	PBSS5320X			
20	5.0	10.0	300/430	0.5	2	34	45	270	5	0.5	PBSS5520X			
20	5.1	10.2	250/370	0.5	2	32 [1]	25	230	5.1	0.255	PBSS302PX			
30	3.0	5.0	200/380	0.5	2	80	40	320	3	0.3	PBSS5330X			
30	5.1	10.2	250/400	0.5	2	32 [1]	25	230	5.1	0.255	PBSS303PX			
40	4.0	10.0	250/370	0.5	2	45	33	375	5	0.5	PBSS5540X			
50	2.0	5.0	200/ –	0.5	2	160	90	320	2	0.2	PBSS5250X			
50	3.0	5.0	200/375	0.5	2	120	60	390	3	0.3	PBSS5350X			
60	4.2	8.4	200/295	0.5	2	53 [1]	35	310	4.2	0.21	PBSS304PX			
80	4.0	10.0	200/300	0.5	2	50	35	380	5	0.5	PBSS5480X			
80	4.0	8.0	200/280	0.5	2	43	36	240	4	0.4	PBSS305PX			
100	1.0	3.0	150/350	0.5	5	170	90	320	1	0.1	PBSS9110X			
100	3.7	7.4	200/300	0.5	2	52	45	300	4	0.4	PBSS306PX			
12	5.7	11.4	250/400	0.5	2	30 [1]	20	245	5.7	0.285	PBSS301PZ	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [2]
20	5.5	11.0	250/370	0.5	2	34 [1]	25	265	5.5	0.275	PBSS302PZ			
30	5.3	10.6	250/400	0.5	2	35 [1]	25	265	5.3	0.265	PBSS303PZ			
40	5.0	10.0	250/350	0.5	2	55	80	160	2	0.2	PBSS5540Z			
50	3.0	5.0	200/300	0.5	2	120	70	300	2	0.2	PBSS5350Z			
60	4.5	9.0	200/295	0.5	2	59 [1]	35	375	4.5	0.225	PBSS304PZ			
80	4.5	9.0	200/280	0.5	2	69 [1]	36	450	4.5	0.225	PBSS305PZ			
100	1.0	3.0	150/ –	0.5	5	170	90	320	1	0.1	PBSS9110Z			
100	4.1	8.2	200/300	0.5	5	57	45	325	4.1	0.41	PBSS306PZ			

[1] I_C/I_B = 20
[2] *Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm^2*

Small-signal discretes

Low-V$_{CEsat}$ (BISS) transistors, double

V$_{CEO}$ (V)	I$_C$ (A)	Polarity	h$_{FE}$ min	@ I$_C$ (A)	@ V$_{CE}$ (V)	V$_{CEsat}$ typ (mV) @ I$_C$ = 0.5 A; I$_B$ = 0.05 A	V$_{CEsat}$ max (mV)	@ I$_C$ (A)	@ I$_B$ (A)	Product	Package	Size (mm)	P$_{tot}$ (mW)
15	0.5	2 x PNP	200	0.01	2	170 [1]	250	0.5	0.05	PBSS3515VS	SOT666	1.6 x 1.2 x 0.55	500 [2]
		NPN/PNP	200	0.01	2	170 [1]	250	0.5	0.05	PBSS2515VPN			
		2 x NPN	200	0.01	2	170 [1]	250	0.5	0.05	PBSS2515VS			
15	0.5	NPN/PNP	200	0.01	2	170 [1]	250	0.5	0.05	PBSS2515YPN	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [2]
40	1.0	NPN/PNP	300/250	0.5	5	130/150	500	1	0.1	PBSS4140DPN	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
	2.0	NPN/PNP	300/250	0.5	5	80/100	400/530	2	0.2	PBSS4240DPN			
60	1.0	2 x NPN	200	0.5	5	115	250	1	0.1	PBSS4160DS			
		2 x PNP	150	0.5	5	120	330	1	0.1	PBSS5160DS			
		NPN/PNP	200/150	0.5	5	115/120	250/330	1	0.1	PBSS4160DPN			
50	2.7	2 x NPN	300	0.5	2	50	340	2.7	0.27	PBSS4350SS	SOT96 (SO8)	4.9 x 3.9 x 1.75	1430 [4]
		2 x PNP	200	0.5	2	60	370	2.7	0.27	PBSS5350SS			
		NPN/PNP	300/200	0.5	2	50/60	340/370	2.7	0.27	PBSS4350SPN			

