



RF Manual 14th edition

Application and design manual
for High Performance RF products
May 2010



RF Manual 14th edition

High Performance RF for the most demanding applications

NXP's RF Manual makes design work much easier

NXP's RF Manual – one of the most important reference tools on the market for today's RF designers – features our complete range of RF products, from low to high power signal conditioning & high speed data converters.

What's new?

This RF Manual features new applications, such as: point-to-point communication, radar, VSAT, MoCA (Multimedia over Coax Alliance), NIM (Network Interface Module for TV reception), Digital Satellite Set-top-box RF (Plasma) lighting, medical imaging, microwave furnaces and Mobile platforms. And we describe thoroughly new developments in our main technologies SiGe:C QUBiC and LDMOS.

New products families have been added to our broad portfolio, like: Quad pin diodes, 6th and 7th generation SiGe:C wideband transistors, variable gain amplifiers, LNA's for wireless infrastructures, LNA's and MOSFETs for STB and a full line-up of high speed converters. And of course the latest additions and improvements are included: GPS LNA's, medium power amplifiers, LO generators and CATV modules.

Our base station offering has grown extensively by e.g. a comprehensive set of best in class Doherty amplifier designs, a broad selection of medium power, variable gain and low noise amplifiers and our JESD204A-compliant, high speed DACs and ADCs.

Last but not least, we expanded our cross reference list with 40% to over 1.200 items.

A strong foundation in RF

Shipping billions of RF products annually, NXP is a true industry leader in high performance RF. Our RF small signal products are widely installed in satellites, cellular base stations, mobile devices, cars, TV tuners and CATV. We're a leader in high power RF for cellular infrastructure, broadcast/ISM and Radar applications. With our new, serialized signal processing architectures with JESD204A-compliant high-speed converters, we are enabling a transition to more compact, higher performance systems.

Our IP extends far beyond our packaged products to our patented high performance processes. From high-power LDMOS for power amplifiers, CMOS processes for our high-speed converters, and the most advanced SiGe:C (QUBiC4) for RF small signal transistors, MMICs and ICs. Our in-house process and technology portfolio sets us apart.

What's more, producing over 65 million units per day, we control our front- and back-end manufacturing quality and cost structures with internal 8-inch IC fabs in the Netherlands and Singapore and assembly plants in Thailand, Taiwan and China. Our processes are all AEC100 certified for supply into the most quality-conscious customers and applications.

NXP's firsts in RF

- 1963 – First transistors and diodes on 0.75 inch wafers
- 1964 – First RF wideband transistor with 1.5 GHz max
- 1970 – BFR90, a 5 GHz RF wideband transistor
- 1978 – BFQ33, a 14 GHz RF wideband transistor
- 1989 – Output matching in common emitter base station transistors
- 1992 – Highest power broadcast bipolar devices
- 1996 – Highest performance 2 GHz LDMOS
- 2004 – Gen5 LDMOS which becomes the industry's most advanced process for power amplifiers
- 2006 – Fully integrated Doherty transistors
- 2007 – Industry's first fully integrated, silicon-based IC solution for satellite: TFF1004HN
- 2008 – High speed data converters based on JESD204A standard
- 2009 – 1kW single transistor (BLF578) power amplifier for FM radio (88 to 108 MHz)
- 2009 – State-of-the-art, next generation SiGe:C BiCMOS QUBiC4Xi technology

"I'm proud to present the latest edition of our RF Manual. It covers NXP's entire range of RF products in one comprehensive manual, and I'm convinced that you'll find the 14th edition even more useful in your daily design work."

Kind regards,



John Croteau

Sr. Vice President & General Manager
Business Line High Performance RF

RF Manual web page

www.nxp.com/rfmanual

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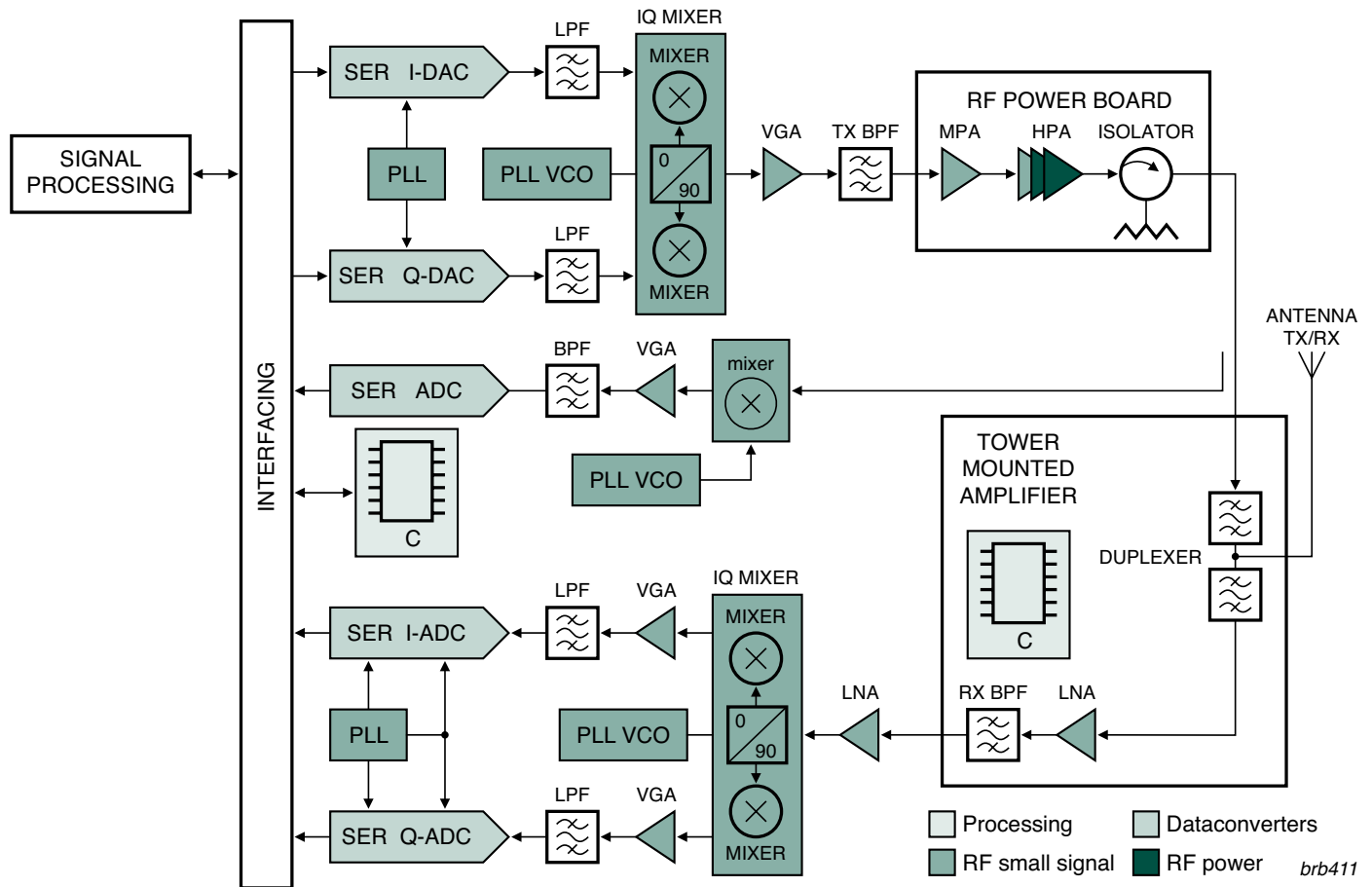


1.1 Mobile Communication Infrastructure

1.1.1 Base stations (all cellular standards and frequencies)

See also brochure: 'Your partner in Mobile Communication Infrastructure design': document number: 9397 750 16837.

Application diagram



Above diagram shows a simplified base station block diagram with its two main branches: transmit (upper half, TX) and receive (lower half, RX).

Walking along the transmit branch, after the interfacing into the signal processing part, one first encounters the digital to analog converters (DAC), which include a serial interface in our case (SER). The transmit signal then passes a low-pass filter block (LPF) and is being upconverted in the IQ mixer stage. Next follows a variable gain amplifier (VGA), a bandpass filter (TX BPF) and the power amplifier board with a medium power amplifier- (MPA) and the high power amplifier (HPA) stages.

An isolator and duplexer are the last two basic blocks up to the antenna. A feedback line is provided to monitor the transmitted signal. The TX signal is "sampled", down-converted in a mixer, amplified (VGA), bandpassfiltered (BPF) and converted to digital by an analog to digital converter (SER ADC), with a high speed serial interface.

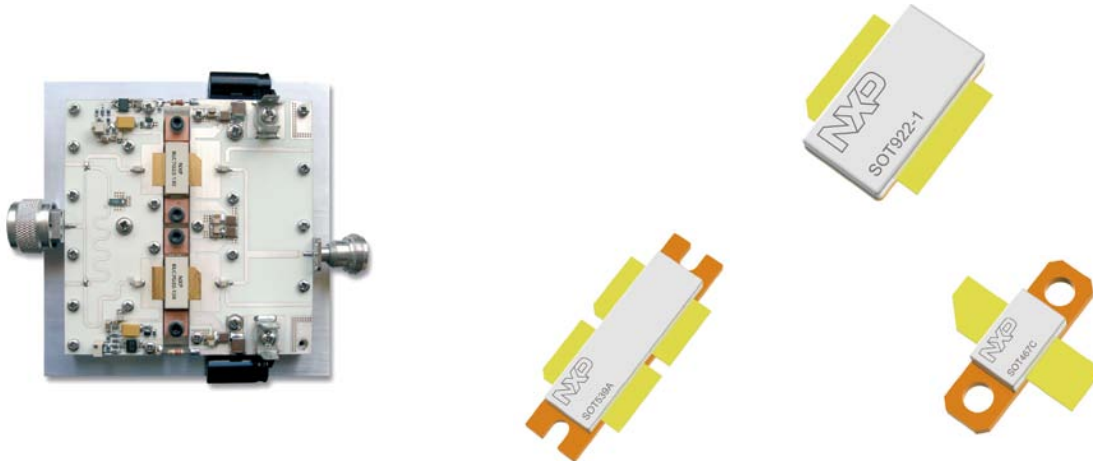
The main RX branch of the base station starts at the duplexer, is amplified by a low noise amplifier (LNA) and band pass filtered (RX BPF) very close to the antenna in a "tower mounted amplifier". A further amplifier (LNA) then feeds into the down conversion mixer; the I and Q base band signals are further amplified (VGA) and via a low pass filter (LPF) fed into the respective ADC's (SER I-ADC and SER Q-DAC).

The serial interface in turn connects to the base band signal processing unit. The synchronizing "heartbeats" in the diagram are controlled by phase locked loops (PLL) with or without a voltage controlled oscillator (VCO). Microcontrollers (μC) provide local control and monitoring functions within the building blocks. The colored building blocks can all be sourced by NXP and are discussed in the following paragraphs.

Recommended products

Function	Sub function	f _{range}	Type	P _{L(AV)}	η _D	G _P	Mode of operation
		MHz		W	%	dB	
HPA (high power amplifier - single transistors)	driver	10 - 2200	BLF6G21-10G	0.6	15	18.5	WCDMA. TD-SCDMA. GSM. EDGE
	MMIC driver	700 - 1000	BLM6G10-30	2	11.5	29	WCDMA
	final	700 - 1000	BLF6G10-160RN	32	27	22.5	WCDMA
		688 - 1000	BLF6G10-200RN	40	28.5	20	WCDMA
	final	1800 - 2000	BLF6G20-230PRN	65	32	17.5	WCDMA
	final	1805 - 1880	BLF7G20L(S)-200	50	30	17	WCDMA
	final	1805 - 1880	BLF7G20L(S)-250P	70	30	17	WCDMA
	final	1805 - 1880	BLF7G20L(S)-300P	85	30	17	WCDMA
	MMIC driver	2100 - 2200	BLM6G22-30	2	9	29.5	WCDMA
	integrated Doherty driver	2010 - 2025	BLD6G21L-50	8	42	13.5	TD-SCDMA
		2110 - 2170	BLD6G22L-50	8	38	13.3	WCDMA
	final	2000 - 2200	BLF7G22L-130	30	32	18.5	WCDMA
			BLF6G22-180PN	50	27.5	17.5	WCDMA
	final	2110 - 2170	BLF6G22-180RN	40	25	16	WCDMA
			BLF7G22L(S)-200	55	17	28	WCDMA
	final	2300 - 2400	BLF7G24L(S)-100(G)	24	18	28	WCDMA
	driver	2500 - 2700	BLF6G27-10	2	20	19	WiMAX
	final		BLF6G27-135	20	22.5	16	WiMAX
	final		BLF7G27L-200P	20	25	16.5	WiMAX
	driver	3400 - 3600	BLF6G38-10	2	20	14	WiMAX
final	BLF6G38-100		18.5	21.5	13	WiMAX	

Function	Freq band (MHz)	PPEAK (dBm)	POUT-AVG (dBm)	VDS (V)	Gain (dB)	Drain Eff. (%)	Type	Main transistor	Peak transistor
HPA (high power amplifier - Doherty designs)	728-768	58	50	32	19	47	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN
	869-894	58	50	32	19	46	SYM	BLF6G10-200RN	BLF6G10-200RN
	925-960	58.9	50	32	22	44	SYM / MMPP	1/2 BLF6G10-260PRN	1/2 BLF6G10-260PRN
	1805-1880	58.2	50	28	16	42	SYM / MPPM	BLF7G20LS-250P	BLF7G20LS-250P
	1930-1990	58	50	32	15.5	37	SYM	BLF6G20-230PRN	BLF6G20-230PRN
	2110-2170	58	50	32	15	40	SYM	BLF6G22-180PN	BLF6G22-180PN
	2300-2400	49.5	42	28	14.5	43	SYM	1/2 BLF7G27-75P	1/2 BLF7G27-75P
	2500-2700	52.5	44.5	28	14	38	SYM	1/2 BLF6G27-150P	1/2 BLF7G27-150P
	3400-3600	51	43	28	11.5	32	SYM	BLF6G38-50	BLF6G38-50



Product highlight:

high power transistor BLF7G20L(S)-300P

NXP's LDMOS Gen6 and Gen7 enable the world's most efficient base station designs by combining very high intrinsic (Si technology) and extrinsic (amplifier design) efficiencies. Gen7 is specifically designed for Doherty amplifiers.

Features

- ▶ unrivalled ruggedness
- ▶ very consistent device performance
- ▶ highest Doherty amplifier efficiencies to date
- ▶ 300 W peak power; 35 W average power in push pull package
- ▶ low thermal resistance design for very reliable operation

Function	Product		Package	Type
Discrete attenuator	RF diode	PIN diode	SOT753	BAP64Q
			SOT753	BAP70Q
			Various^	BAP64

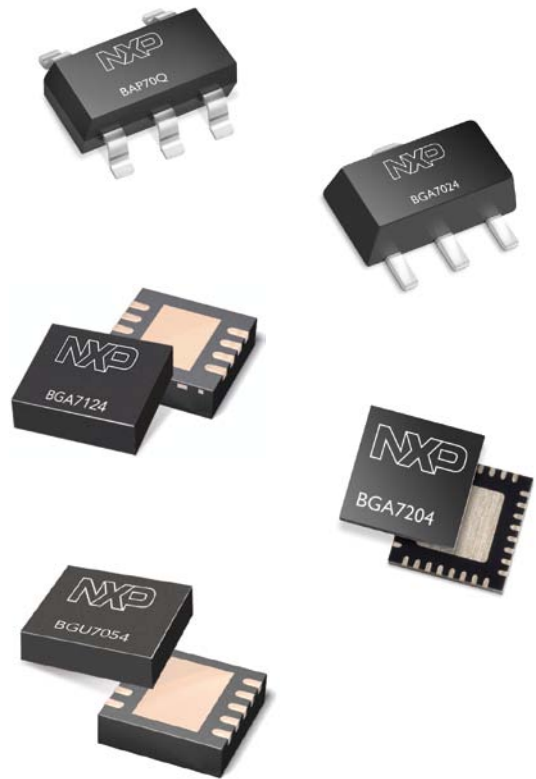
Function	Product		Package	Type
LNA (low noise amplifier) & Mixer	RF transistor	SiGe:C transistor	SOT343F	BFU725F/N1
				BGU7051
	RF MMIC	SiGe:C MMIC	SOT650	BGU7052
				BGU7053
			BGU7054	

Function	Product		Package	Type
VGA (variable gain amplifier)	MMIC	SiGe:C MMIC	SOT617	BGA7202*
				BGA7203*
				BGA7204*
				BGA7350*
				BGA7351*

Function	Product		Package	Type
MPA (medium power amplifier)	MMIC	MMIC	SOT89	BGA6589
			SOT908	BGA7124
			SOT89	BGA7024
		SiGe:C MMIC	SOT908	BGA7127
			SOT89	BGA7027
			SOT908	BGA7130*
			SOT908	BGA7133*

* = check status at 3.1 new products, as this type has not been released yet for mass production.

^ = SOD523, SOD323, SOT23 & SOT323



Function	Sub function	Max. sampling frequency	Type	# of bits	Interface
Dataconverters	dual channel DAC	650 Msps	DAC1405D650	14	LVC MOS
		160 Msps	DAC1405D160	14	LVC MOS
		125 Msps	DAC1401D125	14	LVC MOS
		750 Msps	DAC1408D750	14	JESD204A
	single channel ADC	80 Msps	ADC1207S080	12	LVC MOS
		125 Msps	ADC1415S125	14	LVC MOS&LVDS DDR
		125 Msps	ADC1410S125	14	LVC MOS&LVDS DDR
	dual channel ADC	125 Msps	ADC1412D125	14	LVC MOS&LVDS DDR
		125 Msps	ADC1413D125	14	JES204A

Product highlight:
medium power amplifier BGA7124 MMIC

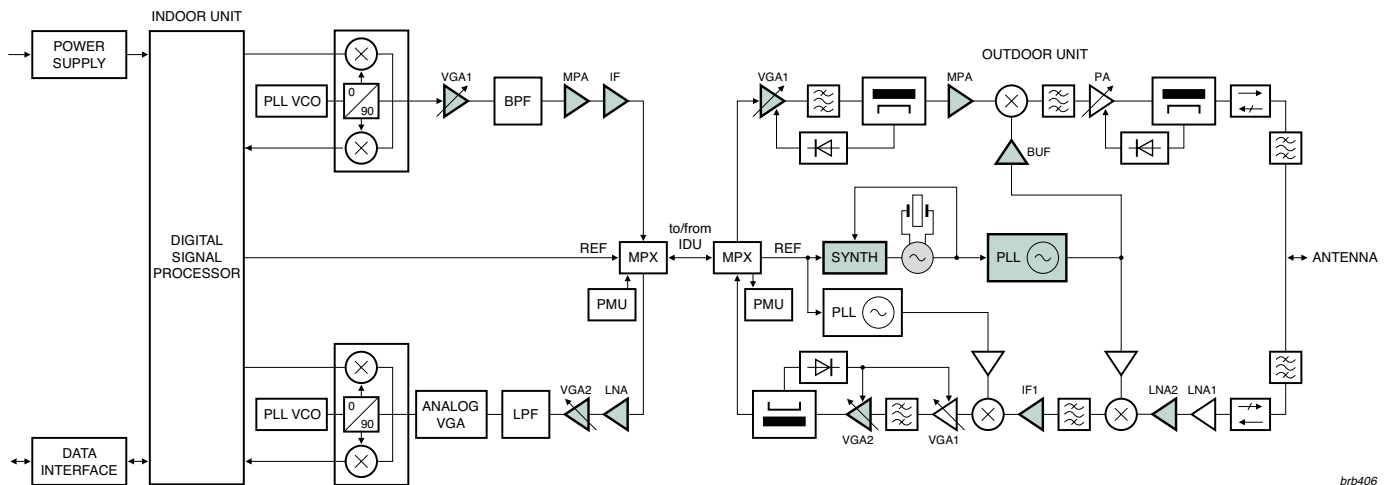
The BGA7124 MMIC is a one-stage driver amplifier, offered in a low-cost ultra small SOT908 leadless package. It delivers 25 dBm output power at 1 dB gain compression and a superior performance for various narrowband-tuned application circuits for frequencies up to 2700 MHz.

Features

- ▶ 400 MHz to 2700 MHz frequency operating range
- ▶ 16 dB small signal gain at 2 GHz
- ▶ 27 dBm output power at 1 dB gain compression
- ▶ Integrated active biasing
- ▶ 3.3 V / 5 V single supply operation
- ▶ Simple quiescent current adjustment
- ▶ 1 µA shutdown mode

1.1.2 Point-to-point

Application diagram



brb406

Recommended products

Indoor unit

Function	Product	Package	Type
VGA 1 (variable gain amplifier)	MMIC	SiGe:C MMIC	SOT617
			BGA7202*
			BGA7203*
			BGA7204*

Function	Product	Package	Type
MPA (medium power amplifier)	MMIC	SiGe:C MMIC	SOT89
			BGA6289
			BGA6489
			BGA6589
			BGA7124
			BGA7024
	SiGe:C MMIC	SOT908	
		SOT89	
		SOT908	
		SOT89	
BGA7127			
BGA7027			
BGA7130*			
BGA7133*			

Function	Product	Package	Type
IF	IF gain block	SiGe:C MMIC	SOT363
			BGA2800
			BGA2801
			BGA2815
			BGA2816
	MMIC	General purpose wideband amplifiers	SOT363
			BGM1012
			BGA2714
			BGA2748
			BGA2771

Function	Product	Package	Type
LNA	RF MMIC	SiGe:C MMIC	SOT891
			BGU7003
			BGU7051*
			BGU7052*
			BGU7053*
	RF transistor	SiGe:C transistor	SOT343F
			BFU725F/N1
		Wideband transistor	SOT343R
			BFG425W
			BFG424W
SOT143R			
BFG325/XR			

Function	Product	Package	Type
VGA 2 (variable gain amplifier)	MMIC	SiGe:C MMIC	SOT617
			BGA7350*
			BGA7351*



* = check status at 3.1 new products, as this type has not been released yet for mass production.

Outdoor unit

Function	Product	Package	Type	
VGA 1 (variable gain amplifier)	MMIC	SiGe:C MMIC	SOT617	BGA7202*
				BGA7203*
				BGA7204*

Function	Product	Package	Type	
VGA 2 (variable gain amplifier)	MMIC	SiGe:C MMIC	SOT617	BGA7202*
				BGA7203*
				BGA7204*
				BGA7350*
				BGA7351*

Function	Product	Package	Type
MPA (medium power amplifier)	MMIC	SOT89	BGA6289
			BGA6489
			BGA6589
	SiGe:C MMIC	SOT908	BGA7124
		SOT89	BGA7024
		SOT908	BGA7127
		SOT89	BGA7027
		SOT908	BGA7130*
			BGA7133*

Function	Product	Package	Type
PLL	RF IC	SiGe:C IC	SOT616
			TFF1003HN
			TFF1007HN*
			TFF11xxxHN*^

Function	Product	Package	Type
Oscillator	RF transistor	Wideband transistor	SOT343R
		SiGe:C transistor	SOT343F
			BFG424W
			BFG425W
			BFU725F/N1

Function	Product	Package	Type
Buffer	RF transistor	SiGe:C transistor	SOT343F
			BFU725F/N1

Function	Product	Package	Type
Synth	RF diode	Varicap diode	SOD523
			BB202

Function	Product	Package	Type
LNA 2	RF transistor	SiGe:C transistor	SOT343F
			BFU725F/N1
	MMIC	SiGe:C MMIC	SOT891
			BGU7003

* = check status at 3.1 new products, as this type has not been released yet for mass production.

^ = 17 different types with LO ranges: 7-15 GHz, see 3.4.2

Function	Product	Package	Type	
IF 1	IF gain block	SiGe:C MMIC	SOT363	BGA2800
				BGA2801
				BGA2815
				BGA2816
				BGA2850
				BGA2865
	MMIC	General purpose wideband amplifiers	BGA2866	
			BGM1014	
			BGM1013	
			BGM1012	
			BGA2714	



Product highlight:

medium power amplifier BGA7124 MMIC

The BGA7124 MMIC is a one-stage driver amplifier, offered in a low-cost ultra small SOT908 leadless package. It delivers 25 dBm output power at 1 dB gain compression and a superior performance for various narrowband-tuned application circuits for frequencies up to 2700 MHz.

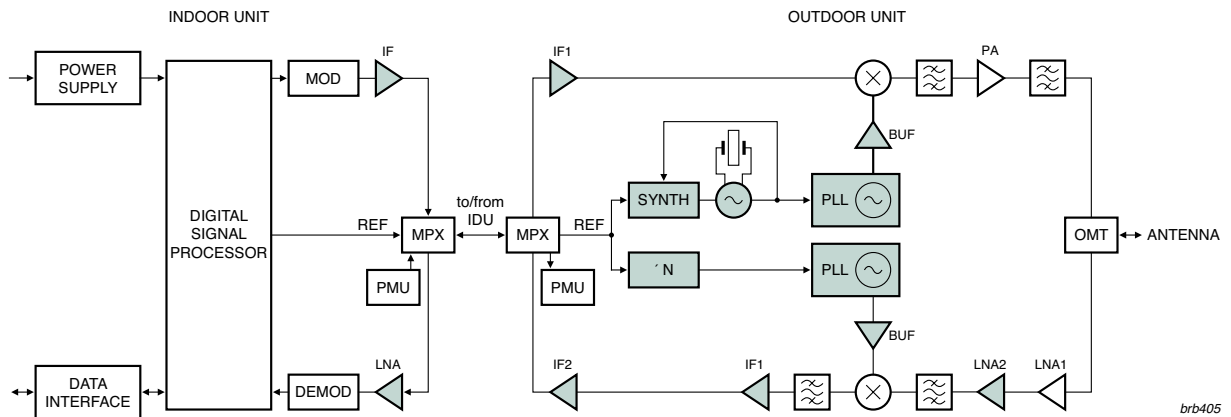
Features

- ▶ 400 MHz to 2700 MHz frequency operating range
- ▶ 16 dB small signal gain at 2 GHz
- ▶ 27 dBm output power at 1 dB gain compression
- ▶ Integrated active biasing
- ▶ 3.3 V / 5 V single supply operation
- ▶ Simple quiescent current adjustment
- ▶ 1 μ A shutdown mode

1.2 Microwave & mmWave

1.2.1 VSAT

Application diagram



brb405



Recommended products VSAT

Indoor unit

Function	Product	Package	Type
IF	IF gain block	SiGe:C MMIC	BGA2800
	MMIC	General purpose wideband amplifiers	BGA2801
			BGA2815
			BGA2816
			BGM1012
			BGA2714
			BGA2748
			BGA2771

Function	Product	Package	Type
LNA	RF transistor	SiGe:C transistor	SOT343F
		Wideband transistor	SOT343R
			SOT143R
			BFU725F/N1
			BFG425W
			BFG424W
			BFG325/XR

Recommended products VSAT

Outdoor unit

Function	Product		Package	Type
IF	IF gain block	SiGe:C MMIC	SOT363	BGA2800
				BGA2801
				BGA2815
				BGA2816
				BGA2850
	BGA2865			
	BGA2866			
	BGM1014			
	BGM1013			
	BGM1012			
BGA2714				
	MMIC	General purpose wideband amplifiers		

Function	Product		Package	Type
LNA2	RF transistor	SiGe:C transistor	SOT343F	BFU725F/N1
	MMIC	SiGe:C MMIC	SOT891	BGU7003

Function	Product		Package	Type
PLL	RF IC	SiGe:C IC	SOT616	TFF1003HN
				TFF1007HN*
				TFF11xxxHN*^

Function	Product		Package	Type
Oscillator	RF transistor	Wideband transistor	SOT343R	BFG424W
		SiGe:C transistor	SOT343F	BFG425W
				BFU725F/N1

Function	Product		Package	Type
Synth	RF diode	Varicap diode	SOD523	BB202

Function	Product		Package	Type
Buffer	RF transistor	SiGe:C transistor	SOT343F	BFU725F/N1

* = check status at 3.1 new products, as this type has not been released yet for mass production.

^ = 17 different types with LO ranges: 7-15 GHz, see 3.4.2



Product highlight:

TFF1003HN

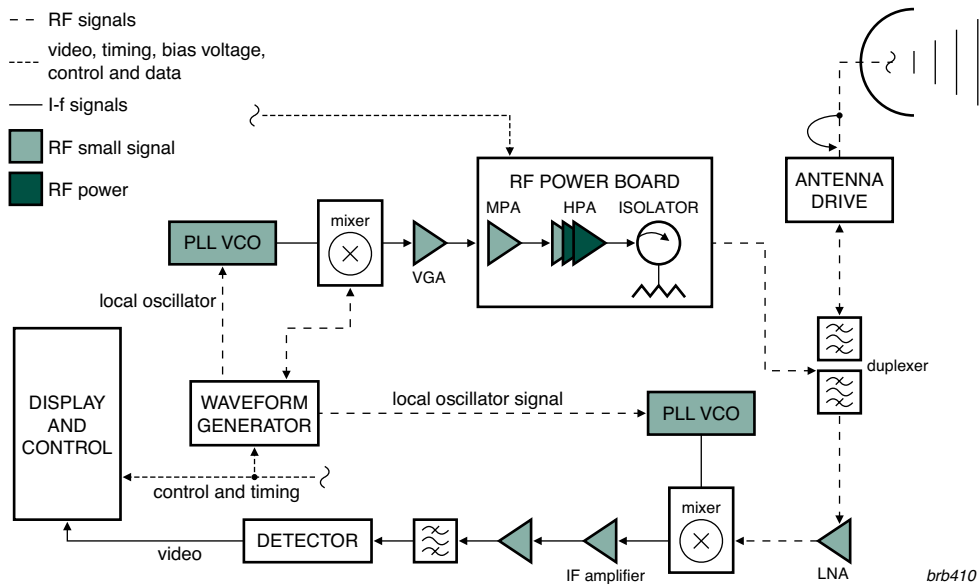
The TFF1003HN is a Ku band frequency generator intended for low phase noise Local Oscillator (LO) circuits for Ku band VSAT transmitters and transceivers. The specified phase noise complies with IESS-308 from Intelsat.

Features

- ▶ Phase noise compliant with IESS-308 (Intelsat)
- ▶ LO generator with VCO range from 12.8 GHz to 13.05 GHz
- ▶ Input signal 50 MHz to 815 MHz
- ▶ Divider settings 16, 32, 64, 128 or 256

1.2.2 Microwave products for Avionics, L- and S-band Radar applications

Application diagram



brb410

Recommended products

Application	Function	Name	Package	MHz	W	%	dB	V	
Avionics power transistors	driver	BLL6H0514-25	SOT467C	500 - 1400	25 (min)	50	19	50	PULSED RF; class AB
	final	BLA6H0912-500	SOT634A	960 - 1215	450	50	17	50	PULSED RF; class AB
	final	BLA6H1011-600	SOT539A	1030 - 1090	600	52	19	50	PULSED RF; class AB
	final	BLA6G1011-200R	SOT502A2	1030 - 1090	200	65	20	28	PULSED RF; class AB
L-Band power transistors	driver	BLL6H0514-25	SOT467C	500 - 1400	25 (min)	50	19	50	PULSED RF; class AB
	final	BLL6H1214-500	SOT539A	1200 - 1400	500 (min)	50	17	50	PULSED RF; class AB
	final	BLL6H1214L(S)-250	SOT502	1200 - 1400	250	55	17	50	Pulsed RF
	final	BLL6HL(S)0514-130	SOT1135	500 - 1400	130	50	18	50	Pulsed RF
S-band power transistors	driver	BLS6G2731-6G	SOT975C	2700 - 3100	6	33	15	32	PULSED RF; class AB
	driver	BLS6G3135-20	SOT608A	3100 - 3500	20	45	15.5	32	PULSED RF; class AB
	driver	BLS6G3135S-20	SOT608B	3100 - 3500	20	45	15.5	32	PULSED RF; class AB
	final	BLS6G2731-120	SOT502A	2700 - 3100	120	48	13.5	32	PULSED RF; class AB
	final	BLS6G2731S-120	SOT502B	2700 - 3100	120	48	13.5	32	PULSED RF; class AB
	final	BLS6G2933S-130	SOT922-1	2900 - 3300	130	47	12.5	32	PULSED RF; class AB
	final	BLS6G3135-120	SOT502A	3100 - 3500	120	43	11	32	PULSED RF; class AB
	final	BLS6G3135S-120	SOT502B	3100 - 3500	120	43	11	32	PULSED RF; class AB
	final	BLS7G2933P-200	pallet	2900 - 3300	200	45	11	32	PULSED RF; class AB
	final	BLS7G2731P-200	pallet	2700 - 3100	200	45	11	32	PULSED RF; class AB
final	BLS6G2731S-130	SOT922	2700 - 3100	130	49	13	32	Pulsed RF	

Function	Product		Package	Type
Discrete attenuator	RF diode	PIN diode	Various [^]	BAP64

[^] = SOD523, SOD323, SOT23 & SOT323

Function	Product		Package	Type
LNA (low noise amplifier) & Mixer	RF transistor	SiGe:C transistor	SOT343F	BFU725F/N1

Function	Product		Package	Type
IF amplifier	MMIC	SiGe:C MMIC	SOT363	BGA2800
				BGA2801
				BGA2815
				BGA2816
				BGA2850
		BGA2865		
		BGA2866		
		BGM1014		
		BGM1013		
		BGM1012		
		General purpose wideband amplifiers		

Function	Product		Package	Type
PLL/VCO LO generator	RF IC	SiGe:C IC	SOT616	TFF1003HN TFF1007HN* TFF11xxxHN* [^]

Function	Product		Package	Type
VGA (variable gain amplifier)	MMIC	SiGe:C MMIC	SOT617	BGA7202*
				BGA7203*
				BGA7204*
				BGA7350*
				BGA7351*

Function	Product		Package	Type
MPA (medium power amplifier)	MMIC	SiGe:C MMIC	SOT908	BGA7124
			SOT89	BGA7024
			SOT908	BGA7127
			SOT89	BGA7027
			SOT908	BGA7130*
			SOT908	BGA7133*
		MMIC	SOT89	BGA6589

* = check status at 3.1 new products, as this type has not been released yet for mass production.

[^] = 17 different types with LO ranges: 7-15 GHz, see 3.4.2



Product highlight:

The BLS6G2933P-200 is the first LDMOS based, industry standard pallet available on the market. This pallet offers more than 40% efficiency includes the complete bias network and can be used as direct replacement for current solutions.

Features

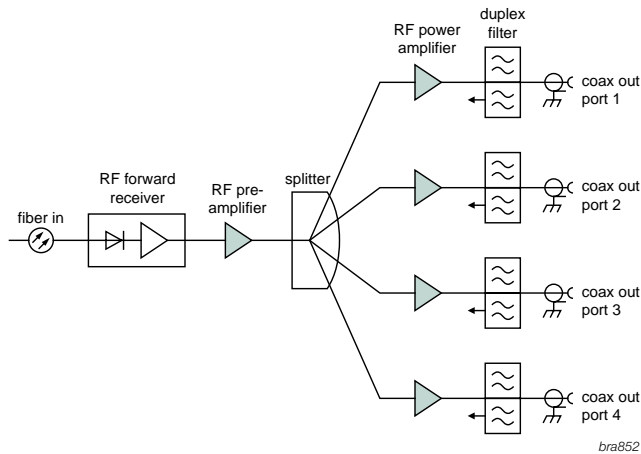
- ▶ P1 dB > 200 W
- ▶ Efficiency > 40%
- ▶ Industry standard footprint
- ▶ 50 Ω in/out matched for entire bandwidth
- ▶ Lightweight heat sink included

1.3 Fixed Communication Infrastructure

Note: looking for MoCA and Satellite Multi Switch Boxes? See chapter 1.4 TV, STB and Satellite.

1.3.1 CATV optical (optical node with multiple out-ports)

Application diagram



Recommended products

Function	Product	Frequency	Package	Type
RF forward receiver	Forward path receiver	870 MHz	SOT115	BGO807
			SOT115	BGO807CE
			SOT115	BGO827

Function	Product	Frequency	Gain (dB)	Type
RF pre-amplifier	Push-Pulls	870 MHz	18 - 19	BGY885A
	Power doubler	870 MHz	18.2 - 18.8	BGD812

Function	Product	Frequency	Gain (dB)	Type
RF power amplifier	Power doublers	870 MHz	20.5 - 22.5	CGD942C
			23 - 25	CGD944C



Product highlight:

BGO807CE

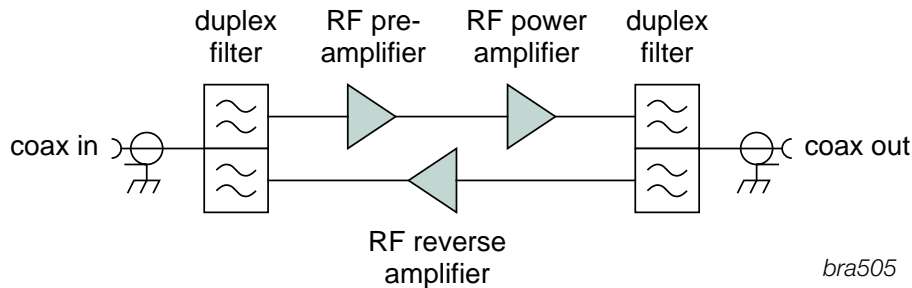
BGO807CE is an integrated optical receiver module that provides high output levels and includes an integrated temperature compensated circuitry. In your optical node design, BGO807CE enables a high performance/ price ratio and ruggedness. When upgrading an HFC network from analog to digital our BGO807CE is the perfect fit.

