Building blocks for vibrant media

Highlights of the NXP product portfolio

NXP
founded by Philips

Building blocks for vibrant media

At NXP Semiconductors, the new company founded by Philips, we're driven by a single purpose — to deliver vibrant media technologies that create better sensory experiences.

Whether it's amazing stereo sound, wireless for complete freedom of movement, or video so clear it makes you look twice, we have the technologies that take your design to the next level.

Choice, performance, and flexibility
We know how important it is to find fresh ideas that save space, extend battery life, and make it easy to implement last-minute changes. Our portfolio gives you all that and more.

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 timers and amplifiers to sophisticated ICs that improve media processing, wireless connectivity, and broadband communications.

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

What's more, all our products are optimized for performance, so they maximize integration while minimizing footprint and power consumption. Programmable features increase your options further, so you can use a standard, off-the-shelf product yet deliver customized functionality.

The end result? A design that's more engaging, more interactive, more portable, and simply more fun to use.

And that's a difference your customers can see, hear, and feel.

NXP at a glance
- Founded in 2006 by Philips
- 50+ years of experience in semiconductors
- Net sales of €4.77 billion in 2005
- R&D investments of more than €965 million in 2005
- 5,300+ patent families
- Roughly 37,000 employees in more than twenty countries
- Ten 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:
- 5-V CMOS logic products for the automotive industry
- Contactless identification for e-passports
- Digital cordless chips
- FM radio ICs for mobile
- GSM/GPRS/EDGE system solutions
- Interface products
- Mobile speaker systems
- Near Field Communication (NFC)
- PC TV chips
- RF products for CATV and satellite tuners
- RFID for electronic ticketing in public transport
- TV chips
- USB

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 multichannel 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 low-power Wi-Fi™ (802.11) and 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-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 (PHY) suitable for use with FPGAs or ASICs. The PHY provides a cost-effective solution for migrating to PCI Express. The PCI Express channel switches allow architectural flexibility in switching PCI Express signals.
Integrated power management	Advanced options for power management, ranging from PIP212 integrated powertrains to 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, very small footprints, low pin-count, low power consumption, comprehensive serial interfaces, and many 8-bit devices with enhanced 80C51 capabilities.
UARTs	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. Single- to eight-channel industrial UARTs with higher baud rates, deeper FIFOs, improved character recognition, and very fast host-bus cycle times.
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, and RF switches. The RF portfolio also includes RF power devices for broadcast, microwave, and basestation applications.
Small-signal discretes	Small-signal devices such as 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.

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)	•						

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			3/4/5	•	•	•	•		•	

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 and decoders

Digital video encoders

			Recommended for new designs		
Product	SAA7128/ SAA7129	SAA7102/ SAA7103	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	•			•	
Macrovision [1] copy protection					
Version 7.1 and 6.1	SAA7128	SAA7102	SAA7120	SAA7128A	SAA7104
Version 1.03 (525p/625p)					SAA7104

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Digital video encoders (continued)

Product	SAA7128/ SAA7129	SAA7102/ SAA7103	Recommended for new designs		
			SAA7120/ SAA7121	SAA7128A/ SAA7129A	SAA7104/ SAA7105
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 I^{2}C-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 video decoders (continued)

Product					Recommended for new designs						
	SAA7110A	SAA7111A	SAA7112	SAA7114	SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
Digital program stream capture									Serial & parallel		Serial & parallel
Universal VBI data slicer		CC only	•	•	•	Including CGMS, Gemstar	•				
I²C 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									•	•	•

Video encoders and decoders

Digital video decoders (continued)

Product	SAA7110A	SAA7111A	SAA7112	SAA7114	Recommended for new designs						
					SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
Stereo ADC and stereo DAC									2x16-bit	2x16-bit	2x16-bit
NICAM & dual FM stereo										•	
BTSC & SAP, EIAJ									•		•
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									•	•	•

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Digital video decoders (continued)

							Recommended for new designs				
Product	SAA7110A	SAA7111A	SAA7112	SAA7114	SAA7113	SAA7115	SAA7118	SAA7130	SAA7133	SAA7134	SAA7135
ACPI-compliant power management								•	•	•	•
Configurable DMA channels								6	6	6	6
General											
Support for 3D comb filters and stereo								•	•	•	•
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								•	•	•	•
I²C master to program peripheral devices								•	•	•	•
I²C 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

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	I²S, 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	I²S, 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	I²S, LSB-justified, compatible with 16-, 20-, and 24-bit formats, 1f$_s$ input format	-90	100	Automatic system clock vs. sample rate detection 256f$_s$, 384f$_s$	0.9	SSOP16	2.4 to 3.6	16- to 100-kHz SRF	18	-40 to +85	44.1
		video mode										24		
UDA1334BTS	Low-power audio DAC	3 V	2	I²S, 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	I²S, 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	
UDA1351H	IEC958 audio DAC	3 V	2	IEC958, I²S	-90	100	256f$_s$ out	0.9	QFP44	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
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 I²C; 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

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)	I²S, 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	
		DAC	2		-91	100			0.9						32, 44.1, and 48
UDA1342TS	Audio CODEC for MD	ADC	2 (with mux)	I²S, 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 I²C inter-face; 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	
		DAC	2		-90	100			0.9						32, 44.1, 48, and 96
UDA1344TS	Low-voltage, low-power stereo audio CODEC with DSP features	ADC	2	I²S, 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	
		DAC	2		-90	100			0.9						32, 44.1, and 48
UDA1345TS	Economy audio CODEC	ADC	2	I²S, 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	
		DAC	2		-85	100			0.9						32, 44.1, 48, and 96
UDA1380TT	SSA-audio CODEC	ADC	2	I²S, 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 I²C 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	
		DAC	2		-88	100			0.9						32, 44.1, 48, and 96
UDA1380HN	SSA-audio CODEC	ADC	2	I²S, 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 I²C 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	
		DAC	2		-88	100			0.9						32, 44.1, 48, and 96
UDA1338H	Multi-channel audio CODEC	ADC	4	I²S audio and voice in-terfaces, 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 vol-ume; soft or quick mute; output signal polarity cntrl	270	-20 to +85	
		DAC	6		-100	114			DM 2.0 SE 1.0						32, 44.1, 48, or 96

Stereo analog-to-digital conveter (ADCs)															
UDA1361TS	96-kHz sampling, 24-bit stereo audio ADC		2	I²S, 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 supporting carkit standard CEA-936-A (Nov 2005) - Supports SPI (up to 26 MHz) and I²C-bus (up to 400 kHz) to access control and status registers - Supports UART pass-through on DP, DM lines - Dual supply voltages: main 3.0 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 ≤ 50 mA	Mobile phone, digital camera, PDA, DVR	ISP1302 eval kit		WLCSP25 HVQFN24 (SOT616-3)
USB On-The-Go dual-role (host / peripheral) controllers					
ISP1362	- [FS, LS] USB OTG single-chip dual-role controller - Built-in charge pump for V_{BUS} generation - Optional support for external V_{BUS} source - Adjustable V_{BUS} output current 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	- [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	- ISP1761 PCI/WinCE eval kit - FlexiUSB™ stack for HS host & devices - ISP1761 PCI/Linux OTG eval kit - ISP1761 PXA25X/Linux OTG eval kit - ISP1761 PXA25x/WinCE eval kit	- 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	LQFP128 (SOT425-1) TFBGA128 (SOT857-1)
USB transceivers					
ISP110x	- 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	
ISP1102	- [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		HBCC16 (SOT639-2) HVQFN14 (SOT773-1)

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)
ISP1104 *CERTIFIED USB*	- [FS] Allows selectable differential or single-ended input mode - V_{BUS} detection input		- ISP1104W BCC eval kit		HBCC16 (SOT639-2)
ISP1105 *CERTIFIED USB*	- [FS, LS] Allows selectable differential or single-ended input mode		- ISP1105BS eval kit - ISP1105W BCC eval kit		HBCC16 (SOT639-2) HVQFN16 (SOT758-1)
ISP1106 *CERTIFIED USB*	- [FS, LS] Allows differential input mode only		- ISP1106W BCC eval kit		TSSOP16 (SOT403-1) HBCC16 (SOT639-2)
ISP1109 *CERTIFIED USB*	- [FS, LS] Peripheral transceiver supporting carkit standard CEA-936-A - Supports SPI (up to 26 MHz) and I²C-bus (up to 400 kHz) to access control and status registers - Supports UART pass-through on DP, DM lines	Carkit, mobile phone	- ISP1109 eval kit	- ISP1109 Firmware Programming Guide	HVQFN32 (SOT617-1)
ISP1110 *CERTIFIED USB*	- [FS] Bidirectional input mode only - Supports UART pass-through on DP, DM lines - V_{BUS} detection input but not in 'suspend' mode - Very good for 3.3-V supply voltage	Mobile phone	- ISP1110 eval kit		HBCC16 (SOT639-2)
USB peripheral controllers					
PDIUSBD12 *CERTIFIED USB*	- [FS] USB peripheral controller 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 - Single 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 peripheral controller 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)
ISP1183 *CERTIFIED USB*	- [FS] USB peripheral controller 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)

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 host controllers					

ISP1160/01	- [FS, LS] USB host controller, 2 downstream ports, host stack written in C
	- Single 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
				   ... Motorola 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
(for the peripheral controller portion)
CERTIFIED USB
	- Industry's first USB point-to-point IC
	- Single 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
				   ... Motorola DragonBallTM 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 for portable devices				
ISP1582 HI-SPEED CERTIFIED USB	- 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 ISP1582 to PXA255 Processor - ISP1582/83 Clearing IN Buffers - ISP1581/82/83 Frequently Asked Questions - Handheld Devices Using the ISP1582/83 - Interfacing the ISP1582/3 to the MCF5249 ColdFire Processor	HVQFN56 (SOT684-1)

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)

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 Clearing IN Buffers
				- ISP1581/82/83 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)

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 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: 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 PCI/Linux eval kit - ISP1760 PCI/WinCE eval kit - ISP1760 PXA25x/Linux eval kit - ISP1760 PXA25x/WinCE eval kit	- Interfacing ISP176x to 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)
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)

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)
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
	- Low-power operation
	- Typical current consumption:
	   ... 35-µA suspend current
	   ... 10-mA idle current
	   ... 11 mA during continuous full-speed receive
	   ... 15 mA during continuous full-speed transmit
	   ... 28 mA during continuous high-speed receive
	   ... 48 mA during continuous high-speed transmit
	- Core power 1.8 V
	- V_{CC} power 3.0 V to 3.6 V
	- "Interface Protect" feature automatically protects ULPI and USB buses during power loss to the ASIC
				- ULPI White Paper
				- Interfacing to the ISP1504/5/6	

ISP1504	- 8-bit data bus, Single Data Rate (SDR) mode - Peripheral, host, and OTG capability - Charge pump: embedded and external supported - Digital I/O interface 1.65 V to 3.6 V - ULPI bus can be placed in three-state mode: allowing ASIC pins to be reused - Accepts system clock frequency 60 MHz - ISP1504ABS: clock frequency 19.2 MHz - ISP1504CBS: clock frequency 26 MHz	Mobile apps or standalone host and peripheral apps	ISP1504 eval kit		HVQFN32 (SOT617-1)
ISP1505	- 8-bit data bus, SDR mode - Peripheral, host capability - OTG support: SRP - Charge pump: external supported - Digital I/O interface 1.65 V to 3.6 V - Accepts system clock frequency 60 MHz - ISP1505ABS: clock frequency 19.2 MHz - ISP1505CBS: clock frequency 26 MHz	Standalone host and peripheral apps, e.g., STB	ISP1505 eval kit		HVQFN24 (SOT616-1)
ISP1506	- 4-bit double data rate (DDR) bus - Peripheral, host and OTG capability - Embedded charge pump - Digital I/O interface 1.65 V to 1.95 V - ISP1506ABS: clock frequency 19.2 MHz - ISP1506BBS: clock frequency 26 MHz	Mobile apps	ISP1506 eval kit		HVQFN24 (SOT616-1)

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)
ESD protection					
PRTR5V0U2X	- ESD protection array for Hi-Speed USB and USB ports - Ultra-low line capacitance (1 pF) - IEC61000-4-2, 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) - IEC61000-4-2, 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

Serial-protocol bridges

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

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

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: Wi-Fi (802.11)

Product	Standard compliance	External components required	Design footprint (mm²)	Standby power consumption	Bluetooth 1.1/1.2 coexistence	QoS	ARM7 processor	Integrated memory	Host interfaces	SiP package dimensions (mm)	Pins
BGW211	802.11g	0	150	< 2 mW	•	•	•	1.25-MB SRAM 256-KB ROM	Optimized SDIO/SPI	10 x 15 x 1.3	68
BGW200	802.11b	3	180	< 2 mW	•	•	•	1.25-MB SRAM 256-KB ROM	Optimized SDIO/SPI	10 x 15 x 1.3	68

Performance comparison: BGW200 vs. BGW211

	BGW200	BGW211
Frequency bands	2.4 to 2.5 GHz	2.4 to 2.5 GHz
Modulations	DBPSK, DQPSK, CCK (DSSS)	DBPSK, DQPSK, CCK (DSSS), OFDM
Data rates	1, 2, 5.5, 11 Mbps	1, 2, 5.5 Mbps (802.11b) 6, 9, 12, 18, 24, 36, 48, 54 Mbps (802.11g)
Transmit power (15 dBm)	731 mW	550 mW (802.11b) 600 mW (802.11g)
Receive power	415 mW	300 mW (802.11b) 400 mW (802.11g)

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	1.2	•	268-k ROM	•	HVQFN	49 mm²	Coexists with Wi-Fi (802.11)
BGB203	Bluetooth SiP with embedded Flash	Baseband, embedded memory, and full radio	1.2	•	268-k Flash	•	HVQFN	56 mm²	Coexists with Wi-Fi (802.11)
BGB210	Bluetooth 2.0 + EDR solution	Baseband, embedded memory, and full radio	2.0+EDR	•	268 kB	•	HVQFN	25 mm²	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	•	HVQFN	15 mm²	Coexists with Wi-Fi (802.11)

Wireless connectivity: Near Field Communication (NFC)

Product	Description	80C51 Core	On-chip memory	RF level detector	Card mode detector	ISO 14443A	MIFARE®	FeliCa™	NFC IP-1	Host protocol support	Power supply	Package
PN511	EASYCONNECT			•		•	Up to 424 kbps	At 212 and 424 kbps	•	USB 2.0 full-speed, SPI, I²C, serial UART	2.5 – 3.3 V	HVQFN40
PN531	SMART EASY CONNECT	•	32-K ROM 1-K RAM	•	•	•	Up to 424 kbps	At 212 and 424 kbps	•	SPI, I²C, serial UART	2.5 – 3.3 V	TSSOP38 HVQFN40

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	One chip 2x50..100 W	SE/BTL	±12.5..30	2x90 (4 Ω, ±27 V)	0.02%	50	30/36	55	75	<150	210	2	•	HSOP24	Eff=90%
TDA8920BJ	One chip 2x50..100 W	SE/BTL	±12.5..30	2x90 (4 Ω, ±27 V)	0.02%	50	30/36	55	75	<150	210	1.3	•	SIL23P	Eff=90%
TDA8922BTH	One chip 2x25..50 W	SE/BTL	±12.5..30	2x50 (6 Ω, ±26 V)	0.02%	50	30/36	55	75	<150	210	2	•	HSOP24	Eff=90%
TDA8922BJ	One chip 2x25..50 W	SE/BTL	±12.5..30	2x50 (6 Ω, ±26 V)	0.02%	50	30/36	55	75	<150	210	1.3	•	SIL23P	Eff=90%
TDA8931T	Pow comp 1x20 W Dolby compliant	SE	12..34 (OVP 27 V)	1x16 W (4 Ω, 22 V) 1x15 W (8 Ω, 29 V)	0.014%	22	20	55	75		128	15	•	SO20L	Eff=90%, Rail-to-rail
TDA8932T	One-Chip 2x15..25 W	SE	10..36	2x16 W (4 Ω, 22 V) 2x15 W (8 Ω, 29 V)	0.01%	30	30	55	80		100	44	•	SO32L	Eff=92%
TDA8933T	One-Chip 2x10 W	SE	10..36	2x7 W (4 Ω, 15 V) 2x10 W (8 Ω, 24 V)	0.01%	30	30	55	80		100	44	•	SO32L	Eff=90%
TFA9810T	Pow stage 2x10 W	BTL	8..20	2x9 W (8 Ω,12 V) 2x12 W (8 Ω, 14 V)	0.08%	35	20	45	70	<20	200	44		SO32L	Eff=90%