[1] @ I$_C$ = 0.5 A; I$_B$ = 0.025 A
[2] *Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm^2*
[3] *Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm^2*
[4] *Device mounted on a ceramic PCB, Al$_2$O$_3$, standard footprint*

Small-signal discretes

Resistor-equipped transistors (RETs), 100 mA, single

Package					SOT23		SOT323 (SC-70)		SOT416 (SC-75)		SOT883 (SC-101)	
Size (mm)					2.9 x 1.3 x 1.0		2.0 x 1.25 x 0.95		1.6 x 0.8 x 0.77		1.0 x 0.6 x 0.5	
P_{tot} (mW)					250		200		150		250	
V_{CEO} (V)	I_C (mA)		R1 (kΩ)	R2 (kΩ)	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
50	100	R1 = R2	2.2	2.2	PDTC123ET	PDTA123ET	PDTC123EU	PDTA123EU	PDTC123EE	PDTA123EE	PDTC123EM	PDTA123EM
			4.7	4.7	PDTC143ET	PDTA143ET	PDTC143EU	PDTA143EU	PDTC143EE	PDTA143EE	PDTC143EM	PDTA143EM
			10	10	PDTC114ET	PDTA114ET	PDTC114EU	PDTA114EU	PDTC114EE	PDTA114EE	PDTC114EM	PDTA114EM
			22	22	PDTC124ET	PDTA124ET	PDTC124EU	PDTA124EU	PDTC124EE	PDTA124EE	PDTC124EM	PDTA124EM
			47	47	PDTC144ET	PDTA144ET	PDTC144EU	PDTA144EU	PDTC144EE	PDTA144EE	PDTC144EM	PDTA144EM
			100	100	PDTC115ET	PDTA115ET	PDTC115EU	PDTA115EU	PDTC115EE	PDTA115EE	PDTC115EM	PDTA115EM
		R1 ≠ R2	2.2	10	PDTC123YT	PDTA123YT	PDTC123YU	PDTA123YU	PDTC123YE	PDTA123YE	PDTC123YM	PDTA123YM
			2.2	47	PDTC123JT	PDTA123JT	PDTC123JU	PDTA123JU	PDTC123JE	PDTA123JE	PDTC123JM	PDTA123JM
			4.7	10	PDTC143XT	PDTA143XT	PDTC143XU	PDTA143XU	PDTC143XE	PDTA143XE	PDTC143XM	PDTA143XM
			4.7	47	PDTC143ZT	PDTA143ZT	PDTC143ZU	PDTA143ZU	PDTC143ZE	PDTA143ZE	PDTC143ZM	PDTA143ZM
			10	47	PDTC114YT	PDTA114YT	PDTC114YU	PDTA114YU	PDTC114YE	PDTA114YE	PDTC114YM	PDTA114YM
			22	47	PDTC124XT	PDTA124XT	PDTC124XU	PDTA124XU	PDTC124XE	PDTA124XE	PDTC124XM	PDTA124XM
			47	10	PDTC144VT	PDTA144VT	PDTC144VU	PDTA144VU	PDTC144VE	PDTA144VE	PDTC144VM	PDTA144VM
			47	22	PDTC144WT	PDTA144WT	PDTC144WU	PDTA144WU	PDTC144WE	PDTA144WE	PDTC144WM	PDTA144WM
		Only R1	2.2		PDTC123TT	PDTA123TT	PDTC123TU	PDTA123TU	PDTC123TE	PDTA123TE	PDTC123TM	PDTA123TM
			4.7		PDTC143TT	PDTA143TT	PDTC143TU	PDTA143TU	PDTC143TE	PDTA143TE	PDTC143TM	PDTA143TM
			10		PDTC114TT	PDTA114TT	PDTC114TU	PDTA114TU	PDTC114TE	PDTA114TE	PDTC114TM	PDTA114TM
			22		PDTC124TT	PDTA124TT	PDTC124TU	PDTA124TU	PDTC124TE	PDTA124TE	PDTC124TM	PDTA124TM
			47		PDTC144TT	PDTA144TT	PDTC144TU	PDTA144TU	PDTC144TE	PDTA144TE	PDTC144TM	PDTA144TM
			100		PDTC115TT	PDTA115TT	PDTC115TU	PDTA115TU	PDTC115TE	PDTA115TE	PDTC115TM	PDTA115TM