Features

- ▶ Excellent linearity
- ▶ Low noise
- ▶ Excellent flatness
- ▶ Standard CATV outline
- ▶ Rugged construction
- ▶ Gold metallization ensures excellent reliability
- ▶ High optical input power range

1.3.2 CATV electrical (line extenders)

Application diagram



Recommended products

Function	Product	Frequency	Gain (dB)	Type
RF pre-amplifier	Push-Pulls	550 MHz	33.5 - 35.5	BGY588N
			33.5 - 35.5	BGY588C
			26.2 - 27.8	BGY587B
		600 MHz	21 - 22	BGY687
			33.5 - 35.2	BGE788C
		750 MHz	33.5 - 34.5	BGE788
			18 - 19	BGY785A
			21 - 22	BGY787
		870 MHz	18 - 19	BGY885A
			21 - 22	BGY887
			33.5 - 34.5	BGY888
			34.5 - 36.5	CGY888C
		1000 MHz	18 - 19	BGY1085A
			22	CGY1041*
			24	CGY1043*
28	CGY1047			
29	CGY1049*			
		32	CGY1032*	

Function	Product	Frequency	Gain (dB)	Type
RF power amplifier	Power doublers	550 MHz	18-19	BGD502
			19.5 - 20.5	BGD704
		750 MHz	18.2 - 18.8	BGD712
			18.2 - 18.8	BGD712C
			20 - 20.6	BGD714
		870 MHz	18 - 19	BGD802
			18.2 - 18.8	BGD812
			19.7 - 20.3	BGD814
			20.5 - 22.5	CGD942C
		1000 MHz	23 - 25	CGD944C
			21	CGD1040Hi
			23	CGD1042H
			23	CGD1042Hi
25	CGD1044H			
25	CGD1044Hi			
26	CGD1046Hi*			

Function	Product	Frequency	Gain (dB)	Type
RF reverse amplifier	Reverse hybrids	5-75 MHz	29.2 - 30.8	BGY68
		5-120 MHz	24.5 - 25.5	BGY66B
		5-200 MHz	23.5 - 24.5	BGY67A

All available in SOT115 package.

* = check status at 3.1 new products, as this type has not been released yet for mass production.



Product highlight:

CGD1046Hi

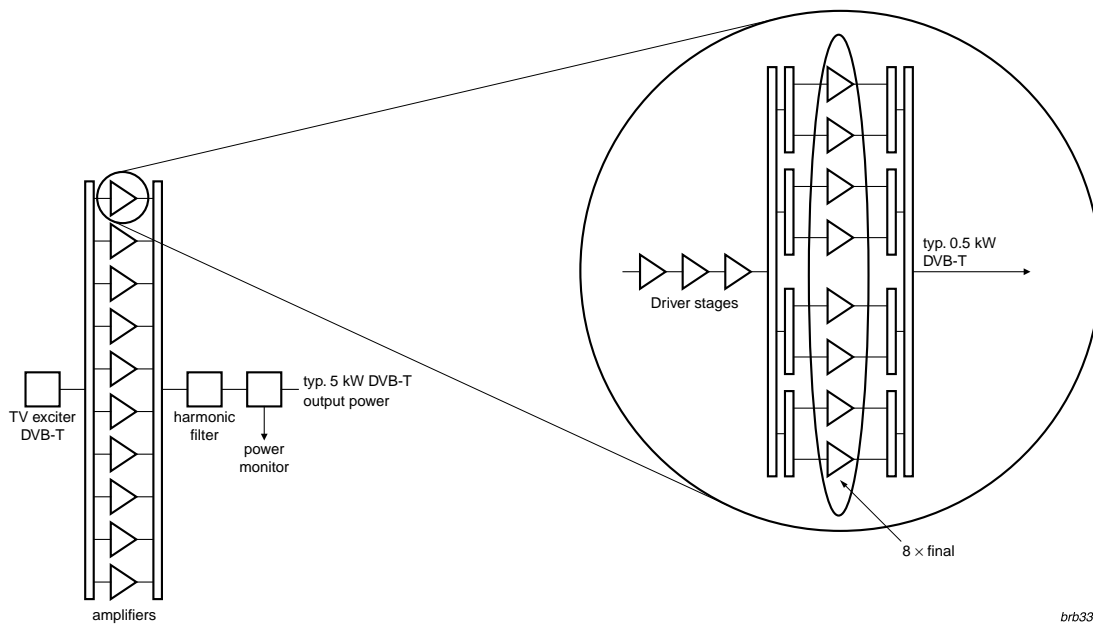
CGD1046Hi* with a very high-output power level is primarily designed for use in fiber deep-optical-node applications (N+1/2/3). This 1 GHz hybrid amplifier solution offers an extended temperature range, high power overstress capabilities in case of surges and high ESD levels resulting in a low cost of ownership. It's designed for durability and offering superior ruggedness.

Features

- ▶ High-output power
- ▶ High power gain for power doublers
- ▶ Extremely low noise
- ▶ Dark Green products
- ▶ GaAs HFET dies for high-end applications
- ▶ Rugged construction
- ▶ Superior levels of ESD protection
- ▶ Integrated ringwave protection
- ▶ Design optimized for digital channel loading
- ▶ Temperature compensated gain response
- ▶ Optimized heat management
- ▶ Excellent temperature resistance

1.3.3 Broadcast / ISM (industrial, scientific & medical)

Application diagram



brb339

Recommended products

Function	Type	f_{range}	$P_{L(AV)}$	η_D	G_p	Mode of operation
		MHz	W	%	dB	
driver	BLF871(S)	0 - 1000	100	47	21	2-TONE
		0 - 1000	24	33	22	DVB-T
driver	BLF881(S)	0 - 1000	140	49	21	2-TONE
		0 - 1000	33	34	21	DVB-T
driver	BLF571	0 - 1000	20	70	27.5	CW
final	BLF573(S)	0 - 1000	300	70	27.2	CW
final	BLF574	0 - 1000	500	70	26.5	CW
final	BLF578	0 - 1000	1200	71	24	PULSED RF
		0 - 1000	1000	75	26	CW
final	BLF645	0 - 1400	100	45	18	2-TONE
		0 - 1400	100	56	18	CW
final	BLF878	470 - 860	75	32	21	DVB-T
		470 - 860	300	46	21	DVB-T
final	BLF888	470 - 860	250	46	19	2-TONE
		470 - 860	110	31	19	DVB-T
final	BLF888A(S)	470 - 860	250	46	19	2-TONE
		470 - 860	115	32	19	DVB-T
final	BLF177	28 - 108	150	>35	20	CW class AB
	BLF278	108 - 225	250 - 300	50 - 80	14 - 20	CW class AB

Product highlight:

NXP's 50 V high voltage LDMOS process enables highest power and unequalled ruggedness.
BLF888A: delivers the highest power level for digital broadcasting available to date.

Features

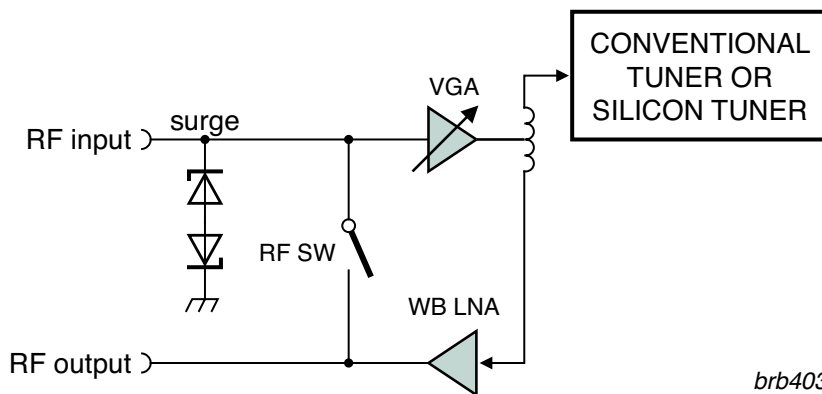
- ▶ Best broadband efficiency
- ▶ Highest power devices
- ▶ Unrivalled ruggedness
- ▶ Low-thermal resistance design for very reliable operation
- ▶ Very consistent device performance

1.4 TV, NIM (STB) and Satellite

Note: looking for TV on Mobile? See chapter 1.5.1 Handset.

1.4.1 Network interface module (NIM) for TV reception

Application diagram



brb403

Make a high performance active splitter in a NIM tuner with BGU703x.

Nowadays more flexibility in design and more complicated signal handling is required for a TV tuner. A front-end of a TV signal receiver is no longer just a tuned receiver, but has evolved into a RF Network Interface Module (NIM) with tuned demodulators, active splitters and re-modulators. The active splitter requires an LNA with excellent linearity. We have developed a new series of LNA/ VGA MMICs (BGU703x) designed specifically for high linearity (IP3O of 29 dBm) in low noise applications like an active splitter in a NIM tuner.

Save energy with BF11x8

The BF11x8 series are small signal RF switching MOSFETs which can be used for switching RF signals up to 1 GHz. With the use of the BF11x8 series as a RF switch you can save a considerable amount of energy. When a recording device (DVD-R, HDD-R, VCR, DVR) is powered off people can remain watching TV, although the antenna is looped via the recording device. Without using BF11x8 the antenna signal is lost. At the moment the power of the recording device is on, the BF11x8 is open, so the RF signal travels via the recording device to the TV tuner. At the moment the power of the recording device is completely off, the BF11x8 closes. This ensures that the RF signal is looped through directly to the TV tuner and that TV reception is guaranteed. Energy is saved because the recording device can be powered off.



Recommended products

Function	Product	Package	Type	
RF Switch / PLT switch	MOSFET	5V Silicon RF switch	SOT23	BF1107
			SOT143B	BF1108
			SOT143R	BF1108R
			SOT343	BF1108W
			SOT343R	BF1108WR
		3.3V Silicon RF Switch	SOT143B	BF1118
			SOT143R	BF1118R
			SOT343	BF1118W
			SOT343R	BF1118WR

Note: Using the BF1108 as passive loop through switch between the RF input and output of a NIM tuner can save considerable energy. For example, when the HDR is not in used, the TV signal can still be distributed to the TV without having to power up the active splitter circuit in the HDR. That is because the BF1108 RF switch is closed when no power is supplied to it, and is open when it is powered on. For 3.3 V applications, the BF1118 can be used instead.

Function	Product	Package	Type	
VGA	RF BiMOS MMIC	Wideband transistor with gain levels of 5 dB and 10 dB, plus a bypass mode.	SOT363	BGU7033*^
			SOT363	BGU7032*^
		Wideband transistor with gain level of 10dB and a bypass mode.	SOT363	BGU7031*^
LNA	RF bipolar transistor	Wideband transistor	SOT143	BFG520
			SOT143	BFG540
			SOT89	BFQ540

* = check status at 3.1 new products, as this type has not been released yet for mass production.

^ = this new series of LNA MMICs is designed specifically for high linearity (IP3O of 29 dBm), low noise application like those in an active splitter or NIM tuner. Housed in a 6-pin SOT363 plastic SMD package, these MMICs are equipped with internal bias and matched to 75 ohms internally. For the VGAs, current consumption is < 5mA during the bypass mode. Only 2 external components are needed, thus saving precious circuit board space!

Function	Product	Package	Type	
AGC control amplifier	MOSFET	2 – in – 1 with band switch @ 5V	SOT363	BF1215
		2 – in – 1 @ 5V	SOT363	BF1216
		5V	SOT343	BF1217

Note: given that there is now an LNA before the MOSFET, the gain of these MOSFETs is made slightly lower and the cross-modulation higher. That way, the MOSFET would not be constantly under AGC even under nominal RF input level.



Product highlight:

BF11x8 silicon RF switch, MOSFET

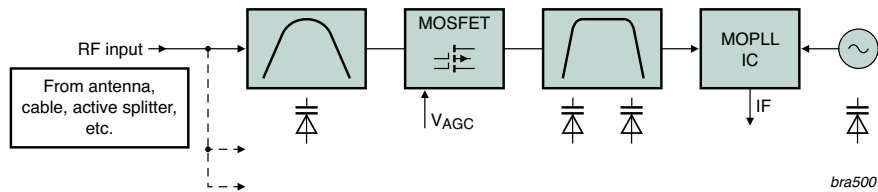
This switch is a combination of a depletion type field-effect transistor and a band switching diode in an SOT143 or SOT343 package. The low insertion loss and high isolation capabilities of this device provide excellent RF switching functions. The gate of the MOSFET can be isolated from ground with the diode, resulting in low losses. Integrated diodes between gate and source and between gate and drain protect against excessive input voltage surges.

Features

- ▶ Specially designed for low loss RF switching up to 1 GHz
- ▶ Easy to design-in
- ▶ Power ON: low losses
- ▶ Power OFF: high isolation
- ▶ ON or OFF, ZERO power consumption

1.4.2 Basic TV tuner

Application diagram



Recommended products

Function	Product	Package	Type	
Input filter	Varicap diode	VHF low	SOD323	BB152
			SOD523	BB182
			SOD882T	BB182LX
		VHF high	SOD323	BB153
			SOD523	BB178
			SOD523	BB187
		UHF	SOD882T	BB178LX
			SOD882T	BB187LX
			SOD323	BB149A
			SOD882T	BB179LX
			SOD523	BB179
			SOD523	BB189

Function	Product	Package	Type	
Bandpass filter	Varicap diode	VHF low	SOD323	BB152
			SOD882T	BB182LX
			SOD523	BB182
		VHF high	SOD323	BB153
			SOD882T	BB178LX
			SOD523	BB178
		UHF	SOD882T	BB187LX
			SOD523	BB187
			SOD323	BB149A
			SOD882T	BB179LX
			SOD523	BB179
			SOD523	BB189

Function	Product	Package	Type	
RF pre-amplifier	MOSFET	5 V	SOT143	BF1201
			SOT143	BF1202
			SOT143	BF1105
			SOT143	BF1211
			SOT143	BF1212
		2-in-1 @ 5 V	SOT363	BF1102R
			SOT363	BF1203
			SOT363	BF1204
			SOT363	BF1205
			SOT363	BF1205C
			SOT363	BF1206
			SOT363	BF1207
			SOT666	BF1208
			SOT666	BF1208D
			SOT363	BF1210
			SOT363	BF1214
			SOT363	BF1218
			2-in-1 @ 3 V	SOT666

Function	Product	Package	Type	
Oscillator	Varicap diode	VHF low	SOD323	BB152
			SOD882T	BB182LX
			SOD523	BB182
		VHF high	SOD323	BB153
			SOD882T	BB178LX
			SOD523	BB178
		UHF	SOD882T	BB187LX
			SOD523	BB187
			SOD323	BB149A
			SOD882T	BB179LX
			SOD523	BB179
			SOD523	BB189

Function	Product	Package	Type	
RF pre-amplifier	MOSFET	2-in-1 with band switch @ 5V	SOT363	BF1215
		2-in-1 @ 5V	SOT363	BF1216
		5V	SOT343	BF1217

Product highlight: BF1206F dual gate mosfet double amplifier specified for low power applications

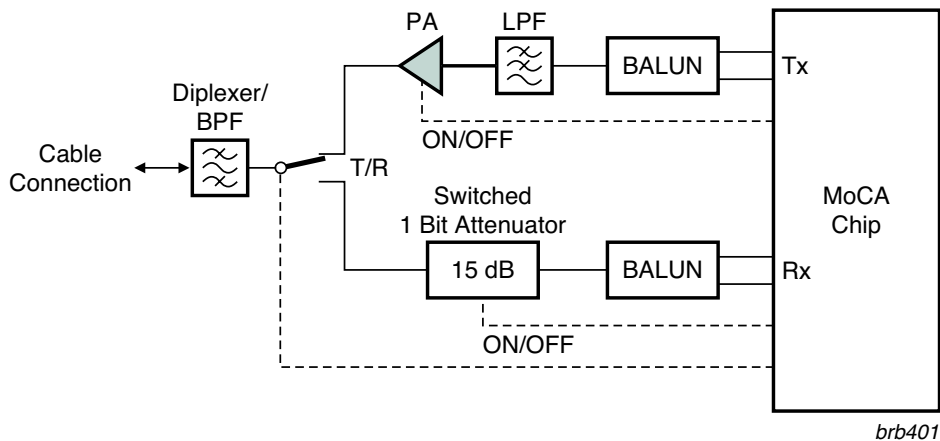
The device consists of two dual gate mosfet amplifiers in a small SOT666 flatlead package. The BF1206F is a true low power device specified for low voltage and low currents, intended for use in mobile applications where power consumption is critical. Performance is suitable for application at supply voltages of 3 Volts and drain currents of 4 mA.

Features

- ▶ Low power specified
- ▶ Two amplifiers in one small SOT666 package
- ▶ Shared gate 2 and Source leads
- ▶ Each amplifier is biased by an external bias resistor
- ▶ Excellent noise and crossmodulation performance

1.4.3 MoCA (Multimedia over Coax Alliance)

Application diagram



Recommended products

Function	Product	Package	Type	
SPDT switch	RF diode	PIN diode	SOD523	BAP64-02
			SOD323	BAP64-03
			SOT23	BAP64-04
			SOT323	BAP64-04W
			SOT23	BAP64-05
			SOT323	BAP64-05W
			SOT23	BAP64-06
			SOT323	BAP64-06W
		SOD822T	BAP64LX	

Function	Product	Package	Type	
PA (power amplifier)	MMIC	SiGe:C MMIC	SOT908	BGA7124
			SOT89	BGA7024
			SOT908	BGA7127
			SOT89	BGA7027



Product highlight:

medium power amplifier BGA7124 MMIC

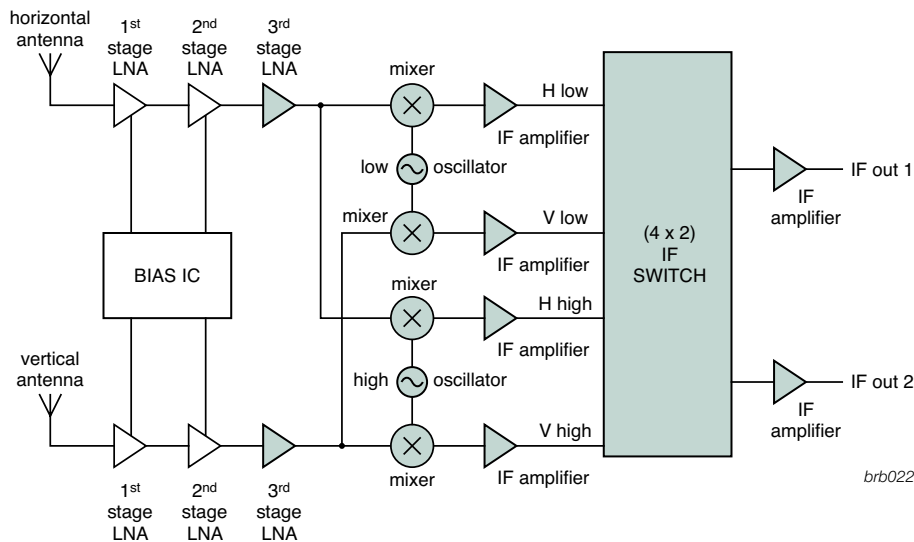
The BGA7124 MMIC is a one-stage driver amplifier, offered in a low-cost ultra small SOT908 leadless package. It delivers 25 dBm output power at 1 dB gain compression and a superior performance for various narrowband-tuned application circuits for frequencies up to 2700 MHz.

Features

- ▶ 400 MHz to 2700 MHz frequency operating range
- ▶ 16 dB small signal gain at 2 GHz
- ▶ 27 dBm output power at 1 dB gain compression
- ▶ Integrated active biasing
- ▶ 3.3 V / 5 V single supply operation
- ▶ Simple quiescent current adjustment
- ▶ 1 μ A shutdown mode

1.4.4 Satellite outdoor unit, low noise block (LNB) for multiple users

Application diagram



brb022

Recommended products

Function	Product	Package	Type
Oscillator	RF bipolar transistor	Wideband transistor	SOT343 BFG424W
			SOT343F BFG424F
	RF transistor	SiGe:C transistor	SOT343F BFU725F/N1

Function	Product	Package	Type
1 st stage IF amplifier	MMIC	General purpose amplifier	SOT363 BGA2711
			SOT363 BGA2712
			SOT363 BGA2748
			SOT363 BGA2714
			SOT363 BGA2717
		IF gain block	SOT363 BGA2800
			SOT363 BGA2801
			SOT363 BGA2815
			SOT363 BGA2816
			SOT363 BGA2850
	RF bipolar transistor	Wideband transistor	SOT343 BFG424W
			SOT343F BFG424F
			SOT363 BGA2865
			SOT363 BGA2866

Function	Product	Package	Type
IF switch	RF diode	PIN diode	various BAP64 [^]
			various BAP51 [^]
			various BAP1321 [^]
			various BAP50 [^]
			various BAP63 [^]

[^] = also available in ultra small leadless package SOD882T.

Function	Product	Package	Type
Output stage IF amplifier	MMIC	General purpose amplifier	SOT363 BGA2709
			SOT363 BGA2776
			SOT363 BGM1014
			SOT363 BGM1012
			SOT363 BGA2716
		IF gain block#	SOT363 BGA2800
			SOT363 BGA2801
			SOT363 BGA2815
			SOT363 BGA2816
	RF bipolar transistor	Wideband transistor	SOT363 BGA2850
SOT363 BGA2865			
		SOT343 BFG325	

= When using one of our IF gain blocks (BGA28xx) as output stage IF amplifier, you do not need an output inductor anymore.

Function	Product	Package	Type
3 rd stage LNA	RF transistor	SiGe:C transistor	SOT343F BFU725F/N1

Function	Product	Package	Type
Mixer	RF transistor	SiGe:C transistor	SOT343F BFU725F/N1

Product highlight:

BGA28xx-family, IF gain blocks

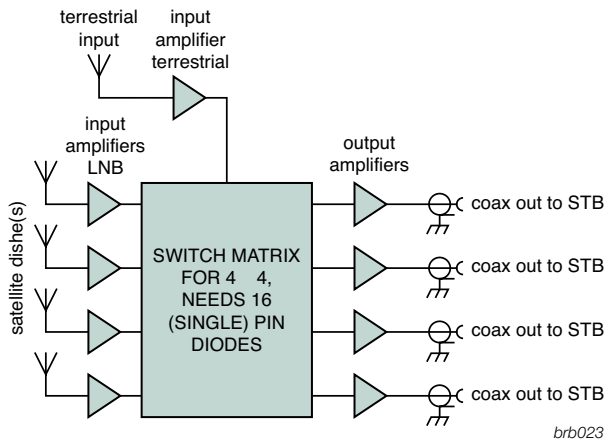
The BGA28xx IF gain blocks are Silicon Monolithic Microwave Integrated Circuit (MMIC) wideband amplifiers with internal matching circuit in a 6-pin SOT363 plastic SMD package.

Features

- ▶ Internally matched to 50 Ω
- ▶ Reverse isolation > 30 dB up to 2 GHz
- ▶ Good linearity with low second order and third order products
- ▶ Unconditionally stable (K > 1)

1.4.5 Satellite Multi Switch Box - 4 x 4 (up to 16 x 16) / DiSEqC / SMATV

Application diagram



Recommended products

Function	Product	Package	Type	
Input amplifier terrestrial	MMIC	General purpose medium power amplifier	SOT89	BGA6289
				BGA6489
				BGA6589
				BGA7024
			SOT908	BGA7124

Function	Product	Package	Type		
Input amplifier LNB	MMIC	General purpose amplifier	SOT363	BGA2771	
			SOT363	BGA2776	
			SOT363	BGA2709	
			SOT363	BGM1012	
			SOT343	BFG325	
	RF bipolar transistor	Wideband transistor	SOT343	BFG425W	
			SOT143	BFG520	
			SOT143	BFG540	
			SiGe:C transistor	SOT343F	BFU725F/N1

Function	Product	Package	Type	
Switch matrix	RF diode	PIN diode	Various	BAP50^
				BAP51^
				BAP63^
				BAP64^
				BAP70^
				BAP1321^
	RF transistor	SiGe:C transistor	SOT343F	BFU725F/N1

^ = also available in ultra small leadless package SOD882T.

Function	Product	Package	Type		
Output amplifier	MMIC	General purpose medium power amplifier	SOT89	BGA6289	
				BGA6489	
				BGA6589	
				BGA7024	
			SOT908	BGA7124	
	RF bipolar transistor	General purpose amplifier	SOT363	BGM1011	
			SOT363	BGM1013	
			SOT363	BGM1014	
			Wideband transistor	SOT223	BFG135
				SOT223	BFG 591
SiGe:C transistor	Wideband transistor	SOT223	BFG198		
		SOT143	BFG540		
		SOT343F	BFU725F/N1		

Product highlight:

PIN diodes for switching matrix

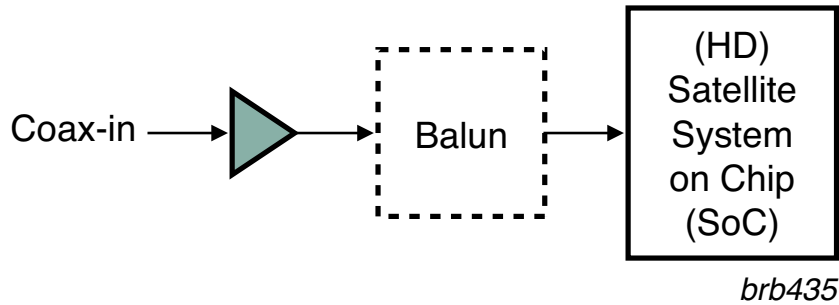
Together with outstanding RF performance, this component simplifies design-in because of its extremely low forward resistance, diode capacitance and series inductance. Significant board space saving by supplying a range of high compact package options – including SOD523, SOD323 and leadless SOD882T.

Features

- ▶ High isolation, low distortion, low insertion loss
- ▶ Low forward resistance (R_d) and diode capacitance (C_d)
- ▶ Ultra-small package options

1.4.6 Digital Satellite Set Top Box (high definition)

Application diagram



Recommended products

Function	Product	Package	Type	
LNA	MMIC	Medium Power Amplifier	SOT89	BGA6289
				BGA6489
				BGA6589



Product highlight:

BGA6489 MMIC medium power amplifier

Silicon Monolithic Microwave Integrated Circuit (MMIC) wideband medium power amplifier with internal matching circuit in a 4-pin SOT89 plastic low thermal resistance SMD package. The BGA6489 provides high-quality performance in satellite applications from 250 MHz - 2.15 GHz.

Features

- ▶ 20 dBm output power
- ▶ Single supply voltage needed

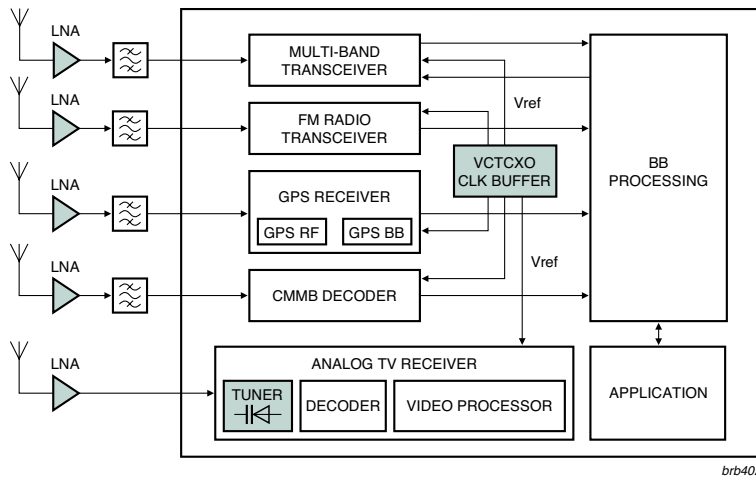
1.5 Consumer Mobile

Note: looking for MoCA and Satellite Multi Switch Boxes? See chapter 1.4 TV, STB and Satellite.

1.5.1 Mobile Platforms (GPS / TV on mobile / FM radio / Reference clock / CMMB^ / LTE)

^ = Chinese Multimedia Mobile Broadcasting (CMMB)

Application diagram



Recommended products

Function	Product	Package	Type	
LTE LNA	MMIC	SiGe:C MMIC	SOT891	BGU7003

Function	Product	Package	Type	
FM radio LNA	Transistor	Wideband transistor	SOT323	BFR93AW BFS505
		SiGe:C MMIC	SOT891	BGU7003
		J-FET	SOT23	BF510

Function	Product	Frequency	Package	Type
GPS LNA	MMIC	SiGe:C MMIC	SOT891	BGU7003
		SiGe:C MMIC	SOT886	BGU7005
		SiGe:C MMIC	SOT886	BGU7007*

Function	Product	Package	Type	
CMMB LNA	Transistor	Wideband transistor	SOT343	BFG425W
		SiGe:C transistor	SOT343F	BFU725F/N1
	MMIC	SiGe:C MMIC	SOT891	BGU7003

* = check status at 3.1 new products, as this type has not been released yet for mass production.
 ^ = also in SOD523

Function	Product	Package	Type	
TV on Mobile LNA	Transistor	Wideband transistor	SOT343	BFG425W
		SiGe:C transistor	SOT343F	BFU725F/N1
	MMIC	SiGe:C MMIC	SOT891	BGU7003

Function	Product	Frequency	Package	Type
TV on Mobile tuning diode	RF diode	Varicap diode^	SOT882T	BB202LX
				BB178LX
				BB179LX
				BB181LX
				BB182LX
				BB184LX
				BB187LX

Function	Product	Frequency	Package	Type
Reference clock	CLK buffer	Wideband transistor	SOT323	BFR93AW
	VCTCXO	Wideband transistor	SOT363A	BFM520

Product highlight: BGU7003 SiGe:C MMIC

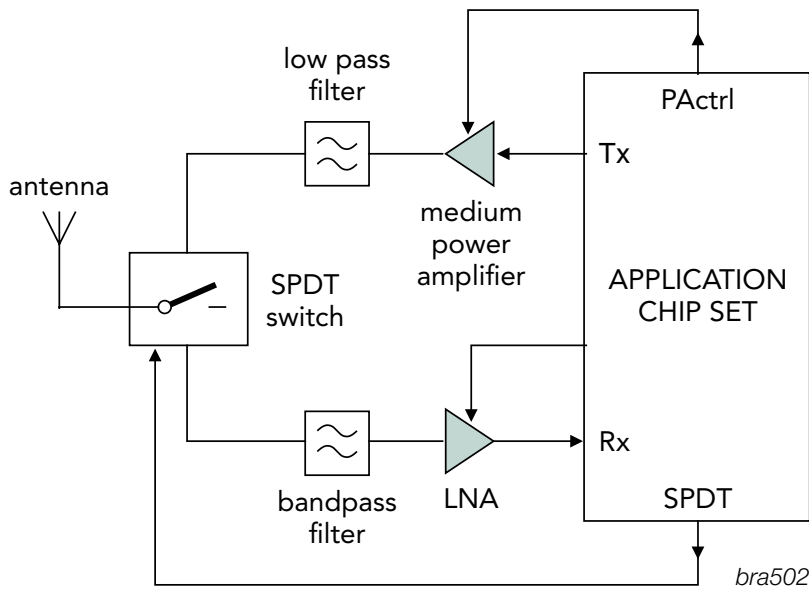
Manufactured in NXP's latest SiGe:C process, this high-frequency RF MMIC delivers high-quality reception with extended battery life. It is a cost-effective, silicon based alternative to GaAs devices, and offers higher integration and easier design-in than discrete bipolar transistors.

Features

- ▶ Low-noise, high-gain microwave MMIC
- ▶ Maximum stable gain = 19 dB at 1.575 GHz
- ▶ 110-GHz fT-Silicon Germanium technology
- ▶ Optimized performance at low (5-mA) supply current
- ▶ Extremely thin, leadless 6-pin SOT891 package
- ▶ Integrated biasing and shutdown for easy integration

1.5.2 A 2.4 & 5 GHz front-end for WLAN (802.11n Dual Concurrent)

Application diagram



Recommended products

Function	Product	Package	Type	
Medium power amplifier	MMIC	Medium power amplifier	SOT89	BGA7024
				BGA7027
			SOT908	BGA7124 BGA7127

Function	Product	Package	Type	
LNA	RF Transistor	SiGe:C transistor	SOT343F	BFU725F/N1
	MMIC	SiGe:C MMIC	SOT891	BGU7003



Product highlight:

medium power amplifier BGA7127 MMIC

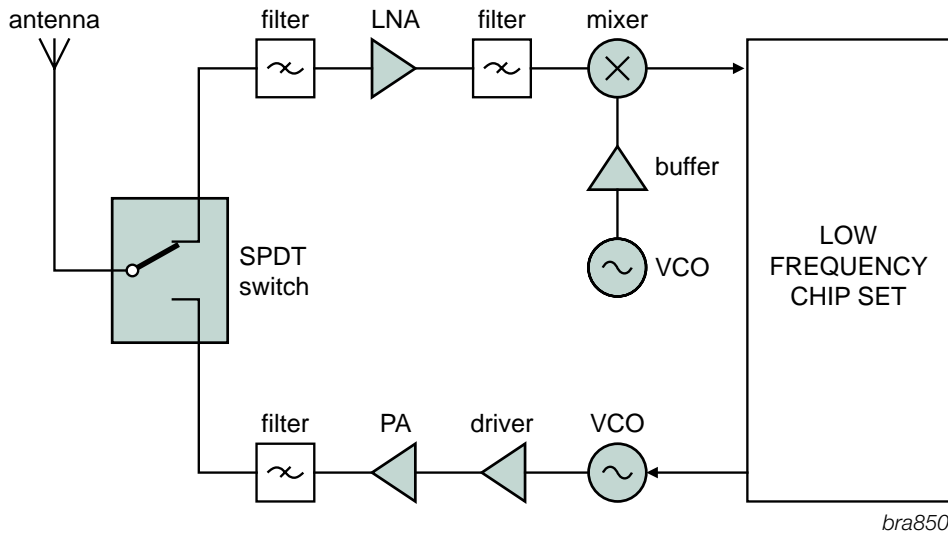
The BGA7127 MMIC is a one-stage driver amplifier, offered in a low-cost ultra small SOT908 leadless package. It delivers 28 dBm output power at 1 dB gain compression and a superior performance for various narrowband-tuned application circuits for frequencies up to 2700 MHz.

Features

- ▶ 400 MHz to 2700 MHz frequency operating range
- ▶ 13 dB small signal gain at 2 GHz
- ▶ 28 dBm output power at 1 dB gain compression
- ▶ Integrated active biasing
- ▶ 3.3 V / 5 V single supply operation
- ▶ Simple quiescent current adjustment
- ▶ 1 μ A shutdown mode

1.5.3 2-way radio / family radio system

Application diagram



Recommended products

Function	Product	Package	Type
SPDT Switch	RF diode	Bandswitch diode	SOD523 BA277
			SOD323 BA591
		PIN diode	various BAP51 [^]
			various BAP1321 [^]

Function	Product	Package	Type
Mixer	RF bipolar transistor	Wideband transistor	SOT343 BFG410W
			SOT343 BFG425W
			SOT343 BFG480W
	MMIC	Linear mixer	SOT363 BGA2022

Function	Product	Package	Type
LNA	RF bipolar transistor	Wideband transistor	SOT23 PBR951
			SOT323 PRF957
			SOT323 PRF947
	SiGe:C transistor		SOT343F BFU725F/N1
		MMIC	Low noise wideband ampl.
			SOT343R BGA2003

Function	Product	Package	Type
Buffer	RF bipolar transistor	Wideband transistor	SOT23 PBR951
			SOT323 PRF957
			SOT323 PRF947
			SOT416 PRF949

Function	Product	Package	Type
Driver	RF bipolar transistor	Wideband transistor	SOT323 PRF957
			SOT23 PBR951
	MMIC	Amplifier	SOT363 BGA2031/1
		Gen. purpose wideband ampl.	SOT363 BGA2771
			SOT363 BGA2776

Function	Product	Package	Type
Power amplifier	MMIC	Gen. purpose wideband ampl.	SOT89 BGA6289
			BGA6489
			BGA6589
			BGA7024
			BGA7027

[^] = also available in ultra small leadless package SOD882T

Function	Product	Package	Type
VCO	Varicap diodes	VCO varicap diodes	SOD523 BB198
			SOD323 BB156

Product highlight:

PRF957 silicon NPN UHF wideband transistor

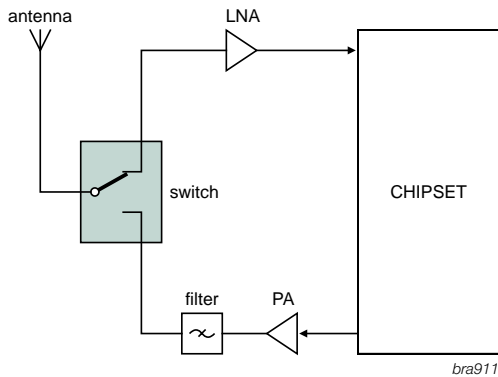
Silicon NPN UHF wideband transistor in a surface mount 3-pin SOT323 package is primarily intended for wideband applications in the RF front end. The transistor is widely built as LNA, power amplifier, driver and buffer in the UHF band application.

Features

- ▶ Small 3-pin plastic surface mounted package
- ▶ Low noise (1.3 dB at 1 GHz) and high power gain (15 dB at 1 GHz)
- ▶ Gold metallization ensures excellent reliability

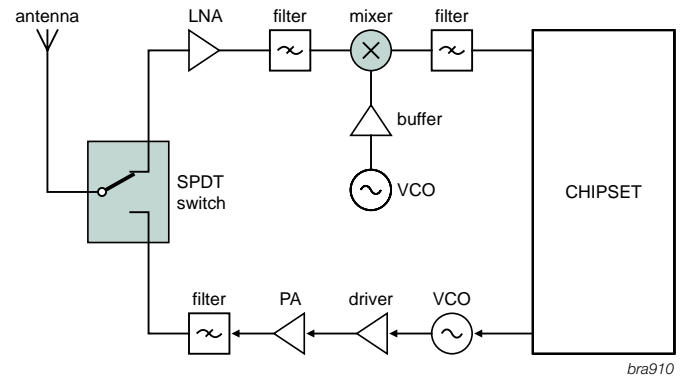
1.5.4 DECT front-end

Application diagram



DECT in-house base station

Application diagram



Recommended products

Function	Product	Package	Type	
RF Switch	RF diode	PIN Diode	various	BAP51 [^]
			various	BAP55 [^]
			various	BAP142 [^]
			various	BAP63 [^]
			various	BAP64 [^]
			various	BAP1321 [^]

[^] = also available in ultra small leadless package SOD882T.