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	2x6 W (4 Ω,14.4 V)		0.10%	40	20	>48	>40		50	>52	•	SIL9MPF HDIP18	Equal phase
TDA1517ATW	mini SMD 2x3 W	SE/BTL	6.0 - 18	2x3 W (8 Ω,14.4 V)		0.10%	40	26/20	>50	>40	<150	50/70	37	•	HTSSOP20	Inv. phase
TDA2614	6 W HIFI	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 HIFI	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 HIFI	SE	7.5 - 21	15 W (±16 V, 8 Ω)		0.15%	40	30	60	70		70	2.5	•	SIL9P	Sym. supply

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
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	2x75 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	2x5 W	BTL	4.5 - 18	2x5 W (12 V, 8 Ω)	73.5 dB	0.20%	15	40	38	>40	<200	210	4	•	SIL13P	
TDA8551T	1x1 W	BTL	2.7 - 5.5	1.4 W (5 V, 8 Ω)	•	0.15	6 (Vp = 5 V)	20	>48			60	160	•	SO8	
TDA8552T(S)	2x1.4 W	BTL	2.7 - 5.5	1.4 W (5 V, 8 Ω)	•	0.10%	BTL:10 (Vp = 3.3 V) SE: 5 (Vp = 3.3 V)	20 - 30	>50			60	60 (110)	•	SO/ SSOP20	
TDA8941P	1x1.5 W	BTL	4.5 - 18	1.5 W (9 V, 16 Ω)		0.03%	14	32	65		<200	90	100	•	DIP8	
TDA8942P	2x1.5 W	BTL	06-18	2x1.5 W (9 V, 16 Ω)		0.03%	22	32	65	75	<150	90	10	•	SIL9MPF/ SO20	Rail-to-rail
TDA8943SF	1x6 W	BTL	06-18	6 W (12 V, 8 Ω)		0.03%	15	32	65		<200	90	18	•	SIL9MPF	
TDA8944J	2x7 W	BTL	06-18	2x7 W (8 Ω, 12 V)		0.03%	24	32	65	75	<200	90	6.9	•	SIL13P	
TDA8944AJ	2x7.5 W	BTL	06-18	2x7 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	06-18	15 W (8 Ω, 18 V)		0.03%	18	32	65		<200	90	9	•	SIL13P	
TDA8946J	2x15 W	BTL	06-18	2x15 W (8 Ω, 18 V)		0.03%	28	32	65	75	<200	90	4.5	•	SIL17P	
TDA8946AJ	2x15 W	BTL	06-18	2x15 W (8 Ω, 18 V)	80 dB floating: 24 dB	0.10%	40	32	55	75	<200	120	2.5	•	SIL17P	
TDA8947J	SE 4x15 W or BTL 2x30..50 W	SE/BTL	9-28	4x15 W (20 V, 4 Ω)		0.07%	100	26/32	60	60	<170	150/200	1.8	•	SIL17P	
TDA8948J	SE 4x10 W or BTL 2x20..30 W	SE/BTL	9-28	4x8 W (18 V, 4 Ω)		0.07%	100	26/32	60	60	<170	150	2	•	SIL17P	

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
TFA9800J	2x6 W	SE	8.5 - 18	2x6 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 2x7 W	SE/BTL	9- 26	2x7.5 W (4 Ω,16V)		0.1/ 0.05%	60	26/32	60	60	<200	150/200	2	•	SIL9LC	
TFA9842AJ	SE 2x7 W	SE	9- 28	2x7.5 W (4Ω,16V)	80 dB	0.1/ 0.05%	60	26	60	60		150	2	•	SIL9LC	
TFA9842BJ	SE 2x7 W	SE	9- 26	2x7.5 W (4Ω,16V)		0.10%	60	26	60	60		150	2	•	SIL9LC	Equal phase
TFA9843J	SE 2x15 W	SE/BTL	9- 26	2x15 W (4 Ω, 22 V)		0.1/ 0.05%	60	26/32	60	60	<200	150/200	2	•	SIL9LC	
TFA9843BJ	SE 2x15 W	SE/BTL	9- 26	2x15 W (4 Ω, 22 V)		0.1/ 0.05%	60	26/32	60	60	<200	150/200	2	•	SIL9LC	Equal phase
TFA9843AJ	SE 2x15 W	SE	9- 28	2x15 W (4 Ω, 22 V)	80 dB	0.1/ 0.05%	60	26	60	60		150	2	•	SIL9LC	

Amplifiers by power rating

Product	Description	Number of channels	Supply voltage	Po(W) @ 10% (SE)	Po(W) @ 10% (BTL)	Mute / Standby	Diff. inputs	Packages
TDA8920BTH	1-Chip Class-D 2x100 W	2 x SE 1 x BTL	±12.5 .. 30 V	100	150	1-pin	•	HSOP24
TDA8922BTH	1-Chip Class-D 2x50 W	2 x SE 1 x BTL	±12.5 .. 30 V	50	50	1-pin	•	HSOP24
TDA8931T	Powerstage 1x20 W Class-D	1 x SE	±12..35 V	20		Mute		SO20SIL
TDA8932T	1-Chip 2x15 W Class-D	2 x SE	±10 .. 36 V	15	25	Mute	•	SO23L
TFA9810	Powerstage 2x12 W Class-D	2 x BTL	±10 .. 20 V		12		•	SO32L
TDA8933T	1-Chip 2x10 W Class-D	2 x SE	±10 .. 36 V	10	20	Mute	•	SO32L
TDA8947J	4x15 W SE / 2x30 W BTL	2 x SE 1 x BTL 2 x BTL, 4 x SE	9 .. 28 V	13 (22 V)	29 (22 V)	Mute / Standby	BTL:Y / SE: Quasi	SIL17P-sold
TDA2616	2x12 W HIFI	2 x SE 1 x BTL	7.5 .. 21 V	15	26	Mute	•	SIL9P
TDA2616Q	2x12 W HIFI	2 x SE 1 x BTL	7.5 .. 21 V	15	26	Mute	•	DBS9P
TFA9843J	2x15 W	2 x SE 1 x BTL 2 x BTL / 4 x SE	9 .. 28 V	8.5	17	Mute / Standby	BTL:Y / SE: Quasi	LSIL9
TDA8945S	1x15 W	1 x BTL	6 .. 18 V		15	Mute / Standby	•	SIL9P
TDA8946J	2x15 W	2 x BTL	6 .. 18 V		15	Mute / Standby	•	SIL17P-sold
TDA8946AJ	2x15 W DC CTRL	2 x BTL	4.5 .. 18 V		15	Mute / Standby	•	SIL17P-sold
TDA2614	6 W HIFI	1 x SE	15 .. 42 V	8.5		Mute	•	SIL9MPF
TDA2615	2x6 W HIFI	2 x SE	7.5 .. 21 V	8		Mute	•	SIL9MPF
TDA8948J	4x10 W SE / 2x20 W BTL	4 x SE 2 x BTL	9 .. 28 V	8	16	Mute / Standby	BTL:Y / SE: Quasi	SIL17P
TFA9842J	2x7 W	2 x SE 1 x BTL	9 .. 26 V	7	15	Mute / Standby	BTL:Y / SE: Quasi	SIL9C
TDA7057AQ	2x5 W C Vol CTRL	2 x BTL	4.5 .. 18 V		8	NA		SIL13P
TDA1517ATW	Mini SMD 2x3 W	1 x BTL 2 x SE	6.0 .. 18 V	4	8			HTSSOP20
TDA8944AJ	2x7.5 W DC CTRL	2 x BTL	4.5 .. 18 V		7.5	Mute / Standby	•	SIL17P-glue

Audio amplifiers

Amplifiers by power rating (continued)

Product	Description	Number of channels	Supply voltage	Po(W) @ 10% (SE)	Po(W) @ 10% (BTL)	Mute / Standby	Diff. inputs	Packages
TDA8944J	2x7 W	2 x BTL	6 .. 18 V		7	Mute / Standby	•	SIL17P-glue
TFA9800	2x6 W	2 x SE	8.5 .. 18 V	6		Mute / Standby		SIL9C
TDA1517(P)	2 x 6 W	2 x SE	8.5 .. 18 V	6				SIL9MPF/HDIP18
TDA8943SF	1x6 W	1 x BTL	6 .. 18 V		6	Mute / Standby	•	SIL9MP
TDA7056A(T)	1x3 W DC Vol CTRL	1 x BTL	4.5 .. 18 V		5	NA		SIL9MPF/SO20
TDA7056B	1x5 W DC Vol CTRL	1 x BTL	4.5 .. 18V		5	NA		SIL9MPF
TDA7056	1x3 W	1 x BTL	3.0 .. 18 V		3	NA		SIL9MPF
TDA8551T	MM BTL DIG Vol CTRL	1 x BTL	2.7 .. 5.5 V		2	1-pin		SO8
TDA8552T(S)	MM 2 x BTL DIG Vol CTRL	2 x BTL	2.7 .. 5.5 V		2	1-pin		SO/SSOP20
TDA8941P	1x1.5 W	1 x BTL	6 .. 18 V		1.5	Mute / Standby	•	DIP8
TDA8942P	2x1.5 W	2 x BTL	6 .. 18 V		1.5	Mute / Standby	•	DIP16
TDA7050(T)	Headphone amp 2x75 mW	2 x SE 1 x BTL	1.6 .. 6.0 V	0.075	0.15		•	DIL/SO8

Transimpedance pre-amplifiers

Product	Package	Description	Operating temperature range (°C)	Single supply voltage range (V)	Supply current max/min (mA)	IO$_{MAX}$ min/typ (mA)	I$_{IN}$ input current min/typ (µA)	BW -3 dB (MHz)	Differential O/P trans-resistance (kΩ)	Differential O/P voltage swing min/typ (Vp-p)	Max power dissipation (mW)	PSRR (dB)	Input noise current density (pA/sqrt(Hz))
SA5211	D (SO14)	180-MHz transimpedance amp	-40 to +85	4.5 to 5.5	20 / 31	3 / 4	±20 / ±40	180	28	1.7 / 3.2	1000	65	1.8
SA5211/01	D (SO14)	180-MHz transimpedance amp	-40 to +85	4.5 to 5.5	20 / 31	3 / 4	±20 / ±40	180	28	1.7 / 3.2	1000	65	1.8
SA5212A	D (SO8)	140-MHz transimpedance amp	-40 to +85	4.5 to 5.5	20 / 33	3 / 4	±40 / ±80	140	14	1.7 / 3.2	750	33	2.5
SA5212A/01	D (SO8)	140-MHz transimpedance amp	-40 to +85	4.5 to 5.5	20 / 33	3 / 4	±40 / ±80	140	14	1.7 / 3.2	750	33	2.5

Audio amplifiers

Product	Package	Package thermal resistance (°C/W)	Description	Operating temperature range (°C)	Channels	Single supply (VDC)	Dual supply (±VDC)	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 to 7	1.5 to 3.5	3/5	25	5	5.5	70 (typ)	10	0.01	90	60	-70/0.03		
TDA1308A	UK (WL-CSP8)	TBD	Class-AB stereo headphone driver	-40 to +85	2	3 to 7	1.5 to 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 to 7	1.5 to 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 to 7	1.5 to 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 to 7	1.5 to 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 to 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 to 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 to 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 to 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 to 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 to 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 to 18		15/22	5500			6/30		500 (max)	50 (min)			2.2	0.15/0.3 @ P_O = 0.4 W

All audio amplifiers have short-circuit protection

Audio amplifiers

Rail-to-rail op amps

Product	Package	Operating temperature range (°C)	Channels	Single supply voltage range (V)	Dual supply voltage range (±V)	Slew rate (V/μs)	CMRR min/typ (dB)	PSRR min/typ (dB)	GBW product (MHz)	Input offset voltage (±mV)	Input offset current (±nA)	Input bias current (nA)	Max power dissipation (mW)	Short-circuit protection	Input swing	Output swing	Open loop gain (dB)	Input noise voltage [nV/sqrt (Hz)]
NE5232/01	D (SO8) N (DIP8)	0 to +70	2	2 to 5.5	1 to 2.75	0.8	80/100	80/100	2.5	0.4	4	-90	500	Y	250 mV beyond ± rails	≤ 50 mV of rails	110	33
NE5234/01	D (SO14) N (DIP14)	0 to +70	4	2 to 5.5	1 to 2.75	0.8	80/100	80/100	2.5	0.2	3	-90	500	Y	250 mV beyond ± rails	≤ 50 mV of rails	110	25
SA5232/01	D (SO8) N (DIP8)	-40 to +85	2	2 to 5.5	1 to 2.75	0.8	80/100	80/100	2.5	0.6	6	-90	500	Y	250 mV beyond ± rails	≤ 50 mV of rails	110	33
SE5234/01	N (DIP8)	-40 to +125	4	2 to 5.5	1 to 2.75	0.8	80/100	80/100	2.5	0.2	3	-90	500	Y	250 mV beyond ± rails	≤ 50 mV of rails	110	25

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 IN$_1$ (Ω)	Differential input resistance at IN$_2$ (Ω)	Hysteresis voltage single-ended output (mVp-p)
SA5214	D (SO20)	Post amplifier with link status indicator	250	-40 to +85	75	4.75 to 5.25	4.75 to 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 to 5.25	4.75 to 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 to 5.5	4.5 to 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 to 5.5	4.5 to 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 to 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 to 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 to 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 to 7.0	36 / 50	1100	700	18 / 22	22 / 28	18 / 45	9.3	-60	-10	-3	+5	+13

Timers

Product	Package	Operating temperature range (°C)	Operating voltage range (V)	Power dissipation (mW)	I/O type	Maximum astable oscillator frequency (kHz)	Threshold voltage typ (xVDD)	Trigger voltage typ (xVDD)	Trigger current VDD = VTRIG = VMAX typ (pA)	Threshold current VDD = VTRIG = VMAX typ (pA)	Reset current VDD = VTRIG = VMAX typ (pA)	Reset voltage VDD = VTRIG = VMAX typ (pA)	Output rise time typ/max (ns)	Output fall time typ/max (ns)
ICM7555C/01	D (SO8)	0 to +70	3 to 16	780	CMOS, TTL	≥ 500	0.65	0.31	50	50	100	0.4 / 1.0	45 / 75	20 / 75
ICM7555CN/01	N (DIP8)	0 to +70	3 to 16	1160	CMOS, TTL	≥ 500	0.65	0.31	50	50	100	0.4 / 1.0	45 / 75	20 / 75
ICM7555I/01	D (SO8)	-40 to +85	3 to 16	780	CMOS, TTL	≥ 500	0.65	0.31	50	50	100	0.4 / 1.0	45 / 75	20 / 75
ICM7555I/01	N (DIP8)	-40 to +85	3 to 16	1160	CMOS, TTL	≥ 500	0.65	0.31	50	50	100	0.4 / 1.0	45 / 75	20 / 75
AU7555/01	D (SO8)	-40 to +125	3 to 16	780	CMOS, TTL	≥ 500	0.65	0.31	50	50	100	0.4 / 1.0	45 / 75	20 / 75

I²C-bus devices

I²C-bus devices

Device	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 to 70	-40 to 85	-55 to 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 to 125		16							DS
NE1619							2 °C	•					2							•	•	•	•			0 to 125		16							DS
P82B715					1-1				NA												•	•	•				•		8	PN	TD					
P82B96					1-1				NA										•	•	•	•				-40 to 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 to 125		8						DP	
PCA8581/81C									1				8						•	•	•	•				-25 to 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	

| | Type of function in device | | | | | | | | | | | | | | | | Features | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | 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 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 to 70	-40 to 85	-55 to 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	
PCA9560			5-1-2										4			25-100			•	•	•	•					•		20			D			PW	

Continued next page

I²C-bus devices (continued)