Resistor-equipped transistors (RETs), 100 mA, double

Package					SOT457 (SC-74)		SOT363 (SC-88)			SOT666		
Size (mm)					2.9 x 1.5 x 1.0		2.0 x 1.25 x 0.95			1.6 x 1.2 x 0.55		
P_{tot} (mW)					600		300					
V_{CEO} (V)	I_C (mA)		R1 (kΩ)	R2 (kΩ)	NPN/NPN	NPN/PNP	NPN/NPN	NPN/PNP	PNP/PNP	NPN/NPN	NPN/PNP	PNP/PNP
50	100	R1 = R2	2.2	2.2			PUMH20	PUMD20	PUMB20	PEMH20	PEMD20	PEMB20
			4.7	4.7			PUMH15	PUMD15	PUMB15	PEMH15	PEMD15	PEMB15
			10	10		PIMD3	PUMH11	PUMD3	PUMB11	PEMH11	PEMD3	PEMB11
			22	22		PIMD2	PUMH1	PUMD2	PUMB1	PEMH1	PEMD2	PEMB1
			47	47			PUMH2	PUMD12	PUMB2	PEMH2	PEMD12	PEMB2
			100	100			PUMH24	PUMD24	PUMB24	PEMH24	PEMD24	PEMB24
		R1 ≠ R2	2.2	47			PUMH10	PUMD10	PUMB10	PEMH10	PEMD10	PEMB10
			4.7	10			PUMH18	PUMD18	PUMB18	PEMH18	PEMD18	PEMB18
			4.7	47			PUMH13	PUMD13	PUMB13	PEMH13	PEMD13	PEMB13
			10	47	PIMH9		PUMH9	PUMD9	PUMB9	PEMH9	PEMD9	PEMB9
			22	47			PUMH16	PUMD16	PUMB16	PEMH16	PEMD16	PEMB16
			47	22			PUMH17	PUMD17	PUMB17	PEMH17	PEMD17	PEMB17
			47/2.2	47/47				PUMD48			PEMD48	
		Only R1	2.2				PUMH30	PUMD30	PUMB30	PEMH30	PEMD30	PEMB30
			4.7				PUMH7	PUMD6	PUMB3	PEMH7	PEMD6	PEMB3
			10				PUMH4	PUMD4	PUMB4	PEMH4	PEMD4	PEMB4
			22				PUMH19	PUMD19	PUMB19	PEMH19	PEMD19	PEMB19
			47				PUMH14	PUMD14	PUMB14	PEMH14	PEMD14	PEMB14

Small-signal discretes

Resistor-equipped transistors (RETs), 500 mA, single

Package					SOT23	
Size (mm)					2.9 x 1.3 x 1.0	
P_{tot} (mW)					250	
V_{CEO} (V)	I_C (mA)		R1 (kΩ)	R2 (kΩ)	NPN	PNP
50	500	R1 = R2	1.0	1.0	PDTD113ET	PDTB113ET
			2.2	2.2	PDTD123ET	PDTB123ET
		R1 ≠ R2	1.0	10	PDTD113ZT	PDTB113ZT
			2.2	10	PDTD123YT	PDTB123YT
		Only R1	2.2		PDTD123TT	PDTB123TT

BISS RETs

Package						SOT23
Size (mm)						2.9 x 1.3 x 1.0
P_{tot} (mW)						250
Polarity	V_{CEO} (V)	I_C (mA)		R1 (kΩ)	R2 (kΩ)	
NPN	50	600	R1 = R2	1	1	PBRN113ET
				2.2	2.2	PBRN123ET
			R1 ≠ R2	1	10	PBRN113ZT
				2.2	10	PBRN123YT
PNP	50	600	R1 = R2	1	1	PBRP113ET
				2.2	2.2	PBRP123ET
			R1 ≠ R2	1	10	PBRP113ZT
				2.2	10	PBRP123YT

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