Recommended products

Function	Product	Package	Type	
RF Switch	RF diode	PIN Diode	various	BAP51 [^]
			various	BAP55 [^]
			various	BAP142 [^]
			various	BAP63 [^]
			various	BAP64 [^]
			various	BAP1321 [^]

Function	Product	Package	Type	
Mixer	RF bipolar transistor	Wideband transistor	SOT343	BFG410W
			SOT343	BFG425W
		SiGe:C transistor	SOT343	BFG480W
	MMIC	Linear mixer	SOT363	BFU725F/N1#

= also for 5.8 GHz

Product highlight:

BAP64xx PIN diode for RF switch

Operating up to 3 GHz with high-voltage handling capabilities, NXP's PIN diodes are ideal for a wide range of wireless communication application. Together with outstanding RF performance, this component simplify design-in because of its extremely low forward resistance, diode capacitance and series inductance.

Significant board space saving by supplying a range of high compact package options – including SOD523, SOD323 and leadless SOD882T.

Features

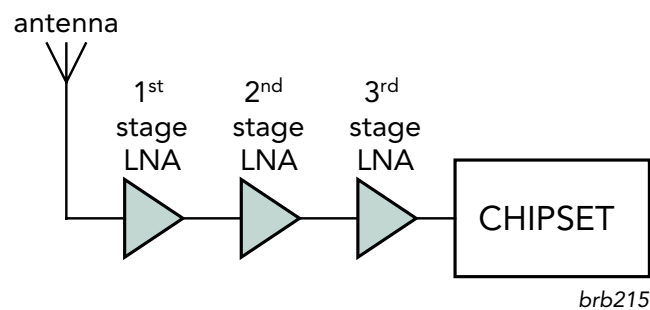
- ▶ Operate up to 3 GHz
- ▶ High isolation, low distortion, low insertion loss
- ▶ Low forward resistance (R_d) and diode capacitance (C_d)
- ▶ Ultra-small package options

1.6 Automotive & Industrial

Note: looking for GPS? See chapter 1.5.1 Handset.

1.6.1 Active antenna

Application diagram



Recommended products

Function	Product		Package	Type
1 st stage LNA	MMIC	Low noise wideband amplifier	SOT343R	BGA2001
			SOT343R	BGA2003

Function	Product		Package	Type
2 nd stage LNA	MMIC	General purpose wideband amplifier	SOT363	BGM1013
			SOT363	BGM1011
			SOT363	BGA2715
			SOT363	BGA2748

Function	Product		Package	Type
3 rd stage LNA	RF transistor	SiGe:C transistor	SOT343F	BFU725F/N1
	MMIC	SiGe:C MMIC	SOT891	BGU7003



Product highlight: BGU7003 SiGe:C MMIC

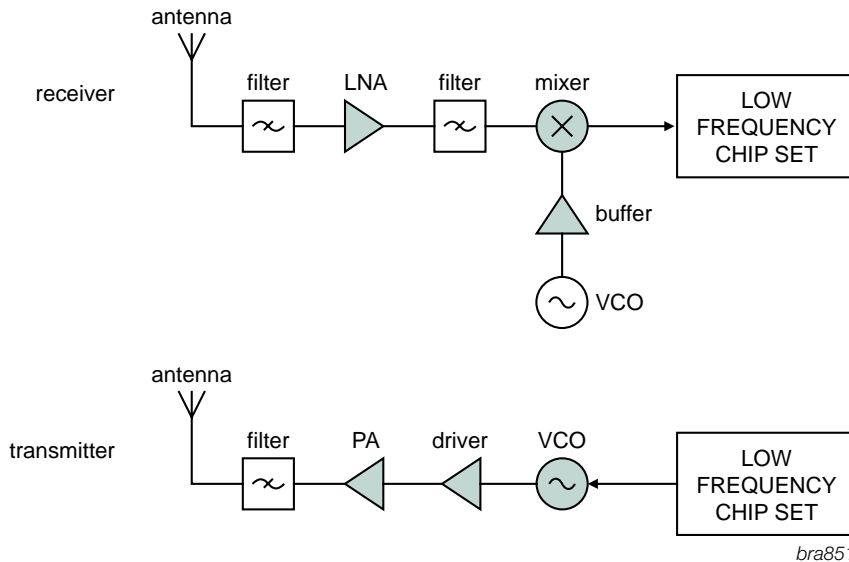
Manufactured in NXP's latest SiGe:C process, this high-frequency RF MMIC delivers high-quality reception with extended battery life. It is a cost-effective, silicon based alternative to GaAs devices, and offers higher integration and easier design-in than discrete bipolar transistors.

Features

- ▶ Low-noise, high-gain microwave MMIC
- ▶ Maximum stable gain = 19 dB at 1.575 GHz
- ▶ 110-GHz f_T -Silicon Germanium technology
- ▶ Optimized performance at low (5-mA) supply current
- ▶ Extremely thin, leadless 6-pin SOT891 package
- ▶ Integrated biasing and shutdown for easy integration

1.6.2 Remote keyless entry, RF generic front-end with dedicated antenna for reception and transmission

Application diagram



Recommended products

Function	Product	Package	Type	
LNA	RF bipolar transistor	Wideband transistor	SOT23 PBR951	
			SOT323 PRF957	
			SOT323 PRF947	
	MMIC	Low noise wideband ampl.		BGA2001
			SOT343R	BGA2002 [^] BGA2003
	SiGe:C MMIC	SOT891	BGU7003	

Function	Product	Package	Type	
Driver	RF bipolar transistor	Wideband transistor	SOT323 PRF957	
			SOT23 PBR951	
		Amplifier	SOT363 BGA2031/1	
	MMIC	Gen. purpose wideband ampl.		SOT363 BGA2771
				SOT363 BGA2776

Function	Product	Package	Type
VCO	Varicap diodes	VCO varicap diodes	SOD323 BB148
			SOD323 BB149A
			SOD523 BB198
			SOD323 BB156

[^] = automotive qualified

Function	Product	Package	Type
Mixer	RF bipolar transistor	Wideband transistor	SOT343 BFG410W
			SOT343 BFG425W
			SOT343 BFG480W
	MMIC	Linear mixer	SOT363 BGA2022

Function	Product	Package	Type
Buffer	RF bipolar transistor	Wideband transistor	SOT23 PBR951
			SOT323 PRF957
			SOT323 PRF947
			SOT416 PRF949

Function	Product	Package	Type	
Power amplifier	RF bipolar transistor	Wideband transistor	SOT323 PRF957	
			SOT23 PBR951	
		Amplifier	SOT363 BGA2031/1	
	MMIC	Gen. purpose wideband ampl.		SOT363 BGA2771
				SOT363 BGA2776
				SOT908 BGA7124

Product highlight: NXP varicap diodes for VCO

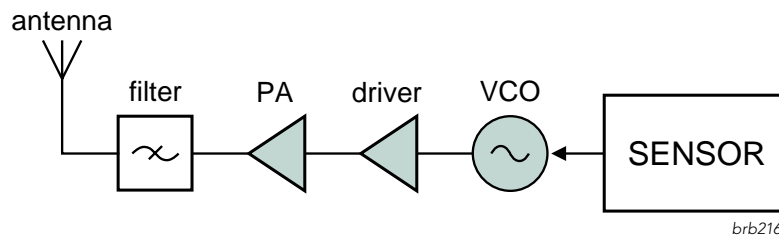
Varicap diodes are principally used as voltage varicap capacitors with their diode function a secondary option. These devices are ideal for voltage controlled oscillators (VCO) in ISM band applications.

Features

- ▶ Excellent linearity
- ▶ Excellent matching
- ▶ Very low series resistance
- ▶ High capacitance ratio

1.6.3 Tire pressure monitoring system

Application diagram



Recommended products

Function	Product	Package	Type	
PA	RF bipolar transistor	Wideband transistor	SOT23	BFR92A
			SOT323	BFR92AW
			SOT23	BFR94A^
			SOT323	BFR93AW
			SOT323	BFR94AW^

Function	Product	Package	Type		
Driver	RF bipolar transistor	Wideband transistor	SOT323	PRF957	
			SOT23	PBR951	
	MMIC	Amplifier	SOT363	BGA2031/1	
			SOT363	Gen. purpose wideband ampl.	BGA2771
				BGA2776	

Function	Product	Package	Type	
VCO	Varicap diodes	VCO varicap diodes	SOD523	BB198
			SOD323	BB156

^ = automotive qualified



Product highlight: BFR94AW silicon NPN transistor

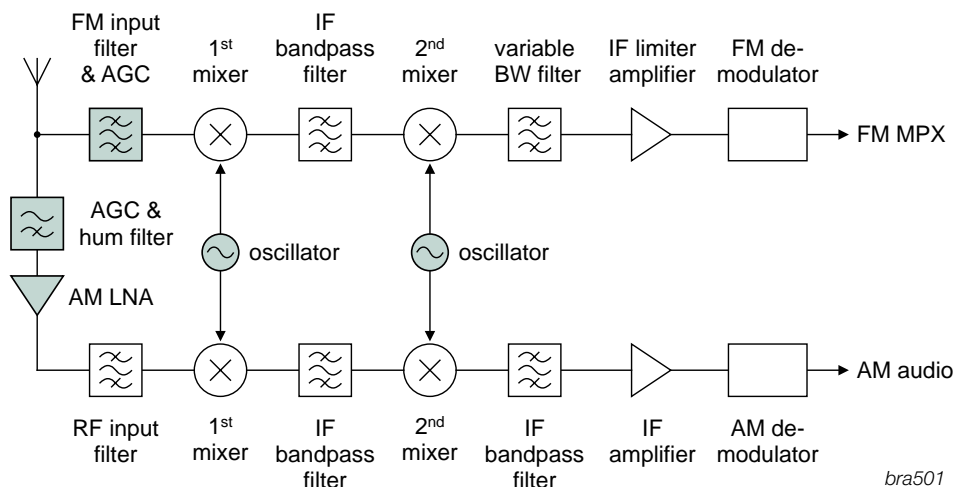
It is designed for use in RF amplifiers, mixers and oscillators with signal frequencies up to 1 GHz. This silicon NPN transistor encapsulated in a plastic SOT323 (S-mini) package. The BFR92AW uses the same crystal as the SOT23 version, BFR92A.

Features

- ▶ High power gain
- ▶ Gold metallization ensures excellent reliability
- ▶ SOT323 (S-mini) package
- ▶ AUTOMOTIVE QUALIFIED

1.6.4 Car radio receiver (CREST ICs: TEF6860HL, TEF6862HL)

Application diagram



Recommended products

Function	Product	Package	Type	
AM LNA	RF transistor	JFET	SOT23	BF862
FM input filter & AGC	RF diode	Varicap diode	SOT23	BB201 [^]
			SOT23	BB207
		PIN diode	SOD523	BAP70-02
			SOD323	BAP70-03

[^] = OIRT

Note 1:

All these recommended discrete products are applicable for NICEPACS, CCC and DDICE: NICE:TEA6840H,TEA6845H,TEA6846H, NICEPACS:TEA6848H,TEA6849H; CCC:TEF6901H,TEF6903H; DDICE:TEA6721HL. All these recommended discrete products are applicable excluding AM LNA in: DICE2:TEF6730HWCE.

Function	Product	Package	Type	
AGC & hum filter	RF diode	PIN diode	SOT363	BAP70AM

Function	Product	Package	Type	
Oscillator	RF diode	Varicap diode	SOD323	BB156
			SOD523	BB208-02

Note 2:

Phone and portable radio (IC:TEA5767/68) use varicap BB202 as FM oscillator.

Product highlight:

BF862 Junction Field Effect Transistor

Our Tuning component portfolio contains excellent products for car radio reception applications, playing a vital role for in-vehicle media platforms. The NXP devices for this application ensure excellent reception quality and ease of design in. Performance is demonstrated in reference designs.

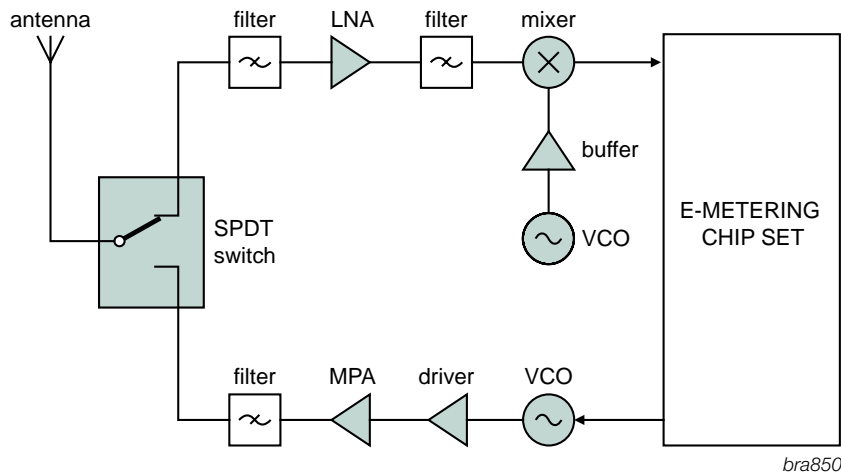
High performance Junction Fet BF862, specially designed for car radio AM amplifiers.

Features

- ▶ High transition frequency and optimized input capacitance for excellent sensitivity
- ▶ High transfer admittance resulting in high gain
- ▶ Encapsulated in the versatile and easy to use SOT23 package

1.6.5 E-metering, RF generic front-end with a single antenna / ZigBee

Application diagram



Recommended products

Function	Product	Package	Type
SPDT Switch	RF diode	Bandswitch diode	SOD523 BA277
			SOD323 BA591
		PIN diode	various BAP51 [^]
			various BAP1321 [^]

Function	Product	Package	Type
LNA	RF transistor	SiGe:C transistor	SOT343F BFU725F /N1
	MMIC	Low noise	SOT343R BGA2001
		wideband ampl.	SOT343R BGA2003
		SiGe:C MMIC	SOT891 BGU7003

Function	Product	Package	Type
Driver	RF bipolar transistor	Wideband transistor	SOT343 BFG425W
	MMIC	Amplifier	SOT363 BGA2031/1
		Gen. purpose	SOT363 BGA2771
		wideband ampl.	SOT363 BGA2776

[^] = also available in ultra small leadless package SOD882T.

Function	Product	Package	Type
Mixer	RF bipolar transistor	Wideband transistor	SOT343 BFG410W
			SOT343 BFG425W
			SOT343 BFG480W
	MMIC	Linear mixer	SOT363 BGA2022

Function	Product	Package	Type
Buffer	RF bipolar transistor	Wideband transistor	SOT23 PBR951
			SOT323 PRF957
			SOT323 PRF947
			SOT416 PRF949

Function	Product	Package	Type	
Medium power amplifier	RF bipolar transistor	Wideband transistor	SOT343 BFG21W	
	MMIC	Gen. purpose wideband ampl.	SOT89 BGA6289	
				BGA6489
				BGA6589
				BGA7124
		SOT908 BGA7127		

Function	Product	Package	Type
VCO	Varicap diodes	VCO varicap diodes	SOD523 BB198
			SOD323 BB156

Product highlight:

BGA7127 MMIC medium power amplifier

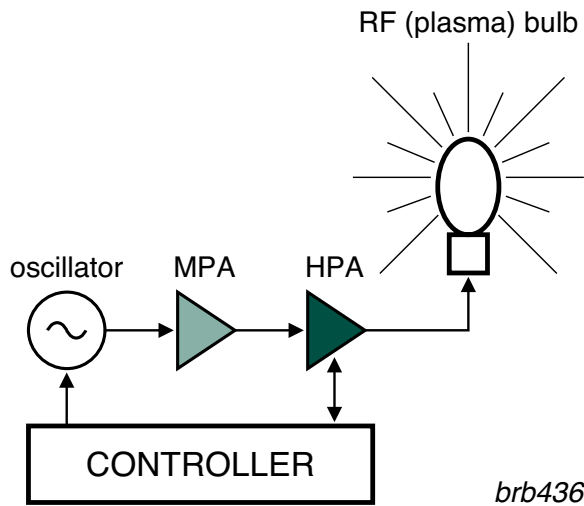
The BGA7127 MMIC is a one-stage driver amplifier, offered in a low-cost ultra small SOT908 leadless package. It delivers 27 dBm output power at 1 dB gain compression and a superior performance for various narrowband-tuned application circuits for frequencies up to 2700 MHz.

Features

- ▶ 400 MHz to 2700 MHz frequency operating range
- ▶ 16 dB small signal gain at 2 GHz
- ▶ 27 dBm output power at 1 dB gain compression
- ▶ Integrated active biasing
- ▶ 3.3 V / 5 V single supply operation
- ▶ Simple quiescent current adjustment
- ▶ 1 μ A shutdown mode

1.6.6 RF Plasma Lighting

Application diagram



Recommended products

Function	Type	f_{range} (MHz)	P_L W	G_p dB	Mode of operation
driver	BLF571	0 - 1000	20	27.5	1-TONE; 2-TONE; CW
final	BLF573S	0 - 1000	300	27.2	1-TONE; 2-TONE; CW
final	BLF574	0 - 1000	400	26.5	1-TONE; 2-TONE; CW
final	BLF578	0 - 1000	1200	24	1-TONE; PULSED RF
		0 - 1000	1000	24	1-TONE; CW
final	BLF645	0 - 1300	100	18	2-TONE
		0 - 1300	100	17	CW
final	BLF 278	108 - 225	250	16	class AB
final	BLF 177	28 - 108	150	19	class B

Function	Product	Package	Type	
MPA (medium power amplifier)	MMIC	MMIC	SOT89	BGA6289
				BGA6489
				BGA6589
		SiGe:C MMIC	SOT908	BGA7124
			SOT89	BGA7024
			SOT908	BGA7127
			SOT89	BGA7027
			SOT908	BGA7130*
	BGA7133*			

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Product highlight:

NXP's 50 V high voltage LDMOS process enables highest power at unprecedented ruggedness levels necessary for this kind of application.

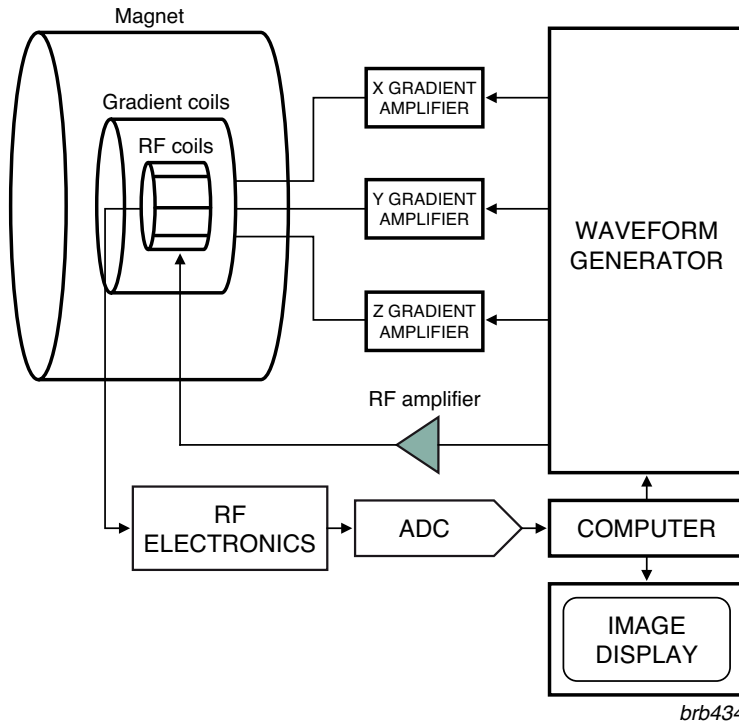
BLF578: 1000 W CW operation - highest power LDMOS

Features

- ▶ Highest power device
- ▶ Unprecedented ruggedness
- ▶ Low-thermal resistance design for very reliable operation
- ▶ Very consistent device performance
- ▶ Broadband device for flexible use

1.6.7 Medical Imaging

Application diagram



Recommended products

Function	Type	f_{range} (MHz)	P_L W	G_P dB
driver	BLF871(S)	0 - 1000	100	21
driver	BLF881	0 - 1000	120	21
driver	BLF571	0 - 1000	20	27.5
final	BLF573S	0 - 1000	300	27.2
final	BLF574	0 - 1000	400	26.5
final	BLF578	0 - 1000	1200	24
final	BLF645	0 - 1300	100	18

Product highlight:

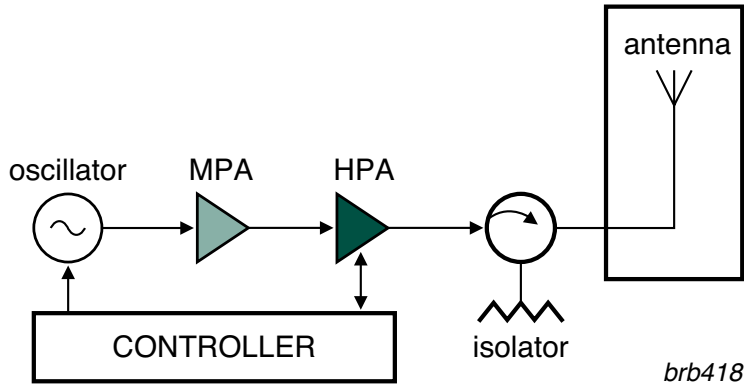
NXP's line of 50 V High voltage LDMOS devices enable highest power output and feature unequalled ruggedness for pulsed operation in MRI and NMR applications. The high power densities enable very compact amplifier design.

Features

- ▶ Best broadband efficiency
- ▶ Highest power (density) devices
- ▶ Unrivalled ruggedness
- ▶ Very consistent device performance

1.6.8 RF Microwave furnace application

Application diagram



Recommended products

Function	Type	frange MHz	$P_{L(AV)}$ W	η_o %	GP dB	Availability
Driver	BLF6G24-12	2000 - 2200	40	27.5	17	Q3 2010
Final	BLF6G24-180PN	2000 - 2200	50	27.5	17.5	Q3 2010
Final	BLF7G24L (S)-250P	2500 - 2700	20	25	16.5	Q3 2010

Function	Product	Package	Type
MPA (medium power amplifier)	MMIC	SOT89	BGA6289
			BGA6489
			BGA6589
	SiGe:C MMIC	SOT89	BGA7124
			BGA7024
			BGA7127
			BGA7027
			BGA7130*
	SOT908	BGA7133*	

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Product highlight:

NXP's 6th and 7th generation LDMOS technology together with advanced package concepts enable best in class performing power amplifiers. The unsurpassed ruggedness and low thermal resistance in connection with the high intrinsic efficiency make these transistors ideally suited for the furnace application.

Features

- ▶ Excellent ruggedness
- ▶ Very consistent device performance
- ▶ Low thermal resistance design for unrivalled reliability
- ▶ Very easy to design with

2. Technologies & focus products

2.1 Get the fastest TTFF[^] with GPS LNAs that use proven QUBiC4X SiGe:C

[^] TTFF = Time-To-First-Fix

NXP GPS LNAs BGU7003, BGU7005, BGU7006 and BGU7007

Manufactured in NXP's breakthrough QUBiC4X SiGe:C process technology and available in the industry's smallest package, this highly integrated GPS LNAs reduce cost while delivering better sensitivity, greater immunity against jamming signals, and higher linearity.



These LNAs designed for GPS receiver applications, are produced in NXP's industry-leading QUBiC4X process, a 0.25- μm SiGe:C technology. They have very low noise figures and superior linearity performance, so they help to improve overall sensitivity, which in turn leads to faster Time-To-First-Fix (TTFF) and better tracking.

Features

- Requires only 4 external components (including decoupling) to build complete GPS front-end.
- Requires only one external matching component
- Low current consumption (5 mA)
- Low noise figure (NF): 0.8 - 0.9 dB at 1.575 GHz
- Low current consumption in power-down mode (<1 μA)
- ESD protection on all pins
- Supply voltage: max 2.85 V, optimized for 1.8 V
- Proven, robust QUBiC4X SiGe:C process technology ($f_T = 110 \text{ GHz}$)

The proven QUBiC4X process improves overall RF performance and means the LNAs are less expensive and offer higher, more flexible performance than their GaAs counterparts.

They restore sensitivity, provide greater immunity against out-of-band cellular signals, reduce filtering requirements, and lower overall cost. They can be placed close to the GPS antenna, minimizing the noise figure. Additional gain amplifies the GPS signal and raises the on-board signal-to-jammer ratio.

The GPS receiver can be put close to the primary phone antenna, for the best GSM/UMTS performance, while the GPS antenna can be placed far away. This improves antenna-to-antenna isolation and results in higher performance.

		@ 1.575 GHz																		
Type	Package	supply voltage		supply current			insertion power gain			noise figure	input power at 1 dB gain compression					input third-order intercept point				
		V_{cc}		I_{cc}			$ s_{21} ^2$			NF	$P_{1(dB)}$					IP3i				
		V		mA			dB			dB	dBm					dBm				
		Min	Max	Min	Typ	Max	Min	Typ	Max	Typ	$V_{cc} = 1.8 \text{ V}$, Min	$V_{cc} = 1.8 \text{ V}$, Typ	$V_{cc} = 2.5 \text{ V}$, $I_{cc} = 5 \text{ mA}$	$V_{cc} = 2.85 \text{ V}$, Min	$V_{cc} = 2.85 \text{ V}$, Typ	$V_{cc} = 1.8 \text{ V}$, Min	$V_{cc} = 1.8 \text{ V}$, Typ	$V_{cc} = 2.5 \text{ V}$, $I_{cc} = 5 \text{ mA}$	$V_{cc} = 2.85 \text{ V}$, Min	$V_{cc} = 2.85 \text{ V}$, Typ
BGU7003	SOT891	2.2	2.85	3	-	15	16	18.3	20	0.8	-	-	-20	-	-	-	-	0	-	-
BGU7005	SOT886	1.5	2.85	-	4.5	-	-	16.5**	-	0.9	-14	-11	-	-11	-8	5	9	-	5	12
BGU7006*	WLCSP***	1.5	2.85	-	3.8	-	-	16.5**	-	0.9	-14	-11	-	-12	-9	1	4	-	5	9
BGU7007*	SOT886	1.5	2.85	-	4.8	-	-	18****	-	0.9	-14	-11	-	-11	-8	5	9	-	5	12

* = check status at 3.1 new products, as this type has not been released yet for mass production.

** = 16.5 dB without jammer / 17.5 dB with jammer

*** = 5 solder bumps, pitch 220 μm

**** = 18 dB without jammer / 19 dB with jammer

2.2 Always the right match with our latest 6th and 7th generation SiGe:C wideband transistors

Meet the trend towards higher frequencies. With NXP Semiconductors' latest SiGe:C microwave NPN transistors, you get high switching frequencies plus extremely high gain and low noise. All this in an easy-to-use SOT343F package. It's the ideal solution for applications up to 30 GHz.

Benefits

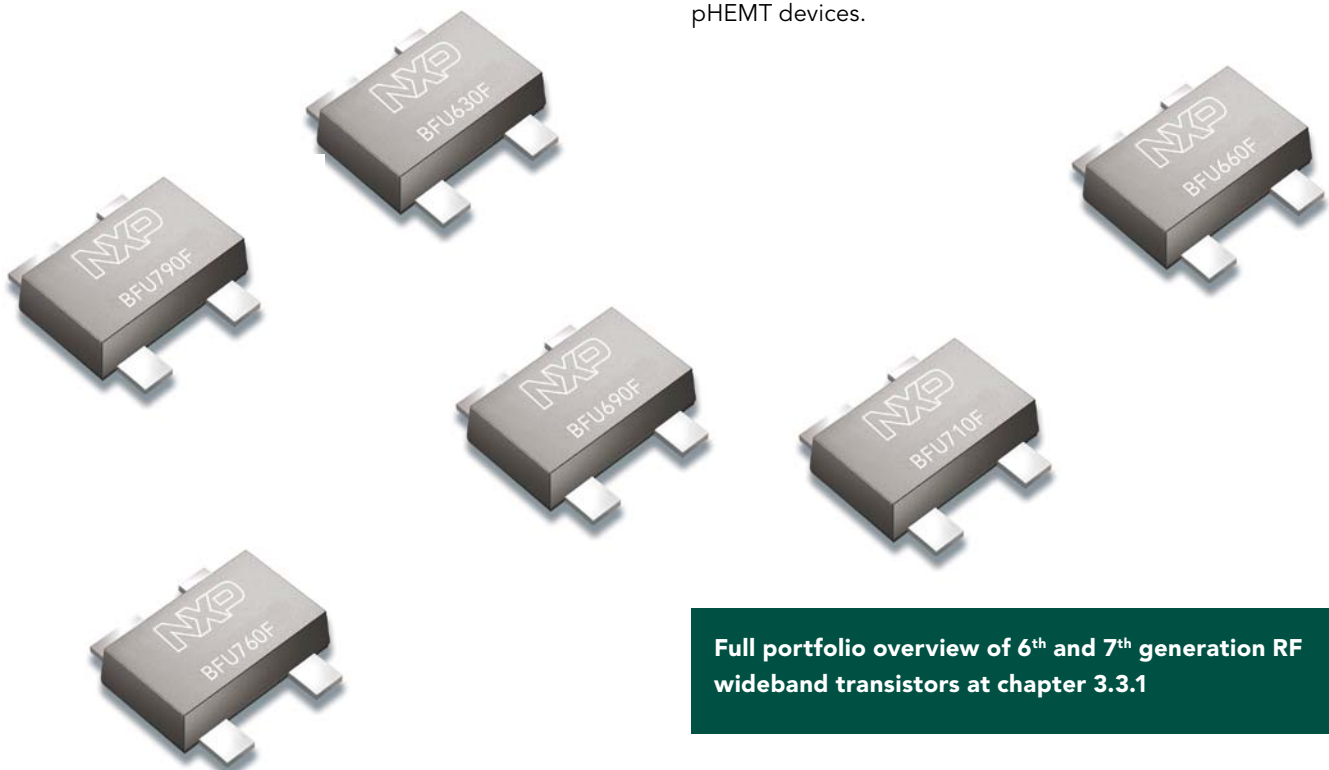
- ▶ Plastic surface-mount SOT343F package
- ▶ SiGe:C process delivers high switching frequency from a silicon-based device
- ▶ Cost-effective alternative to GaAs devices
- ▶ RoHS compliant

Applications

- ▶ Low noise amplifier (LNA) for microwave communications systems
- ▶ 2nd stage LNA and mixer in direct broadcast satellite (DBS) low-noise blocks (LNBS)
- ▶ GPS systems
- ▶ Satellite radio
- ▶ WLAN/WiMAX and CDMA applications, LTE
- ▶ DVB, CMMB

The NPN microwave transistors deliver an unbeatable blend of high switching frequency, high gain and very low noise. Thanks to the ultra-low noise figures, they are perfect for your sensitive RF receivers particularly those for high-performance cell phones. Alternatively, with the high cut-off frequencies, they are your ideal solution for microwave applications in the 10 GHz to 30 GHz range, such as satellite TV receivers and automotive collision avoidance radar.

These new 6th and 7th generation SiGe:C wideband transistors get their outstanding performance from our innovative silicon-germanium-carbon (SiGe:C) BiCMOS process. QUBiC4X was designed specifically to meet the needs of real-life, high-frequency applications and delivers an unrivalled fusion of high power gain and excellent dynamic range. It combines the performance of gallium-arsenide (GaAs) technologies with the reliability of a silicon-based process. In addition, with these transistors, you don't need a biasing IC or negative biasing voltage. So it's a much more cost-effective solution than GaAs pHEMT devices.



Full portfolio overview of 6th and 7th generation RF wideband transistors at chapter 3.3.1

2.3 NXP Medium-Power MMICs BGA7xxx for broadband applications

Broadband QUBiC4 MMICs for all 400-2700 MHz applications

Produced in NXP's proven QUBiC4 Si BiCMOS process, these MMICs bring improved thermal performance and added-value features to all 400-2700 MHz applications – at a lower cost than GaAs versions.



Features

- ▶ ESD protection at all pins
- ▶ Single-supply operation (3.3 or 5 V)
- ▶ Integrated active biasing
- ▶ Fast shutdown
- ▶ Quiescent current adjustment
- ▶ Two package options, smallest leadless package (3 x 3 mm) and leaded SOT-89

Applications

- ▶ Wireless infrastructure (base station, repeater)
- ▶ eMetering
- ▶ Broadband CPE (MoCA)
- ▶ Satellite Master Antenna TV (SMATV)
- ▶ Industrial applications
- ▶ W-LAN / ISM / RFID

Manufactured in NXP's breakthrough QUBiC4 process, these MMICs deliver a comparable level of RF performance as their GaAs equivalents, but at a lower cost and with additional features, like thermal performance and ESD robustness. The QUBiC4 process makes it possible to support even more features, including active biasing, quiescent adjustment, VGA interfaces, and a power-saving shutdown mode. To increase design flexibility, all the MMICs support single-supply (3.3/5 V) operation. And, to save space, they are available in the smallest package size (3 x 3 mm) and with leadless options.

MoCA

These MMICs are exceptionally well-suited for use a MoCA (Multimedia over Cable Alliance) PA in both the STB and in PC dongles. The MMICs offer the system designer the ability to

tailor gain or P1dB for specific platform requirements. Between 475-625 MHz and 1.15-1.5 GHz gain flatness is unrivalled. NXP Medium Power MMICs operate at low current consumption and offer a fast shut-down function to save as much power as possible. With ESD protection, active biasing and SOT89 package availability, design-in is simplified and requires a minimum of external components.

Base station

The high power level of these MMICs makes them an excellent choice for mobile-infrastructure applications. They offer the highest gain overall all base stations frequencies. The quiescent-current feature allows for high efficiency and linearity in Class-AB operation. The bias circuitry delivers a stable performance over temperature and supply variations. The integrated shutdown function is a power-saving feature and can be used for fast shutdown. The MMICs can be tuned for any band between VHF and 2.7 GHz. Unbeatable thermal performance (30 °C/W) improves overall quality and reliability.

eMetering

These MMICs are also very well suited to eMetering applications in the 900-2400 MHz ISM band. High integration and single-supply operation mean that the MMICs can be combined with just a few other components to create a full-featured solution. The MMICs can be operated on battery power (with an energy-saving shutdown mode) and are tunable between Class A and AB. They can also work on a power-line network, so they support gas metering with or without a power connection. The built-in reliability and quality of a silicon-based process provides longevity, as does the improved ESD performance.

Type	Package		f (MHz)	Supply			Shutdown control					RF performance				RF performance			
				V _{cc}	I _{cc}		V _{I(D)(SHDN)}		V _{I(D)(SHDN)}		I _{I(D)(SHDN)}	Typ @ f = 940 MHz				Typ @ f = 1960 MHz			
				Typ (V)	Typ (mA)	Max (mA)	Min (V)	Max (V)	Min (V)	Max (V)	Typ (μA)	Gp dB	P _{L(1dB)} dBm	OIP3 dBm	NF dB	Gp dB	P _{L(1dB)} dBm	OIP3 dBm	NF dB
BGA7124	SOT908	leadless	400 - 2700	5	130	200	0	0.7	2.5	Vbias	4	22	25	38	5	16	24	38	5
BGA7024	SOT89	leaded	400 - 2700	5	110	-	-	-	-	-	-	22	24	38	3	16	25	38	4
BGA7127*	SOT908	leadless	400 - 2700	5	180	325	0	0.7	2.5	Vbias	4	20	28	44	3	13	28	43	5
BGA7027*	SOT89	leaded	400 - 2700	5	170	-	-	-	-	-	-	19	28	41	3	12	28	43	4
BGA7130*	SOT908	leadless	400 - 2700	5	-	-	0	0.7	2.5	Vbias	4	18	30	45	4	12	30	45	4
BGA7133*	SOT908	leadless	400 - 2700	5	-	-	0	0.7	2.5	Vbias	4	18	33	46	4	12	33	47	4

The specifications of the BGA7130 and BGA7133 are target specifications until development is completed.

* = check status at 3.1 new products, as this type has not been released yet for mass production.

2.4 Low-noise LO generators for microwave & mmWave radios

NXP LO generators (integrated VCO/PLL) TFF11xxxHN

Manufactured in NXP's breakthrough QUBiC4X SiGe:C process technology, these highly integrated, alignment-free LO generators are low power consumption and low-spurious solutions that simplify design-in and lower the total cost of ownership.



Features

- ▶ TFF11xxxHN family: Lowest noise LO generators for a full family in range 7 to 15 GHz
- ▶ Maximum power consumption for all types, typical 330 mW
- ▶ Phase-noise compliant with IESS-308 (Intelsat)
- ▶ Proven QUBiC4X SiGe:C technology (120-GHz f_T process)
- ▶ External loop filter
- ▶ Differential input and output
- ▶ Lock-detect output
- ▶ Internally stabilized voltage reference for loop filter
- ▶ 24-pin HVQFN (SOT616-1) package

Applications: TFF11xxxHN family

- ▶ Industrial/Medical Test and Measurement Equipment
- ▶ Electronic Warfare (EW)
- ▶ Electronic Countermeasures (ECM)
- ▶ Point to Point
- ▶ Point to Multi-Point
- ▶ Satellite Communication

These low-noise local-oscillator (LO) generators, optimized for use in many different microwave applications between 7 and 15 GHz, deliver highly accurate performance in a small footprint. They require no alignment or frequency modification on the production line, so they simplify manufacturing. High integration saves board space and makes design-in easier, for lower overall cost and faster development, enabling quick time-to-market.

Since these ICs are manufactured in NXP's industry-leading QUBiC4X SiGe:C process, they offer better overall RF performance, are more robust than their GaAs equivalents, and consume much less power. The process technology also enables higher integration, for added features. NXP owns the industrial base for production (wafer fab, test, assembly), so volume supplies can be assured.

The TFF1003HN is the basis for the entire family of LO generators. It has VCO coverage of 12.8 to 13.05 GHz and accepts input signals from 50 to 816 MHz. The divider can be set for 16, 32, 64, 128, or 256, and the output level is -5 dBm with a stability of ± 2 dB. The family of LO generators is completed by a range of 18 different devices operating in a center frequency ranging from 7 to 15 GHz. The RF performance of all these devices is consistent with the TFF1003HN.

All the LO generators have very low power dissipation typical 330 mW, and all are available in a space-saving 24-pin HVQFN package.

Full portfolio overview of low noise LO generators for general microwave applications at chapter 3.4.2

2.5 Complete satellite portfolio for all LNB architectures

NXP satellite LNB devices BFU725F/N1 and BGA28xx

Designed for use in LNAs, mixers, and IF amplifiers, these robust, small-footprint products are manufactured in NXP's groundbreaking QUBiC4X SiGe:C and QUBiC4+ process technology and are the latest additions to NXP's leading portfolio for satellite LNB.