Device	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 to 70	-40 to 85	-55 to 125	Pin count	DIP	SO (narrow)	SO (wide)	SSOP	QSOP	TSSOP	HVQFN
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			D	TS		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												24ch	2					•	•	•		•	•				•		100			LQFP100				
PCF2116												48-ch	2					•	•	•	•						•					DIE				
PCF2119												32ch	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						•	•	•	•					•		48			LQFP48				
PCF8563										•			1	0/1			•	•	•	•	•	•	•	•	•		•		8	PN		TD			DP	
PCF8566													96	16				•	•	•	•						•		40	PN		VSO40				
PCF8570									2				8					•	•	•	•						•		8	PN		TD				

	Type of function in device																Features																		
																	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 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 to 70	-40 to 85	-55 to 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 to 125			24			D			DP	
SAA1064												4x8	4			21-mA			•	•	•						•		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 to 125			8						PW	TK
SE98							2 °C						8	0/1						•				•	•	-20 to 125			8						PW	TK
TDA8444											6		8						12 V		•	•				-20 to 70			16	P		T				

Datasheets can be downloaded at: **www.nxp.com/i2clogic** or **www.nxp.com/i2c**

PCI EXPRESS

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

PCI EXPRESS

Integrated power management

µTrenchMOS in SOT-23

Product	V_{DS} max (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. $R_{DS(on)}$ mW V_{GS}=10V	V_{GS}=4.5V	V_{GS}=2.5V	QGD (nC)
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
PH2625L	25	2.8	4.1		7.3
PH5525L	25	5.5	8.2		3.3
PH6325L	25	6.3	9.5		3.3
PH3230S	30	3.2	6.5		13
PH3330L	30	3.3	4.5		6.9
PH3830L	30	3.8	4.9		11
PH4530L	30	5.7	7.2		6.5
PH5330E	30	5.7	8.5		6
PH8030L	30	5.9	9.7		3.1
PH7030L	30	7.9	10		3.2
PH8230E	30	8.2	13.2		5
PH16030L	30	16	23.5		2.9
PH4840S	40	4.1	4.8 (@7V)		16
PH955L	55	8.3	9.9		17
PH1955L	55	17.3	21		8
PH3855L	55	38	45		5.5
PH1875L	75	16.5	20		15
PH3075L	75	28	34		9
PH3475S	75	34			8.6
PH20100S	100	23			8.9

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

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

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

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

For more information on NXP power products visit **www.nxp.com/power**

Logic cross-reference

Logic competitive cross-reference

Family	Package	NXP	Texas Instruments	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
CMOS							
HEF4000B	DIP SOIC SSOP I SSOP II TSSOP	HEF4xxxBPN HEF4xxxBTD HEF4xxxDB	CD4xxxBE CD4xxxBM	CD4xxxBN CD4xxxBM/WM CD4xxxMTC	MC14xxxBP MC14xxxBD MC14xxxDT	TC4xxxBP TC4xxxBFN TC4xxxFS	HCF4xxxBEY HCF4xxxBM1/M013TR
HC(T) T=TTL	DIP SOIC SSOP II TSSOP DQFN	74HC(T)xxxN 74HC(T)xxxD 74HC(T)xxxDB 74HC(T)xxxPW 74HC(T)xxxBQ	SN74HC(T)xxxN SN74HC(T)xxxD/DW SN74HC(T)xxxDB SN74HC(T)xxxPW	MM74HC(T)xxxN MM74HC(T)xxxM/WM MM74HC(T)xxxMTC 74HC(T)xxxBQ	MC74HC(T)xxxN MC74HC(T)xxxD MC74HC(T)xxxDT	TC74HC(T)xxxAP TC74HC(T)xxxAFW	M74HCxxxB1R M74HCxxxM1R/RM13TR M74HCxxxTTR
AHC(T) T=TTL	SOIC TSSOP DQFN	74AHC(T)xxxD 74AHC(T)xxxPW 74AHC(T)xxxBQ	SN74AHC(T)xxxD/DW SN74AHC(T)xxxPW	MM74VHC(T)xxxM/WM MM74VHC(T)xxxMTC MM74VHC(T)xxxBQ	MC74VHC(T)xxxD MC74VHC(T)xxxDT	TC74VHC(T)xxxAFN/FW TC74VHC(T)xxxAFT	74VHCxxxTTR/ATTR 74VHCTxxxTTR/ATTR
Low-voltage CMOS							
LVC(H) H=bushold feature	SOIC SSOP II TSSOP I DQFN SSOP III TSSOP II LFGBA VFBGA	74LVC(H)xxxAD 74LVC(H)xxxADB 74LVC(H)xxxAPW 74LVC(H)xxxBQ 74LVC(H)16xxxADL 74LVC(H)16xxxADGG 74LVC(H)32xxxAEC 74LVC(H)32xxxAEV	SN74LVC(H)xxxAD/DW SN74LVC(H)xxxADB SN74LVC(H)xxxAPW SN74LVC(H)16xxxADL SN74LVC(H)16xxxADGG SN74LVC(H)32xxxAGKE SN74LVC(H)32xxxAGQL	74LCXxxxM/WM 74LCXxxxMSA 74LCXxxxMTC 74LCXxxxBQ 74LCX16xxxMEA 74LCX16xxxMTD	MC74LCXxxxD MC74LCXxxxSD MC74LCXxxxDT MC74LCX16xxxDT	TC74LCXxxxFN/FW TC74LCXxxxFT TC74LCX16xxxFT	74LCXxxxM/MTR 74LCXxxxTTR 74LCX(H)16xxxM/MTR
ALVC(H)	SO TSSOP DQFN SSOP III TSSOP II LFBGA	74ALVCxxxD 74ALVCxxxPW 74ALVCxxxBQ 74ALVC(H)16xxxDL 74ALVC(H)16xxxDGG 74ALVC(H)32xxxEC	SN74ALVCxxxD/DW SN74ALVCxxxPW SN74ALVC(H)16xxxDL SN74ALVC(H)16xxxDGG SN74ALVC(H)32xxxGKE	74VCXxxxM 74VCXxxxMTC 74VCXxxxBQ 74VCX16xxxMEA 74VCX16xxxMTD		TC74VCX16xxxFT	74VCX(H)16xxxTTR
LV	SOIC SSOP II TSSOP I	74LVxxxD 74LVxxxDB 74LVxxxPW	SN74LVxxxD/DW SN74LVxxxDB SN74LVxxxPW	74LVXxxxM/WM 74LVXxxxMSA 74LVXxxxMTC	MC74LVXxxxD MC74LVXxxxDT	TC74LVXxxxFN/FW TC74LVXxxxFS TC74LVXxxxFT	

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

Logic competitive cross-reference (continued)

Family	Package	NXP	Texas Instruments	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
5-volt BiCMOS							
ABT(H) H=bushold feature	DIP SOIC SSOP II TSSOP SSOP III TSSOP II	74ABTxxxN 74ABTxxxD 74ABTxxxDB 74ABTxxxPW 74ABT(H)16xxxDL 74ABT(H)16xxxDGG	SN74ABTxxxN SN74ABTxxxD/DW SN74ABTxxxDB SN74ABTxxxPW SN74ABT(H)16xxxDL SN74ABT(H)16xxxDGG	74ABTxxxPC 74ABTxxxSC 74ABTxxxMSA 74ABTxxxMTC 74ABT16xxxSSC 74ABT16xxxMTD			
Low-voltage BiCMOS							
LVT NXP – bushold is built in	SOIC SSOP II TSSOP DQFN SSOP III TSSOP II VFBGA LFBGA	74LVTxxxD 74LVTxxxDB 74LVTxxxPW 74LVTxxxBQ 74LVT16xxxDL 74LVT16xxxDGG 74LVT16xxxEV 74LVT32xxxEC	SN74LVTHxxxD/DW SN74LVTHxxxDB SN74LVTHxxxPW SN74LVTH16xxxDL SN74LVTH16xxxDGG SN74LVTH16xxxGQL SN74LVTH16xxxGKE	74LVTHxxxM/WM 74LVTHxxxMSA 74LVTHxxxMTC 74LVTH16xxxMEA 74LVTH16xxxMTD			
ALVT bushold is built in	SSOP III TSSOP II	74ALVT16xxxDL 74ALVT16xxxDGG	SN74ALVT16xxxDL SN74ALVT16xxxDGG				
Bipolar							
FAST	DIP SOIC SSOP II	N74FxxxN N74FxxxD N74FxxxDB	SN74FxxxN SN74FxxxD/DW SN74FxxxDB	74FxxxPC/SPC 74FxxxSC 74FxxxMSA			

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		NC7SxxxP5	MC74HC1GxxxDFT	TC7SxxxFU	74H1GxxxCTR
SOT753	74HC1GxxxGV		NC7SxxxM5	MC74HC1GxxxDTT	TC7SxxxF	74H1GxxxSTR
SOT363	74HC1GxxxGW					
SOT457	74HC1GxxxGV					
SOT363	74HC2GxxxGW					
SOT457	74HC2GxxxGV					
SOT505-2	74HC2GxxxDP				TC7WxxxFU	
SOT765	74HC2GxxxDC				TC7WxxxF	
SOT505-2	74HC3GxxxDP				TC7WxxxFU	
SOT765	74HC3GxxxDC				TC7WxxxF	
HCT series						
SOT353	74HCT1GxxxGW		NC7STxxxP5		TC7STxxxFU	
SOT753	74HCT1GxxxGV		NC7STxxxM5		TC7STxxxF	
SOT363	74HCT1GxxxGW					
SOT457	74HCT1GxxxGV					
SOT363	74HCT2GxxxGW					
SOT457	74HCT2GxxxGV					
SOT505-2	74HCT2GxxxDP				TC7WTxxxFU	
SOT765	74HCT2GxxxDC				TC7WTxxxF	
SOT505-2	74HCT3GxxxDP				TC7WTxxxFU	
SOT765	74HCT3GxxxDC				TC7WTxxxF	
AHC series						
SOT353	74AHC1GxxxGW	SN74AHC1GxxxDCKMC		74AHC1GxxxDFT	TC7SHxxxFU	74V1GxxxCTR
SOT753	74AHC1GxxxGV	SN74AHC1GxxxDBVMC		74AHC1GxxxDTT	TC7SHxxxF	74V1GxxxSTR
SOT363	74AHC1GxxxGW					
SOT457	74AHC1GxxxGV					
SOT363	74AHC2GxxxGW					
SOT457	74AHC2GxxxGV					
SOT505-2	74AHC2GxxxDP				TC7WHxxxFU	
SOT765	74AHC2GxxxDC					
SOT505-2	74AHC3GxxxDP				TC7WHxxxFU	
SOT765	74AHC3GxxxDC					

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
SOT363	74AHCT1GxxxGW					
SOT457	74AHCT1GxxxGV					
SOT363	74AHCT2GxxxGW					
SOT457	74AHCT2GxxxGV					
SOT505-2	74AHCT2GxxxDP					
SOT765	74AHCT2GxxxDC					
SOT505-2	74AHCT3GxxxDP					
SOT765	74AHCT3GxxxDC					
LVC series						
SOT353	74LVC1GxxxGW	SN74LVC1GxxxDCK	NC7SZxxxP5	NL17SZxxxDFT	TC7SZxxxFU	74LX1GxxxCTR
SOT753	74LVC1GxxxGV	SN74LVC1GxxxDBV	NC7SZxxxM5	NL17SZxxxDTT	TC7SZxxxF	74LX1GxxxSTR
SOT886	74LVC1GxxxGM	SN74LVC1GxxxYZP	NC7SZxxxL6			
SOT363	74LVC1GxxxGW	SN74LVC1GxxxDCK	NC7SZxxxP6	NL17SZxxxDFT	TC7SZxxxFU	
SOT457	74LVC1GxxxGV	SN74LVC1GxxxDBV		NL17SZxxxDTT	TC7SZxxxF	
SOT891	74LVC1GxxxGF					
SOT505-2	74LVC1GxxxDP	SN74LVC1GxxxDCT / SN74LVC2GxxxDCT			TC7SZxxxFU	
SOT765	74LVC1GxxxDC	SN74LVC1GxxxDCU / SN74LVC2GxxxDCU	NC7SZxxxK8	NL17SZxxxUS	TC7SZxxxF	
SOT883	74LVC1GxxxGT	SN74LVC1GxxxYZP / SN74LVC2GxxxYZP				
SOT902	74LVC1GxxxGM		NC7SZxxxL8			
SOT886	74LVC2GxxxGM	SN74LVC2GxxxYZP	NC7WZxxxL6			
SOT363	74LVC2GxxxGW	SN74LVC2GxxxDBV	NC7WZxxxP6	NL27WZxxxDFT		
SOT457	74LVC2GxxxGV	SN74LVC2GxxxDCT		NL27WZxxxDTT		
SOT891	74LVC2GxxxGF					
SOT505-2	74LVC2GxxxDP	SN74LVC2GxxxDCT				
SOT765	74LVC2GxxxDC	SN74LVC2GxxxDCU	NC7WZxxxK8	NL27WZxxxUS		
SOT883	74LVC2GxxxGT	SN74LVC2GxxxYZP				
SOT902	74LVC2GxxxGM		NC7WZxxxL8			
SOT505-2	74LVC3GxxxDP	SN74LVC3GxxxDCT				
SOT765	74LVC3GxxxDC	SN74LVC3GxxxDCU	NC7NZxxxK8	NL37NZxxxUS		
SOT883	74LVC3GxxxGT	SN74LVC3GxxxYZP				
SOT902	74LVC3GxxxGM		NC7NZxxxL8			

Logic cross-reference

PicoGate and MicroPak competitive cross-reference (continued)

Package	NXP	Texas Instruments	Fairchild Semiconductor	ON Semiconductor	Toshiba	ST Microelectronics
AUP series						
SOT353	74AUP1GxxxGW	SN74AUP1GxxxDCK	NC7SPxxxP5		TC7SLxxxFU	
SOT886	74AUP1GxxxGM	SN74AUP1GxxxYZP	NC7SPxxxL6			
SOT363	74AUP1GxxxGW	SN74AUP1GxxxDCK	NC7SPxxxP6			
SOT891	74AUP1GxxxGF					
SOT765	74AUP1GxxxDC		NC7SPxxxK8			
SOT833	74AUP1GxxxGT					
SOT902	74AUP1GxxxGM		NC7SPxxxL8			
SOT886	74AUP2GxxxGM		NC7WPxxxL6			
SOT363	74AUP2GxxxGW		NC7WPxxxP6			
SOT891	74AUP2GxxxGF					
SOT765	74AUP2GxxxDC		NC7WPxxxK8			
SOT833	74AUP2GxxxGT					
SOT902	74AUP2GxxxGM		NC7WPxxxL8			
SOT765	74AUP3GxxxDC		NC7NPxxxK8			
SOT833	74AUP3GxxxGT					
SOT902	74AUP3GxxxGM		NC7NPxxxL8			

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 – 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

LPC3000 family

Product	RAM	Instruction cache	Data cache	No. of timers [1]	PWM channels	USB	UART	I²C	SPI	ADC (10-bit) No. of channels	I/O pins	Interrupts (Ext) / levels	External bus interface	PLL	Max freq (MHz)	CPU I	I/O voltage	Temp range options	Package
LPC3000 devices are based on the ARM926EJ core and provide a vector floating-point coprocessor and integrated USB On-The-Go																			
LPC3180	64 K	32 K	32 K	4	2	1	7	2	2	3	55	60 (18) / 3	•	•	208	1.2 V	3 / 1.8 V	F	LFBGA320