BFU725F/N1 RF transistor

The BFU725F/N1 is a RF transistor that can be used in the LNA part and as a mixer for a DBS LNB. In either application, it delivers low power consumption, good noise and linearity, and the lowest cost compared to GaAs pHEMT solution.

BFU725F/N1 as mixer in Ku-band LNB

- ▶ Power consumption: 2 mA at 5 V
- ▶ Single supply: 3, 5, or 6 V
- ▶ Noise, Single Side Band: 7 dB (including BPF)
- ▶ Linearity: better than 0 dBm OIP3
- ▶ Gain, SSB: 2 dB (including BPF)
- ▶ RF/LO/IF Match: better than 12/15/18 dB
- ▶ Broadband unconditionally stable
- ▶ LO-RF isolation better than 18 dB



BFU725F/N1 as 2nd or 3rd stage LNA in Ku-band LNB

- ▶ Power consumption: 11 mA at 5 V
- ▶ Single supply: 3, 5, or 6 V
- ▶ Noise, SSB: typically 1.3 dB
- ▶ Linearity: better than 10 dBm OIP3
- ▶ Gain, SSB: typically 10.5 dB
- ▶ In/Out match: better than 7/12 dB
- ▶ Broadband unconditionally stable

BFU725F/N1 as LNA for C-band LNB

- ▶ Power consumption: 7 mA at 5 V
- ▶ Single supply: 5 or 6 V
- ▶ Noise: 0.65 dB
- ▶ Linearity: better than 10 dBm OIP3
- ▶ Gain: 15 dB
- ▶ In/Out Match: better than 10 dB
- ▶ Broadband unconditionally stable

BGA28xx MMICs as IF amplifiers (1st stage & output stage)

For compatibility with existing designs, the series uses a market standard package, the SOT363 and the pin-compliant SOT363F package. The pinning is identical to NXP's current gain block family, and the blocks deliver similar noise figures. New features include flatter gain, a gain slope of 0.5 dB, improved P_{1dB} vs. I_{cc} , and no necessity of an output inductor (also not at high P_{1dB} models).

- ▶ Internally matched at 50 Ω
- ▶ Gain slope 0.5 dB
- ▶ Single supply current
 - At 3.3 V or 5 V
- ▶ Reverse isolation: >30 dB up to 2 GHz
- ▶ Best-in-class linearity vs current consumption
- ▶ Noise figure: 4 to 6 dB at 1 GHz
- ▶ Unconditionally stable ($K > 1$)
- ▶ High compression point models work without output inductor
- ▶ 6-pin SOT363 plastic SMD package

These products – the BFU725F/N1 transistor for LNA and mixer applications, and the BGA28xx series of MMICs for IF amplifiers – are the most recent additions to NXP's

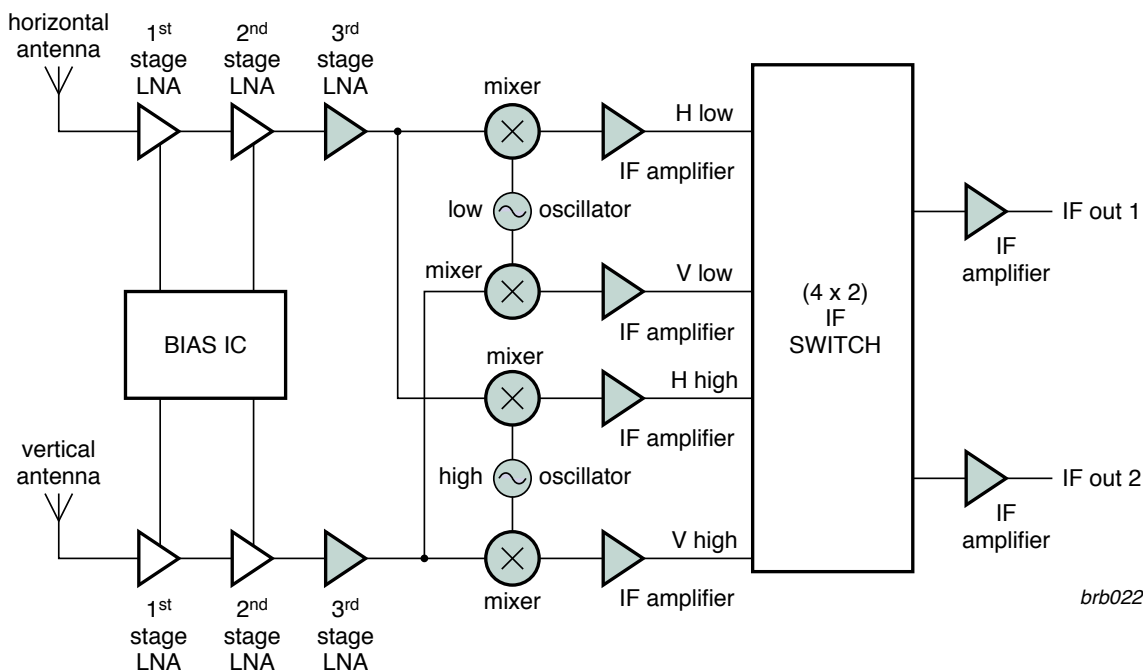


leading portfolio for satellite LNB. They join the other discrete products, including oscillators, amplifiers, switches, and biasing, to provide complete coverage for all LNB architectures.

they offer better overall RF performance and are more robust than their GaAs equivalents for the lowest cost. The process technology also enables higher integration, for added features. NXP owns the industrial base for production (wafer fab, test, assembly), so volume supplies can be assured.

Since the transistor and the MMICs are manufactured in NXP's industry-leading QUBiC4X SiGe:C and QuBiC4+ process,

Satellite outdoor unit, LNB for multiple users



NOTE: Also look at chapter 1.4.4 satellite outdoor unit.

Quick reference satellite IF gain MMICs

Type	Package	@		F_u	@ 1 GHz			Gain (dB) @			
		V_s	I_s		@ -3dB	NF	Gain	OIP3	250	950	1550
		(V)	(mA)	(GHz)	(dB)	(dB)	(dBm)	(MHz)	(MHz)	(MHz)	(MHz)
BGA2800	SOT363	3.3	9.7	>3	3.4	20.2	11.5	20.0	20.2	20.6	20.6
BGA2801	SOT363	3.3	12.4	3.0	3.6	22.1	13.6	22.3	22.1	23.0	23.8
BGA2815	SOT363	3.3	16.4	>3	3.4	25.4	18.2	26.2	25.4	25.5	25.8
BGA2816	SOT363	3.3	19.6	2.3	2.8	31.2	16.1	32.0	31.2	30.6	28.7
BGA2850	SOT363	5.0	7.7	>3	3.9	23.3	8.7	22.9	23.2	23.9	24.0
BGA2865	SOT363	5.0	22.7	2.6	3.7	31.9	20.9	31.2	31.8	32.6	31.4
BGA2866	SOT363	5.0	15.4	>3	3.6	23.4	17.7	23.0	23.3	24.0	24.3

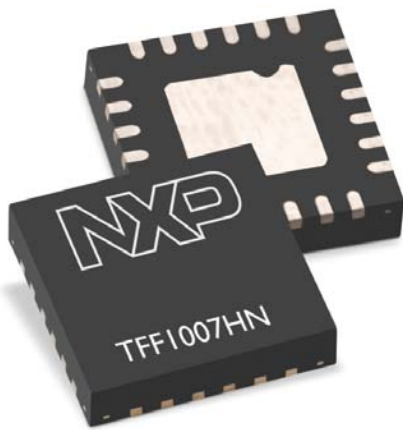
No output inductor necessary when using the new BGA28xx IF Gain blocks at the output stage.

2.6 VSAT, 2-way communication via satellite

Design a Ku-band VSAT transmitter or transceiver that meets IESS-308

NXP Ku-band RF LO Generator IC's for VSAT

The TFF100xHN family are Ku-band RF PLLs, with integrated VCO intended for low phase-noise Local Oscillator (LO) circuits in Ku-band VSAT transmitters and transceivers. Manufactured in a high-performance SiGe:C process, it delivers extremely low phase noise and complies with the IESS-308 from Intelsat.



Features

- ▶ Phase noise compliant with IESS-308 (Intelsat)
- ▶ Differential input and output
- ▶ Divider settings at 16, 32, 64, 128 or 256
- ▶ Lock-detect output
- ▶ SiGe:C technology (120-GHz f_T process)
- ▶ HVQFN24 (SOT616-1) package

Applications

- ▶ VSAT block-up-converters
- ▶ VSAT down conversion
- ▶ Local oscillator signal generation

VSAT networks are commonly used to transmit narrowband data, such as point-of-sale transactions for credit cards, or to transmit broadband data that supports satellite Internet access to a remote location, VoIP, or video.

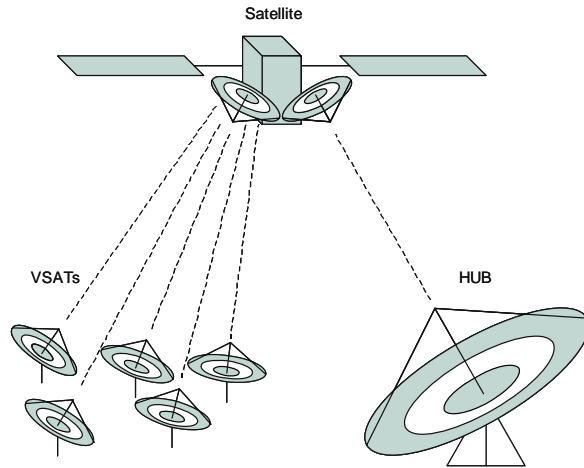
The network typically consists of a dish antenna, an outdoor unit, and an indoor unit. The outdoor unit is used for frequency translation between RF and IF, and usually includes a microwave-based uplink/downlink separator, a Low Noise Block (LNB) for receiving the downlink signals, and a Block Up Converter (BUC).

The VSAT IC's can be used to create the LO generator for a linear BUC (meaning the IF or RF conversion is done by mixing with an LO).

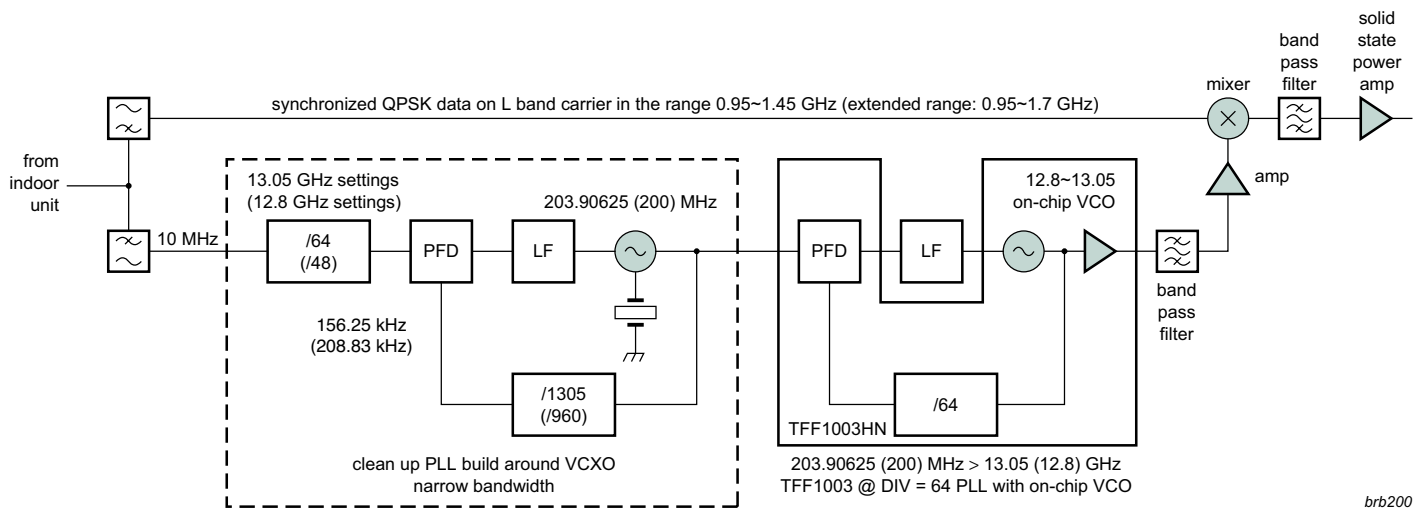
To enable precise frequency and time multiplexing, the downlink signal provides an accurate frequency reference of 10 MHz. The indoor unit frequency multiplexes this with the uplink IF signal, and the LO signal in the BUC needs to be frequency locked to the reference.

The TFF100xHN IC's are housed in a 24-pin HVQFN (SOT616-1) package. The pins have been assigned for optimal performance. Three voltage domains are used to separate the block on the IC, and two pins for each output (OUT-P) and OUT-N) have been reserved to match a typical layout using a linewidth of $Z = 50 \Omega$ microstrip on a 20-mil RO4003 board (1.1 mm).

The ground pins have been placed next to the reference input and the output, and, to minimize crossings in the application, all the supply pins are on the same side of the IC.



Typical VSAT network



Complete LO generator for linear BUC with TFF1003HN

Type	Package	$f_{\text{IN(REF)}}$	V_{CC}	I_{CC}	PLL phase noise @ N=64 @ 100 kHz	PLL	Output buffer		Input
			Typ	Max		$f_{\text{O(RF)}}$	P_{O}	$RL_{\text{out(RF)}}$	S_{I}
					MHz		V	mA	dBc/Hz
TFF1003HN	SOT616	50~815	3.3	100	-92	12.8~13.05	-5	-10	-10
TFF1007HN	SOT616	230.46~234.38	3.3	100	-104	14.75~15	-3	-10	-10

2.7 NXP CATV C-family for the Chinese SARFT standard

Connecting people, protecting your network

Specially designed for the Chinese Hybrid Fiber Coax (HFC) infrastructure, NXP CATV C-family offers you a total solution for cable TV networks. It is both flexible enough for connecting rural communities as part of China's 'Connecting every village' program and powerful enough for upgrading major cities from analog to high-end digital services. All C-type devices are compliant with the Chinese State Administration for Radio, Film and Television (SARFT) standard, and cover most HFC applications in the 550 - 870 MHz range.



Products

- ▶ BGY588C, BGE788C, CGY888C and BGY835C push-pull amplifiers
- ▶ BGD712C, CGD944C and CGD942C power doublers
- ▶ BGO807C and BGO807CE optical receiver

Features

- ▶ Excellent linearity, stability and reliability
- ▶ High power gain
- ▶ Extremely low noise
- ▶ Silicon Nitride passivity
- ▶ GaAs HFET dies for high end devices

Benefits

- ▶ Compliant with Chinese SARFT HFC networks standard
- ▶ Transparent cap allows confirmation of product authenticity
- ▶ Rugged construction

Further extending our high quality CATV portfolio, this new family lets you address an even wider range of HFC applications. Dedicated solutions for the implementation of CATV systems in China, our C-type devices deliver the performance you need for modern TV infrastructures.

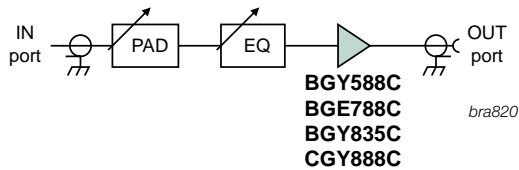
The BGY588C, BGE788C and BGD712C devices cover the frequency range from 550 MHz to 750 MHz. Extending the C-family portfolio into the high-end segment, the CGD944C, CGD942C, CGY888C and BGO807C operate between 40 MHz and 870 MHz and have been specifically tested under Chinese raster conditions. Manufactured using our GaAs HFET die process, the CGD942C, and CGD944C are high-gain, high-performance 870 MHz power doublers. They are capable of satisfying the demanding requirements of top-end applications including high-power optical nodes.

Our GaAs HFET MMIC dies are providing 'by design' the best ESD protection levels with no needs for external TVS components normally used with GaAs pHEMT devices.

All CATV C-type devices feature a see-through cap that makes it easy to distinguish them from counterfeit products.

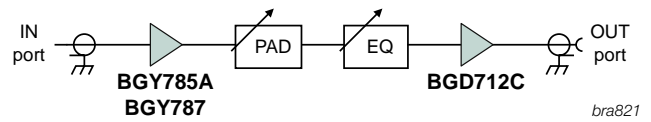
BGY588C, BGE788C, CGY888C and BGY835C

The last stage of an HFC network structure is called a terminating amplifier or 'user amplifier' as it is close to the subscribers. Each terminating amplifier requires a single module such as BGY588C for 550 MHz, BGE788C for 750 MHz and CGY888C for 860 MHz systems. These modules are fitting perfectly in the Chinese 'Connecting to Every Village' projects.



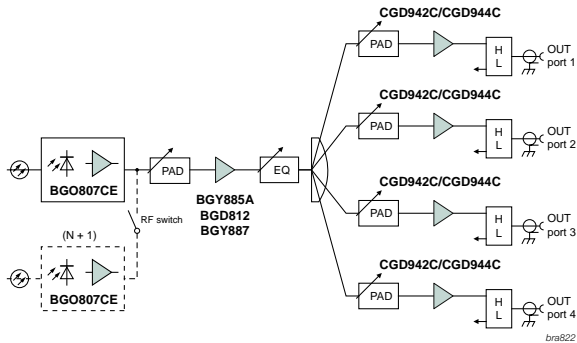
BGD712C

The BGD712C is a 750 MHz, 18 dB power doubler module. It has been designed for 750 MHz optical nodes including ordinary or optical receivers and distribution amplifiers. It can also be used in line extender amplifiers together with a 750 MHz push-pull module, such as BGY785A or BGY787. As such it can be used widely in Chinese 'Connecting to Every Village' projects.



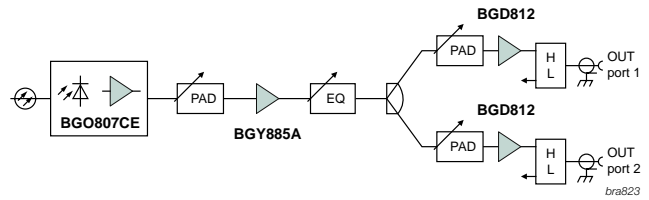
CGD944C and CGD942C

Our full GaAs power doublers modules, CGD942C and CGD944C offer high output power and better CTB and CSO than other modules. Designed for high-end HFC networks containing optical nodes with multiple out-ports, these modules enable each port to directly cover at least 125 subscribers. These two devices are ideal when used in upgrading HFC networks to 860 MHz.



BGO807CE

BGO807CE is an integrated optical receiver module that provides high output levels and includes an integrated temperature compensated circuitry. In your optical node design, BGO807CE enables a high performance/ price ratio and ruggedness. When upgrading an HFC network from analog to digital our BGO807CE is the perfect fit.



C-family application information

Application	BGY588C	BGE788C	CGY888C	BGD712C	BGO807C	CGD944C	CGD942C
Optical node				•	•	•	•
Optical receiver				•	•	•	•
Distribution amplifier			•	•	•	•	
Line extender amplifier			•	•	•	•	
Terminating amplifier	•	•	•				

Push-pull amplifiers

Parameters		BGY588C	BGE788C	CGY888C	BGY835C
Power gain (dB)	typ.	34.5	34.2	35.5	34
Slope (dB)	range	0.2 - 1.7	0.3 - 2.3	1.5 typ.	1.5 typ.
Composite triple beat (dBc)	max.	-57	-49	-66	-60
Composite 2 nd order distortion (dBc)	max.	-62	-52	-64	-55
Noise (@ f _{MAX}) (dB)	max.	8	8	3 typ.	7
Total current consumption (mA)	typ.	325	305	280	340
Frequency range (MHz)	range	40 - 550	40 - 750	40 - 870	40 - 870

Power doublers

Parameters		BGD712C	CGD944C	CGD942C
Power gain (dB)	typ.	18.5	25	23
Slope (dB)	range	0.5 - 1.5	1 - 2	1 - 2
Composite triple beat (dBc)	max.	-62	-66	-66
Composite 2 nd order distortion (dBc)	max.	-63	-67	-67
Noise (@ f _{MAX}) (dB)	max.	7	5	5
Total current consumption (mA)	typ.	395	450	450
Frequency range (MHz)	range	40 - 750	40 - 870	40 - 870

Optical receiver

Parameters		BGO807C	BGO807CE
Responsivity (V/W)	min.	800	800
Slope (dB)	range	0 - 2	0 - 2
Third order intermodulation distortion (dB)	max.	-71	-71
Second order intermodulation distortion (dB)	max.	-54	-53
Noise (@ f _{MAX}) pA/Sqrt (Hz)	max.	8.5	8.5
Total current consumption (mA)	typ.	190	190
Frequency range (MHz)	range	40 - 870	40 - 870
Connector		- / SCO / FCO	



2.7.1 NXP GaAs HFC CATV solutions CGY888C, CGD942C and CGD944C

Complete GaAs amplifier solutions for Chinese HFC networks

These high-performance GaAs solutions, specially designed for the Chinese SARFT HFC standard, provide complete functionality in a format that reduces chip-count and lowers overall cost.

Products

- ▶ 870-MHz push-pull amplifier: CGY888C
- ▶ 870-MHz power doublers: CGD942C (23-dB gain), CGD944C (25-dB gain)

Features

- ▶ GaAs HFET process for best performance and lowest chip-count
- ▶ Excellent linearity, stability, and reliability
- ▶ High power gain
- ▶ Extremely low noise
- ▶ Excellent return-loss properties

Benefits

- ▶ Fully compliant with Chinese SARFT HFC networks standard
- ▶ Transparent cap confirms product authenticity
- ▶ Rugged construction
- ▶ Unconditionally stable
- ▶ Thermally optimized design

Applications

- ▶ Hybrid Fiber Coax (HFC) applications
- ▶ Line extenders
- ▶ Trunk amplifiers
- ▶ Fiber deep-optical-node (N+0/1/2)

To support Chinese HFC CATV infrastructure applications as a single-source supplier, NXP offers the C-family, a complete line of dedicated RF amplifier modules that deliver the very high level of performance required for next-generation HFC TV networks.

The family includes the 870-MHz push-pull amplifier CGY888C, a GaAs upgrade of NXP's industry-leading BGY888 and BGY835C products, and two 870-MHz power doublers: the CGD942C, which has a typical gain of 23 dB, and the CGD944C, with a typical gain of 25 dB.

The modules are flexible enough to connect rural communities as part of China's 'Connect Every Village' project, and powerful enough to upgrade major cities from analog to high-end digital services.

The modules have been tested under Chinese raster conditions and fully comply with the Chinese SRAFT standard. They also cover most HFC applications in the range of 550 to 870 MHz and are compatible with previous generations of NXP HFC solutions, so they can be used to upgrade existing networks to a higher level of performance.

Produced in NXP's advanced GaAs HFET die process, the modules deliver excellent linearity with extremely low noise, and work seamlessly together. The GaAs process improves performance and, by reducing chip count, saves overall cost. It offers stronger signal strength than Si, so there are fewer amplifiers required, and it provides superior ESD protection compared to GaAs pHEMT processes, so there's no need for external TVS components. The CGY888C is well suited for use in the last stage of an HFC network, which is known as a terminating amplifier or a user amplifier since it is close to subscribers.

The CGD942C and the CGD944C offer higher output power and better CTB and CSO than other power doublers, so they are ideal for use in HFC networks that have optical nodes with multiple out-ports. The modules enable each port to cover at least 125 subscribers directly.

All the C-family modules are delivered with transparent caps that make it easy to distinguish them from counterfeit products.

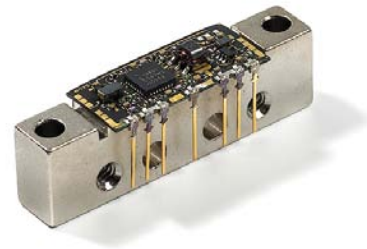
Unmatched new ESD protection levels:

All new standard NXP CATV SOT115 hybrids, power doublers or push pulls, released in 2009 and onwards will have a build-in extra protection on top of the existing one for very high level ESD surges. Those surge levels will leave our devices without any damage or destruction. Human body or biased ESD levels will increase respectively to 2000 V and 1500 V which is making now NXP CATV devices the most ESD robust product on the market today.

2.8 Highly efficient line-up of 1 GHz GaAs modules for sustainable CATV networks

NXP high-gain power doublers CGD104xHi and push-pulls CGY104x

Designed for 1-GHz “sustainable networks,” these high-performance GaAs devices enable extended bandwidth and higher data rates. They deliver increased network capacity and make way for high-end services like HDTV, VoIP, and digital simulcasting.



Key features

- ▶ Excellent linearity, stability, and reliability
- ▶ High power gain for power doublers
- ▶ Extremely low noise
- ▶ Dark Green products
- ▶ GaAs HFET dies for high-end applications
- ▶ Rugged construction
- ▶ Superior levels of ESD protection
- ▶ Integrated ringwave protection
- ▶ Design optimized for digital channel loading
- ▶ Temperature compensated gain response
- ▶ Optimized heat management
- ▶ Excellent temperature resistance

Key benefits

- ▶ Simple upgrade to 1-GHz capable networks
- ▶ Low total cost of ownership
- ▶ High power-stress capability
- ▶ Highly automated assembly

Key applications

- ▶ Hybrid Fiber Coax (HFC) applications
- ▶ Line extenders
- ▶ Trunk amplifiers
- ▶ Fiber deep-optical-node (N+0/1/2)
- ▶ Bridgers

New CATV GaAs platform lay-out

The NXP power doublers CGD104xH and CGD104xHi are ideal for use in line extenders and trunk amplifiers. They support fiber deep-optical-node applications (N+0/1/2), delivering the highest output power on the market today. The GaAs HFET die process delivers high gain, excellent CTB and CSO ratings, along with lower current.

The new NXP CGY1047x push-pull family is the first line-up on the market combining very low noise, best-in-class distortion parameters, and low “carbon footprint” capabilities. It delivers the best performance for the lowest power consumption, so it reduces OPEX and CO₂ emissions

All of NXP’s 1-GHz solutions are designed for durability and offer superior ruggedness, an extended temperature range, high power overstress capabilities, and extremely high ESD levels. As a result, they also reduce the cost of ownership.

The GaAs die is inserted in a HVQFN package that is then mounted on thermal vias that manage heat transfer to the heat sink. Temperature-control circuitry keeps the module’s high performance stable over a wide range of temperature. Assembly is fully automated and requires almost no human intervention, so repeatability remains very high.

Upcoming products

Additional push-pulls, currently under development, will extend the capabilities of the power doublers even further, supporting almost all modern HFC applications. The push-pull CGY1041 will deliver a gain of 21 dB, the CGY1043 a gain of

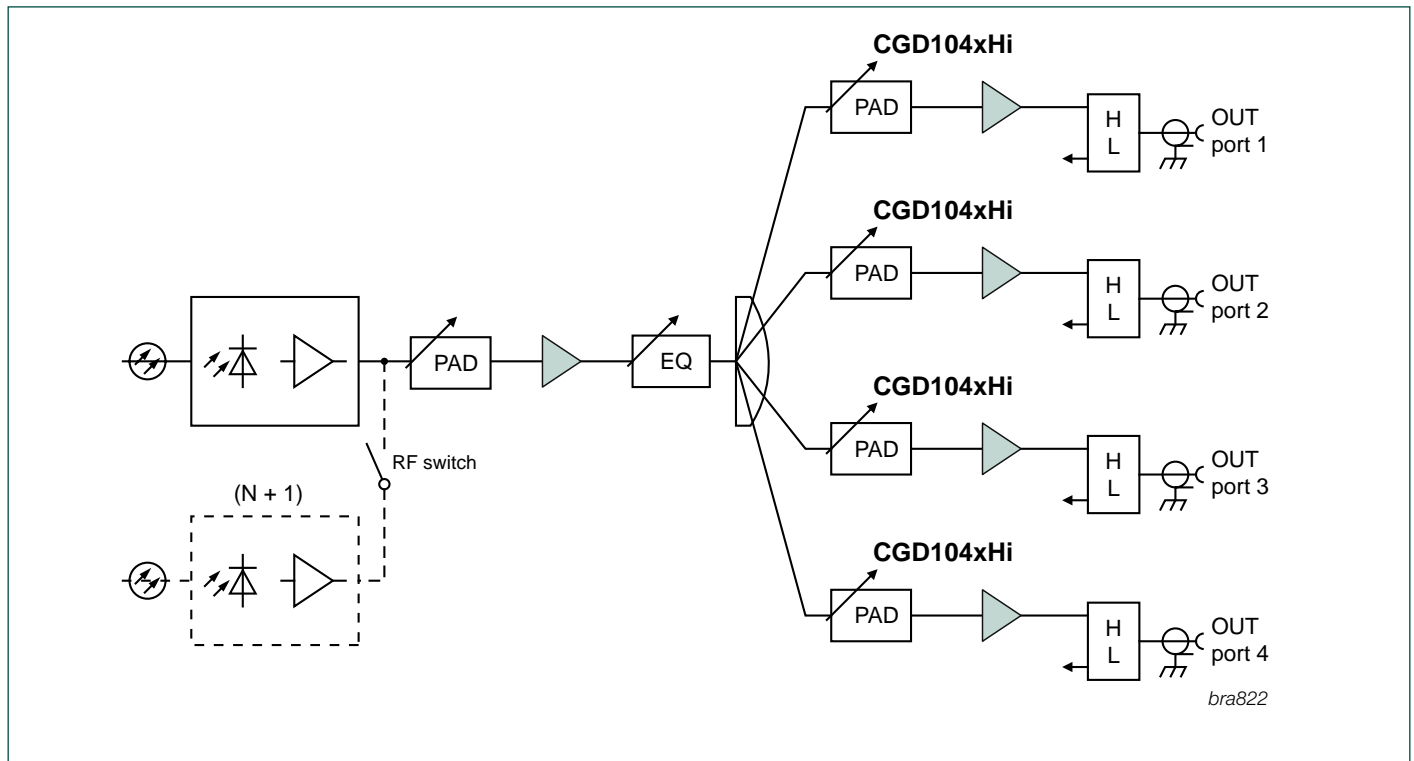
23 dB, the CGY1049 a gain of 29 dB and the CGY1032 a gain of 32 dB. NXP is also developing a new, highly integrated power doubler. The CGD1046Hi will deliver, in one IC, a 26-dB power gain with 60-dBmV output power and excellent ESD protection, for the ultimate in high-quality, distortionless devices.

Quick reference data CATV 1 GHz power doublers and push pulls

		CATV 1-GHz power doublers					
Parameters		CGD1040Hi	CGD1042H	CGD1042Hi	CGD1044H	CGD1044Hi	CGD1046Hi*
Power gain (dB)	typ.	21	23	23	25	25	27
Slope cable equivalent (dB)	typ.	1.5	1.5	1.5	1	1.5	0.5 - 2.0
Composite triple beat (dB)	typ.	-69	-69	-69	-69	-69	-73
Composite 2 nd order distortion (dB)	typ.	-68	-68	-68	-68	-68	-68
Noise (@f _{MAX}) (dB)	max.	6	6	6	6	6	5
Total current consumption (mA)	typ.	440	450	440	450	440	460
Frequency range (MHz)	range	40 - 1003	40 - 1003	40 - 1003	40 - 1003	40 - 1003	40 - 1003

		CATV 1-GHz push-pulls			
Parameters		CGY1041	CGY1043	CGY1049*	CGY1032*
Power gain (dB)	typ.	22	24	30	33
Slope cable equivalent (dB)	typ.	1.5	1.5	2	1.5
Composite triple beat (dB)	typ.	-62	-64	-62	-62
Composite 2 nd order distortion (dB)	typ.	-62	-64	-64	-64
Noise (@f _{MAX}) (dB)	max.	5.5	5.5	4.5	4.5
Total current consumption (mA)	typ.	250	250	250	250
Frequency range (MHz)	range	40 - 1003	40 - 1003	40 - 1003	40 - 1003

* = check status at 3.1 new products, as this type has not been released yet for mass production.



An optical node with multiple out-ports using the CGD1040Hi / CGD1042Hi / CGD1044Hi / CGD1046Hi

2.9 Doherty amplifier technology for state-of-art wireless infrastructure

Best in class PA designs enable considerable energy savings

NXP's latest power amplifier designs enable wireless infrastructure to run with significantly higher energy efficiency – towards "Green Base Stations". In order to achieve the highest efficiencies currently possible, NXP combines its latest generations LDMOS technology (Gen6 & 7) with the Doherty concept. This way, the optimized intrinsic performance of our LDMOS technology combines perfectly with the extrinsic Doherty technology into very efficient, high gain, readily linearizable, and lower operation cost power amplifiers.

Developed by W.H. Doherty in 1936, the Doherty amplifier remained largely dormant because the dominant mobile communication system modulation techniques (FM, GMSK and EDGE) did not require high peak-to-average ratio (PAR) signals. However, the high power added efficiency architecture of the Doherty amplifier has made it the preferred option for today's service providers for base stations transmitting 3G, 4G or multi-carrier standards.

NXP's Doherty amplifiers ensure high-efficiency while maintaining a very similar peak power capability of two transistors combined. The input and output sections are internally matched, benefiting the amplifier designs with high gain and good gain flatness and phase linearity over a wide frequency band.

Integrated Doherty

NXP can even offer the world's first fully integrated Doherty designs: From the outside these devices look like an ordinary transistor. In fact, they are completely integrated Doherty amplifiers that deliver the highest efficiency levels for base station applications. With the ease of design-in of an ordinary class AB transistor, they also provide significant space and cost savings.

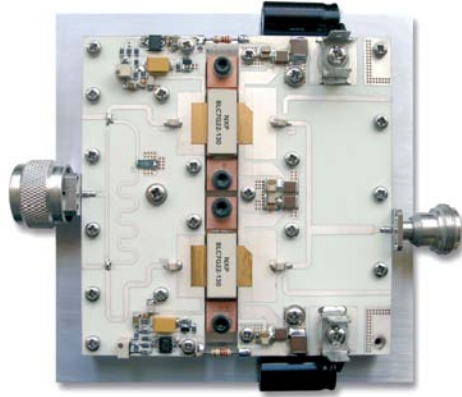
Key features & benefits

- ▶ Contains splitter, main- and peak amplifier, delay lines and combiner in one package
 - 40% efficiency @ 10 W average power
 - no additional tuning in manufacturing
- ▶ Design is as easy as with a single class AB transistor
- ▶ Ideally suited for space-constrained applications (e.g. remote radio heads, antenna arrays)
- ▶ Currently available for TD-S-CDMA (BLD6G21L(S)-50) and W-CDMA (BLD22L(S)-50); see chapter 3.7.1.4 for details

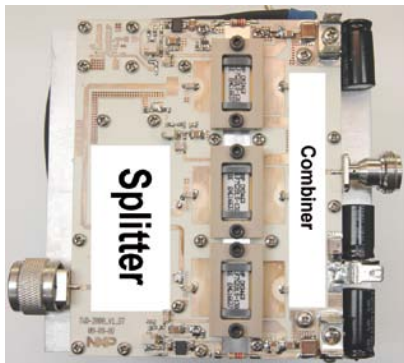


Discrete Doherty amplifiers

Next to the integrated versions, NXP also offers product demonstrators for very efficient, high power, discrete 2- and 3- way Doherty amplifiers. The 2 way designs based on the BLF7G22LS-130 device deliver 47.0 dBm (50 W) with 43% efficiency and 15.7 dB gain for W-CDMA applications.



Our flagship 3-way Doherty demonstrator even achieves 48% efficiency at 48 dBm (63 W) average output power and 15.0 dB gain with a 2 carrier W-CDMA signal. The current design covers the W-CDMA standard for band 1 operation and is tailored towards high yield, minimum tuning, volume manufacturing.



Key features & benefits

- ▶ Most efficient Doherty amplifier designs available to date
- ▶ Production proven, very consistent designs
- ▶ NXP's LDMOS provides unsurpassed ruggedness
- ▶ Currently available for the following frequency bands:
 - 728 - 821 MHz
 - 869 - 960 MHz
 - 1805 - 1880 MHz (DCS)
 - 1930 - 1990 MHz (PCS)
 - 1880 - 2025 MHz (TD-SCDMA)
 - 2110 - 2170 MHz (UMTS / LTE)
 - 2300 - 2400 MHz (WiBRO / LTE)
 - 2500 - 2700 MHz (WiMAX / LTE)
 - 3300 - 3800 MHz (WiMAX)

All our product demonstrators are supported by comprehensive support documentation and hardware. Please see chapter 3.7.1.7 for a complete list of available designs.

Featured Doherty designs

Freq band (MHz)	PPEAK (dBm)	POUT-AVG (dBm)	VDS (V)	Gain (dB)	Drain Eff. (%)	Type	Main transistor	Peak transistor
728-756	59.1	50.5	32	19	40	SYM	BLF6G10-260PM	BLF6G10-260PM
790-821	58	50	32	19	47	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN
869-894	58	50	32	19	46	SYM	BLF6G10-200RN	BLF6G10-200RN
925-960	58.9	50	32	22	44	SYM / MMPP	BLF6G10-260PRN	BLF6G10-260PRN
1805-1880	58.2	50	28	16	42	SYM / MPPM	BLF7G20LS-250P	BLF7G20LS-250P
1930-1990	58	50	32	15.5	37	SYM	BLF6G20-230PRN	BLF6G20-230PRN
2110-2170	58	50	32	15	40	SYM	BLF6G22-180PN	BLF6G22-180PN
2300-2400	49.5	42	28	14.5	43	SYM	1/2 BLF7G27-75P	1/2 BLF7G27-75P
2500-2700	52.5	44.5	28	14	38	SYM	1/2 BLF6G27-150P	1/2 BLF7G27-150P
3400-3600	51	43	28	11.5	32	SYM	BLF6G38-50	BLF6G38-50

2.10 Boost efficiency and lower system cost in wireless infrastructure with GaN

NXP GaN technology for RF power

This new gallium-nitride (GaN) technology, the result of a collaborative development effort, enables high-power amplifiers that deliver very high efficiency in next-generation wireless communication systems.