[1] Includes WDT and RTC

LPC2000 family

Product	RAM	Flash	No. of timers [1]	PWM (ch)	RTC/system timer	Ethernet	USB	UART	I²C	CAN	SPI	SSP	I²S	ADC channels (10-bit)	DAC channels (10-bit)	SD/MMC	I/O pins	Program security	Max freq (MHz)	Temp range options	Package
LPC2800 devices																					
LPC2888	64 K	1M	5				1	1	1					5			85	•	60	F	TBGA180
LPC2880 [2]	64 K		5				1	1	1					5			79		60	F	TBGA180
LPC2400 devices																					
LPC24xx	98K	512K	6	12 [3]		1	1 [4]	4 [5]	3	2	1	2	1	8	1	•	160	•	72	F	
LPC2300 devices																					
LPC2378	58K	512K	6	6		1	1 [4]	4 [5]	3	2	1	2	1	8	1	•	104	•	72	F	LQFP144
LPC2368	58K	512K	6	6		1	1 [4]	4 [5]	3	2	1	2	1	8	1	•	70	•	72	F	LQFP100
LPC2366	58K	256K	6	6		1	1 [4]	4 [5]	3	2	1	2	1	8	1	•	70	•	72	F	LQFP100
LPC2364	34K	128K	6	6		1	1 [4]	4 [5]	3	2	1	2	1	8	1	•	160	•	72	F	LQFP100
LPC2200 devices are based on the ARM7TDMI-S core and offer up to four CAN channels as well as eight 10-bit ADC channels																					
LPC2294	16 K	256 K	5	6	•			2	•	4	2			8			112	•	60	J	LQFP144
LPC2292	16 K	256 K	5	6	•			2	•	2	2			8			112	•	60	F	LQFP144
LPC2290	16 K		5	6	•			2	•	2	2			8			76		60	F	LQFP144 TFBGA144
LPC2214	16 K	256 K	5	6	•			2	•		2			8			112	•	60	F	LQFP144
LPC2212	16 K	128 K	5	6	•			2	•		2			8			112	•	60	F	LQFP144
LPC2210	16 K		5	6	•			2	•		2			8			76		60	F	LQFP144

[1] Includes WatchDog and Real-Time clock, [2] LPC2880 is the ROMless version of the LPC2888, [3] 2 PWM blocks, [4] USB 2.0 FS device with PHY, DMA, and 4K RAM, [5] UART 3 with IrDA, [6] Using timers 0-3

LPC2000 family (continued)

Product	Memory		Timers			Serial interfaces								ADC channels (10-bit)	DAC channels (10-bit)	SD/MMC	I/O pins	Program security	Max freq (MHz)	Temp range options	Package
	RAM	Flash	No. of timers[1]	PWM (ch)	RTC/system timer	Ethernet	USB	UART	I²C	CAN	SPI	SSP	I²S								
LPC2100 devices are based on the ARM7TDMI-S core and offer 60-MHz operation, up to four CAN channels, up to four 10-bit ADC channels, and on-chip real-time monitor and trace																					
LPC2194	16 K	256 K	5	6	•			2	•	4	2			4			46	•	60	J	LQFP64
LPC2148	32 K	512 K	5	6	•		1	2	2		2			16	1		46		60		LQFP64
LPC2146	32 K	256 K	5	6	•		1	2	2		2			16	1		46		60		LQFP64
LPC2144	16 K	128 K	5	6	•		1	2	2		2			8	1		46		60		LQFP64
LPC2142	16 K	64 K	5	6	•		1	2	2		2			8	1		46		60		LQFP64
LPC2141	18 K	32 K	5	6	•		1	2	2		2			8	1		46		60		LQFP64
LPC2138	32 K	512 K	5	6	•			2	2		2			16	1		47	•	60	F, H	HVQFN64, LQFP64
LPC2136	32 K	256 K	5	6	•			2	2		2			16	1		47	•	60	F	LQFP64
LPC2134	16 K	128 K	5	6	•			2	2		2			16	1		47	•	60	F	LQFP64
LPC2132	16 K	64 K	5	6	•			2	2		2			8	1		47	•	60	F, H	HVQFN64, LQFP64
LPC2131	8 K	32 K	5	6	•			2	2		2			8			47	•	60	F	LQFP64
LPC2129	16 K	256 K	5	6	•			2	1	2	2			4			46	•	60	F	LQFP64, HVQFN64
LPC2124	16 K	256 K	5	6	•			2	1		2			4			46	•	60	F	LQFP64, HVQFN64
LPC2119	16 K	128 K	5	6	•			2	1	2	2			4			46	•	60	F	LQFP64
LPC2114	16 K	128 K	5	6	•			2	1		2			4			46	•	60	F	LQFP64
LPC2106	64 K	128 K	5	6	•			2	1		1						32		60	B, F	LQFP48
LPC2105	32 K	128 K	5	6	•			2	1		1						32		60	B	LQFP48
LPC2104	16 K	128 K	5	6	•			2	1		1						32		60	B	LQFP48
LPC2103	8 K	32 K	6	14[6]				2	2		2			8			32		70	F	LQFP48
LPC2102	4 K	16 K	6	14[6]				2	2		2			8			32		70	F	LQFP48
LPC2101	2 K	8 K	6	14[6]				2	2		2			8			32		70	F	LQFP48

[1] Includes Watchdog and real-time clock, [2] LPC2880 is the ROMless version of the LPC2888, [3] 2 PWM blocks, [4] USB 2.0 FS device with PHY, DMA, and 4-K RAM, [5] UART 3 with IrDA, [6] Using timers 0-3

Microcontrollers

LPC900 family

| Product | Memory | | | | Timers | | | Serial interfaces | | | | ADC channels/bits | Analog comparators | I/O pins | Program security | Max frequency (MHz) | Temperature range options | Package |
	RAM	EEPROM (dedicated)	Flash	OTP/ROM	No. of timers (total)	PWM (ch)	RTC/system timer	UART	I²C	CAN	SPI							
LPC95x devices																		
P89LPC952	512 B		8 K		4	2 ch	1	2	1		1	8/10	2	42	•	18	F	PLCC44, LQFP48
LPC940x devices																		
P89LPC9408	768 B	512 B	8 K		5	CCU	1	1	1		1	8/10	2	23	•	18	F	LQFP64
P89LPC9401	256 B		8 K		4	2 ch	1	1	1		1		2	23	•	18	F	LQFP64
LPC93x devices																		
P89LPC938	768 B	512 B	8 K		5	CCU	1	1	1		1	8/10		26	•	18	F	TSSOP28, PLCC28, HVQFN28
P89LPC9381	256 B		4 K		4	2 ch	1	1	1		1	8/10	2	26	•	18	F	TSSOP28, PLCC28
P89LPC936	768 B	512 B	16 K		5	CCU	1	1	1		1	2x 4/8	2	26	•	18	F	TSSOP28
P89LPC935	768 B	512 B	8 K		5	CCU	1	1	1		1	2x 4/8	2	26	•	18	F	TSSOP28, PLCC28, HVQFN28
P89LPC933/934	256 B		4/8 K		4	2 ch	1	1	1		1	4/8	2	26	•	18	F	TSSOP28
P89LPC932A1	768 B	512 B	8 K		5	CCU	1	1	1		1		2	26	•	18	F	PLCC28, HVQFN28, TSSOP28
P89LPC930/931	256 B		4/8 K		4	2 ch	1	1	1		1		2	26	•	18	F	TSSOP28
LPC92x devices																		
P89LPC924/925	256 B		4/8 K		4	2 ch	1	1	1			4/8	2	18	•	18	F	TSSOP20
P89LPC921/922	256 B		4/8 K		4	2 ch	1	1	1				2	18	•	18	F	TSSOP20, DIP20
P89LPC920	256 B		2 K		4	2 ch	1	1	1				2	18	•	18	F	TSSOP20
LPC91x devices																		
P89LPC917	256 B		2 K		4	2 ch	1	1	1			4/8	2	14	•	18	F	TSSOP16
P89LPC916	256 B		2 K		4	1 ch	1	1	1		1	4/8	2	14	•	18	F	TSSOP16
P89LPC915	256 B		2 K		4	1 ch	1	1	1			4/8	2	12	•	18	F, H	TSSOP14 DIP14

Continued next page

LPC900 family (continued)

Product	Memory				Timers			Serial interfaces				ADC channels/bits	Analog comparators	I/O pins	Program security	Max frequency (MHz)	Temperature range options	Package
	RAM	EEPROM (dedicated)	Flash	OTP/ROM	No. of timers (total)	PWM (ch)	RTC/system timer	UART	I²C	CAN	SPI							
P89LPC914	128 B		1 K		4	1 ch	1	1			1		2	12	•	IRC	F	TSSOP14
P89LPC913	128 B		1 K		4		1	1			1		2	12	•	18	F	TSSOP14
P89LPC912	128 B		1 K		4	1 ch	1				1		2	12	•	18	F	TSSOP14
LPC910x devices																		
P89LPC9107	128 B		1 K		4	2 ch	1	1				4/8	1	10	•	18	F	TSSOP14 DIP14
P89LPC9103	128 B		1 K		4		1	1				4/8	1	8	•	18	F	HVSON10
P89LPC9102	128 B		1 K		4	2 ch	1					4/8	1	8	•	18	F	HVSON10
LPC90x devices																		
P89LPC908	128 B		1 K		4		1	1					1	6	•	IRC	F	SO8
P89LPC907	128 B		1 K		4		1	1 [1]					1	6	•	IRC	F	SO8
P89LPC906	128 B		1 K		4	1 ch	1						1	6	•	18	F	SO8
P89LPC904	128 B		1 K		4		1	1				2/8	2	6	•	18	F	SO8
P89LPC903	128 B		1 K		4		1	1					2	6	•	IRC	F	SO8
P89LPC902	128 B		1 K		4		•						2	6	•	IRC	F	SO8, DIP8
P89LPC901	128 B		1 K		4	1 ch	•						1	6	•	18	F	SO8, DIP8

[1] Transmit function only

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	=	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	Channel	V_{CC} (±10%)	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	Part number (temp range 0 to 70 °C)	Part number (temp range -40 to 85 °C)
SCC2691	Single-channel version of SCC2692	1	5 V	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 V	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 V	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 V	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 V	125	3/1	Normal Vectored	14	1		3/1 level		Motorola		DIL40 PLCC44	SCC68681AC1N40 SCC68681AC1A44	SCC68681AE1N40 SCC68681AE1A44
SCC2681T	CMOS version of SCN2681T	2	5 V	500	3/1	Normal	15	1		3/1 level		Intel	•	PLCC84	SCC2681TC1A44	
SCC2692	CMOS version of SCN2681	2	5 V	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 V	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 V	1000	8/8	Normal multi-level	15	1	•	All		Intel	•	DIL40 PLCC44 QFP44		SCC26C92A1N SCC26C92A1A SCC26C92A1B

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Industrial UARTs (continued)

Product	Comment	Channel	V_{CC} (±10%)	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	Part number (temp range 0 to 70 °C)	Part number (temp range -40 to 85 °C)
SC28L92	Low-power, faster version of SC26C92	2	3.3 or 5 V	1000	16/6 or 8/8	Normal multi-level vectored IACK/DACK	15	1	•	All		Intel or Motorola	•	PLCC44 QFP44		SC28L92A1A SC28L92A1B
SC28L202	Enhanced, faster version of SC28L92	2	3.3 or 5 V	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 V	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 V	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 V	125	3/1	Normal	32	4		3/1 level		Intel	•	PLCC84	SCC2698BC1A84	SCC2698BE1A84
SC28L198	Enhanced version of SCC2698B	8	3.3 or 5 V	1000	16/16	Normal multi-level IACK/DACK I2A	32	2	•	All	Auto	Intel or Motorola	•	PLCC84 LQFP100		SC28L198A1A SC28L198A1BE

VCO varicap diodes

Product	Package	Cd @ Vr (pF)			Cd @ Vr (pF)			Tuning range Cd over voltage range (V)			RS (Ω)	Note
		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	New product
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	New product
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	

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

Radio varicap diodes: FM radio tuning

Product	Package	Cd @ Vr (pF)			Cd @ Vr (pF)			Tuning range Cd over voltage range (V)			RS (Ω)	Note
		Min	Max	(V)	Min	Max	(V)	Ratio (min)	V1 to V2		Typ	
BB200	SOT23	65.8	74.2	1	12	14.8	4.5	5	1	4.5	0.43	
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	New product
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				Note
		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	•	•		•	New product
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	•			•	New product
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	•	•			New product
BB185LX	SOD882T	2.45	2.97	10	12	1	10	0.75	2	•	•			New product
Unmatched														
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				Note
		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	•			•	New product
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	•			•	New product
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	•			•	New product
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				•		New product

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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
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
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	
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	**BAP70LX**		BAP70-04W	BAP70-05				BAP70AM
BAP1321-03	BAP1321-02	**BAP1321LX**	BAP1321-04						

*Types in **bold** indicate new product*

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

Product	Package	@ VS [1] (V)	Is (mA)	@ 900 MHz NF (dB)	Gain[2] (dB)	OIP3 (dBm)	P1dB (dBm)	@ 1800 MHz NF (dB)	Gain[2] (dB)	OIP3 (dBm)	P1dB (dBm)	Gain [2] 2.5 GHz	Limits 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	@ VS (V)	Is (mA)	Frequency range (MHz)	@ 900 MHz Gain [1] (dB)	DG[2] (dB)	P1dB (dBm)	ACPR (dBc)	@ 1900 MHz Gain [1] (dB)	DG[2] (dB)	P1dB (dBm)	ACPR (dBc)	Limits 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

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

Product	Package	@ VS (V)	Is (mA)	f_U [1] @ -3 dB (GHz)	@ 1 GHz NF (dB)	Psat (dBm)	Gain[3] (dB)	P1dB (dBm)	OIP3 (dBm)	Gain [3] (dB) @ 100 MHz	2.2 GHz	2.6 GHz	3.0 GHz	Limits 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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RF

Wideband linear mixer

Product	Package	@ VS (V)	@ Is (mA)	RF input freq range	IF ouput freq range	@ 880 MHz NF (dB)	@ 880 MHz Gain [1] (dB)	@ 880 MHz OIP3 (dBm)	@ 2450 MHz NF (dB)	@ 2450 MHz Gain [1] (dB)	@ 2450 MHz OIP3 (dBm)	Limits Vs (V)	Limits Is (mA)	Limits 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	@ VS (V)	@ Is (mA)	@ 900 MHz NF (dB)	@ 900 MHz Gain (dB)	@ 900 MHz IIP3 (dBm)	@ 1800 MHz NF (dB)	@ 1800 MHz Gain (dB)	@ 1800 MHz IIP3 (dBm)	Gain [3] (dB) @ 100 MHz	Gain [3] (dB) @ 1.0 GHz	Gain [3] (dB) @ 2.6 GHz	Gain [3] (dB) @ 3.0 GHz	Limits Vs (V)	Limits Is (mA)	Limits 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	Curve	Package	Typ f_T (GHz)	V_{ceo} (V)	I_C (mA)	P_{tot} (mW)	Polarity	G_{UM} (dB)	NF (dB)	@ (MHz)	G_{UM} (dB)	NF (dB)	@ (MHz)	V_O (mV)	PI (dBm)	ITO (dBm)	@ I_C & (mA)	V_{ce} (V)
					Maximum values													
BFS17	3	SOT23	1	15	25	300	NPN		4.5	500								
BFS17W	3	SOT323	1.6	15	50	300	NPN		4.5	500								
BFS17A	4	SOT23	2.8	15	25	300	NPN	13.5	2.5	800				150			14	10
BFR92A	7	SOT23	5	15	25	300	NPN	14	2.1	1000	8	3	2000	150			14	10
BFR92AW	7	SOT323	5	15	25	300	NPN	14	2	1000	8	3	2000					
BFR93AW	8	SOT323	5	12	35	300	NPN	13	1.5	1000	8	2.1	2000					
BFG591	22	SOT223	7	15	200	2000	NPN	13		900	7.5		2000	700			70	10
BFG67(/X)	14	SOT143	8	10	50	380	NPN	17	1.7	1000	10	2.5	2000					
BFQ67W	14	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)	20	SOT143	9	15	70	300	NPN	19	1.6	900	13	1.9	2000	275	17	26	20	6
BFG520W(/X)	20	SOT343	9	15	70	500	NPN	17	1.1	900	11	1.85	2000	275	17	26	20	6
BFG540(/X)	21	SOT143	9	15	120	500	NPN	18	1.3	900	11	2.1	2000	500	21	34	40	8
BFG540W(/X)	21	SOT343	9	15	120	500	NPN	16	1.3	900	10	2.1	2000	500	21	34	40	8
BFG541	21	SOT223	9	15	120	650	NPN	15	1.3	900	9	2.1	2000	500	21	34	40	8
BFM505	19	SOT363	9	8	18	500	NPN	17	1.1	900	10	1.9	2000					
BFM520	20	SOT363	9	8	70	1000	NPN	15	1.2	900	9	1.9	2000					
BFQ540	21	SOT89	9	15	120	1200	NPN		1.9	900				500			40	8
BFR505	19	SOT23	9	15	18	150	NPN	17	1.2	900	10	1.9	2000		4	10	5	6
BFR505T	19	SOT416	9	15	18	150	NPN	17	1.2	900								

G_{UM} = Maximum Unilateral Gain

Wideband transistors [RF small signal] (continued)

Product	Curve	Package	Typ f_T (GHz)	Maximum values V_{ceo} (V)	Maximum values I_c (mA)	Maximum values P_{tot} (mW)	Polarity	G_{UM} (dB)	NF (dB)	@ (MHz)	G_{UM} (dB)	NF (dB)	@ (MHz)	V_O (mV)	PI (dBm)	ITO (dBm)	@ I_c & (mA)	V_{ce} (V)
BFR520	20	SOT23	9	15	70	300	NPN	15	1.1	900	9	1.9	2000		17	26	20	6
BFR520T	20	SOT416	9	15	70	150	NPN	15	1.1	900	9	1.9	2000		17	26	20	6
BFR540	21	SOT23	9	15	120	500	NPN	14	1.3	900	7	2.1	2000	550	21	34	40	8
BFS505	19	SOT323	9	15	18	150	NPN	17	1.2	900	10	1.9	2000		4	10	5	6
BFS520	20	SOT323	9	15	70	300	NPN	15	1.1	900	9	1.9	2000		17	26	20	6
BFS540	21	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					
BFG310W/XR	4, 5	SOT343XR	14	6	10	60	NPN	18	1.0	1000					1.8	8.5	5	3
BFG310/XR	4, 5	SOT143XR	14	6	10	60	NPN	18	1.0	1000					1.8	8.5	5	3
BFG325W/XR	4, 5	SOT343XR	14	6	35	210	NPN	18.3	1.1	3000					8.7	19.4	15	3
BFG325/XR	4, 5	SOT143XR	14	6	35	210	NPN	18.3	1.1	3000					8.7	19.4	15	3
BFG480W	29	SOT343	21	4.5	250	360	NPN		1.2	900	16	1.8	2000		20	28	80	2
BFG410W	26	SOT343	22	4.5	12	54	NPN		0.9	900	21	1.2	2000		5	15	10	2
BFG424F	27	SOT343F	25	4.5	30	135	NPN		0.8	900	23	1.2	2000		12	22	25	2
BFG424W	27	SOT343	25	4.5	30	135	NPN		0.8	900	22	1.2	2000		12	22	25	2
BFG425W	27	SOT343	25	4.5	30	135	NPN		0.8	900	20	1.2	2000		12	22	25	2

G_{UM} = Maximum Unilateral Gain

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

N-channel junction field-effect transistors (FETs)

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

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

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

N-channel, dual-gate MOSFETs for switching

Product	Package	V_{DS} (V)	I_D (mA)	I_{DSS} (mA) Min	I_{DSS} (mA) Max	$V_{(p)GS}$ (V) Min	$V_{(p)GS}$ (V) Max	lYfsl (mS) Min	lYfsl (mS) Max	Cis (pF) Typ	Cos (pF) Typ	F @ 800 MHz Typ	VHF	UHF
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	•	•

Continued next page

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

Product	Package	V_{DS} (V)	I_D (mA)	I_{DSS} (mA) Min	I_{DSS} (mA) Max	$V_{(p)GS}$ (V) Min	$V_{(p)GS}$ (V) Max	|Yfs| (mS) Min	|Yfs| (mS) Max	Cis (pF) Typ	Cos (pF) Typ	F @ 800 MHz Typ	VHF	UHF
BF1203[5]	SOT363	10 10	30 30	11 8	19 16	0.3 0.3	1.2[1] 1.2[1]	23 25	35 40	2.6 1.7	0.9 0.85	1.9 1.1	• 	• •
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	• 	 •
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	• 	 •
BF1210[11][12]	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		•

[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

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

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

Types in green are new products.

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)
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
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. Types in green are new products.

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

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RF

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)
5-to-300-MHz reverse optical receiver												
BGO387	300-MHz reverse optical receiver	5 - 300	800	0 - 2	± 0.3	16	-80	-70	54.25	1	7.5	190
40-to-750-MHz forward path receiver												
BGO747	750-MHz optical receiver	40 - 750	800	0 - 2	1	11	-75	-63	746.5	1	7	205
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 Imod/Bias (mA)	Features Dual loop	Features Input	V_{CC}	Power dissipation
TZA3010B	Laser driver	30 - 3200	HBCC32		60 - 100		CML/PECL	3.3 [1]	420
TZA3011A	Laser driver	30 - 3200	HBCC32	•	100 - 100	•	CML/PECL	3.3 [1]	420
TZA3011B	Laser driver	30 - 3200	HBCC32	•	100 - 100	•	CML/PECL	3.3 [1]	420
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	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 to 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 to 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 to 8.0	2.8	500	200	14 / 17 /–	No LNA	No LNA	No LNA
SA602A/01	D (SO8) N (DIP8)	4.5 to 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

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RF

RF/IF systems

Product	Package	VCC 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 to 8.0	41	-92 dBm	(1)	•	•	90	±1.5	1.9/3.1
SA614A/01	D (SO16)	4.5 to 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	VDD operating range (V)	IDD max (µA)	Channel enable Logic 1 level (VIH)	Channel enable Logic 0 level (VIL)	Insertion loss, S21, S12 (ON channel) DC - 100 MHz typ/max (dB)	Insertion loss, S21, S12 (ON channel) 500 MHz typ/max (dB)	Insertion loss, S21, S12 (ON channel) 900 MHz typ/max (dB)	Isolation S21, S12 (OFF channel) 10 MHz min/typ (dB)	Isolation S21, S12 (OFF channel) 100 MHz min/typ (dB)	Isolation S21, S12 (OFF channel) 500 MHz min/typ (dB)	Isolation S21, S12 (OFF channel) 900 MHz min/typ (dB)	Return loss S11, S22 (ON channel) DC - 400 MHz typ (dB)	Return loss S11, S22 (ON channel) 900 MHz typ (dB)	Return loss S11, S22 (OFF channel) DC - 400 MHz typ (dB)	Return loss S11, S22 (OFF channel) 900 MHz typ (dB)	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)	ZO = 50 Ω 100 MHz typ (dB)	ZO = 50 Ω 900 MHz typ (dB)
SA630	D (SO8) UK (CSP8)	3.0 to 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 to 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

Device	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 to 5.5	1	55	72	22	90	68	7.0-15	300-1200	4.0-20	2, 2.5, 4, 1, 128	•	•	•	•	•	•	•	•

Full single-conversion FM receivers

Product	Package	VCC operating range (V)	ICC 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 to 8.0	6.6	500	150	90	41	-120 [1]				•			•
SA615/01	D (SO20) DK (SSOP20)	4.5 to 8.0	7.4	500	150	80	41	-118 [1]				•			•
SA606/01	D (SO20) DK (SSOP20)	2.7 to 6.0	4.2	150	150	90	5.5	-117 [1]	•					•	
SA616/01	D (SO20) DK (SSOP20)	2.7 to 6.0	5	150	150	80	5.5	-117 [1]							
SA676/01	D (SO20) DK (SSOP20)	2.7 to 6.0	5	100	100	70	5.5	-114 [1]							
SA58640	DK (SSOP20)	4.5 to 6.0	6	100	100	60	5.5	-110 [1]	•	•					
SA607/01	DK (SSOP20)	2.7 to 6.0	4.2	150	150	90	5.5	-117 [1]		•				•	
SA608/01	DK (SSOP20)	2.7 to 6.0	4.2	150	150	90	5.5	-117 [1]		•			•		
SA647	DH (TSSOP20)	2.7 to 5.5	7	200 max	200 max	85	2	N/A			• [4]		•		
SA636/01	DK (SSOP20)	2.7 to 5.5	7.5	500	500	90	41	-106 [2]			• [5]		•		
SA639/01	DH (TSSOP24)	2.7 to 5.5	10	500	500	80	41	-85 [2]							
SA58641	DK (SSOP20)	4.5 to 5.5	8.5	500	500	70	41	-95 [3]			• [5]		•		

[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

HF, VHF, and UHF power transistors

Type	Package	Frequency band (MHz)	IMD3 intermodulation distortion (dBc)	Output power (W)	Voltage (V)	Power gain (dB)	Drain efficiency (%)	Application
UHF LDMOS (470-680 MHz)								
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. Mil. 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)								
BLF647	SOT540A	600	-30	150	32	16	55	VHF transmitter
BLF369	SOT800A	500	-28	500	32	20	60	VHF transmitter
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

HF, VHF, and UHF power transistors (continued)

Type	Package	Frequency band (MHz)	IMD3 intermodulation distortion (dBc)	Output power (W)	Voltage (V)	Power gain (dB)	Drain efficiency (%)	Application
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

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

Type	Package	Frequency band (MHz) (Input/Output)	Output power (W)	Voltage (V) (MHz)	TP (us) (W)	Duty cycle (dB) (%)	Power gain (dB) (%)	Drain efficiency (N %) (dBc)	Application(s) (dBc)
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
MX0912B100Y	SOT439A	960 - 1215	115	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
BLS2731-10	SOT445C	2700 - 3100	12.5	40	100	10	9	45	S-band radar
BLS3135-65	SOT422A	3100 - 3500	65	40	100	10	8	40	S-band radar
BLS3135-50	SOT422A	3100 - 3500	50	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									
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

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				TBD
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				TBD
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	TBD	10	-45	-48				TBD

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	TBD	10	-45	-48				TBD
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	

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						TBD
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				TBD
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				TBD
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		TBD
BLC6G20LS-75	SOT896-1	I/O	CW EDGE	1800 - 2000	63 29.5	19 19	52 38.5			-62.5	-72	1.5	TBD
BLC6G20-75	SOT895-1	I/O	CW EDGE	1800 - 2000	63 29.5	19 19	52 38.5			-62.5	-72	1.5	TBD
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

Continued next page

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	TBD	10	-45	-48				TBD
BLF6G21-6	SOT538A		CW	800-4000	6	TBD	10	-45	-48				TBD
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	

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													
BLF6G22-180P	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						TBD
BLF6G22LS-130	SOT502B	I/O	W-CDMA / UMTS	2000 - 2200	30	17	28.5	-37	-40				0.43
BLF6G22-130	SOT502A	I/O	W-CDMA / UMTS	2000 - 2200	30	17	28.5	-37	-40				TBD
BLC6G22LS-130	SOT896-1	I/O	W-CDMA / UMTS	2000 - 2200	30	16	31	-37	-40				0.43
BLC6G22-130	SOT895-1	I/O	W-CDMA / UMTS	2000 - 2200	30	16	31	-37	-40				TBD
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				TBD
BLC6G22LS-100	SOT896-1	I/O	W-CDMA / UMTS	2000 - 2200	25	18	32	-37	-40				0.45
BLC6G22-100	SOT895-1	I/O	W-CDMA / UMTS	2000 - 2200	25	18	32	-37	-40				TBD
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
BLMC6G22LS-30	SOT896-1	I/O	W-CDMA / VHTS	2000 - 2200	2	29	8	-45	-48				
BLMC6G22-30	SOT895-1	I/O	W-CDMA / VHTS	2000 - 2200	2	29	8	-45	-48				
BLM6G22-30G	SOT822-1	I/O	W-CDMA / UMTS	2100 - 2200	2	27	11	-50	-52				2

RF

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)
BLM6G22-30	SOT834-1	I/O	W-CDMA / UMTS	2100 - 2200	2	27	11	-50	-52				2
BLF6G21-15	SOT538A		CW	800-4000	15	TBD	10	-45	-48				TBD
BLF6G21-6	SOT538A		CW	800-4000	6	TBD	10	-45	-48				TBD
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
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

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								
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
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
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

Radio ICs for FM, RDS, AM/FM

Product	Description	Package	Number of external components	Required PCB area	Clock frequency	Interface bus	Current consumption
TEA5767	FM radio	HVQFN40 (6 x 6 mm)	25	150 mm²	32.768 kHz or 13 MHz	I²C or 3-wire	11 mA
TEA5761	FM radio	WL-CSP (3.5 x 3.5 mm)	14	45 mm²	32.768 kHz	I²C	13 mA
TEA5764	FM stereo + RDS	HVQFN40 (6 x 6 mm) and WL-CSP (4 x 4 mm)	22	70 mm²	32.768 kHz	I²C	13 mA
TEA5777	FM stereo + AM	HVQFN48 (7 x 7 mm)	25	200 mm²	4 MHz or 13 MHz	I²C or 3-wire	12 mA
TEA5760	FM radio	WL-CSP (3 x 2.9 mm)	10	35 mm²	32.768 kHz	I²C	14 mA
TEA5766	FM stereo + RDS	WL-CSP (3.3 x 3.4 mm)	10	35 mm²	32.768 kHz	I²C + 3-wire SPI	14 mA

Small-signal discretes

Single low V_{CEsat} (BISS) transistors: PNP

V_{CEO} (V)	I_C (A)	I_{CM} (A)	Type	h_{FE} (min/typ)	@ I_C (A)	@ V_{CE} (V)	R_{CEsat} typ (mΩ) @ I_C max	V_{CEsat} typ (mV) @ I_C = 0.5 A; I_B = 0.05 A	V_{CEsat} max (mV)	@ I_C max (A)	@ I_B (A)	Package	Size (mm)	P_{tot} (mW)
40	1.0	2.0	PBSS5140S	250/ -	0.5	5	150	150	500	1	0.1	SOT54 (TO-92)	3.9 x 4.6 x 5.1	830 [1]
50	3.0	5.0	PBSS5350S	200/ -	0.5	2	120	80	300	2	0.2	SOT54 (TO-92)	3.9 x 4.6 x 5.1	830 [1]
100	1.0	3.0	PBSS9110S/AS	150/ -	0.25	5	170	100	320	1	0.1	SOT54 (TO-92)	3.9 x 4.6 x 5.1	830 [1]
15	0.5	1.0	PBSS3515M	200/ -	0.01	2	300	150	250	0.5	0.05	SOT883 (SC-101)	1.0 x 0.6 x 0.5	250 [2]
40	0.5	1.0	PBSS3540M	200/ -	0.01	2	440	220	350	0.5	0.05	SOT883 (SC-101)	1.0 x 0.6 x 0.5	250 [2]
20	2.0	4.0	PBSS5220V	220/440	0.1	2	135	75	390	2	0.2	SOT666	1.6 x 1.2 x 0.55	500 [2]
40	1.0	2.0	PBSS5140V	300/ -	0.1	5	200	120	310	1	0.1	SOT666	1.6 x 1.2 x 0.55	500 [2]
40	1.8	3.0	PBSS5240V	300/ -	0.1	5	185	100	530	2	0.2	SOT666	1.6 x 1.2 x 0.55	500 [2]
60	1.0	2.0	PBSS5160V	150/250	0.5	5	220	120	330	1	0.1	SOT666	1.6 x 1.2 x 0.55	500 [2]
15	0.5	1.0	PBSS3515E	200/ -	0.01	2	300	130	250	0.5	0.05	SOT416 (SC-75)	1.6 x 0.8 x 0.77	250 [2]
40	0.5	1.0	PBSS3540E	200/ -	0.01	2	440	230	350	0.5	0.05	SOT416 (SC-75)	1.6 x 0.8 x 0.77	250 [2]
40	2.0	3.0	PBSS5240Y	300/ -	0.1	2			350	2	0.2	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [2]
100	1.0	3.0	PBSS9110Y	150/ -	0.25	5	170	93	320	1	0.1	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [2]
40	1.0	2.0	PBSS5140U	300/ -	0.1	5	230	130	500	1	0.1	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350 [2]
60	1.0	2.0	PBSS5160U	150/250	0.5	5	255	135	340	1	0.1	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350 [2]
60	1.0	2.0	PBSS5160K	150/250	0.5	5	255	135	340	1	0.1	SOT346 (SC-59A)	2.9 x 1.5 x 1.15	350 [2]
20	1.0	2.0	PBSS5120T	300/450	0.1	2		< 125	250	1	0.05	SOT23	2.9 x 1.3 x 1.0	480 [2]
20	2.0	3.0	PBSS5220T	225/ -	0.5	2		< 80	225	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
20	2.0	5.0	PBSS5320T	220/ -	0.5	2	75	50	210	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
30	1.0	3.0	PBSS5130T	260/350	0.5	2		< 110	225	1	0.05	SOT23	2.9 x 1.3 x 1.0	480 [2]
30	2.0	3.0	PBSS5230T	300/450	0.1	2		80	350	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
40	1.0	2.0	PMMT591A	300/800	0.1	5	250	130	500	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
40	1.0	2.0	PBSS5140T	300/ -	0.1	5	230	150	500	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
40	2.0	3.0	PBSS5240T	300/450	0.1	2	150	80	350	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
50	2.0	3.0	PBSS5250T	200/ -	0.5	2		< 90	300	2	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
50	2.0	5.0	PBSS5350T	200/ -	0.5	2	90	55	270	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
60	1.0	2.0	PBSS5160T	150/250	0.5	5	220	120	330	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
100	1.0	3.0	PBSS9110T	150/ -	0.5	5	170	95	320	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]