Features

- ▶ Power density that is up to five times higher than Si LDMOS
- ▶ 50 V operation
- ▶ High gain
- ▶ High efficiency
- ▶ High reliability
- ▶ Low parasitics

Benefits

- ▶ High frequency combined with high power
- ▶ Broadband operation that lets a single power amplifier function at multiple frequencies
- ▶ Enabling technology for next-generation, high-power, Switch Mode Power Amplifier (SMPA) architectures
- ▶ Lowers system costs and operational expenditures
- ▶ Ideal for tower-top base stations

Applications

- ▶ Cellular base stations
- ▶ WiMAX
- ▶ Broadcast
- ▶ Radar

Collaborating with United Monolithic Semiconductors and the Fraunhofer Institute for Applied Solid State Physics, NXP Semiconductors is developing a gallium-nitride (GaN) process technology that boosts performance of next-generation RF power amplifiers.

The new GaN process, with its high frequency combined with high power, puts NXP in the ideal position of being able to support future applications while continuing to evolve its well-established LDMOS technology.

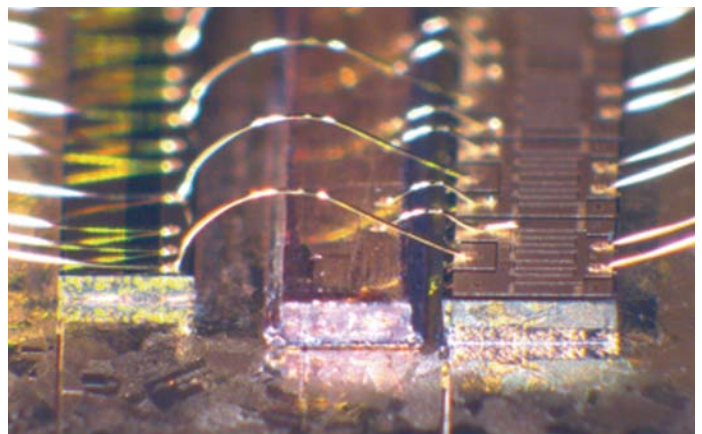
The GaN technology delivers numerous benefits to manufacturers of infrastructure equipment. Using the GaN technology in a transmitter represents a significant cost savings in system manufacturing, along with major improvements in system performance and flexibility.

Most of today's base station power amplifiers are limited to specific applications. The new GaN-based technology lets operators use a "universal transmitter" to switch between systems and frequencies, so they can instantly meet demands in the base station's coverage area. GaN transistors enable much more efficient power amplifiers and as a result drive down the operational costs of telecom operators.

GaN transistors can operate at much higher junction temperatures than Si- and GaAs-based devices, so GaN is an ideal candidate for environments with reduced cooling capabilities, such as tower-top base stations. Also, with its high power densities, GaN has the potential to expand into other areas, including high-power broadcast applications, where solid-state power amplifiers built with vacuum tubes are still the norm.

NXP's first GaN broadband power amplifiers are expected to be available in 2010, with Switch Mode Power Amplifiers (SMPAs) following quickly thereafter.

Performance (targets)	
Saturated output power at 50 V	100 W
Frequency	2.2 GHz
Maximum PAE	68%
Linear power gain	19 dB
2C-WCDMA linear efficiency with DPD	40% at -52 dBc IM3 at 8 dB OPBO



Assembly of GaN power bar in standard ceramic package

2.11 Looking for the leader in SiGe:C? You've just found us!

NXP QUBiC4 process technology

NXP's innovative high performance SiGe:C QUBiC4 process allows customers to incorporate more functionality into devices with less space, competitive cost, superb reliability and significant manufacturing advantages. Our state-of-the-art QUBiC4 technology and extensive IP availability speeds the migration from GaAs components to silicon by enabling cutting-edge products with best in class low-noise performance, linearity, power consumption, immunity to out-of-band signals, spurious performance and output power. NXP's QUBiC is a mature process in mass production since 2002 with continuous performance upgrades since then. The QUBiC4 process is automotive qualified and dual sourced in two high volume NXP-owned 8 inch waferfabs providing flexible, low cost manufacturing with high yields and very low ppm in the field.

QUBiC4 in 3 variants, each having it's benefits for specific application areas:

QUBiC4+

The QUBiC4+ BiCMOS process features 0.25 μm CMOS with 5 metal layers for integration of dense digital logic based smart functionality, a rich set of active and passive devices for high-frequency mixed-signal designs including thick top metal layers for high quality inductors. The device set; including a 37 GHz FT NPNs with 3.8 V breakdown voltage (BV_{ce0}) and low noise figure (NF < 1.1 @ 2 GHz), 7 GHz ft VPnPs, a 28 GHz high voltage NPN with 5.9 V breakdown voltage, differential and single ended varicaps with Q-factor>30, scalable inductors with Q-factor>20, 800 MHz FT lateral PNP's, 0.25 μm CMOS, 137, 220 & 12 to 2000 ohm/sq. poly and active resistors, a 270 ohm/sq. SiCr thin film resistor, a 5.7 fF/ μm^2 oxide capacitor and an 5 fF/ μm^2 MIM capacitor, 1 to 6 fF/ μm^2 oxide capacitors and various other devices including L-PNPs, isolated NMOS, 3.3 V CMOS and RF-CMOS transistorscapacitor. The QUBiC4+ process is: silicon based and , ideal for applications up to 5 GHz (Ft = 37 GHz , NF < 1.1 dB @ 1.2 GHz) and e.g. for medium power amplifiers up to 33 dBm.

QUBiC4X

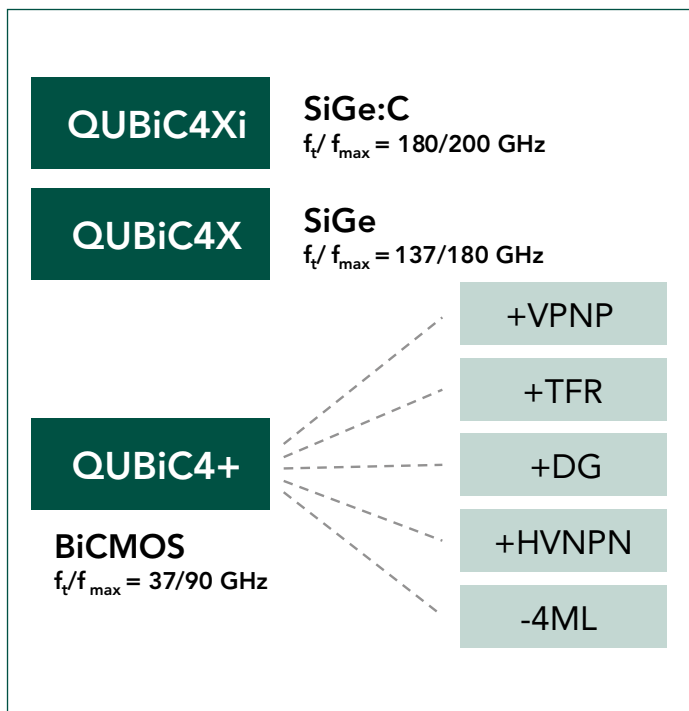
The QUBiC4X BiCMOS process is a SiGe:C based extension of the QUBiC process for high-frequency mixed signal designs and offers on top of features the a rich set of devices for QUBiC high-frequency mixed-signal designs; including also a 140 GHz FT NPN with 2.5 V breakdown voltage and very low noise figure (NF < 1.0 @ 10GHz). s, 0.25 μm CMOS, 220, a variety of resistors, a 5.7 fF/ μm^2 oxide capacitor and a 5 fF/ μm^2 MIM capacitor.

The QUBiC4X: first SiGe:C process is, ideal for applications typically up to 30 GHz (Ft = 137 GHz , NF < 0.8dB @ 10 GHz) and ultra low noise applications, e.g. LNAs and mixers.

QUBiC4Xi

The QUBiC4Xi BiCMOS process further enhances the QUBiC4X process and offers additionally a features a set of devices for high-frequency mixed-signal designs; including 180 GHz FT NPNs with 1.4 V breakdown voltage and ultra-low noise figure (NF < 0.7 @ 10 GHz), 0.25 μm CMOS, several resistors, a 5.7 fF/ μm^2 oxide capacitor and a 5 fF/ μm^2 MI capacitor. QUBiC4Xi is the: newest SiGe:C process improved on Ft (> 200 GHz) and even lower noise figure (NF < 0.5 7 dB @ 10 GHz) and is, ideal for applications beyond 30 GHz, e.g. LO generators.





QUBiC4+

- ▶ Baseline, 0.25um CMOS, single poly, 5 metal
- ▶ Digital gate density 26k gates/mm²
- ▶ $f_t / f_{MAX} = 37/90$ GHz
- ▶ +TFR – Thin Film Resistor
- ▶ +DG – Dual Gate Oxide MOS
- ▶ +HVNPN – High Voltage NPN
- ▶ +VPNP – Vertical PNP
- ▶ -4ML – high density 5fF/μm² MIM capacitor
- ▶ Wide range of active and high quality passive devices
- ▶ Optimized for up to 5GHz applications

QUBiC4X

- ▶ SiGe:C process
- ▶ $f_t / f_{MAX} = 137/180$ GHz
- ▶ optimized for up to 15 GHz applications

QUBiC4Xi

- ▶ Improves f_t / f_{MAX} up to 180/200 GHz
- ▶ Optimized for ultra-low noise for microwave above 10 GHz

Features	QUBiC4+/4+/4DG	QUBiC4X	QUBiC4X
Release for production	2002/2004/2006	2006	2008
CMOS/Bipolar	CMOS 0.25um, Bipolar 0.4um, Double poly, Deep trench, Si	CMOS 0.25um, Bipolar LV 0.4um, Double poly, Deep trench, SiGe:C	CMOS 0.25um, Bipolar LV 0.3um, Double poly, Deep trench, SiGe:C
LV NPN Ft/Fmax (GHz)	37/90 (Si)	137/180 (SiGe:C)	180/200 (SiGe:C)
HV NPN Ft/Fmax (GHz)	28/70 (Si)	60/120 (SiGe:C)	tbd (SiGe:C)
NPN BVce0: HV/LV **	5.9 / 3.8 V	3.2 / 2.0 V	2.5 / 1.4 V
V-PNP Ft / BVcb0 (GHz / V)	7 / >9	planned	planned
CMOS Voltage / Dual Gate	2.5 / 3.3 V	2.5 V	2.5 V
Noise figure NPN (dB)	2GHz: 1.1	10GHz: 1.0	10GHz: 0.7
RFCMOS Ft (GHz)	NMOS 58, PMOS 19	NMOS 58, PMOS 19	NMOS 58, PMOS 19
Isolation (60 dB @ 10 GHz)	STI and DTI	STI and DTI	STI and DTI
Interconnection (AlCu with CMP W Plugs)	5 LM, 3 μm top Metal	5 LM, 3 μm top Metal 2 μm M4	5 LM, 3 μm top Metal
Capacitors	NW, DN, Poly-Poly 5fF/um ² MIM	NW, DN, Poly-Poly 5fF/um ² MIM	NW, DN, Poly-Poly 5fF/um ² MIM
Resistors (Ohm/sq)	Poly (64/220/330/2K), Active (12, 57), High Precision SiCr (270)	Poly (64/220/330/2K), Active (12, 57), High Precision SiCr tbd	Poly (64/220/330/2K), Active (12, 57), High Precision SiCr tbd
Varicaps (single-ended & differential)	2x single ended, Q > 40 3x differential, Q 30-50	2x single ended, Q > 40 3x differential, Q 30-50	2x single ended, Q > 40 3x differential, Q 30-50
Inductors (1.5nH @ 2 Ghz) - scalable	Q > 21, Thick Metal, Deep trench isolation, High R substrate	Q > 21, Thick Metal, Deep trench isolation, High R substrate	Q > 21, Thick Metal, Deep trench isolation, High R substrate
Other devices	LPNP, Isolated NMOS	LPNP, Isolated-NMOS tbd	LPNP, Isolated-NMOS tbd
Mask count	31 / 32 (MIM) / 33 (DG)	35 (MIM)	35 (MIM)

2.12 Microwave / Radar

NXP, your partner in High Performance microwave applications

NXP has a 50+ years history in semiconductor technology and component design. For more than 3 decades we are leading in providing high performance RF technologies for microwave applications. The company has built a strong position in the field of RF small signal and power transistors for microwave amplifiers with a solid and growing, and best-in-class Si devices and processing technologies.

We were the first semiconductor company to supply S-band transistors (2700 - 3500 MHz) based on laterally diffused metal-oxide-silicon (LDMOS). To further strengthen our position towards the future, we currently develop new high power and high-bandwidth technologies based on gallium nitride (GaN) material.

Another enabling technology is NXP's BICMOS process QUBiC that is available in several variants with f_T up to 200 GHz, each specialized to address specific small signal RF applications.

The product portfolio encompasses:

- Low noise amplifiers (LNA)
- Variable gain amplifiers (VGA)
- Mixers,
- Local oscillators (LO)
- LO Generators

Coming from a component background, NXP now also focuses on architectural breakthroughs by highly integrated products for microwave and millimeter wave. One example is a family of LO Generators from 7G Hz to 15 GHz with integrated Phase-Locked Loop and Voltage Controlled Oscillator.

Another example is an integrated RF power module in S-band (3.1-3.5 GHz) at 200 W. Both products are highlighted in the following:

RF small signal product highlight:

LO generators TFF11xxxHN

Manufactured in NXP's breakthrough QUBiC4X SiGe:C process technology, these highly integrated, alignment-free LO generators are low-power, low-spurious solutions that simplify design-in and lower the total cost of ownership.



Features

- ▶ Lowest noise LO generators for 7 to 15 GHz range
- ▶ Maximum power consumption for all types, typical 330 mW
- ▶ Phase-noise compliant with IESS-308 (Intelsat)
- ▶ Proven QUBiC4X SiGe:C technology (120 GHz f_T process)
- ▶ External loop filter
- ▶ Differential input and output
- ▶ Lock-detect output
- ▶ Internally stabilized voltage reference for loop filter

RF Power product highlight!

The BLS6G2933P-200 is the first LDMOS based, industry standard pallet produced by NXP. This pallet offers more than 40% efficiency and includes the complete bias network for S-band applications.



Features:

- ▶ Reduces component count and considerably simplifies radar system design
- ▶ P1 dB output power 200 W
- ▶ Efficiency > 40%
- ▶ Industry standard footprint
- ▶ 50 Ω in/out matched for entire bandwidth
- ▶ Lightweight heat sink included
- ▶ The advantages of LDMOS in comparison with Bipolar
 - Higher gain and better efficiency
 - Better ruggedness – overdrive without risk to 5 dB
 - Improved pulse droop and insertion phase
 - Very consistent performance – no tuning required
 - Improved thermal characteristics, no thermal runaway
 - Non-toxic packaging and ROHS compliance

For a complete list of products see the respective small signal and power microwave pages

Microwave applications and bands of operation

System	Frequency
VHF and UHF	<1 GHz
L-Band	1200 - 1400 MHz
S-Band	2700 - 3500 MHz
X-band	8000 - 12000 MHz
Commercial Avionics	
DME (Distance Measuring Equipment)	978 - 1215 MHz
Transponders	
Mode A / Mode S / Mode C / TCAS	1030 - 1090 MHz
Military Avionics	
IFF Transponders (Identification, Friend or Foe)	1030 - 1090 MHz
TACAN (Tactical Air Navigation)	960 - 1215 MHz
JTIDS / MIDS (Joint Tactical Information Distribution System)	960 - 1215 MHz
Marine radar	9300 - 9500 MHz

2.13 Digital broadcasting at its best

The BLF881 / BLF888 transistor line-up enables today's most powerful and efficient digital broadcast transmitter applications

BLF881

The transistor is based on NXP's new 50V LDMOS technology, and features 140 W RF output power for broadcast transmitter and industrial applications. An unmatched device, the BLF881 can be used in the HF to 1 GHz range. The excellent ruggedness and broadband performance of this device makes it ideal for digital transmitter applications – either stand alone or as a driver in combination with the high-power transistor BLF888.

The BLF881 is also available in an earless version: BLF881S, enabling an even more compact PCB design.

BLF888

Also based on the new 50 V technology created by NXP, the BLF888 is the most powerful LDMOS broadcast transistor to date. The 500 W LDMOS device is specifically designed for digital broadcast transmitter applications. The transistor delivers 110 W average power for a DVB-T signal over the full UHF band from 470 MHz to 860 MHz. The excellent efficiency and ruggedness of this device makes it ideal as the final stage for advanced digital transmitter applications

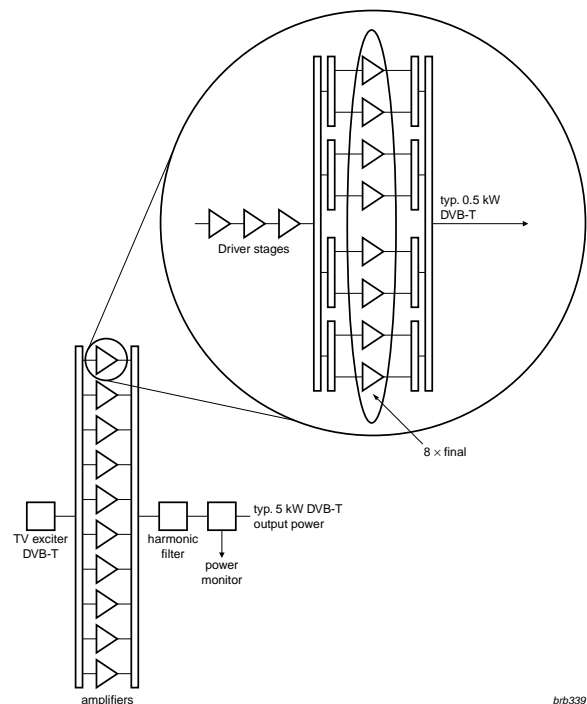
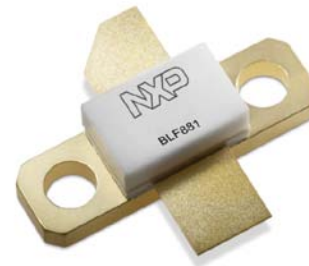
Key benefits

- ▶ 50 V operations to achieve highest power levels in the market
- ▶ Best-in-class ruggedness designed into all devices
- ▶ Best broadband efficiency
- ▶ Best-in-class design support
- ▶ Very low thermal resistance design for unrivalled reliability

Key applications

- ▶ Analogue and digital TV transmitters

Device	f_{range} (MHz)	$P_{L(AV)}$ W	η_D %	G_p dB	@ V_{DS} V	Mode of operation
BLF881(S)	0 - 1000	120	48	21	50	2-TONE
	0 - 1000	30	31	21	50	DVB-T
BLF888	470 - 860	250	46	19	50	2-TONE
	470 - 860	110	31	19	50	DVB-T



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3. Product portfolio

NXP RF product catalog:

<http://www.nxp.com/rf>

3.1 New products

DEV = In development

CQS = Customer qualification samples

RFS = Release for supply

Type	Application / Description	Status May 2010	Planned release	Chapter
NEW: RF diodes				
BAP64Q	Quad pin diodes for e.g. discrete attenuators	RFS	Released	3.2.2
BAP70Q	Quad pin diodes for e.g. discrete attenuators	RFS	Released	3.2.2
NEW: SiGe:C transistors				
BFU610F	6st generation wideband transistor	DEV	Q4 2010	3.3.1
BFU630F	6st generation wideband transistor	DEV	Q4 2010	3.3.1
BFU660F	6st generation wideband transistor	DEV	Q4 2010	3.3.1
BFU690F	6st generation wideband transistor	DEV	Q4 2010	3.3.1
BFU710F	7th generation wideband transistor	DEV	Q4 2010	3.3.1
BFU730F	7th generation wideband transistor	DEV	Q4 2010	3.3.1
BFU760F	7th generation wideband transistor	DEV	Q4 2010	3.3.1
BFU790F	7th generation wideband transistor	DEV	Q4 2010	3.3.1
NEW: Automotive Qualified Wideband MMIC and transistors				
BGA2002	Low noise wideband amplifier MMIC	RFS	Released	3.4.1
BFR94A	RF wideband transistor	RFS	Released	3.3.1
BFR94AW	RF wideband transistor	RFS	Released	3.3.1
NEW: SiGe:C MMICs LNA's for GPS and STB				
BGU7005	SiGe:C MMIC, incl matching output for GPS LNA, 16.5 dB	RFS	Released	3.4.1
BGU7006	SiGe:C MMIC, GPS LNA in wafer level chip-scale package (WLCSP)	DEV	Q4 2010	3.4.1
BGU7007	SiGe:C MMIC, incl matching output for GPS LNA, 18 dB	DEV	Q1 2011	3.4.1
BGU7031	SiGe:C LNA for STB tuning	CQS	Q3 2010	3.4.1
BGU7032	SiGe:C LNA for STB tuning	CQS	Q3 2010	3.4.1
BGU7033	SiGe:C LNA for STB tuning	CQS	Q3 2010	3.4.1
NEW: Mosfets				
BF1215	Double mosfet for STB tuning, world class cross modulation performance	RFS	Released	3.5.2
BF1216	Double mosfet for STB tuning, world class cross modulation performance	RFS	Released	3.5.2
BF1217	Single mosfet for STB tuning, world class cross modulation performance	RFS	Released	3.5.2
BF1218	Double mosfet for TV tuning	RFS	Released	3.5.2
BF1118 series	Mosfet RF switches for antenna loop through	RFS	Released	3.5.2
NEW: Medium power amplifier MMICs				
BGA7124	Medium power amplifier, 24 dBm P1dB, leadless SOT908	RFS	Released	3.4.1
BGA7024	Medium power amplifier, 24 dBm P1dB, leaded SOT89	RFS	Released	3.4.1
BGA7127	Medium power amplifier, 27 dBm P1dB, leadless SOT908	RFS	Released	3.4.1
BGA7027	Medium power amplifier, 27 dBm P1dB, leaded SOT89	RFS	Released	3.4.1
BGA7130	Medium power amplifier, 30 dBm P1dB, leadless SOT908	DEV	Q1 2011	3.4.1
BGA7133	Medium power amplifier, 33 dBm P1dB, leadless SOT908	DEV	Q1 2011	3.4.1
NEW: Variable Gain Amplifiers (VGA)				
BGA7350	Dual IF VGA, control range 24 dB	DEV	Q4 2010	3.4.1
BGA7351	Dual IF VGA, control range 28 dB	DEV	Q1 2011	3.4.1
BGA7202	Tx RF VGA, 0.7 - 2.2 GHz	DEV	Q4 2010	3.4.1
BGA7203	Tx RF VGA, 2.1 - 2.8 GHz	DEV	Q1 2011	3.4.1
BGA7204	Tx RF VGA, 0.7 - 2.8 GHz	DEV	Q1 2011	3.4.1
NEW: SiGe:C LNA's for wireless infrastructures				
BGU7051	Low Noise Amplifier 900 MHz	DEV	Q1 2011	3.4.1
BGU7052	Low Noise Amplifier 1.9 GHz	DEV	Q2 2011	3.4.1
BGU7053	Low Noise Amplifier 2.5 GHz	DEV	Q2 2011	3.4.1
BGU7054	Low Noise Amplifier 3.5 GHz	DEV	Q3 2011	3.4.1

Type	Application / Description	Status May 2010	Planned release	Chapter
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NEW: RF IC's & MMICs for e.g. satellite, VCO/PLL

BGA2800	Satellite IF gain block	RFS	Released	3.4.1
BGA2801	Satellite IF gain block	RFS	Released	3.4.1
BGA2815	Satellite IF gain block	RFS	Released	3.4.1
BGA2816	Satellite IF gain block	RFS	Released	3.4.1
BGA2850	Satellite IF gain block	RFS	Released	3.4.1
BGA2865	Satellite IF gain block	RFS	Released	3.4.1
BGA2866	Satellite IF gain block	RFS	Released	3.4.1
TFF1003HN	Low noise LO generator for VSAT applications	RFS	Released	3.4.2
TFF1007HN	Low noise LO generator for VSAT applications	CQS	Q3 2010	3.4.2
TFF11070HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11073HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11077HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11080HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11084HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11088HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11092HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11096HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11101HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11105HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11110HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11115HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11121HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11126HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11139HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11145HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2
TFF11152HN	Low noise LO generator for general microwave applications	CQS	Q3 2010	3.4.2

NEW: RF CATV modules

CGY1041	1 GHz, 21 dB gain Push Pull, GaAs HFET SOT115	CQS	Q2 2010	3.6.2
CGY1043	1 GHz, 23 dB gain Push Pull, GaAs HFET SOT115	CQS	Q2 2010	3.6.2
CGY1049	1 GHz, 29 dB gain Push Pull, GaAs HFET SOT115	DEV	Q3 2010	3.6.2
CGY1032	1 GHz, 32 dB gain Push Pull, GaAs HFET SOT115	DEV	Q3 2010	3.6.2
CGD1046Hi	1 GHz, 26 dB gain Power Doubler, GaAs HFET SOT115	CQS	Q2 2010	3.6.3
BGO807CE	870 MHz, forward path optical receiver, SOT115	RFS	Released	3.6.4

NEW: RF High Speed Data Converters

ADC1613D series	Dual 16-bit ADC up to 65/80/105/125Msps with serial interface	CQS	Released	3.8.1
ADC1610S series	Single 16-bit ADC up to 65/80/105/125Msps	CQS	Released	3.8.1
ADC1415S series	Single 14-bit ADC up to 65/80/105/125Msps with input buffer	CQS	Released	3.8.1
ADC1413D series	Dual 14-bit ADC up to 65/80/105/125Msps with serial interface	CQS	Released	3.8.1
ADC1412D series	Dual 14-bit ADC up to 65/80/105/125Msps	CQS	Q3 2010	3.8.1
ADC1410S series	Single 14-bit ADC up to 65/80/105/125Msps	CQS	Released	3.8.1
ADC1215S series	Single 12-bit ADC up to 65/80/105/125Msps with input buffer	CQS	Released	3.8.1
ADC1213D series	Dual 12-bit ADC up to 65/80/105/125Msps with serial interface	CQS	Released	3.8.1
ADC1212D series	Dual 12-bit ADC up to 65/80/105/125Msps	CQS	Q3 2010	3.8.1
ADC1210S series	Single 12-bit ADC up to 65/80/105/125Msps	CQS	Released	3.8.1
ADC1115S125	Single 11-bit ADC up to 125Msps with input buffer	CQS	Released	3.8.1
ADC1113D125	Dual 11-bit ADC up to 125Msps with serial interface	CQS	Released	3.8.1
ADC1015S series	Single 10-bit ADC up to 65/80/105/125Msps with input buffer	CQS	Released	3.8.1
ADC1010S series	Single 10-bit ADC up to 125Msps	CQS	Released	3.8.1
DAC1408D series	Dual 14-bit DAC up to 650/750 Msps	CQS	Q3 2010	3.8.2
DAC1405D series	Dual 14-bit DAC up to 650/750 Msps	RFS	Released	3.8.2
DAC1208D series	Dual 12-bit DAC up to 650/750 Msps	CQS	Q3 2010	3.8.2
DAC1205D series	Dual 12-bit DAC up to 650/750 Msps	RFS	Released	3.8.2
DAC1008D series	Dual 10-bit DAC up to 650/750 Msps	CQS	Q3 2010	3.8.2
DAC1005D series	Dual 10-bit DAC up to 650/750 Msps	RFS	Released	3.8.2

NEW: RF Power cellular transistors

BLF7G24L(S)-100(G)	Power Gen7 LDMOS transistor for base station applications	DEV	Q4 2010	3.7.1.4
BLF7G27L(S)-75P	Power Gen7 LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.4
BLF7G27L(S)-50BN	Power LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.4
BLF7G27L(S)-100	Power Gen7 LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.4
BLF7G27L(S)-140	Power Gen7 LDMOS transistor for base station applications	DEV	Q3 2010	3.7.1.4
BLF7G22L(S)-250P	Power Gen7 LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.3
BLF7G20L(S)-300P	Power Gen7 LDMOS transistor for base station applications	DEV	Q3 2010	3.7.1.2
BLF7G20L(S)-200	Power Gen7 LDMOS transistor for base station applications	DEV	Q3 2010	3.7.1.2
BLF7G20L(S)-250P	Power Gen7 LDMOS transistor for base station applications	DEV	Q3 2010	3.7.1.2
BLF6G10L(S)-40BRN	Power LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.1
BLF6G10L(S)-260PRN	Power LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.1
BLF6G07L(S)-260PBM	Power LDMOS transistor for base station applications	DEV	Q2 2010	3.7.1.1

NEW: RF Power Broadcast transistors

BLF573	High Voltage RF Power transistor for broadcast/ISM	DEV	Q2 2010	3.7.2.1
BLF888A(S)	High Voltage RF Power transistor for broadcast/ISM	DEV	Q3 2010	3.7.2.1

NEW: RF Power Microwave transistors

BLS7G2729S-300P	RF Power transistors for S band	DEV	Q4 2010	3.7.3.3
BLS6G2933P-200	High voltage RF Power pallet for S band	DEV	Q3 2010	3.7.3.3
BLS7G2731P-200	High voltage RF Power pallet for S band	DEV	Q4 2010	3.7.3.3

3.2 RF diodes

3.2.1 Varicap diodes

NEW: Varicap selection guide on www.nxp.com/varicaps
Easy-to-use parametric filters help you to choose the right varicap for your design.

Why choose NXP semiconductors' varicap diodes:

- ▶ Reference designs for TV and radio tuning
- ▶ Direct matching process
- ▶ Small tolerances
- ▶ Short leadtimes
- ▶ Complete portfolio covering broad frequency range and variety in package (including leadless)
- ▶ Reliable volume supply

VCO and FM radio tuning varicap diodes

Type	Package	Number of diodes	Configuration	@ f = 1 MHz												r _s typ	r _s max	@ f =
				C _d min	C _d typ	C _d max	@ V _R =	C _d min	C _d typ	C _d max	@ V _R =	C _{d1} /C _{d2} min	C _{d1} /C _{d2} max	@ V1 =	@ V2 =			
				(pF)	(pF)	(pF)	(V)	(pF)	(pF)	(pF)	(V)			(V)	(V)			
BB145B	SOD523	1	SG	6.4	-	7.2	1	2.55	-	2.95	4	2.2	-	1	4	-	0.6	470
BB156	SOD323	1	SG	14.4	16	17.6	1	4.2	4.8	5.4	7.5	2.7	3.9	1	7.5	0.4	0.7	470
BB198	SOD523	1	SG	25	-	28.5	1	4.8	-	6.8	4	-	-	-	-	-	0.8	100
BB199	SOD523	1	SG	36.5	-	42.5	0.5	11.8	-	13.8	2	2.8	-	0.5	2	0.25	-	100
BB201	SOT23	2	CC	89	95	102	1	25.5	27.6	29.7	7.5	3.1	3.8	1	7.5	0.25	0.5	100
BB202^^	SOD523	1	SG	28.2	-	33.5	0.2	7.2	-	11.2	2.3	2.5	-	0.2	2.3	0.35	0.6	100
BB202LX^^	SOD882T	1	SG	28.2	-	33.5	0.2	7.2	-	11.2	2.3	2.5	-	0.2	2.3	0.35	-	100
BB207^	SOT23	2	CC	76	81	86	1	25.5	27.6	29.7	7.5	2.6	3.3	1	7.5	0.2	0.4	100
BB208-02^	SOD523	1	SG	19.9	-	23.2	1	4.5	-	5.4	7.5	3.7	5.2	1	7.5	0.35	0.5	100
BB208-03^	SOD323	1	SG	19.9	-	23.2	1	4.5	-	5.4	7.5	3.7	5.2	1	7.5	0.35	0.5	100

^ = Including special design for FM car radio (CREST-IC:TEF6860).

^^ = Including special design for mobile phone tuner ICs.

Type of connection:

SG: Single

CC: Common Cathode

TV / VCR / DVD / HDD varicap diodes - UHF tuning

Type	Package	@ f = 1 MHz										r _s typ	r _s max	@ f =	@ C _d =	ΔC _d /C _d	@ V ₁ =	@ V ₂ =	@ N _s =
		C _d min	C _d typ	C _d max	@ V _R =	C _{d1} /C _{d2} min	C _{d1} /C _{d2} typ	C _{d1} /C _{d2} max	@ V ₁ =	@ V ₂ =									
		(pF)	(pF)	(pF)	(V)				(V)	(V)	(Ω)								
Matched																			
BB149	SOD323	1.9	2.1	2.25	28	8.2	9	10	1	28	-	0.75	470	9	2	0.5	28	10	
BB149A	SOD323	1.951	2.1	2.225	28	8.45	9	10.9	1	28	0.6	0.75	470	9	2	1	28	10	
BB179	SOD523	1.951	2.1	2.225	28	8.45	9	10.9	1	28	0.6	0.75	470	9	2	1	28	10	
BB179B	SOD523	1.9	2.1	2.25	28	8.45	9	10	1	28	0.6	0.75	470	9	2	1	28	10	
BB179BLX	SOD882T	1.9	-	2.25	28	-	9	-	1	28	0.65	-	470	9	2	1	28	10	
BB179LX	SOD882T	1.95	2.1	2.22	28	8.45	9	10.9	1	28	0.65	-	470	30	2	1	28	5	
BB184	SOD523	1.87	2	2.13	10	6	7	-	1	10	0.65	-	470	9	2	1	10	5	
BB189	SOD523	1.89	2.04	2.18	25	6.3	7.3	-	2	25	0.65	0.7	470	9	1.8	2	25	10	
Unmatched																			
BB135	SOD323	1.7	-	2.1	28	8.9	-	12	0.5	28	-	0.75	470	9	-	-	-	-	

Bold = Highly recommended product

TV / VCR / DVD / HDD varicap diodes - VHF tuning

Type	Package	@ f = 1 MHz										r _s typ	r _s max	@ f =	@ C _d =	ΔC _d /C _d	@ V ₁ =	@ V ₂ =	@ N _s =
		C _d min	C _d typ	C _d max	@ V _R =	C _{d1} /C _{d2} min	C _{d1} /C _{d2} typ	C _{d1} /C _{d2} max	@ V ₁ =	@ V ₂ =									
		(pF)	(pF)	(pF)	(V)				(V)	(V)									
Matched																			
BB148	SOD323	2.4	2.6	2.75	28	14.5	15	-	1	28	-	0.9	100	12	2	0.5	28	10	
BB152	SOD323	2.48	2.7	2.89	28	20.6	22	-	1	28	1	1.2	100	30	2	1	28	10	
BB153	SOD323	2.361	2.6	2.754	28	13.5	15	-	1	28	0.65	0.8	100	30	2	1	28	10	
BB178	SOD523	2.361	2.6	2.754	28	13.5	15	-	1	28	0.65	0.8	100	30	2	1	28	10	
BB178LX	SOD882T	2.36	2.6	2.75	28	13.5	15	-	1	28	0.7	-	470	30	2	1	28	5	
BB182	SOD523	2.48	2.7	2.89	28	20.6	22	-	1	28	1	1.2	100	30	2	1	28	10	
BB182LX	SOD882T	2.48	2.7	2.89	28	-	22	-	1	28	1	-	100	30	2	1	28	10	
BB187	SOD523	2.57	2.75	2.92	25	11	-	-	2	25	-	0.75	470	-	2	2	25	10	
BB187LX	SOD882T	2.57	2.75	2.92	25	11	-	-	2	25	-	0.75	470	-	2	2	25	10	
Unmatched																			
BB131	SOD323	0.7	-	1.055	28	12	-	16	0.5	28	-	3	470	9	-	-	-	-	
BB181	SOD523	0.7	-	1.055	28	12	-	16	0.5	28	-	3	470	9	-	-	-	-	
BB181LX	SOD882T	0.7	-	1.055	28	-	14	-	0.5	28	2	-	470	9	-	-	-	-	
BBY40	SOT23	4.3	-	6	25	5	-	6.5	3	25	-	0.7	200	25	-	-	-	-	

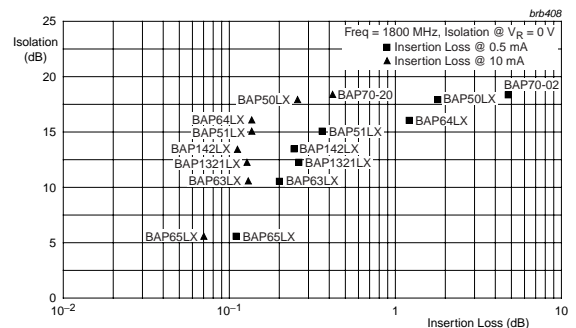
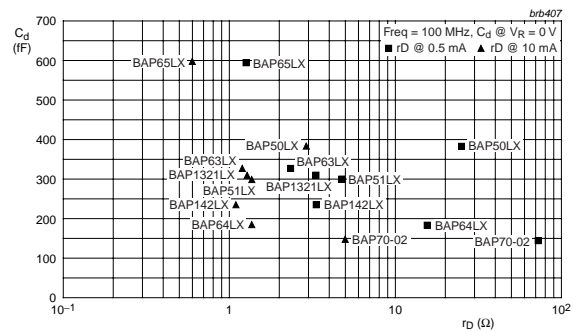
Bold = Highly recommended product

3.2.2 PIN diodes

NEW: Pin diode selection guide on www.nxp.com/pindiodes
Easy-to-use parametric filters help you to choose the right pin diode for your design.