Single low V_{CEsat} (BISS) transistors: PNP (continued)

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

Types in green are new, third-generation BISS
[1] Device mounted on a PCB, single-sided copper, tin-plated and standard footprint
[2] Device mounted on a PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm²
[3] Device mounted on a PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm²
[4] I_C/I_B = 20

Small-signal discretes

Single low V_{CEsat} (BISS) transistors: NPN

V_{CEO} (V)	I_C (A)	I_{CM} (A)	Type	h_{FE} (min/typ)	@ I_C (A)	@ V_{CE} (V)	R_{CEsat} typ (mΩ) @ I_C max; 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 max (A)	@ I_B (A)	Package	Size (mm)	P_{tot} (mW)
40	1.0	2.0	PBSS4140S	300/ -	0.5	5	230	120	500	1	0.1	SOT54 (TO-92)	3.9 x 4.6 x 5.1	830 [1]
50	3.0	5.0	PBSS4350S	200/ -	0.5	2	100		290	2	0.2	SOT54 (TO-92)	3.9 x 4.6 x 5.1	830 [1]
100	1.0	3.0	PBSS8110S/AS	150/ -	0.25	10	165	< 110	200	1	0.1	SOT54 (TO-92)	3.9 x 4.6 x 5.1	830 [1]
15	0.5	1.0	PBSS2515M	200/ -	0.01	2	360		250	0.5	0.05	SOT883 (SC-101)	1.0 x 0.6 x 0.5	250 [2]
40	0.5	1.0	PBSS2540M	200/ -	0.01	2	380		250	0.5	0.05	SOT883 (SC-101)	1.0 x 0.6 x 0.5	250 [2]
20	2.0	4.0	PBSS4220V	220/ -	0.5	2	150	70	400	2	0.2	SOT666	1.6 x 1.2 x 0.55	500 [2]
40	1.0	3.0	PBSS4140V	300/ -	0.5	5	150	70	190	1	0.1	SOT666	1.6 x 1.2 x 0.55	500 [2]
40	2.0	3.0	PBSS4240V	300/ -	0.5	5	150	70	400	2	0.2	SOT666	1.6 x 1.2 x 0.55	500 [2]
60	1.0	2.0	PBSS4160V	200/ -	0.5	5	200	110	250	1	0.1	SOT666	1.6 x 1.2 x 0.55	500 [2]
15	0.5	1.0	PBSS2515E	150/ -	0.1	2	300	205	250	0.5	0.05	SOT416 (SC-75)	1.6 x 0.8 x 0.77	250 [2]
40	0.5	1.0	PBSS2540E	100/ -	0.1	2	380	305	250	0.5	0.05	SOT416 (SC-75)	1.6 x 0.8 x 0.77	250 [2]
40	2.0	3.0	PBSS4240Y	300/ -	0.5	2	120	70	320	2	0.2	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [2]
100	1.0	3.0	PBSS8110Y	150/ -	0.25	10	160	300	200	1	0.1	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [2]
40	1.0	2.0	PBSS4140U	300/ -	0.5	5	240	120	500	1	0.1	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350 [2]
60	1.0	2.0	PBSS4160U	200/420	0.5	5	230	120	280	1	0.1	SOT323 (SC-70)	2.0 x 1.25 x 0.95	350 [2]
60	1.0	2.0	PBSS4160K	200/420	0.5	5	230	120	280	1	0.1	SOT346 (SC-59A)	2.9 x 1.5 x 1.15	350 [2]
20	1.0	3.0	PBSS4120T	350/470	0.1	2			250	1	0.05	SOT23	2.9 x 1.3 x 1.0	480 [2]
20	2.0	5.0	PBSS4320T	220/ -	0.5	2	80	45	310	3	0.3	SOT23	2.9 x 1.3 x 1.0	480 [2]
30	1.0	3.0	PBSS4130T	300/450	0.5	2			270	1	0.05	SOT23	2.9 x 1.3 x 1.0	480 [2]
30	2.0	3.0	PBSS4230T	300/450	0.5	2	120	70	320	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
40	1.0	2.0	PMMT491A	300/ -	0.5	5	230	120	500	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
40	1.0	2.0	PBSS4140T	300/ -	0.5	5	240	130	500	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
40	2.0	3.0	PBSS4240T	300/450	0.5	2	120	70	320	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
50	2.0	5.0	PBSS4350T	300/ -	0.5	2	100	60	260	2	0.2	SOT23	2.9 x 1.3 x 1.0	480 [2]
60	1.0	2.0	PBSS4160T	200/350	0.5	5	200	110	250	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]
100	1.0	3.0	PBSS8110T	150/ -	0.25	10	165		200	1	0.1	SOT23	2.9 x 1.3 x 1.0	480 [2]

Single low V_{CEsat} (BISS) transistors: NPN

V_{CEO} (V)	I_C (A)	I_{CM} (A)	Type	h_{FE} (min/typ)	@ I_C (A)	@ V_{CE} (V)	R_{CEsat} typ (mΩ) @ I_C max; 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 max (A)	@ I_B (A)	Package	Size (mm)	P_{tot} (mW)
20	4.0	15.0	PBSS301ND	300/ -	0.5	2	50	30	280	4	0.4	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
40	4.0	15.0	PBSS302ND	300/ -	0.5	2	55	35	300	4	0.4	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
50	3.0	5.0	PBSS4350D	200/ -	0.5	2	110	65	290	2	0.2	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
60	3.0	6.0	PBSS303ND	345/ -	0.5	2	65	40	260	3	0.3	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
80	3.0	6.0	PBSS304ND	240/ -	0.5	2	67	40	255	3	0.3	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
100	1.0	3.0	PBSS8110D	150/ -	0.25	10	160	75	200	1	0.1	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
100	3.0	4.0	PBSS305ND	170/ -	0.5	2	72	45	360	4	0.4	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [3]
12	5.3	10.6	PBSS301NX	300/ -	0.5	2	27 [4]	18	200	5.3	0.265	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
20	3.0	5.0	PBSS4320X	220/ -	0.5	2	85	45	310	3	0.3	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
20	5.0	10.0	PBSS4520X	300/ -	0.5	2	32	35	220	5	0.5	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
20	5.3	10.6	PBSS302NX	300/570	0.5	2	27 [4]	20	200	5.3	0.265	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
30	3.0	5.0	PBSS4330X	300/ -	0.5	2	80	45	300	3	0.3	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
30	5.1	10.2	PBSS303NX	300/480	0.5	2	30 [4]	20	220	5.1	0.255	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
40	4.0	10.0	PBSS4540X	300/ -	0.5	2	40	21	355	5	0.5	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
50	2.0	5.0	PBSS4250X	300/ -	0.5	2		< 90	320	2	0.2	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
50	3.0	5.0	PBSS4350X	300/ -	0.5	2	75	50	370	3	0.3	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
60	4.7	9.4	PBSS304NX	300/ -	0.5	2	37 [4]	25	245	4.7	0.235	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
80	4.0	10.0	PBSS4480X	250/ -	0.5	2	43 [4]	25	230	4	0.2	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
80	4.6	9.2	PBSS305NX	300/ -	0.5	2	37 [4]	25	240	4.6	0.23	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
100	1.0	3.0	PBSS8110X	150/ -	0.25	10	165	40	200	1	0.1	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
100	4.5	9.0	PBSS306NX	200/ -	0.5	2	38 [4]	27	245	4.5	0.225	SOT89 (SC-62)	4.5 x 2.5 x 1.5	1650 [3]
12	5.8	11.6	PBSS301NZ	300/530	0.5	2	29 [4]	18	235	5.8	0.29	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
20	5.8	10.2	PBSS302NZ	300/570	0.5	2	30 [4]	20	250	5.8	0.29	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
30	5.5	11.0	PBSS303NZ	300/480	0.5	2	31 [4]	275	240	5.5	0.275	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
40	5.0	10.0	PBSS4540Z	300/500	0.5	2	42	50	355	5	0.5	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
50	3.0	5.0	PBSS4350Z	200/ -	0.5	2	110		290	2	0.2	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
60	5.2	10.4	PBSS304NZ	300/520	0.5	2	39 [4]	200	280	5.2	0.26	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
80	5.1	10.2	PBSS305NZ	300/470	0.5	2	38 [4]	190	270	5.1	0.255	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
100	1.0	3.0	PBSS8110Z	150/ -	0.25	10	160	73	200	1	0.1	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]
100	5.1	10.2	PBSS306NZ	200/330	0.5	2	43 [4]	215	300	5.1	0.255	SOT223 (SC-73)	6.5 x 3.5 x 1.65	1700 [3]

Types in green are new, third-generation BISS
[1] Device mounted on a PCB, single-sided copper, tin-plated and standard footprint
[2] Device mounted on a PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm²
[3] Device mounted on a PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm²
[4] I_C/I_B = 20

Small-signal discretes

Double low V_{CEsat} (BISS) transistors

V_{CEO} (V)	I_C (A)	Polarity	Type	h_{FE} (min/typ)	@ I_C (A)	@ V_{CE} (V)	V_{CEsat} typ (mV) @ I_C = 0.5 A; I_B = 0.025 A	V_{CEsat} max (mV)	@ I_C (A)	@ I_B (A)	Package	Size (mm)	P_{tot} (mW)
15	0.5	2 x PNP	PBSS3515VS	200/ -	0.01	2	< 150	< 250	0.5	0.05	SOT666	1.6 x 1.2 x 0.55	500 [1]
15	0.5	NPN/PNP	PBSS2515VPN	200/ -	0.01	2	< 150	< 250	0.5	0.05	SOT666	1.6 x 1.2 x 0.55	500 [1]
15	0.5	2 x NPN	PBSS2515VS	200/ -	0.01	2	< 150	< 250	0.5	0.05	SOT666	1.6 x 1.2 x 0.55	500 [1]
15	0.5	NPN/PNP	PBSS2515YPN	200/ -	0.01	2	<150	< 250	0.5	0.05	SOT363 (SC-88)	2.0 x 1.25 x 0.95	430 [1]
40	1.0	NPN/PNP	PBSS4140DPN	300/ -	0.001	5	130 [3]	< 500	1	0.1	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
40	2.0	NPN/PNP	PBSS4240DPN	300/ -	0.001	5	80 [3]/100 [3]	< 400/530	2	0.2	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
60	1.0	2 x NPN	PBSS4160DS	250/500	0.001	5	115 [3]	< 250	1	0.1	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
60	1.0	2 x PNP	PBSS5160DS	200/350	0.001	5	120 [3]	< 330	1	0.1	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
60	1.0	NPN/PNP	PBSS4160DPN	250/500 200/350	0.001	5	115 [3]/120 [3]	< 250/330	1	0.1	SOT457 (SC-74)	2.9 x 1.5 x 1.0	750 [2]
50	2.5	2 x NPN	PBSS4350SS	TBD							SO8	4.9 x 3.9 x 1.75	TBD
50	2.5	2 x PNP	PBSS5350SS	TBD							SO8	4.9 x 3.9 x 1.75	TBD
50	2.5	NPN/PNP	PBSS4350SPN	TBD							SO8	4.9 x 3.9 x 1.75	TBD

[1] Device mounted on a PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm²
[2] Device mounted on a PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm²
[3] @ I_C = 0.5 A; I_B = 0.05 A

BISS loadswitches

V_{CEO} (V)	I_C (A)	Type	R1, R2 (kΩ)	R_{CEsat} typ (mΩ) @ I_C	V_{CEsat} typ (mV) @ I_C = 0.5 A	V_{CEsat} max (mV) @ I_C	Package	Size (mm)	P_{tot} (mW)
15	0.5	PBLS1501V	2.2	300	150	250	SOT666	1.6 x 1.2 x 0.55	300 [2]
15	0.5	PBLS1502V	4.7	300	150	250	SOT666	1.6 x 1.2 x 0.55	300 [2]
15	0.5	PBLS1503V	10	300	150	250	SOT666	1.6 x 1.2 x 0.55	300 [2]
15	0.5	PBLS1504V	22	300	150	250	SOT666	1.6 x 1.2 x 0.55	300 [2]
40	0.5	PBLS4001V	2.2	440	220	350	SOT666	1.6 x 1.2 x 0.55	300 [2]
40	0.5	PBLS4002V	4.7	440	220	350	SOT666	1.6 x 1.2 x 0.55	300 [2]
40	0.5	PBLS4003V	10	440	220	350	SOT666	1.6 x 1.2 x 0.55	300 [2]
40	0.5	PBLS4004V	22	440	220	350	SOT666	1.6 x 1.2 x 0.55	300 [2]

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

BISS loadswitches (continued)

V_{CEO} (V)	I_C (A)	Type	R1, R2 (kΩ)	R_{CEsat} typ (mΩ) @ I_C	V_{CEsat} typ (mV) @ I_C = 0.5 A	V_{CEsat} max (mV) @ I_C	Package	Size (mm)	P_{tot} (mW)
40	0.5	PBLS4005V	47	440	220	350	SOT666	1.6 x 1.2 x 0.55	300 [2]
15	0.5	PBLS1501Y	2.2	300	150	250	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
15	0.5	PBLS1502Y	4.7	300	150	250	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
15	0.5	PBLS1503Y	10	300	150	250	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
15	0.5	PBLS1504Y	22	300	150	250	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
40	0.5	PBLS4001Y	2.2	440	220	350	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
40	0.5	PBLS4002Y	4.7	440	220	350	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
40	0.5	PBLS4003Y	10	440	220	350	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
40	0.5	PBLS4004Y	22	440	220	350	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
40	0.5	PBLS4005Y	47	440	220	350	SOT363 (SC-88)	2.0 x 1.25 x 0.95	300 [2]
20	1	PBLS2001D	2.2	185	100	280	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
20	1	PBLS2002D	4.7	185	100	280	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
20	1	PBLS2003D	10	185	100	280	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
20	1	PBLS2004D	22	185	100	280	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
40	1	PBLS4001D	2.2	220	120	310	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
40	1	PBLS4002D	4.7	220	120	310	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
40	1	PBLS4003D	10	220	120	310	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
40	1	PBLS4004D	22	220	120	310	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
40	1	PBLS4005D	47	220	120	310	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
60	1	PBLS6001D	2.2	255	135	340	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
60	1	PBLS6002D	4.7	255	135	340	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
60	1	PBLS6003D	10	255	135	340	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
60	1	PBLS6004D	22	255	135	340	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
60	1	PBLS6005D	47	255	135	340	SOT457 (SC-74)	2.9 x 1.5 x 1.0	600 [1]
20	3	PBLS2001S	2.2	75	45	355	SO8	4.9 x 3.9 x 1.75	1500 [1]
20	3	PBLS2002S	4.7	75	45	355	SO8	4.9 x 3.9 x 1.75	1500 [1]
20	3	PBLS2003S	10	75	45	355	SO8	4.9 x 3.9 x 1.75	1500 [1]

[1] Device mounted on a ceramic PCB, AL2O3 standard footprint
[2] Device mounted on a FR4 PCB, single-sided copper, tin-plated and standard footprint

Small-signal discretes

Matched-pair transistors (new)

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

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

50-V, 500-mA RETs (new)

Package		SOT346 (SC-59A)		SOT23		SOT54 (TO-92)	
P_{tot}		250 mW		250 mW		500 mW	
R1 (kΩ)	R2 (kΩ)	NPN	PNP	NPN	PNP	NPN	PNP
R1 = R2							
1.0	1.0	PDTD113EK	PDTB113EK	PDTD113ET	PDTB113ET	PDTD113ES	PDTB113ES
2.2	2.2	PDTD123EK	PDTB123EK	PDTD123ET	PDTB123ET	PDTD123ES	PDTB123ES
R1 ≠ R2							
1.0	10	PDTD113ZK	PDTB113ZK	PDTD113ZT	PDTB113ZT	PDTD113ZS	PDTB113ZS
2.2	10	PDTD123YK	PDTB123YK	PDTD123YT	PDTB123YT	PDTD123YS	PDTB123YS
Only R1							
2.2		PDTD123TK	PDTB123TK	PDTD123TT	PDTB123TT	PDTD123TS	PDTB123TS

MOSFET driver transistors (new)

Package			SOT457 (SC-74)	SOT346 (SC-59A)	SOT457 (SC-74)		SOT457 (SC-74)
P_{tot}			600 mW	250 mW	600 mW		600 mW
Contains	I_C (A)	I_{CM} (A)			R1 = R2 (kΩ)		
General-purpose transistors	0.1	0.2	PMD9050D	PMD4001K (NPN)		PMD9010D	BCV65 (SOT143B)
General-purpose transistors	0.1	0.2		PMD5001K (PNP)	2.2	PMD9001D	
General-purpose transistors	0.1	0.2			4.7	PMD9002D	
General-purpose transistors	0.1	0.2			10	PMD9003D	
Switching transistors - reduced storage time	0.6	1.2		PMD4002K (NPN)			PMD2001D
Switching transistors - reduced storage time	0.6	1.2		PMD5002K (PNP)			
Low V_{CEsat} (BISS) transistors - Low V_{CEsat} high h_{FE} and I_C	1.0	2.0		PMD4003K (NPN)			PMD3001D
Low V_{CEsat} (BISS) transistors - Low V_{CEsat} high h_{FE} and I_C	1.0	2.0		PMD5003K (PNP)			

Small-signal discretes

50-V, 100-mA single RETs

Package		SOT346 (SC-59A)		SOT23		SOT323 (SC-70)		SOT416 (SC-75)		SOT883 (SC-101)		SOT54 (TO-92)	
P_{tot}		250 mW		250 mW		200 mW		150 mW		250 mW		500 mW	
R1 (kΩ)	R2 (kΩ)	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
R1 = R2													
2.2	2.2	PDTC123EK	PDTA123EK	PDTC123ET	PDTA123ET	PDTC123EU	PDTA123EU	PDTC123EE	PDTA123EE	PDTC123EM	PDTA123EM	PDTC123ES	PDTA123ES
4.7	4.7	PDTC143EK	PDTA143EK	PDTC143ET	PDTA143ET	PDTC143EU	PDTA143EU	PDTC143EE	PDTA143EE	PDTC143EM	PDTA143EM	PDTC143ES	PDTA143ES
10	10	PDTC114EK	PDTA114EK	PDTC114ET	PDTA114ET	PDTC114EU	PDTA114EU	PDTC114EE	PDTA114EE	PDTC114EM	PDTA114EM	PDTC114ES	PDTA114ES
22	22	PDTC124EK	PDTA124EK	PDTC124ET	PDTA124ET	PDTC124EU	PDTA124EU	PDTC124EE	PDTA124EE	PDTC124EM	PDTA124EM	PDTC124ES	PDTA124ES
47	47	PDTC144EK	PDTA144EK	PDTC144ET	PDTA144ET	PDTC144EU	PDTA144EU	PDTC144EE	PDTA144EE	PDTC144EM	PDTA144EM	PDTC144ES	PDTA144ES
100	100	PDTC115EK	PDTA115EK	PDTC115ET	PDTA115ET	PDTC115EU	PDTA115EU	PDTC115EE	PDTA115EE	PDTC115EM	PDTA115EM	PDTC115ES	PDTA115ES
R1≠R2													
2.2	10	PDTC123YK	PDTA123YK	PDTC123YT	PDTA123YT	PDTC123YU	PDTA123YU	PDTC123YE	PDTA123YE	PDTC123YM	PDTA123YM	PDTC123YS	PDTA123YS
2.2	47	PDTC123JK	PDTA123JK	PDTC123JT	PDTA123JT	PDTC123JU	PDTA123JU	PDTC123JE	PDTA123JE	PDTC123JM	PDTA123JM	PDTC123JS	PDTA123JS
4.7	10	PDTC143XK	PDTA143XK	PDTC143XT	PDTA143XT	PDTC143XU	PDTA143XU	PDTC143XE	PDTA143XE	PDTC143XM	PDTA143XM	PDTC143XS	PDTA143XS
4.7	47	PDTC143ZK	PDTA143ZK	PDTC143ZT	PDTA143ZT	PDTC143ZU	PDTA143ZU	PDTC143ZE	PDTA143ZE	PDTC143ZM	PDTA143ZM	PDTC143ZS	PDTA143ZS
10	47	PDTC114YK	PDTA114YK	PDTC114YT	PDTA114YT	PDTC114YU	PDTA114YU	PDTC114YE	PDTA114YE	PDTC114YM	PDTA114YM	PDTC114YS	PDTA114YS
22	47	PDTC124XK	PDTA124XK	PDTC124XT	PDTA124XT	PDTC124XU	PDTA124XU	PDTC124XE	PDTA124XE	PDTC124XM	PDTA124XM	PDTC124XS	PDTA124XS
47	10	PDTC144VK	PDTA144VK	PDTC144VT	PDTA144VT	PDTC144VU	PDTA144VU	PDTC144VE	PDTA144VE	PDTC144VM	PDTA144VM	PDTC144VS	PDTA144VS
47	22	PDTC144WK	PDTA144WK	PDTC144WT	PDTA144WT	PDTC144WU	PDTA144WU	PDTC144WE	PDTA144WE	PDTC144WM	PDTA144WM	PDTC144WS	PDTA144WS
Only R1													
2.2		PDTC123TK	PDTC123TK	PDTC123TT	PDTC123TT	PDTC123TU	PDTC123TU	PDTC123TE	PDTC123TE	PDTC123TM	PDTC123TM	PDTC123TS	PDTC123TS
4.7		PDTC143TK	PDTA143TK	PDTC143TT	PDTA143TT	PDTC143TU	PDTA143TU	PDTC143TE	PDTA143TE	PDTC143TM	PDTA143TM	PDTC143TS	PDTA143TS
10		PDTC114TK	PDTA114TK	PDTC114TT	PDTA114TT	PDTC114TU	PDTA114TU	PDTC114TE	PDTA114TE	PDTC114TM	PDTA114TM	PDTC114TS	PDTA114TS
22		PDTC124TK	PDTA124TK	PDTC124TT	PDTA124TT	PDTC124TU	PDTA124TU	PDTC124TE	PDTA124TE	PDTC124TM	PDTA124TM	PDTC124TS	PDTA124TS
47		PDTC144TK	PDTA144TK	PDTC144TT	PDTA144TT	PDTC144TU	PDTA144TU	PDTC144TE	PDTA144TE	PDTC144TM	PDTA144TM	PDTC144TS	PDTA144TS
100		PDTC115TK	PDTA115TK	PDTC115TT	PDTA115TT	PDTC115TU	PDTA115TU	PDTC115TE	PDTA115TE	PDTC115TM	PDTA115TM	PDTC115TS	PDTA115TS

500-V, 100-mA double RETs

Package		SOT457 (SC-74)		SOT363 (SC-88)			SOT666		
P_{tot}		600 mW		300 mW			300 mW		
R1 (kΩ)	R2 (kΩ)	NPN/NPN	NPN/PNP	NPN/NPN	NPN/PNP	PNP/PNP	NPN/NPN	NPN/PNP	PNP/PNP
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
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

BISS RETs (new)

Package						SOT346 (SC-59A)	SOT23	SOT54 (TO-92)
P_{tot} max						250 mW	250 mW	500 mW
Polarity	I_C (mA)	V_{CEO} (V)		R1 (kΩ)	R2 (kΩ)			
NPN	800	50	R1 = R2	1	1			PBRN113ES
NPN	800	50	R1 = R2	2.2	2.2	PBRN123EK	PBRN123ET	PBRN123ES
NPN	800	50	R1 ≠ R2	1	10	PBRN113ZK	PBRN113ZT	PBRN113ZS
NPN	800	50	R1 ≠ R2	2.2	10	PBRN123YK	PBRN123YT	PBRN123YS
PNP	800	50	R1 = R2	1	1			PBRP113ES
PNP	800	50	R1 = R2	2.2	2.2			PBRP123ES
PNP	800	50	R1 ≠ R2	1	10			PBRP113ZS
PNP	800	50	R1 ≠ R2	2.2	10			PBRP123YS

Low-V_F (MEGA) Schottky rectifiers / Low V_{CEsat} (BISS) transistor modules

Package						SOT96 (SO8)	SOT457 (SC-74)	SOT353 (SC-88A)
Size (mm)						4.9 x 3.9 x 1.75	2.9 x 1.5 x 1.0	2.1 x 1.25 x 0.95
Transistor			Schottky rectifier			P_{tot}		
I_C max (A)	V_{CEO} max (V)	R_{CEsat} max (mΩ)	I_F max (A)	V_R max (V)	V_F max (mV)	1000 mW	500 mW	250 mW
Configuration						NPN	NPN	NPN
0.5	15	500	0.5	20	390			PMEM1505NG
1.0	40	220	1	20	550		PMEM4010ND	
2.0	40	190	1	20	550		PMEM4020ND	
2.0	40	190	1	40	640		PMEM4020AND	
3.0	40	130	1	40	500	PMEM4030NS		
Configuration						PNP	PNP	PNP
0.5	15	500	0.5	20	390			PMEM1505PG
1.0	40	340	1	20	550		PMEM4010PD	
2.0	40	280	1	20	550		PMEM4020PD	
2.0	40	280	1	40	640		PMEM4020APD	
3.0	40	135	1	40	500	PMEM4030PS		

Very low-V$_F$ (MEGA) Schottky rectifiers

Package					SOT457 (SC-74)	SOT346 (SC-59A)	SOT23	SOD123F	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	SOD882
Size (mm)					2.9 x 1.5 x 1.0	2.9 x 1.5 x 1.15	2.9 x 1.3 x 1.0	2.6 x 1.6 x 1.1	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)					500	TBD	250	830	400	830	300	500	250
I$_F$ max (A)	V$_R$ max (V)	V$_F$ max (mV)	I$_R$ max (mA)	Configuration									
0.2	30	480	0.05	Single								PMEG3002AEB	PMEG3002AEL
0.2	30	480	0.05	Dual isolated							PMEG3002TV		
0.2	40	600	0.01	Single								PMEG4002EB	PMEG4002EL
0.2	60	600	0.01	Single								PMEG6002EB	
0.2	60	600	0.01	Dual isolated							PMEG6002TV		
0.5	20	390	0.2	Single			PMEG2005ET	PMEG2005EH	PMEG2005AEA	PMEG2005EJ	PMEG2005AEV		
0.5	20	440	1.5	Single									PMEG2005AEL
0.5	20	480	0.03	Single								PMEG2005EB	
0.5	20	500	0.03	Single									PMEG2005EL
0.5	30	430	0.15	Single			PMEG3005ET	PMEG3005EH	PMEG3005AEA	PMEG3005EJ	PMEG3005AEV		
0.5	30	500	0.5	Single								PMEG3005EB	PMEG3005EL
0.5	40	470	0.1	Single			PMEG4005ET	PMEG4005EH	PMEG4005AEA	PMEG4005EJ	PMEG4005AEV		
1.0	20	430	0.2	Single		PMEG2010AEK	PMEG2010AET	PMEG2010AEH					
1.0	20	500	0.2	Single			PMEG2010ET	PMEG2010EH	PMEG2010BEA	PMEG2010EJ	PMEG2010BEV		
1.0	20	550	0.1	Single					PMEG2010EA	PMEG2010AEJ	PMEG2010EV		
1.0	20	620	1.5	Single								PMEG2010AEB	
1.0	30	540	0.1	Single				PMEG3010CEH		PMEG3010CEJ			
1.0	30	560	0.15	Single			PMEG3010ET	PMEG3010EH	PMEG3010BEA	PMEG3010EJ	PMEG3010BEV		

Continued next page

Very low-V_F (MEGA) Schottky rectifiers (continued)

Package					SOT457 (SC-74)	SOT346 (SC-59A)	SOT23	SOD123F	SOD323 (SC-76)	SOD323F (SC-90)	SOT666	SOD523 (SC-79)	SOD882
Size (mm)					2.9 x 1.5 x 1.0	2.9 x 1.5 x 1.15	2.9 x 1.3 x 1.0	2.6 x 1.6 x 1.1	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)					500	TBD	250	830	400	830	300	500	250
I_F max (A)	V_R max (V)	V_F max (mV)	I_R max (mA)	Configuration									
1.0	30	680	0.5	Single								PMEG3010EB	
1.0	40	600	0.1	Single				PMEG4010CEH		PMEG4010CEJ			
1.0	40	640	0.1	Single			PMEG4010ET	PMEG4010EH	PMEG4010BEA	PMEG4010EJ	PMEG4010BEV		
1.0	60	650	0.35	Single	PMEG6010AED								
1.0	60	710	0.1	Single				PMEG6010CEH		PMEG6010CEJ			
1.5	20	660	0.2	Single				PMEG2015EH	PMEG2015EA	PMEG2015EJ	PMEG2015EV		
1.5	30	500	1.0	Single				PMEG3015EH		PMEG3015EJ	PMEG3015EV		
2.0	10	460	3.0	Single				PMEG1020EH	PMEG1020EA	PMEG1020EJ	PMEG1020EV		
2.0	20	525	0.2	Single				PMEG2020EH	PMEG2020AEA	PMEG2020EJ			
2.0	30	620	1.0	Single				PMEG3020EH		PMEG3020EJ			
3.0	10	530	3.0	Single				PMEG1030EH		PMEG1030EJ			

ESD protection diodes: 1 to 18 lines, standard capacitance

Number of protected lines		I_{RM} @ V_{RWM}		C_{line}	P_{PP} [1]	ESD rating [2]		
Uni-directional	Bi-directional	Max (µA)	(V)	Typ (pF)	Max (W)	Max (kV)	Type	Package
1		2	3.3	200	150	30	PESD3V3S1UL	SOD882
1		1	5	150	150	30	PESD5V0S1UL	SOD882
1		0.05	12	38	150	30	PESD12VS1UL	SOD882
1		0.05	15	32	150	30	PESD15VS1UL	SOD882
1		0.05	24	23	150	23	PESD24VS1UL	SOD882
1		2	3.3	207	330	30	PESD3V3S1UB	SOD523 (SC-79)
1		1	5	152	260	30	PESD5V0S1UB	SOD523 (SC-79)
1		0.05	12	38	180	30	PESD12VS1UB	SOD523 (SC-79)
1		0.05	15	32	160	30	PESD15VS1UB	SOD523 (SC-79)
1		0.05	24	23	160	23	PESD24VS1UB	SOD523 (SC-79)
	1	0.1	5	35	120	30	PESD5V0S1BA	SOD323 (SC-76)
	1	0.1	5	35	120	30	PESD5V0S1BB	SOD523 (SC-79)
	1	0.1	5	35	120	30	PESD5V0S1BL	SOD882
	1	2	3.3	101	500	30	PESD3V3L1BA	SOD323 (SC-76)
	1	1	5	75	500	30	PESD5V0L1BA	SOD323 (SC-76)
	1	0.05	12	19	200	30	PESD12VL1BA	SOD323 (SC-76)
	1	0.05	15	16	200	30	PESD15VL1BA	SOD323 (SC-76)
	1	0.05	24	11	200	23	PESD24VL1BA	SOD323 (SC-76)
2	1	2	3.3	207	330	30	PESD3V3S2UAT	SOT23
2	1	1	5	152	260	30	PESD5V0S2UAT	SOT23
2	1	0.05	12	38	180	30	PESD12VS2UAT	SOT23
2	1	0.05	15	32	160	30	PESD15VS2UAT	SOT23
2	1	0.05	24	23	160	23	PESD24VS2UAT	SOT23
2	1	3	3.3	200	150	30	PESD3V3S2UQ	SOT663
2	1	0.3	5	150	150	30	PESD5V0S2UQ	SOT663
2	1	0.03	12	38	150	30	PESD12VS2UQ	SOT663
2	1	0.05	15	32	150	30	PESD15VS2UQ	SOT663
2	1	0.05	24	23	150	23	PESD24VS2UQ	SOT663