Why choose NXP Semiconductors' PIN diodes:

- ▶ Broad portfolio
- ▶ Unrivalled performance
- ▶ Short leadtimes
- ▶ Low series inductance
- ▶ Low insertion loss
- ▶ Low capacitance



Look for more graphs showing the Pin diode line-up at other frequencies on our web site: www.nxp.com/pindiodes

PIN diodes: typical r_D @ 1 mA ≤ 2, switching diodes

Type	Package	Number of diodes	Conf	V _R max (V)	IF max (mA)	@ f = 100 MHz						@ f = 1 MHz					
						@ IF = 0.5 mA		@ IF = 1 mA		@ IF = 10 mA		@ V _R = 0 V		@ V _R = 1 V		@ V _R = 20 V	
						r _D typ (Ω)	r _D max (Ω)	r _D typ (Ω)	r _D max (Ω)	r _D typ (Ω)	r _D max (Ω)	C _d typ (pF)	C _d max (pF)	C _d typ (pF)	C _d max (pF)	C _d typ (pF)	C _d max (pF)
BAP65LX	SOD882T	1	SG	30	100	-	-	0.94	-	0.49	0.9	0.61	0.48	0.85	0.37	-	
BAP65-02	SOD523	1	SG	30	100	-	-	1	-	0.56	0.9	0.65	0.55	0.9	0.375	-	
BAP65-03	SOD323	1	SG	30	100	-	-	1	-	0.56	0.9	0.65	0.55	0.9	0.375	-	
BAP65-05	SOT23	2	CC	30	100	-	-	1	-	0.56	0.9	0.7	0.575	0.9	0.425	-	
BAP65-05W	SOT323	2	CC	30	100	-	-	1	-	0.56	0.9	0.7	0.575	0.9	0.425	-	
BAP63LX	SOD882T	1	SG	50	100	2.3	3.3	1.87	3	1.19	1.8	0.34	0.29	-	0.24	0.3	
BAP63-02	SOD523	1	SG	50	100	2.5	3.5	1.95	3	1.17	1.8	0.36	0.32	-	0.25	0.32	
BAP63-03	SOD323	1	SG	50	100	2.5	3.5	1.95	3	1.17	1.8	0.4	0.35	-	0.27	0.32	
BAP63-05W	SOT323	2	CC	50	100	2.5	3.5	1.95	3	1.17	1.8	0.4	0.35	-	0.3	0.35	

PIN diodes: typical r_D @ 1 mA = 2.2 - 2.4, switching diodes

Type	Package	Number of diodes	Conf	V_R max (V)	IF max (mA)	@ f = 100 MHz						@ f = 1 MHz				
						@ IF = 0.5 mA		@ IF = 1 mA		@ IF = 10 mA		@ $V_R = 0$ V	@ $V_R = 1$ V		@ $V_R = 20$ V	
						r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	C_d typ (pF)	C_d typ (pF)	C_d max (pF)	C_d typ (pF)	C_d max (pF)
BAP55LX	SOD882T	1	SG	50	100	3.3	4.5	2.2	3.3	0.8	1.2	0.28	0.23	-	0.18	0.28
BAP1321-02	SOD523	1	SG	60	100	3.4	5	2.4	3.6	1.2	1.8	0.4	0.35	0.45	0.25	0.32
BAP1321-03	SOD323	1	SG	60	100	3.4	5	2.4	3.6	1.2	1.8	0.4	0.35	0.45	0.25	0.32
BAP1321-04	SOT23	2	SR	60	100	3.4	5	2.4	3.6	1.2	1.8	0.42	0.375	0.45	0.275	0.325
BAP1321LX	SOD882T	1	SG	60	100	3.3	5	2.4	3.6	1.2	1.8	0.32	0.27	0.38	0.21	0.28
BAP142LX	SOD882T	1	SG	50	100	3.3	5	2.4	3.6	1	1.8	0.25	0.22	-	0.16	0.26

PIN diodes: typical r_D @ 1 mA = 3.2 - 3.6, switching diodes

Type	Package	Number of diodes	Conf	V_R max (V)	IF max (mA)	@ f = 100 MHz						@ f = 1 MHz				
						@ IF = 0.5 mA		@ IF = 1 mA		@ IF = 10 mA		@ $V_R = 0$ V	@ $V_R = 1$ V		@ $V_R = 20$ V	
						r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	C_d typ (pF)	C_d typ (pF)	C_d max (pF)	C_d typ (pF)	C_d max (pF)
BAP51LX	SOD882T	1	SG	60	100	4.9	9	3.2	6.5	1.4	2.5	0.3	0.22	0.4	0.17	0.3
BAP51-02	SOD523	1	SG	60	50	5.5	9	3.6	6.5	1.5	2.5	0.4	0.3	0.55	0.2	0.35
BAP51-03	SOD323	1	SG	50	50	5.5	9	3.6	6.5	1.5	2.5	0.4	0.3	0.55	0.2	0.35
BAP51-04W	SOT323	2	SR	50	50	5.5	9	3.6	6.5	1.5	2.5	0.4	0.3	0.55	0.2	0.35
BAP51-05W	SOT323	2	CC	50	50	5.5	9	3.6	6.5	1.5	2.5	0.4	0.3	0.55	0.2	0.35
BAP51-06W	SOT323	2	CA	50	50	5.5	-	3.6	-	2	-	0.4	0.3	-	0.2	-

PIN diodes: typical r_D @ 1 mA = 10, attenuator/switching diodes

Type	Package	Number of diodes	Conf	V_R max (V)	IF max (mA)	@ f = 100 MHz						@ f = 1 MHz				
						@ IF = 0.5 mA		@ IF = 1 mA		@ IF = 10 mA		@ $V_R = 0$ V	@ $V_R = 1$ V		@ $V_R = 20$ V	
						r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	C_d typ (pF)	C_d typ (pF)	C_d max (pF)	C_d typ (pF)	C_d max (pF)
BAP64Q	SOT753	4	SR	100	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35
BAP64-02	SOD523	1	SG	175	100	20	40	10	20	2	3.8	0.48	0.35	-	0.23	0.35
BAP64-03	SOD323	1	SG	175	100	20	40	10	20	2	3.8	0.48	0.35	-	0.23	0.35
BAP64-04	SOT23	2	SR	175	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35
BAP64-04W	SOT323	2	SR	100	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35
BAP64-05	SOT23	2	CC	175	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35
BAP64-05W	SOT323	2	CC	100	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35
BAP64-06	SOT23	2	CA	175	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35
BAP64-06W	SOT323	2	CA	100	100	20	40	10	20	2	3.8	0.52	0.37	-	0.23	0.35

PIN diodes: typical r_D @ 1 mA = 14 - 16, attenuator diodes

Type	Package	Number of diodes	Conf	V_R max (V)	IF max (mA)	@ f = 100 MHz						@ f = 1 MHz					
						@ IF = 0.5 mA		@ IF = 1 mA		@ IF = 10 mA		@ $V_R = 0$ V	@ $V_R = 1$ V		@ $V_R = 20$ V		
						r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	C_d typ (pF)	C_d typ (pF)	C_d max (pF)	C_d typ (pF)	C_d max (pF)	@ $V_R = 20$ V (V)
BAP50-02	SOD523	1	SG	50	50	25	40	14	25	3	5	0.4	0.3	0.55	0.22	0.35	5
BAP50-03	SOD323	1	SG	50	50	25	40	14	25	3	5	0.4	0.3	0.55	0.2	0.35	5
BAP50-04	SOT23	2	SR	50	50	25	40	14	25	3	5	0.45	0.35	0.6	0.3	0.5	5
BAP50-04W	SOT323	2	SR	50	50	25	40	14	25	3	5	0.45	0.35	0.6	0.3	0.5	5
BAP50-05	SOT23	2	CC	50	50	25	40	14	25	3	5	0.45	0.3	0.5	0.35	0.6	1
BAP50-05W	SOT323	2	CC	50	50	25	40	14	25	3	5	0.45	0.35	0.6	0.3	0.5	5
BAP50LX	SOD882T	1	SG	50	50	26	40	14	25	3	5	0.4	0.28	0.55	0.19	0.35	5
BAP64LX^	SOD882T	1	SG	60	100	31	50	16	26	2.6	4.4	0.48	0.34	-	0.17	0.3	20

^ = attenuator / switching diode

PIN diodes: typical r_D @ 1 mA = 40, attenuator diodes

Type	Package	Number of diodes	Conf	V_R max (V)	IF max (mA)	@ f = 100 MHz						@ f = 1 MHz				
						@ IF = 0.5 mA		@ IF = 1 mA		@ IF = 10 mA		@ $V_R = 0$ V	@ $V_R = 1$ V		@ $V_R = 20$ V	
						r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	r_D typ (Ω)	r_D max (Ω)	C_d typ (pF)	C_d typ (pF)	C_d max (pF)	C_d typ (pF)	C_d max (pF)
BAP70Q	SOT753	4	SR	50	100	77	100	40	50	5.4	7	0.6	0.43	-	0.25	0.3
BAP70-02	SOD523	1	SG	50	100	77	100	40	50	5.4	7	0.57	0.4	-	0.2	0.25
BAP70-03	SOD323	1	SG	50	100	77	100	40	50	5.4	7	0.57	0.4	-	0.2	0.25
BAP70-04W	SOT323	2	SR	50	100	77	100	40	50	5.4	7	0.6	0.43	-	0.25	0.3
BAP70-05	SOT23	2	CC	50	100	77	100	40	50	5.4	7	0.6	0.43	-	0.25	0.3
BAP70AM	SOT363	4	SR	50	100	77	100	40	50	5.4	7	0.57	0.4	-	0.2	0.25

Bold = highly recommended product

Bold Red = New, highly recommended product

SG = Single

SR = Series

CC = Common Cathode

CA = Common Anode

3.2.3 Band-switch diodes

Why choose NXP Semiconductors' bandswitch diodes:

- ▶ Reliable volume supplier
- ▶ Short leadtimes
- ▶ Low series Inductance
- ▶ Low Insertion loss
- ▶ Low capacitance
- ▶ High reverse Isolation

Type	Package	V_R max (V)	IF max (mA)	r_D max (Ω)	@ IF = (mA)	@ f = (MHz)	C_d max (pF)	@ V_R = (V)	@ f = (MHz)
BA277	SOD523	35	100	0.7	2	100	1.2	6	1
BA591	SOD323	35	100	0.7	3	100	0.9	3	1
BA891	SOD523	35	100	0.7	3	100	0.9	3	1
BAT18	SOT23	35	100	0.7	5	200	1	20	1

Bold = Highly recommended product

3.2.4 Schottky diodes

NEW: Schottky diode selection guide on www.nxp.com/rfschottkydiodes
Easy-to-use parametric filters help you to choose the right schottky diode for your design.

Why choose NXP Semiconductors' schottky diodes

- ▶ (Very) low diode capacitance
- ▶ (Very) low forward voltage
- ▶ Single and triple-isolated diode
- ▶ (Ultra / very) small package

Applications

- ▶ Digital applications:
 - ultra high-speed switching
 - clamping circuits
- ▶ RF applications:
 - diode ring mixer
 - RF detector
 - RF voltage doubler

Low-capacitance Schottky diodes

Type	Package	Configuration	V_R max. (V)	I_F max. (mA)	V_F max. (mV)	C_D max. (pF)
BAT17	SOT23	single	4	30	450 @ IF = 1 mA	1 @ VR = 0 V
PMBD353	SOT23	dual series	4	30	450 @ IF = 1 mA	1 @ VR = 0 V
PMBD354^	SOT23	dual series	4	30	450 @ IF = 1 mA	1 @ VR = 0 V
1PS76SB17	SOD323	single	4	30	450 @ IF = 1 mA	1 @ VR = 0 V
1PS66SB17	SOT666	triple isolated	4	30	450 @ IF = 1 mA	1 @ VR = 0 V
1PS79SB17	SOD523	single	4	30	450 @ IF = 1 mA	1 @ VR = 0 V
1PS88SB82	SOT363	triple isolated	15	30	340 @ IF = 1 mA	1 @ VR = 0 V
1PS70SB82	SOT323	single	15	30	340 @ IF = 1 mA	1 @ VR = 0 V
1PS70SB84	SOT323	dual series	15	30	340 @ IF = 1 mA	1 @ VR = 0 V
1PS70SB85	SOT323	dual c.c.	15	30	340 @ IF = 1 mA	1 @ VR = 0 V
1PS70SB86	SOT323	dual c.a.	15	30	340 @ IF = 1 mA	1 @ VR = 0 V
1PS66SB82	SOT666	triple isolated	15	30	340 @ IF = 1 mA	1 @ VR = 0 V
1PS10SB82	SOD882	single	15	30	340 @ IF = 1 mA	1 @ VR = 0 V

^ Diodes have matched capacitance

3.3 RF Bipolar transistors

3.3.1 Wideband transistors

NEW: RF wideband transistor selection guide on www.nxp.com/rftransistors
Easy-to-use parametric filters help you to choose the right RF wideband transistor for your design.

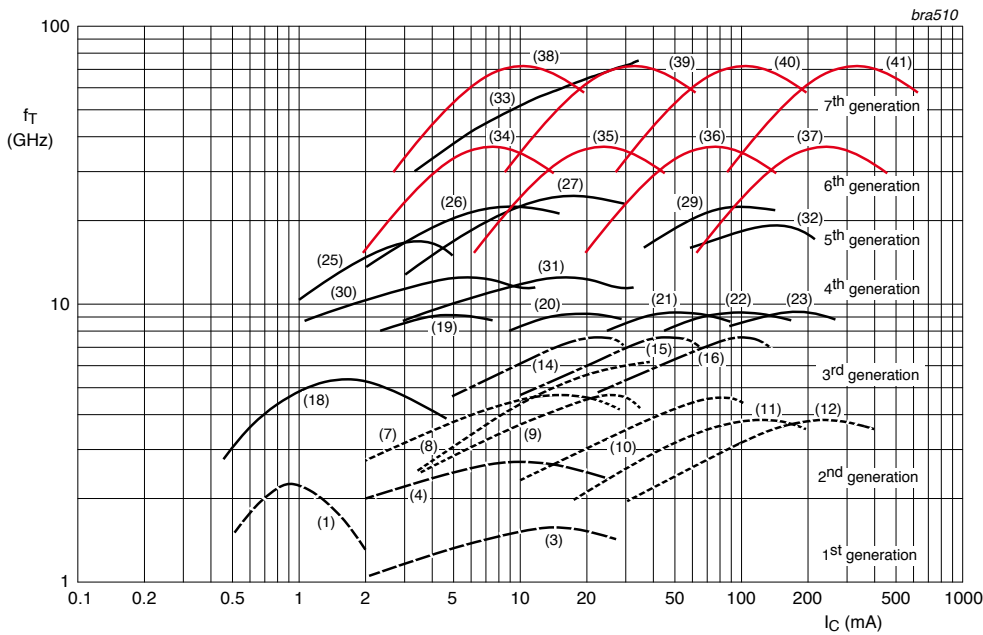
Why choose NXP Semiconductors' wideband transistors

- ▶ Broad portfolio (1st - 7th generation)
- ▶ Short leadtimes
- ▶ Smallest packages
- ▶ Volume delivery

Wideband transistors

The f_T - I_C curve represents Transition Frequency (f_T) characteristics as a function of collector current (I_C) for the six generations of RF wideband transistors. A group of transistors having the same collector current (I_C) & similar transition frequencies (f_T) represents a curve. The curve number matches the products in the table, detailing their RF characteristics.

Wideband transistors line-up per frequency



PIN	DESCRIPTION
Type (see Fig.1)	
1	collector
2	base
3	emitter
4	emitter
Type/X (see Fig.1)	
1	collector
2	emitter
3	base
4	emitter
Type/XR (see Fig.2)	
1	collector
2	emitter
3	base
4	emitter

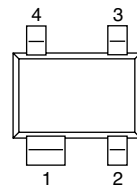


Figure 1

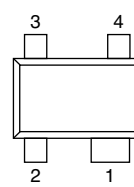


Figure 2

Wideband transistors (RF small signal)

RF power transistors for handheld equipment

Type	Package	V _{CEO} (max) (V)	I _c (max) (mA)	P _{tot} (max) (mW)	Polarity	GUM (typ) (dB)	@ f = (MHz)	@ I _c = (mA)	@ V _{CE} = (V)
BFG10	SOT143	8	250	400	NPN	7	1900	1	3.6
BFG10/X	SOT143	8	250	400	NPN	7	1900	1	3.6
BFG10W/X	SOT343	10	250	400	NPN	7	1900	1	3.6
BLT50	SOT223	10	500	2000	NPN	-	-	-	-
BLT70	SOT223H	8	250	2100	NPN	-	-	-	-
BLT80	SOT223	10	250	2000	NPN	-	-	-	-
BLT81	SOT223	9.5	500	2000	NPN	-	-	-	-

RF wideband transistors generation 1 - 3

Type	Generation	Curve	Package	f _T (typ) (GHz)	V _{CEO} (max) (V)	I _c (max) (mA)	P _{tot} (max) (mW)	Polarity	GUM (typ) (dB)	@ f = (MHz)	@ I _c = (mA)	@ V _{CE} = (V)	GUM (typ) (dB)	@ f = (MHz)	@ I _c = (mA)	@ V _{CE} = (V)	NF (typ) (dB)	@ f = (MHz)	@ I _c = (mA)	@ V _{CE} = (V)	NF (typ) (dB)	@ f = (MHz)	@ I _c = (mA)	@ V _{CE} = (V)
BFS17	1 st	3	SOT23	1	15	25	300	NPN	-	-	-	-	-	-	-	-	4.5	500	2	5	-	-	-	-
BFS17W	1 st	3	SOT323	1.6	15	50	300	NPN	-	-	-	-	-	-	-	-	4.5	500	2	5	-	-	-	-
BFT25	1 st	1	SOT23	2.3	5	6.5	30	NPN	18	500	1	1	12	800	1	1	3.8	500	1	1	-	-	-	-
BFG25A/X	2 nd	18	SOT143B	5	5	6.5	32	NPN	-	-	-	-	18	1000	0.5	1	1.8	1000	0.5	1	-	-	-	-
BFG25AW	2 nd	18	SOT343N	5	5	6.5	500	NPN	-	-	-	-	16	2000	0.5	1	2	1000	1	1	-	-	-	-
BFG25AW/X	2 nd	18	SOT343N	5	5	6.5	500	NPN	16	1000	0.5	1	8	2000	0.5	1	2	1000	1	1	-	-	-	-
BFG31	2 nd	10	SOT223	5	-15	-100	1000	PNP	16	500	-70	-10	12	800	-70	-10	-	-	-	-	-	-	-	-
BFG35	2 nd	11	SOT223	4	18	150	1000	NPN	15	500	100	10	11	800	100	10	-	-	-	-	-	-	-	-
BFG92A/X	2 nd	7	SOT143B	5	15	25	400	NPN	16	1000	15	10	11	2000	15	10	2	1000	5	10	3	2000	5	10
BFG97	2 nd	10	SOT223	5.5	15	100	1000	NPN	16	500	70	10	12	800	70	10	-	-	-	-	-	-	-	-
BFQ149	2 nd	10	SOT89	5	-15	-100	1000	PNP	12	500	-50	-10	-	-	-	-	3.75	500	-50	-10	-	-	-	-
BFQ18A	2 nd	11	SOT89	4	18	150	1000	NPN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BFQ19	2 nd	10	SOT89	5.5	15	100	1000	NPN	11.5	500	50	10	7.5	800	50	10	3.3	500	50	10	-	-	-	-
BFR106	2 nd	10	SOT23	5	15	100	500	NPN	-	-	-	-	11.5	800	30	6	3.5	800	30	6	-	-	-	-
BFR92A	2 nd	7	SOT23	5	15	25	300	NPN	14	1000	15	10	8	2000	15	10	3	2000	5	10	2.1	1000	5	10
BFR92AW	2 nd	7	SOT323	5	15	25	300	NPN	14	1000	15	10	8	2000	15	10	2	1000	5	10	3	2000	5	10
BFS17A	2 nd	4	SOT23	2.8	15	25	300	NPN	-	-	-	-	13.5	800	14	10	2.5	800	2	5	-	-	-	-
BFS25A	2 nd	18	SOT323	5	5	6.5	32	NPN	-	-	-	-	13	1000	0.5	1	1.8	1000	1	1	-	-	-	-
BFT25A	2 nd	18	SOT23	5	5	6.5	32	NPN	-	-	-	-	15	1000	0.5	1	1.8	1000	0.5	1	-	-	-	-
BFT92	2 nd	7	SOT23	5	-15	-25	300	PNP	18	500	-14	-10	-	-	-	-	2.5	500	-5	-10	-	-	-	-
BFT92W	2 nd	7	SOT323	4	-15	-35	300	PNP	17	500	-15	-10	11	1000	-15	-10	2.5	500	-5	-10	3	1000	-5	-10
BFT93	2 nd	9	SOT23	5	-12	-35	300	PNP	16.5	500	-30	-5	-	-	-	-	2.4	500	-10	-5	-	-	-	-
BFT93W	2 nd	9	SOT323	4	-12	-50	300	PNP	15.5	500	-30	-5	10	1000	-30	-5	2.4	500	-10	-5	3	1000	-10	-5
BFG135	3 rd	16	SOT223	7	15	150	1000	NPN	16	500	100	10	12	800	100	10	-	-	-	-	-	-	-	-
BFG198	3 rd	15	SOT223	8	10	100	1000	NPN	18	500	50	8	15	800	50	8	-	-	-	-	-	-	-	-
BFQ590	3 rd	22	SOT143B	5	15	200	400	NPN	13	900	80	4	7.5	2000	80	4	-	-	-	-	-	-	-	-
BFG590/X	3 rd	22	SOT143B	5	15	200	400	NPN	13	900	80	4	7.5	2000	80	4	-	-	-	-	-	-	-	-
BFG591	3 rd	22	SOT223	7	15	200	2000	NPN	13	900	70	12	7.5	2000	70	12	-	-	-	-	-	-	-	-
BFG67	3 rd	14	SOT143B	8	10	50	380	NPN	17	1000	15	8	10	2000	15	8	1.7	1000	15	8	2.5	2000	5	8
BFQ67/X	3 rd	14	SOT143B	8	10	50	380	NPN	17	1000	15	8	10	2000	15	8	1.7	1000	15	8	2.5	2000	5	8
BFG93A	3 rd	8	SOT143B	6	12	35	300	NPN	16	1000	30	8	10	2000	30	8	1.7	1000	5	8	2.3	2000	5	8
BFG93A/X	3 rd	8	SOT143B	6	12	35	300	NPN	16	1000	30	8	10	2000	30	8	1.7	1000	5	8	2.3	2000	5	8
BFG94	3 rd	8	SOT223	6	12	60	700	NPN	-	-	-	-	13.5	1000	45	10	2.7	500	45	10	3	1000	45	10
BFQ591	3 rd	22	SOT89	7	15	200	2250	NPN	11	900	70	12	5.5	2000	70	12	-	-	-	-	-	-	-	-
BFQ67W	3 rd	14	SOT323	8	10	50	300	NPN	13	1000	15	8	8	2000	15	8	1.3	1000	5	8	2.7	2000	15	8
BFR93A	3 rd	8	SOT23	6	12	35	300	NPN	13	1000	30	8	7	2000	30	8	1.9	1000	5	8	3	2000	5	8
BFR94A^	3 rd	8	SOT23	6	12	35	300	NPN	13	1000	30	8	7	2000	30	8	1.9	1000	5	8	3	2000	5	8
BFR93AR	3 rd	8	SOT23	6	12	35	300	NPN	13	1000	30	8	7	2000	30	8	1.9	1000	5	8	3	2000	5	8
BFR93AW	3 rd	8	SOT323	5	12	35	300	NPN	13	1000	30	8	8	2000	30	8	1.5	1000	5	8	2.1	2000	5	8
BFR94AW^	3 rd	8	SOT323	5	12	35	300	NPN	13	1000	30	8	8	2000	30	8	1.5	1000	5	8	2.1	2000	5	8

Bold = Highly recommended product

Bold Red = New, highly recommended product

^ = automotive qualified

RF wideband transistors generation 4 - 4.5

Type	Generation	Curve	Package	f _T (typ) (GHz)	V _{CE0} (max) (V)	I _C (max) (mA)	P _{tot} (max) (mW)	Polarity	GUM (typ) (dB)	@ f = (MHz)	@ I _C = (mA)	@ V _{CE} = (V)	NF (typ) (dB)	@ f = (MHz)	@ I _C = (mA)	@ V _{CE} = (V)	NF (typ) (dB)	@ f = (MHz)	@ I _C = (mA)	@ V _{CE} = (V)	PL(1dB) (typ) (dBmW)	@ V _{CE} = (V)	@ f = (MHz)	@ I _C = (mA)	IP3 (typ) (dBm)	@ IC = (mA)	@ VCE = (V)
BFG505	4 th	19	SOT143B	9	15	18	150	NPN	13	2000	5	6	1.6	900	5	6	1.9	2000	1.25	6	4	6	900	5	10	5	6
BFG505/X	4 th	19	SOT143B	9	15	18	150	NPN	13	2000	5	6	1.6	900	5	6	1.9	2000	1.25	6	4	6	900	5	10	5	6
BFG505W	4 th	19	SOT343N	9	15	18	500	NPN	12	2000	5	6	1.6	900	5	6	1.9	2000	1.25	6	4	6	900	5	10	5	6
BFG505W/X	4 th	19	SOT343N	9	15	18	500	NPN	12	2000	5	6	1.6	900	5	6	1.9	2000	1.25	6	4	6	900	5	10	5	6
BFG505W/XR	4 th	19	SOT343R	9	15	18	500	NPN	12	2000	5	6	1.6	900	5	6	1.9	2000	1.25	6	4	6	900	5	10	5	6
BFG520	4 th	20	SOT143B	9	15	70	300	NPN	13	2000	20	6	1.6	900	20	6	1.9	2000	5	6	17	6	900	20	26	20	6
BFG520/X	4 th	20	SOT143B	9	15	70	300	NPN	13	2000	20	6	1.6	900	20	6	1.9	2000	5	6	17	6	900	20	26	20	6
BFG520/XR	4 th	20	SOT143R	9	15	70	300	NPN	13	2000	20	6	1.6	900	20	6	1.9	2000	5	6	17	6	900	20	26	20	6
BFG520W	4 th	20	SOT343N	9	15	70	500	NPN	11	2000	20	6	1.1	900	5	6	1.85	2000	5	6	17	6	900	20	26	20	6
BFG520W/X	4 th	20	SOT343N	9	15	70	500	NPN	11	2000	20	6	1.1	900	5	6	1.85	2000	5	6	17	6	900	20	26	20	6
BFG540	4 th	21	SOT143B	9	15	120	400	NPN	11	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFG540/X	4 th	21	SOT143B	9	15	120	400	NPN	11	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFG540/XR	4 th	21	SOT143R	9	15	120	400	NPN	11	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFG540W	4 th	21	SOT343N	9	15	120	500	NPN	10	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFG540W/X	4 th	21	SOT343N	9	15	120	500	NPN	10	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFG540W/XR	4 th	21	SOT343R	9	15	120	500	NPN	10	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFG541	4 th	21	SOT223	9	15	120	650	NPN	9	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFM505	4 th	19	SOT363A	9	8	18	500	NPN	10	2000	5	3	1.1	900	1	3	1.9	2000	5	3	-	-	-	-	-	-	-
BFM520	4 th	20	SOT363A	9	8	70	1000	NPN	9	2000	20	3	1.2	900	5	3	1.9	2000	5	3	-	-	-	-	-	-	-
BFQ540	4 th	21	SOT89	9	15	120	1,200	NPN	-	-	-	-	1.9	900	40	8	-	-	-	-	-	-	-	-	-	-	-
BFQ67	4 th	14	SOT23	8	10	50	300	NPN	8	2000	15	8	1.7	1000	15	8	2.7	2000	15	8	-	-	-	-	-	-	-
BFR505	4 th	19	SOT23	9	15	18	150	NPN	10	2000	5	6	1.2	900	5	6	1.9	2000	5	6	4	6	900	5	10	5	6
BFR505T	4 th	19	SOT416	9	15	18	150	NPN	10	2000	5	6	1.2	900	1.25	6	1.9	2000	1.25	6	5	6	900	5	10	5	6
BFR520	4 th	20	SOT23	9	15	70	300	NPN	9	2000	20	6	1.1	900	5	6	1.9	2000	5	6	17	6	900	20	26	20	6
BFR520T	4 th	20	SOT416	9	15	70	150	NPN	9	2000	20	6	1.1	900	5	6	1.9	2000	5	6	17	6	900	20	26	20	6
BFR540	4 th	21	SOT23	9	15	120	500	NPN	7	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
BFS505	4 th	19	SOT323	9	15	18	150	NPN	10	2000	5	6	1.2	900	1.25	6	1.9	2000	1.25	6	4	6	900	5	10	5	6
BFS520	4 th	20	SOT323	9	15	70	300	NPN	9	2000	20	6	1.1	900	5	6	1.9	2000	5	6	17	6	900	20	26	20	6
BFS540	4 th	21	SOT323	9	15	120	500	NPN	8	2000	40	8	1.3	900	10	8	2.1	2000	10	8	21	8	900	40	34	40	8
PBR941	4 th	20	SOT23	8	10	50	360	NPN	9.5	2000	15	6	1.4	1000	5	6	2	2000	5	6	-	-	-	-	-	-	-
PBR951	4 th	21	SOT23	8	10	100	365	NPN	8	2000	30	6	1.3	1000	5	6	2	2000	5	6	-	-	-	-	-	-	-
PRF947	4 th	20	SOT323	8.5	10	50	250	NPN	10	2000	15	6	1.5	1000	5	6	2.1	2000	5	6	-	-	-	-	-	-	-
PRF949	4 th	20	SOT416	9	10	50	150	NPN	10	2000	15	6	1.5	1000	5	6	2.1	2000	5	6	-	-	-	-	-	-	-
PRF957	4 th	21	SOT323	8.5	10	100	270	NPN	9.2	2000	30	6	1.3	1000	5	6	1.8	2000	5	6	-	-	-	-	-	-	-
BFG310/XR	4.5	30	SOT143R	14	6	10	60	NPN	18	1800	5	3	-	-	-	-	1	2000	1	3	1.8	3	1800	5	8.5	5	3
BFG310W/XR	4.5	30	SOT343R	14	6	10	60	NPN	18	1800	5	3	-	-	-	-	1	2000	1	3	1.8	3	1800	5	8.5	5	3
BFG325/XR	4.5	31	SOT143R	14	6	35	210	NPN	18.3	1800	15	3	-	-	-	-	1.1	2000	3	3	8.7	3	1800	15	19.4	15	3
BFG325W/XR	4.5	31	SOT343R	14	6	35	210	NPN	18.3	1800	15	3	-	-	-	-	1.1	2000	3	3	8.7	3	1800	15	19.4	15	3

RF wideband transistors generation 5 - 7

Type	Generation	Curve	Package	f _T (typ) (GHz)	V _{CE0} (max) (V)	I _C (max) (mA)	P _{tot} (max) (mW)	Polarity	GUM (typ) (dB)	@ f = (MHz)	@ I _C = (mA)	@ V _{CE} = (V)	NF (typ) (dB)	@ f = (MHz)	@ I _C = (mA)	@ V _{CE} = (V)	NF (typ) (dB)	@ f = (MHz)	@ I _C = (mA)	@ V _{CE} = (V)	PL(1dB) (typ) (dBmW)	@ V _{CE} = (V)	@ f = (MHz)	@ I _C = (mA)	IP3 (typ) (dBm)	@ IC = (mA)	@ VCE = (V)
BFG21W	5 th	32	SOT343R	-	4.5	500	600	NPN	10	1900	1	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BFG403W	5 th	25	SOT343R	17	4.5	3.6	16	NPN	22	2000	3	2	1	900	1	2	1.6	2000	1	2	5	1	900	1	6	1	1
BFG410W	5 th	26	SOT343R	22	4.5	12	54	NPN	21	2000	10	2	0.9	900	1	2	1.2	2000	1	2	5	2	2000	10	15	10	2
BFG424F	5 th	27	SOT343F	25	4.5	30	135	NPN	23	2000	25	2	0.8	900	2	2	1.2	2000	2	2	12	2	2000	25	22	25	2
BFG424W	5 th	27	SOT343R	25	4.5	30	135	NPN	22	2000	25	2	0.8	900	2	2	1.2	2000	2	2	12	2	2000	25	22	25	2
BFG425W	5 th	27	SOT343R	25	4.5	30	135	NPN	20	2000	25	2	0.8	900	2	2	1.2	2000	2	2	12	2	2000	25	22	25	2
BFG480W	5 th	29	SOT343R	21	4.5	250	360	NPN	16	2000	80	2	1.2	900	8	2	1.8	2000	8	2	20	3.6	2000	1	28	80	2
BFU610F*	6 th	34	SOT343F	40	5	10	50	NPN	21	5800	8	2	0.75	2400	1	2	1.4	5800	1	2	-	-	-	-	14	8	5
BFU630F*	6 th	35	SOT343F	40	5	30	130	NPN	28	2400	25	2	0.58	1500	5	2	0.73	2400	5	2	-	-	-	-	23	25	5
BFU660F*	6 th	36	SOT343F	40	5	70	200	NPN	28.5	1500	60	2	0.6	1500	20	2	0.75	2400	20	2	-	-	-	-	30	60	5
BFU690F*	6 th	37	SOT343F	40	5	100	300	NPN	25.6	1500	90	2	0.7	1500	50	2	0.9	2400	50	2	-	-	-	-	35	90	5
BFU710F*	7 th	38	SOT343F	70	2.8	10	30	NPN	16.5	12000	8	2	0.9	5800	2	2	1.7	12000	2	2	-	-	-	-	14.5	8	2
BFU725F/N1	7 th	33	SOT343F	70	2.8	40	136	NPN	18	5800	25	2	0.47	2400	5	2	0.7	5800	5	2	8	2	5800	25	19	25	2
BFU730F*	7 th	39	SOT343F	70	2.8	30	130	NPN	20.3	5800	25	2	0.56	2400	5	2	1	5800	5	2	-	-	-	-	20.5	25	2
BFU760F*	7 th	40	SOT343F	70	2.8	70	200	NPN	25	2400	60	2	0.5	1500	20	2	0.6	2400	20	2	-	-	-	-	23	60	2
BFU790F*	7 th	41	SOT343F	70	2.8	100	250	NPN	20.4	2400	90	2	0.56	1500	50	2	0.7	2400	50	2	-	-	-	-	24	90	2

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Bold

3.4 RF ICs

3.4.1 MMICs

NEW: RF MMIC selection guide on www.nxp.com/mmics Easy-to-use parametric filters help you to choose the right zRF MMIC for your design.

Why choose NXP Semiconductors' MMICs

- ▶ Reduced RF component count
- ▶ Easy circuit design-in
- ▶ Reduced board size
- ▶ Short time-to-market
- ▶ Broad portfolio
- ▶ Volume delivery
- ▶ Short leadtimes
- ▶ Excellent gain flatness[^]
- ▶ No output inductor necessary anymore[^]

[^] = only for new satellite IF gain blocks, BGA28xx-family.

General-purpose wideband amplifiers (50 Ohm gain blocks)

Type	Package	@		Fu ⁽¹⁾	@ 1 GHz					Gain ⁽³⁾ (dB) @				Limits		
		V _s	I _s	@-3 dB	NF	P _{sat}	Gain ⁽²⁾	P _{1dB}	OIP3	100	2.2	2.6	3.0	V _s	I _s	P _{tot}
		(V)	(mA)	(GHz)	(dB)	(dBm)	(dB)	(dBm)	(dBm)	MHz	GHz	GHz	GHz	(V)	(mA)	(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	12.7	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	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	20.8	21.9	21.2	19.3	6	25	200
BGM1011	SOT363	5	25.5	-	4.7	13.8	30 ⁽²⁾	12.2	23	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	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	21.0 ⁽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	4.58	2.7	2.2	-3.4	20.4	-7.9	2.1	20.8	20.8	19.4	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	8.0	3.2	2.3 ⁽²⁾	1.4	23.9	-2.6	10.0	18.6	25.1	24.0	22.1	6	15	200

Notes: ⁽¹⁾ Upper -3 dB point, to gain at 1 GHz. ⁽²⁾ Optimized parameter ⁽³⁾ Gain = |S₂₁|²

New general-purpose wideband amplifiers (50 Ohm gain blocks)

Type	Package	@		Fu	@ 1 GHz			Gain (dB) @			
		V _s	I _s	@-3 dB	NF	Gain	OIP3	250	950	1550	2150
		(V)	(mA)	(GHz)	(dB)	(dB)	(dBm)	(MHz)	(MHz)	(MHz)	(MHz)
BGA2800	SOT363	3.3	9.7	>3	3.4	20.2	11.5	20.0	20.2	20.6	20.6
BGA2801	SOT363	3.3	12.4	3.0	3.6	22.1	13.6	22.3	22.1	23.0	23.8
BGA2815	SOT363	3.3	16.4	>3	3.4	25.4	18.2	26.2	25.4	25.5	25.8
BGA2816	SOT363	3.3	19.6	2.3	2.8	31.2	16.1	32.0	31.2	30.6	28.7
BGA2850	SOT363	5.0	7.7	>3	3.9	23.3	8.7	22.9	23.2	23.9	24.0
BGA2865	SOT363	5.0	22.7	2.6	3.7	31.9	20.9	31.2	31.8	32.6	31.4
BGA2866	SOT363	5.0	15.4	>3	3.6	23.4	17.7	23.0	23.3	24.0	24.3



No output inductor necessary when using the new BGA28xx IF Gain blocks at the output stage.