[1] 8-to-20-µs surge pulse according to IEC61000-4-5, [2] According to IEC61000-4-2 (contact discharge)

Small-signal discretes

ESD protection diodes: 1 to 18 lines, standard capacitance (continued)

Number of protected lines		I_{RM} @ V_{RWM}		C_{line}	P_{PP} [1]	ESD rating [2]		
Uni-directional	Bi-directional	Max (µA)	(V)	Typ (pF)	Max (W)	Max (kV)	Type	Package
2	1	2	3.3	207	330	30	PESD3V3S2UT	SOT23
2	1	1	5.3	152	260	30	PESD5V2S2UT	SOT23
2	1	1	12	38	180	30	PESD12VS2UT	SOT23
2	1	1	15	32	160	30	PESD15VS2UT	SOT23
2	1	1	24	23	160	23	PESD24VS2UT	SOT23
	2	0.1	5	35	120	30	PESD5V0S2BT	SOT23
	2	2	3.3	101	350	30	PESD3V3L2BT	SOT23
	2	1	5	75	350	30	PESD5V0L2BT	SOT23
	2	0.05	12	19	200	30	PESD12VL2BT	SOT23
	2	0.05	15	16	200	30	PESD15VL2BT	SOT23
	2	0.05	24	11	200	23	PESD24VL2BT	SOT23
4	3	2	3	200		8	BZA456A	SOT457 (SC-74)
4	3	0.7	4	165		8	BZA462A	SOT457 (SC-74)
4	3	0.075	14	37		8	BZA418A	SOT457 (SC-74)
4	3	0.1	15	37		8	BZA420A	SOT457 (SC-74)
4	3	2.2	3.3	215	200	30	PESD3V3S4UD	SOT457 (SC-74)
4	3	0.15	5	158	200	30	PESD5V0S4UD	SOT457 (SC-74)
4	3	0.01	12	73	200	30	PESD12VS4UD	SOT457 (SC-74)
4	3	0.01	15	61	200	30	PESD15VS4UD	SOT457 (SC-74)
4	3	0.01	24	45	200	23	PESD24VS4UD	SOT457 (SC-74)
4	3	2	3	200		8	BZA856A	SOT353 (SC-88A)
4	3	0.7	4	165		8	BZA862A	SOT353 (SC-88A)
4	3	0.2	4.3	145		8	BZA868A	SOT353 (SC-88A)
4	3	0.01	15	37		8	BZA820A	SOT353 (SC-88A)
4	3	1	3	107		8	BZA856AL	SOT353 (SC-88A)
4	3	0.5	4	90		8	BZA862AL	SOT353 (SC-88A)
4	3	0.01	4.3	78		8	BZA868AL	SOT353 (SC-88A)

[1] 8-to-20-µs surge pulse according to IEC61000-4-5, [2] According to IEC61000-4-2 (contact discharge)

ESD protection diodes: 1 to 18 lines, standard capacitance (continued)

Number of protected lines		I_{RM} @ V_{RWM}		C_{line}	P_{PP} [1]	ESD rating [2]		
Uni-directional	Bi-directional	Max (µA)	(V)	Typ (pF)	Max (W)	Max (kV)	Type	Package
4	3	1	3	107		8	BZA956A	SOT665
4	3	0.5	4	90		8	BZA962A	SOT665
4	3	0.01	4.3	78		8	BZA968A	SOT665
4	3	0.01	3.3	30		15	IP4042CX5/LF	5-ball CSP
	4	0.01	5	48		15	BZA408B	SOT457 (SC-74)
5	4	2.2	3.3	215	200	30	PESD3V3S5UD	SOT457 (SC-74)
5	4	0.15	5	158	200	30	PESD5V0S5UD	SOT457 (SC-74)
5	4	0.01	12	73	200	30	PESD12VS5UD	SOT457 (SC-74)
5	4	0.01	15	61	200	30	PESD15VS5UD	SOT457 (SC-74)
5	4	0.01	24	45	200	23	PESD24VS5UD	SOT457 (SC-74)
18	17	1	5.2	100	100	8	BZA100	SOT163 (SO20)
18	17	1	5.2	100	100	8	PESD5V2S18U	SOT339-1 (SSOP20)

[1] 8-to-20-µs surge pulse according to IEC61000-4-5, [2] According to IEC61000-4-2 (contact discharge)

ESD protection diodes: 1 to 16 lines, low capacitance

Number of protected lines		I_{RM} @ V_{RWM}		C_{line}	P_{PP} [1]	ESD rating [2]		
Uni-directional	Bi-directional	Max (µA)	(V)	Typ (pF)	Max (W)	Max (kV)	Type	Package
1		2	3.3	0.6	80	30	PESD3V3U1UT	SOT23
1		1	5	0.6	80	30	PESD5V0U1UT	SOT23
1		0.05	12	0.6	200	30	PESD12VU1UT	SOT23
1		0.05	15	0.6	200	30	PESD15VU1UT	SOT23
1		0.05	24	0.6	200	23	PESD24VU1UT	SOT23
	1	0.1	5	2.9	25	10	PESD5V0U1BA	SOD323 (SC-76)
	1	0.1	5	2.9	25	10	PESD5V0U1BB	SOD523 (SC-79)
	1	0.1	5	2.9	25	10	PESD5V0U1BL	SOD882

[1] 8/20µs surge pulse acc. to IEC61000-4-5, [2] According to IEC61000-4-2 (contact discharge)

Small-signal discretes

ESD protection diodes: 1 to 16 lines, low capacitance (continued)

| Number of protected lines | | I_{RM} @ V_{RWM} | | C_{line} | P_{PP} [1] | ESD rating [2] | | |
Uni-directional	Bi-directional	Max (µA)	(V)	Typ (pF)	Max (W)	Max (kV)	Type	Package
	1	0.05	15 (diode 1) 24 (diode 2)	13	160	23	PESD1LIN	SOD323 (SC-76)
2	1	0.3	3.3	22	30	15	PESD3V3L2UM	SOT883 (SC-101)
2	1	0.025	5	16	30	15	PESD5V0L2UM	SOT883 (SC-101)
	2	0.1	5	2.8	25	10	PESD5V0U2BT	SOT23
	2	0.05	24	11	200	23	PESD1CAN	SOT23
	2	0.01	24	25	230	30	PESD2CAN	SOT23
4	3	0.3	3.3	22	30	20	PESD3V3L4UG	SOT353 (SC-88A)
4	3	0.025	5	16	30	20	PESD5V0L4UG	SOT353 (SC-88A)
4	3	0.3	3.3	15	16	10	PESD3V3V4UG	SOT353 (SC-88A)
4	3	0.025	5	12	16	10	PESD5V0V4UG	SOT353 (SC-88A)
4	3	0.3	3.3	22	30	20	PESD3V3L4UW	SOT665
4	3	0.025	5	16	30	20	PESD5V0L4UW	SOT665
4	3	0.3	3.3	15	16	10	PESD3V3V4UW	SOT665
4	3	0.025	5	12	16	10	PESD5V0V4UW	SOT665
	4	0.01	5	16		8	IP4043CX5/LF	5 ball CSP
5	4	0.3	3.3	22	25	20	PESD3V3L5UY	SOT363 (SC-88)
5	4	0.025	5	16	25	20	PESD5V0L5UY	SOT363 (SC-88)
5	4	0.3	3.3	22	25	20	PESD3V3L5UV	SOT666
5	4	0.025	5	16	25	20	PESD5V0L5UV	SOT666
6	5	0.025	5	16	35	20	PESD5V0L6US	SOT96-1 (SO8)
6	5	0.025	5	16	35	20	PESD5V0L6UAS	SOT505-1 (TSSOP8)
	7	0.025	5	7	35	20	PESD5V0L7BS	SOT96-1 (SO8)
	7	0.025	5	7	35	20	PESD5V0L7BAS	SOT505-1 (TSSOP8)
16	15	0.01	3	15		15	IP4080CX20/LF	WLCSP

[1] 8/20-µs surge pulse according to IEC61000-4-5, [2] According to IEC61000-4-2 (contact discharge)

ESD protection diodes: rail-to-rail, ultra-low capacitance

Number of protected lines	I_{RM} @ V_{RWM}		C_{line}	ESD rating [1]		
	Max (µA)	(V)	Typ (pF)	Max (kV)	Type	Package
2	0.1	3	1	8	PRTR5V0U2X	SOT143
2	0.1	3	1.8	12	PRTR5V0U2AX	SOT143
3	0.1	3	4	8	IP4059CX5/LF	5-ball CSP
4	0.1	3	1	8	PRTR5V0U4D	SOT457 (SC-74)
6	0.1	3	1	8	PRTR5V0U6S	SOT96-1 (SO8)
6	0.1	3	1	8	PRTR5V0U6AS	SOT96-1 (SO8)
7	0.1	3	4	8	IP4067CX9/LF	9-ball CSP
8	0.1	3	1	8	PRTR5V0U8S	SOT552-1 (TSSOP10)

[1] According to IEC61000-4-2 (contact discharge)

Low-capacitance Schottky diodes

Product	Package	V_R max (V)	I_F max (mA)	V_F max (mV)	C_D max (pF)
BAT17	SOT23	4	30	450 @ I_F = 1 mA	1 @ V_R = 0 V
PMBD353	SOT23	4	30	450 @ I_F = 1 mA	1 @ V_R = 0 V
PMBD354	SOT23	4	30	450 @ I_F = 1 mA	1 @ V_R = 0 V
1PS76SB17	SOD323	4	30	450 @ I_F = 1 mA	1 @ V_R = 0 V
1PS66SB17	SOT666	4	30	450 @ I_F = 1 mA	1 @ V_R = 0 V
1PS79SB17	SOD523	4	30	450 @ I_F = 1 mA	1 @ V_R = 0 V
1PS88SB82	SOT363	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V
1PS70SB82	SOT323	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V
1PS70SB84	SOT323	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V
1PS70SB85	SOT323	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V
1PS70SB86	SOT323	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V
1PS66SB82	SOT666	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V
1PS10SB82	SOD882	15	30	340 @ I_F = 1 mA	1 @ V_R = 0 V

Small-signal discretes

EMI filtering for computing and consumer applications

Interface	Number of lines	Buffer	Level shifter	C_{line}	Resistor	Remark	Type	Package
VGA	7	•	•	5 pF	55 Ω	sync buffer, DDC level shifter	IP4770CZ16	SSOP16
VGA	7	•	•	5 pF	65 Ω	sync buffer, DDC level shifter	IP4771CZ16	SSOP16
VGA	7	•	•	5 pF	10 Ω	sync buffer, DDC level shifter	IP4772CZ16	SSOP16
IEEE1394	4			5 pF	55 Ω	common mode filter	IP4224CZ6	SOT457 (SC-74)
USB2.0	2			1 pF		ESD protection	PRTR5V0U2X	SOT143
USB2.0	4			1 pF		ESD protection	IP4220CZ6	SOT457 (SC-74)
USB2.0	4			3 pF	1 Ω	> 15 kV contact ESD protection with pi-filter	IP4225CZ10	SOT457 (SC-74)
HDMI	4			1 pF		ESD protection	PRTR5V0U4D	SOT457 (SC-74)
HDMI	4			0.7 pF		ESD protection	IP4280CZ10	TSSOP10
HDMI	8			1 pF		ESD protection	PRTR5V0U8S	TSSOP10
HDMI	8	•	•	0.7 pF		level shifter, ESD protection	IP4776CZ38	TSSOP38

EMI filtering and ESD protection for mobile phones

Baseband interface	Number of lines	Line small-signal equivalents		Clock speed digital interface	Remark	Type	Package
		R_{line}	C_{line}				
Reverse battery	1		240 pF		Overvoltage and reverse battery protection	IP4085CX5/LF	5 ball CSP
Audio	2	0.9 Ω	290 pF		Low ohmic speaker (< ~8 Ω)	IP4047CX6/LF	6 ball CSP
Audio	2	10 Ω	200 pF		High ohmic speaker (> ~8 Ω)	IP4048CX5/LF	5 ball CSP
Audio	2	68 Ω	110 pF		Differential microphone	IP4049CX5/LF	5 ball CSP
Audio	2	470 Ω	35 pF		Differential microphone	IP4055CX5/LF	5 ball CSP
USB	2	33 Ω / 1.5 kΩ	35 pF	~5.5 MHz	Fully integrated USB2.0 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
USB	2	33 Ω	35 pF	~5.5 MHz	Fully integrated USB1.0 low / full-speed interface with EMI filter, ESD protection and impedance matching on NXP ISP1110	IP4078CX6/LF	6 ball CSP
USB	2		1.4 pF	~1 GHz	USB2.0 high-speed ESD protection on NXP ISP1504/01 HS transceiver	IP4359CX4/LF	4 ball CSP
USB	3		3 pF	~240 MHz	USB2.0 high-speed ESD protection on NXP ISP176x and ISP1504	IP4059CX5/LF	5 ball CSP
Sim card	3	47 Ω / 100 Ω	35 pF	~12 MHz	EMI filter, ESD protection	IP4044CX8/LF	8 ball CSP
Sim card	3	47 Ω / 100 Ω	< 20 pF	~20 MHz	EMI filter, ESD protection	IP4064CX8/LF	8 ball CSP
Bottom connector	4	100 Ω	30 pF	~30 MHz	EMI filter, ESD protection	IP4253-6CZ12	12 pin QFN
Bottom connector	6	100 Ω	60 pF	~20 MHz	EMI filter, ESD protection	IP4053CX15/LF	15 ball CSP
Bottom connector	6	100 Ω	30 pF	~40 MHz	EMI filter and ESD protection + 4 single protection diodes	IP4153CX15/LF	15 ball CSP
Memory cards	4	47 Ω / 13 kΩ / 56 kΩ	25 pF		MMC ESD protection, pull-up resistors	IP4051CX11/LF	11 ball CSP
Memory cards	4	50 Ω / 75 kΩ / 7 kΩ	18 pF	~25 MHz	High-speed MMC ESD protection, pull-up resistors	IP4060CX16/LF	16 ball CSP
Memory cards	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
Memory cards	7		5 pF	~24 MHz	Memory stick PRO ESD protection	IP4067CX9/LF	9 ball CSP
Memory cards	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
Memory cards	9			> 52 MHz	(Mini) SD/SDIO memory cardlevel shifter, can be combined with IP4352CX24/LF	IP4852CX24/LF	25 ball CSP
LCD display	4	100 Ω	30 pF	~30 MHz	EMI filter, ESD protection	IP4253-4CZ8	8 pin QFN
LCD display	8	100 Ω	30 pF	~30 MHz	EMI filter, ESD protection	IP4253-8CZ16	16 pin QFN
LCD display	8	100 Ω	50 pF	~25 MHz	EMI filter, ESD protection	IP4088CX20/LF	20 ball CSP
LCD display	10	80 Ω	40 pF	~30 MHz	EMI filter, ESD protection	IP4033CX25/LF	25 ball CSP
LCD display	10	84 Ω	14 pF	~40 MHz	EMI filter, ESD protection	IP4040CX25/LF	25 ball CSP
LCD display	10	200 Ω	50 pF	~20 MHz	EMI filter, ESD protection	IP4041CX25/LF	25 ball CSP
Keypad	10	1 kΩ	50 pF	< 1 MHz	EMI filter, ESD protection	IP4035CX24/LF	24 ball CSP
Rail-to-rail protection	4		1 pF	~1.5 GHz	ESD protection	PRTR5V0U4Y	SOT363 (SC-88)

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