Bold Red = New, highly recommended product

2-stage variable gain linear amplifier

Type	Package	@		Frequency Range	@ 900 MHz				@ 1900 MHz				Limits		
		V _s	I _s		Gain ⁽¹⁾	DG ⁽²⁾	P _{1dB}	ACPR	Gain ⁽¹⁾	DG ⁽²⁾	P _{1dB}	ACPR	V _s	I _s	P _{tot}
		(V)	(mA)		(dB)	(dB)	(dBm)	(dBc)	(dB)	(dB)	(dBm)	(dBc)	(V)	(mA)	(mW)
BGA2031/1	SOT363	3	51	800-2500	24	62	11	49	23	56	13	49	3.3	77	200

Notes: ⁽¹⁾ Gain = GP, power gain. ⁽²⁾ DG = Gain control range

Wideband linear mixer

Type	Package	@		RF Input	IF Output	@ 880 MHz			@ 1900 MHz			Limits		
		V _s	I _s	Frequency Range	Frequency Range	NF	Gain ⁽¹⁾	OIP3	NF	Gain ⁽¹⁾	OIP3	V _s	I _s	P _{tot}
		(V)	(mA)			(dB)	(dB)	(dBm)	(dB)	(dB)	(dB)	(dB)	(V)	(mA)
BGA2022	SOT363	3	6	800 - 2500	50 - 500	9	5	4	9	6	10	4	10	40

Notes: ⁽¹⁾ Gain = GP, power gain. ⁽²⁾ DG = Gain control range

Low-noise wideband amplifiers

Type	Package	@		@ 900 MHz			@ 1800 MHz			Gain ⁽³⁾ (dB) @				Limits		
		V _s	I _s	NF	Gain	IIP3	NF	Gain	IIP3	100	1	2.6	3.0	V _s	I _s	P _{tot}
		(V)	(mA)	(dB)	(dB)	(dBm)	(dB)	(dB)	(dBm)	MHz	GHz	GHz	GHz	(V)	(mA)	(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
BGA2002[^]	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	10.1	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

Notes: ⁽¹⁾ MSG ⁽²⁾ Adjustable bias ⁽³⁾ |S₂₁|²

[^] = Automotive qualified

General-purpose, med. power ampl. (50 ohm gain blocks)

Type	Package	@		@ 900 MHz				@ 1800 MHz				Gain ⁽²⁾	Limits		
		V _s ⁽¹⁾	I _s	NF	Gain ⁽²⁾	OIP3	P _{1dB}	NF	Gain ⁽²⁾	OIP3	P1 dB	2.5	V _s ⁽¹⁾	I _s	P _{tot}
		(V)	(mA)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	GHz	(V)	(mA)	(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

Notes: ⁽¹⁾ Device voltage without bias resistor. ⁽²⁾ Gain = |S₂₁|²

Medium power amplifier MMICs for all 400 - 2700 MHz applications

Type	Package	leadless	f	supply		shutdown control					RF performance				RF performance				
				V _{cc}	I _{cc}	V _{I(D)(SHDN)}		V _{I(D)(SHDN)}		I _{I(D)(SHDN)}		Typ @ f = 940 MHz				Typ @ f = 1960 MHz			
				Typ	Typ	Max	Min	Max	Min	Max	Typ	Gp	P _{L(1dB)}	OIP3	NF	Gp	P _{L(1dB)}	OIP3	NF
BGA7124	SOT908	leadless	400 - 2700	5	130	200	0	0.7	2.5	Vbias	4	22	25	38	5	16	24	38	5
BGA7024	SOT89	leaded	400 - 2700	5	110	-	-	-	-	-	-	22	24	38	3	16	25	38	4
BGA7127	SOT908	leadless	400 - 2700	5	180	325	0	0.7	2.5	Vbias	4	20	28	44	3	13	28	43	5
BGA7027	SOT89	leaded	400 - 2700	5	170	-	-	-	-	-	-	19	28	41	3	12	28	43	4
BGA7130*	SOT908	leadless	400 - 2700	5	-	-	0	0.7	2.5	Vbias	4	18	30	45	4	12	30	45	4
BGA7133*	SOT908	leadless	400 - 2700	5	-	-	0	0.7	2.5	Vbias	4	18	33	46	4	12	33	47	4

The specifications of the BGA7130 and BGA7133 are target specifications until development is completed.

SiGe:C MMICs (for e.g. GPS):

Type	Package	Supply voltage		Supply current		@ 1.575 GHz														
						Insertion power gain			Noise figure	Input power at 1 dB gain compression				Input third-order intercept point f ₁ = 1713 MHz, f ₂ = 1851 MHz						
		V _{cc}	I _{cc}	S ₂₁ ²		NF	P _{L(1dB)}				IP ₃									
		V	mA	dB		dB	dBm				dBm									
		Min	Max	Min	Typ	Max	Min	Typ	Max	Typ	V _{cc} = 1.8 V, Min	V _{cc} = 1.8 V, Typ	V _{cc} = 2.5 V, I _{cc} = 5 mA	V _{cc} = 2.85 V, Min	V _{cc} = 2.85 V, Typ	V _{cc} = 1.8 V, Min	V _{cc} = 1.8 V, Typ	V _{cc} = 2.5 V, I _{cc} = 5 mA	V _{cc} = 2.85 V, Min	V _{cc} = 2.85 V, Typ
BGU7003	SOT891	2.2	2.85	3	-	15	16	18,3	20	0,8	-	-	-20	-	-	-	-	0	-	-
BGU7005	SOT886	1.5	2.85	-	4.5	-	-	16.5**	-	0,9	-14	-11	-	-11	-8	5	9	-	5	12
BGU7006*	WLCSP***	1.5	2.85	-	3.8	-	-	16.5**	-	0,9	-14	-11	-	-12	-9	1	4	-	5	9
BGU7007*	SOT886	1.5	2.85	-	4.8	-	-	18****	-	0,9	-14	-11	-	-11	-8	5	9	-	5	12

SiGe:C MMICs for Set-Top-Boxes

Type	Package	Frequency range	Mode	@		Gain ⁽¹⁾	NF	P _{L(1dB)}	OIP3	FL ⁽²⁾	RL _{out}	RL _{in}
				V _{cc}	I _{cc}							
		(MHz)	(V)	(mA)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(dB)	(dB)	
BGU7033*	SOT363	40 - 1000	GP 10 dB	5	43	10	4.5	14	29	-0.2	12	18
			GP 5 dB	5	43	5	6	9	29	-0.2	12	17
			Bypass	5	4	-2	2.5	10	29	-0.2	8	8
BGU7032*	SOT363	40 - 1000	GP 10 dB	5	43	10	4.5	13	29	-0.2	12	18
			Bypass	5	4	-2	2.5	10	29	-0.2	8	8
BGU7031*	SOT363	40 - 1000	GP 10 dB	5	43	10	4.5	13	29	-0.2	12	18

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Bold Red = New, highly recommended product

Notes: ⁽¹⁾ Gain = GP, power gain, ⁽²⁾ Flatness of frequency response = FL

SiGe:C MMICs Variable Gain Amplifiers

Type	Package	Control interface	Vsup (V)	Isup (mA)	frequency (MHz)	Gain range (dB)	@ minimum attenuation			@ maximum attenuation		
							Gain (dB)	OIP3 (dBm)	NF (dB)	Gain (dB)	OIP3 (dBm)	NF (dB)
BGA7202*	SOT617	Analog	5	710	700 ... 1450	27	24	45	6.5	-3	23.5	33.5
BGA7203*	SOT617	Analog	5	710	1450 ... 2200	27	24	45	6.5	-3	23.5	33.5
BGA7204*	SOT617	Parallel, serial	5	160	2100 ... 2750	27	24	45	6.5	-3	23.5	33.5
BGA7350*	SOT617	Parallel, digital	5	240	700 ... 2750	31.5	24	37	6.5	-7.5	19	38
BGA7351*	SOT617	Parallel, digital	5	240	50 ... 250	24	18.5	-	6	-5.5	50	30
						28	18.5	-	6	-9.5	50	34

BGA7350 and BGA7351 are dual VGA products. The VGA function is twice on the chip.
BGA7350 and BGA7351 are designed for receiving.

SiGe:C MMIC LNA's for wireless infrastructures

Type	Package	Vsupply (typ)	@ I _c =	@ f =	Gass (typ)	NF (typ)	P _L (dB) (typ)	OIP3 (typ)	IRL	ORL
		(V)	(mA)	(MHz)	(dB)	(dB)	(dBmW)	(dBm)	(dB)	(dB)
BGU7051*	SOT650	3.3	65	900	20.9	0.7	17.8	34	22	15.8
BGU7052*	SOT650	3.3	65	1900	20.1	0.9	18	35.5	20	15
BGU7053*	SOT650	3.3	65	2500	20	1	18	35	20	15
BGU7054*	SOT650	3.3	65	3500	20	1.1	18	35	20	15



* = check status at 3.1 new products, as this type has not been released yet for mass production.

Bold Red = New, highly recommended product

3.4.2 Low noise LO generators for VSAT and general microwave applications

Why choose NXP Semiconductors' low noise LO generators

- ▶ Lowest total cost of ownership
- ▶ Alignment free concept
- ▶ Easy circuit design-in
- ▶ Improved LO stability



Low noise LO generators for VSAT applications

Type	Package	f _{IN(REF)}	V _{CC}	I _{CC}	PLL phase noise @ N=64, @100 kHz	PLL	Output buffer		Input
		MHz	Typ	Typ	Max	f _{o(RF)}	P _o	R _{Lout(RF)}	S _i
			V	mA	dBc/Hz	(GHz)	dBm	dB	dBm
TFF1003HN	SOT616	50~815	3.3	100	-92	12.8~13.05	-5	-10	-10
TFF1007HN*	SOT616	230.46~234.38	3.3	100	-104	14.75~15	-3	-10	-10

Low noise LO generators for general microwave applications

Type	Package	f _{IN(REF)}	V _{CC}	I _{CC}	PLL phase noise @ N=64		PLL			Output buffer		Input
		MHz	Typ	Typ	@ 100 kHz	@ 10 MHz	f _{o(RF)}			P _o	R _{Lout(RF)}	S _i
			V	mA	dBc/Hz	dBc/Hz	Min	Typ	Max	Typ	Max	Min
TFF11070HN*	SOT616	27 - 448	3.3	100	-95	-131	6.84	7.00	7.16	-5	-10	-10
TFF11073HN*	SOT616	28 - 468	3.3	100	-95	-131	7.16	7.33	7.49	-5	-10	-10
TFF11077HN*	SOT616	29 - 490	3.3	100	-95	-131	7.49	7.67	7.84	-5	-10	-10
TFF11080HN*	SOT616	31 - 513	3.3	100	-95	-131	7.84	8.02	8.21	-5	-10	-10
TFF11084HN*	SOT616	32 - 537	3.3	100	-95	-131	8.21	8.40	8.59	-5	-10	-10
TFF11088HN*	SOT616	34 - 562	3.3	100	-95	-131	8.59	8.79	8.99	-5	-10	-10
TFF11092HN*	SOT616	35 - 588	3.3	100	-95	-131	8.99	9.20	9.41	-5	-10	-10
TFF11096HN*	SOT616	37 - 616	3.3	100	-95	-131	9.41	9.63	9.85	-5	-10	-10
TFF11101HN*	SOT616	38 - 644	3.3	100	-95	-131	9.85	10.07	10.31	-5	-10	-10
TFF11105HN*	SOT616	40 - 674	3.3	100	-95	-131	10.31	10.54	10.79	-5	-10	-10
TFF11110HN*	SOT616	42 - 706	3.3	100	-95	-131	10.79	11.03	11.29	-5	-10	-10
TFF11115HN*	SOT616	44 - 738	3.3	100	-95	-131	11.29	11.55	11.81	-5	-10	-10
TFF11121HN*	SOT616	46 - 773	3.3	100	-95	-131	11.81	12.09	12.36	-5	-10	-10
TFF11126HN*	SOT616	48 - 809	3.3	100	-95	-131	12.36	12.65	12.94	-5	-10	-10
TFF11139HN*	SOT616	53 - 886	3.3	100	-95	-131	13.54	13.85	14.17	-5	-10	-10
TFF11145HN*	SOT616	55 - 927	3.3	100	-95	-131	14.17	14.50	14.83	-5	-10	-10
TFF11152HN*	SOT616	58 - 970	3.3	100	-95	-131	14.83	15.18	15.52	-5	-10	-10

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Bold Red = New, highly recommended product

3.5 RF MOS transistors

3.5.1 JFETs

NEW: JFET selection guide on www.nxp.com/rffets

Easy-to-use parametric filters help you to choose the right junction field effect transistor for your design.

Why choose NXP Semiconductors' JFETs

- ▶ Reliable volume supplier
- ▶ Short leadtimes
- ▶ Broad portfolio

N-channel junction field-effect transistors for switching

Type	Package	V _{DS} (V)	I _G (mA)	CHARACTERISTICS										
				I _{DSS} (mA)		-V _{GSoff} (V)		R _{DS(on)} (Ω)	C _{rs} (pF)		t _{on} (ns)		t _{off} (ns)	
				min	max	min	max	max	min	max	typ	max	typ	max
BSR56	SOT23	40	50	50	-	4	10	25	-	5	-	-	-	25
BSR57	SOT23	40	50	20	100	2	6	40	-	5	-	-	-	50
BSR58	SOT23	40	50	8	80	0.8	4	60	-	5	-	-	-	100
PMBFJ108	SOT23	25	50	80	-	3	10	8	-	15	4	-	6	-
PMBFJ109	SOT23	25	50	40	-	2	6	12	-	15	4	-	6	-
PMBFJ110	SOT23	25	50	10	-	0.5	4	18	-	15	4	-	6	-
PMBFJ111	SOT23	40	50	20	-	3	10	30	-	typ.3	13	-	35	-
PMBFJ112	SOT23	40	50	5	-	1	5	50	-	typ.3	13	-	35	-
PMBFJ113	SOT23	40	50	2	-	0.5	3	100	-	typ.3	13	-	35	-
J108	SOT54	25	50	80	-	3	10	8	-	15	4	-	6	-
J109	SOT54	25	50	40	-	2	6	12	-	15	4	-	6	-
J110	SOT54	25	50	10	-	0.5	4	18	-	15	4	-	6	-
J111	SOT54	40	50	20	-	3	10	30	-	typ.3	13	-	35	-
J112	SOT54	40	50	5	-	1	5	50	-	typ.3	13	-	35	-
J113	SOT54	40	50	2	-	0.5	3	100	-	typ.3	13	-	35	-
PMBF4391	SOT23	40	50	50	150	4	10	30	-	3.5	-	15	-	20
PMBF4392	SOT23	40	50	25	75	2	5	60	-	3.5	-	15	-	35
PMBF4393	SOT23	40	50	5	30	0.5	3	100	-	3.5	-	15	-	50

P-channel junction field-effect transistors for switching

Type	Package	V _{DS} (V)	I _G (mA)	CHARACTERISTICS										
				I _{DSS} (mA)		-V _{GSoff} (V)		R _{DS(on)} (Ω)	C _{rs} (pF)		t _{on} (ns)		t _{off} (ns)	
				min	max	min	max	max	min	max	typ	max	typ	max
PMBFJ174	SOT23	30	50	20	135	5	10	85	-	typ.4	7	-	15	-
PMBFJ175	SOT23	30	50	7	70	3	6	125	-	typ.4	15	-	30	-
PMBFJ176	SOT23	30	50	2	35	1	4	250	-	typ.4	35	-	35	-
PMBFJ177	SOT23	30	50	1.5	20	0.8	2.25	300	-	typ.4	45	-	45	-
J174	SOT54	30	50	20	135	5	10	85	-	typ.4	7	-	15	-
J175	SOT54	30	50	7	70	3	6	125	-	typ.4	15	-	30	-
J176	SOT54	30	50	2	35	1	4	250	-	typ.4	35	-	35	-
J177	SOT54	30	50	1.5	20	0.8	2.25	300	-	typ.4	45	-	45	-

N-channel junction field-effect transistors for general RF applications

Type	Package	V _{DS} (V)	I _G (mA)	CHARACTERISTICS							
				I _{DSS} (mA)		V _{GSoff} (V)		Yfs (mS)		C _{iss} (pF)	
				min	max	min	max	min	max	min	max
DC, LF and HF amplifiers											
BF245A	SOT54	30	10	2	6.5	<8		3	6.5	Typ.=1.1	-
BF245B	SOT54	30	10	6	15	<8		3	6.5	Typ.=1.1	-
BF245C	SOT54	30	10	12	25	<8		3	6.5	Typ.=1.1	-
BF545A	SOT23	30	10	2	6.5	0.4	7.5	3	6.5	0.8	-
BF545B	SOT23	30	10	6	15	0.4	7.5	3	6.5	0.8	-
BF545C	SOT23	30	10	12	25	0.4	7.5	3	6.5	0.8	-
BF556A	SOT23	30	10	3	7	0.5	7.5	4.5	-	0.8	-
BF556B	SOT23	30	10	6	13	0.5	7.5	4.5	-	0.8	-
BF556C	SOT23	30	10	11	18	0.5	7.5	4.5	-	0.8	-
Pre-amplifiers for AM tuners in car radios											
BF861A	SOT23	25	10	2	6.5	0.2	1.0	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	0.3	2	35	-	typ=1.9	-
RF stages FM portables, car radios, main radios & mixer stages											
BF510 ⁽¹⁾	SOT23	20	10	0.7	3	typ. 0.8		2.5		0.4	0.5
BF511 ⁽¹⁾	SOT23	20	10	2.5	7	typ. 1.5		4		0.4	0.5
BF512 ⁽¹⁾	SOT23	20	10	6	12	typ. 2.2		6		0.4	0.5
BF513 ⁽¹⁾	SOT23	20	10	10	18	typ. 3		7		0.4	0.5
Low-level general purpose amplifiers											
BFR30	SOT23	25	5	4	10	<5		1	4	1.5	-
BFR31	SOT23	25	5	1	5	<2.5		1.5	4.5	1.5	-
General-purpose amplifiers											
BFT46	SOT23	25	5	0.2	1.5	<1.2		>1		1.5	-
AM input stages UHF/VHF amplifiers											
PMBFJ308	SOT23	25	50	12	60	1	6.5	>10		1.3	2.5
PMBFJ309	SOT23	25	50	12	30	1	4	>10		1.3	2.5
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

Bold = Highly recommended product

⁽¹⁾ Asymmetrical

3.5.2 MOSFETs

NEW: RF MOSFET selection guide on www.nxp.com/rfets Easy-to-use parametric filters help you to choose the right RF MOSFET for your design.

Why choose NXP Semiconductors' MOSFETs

- ▶ Reference designs for TV tuning
- ▶ Short leadtimes
- ▶ Broad portfolio
- ▶ Smallest packages
- ▶ 2-in-1 FETs for tuner applications
- ▶ Reliable volume supply
- ▶ Best performance MOSFETs for TV tuning



N-channel, single MOSFETs for switching

Type	Package	CHARACTERISTICS															
		V_{DS}	I_D	I_{DSS}		$V_{(th)GS}$		$R_{DS(ON)}$	C_{rs}		t_{on}		t_{off}		$ S_{21(on)} _2$	$ S_{21(off)} _2$	MODE
		(V)	(mA)	min	max	min	max	(Ω)	min	max	typ	max	typ	max	(dB)	(dB)	
BSS83	SOT143	10	50	-	-	0.1 ⁽²⁾	2 ⁽¹⁾	45	typ.0.6	-	1	-	5	-	-	enh.	
Silicon RF Switches																	
BF1107	SOT23	3	10	-	100 ⁽³⁾	-	7 ⁽⁴⁾	20	-	-	-	-	-	2.5	30	depl.	
BF1108⁽⁵⁾	SOT143B	3	10	-	100 ⁽³⁾	-	7 ⁽⁴⁾	20	-	-	-	-	-	3	30	depl.	
BF1108R⁽⁵⁾	SOT143R	3	10	-	100 ⁽³⁾	-	7 ⁽⁴⁾	20	-	-	-	-	-	3	30	depl.	
BF1108W	SOT343	3	10	-	100	-	7 ⁽⁴⁾	20	-	-	-	-	-	3	30	depl.	
BF1108WR	SOT343R	3	10	-	100	-	7 ⁽⁴⁾	20	-	-	-	-	-	3	30	depl.	
BF1118	SOT143B	3	10	-	100	-	7 ⁽⁴⁾	22	-	-	-	-	-	3	30	depl.	
BF1118R	SOT143R	3	10	-	100	-	7 ⁽⁴⁾	22	-	-	-	-	-	3	30	depl.	
BF1118W	SOT343	3	10	-	100	-	7 ⁽⁴⁾	22	-	-	-	-	-	3	30	depl.	
BF1118WR	SOT343R	3	10	-	100	-	7 ⁽⁴⁾	22	-	-	-	-	-	3	30	depl.	

Bold = Highly recommended product

Bold Red = New, highly recommended product

N-channel, dual-gate MOSFETs

Type	Package	CHARACTERISTICS												
		V_{DS}	I_D	I_{DSX}		$V_{(th)GS}$		$ Y_{fs} $		C_{is}	C_{os}	F @ 800 MHz	VHF	UHF
		(V)	(mA)	min	max	min	max	min	max	(pF)	(pF)	(dB)		
With external bias														
BF908	SOT143	12	40	3	27	-	-2	36	50	3.1	1.7	1.5	X	X
BF908R	SOT143R	12	40	3	27	-	-2	36	50	3.1	1.7	1.5	X	X
BF908WR	SOT343R	12	40	3	27	-	-2	36	50	3.1	1.7	1.5	X	X
BF991	SOT143	20	20	4	25	-	-2.5	10	-	2.1	1.1	1	X	-
BF992	SOT143	20	40	-	-	-	-1.3	20	-	4	2	1.2 ⁽⁷⁾	X	-
BF994S	SOT143	20	30	4	20	-	-2.5	15	-	2.5	1	1 ⁽⁷⁾	X	-
BF996S	SOT143	20	30	4	20	-	-2.5	15	-	2.3	0.8	1.8	-	X
BF998	SOT143	12	30	2	18	-	-2.0	21	-	2.1	1.05	1	X	X
BF998R	SOT143R	12	30	2	18	-	-2.0	21	-	2.1	1.05	1	X	X
BF998WR	SOT343R	12	30	2	18	-	-2.5	22	-	2.1	1.05	1	X	X
Fully internal bias														
BF1105	SOT143	7	30	8	16	0.3	1.2 ⁽⁶⁾	25	-	2.2 ⁽⁹⁾	1.2 ⁽⁸⁾	1.7	X	X
BF1105R	SOT143R	7	30	8	16	0.3	1.2 ⁽⁶⁾	25	-	2.2 ⁽⁹⁾	1.2 ⁽⁸⁾	1.7	X	X
BF1105WR	SOT343R	7	30	8	16	0.3	1.2 ⁽⁶⁾	25	-	2.2 ⁽⁹⁾	1.2 ⁽⁸⁾	1.7	X	X
BF1109	SOT143	11	30	8	16	0.3	1.2 ⁽⁶⁾	24	-	2.2 ⁽⁹⁾	1.3 ⁽⁸⁾	1.5	X	X
BF1109R	SOT143R	11	30	8	16	0.3	1.2 ⁽⁶⁾	24	-	2.2 ⁽⁹⁾	1.3 ⁽⁸⁾	1.5	X	X
BF1109WR	SOT343R	11	30	8	16	0.3	1.2 ⁽⁶⁾	24	-	2.2 ⁽⁹⁾	1.3 ⁽⁸⁾	1.5	X	X
Partly internal bias														
BF904A	SOT143	7	30	8	13	0.3	1 ⁽⁶⁾	22	30	2.2	1.3	2	X	X
BF904AR	SOT143R	7	30	8	13	0.3	1 ⁽⁶⁾	22	30	2.2	1.3	2	X	X
BF904AWR	SOT343R	7	30	8	13	0.3	1 ⁽⁶⁾	22	30	2.2	1.3	2	X	X
BF909A	SOT143	7	40	12	20	0.3	1 ⁽⁶⁾	36	50	3.6	2.3	2	X	X
BF909AR	SOT143R	7	40	12	20	0.3	1 ⁽⁶⁾	36	50	3.6	2.3	2	X	X
BF909AWR	SOT343R	7	40	12	20	0.3	1 ⁽⁶⁾	36	50	3.6	2.3	2	X	X

⁽¹⁾ Asymmetrical

⁽⁶⁾ $V_{GS(th)}$

⁽²⁾ $V_{GS(th)}$

⁽⁷⁾ @ 200 MHz

⁽³⁾ I_D

⁽⁸⁾ C_{OSS}

⁽⁴⁾ V_{SG}

⁽⁹⁾ C_{ig}

⁽⁵⁾ Depletion FET plus diode in one package

N-channel, dual-gate MOSFETs

Type	Package	V _{DS} (V)	I _D (mA)	CHARACTERISTICS										VHF	UHF
				I _{DSX} (mA)		V _{(th)gs} (V)		Yfs (mS)		C _{is} (pF)	C _{os} (pF)	F @ 800 MHz (dB)			
				min	max	min	max	min	max	typ	typ	typ			
Partly internal bias															
BF1100	SOT143	14	30	8	13	0.3	1.2 ⁽⁶⁾	24	33	2.2	1.4	2	X	X	
BF1100R	SOT143R	14	30	8	13	0.3	1.2 ⁽⁶⁾	24	33	2.2	1.4	2	X	X	
BF1100WR	SOT343R	14	30	8	13	0.3	1.2 ⁽⁶⁾	24	33	2.2	1.4	2	X	X	
BF1101	SOT143	7	30	8	16	0.3	1 ⁽⁶⁾	25	-	2.2	1.2 ⁽⁶⁾	1.7	X	X	
BF1101R	SOT143R	7	30	8	16	0.3	1 ⁽⁶⁾	25	-	2.2	1.2 ⁽⁶⁾	1.7	X	X	
BF1101WR	SOT343R	7	30	8	16	0.3	1 ⁽⁶⁾	25	-	2.2	1.2 ⁽⁶⁾	1.7	X	X	
BF1102(R) ⁽¹⁰⁾	SOT363	7	40	12	20	0.3	1.2 ⁽⁶⁾	36	-	2.8 ⁽⁹⁾	1.6 ⁽⁶⁾	2	X	X	
BF1201	SOT143	10	30 ⁽¹⁾	11	19	0.3	1.2 ⁽⁶⁾	23	35	2.6	0.9	1.9	X	X	
BF1201R	SOT143R	10	30 ⁽¹⁾	11	19	0.3	1.2 ⁽⁶⁾	23	35	2.6	0.9	1.9	X	X	
BF1201WR	SOT343R	10	30 ⁽¹⁾	11	19	0.3	1.2 ⁽⁶⁾	23	35	2.6	0.9	1.9	X	X	
BF1202	SOT143	10	30	8	16	0.3	1.2 ⁽⁶⁾	25	40	1.7	0.85	1.1	X	X	
BF1202R	SOT143R	10	30	8	16	0.3	1.2 ⁽⁶⁾	25	40	1.7	0.85	1.1	X	X	
BF1202WR	SOT343R	10	30	8	16	0.3	1.2 ⁽⁶⁾	25	40	1.7	0.85	1.1	X	X	
BF1203 ⁽¹¹⁾	SOT363	10	30	11	19	0.3	1.2 ⁽⁶⁾	23	35	2.6	0.9	1.9	X	-	
		10	30	8	16	0.3	1.2	25	40	1.7	0.85	1.1	-	X	
BF1204 ⁽¹⁰⁾	SOT363	10	30	8	16	0.3	1.2 ⁽⁶⁾	25	40	1.7	0.85	1.1	X	X	
BF1205C ⁽¹¹⁾⁽¹²⁾⁽¹³⁾	SOT363	6	30	14	24	0.3	1	26	41	2.2	0.9	1.4	X	-	
		6	30	9	17	0.3	1	28	43	2	0.85	1.4	-	X	
BF1205 ⁽¹¹⁾⁽¹²⁾⁽¹³⁾	SOT363	10	30	8	16	0.3	1.0	26	40	1.8	0.75	1.2	X	-	
		7	30	8	16	0.3	1.0	26	40	2.0	0.85	1.4	-	X	
BF1206 ⁽¹¹⁾	SOT363	6	30	14	23	0.3	1.0	33	48	2.4	1.1	1.6	X	-	
		6	30	9	17	0.3	1.0	29	44	1.7	0.85	1.4	-	X	
BF1206F ⁽¹¹⁾	SOT666	6	30	3	6.5	0.3	1.0	17	32	2.4	1.1	1.1	X	-	
		6	30	3	6.5	0.3	1.0	17	32	1.7	0.85	1.0	-	X	
BF1207 ⁽¹¹⁾⁽¹³⁾⁽¹⁴⁾	SOT363	6	30	13	23	0.3	1.0	25	40	2.2	0.9	1.4	X	-	
		6	30	9	19	0.3	1.0	26	41	1.8	0.8	1.4	-	X	
BF1208 ⁽¹¹⁾⁽¹²⁾⁽¹³⁾	SOT666	6	30	14	24	0.3	1	26	41	2.2	0.9	1.4	X	-	
		6	30	9	17	0.3	1	28	43	2	0.85	1.4	-	X	
BF1208D ⁽¹¹⁾⁽¹²⁾⁽¹³⁾	SOT666	6	30	14	24	0.3	1	26	41	2.1	0.8	1.1	X	-	
		6	30	10	20	0.3	1	25	40	2.1	0.85	1.4	-	X	
BF1210 ⁽¹¹⁾⁽¹²⁾	SOT363	6	30	14	24	0.3	1	26	41	2.2	0.9	1.4	X	-	
		6	30	9	17	0.3	1	28	43	2	0.85	1.4	-	X	
BF1211	SOT143	6	30	11	19	0.3	1.0	25	40	2.1	0.9	1.3	X	-	
BF1211R	SOT143R	6	30	11	19	0.3	1.0	25	40	2.1	0.9	1.3	X	-	
BF1211WR	SOT343	6	30	11	19	0.3	1.0	25	40	2.1	0.9	1.3	X	-	
BF1212	SOT143	6	30	8	16	0.3	1.0	28	43	1.7	0.9	1.1	-	X	
BF1212R	SOT143R	6	30	8	16	0.3	1.0	28	43	1.7	0.9	1.1	-	X	
BF1212WR	SOT343	6	30	8	16	0.3	1.0	28	43	1.7	0.9	1.1	-	X	
BF1214 ⁽¹⁰⁾	SOT363	6	30	13	23	0.3	1.0	25	35	2.2	0.9	1.4	X	X	
BF1218 ⁽¹¹⁾⁽¹²⁾⁽¹³⁾	SOT363	6	30	14	24	0.3	1	26	41	2.1	0.8	1.1	X	-	
		6	30	10	20	0.3	1	25	40	2.1	0.85	1.4	-	X	

Bold = Highly recommended product

Bold Red = New, highly recommended product

⁽¹⁾ Asymmetrical

⁽²⁾ V_{GS(th)}

⁽³⁾ I_D

⁽⁴⁾ V_{SG}

⁽⁵⁾ Depletion FET plus diode in one package

⁽⁷⁾ @200 MHz

⁽⁸⁾ C_{oss}

⁽⁹⁾ C_{ig}

⁽¹⁰⁾ Two equal dual gate MOSFETs in one package

⁽¹¹⁾ Two low noise gain amplifiers in one package

⁽¹²⁾ Transistor A: fully internal bias, transistor B: partly internal bias

⁽¹³⁾ Internal switching function

⁽¹⁴⁾ Transistor A: partly internal bias, transistor B: fully internal bias

N-channel, dual gate MOSFETs for Set-Top-Boxes

Type	Package	V _{DS} (V)	I _D (mA)	CHARACTERISTICS							X-Mod @ 40 dB gain reduction (dB)
				I _{DSX} (mA)	V _{(th)gs} (V)		Yfs (mS)	C _{is} (pF)	C _{os} (pF)	F @ 800 MHz (dB)	
				max	min	max	typ	typ	typ	typ	
BF1215 ⁽¹⁾⁽²⁾⁽³⁾	SOT363	6	30	19.5	0.3	1	27	2.5	0.8	1.9	107
		6	30	23	0.3	1	27	2.5	0.8	1.9	107
BF1216 ⁽¹⁾	SOT363	6	30	19.5	0.3	1	27	2.5	0.8	1.9	107
		6	30	23	0.3	1	27	2.5	0.8	1.9	107
BF1217	SOT343	6	30	23	0.3	1	27	2.5	0.8	1.9	107

⁽¹⁾ Two low noise gain amplifiers in one package

⁽²⁾ Transistor A: fully internal bias, transistor B: partly internal bias

⁽³⁾ Internal switching function

Bold Red = New, highly recommended product



3.6 RF Modules

NEW: CATV module selection guide on www.nxp.com/catv
Easy-to-use parametric filters help you to choose the right CATV module for your design.

Why choose NXP Semiconductors' RF Modules

- ▶ Excellent linearity, stability and reliability
- ▶ Rugged construction
- ▶ Extremely low noise
- ▶ High power gain
- ▶ Low total cost of ownership

CATV types for Chinese (C-types) and 1GHz GaAs HFET line ups

New in our CATV Hybrid portfolio are two families of products. The C types are specially designed for the Chinese market, customized for two major governmental projects. And the GaAs HFET 1 GHz complete line up for high end applications all around the world.

Both families will be extended in the following months to cover all of the twospecific market segments.

C types (China)

- ▶ CATV push pulls, chapter 3.6.2: BGY588C, BGE788C, CGY888C
- ▶ CATV power doublers, chapter 3.6.3: BGD712C
- ▶ CATV optical receivers, chapter 3.6.4: BGO807C

1GHz GaAs HFET very high end Hybrids

- ▶ CATV push pulls, chapter 3.6.2 : CGY1047, CGY1041, CGY1043
- ▶ CATV power doublers, chapter 3.6.3: CGD1040Hi, CGD1042Hi, CGD1044Hi, CGD1046Hi, CGD1042H, CGD1044H

3.6.1 CATV Reverse Hybrids

Frequency range	Type number	Gain (dB)	Slope (dB)	FL	RL _{IN} /RL _{OUT}	CTB	XMOD	CSO	@ Ch	@ Vo (dBmV)	NF @ f _{MAX}	I _{tot} (mA)
5 -75 MHz	BGY68	29.2 - 30.8	-0.2 - 0.5	± 0.2	20/20	-68	-60	-	4	50	3.5	135
5 -120 MHz	BGY66B	24.5 - 25.5	-0.2 - 0.5	± 0.2	20/20	-66	-54	-	14	48	5	135
5 -200 MHz	BGY67	21.5 - 22.5	-0.2 - 0.5	± 0.2	20/20	-67	-60	-	22	50	5.5	230
	BGY67A	23.5 - 24.5	-0.2 - 0.5	± 0.2	20/20	-67	-59	-	22	50	5.5	230
5-200 MHz	BGR269	34.5 - 35.5	0 - 0.6	± 0.4	20/20	-57	-50	-70	28	50	5.2	160

3.6.2 CATV Push-Pulls

Frequency range	Type number	Gain (dB)	Slope (dB)	FL	RL _{IN} /RL _{OUT}	CTB	XMOD	CSO	@ Ch	@ Vo (dBmV)	NF @ f _{MAX}	I _{tot} (mA)
40 - 550 MHz	OM7650	33.2 - 35.5	0.2 - 2	-	10/10	-45	-	-57	77	44	8	340
	BGY588C	33.2 - 35.5	0.2 - 1.7	± 0.5	16/16	-57	-	-62	77	44	8	345
	BGY585A	17.7 - 18.7	0.5 - 2	± 0.2	20/20	-59	-62	-59	77	44	8	240
	BGY587	21.5 - 22.5	0.2 - 1.5	± 0.2	20/20	-57	-58	-54	77	44	7	240
	BGY587B	26.2 - 27.8	0.5 - 2.5	± 0.4	20/20	-57	-60	-57	77	44	6.5	340
	BGY588N	33.5 - 35.5	0.5 - 1.5	± 0.4	20/20	-57	-59	-62	77	44	6	340
40 - 600 MHz	BGY685A	17.7 - 18.7	0.5 - 2.2	± 0.2	20/20	-55	-60	-56	85	44	8.5	240
	BGY687	21 - 22	0.8 - 2.2	± 0.2	20/20	-54	-54	-52	85	44	6.5	240
40 - 750 MHz	OM7670	33.2 - 35.2	1/4	-	10/8	-43	-	-54	110	44	8	340
	BGY785A	18 - 19	0 - 2	± 0.3	20/20	-53	-56	-53	110	44	7	240
	BGE788C	33.2 - 35.2	0.3 - 2.3	± 0.6	16/16	-49	-	-52	110	44	8	325
	BGY787	21 - 22	0 - 1.5	± 0.5	20/20	-53	-52	-53	110	44	6.5	240
	BGE787B	28.5 - 29.5	0.2 - 2.2	± 0.5	20/20	-50	-54	-56	110	44	7	320
	BGE788	33.5 - 34.5	0.5 - 2.5	± 0.5	20/20	-49	-51	-52	110	44	7	320
40 - 870 MHz	BGY883	14.5 - 15.5	0 - 2	± 0.3	20/20	-61	-61	-61	49	44	8.5	235
	BGE885	16.5 - 17.5	0.2 - 1.2	± 0.5	14/14	-	-	-	129	59	8	240
	BGX885N	16.5 - 17.5	0.2 - 1.4	± 0.3	20/20	-	-	-	129	59	8	240
	BGY885A	18 - 19	0 - 2	± 0.3	20/20	-61	-61	-61	49	44	8	240
	BGY887	21 - 22	0.2 - 2	± 0.3	20/20	-55	-61	-57	129	40	6.5	235
	CGY888C	34.5 - 36.5	0.5 - 2.5	± 0.5	20/20	-68	-	-66	112	44	4.0	280
	BGY835C	33.5 - 34.5	0.5 - 2.5	± 0.6	21/21	-60	-59	-55	49	44	7.0	340
	BGY887B	28.5 - 29.5	0.5 - 2.5	± 0.5	20/20	-60	-60	-60	49	44	6.5	340
	BGY888	33.5 - 34.5	0.5 - 2.5	± 0.5	20/20	-60	-59	-55	49	44	7	340
	40 -1003 MHz	BGY1085A	18 - 19	0 - 2	± 0.3	20/20	-53	-54	-56	150	44	7.5

CATV Push-Pulls 1 GHz

Freq range	Type	Gain	Slope	fl	RL _{IN} /RL _{OUT}	CTB	Xmod	CSO	@ Ch	@ Vout	NF	I _{tot}
40-1003 MHz	CGY1041*	22	1.0 - 2.0 dB	±0.8	20/18 dB	-62 dBc	-58 dBc	-64 dBc	79NTSC+75digital	44 dBmV flat	5.5 dB	250 mA
40-1003 MHz	CGY1043*	24	1.0 - 2.0 dB	±0.8	20/18 dB	-62 dBc	-58 dBc	-64 dBc	79NTSC+75digital	44 dBmV flat	5.5 dB	250 mA
40-1003 MHz	CGY1047	28	1.0 - 2.0 dB	±0.5	20/18 dB	-62 dBc	-58 dBc	-64 dBc	79NTSC+75digital	44 dBmV flat	4.5 dB	250 mA
40-1003 MHz	CGY1049*	30	1.5 - 2.5 dB	±0.8	20/18 dB	-62 dBc	-58 dBc	-64 dBc	79NTSC+75digital	44 dBmV flat	4.5 dB	250 mA
40-1003 MHz	CGY1032*	33	1.0 - 2.0 dB	±0.8	20/18 dB	-62 dBc	-58 dBc	-64 dBc	79NTSC+75digital	44 dBmV flat	4.5 dB	250 mA

3.6.3 CATV power doublers

Frequency range	Type number	Gain	Slope	FL	RL _{IN} /RL _{OUT}	CTB	XMOD	CSO	@ Ch	@ Vo	NF @ f _{MAX}	I _{tot} (mA)
		(dB)	(dB)							(dBmV)		
40 - 550 MHz	BGD502	18 - 19	0.2 - 2.2	± 0.3	20/20	-65	-68	-62	77	44	8	435
	BGD702	18 - 19	0.2 - 2	± 0.5	20/20	-58	-62	-58	110	44	8.5	435
	BGD702N	18 - 19	0.2 - 2	± 0.25	20/20	-58	-62	-58	110	44	8.5	435
	BGD712	18.2 - 18.8	0.5 - 1.5	± 0.35	23/23	-62	-63	-63	112	44	7	410
	BGD712C	18.2 - 18.8	0.5 - 1.5	± 0.4	17/17	-62	-	-63	112	44	7	410
	BGD704	19.5 - 20.5	0 - 2	± 0.5	20/20	-57	-61	-56	110	44	8.5	435
40 - 870 MHz	BGD714	20 - 20.6	0.5 - 1.5	± 0.35	23/23	-61	-62	-62	112	44	7	410
	BGD885	16.5 - 17.5	0.2 - 1.6	± 0.5	20/20	-	-	-	129	59	8	450
	BGD802	18 - 19	0.2 - 2	± 0.5	20/20	-54	-59	-56	129	44	9	410
	BGD812	18.2 - 18.8	0.4 - 1.4	± 0.5	23/23	-58	-62	-60	132	44	7.5	410
	BGD804	19.5 - 20.5	0.2 - 2	± 0.5	20/20	-53	-61	-54	129	44	7.5	410
	BGD814	19.7 - 20.3	0.4 - 1.4	± 0.5	22/25	-57.5	-62	-59	132	44	7.5	410
	BGD816L	21.2 - 21.8	0.5 - 1.5	± 0.5	22/25	-55	-58	-56	129	44	7.5	375
	CGD942C	20.5 - 22.5	1 - 2	± 0.3	18/18	-66	-58	-68	132	48	3.5	450
	CGD944C	23 - 25	1 - 2	± 0.3	18/18	-66	-58	-68	132	48	3.5	450
	40 - 1003 MHz	CGD1040Hi	21	1.5	0.5	-20/-20	-65	-68	-68	79 channels	50	<6
CGD1042Hi		23	1.5	0.5	-20/-20	-65	-68	-68	79 channels	50	<6	470
CGD1044Hi		25	1.5	0.5	-20/-20	-65	-68	-68	79 channels	50	<6	470
CGD1046Hi*		25	0 - 2.0	1	20/20	-73	-74	-68	79NTSC+75 [^]	44	5.0	460
CGD1042H		23	0 - 1.5	± 0.3	17.5/20	-70	-67	-68	79 + 75 [^]	59	5.0	450
CGD1044H		25	0 - 1	± 0.3	17.5/20	-70	-67	-68	79 + 75 [^]	59	5.0	450

[^] = digital channels

3.6.4 CATV optical receivers

Frequency range	Type number	S	Slope	FL _{SL}	RL _{out}	IMD3	IMD2	@fm	@Pi	NF @ f _{MAX}	Conn.	I _{tot} (mA)
		(V/W)	(dB)		(dB)			(MHz)	(mW)			
Forward Path Receiver												
40 - 870 MHz	BGO807	800	0 - 2	1	11	-71	-55	854.5	1	8.5		205
	BGO807/FC0	750	0 - 2	1	11	-71	-55	854.5	1	8.5	FC	205
	BGO807/SC0	750	0 - 2	1	11	-71	-55	854.5	1	8.5	SC	205
	BGO807C	800	0 - 2	1	11	-71	-54	854.4	1	8.5		205
	BGO807CE	800	0 - 2	1	11	-71	-53	854.4	1	8.5		205
	BGO807C/FC0	750	0 - 2	1	11	-71	-55	854.5	1	8.5	FC	205
	BGO807C/SC0	750	0 - 2	1	11	-71	-55	854.5	1	8.5	SC	205
	BGO827	800	0 - 2	1	11	-73	-57	854.5	1	8.5		205
	BGO827/FC0	750	0 - 2	1	11	-73	-57	854.5	1	8.5	FC	205
	BGO827/SC0	750	0 - 2	1	11	-73	-57	854.5	1	8.5	SC	205

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Bold Red = New, highly recommended product

Bold = Highly recommended product

NOTES: This table is for reference only.

For full data please refer to the latest datasheet.

For availability please check the NXP Sales office.



Description

Frequency range: minimum and maximum frequency in MHz at which data are characterized @Ch/@Vo. The number of channels and the output voltage at which CTB, XMOD, CSO, IMD2 and IMD3 are characterized @fm. Measurement frequency is fm. Noise Figure is in dB or Noise in pA/Sqrt(Hz). FL_{SL} is Flatness straight line. S is Minimum responsivity of optical receivers.

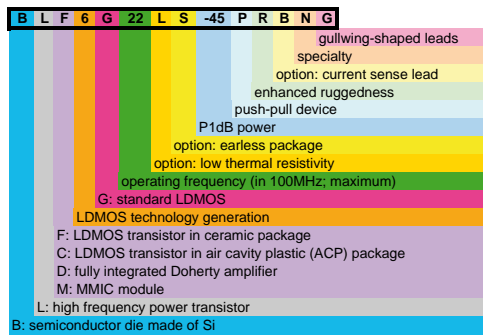
3.7 RF power transistors

NEW: RF power transistor selection guide on www.nxp.com/rfpower
Easy-to-use parametric filters help you to choose the right RF power transistor for your design.

3.7.1 Base Station transistors

http://www.nxp.com/products/mosfets/rf_power_transistors_ldmos/basestations/index.html#preview

Device naming conventions RF power base stations transistors



Why choose NXP Semiconductors' RF power transistors for base stations:

- ▶ Leading technology (generation 6 and 7 of LDMOS)
- ▶ Highest (system) efficiency
- ▶ Best ruggedness
- ▶ Advanced Doherty amplifier designs
- ▶ Industry's first 3.8 GHz Doherty
- ▶ Industry's first fully integrated Doherty amplifier

NXP offers complete line-ups of RF power transistors operation from 800 MHz right up to 3.8 GHz for base stations, covering all cellular technologies (MC-GSM/EDGE, TDMA, (TD-S)CDMA, W-CDMA/UMTS) and WiMAX infrastructures.

3.7.1.1 0.7 - 1.0 GHz line-up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_P	$@V_{DS}$
			MHz	W	%	dB	V
driver	BLF6G21-10G	SOT538A	10 - 2200	0.7	15	18.5	28
driver	BLM6G10-30	SOT834-1	700 - 1000	2	11.5	29	28
driver	BLM6G10-30G	SOT822-1	700 - 1000	2	11.5	29	28
driver	BLF6G10(S)-45	SOT608	700 - 1000	1	7.8	22.5	28
driver	BLF6G10L(S)-40BRN	SOT1112A3/B3	728 - 960	2.5	15	15	23
final	BLF6G10(LS)-135RN	SOT502	700 - 1000	26.5	28	21	28
final	BLF6G10(LS)-160RN	SOT502	700 - 1000	32	27	22.5	32
final	BLF6G10(LS)-200RN	SOT502	688 - 1000	40	28.5	20	28
final	BLF6G10L(S)-260PRN	SOT539A3/B3	728 - 960	40	27	27	22
final	BLF6G07L(S)-260PBM	SOT1110A3/B3	728 - 810	60	31	21	28

3.7.1.2 1.4 - 1.7 GHz line-up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}
			MHz	W	%	dB	V
driver	BLF6G15L(S)-40BRN	SOT1112A3/B3	1475-1511	2,5	13	22	28
final	BLF6G15L(S)-250PBRN	SOT1110A3/B3	1475-1511	60	32.5	18	28

3.7.1.3 1.8 - 2.0 GHz line-up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}
			MHz	W	%	dB	V
driver	BLF6G21-10G	SOT538A	10 - 2200	0.7	15	18.5	28
driver	BLF6G20-40	SOT608A	1800 - 2000	2.5	15	18.8	28
driver	BLF6G20(S)-45	SOT608B	1800 - 2000	2.5	14	19.2	28
final	BLF6G20LS-75	SOT502	1800 - 2000	29.5	37.5	19	28
			1800 - 2000	63	52	19	28
final	BLF6G20(LS)-110	SOT502	1800 - 2000	25	32	19	28
final	BLF6G20LS-140	SOT502B	1800 - 2000	35.5	30	16.5	28
final	BLF6G20-180PN	SOT539A	1800 - 2000	50	29.5	18	32
final	BLF6G20(LS)-180RN	SOT502B	1800 - 2000	40	27	17.2	30
final	BLF6G20-230PRN	SOT539A	1800 - 2000	65	32	17.5	28
final	BLF7G20L(S)-140P	SOT1121B3	1805 - 1880	20	31	17.5	28
final	BLF7G20L(S)-90P	SOT1121A3/B3	1805 - 1880	84	56	19	28
final	BLF7G20L(S)-300P	SOT539A3/B3	1805 - 1880	85	30	17	28
final	BLF7G20L(S)-200	SOT502A3/B3	1805 - 1880	50	30	17	28
final	BLF7G20L(S)-250P	SOT539A3/B3	1805 - 1880	70	30	17	28

3.7.1.4 2.0 - 2.2 GHz line-up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}
			MHz	W	%	dB	V
driver	BLF6G21-10G	SOT538A	10 - 2200	0.7	15	18.5	28
driver	BLM6G22-30	SOT834-1	2100 - 2200	2	9	29.5	28
driver	BLM6G22-30G	SOT882-1	2100 - 2200	2	9	29.5	28
driver	BLF6G22(S)-45	SOT608	2000 - 2200	2.5	13	18.5	28
driver	BLF6G22L(S)-40BN	SOT1112A3/B3	2110 - 2170	2.5	16	19	28
final	BLF6G22LS-75	SOT502B	2000 - 2200	17	30.5	18.7	28
final	BLF6G22LS-100	SOT502B	2000 - 2200	25	29	18.5	28
final	BLF6G22L(S)-130	SOT502	2000 - 2200	30	28.5	17	28
final	BLF7G22LS-130	SOT502B	2000 - 2200	30	32	18.5	28
final	BLF6G22-180PN	SOT539A	2000 - 2200	50	27.5	17.5	32
final	BLF6G22(LS)-180RN	SOT502	2000 - 2200	40	25	16	30
final	BLF7G22L(S)-250PB	SOT1110A3/B3	2110 - 2171	70	>17	30	28
integrated Doherty	BLD6G21L(S)-50	SOT1130	2010 - 2025	8	42	13.5	28
integrated Doherty	BLD6G22L(S)-50	SOT1130	2110 - 2170	8	38	13.3	28

3.7.1.5 2.3- 2.7 GHz line-up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}
			MHz	W	%	dB	V
driver	BLF6G27-10(G)	SOT975	2500 - 2700	2	20	19	28
driver	BLF6G27(S)-45	SOT608	2500 - 2700	7	24	18	28
driver	BLF6G27(LS)-75	SOT502	2500 - 2700	9	23	17	28
driver	BLF7G27L(S)-75P	SOT1121A3/B3	2300 - 2400	10	26	17	28
driver	BLF7G27L(S)-50BN	SOT1112A3/B3	2500 - 2700	3	15	17	28
final	BLF6G27(LS)-135	SOT502	2500 - 2700	20	22.5	16	32
final	BLF7G27L(S)-100	SOT502A3/B3	2500 - 2700	14	24	17.5	28
final	BLF7G24L(S)-100(G)	SOT 502 A	2300 - 2400	14	24	18	28
final	BLF7G27L(S)-140	SOT502A3/B3	2500 - 2700	20	22	17	28
final	BLF7G27L(S)-200P	SOT539	2500 - 2700	20	25	16.5	28

3.7.1.6 3.5 - 3.8 GHz line-up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	$@V_{DS}$
			MHz	W	%	dB	V
driver	BLF6G38-10(G)	SOT975	3400 – 3600	2	20	14	28
driver	BLF6G38(S)-25	SOT608	3400 – 3800	4.5	24	15	28
driver	BLF6G38(LS)-50	SOT502	3400 – 3800	9	23	14	28
final	BLF6G38(LS)-100	SOT502	3400 – 3600	18.5	21.5	13	28

3.7.1.7 Power LDMOS Doherty designs

Freq band (MHz)	PPEAK (dBm)	POUT-AVG (dBm)	VDS (V)	Gain (dB)	Drain Eff. (%)	Type	Main transistor	Peak transistor
728-821 MHz								
790-821	54.5	47.5	28	20	50	SYM	1/2 BLF7G10-300P	1/2 BLF7G10-300P
790-821	55.5	47	28	19	42	SYM	1/2 BLF6G10-260PRN	1/2 BLF6G10-260PRN
790-821	57.2	49.5	32	19	42	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN
728-768	58	50	32	19	47	SYM	BLF6G10LS-200RN	BLF6G10LS-200RN
869-960 MHz								
869-894	52	44	28	20	48	SYM	BLF6G10S-45	BLF6G10S-45
869-894	52.7	44.5	28	15	50	3-WAY	BLF6G10S-45	2x BLF6G10S-45
869-894	53	45	28	tbd	tbd	SYM	1/2 BLF7G10LS-160P	1/2 BLF7G10LS-160P
920-960	53	45	25	tbd	tbd	SYM	1/2 BLF7G10LS-160P	1/2 BLF7G10LS-160P
920-960	56.2	48	28	18.5	40	SYM	BLF6G10-135RN	BLF6G10-135RN
869-894	58	50	32	20.5	46	SYM	BLF6G10-200RN	BLF6G10-200RN
925-960	58.3	50	32	21	39	SYM / MMPP	1/2 BLF6G10-260PRN	1/2 BLF6G10-260PRN
925-960	58.9	50	32	22	44	SYM / MMPP	1/2 BLF6G10-260PRN	1/2 BLF6G10-260PRN
869-894	58	tbd	28	tbd	tbd	ASYM	BLF6G10-200RN	BLF7G10-300P
1476-1511 MHz								
1476-1511	58	tbd	28	tbd	tbd	ASYM	BLF6G15-250PB	BLF6G15-250PB
1476-1511	58.1	49.6	28	16	42	ASYM	BLF7G15LS-200	BLF7G15LS-300P
1805-1880 MHz (DCS)								
1805-1880	52	44	27	14.5	42	SYM	1/2 BLC6G20-130PG	1/2 BLC6G20-130PG
1805-1880	52.5	44.5	28	16	44	SYM	1/2 BLF7G20LS-160P	1/2 BLF7G20LS-160P
1805-1880	55	47	32	16	38	SYM	1/2 BLF6G20-230PRN	1/2 BLF6G20-230PRN
1805-1880	55	47	28	15	40	SYM	BLF6G18-140	BLF6G18-140
1805-1880	55.5	47	28	16	41	SYM	1/2 BLF7G20-250P	1/2 BLF7G20-250P
1805-1880	57.5	49.5	30	16	42	SYM	BLF7G20LS-200	BLF7G20LS-200
1805-1880	57.9	50	32	15.5	37	SYM / MMPP	BLF6G20-230PRN	BLF6G20-230PRN
1805-1880	58.2	50	28	16	42	SYM / MPPM	BLF7G20LS-250P	BLF7G20LS-250P
1930-1990 MHz (PCS)								
1930-1990	53	45	28	16.5	40	SYM	BLF6G20-75	BLF6G20-75
1930-1990	55.2	46.4	28	16	39	SYM	1/2 BLF7G20LS-250P	1/2 BLF7G20LS-250P
1930-1990	56	48	31	15.3	38	SYM	BLF6G20-140	BLF6G20-140
1930-1990	56	49	31	17	41	SYM	2x BLF6G20-75	2x BLF6G20-75
1930-1990	57.5	49.5	28	tbd	tbd	SYM	BLF7G20LS-200	BLF7G20LS-200
1930-1990	58	50	32	15.5	37	SYM	BLF6G20-230PRN	BLF6G20-230PRN
1930-1990	58.2	50	28	16	40	SYM	BLF7G20LS-250P	BLF7G20LS-250P
1880-2025 MHz (TD-SCDMA)								
2010-2025	47	39	28	14.4	41	SYM	BLD6G21-50	BLF6G21-50
1880-2025	50	42	28	17	46	SYM	1/2 BLF7G20-90P	1/2 BLF7G20-90P
2010-2025	50	42	28	17.2	47.2	SYM	1/2 BLF7G20-90P	1/2 BLF7G20-90P
1880 - 1920	52.5	44.5	28	16	44	SYM	1/2 BLF7G20LS-160P	1/2 BLF7G20LS-160P
2110-2170 MHz (UMTS / LTE)								
2110-2170	47	39	28	13	38	SYM	BLD6G22-50	BLF6G22-50
2110-2170	54.7	46.5	28	16.5	43	SYM	BLF6G22-100	BLF6G22-100
2110-2170	54.9	47	28	17	43	SYM	BLF7G22-130	BLF7G22-130
2110-2170	55	47	28	15.5	38	SYM	BLF6G22-130	BLF6G22-130
2110-2170	55.5	46.4	28	15	43	ASYM	BLF7G22LS-130	BLF7G22LS-200
2110-2170	56	48	28	15	48	3-WAY	BLF7G22-130	7G22-130/7G22-130
2110-2170	56.5	48.5	28	16.2	41	SYM	BLF7G22-200	BLF7G22-200
2110-2170	57	49	32	14.5	41	ASYM	BLF6G22-100	BLF6G22-180PN
2110-2170	58	50	32	15	40	SYM	BLF6G22-180PN	BLF6G22-180PN
2110-2170	58.5	51	tbd	tbd	tbd	SYM	BLF7G22LS-250P	BLF7G22LS-250P
2110-2170	59	51	tbd	tbd	tbd	3-WAY	BLF7G22LS-160	BLF7G22LS-160
2110-2170	55	47	28	17	43	SYM	1/2 BLF7G22LS-250P	1/2 BLF7G22LS-250P
2300-2400 MHz (WiBRO / LTE)								
2300-2400	49.5	42	28	14.5	43	SYM	1/2 BLF7G27-75P	1/2 BLF7G27-75P
2300-2400	52	44.5	28	tbd	tbd	ASYM	BLF7G27S-50	BLF7G27LS-100
2300-2400	52.5	45	28	tbd	tbd	SYM	1/2 BLF7G27LS-150P	1/2 BLF7G27LS-150P
2500-2700 MHz (WiMAX / LTE)								
2570-2620	49.5	42	28	15	43	SYM	1/2 BLF7G27-75P	1/2 BLF7G27-75P
2500-2700	50	42	28	15	37.5	SYM	BLF6G27-45	BLF6G27-45
2500-2600	52	44	28	14	40	ASYM	BLF6G27-45	2x BLF6G27-45
2600-2700	52	44	28	14	40	ASYM	BLF6G27-45	2x BLF6G27-45
2600-2700	52	44	28	14	40	ASYM	BLF6G27-45	BLC6G27-100
2500-2700	52.5	44.5	28	14	38	SYM	1/2 BLF6G27-150P	1/2 BLF7G27-150P
2300-2400	52.5	45	28	tbd	tbd	SYM	1/2 BLF7G27LS-150P	1/2 BLF7G27LS-150P
2500-2700	55	47	28	tbd	tbd	ASYM	BLF7G27LS-100	BLF7G27LS-140
2500-2700	56.5	tbd	tbd	tbd	tbd	ASYM	BLF7G27L-140B	BLF7G27L-250PB
3300-3800 MHz (WiMAX)								
3400-3600	49.5	41.5	28	tbd	tbd	SYM	1/2 BLF7G38LS-75P	1/2 BLF7G38LS-75P
3400-3600	51	43	28	11.5	32	SYM	BLF6G38-50	BLF6G38-50
3400-3600	52.5	44.5	28	tbd	tbd	SYM	BLF7G38-75	BLF7G38-75

3.7.2 Broadcast / ISM (industrial, scientific, medical) RF power transistors

http://www.nxp.com/products/mosfets/rf_power_transistors_ldmos/broadcast_ism/index.html#preview

Why choose NXP Semiconductors' RF power transistors for broadcast / ISM applications:

- ▶ Highest power
- ▶ Best ruggedness
- ▶ Best broadband performance
- ▶ Best-in-class design support
- ▶ Very low thermal resistance design for unrivalled reliability

NXP's leading LDMOS technologies together with advanced package concepts enable best in class performing power amplifiers. We offer industry's highest power and best ruggedness for all broadcast technologies.

Our portfolio includes transistors for Ultra High Frequency (UHF), Very High Frequency (VHF) and High Frequency (HF) applications as well as covering ISM frequency bands.

3.7.2.1 0-1000 MHz (UHF/VHF/HF/ISM) LDMOS Line up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}	Mode of operation
			MHz	W	%	dB	V	
driver	BLF871	SOT467C	0 - 1000	100	47	21	40	2-TONE
			0 - 1000	24	33	22	40	DVB-T
driver	BLF871S	SOT467B	0 - 1000	100	47	21	40	2-TONE
			0 - 1000	24	33	22	40	DVB-T
driver	BLF881	SOT467C	0 - 1000	140	49	21	50	2-TONE
			0 - 1000	33	34	21	50	DVB-T
driver	BLF881S	SOT467C	0 - 1000	140	49	21	50	2-TONE
			0 - 1000	33	34	21	50	DVB-T
final	BLF645	SOT540A	0 - 1400	100	45	18	32	2-TONE
			0 - 1400	100	56	18	32	CW
driver	BLF571	SOT467C	0 - 1000	20	70	27.5	50	CW
final	BLF573	SOT502A3	0 - 1000	300	70	27.2	50	CW
final	BLF573S	SOT502B	0 - 1000	300	70	27.2	50	CW
final	BLF574	SOT539A	0 - 1000	500	70	26.5	50	CW
final	BLF578	SOT539A	0 - 1000	1200	71	24	50	PULSED RF
			0 - 1000	1000	75	26	50	CW

3.7.2.2 470-876 MHz (UHF) LDMOS line up

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}	Mode of operation
			MHz	W	%	dB	V	
driver	BLF871	SOT467C	0 - 1000	100	47	21	40	2-TONE
			0 - 1000	24	33	22	40	DVB-T
driver	BLF871S	SOT467B	0 - 1000	100	47	21	40	2-TONE
			0 - 1000	24	33	22	40	DVB-T
final	BLF878	SOT979A	470 - 860	300	32	21	42	CW
			470 - 860	75	46	21	42	DVB-T
driver	BLF881S	SOT467C	0 - 1000	120	48	21	50	2-TONE
			0 - 1000	30	31	21	50	DVB-T
driver	BLF881	SOT467C	0 - 1000	120	48	21	50	2-TONE
			0 - 1000	30	31	21	50	DVB-T
final	BLF888	SOT979A	470 - 860	250	46	19	50	2-TONE
			470 - 860	110	31	19	50	DVB-T
final	BLF888AS	SOT539B	470 - 860	250	46	19	50	2-TONE
			470 - 860	110	31	19	50	DVB-T
final	BLF888A	SOT539B	470 - 860	255	47	19	50	2-TONE
			470 - 860	115	32	19	50	DVB-T

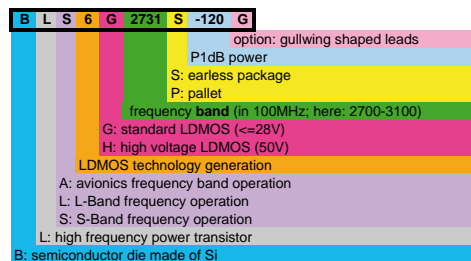
3.7.2.3 28-225 Mhz General purpose VDMOS

Function	Type	Package	f_{range}	$P_{L(AV)}$	η_D	G_p	@ V_{DS}	Mode of operation
			MHz	W	%	dB	V	
final	BLF177	SOT121B	28-108	150	>35	20	50	CW class AB
final	BLF278	SOT262A1	108-225	250-300	50-80	14-20	50	CW class AB

3.7.3 Microwave LDMOS RF power transistors

http://www.nxp.com/products/mosfets/rf_power_transistors_ldmos/microwave_ldmos/index.html#preview

Device naming conventions RF power microwave transistors



Why choose NXP Semiconductors' microwave RF power transistors

- ▶ High gain
- ▶ High efficiency
- ▶ Highest reliability
- ▶ Improved pulse droop and insertion phase
- ▶ Improved ruggedness - overdrive without risk to +5 dB
- ▶ Reduces component count and helps simplify L- and S-band radar design
- ▶ Uses non-toxic, ROHS compliant packages

3.7.3.1 Avionics LDMOS transistors

Function	Type	Package	f_{range}	P_L	η_D	G_p	$@V_{DS}$	Mode of operation
			MHz	W	%	dB	V	
driver	BLL6H0514-25	SOT467C	500 - 1400	25 (min)	50	19	50	PULSED RF; class AB
final	BLA6H0912-500	SOT634A	960 - 1215	450	50	17	50	PULSED RF; class AB
final	BLA6H1011-600	SOT539A	1030 - 1090	600	52	19	50	PULSED RF; class AB
final	BLA6G1011-200R	SOT502A2	1030 - 1090	200	65	20	28	PULSED RF; class AB

3.7.3.2 L-band LDMOS transistors

Function	Type	Package	f_{range}	P_L	η_D	G_p	$@V_{DS}$	Mode of operation
			MHz	W	%	dB	V	
driver	BLL6H0514-25	SOT467C	500 - 1400	25 (min)	50	19	50	PULSED RF; class AB
final	BLL6H1214-500	SOT539A	1200 - 1400	500 (min)	50	17	50	PULSED RF; class AB
final	BLL6H1214L(S)-250	SOT502	1200 - 1400	250	55	17	50	Pulsed RF
final	BLL6HL(S)0514-130	SOT1135	1200 - 1400	130	50	18	50	Pulsed RF

3.7.3.3 S-band LDMOS transistors

Function	Type	Package	f_{range}	P_L	η_D	G_p	$@V_{DS}$	Mode of operation
			MHz	W	%	dB	V	
driver	BLS6G2731-6G	SOT975C	2700 - 3100	6	33	15	32	PULSED RF; class AB
driver	BLS6G3135-20	SOT608A	3100 - 3500	20	45	15.5	32	PULSED RF; class AB
driver	BLS6G3135S-20	SOT608B	3100 - 3500	20	45	15.5	32	PULSED RF; class AB
final	BLS6G2731-120	SOT502A	2700 - 3100	120	48	13.5	32	PULSED RF; class AB
final	BLS6G2731S-120	SOT502B	2700 - 3100	120	48	13.5	32	PULSED RF; class AB
final	BLS6G2933S-130	SOT922-1	2900 - 3300	130	47	12.5	32	PULSED RF; class AB
final	BLS6G3135-120	SOT502A	3100 - 3500	120	43	11	32	PULSED RF; class AB
final	BLS6G3135S-120	SOT502B	3100 - 3500	120	43	11	32	PULSED RF; class AB
final	BLS7G2933P-200	pallet	2900 - 3300	200	45	11	32	PULSED RF; class AB
final	BLS7G2731P-200	pallet	2700 - 3100	200	45	11	32	PULSED RF; class AB
final	BLS6G2731S-130	SOT922	2700 - 3100	130	49	13	32	Pulsed RF
final	BLS7G2729-300P	SOT539A	2700-2900	300	50	15	32	Pulsed RF
final	BLS7G2729S-300P	SOT539B	2700-2900	300	50	15	32	Pulsed RF

3.8 High Speed Data Converters

Analog performance, power optimization and ease of use are the perennial industry challenges for high-speed data converters used in communications. For many years NXP has been quietly developing data converters for captive applications. It is now opening it's high-speed data converters to the entire market, offering a broad portfolio of highly competitive ADCs and DACs featuring three different data interfaces, including the industry's first implementation of the JEDEC JESD204A serial data interface.

3.8.1 High Speed ADCs

Type	Description	Supply Voltage (V)	Power Dissipation (mW)	SFDR (dBc)	SNR (dBFS)	Digital Interface	Package
ADC1613D series	Dual 16-bit ADC up to 65/80/105/125MSPs with serial interface	1.8 / 3.3	445	93	73.2	JESD204A	HVQFN56 8x8
ADC1610S series	Single 16-bit ADC up to 65/80/105/125MSPs	1.8 / 3.3	350	93	73.2	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1415S series	Single 14-bit ADC up to 65/80/105/125MSPs with input buffer	1.8 / 3.3/5	550	91	73.2	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1413D series *	Dual 14-bit ADC up to 65/80/105/125MSPs with serial interface	1.8 / 3.3	445	91	73.2	JESD204A	HVQFN56 8x8
ADC1412D series	Dual 14-bit ADC up to 65/80/105/125MSPs	1.8 / 3.3	350	91	73.2	LVC MOS and LVDS/DRR	HVQFN64 9x9
ADC1410S series	Single 14-bit ADC up to 65/80/105/125MSPs	1.8 / 3.3	350	91	73.2	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1215S series	Single 12-bit ADC up to 65/80/105/125MSPs with input buffer	1.8 / 3.3/5	550	91	70.7	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1213D series	Dual 12-bit ADC up to 65/80/105/125MSPs with serial interface	1.8 / 3.3	445	91	70.7	JESD204A	HVQFN56 8x8
ADC1212D series *	Dual 12-bit ADC up to 65/80/105/125MSPs	1.8 / 3.3	350	91	70.7	LVC MOS and LVDS/DRR	HVQFN64 9x9
ADC1210S series	Single 12-bit ADC up to 65/80/105/125MSPs	1.8 / 3.3	350	91	70.7	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1207S080	Single 12-bit ADC 80 MSPs	5	840	90	71	parallel LVC MOS	HTQFN48 7x7
ADC1206S series	Single 12-bit ADC 40/50/70 MSPs	3.3 / 5.0	550	72	64	parallel CMOS and TTL	QFP44
ADC1115S125	Single 11-bit ADC up to 125MSPs with input buffer	1.8 / 3.3/5	790	90	66.7	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1113D125	Dual 11-bit ADC up to 125MSPs with serial interface	1.8 / 3.3	635	90	66.7	JESD204A	HVQFN56 8x8
ADC1015S series	Single 10-bit ADC up to 65/80/105/125MSPs with input buffer	1.8 / 3.3/5	550	91	61.7	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1010S series	Single 10-bit ADC up to 125MSPs	1.8 / 3.3	350	91	61.7	LVC MOS and LVDS/DRR	HVQFN40 6x6
ADC1006S series	Single 10-bit ADC 50/70 MSPs	3.3 / 5.0	550	71	59	parallel CMOS and TTL	QFP44

3.8.2 High Speed DACs

Type	Description	Supply Voltage (V)	Power Dissipation (mW)	SFDR (dBc)	Interpolation	Package
DAC1408D series *	Dual 14-bit DAC up to 650/750 MSPs	1.8 / 3.3	850	77	2x, 4x, 8x	HVQFN64 9x9
DAC1405D series	Dual 14-bit DAC up to 650/750 MSPs	1.8 / 3.3	550	77	2x, 4x, 8x	HTQFP100 14x14
DAC1403D160	Dual 14-bit DAC 160 MSPs	3.3	210	80	2x	HTQFP80 12x12
DAC1401D125	Dual 14-bit DAC 125 MSPs	3.3	105	88	-	LQFP48
DAC1208D series	Dual 12-bit DAC up to 650/750 MSPs	1.8 / 3.3	850	77	2x, 4x, 8x	HVQFN64 9x9
DAC1205D series	Dual 12-bit DAC up to 650/750 MSPs	1.8 / 3.3	550	80	2x, 4x, 8x	HTQFP100 14x14
DAC1203D160	Dual 12-bit DAC 160 MSPs	3.3	210	77	2x	HTQFP80 12x12
DAC1201D125	Dual 12-bit DAC 125 MSPs	3.3	105	65	-	LQFP48
DAC1008D series	Dual 10-bit DAC up to 650/750 MSPs	1.8 / 3.3	850	77	2x, 4x, 8x	HVQFN64 9x9
DAC1005D series	Dual 10-bit DAC up to 650/750 MSPs	1.8 / 3.3	550	77	2x, 4x, 8x	HTQFP100 14x14
DAC1003D160	Dual 10-bit DAC 160 MSPs	3.3	210	80	2x	HTQFP80 12x12
DAC1001D125	Dual 10-bit DAC 125 MSPs	3.3	105	65	-	LQFP48

* = check status at 3.1 new products, as this type has not been released yet for mass production.

Bold Red = New, highly recommended product



4. Design support

This chapter will make it easier to find and get hold of design-in information and materials, with web links or references to the NXP representative / authorized distributor.

Streamline your RF design with leading RF EDA software

Design kits of the NXP high performance RF small signal products.

NXP offers its RF small signal portfolio in leading RF Electronic Design Automation (EDA) software of: Ansoft Designer RF, AWR Microwave Office and Agilent Advanced Design System (ADS), including installation manuals, on the NXP web: www.nxp.com/models. To predict the behavior of a design by performing simulations, RF EDA software enables design engineers to reduce the number of design cycles, lower the risks and make better RF component choice for RF applications.

4.1 S-Parameters

S-Parameters help you to simulate the behaviour of our devices to your specific adjustments for e.g. voltage, current.

Wideband transistors, FETs & MMICs

First, click on the type number, which takes you directly to the corresponding product information page on the NXP Semiconductors internet.

Second, scroll down on this product information page to find the S-Parameters.

Wideband transistors		
BF67	BFG540W	BFR93AW
BFG135	BFG541	BFS17
BFG198	BFG590	BFS17A
BFG21W	BFG591	BFS17W
BFG25A/X	BFG93A	BFS25A
BFG31	BFG94	BFS505
BFG35	BFG97	BFS520
BFG310/XR	BFM505	BFS540
BFG310W/XR	BFM520	BFT25
BFG325/XR	BFG149	BFT25A
BFG325W/XR	BFQ18A	BFT92
BFG403W	BFQ19	BFT92W
BFG410W	BFQ67	BFT93
BFG424F	BFQ67W	BFT93W
BFG424W	BFR106	BFU725F/N1
BFG425W	BFR505	BRF505T
BFG480W	BFR520	PBR941
BFG505	BFR540	PBR951
BFG520	BFR92A	PRF947
BFG520W	BFR92AW	PRF949
BFG540	BFR93A	PRF957

FETs		
BF1211	BF1212	BF511
BF1211R	BF1212R	BF513
BF1211WR	BF1212WR	BF862

MMICs		
BGA2001	BGM1012	BGA6489
BGA2003	BGM1013	BGA6589
BGA2711	BGM1014	BGA2800
BGA2748	BGM2011	BGA2801
BGA2771	BGA2715	BGA2815
BGA2776	BGA2716	BGA2816
BGA2709	BGA2717	BGA2850
BGU7003	BGA2011	BGA2865
BGA2712	BGA2012	BGA2866
BGM1011	BGA6289	

4.2 Simulation models

4.2.1 Spice models

Spice models help you to create the optimal performance and to understand which external components have a certain influence on that performance.

Wideband transistors, FETs & Varicaps diodes

First, click on the type number which takes you directly to the corresponding product information page on the NXP Semiconductors internet.

Second, scroll down on this product information page to find the Spice models.

Wideband transistors			
BFG10	BFG505	BFG92A/X	BFR93AW
BFG10/X	BFG505/X	BFG93A	BFS17
BFG10W/X	BFG505W/X	BFG94	BFS17A
BFG135	BFG520	BFG97	BFS17W
BFG198	BFG520/X	BFM505	BFS25A
BFG21W	BFG520/XR	BFM520	BFS505
BFG25A/X	BFG520W	BFQ149	BFS520
BFG25AW/X	BFG520W/X	BFQ18A	BFS540
BFG31	BFG540	BFQ19	BFT25A
BFG310/XR	BFG540/X	BFQ540	BFT92
BFG310W/XR	BFG540/XR	BFQ67	BFT92W
BFG325/XR	BFG540W	BFQ67W	BFT93
BFG325W/XR	BFG540W/X	BFR106	BFT93W
BFG35	BFG540W/XR	BFR505	PBR941
BFG403W	BFG541	BFR505T	PBR951
BFG410W	BFG590	BFR520	PRF947
BFG424F	BFG590/X	BFR540	PRF949
BFG424W	BFG591	BFR92A	PRF957
BFG425W	BFG67	BFR92AW	
BFG480W	BFG67/X	BFR93A	

FETs			
BF862	BF908	BF909	BF998
BF904			

Varicap diodes			
BB145B	BB156	BB201	BB208-02
BB149	BB179	BB202	
BB149A	BB179B	BB207	

4.2.2 RF Power device simulation models

For easy design-in, NXP provides fully physics based, electro-thermal models for the RF power transistors. These models are available for Advanced Design System (ADS)[®] from Agilent and for Microwave Office (MWO)[®] from Applied Wave Research (AWR). Newly developed models per product are based on the best in class RFLDMOS model, developed by NXP Research, a recognized leader in physics based models. This concept yields most reliable simulation results over a wide range of electrical conditions. The standard models fully support DC, AC, s-parameter (small signal), harmonic balance (large signal) and time domain simulations. NXP RF power models allow designers to assess the performance of complex PA systems at an early stage of the development process.

The available models come with all necessary libraries and documentation, and can be downloaded at NXP's website.

Product Type	ADS Model	MWO Model	Product Type	ADS Model	MWO Model
BLF369	Y	N	BLF6G27(S)-45	Y	Y
BLF3G21-6	Y	N	BLF6G27(LS)-135	Y	N
BLF571	Y	Y	BLF6G27(LS)-75	Y	N
BLF573(S)	Y	Y	BLF6G38-10(G)	Y	N
BLF574	Y	Y	BLF6G38(LS)-100	Y	N
BLF578	Y	Y	BLF6G38(LS)-50	Y	Y
BLF645	Y	N	BLF6G38(S)-25	Y	Y
BLF6G10(LS)-135RN	N	Y	BLF7G22L(S)-130	Y	N
BLF6G10L(S)-260PRN	Y	N	BLF871(S)	Y	N
BLF6G10(S)-45	Y	Y	BLF878	Y	N
BLF6G20-45	Y	Y	BLF881(S)	Y	N
BLF6G20(LS)-180RN	Y	N	BLF888	Y	N
BLF6G20(S)-230PRN	Y	N	BLL6H0514-25	Y	N
BLF6G20S-45	Y	Y	BLL6H1214-500	Y	N
BLF6G21-10G	Y	N	BLM6G22-30	Y	N
BLF6G22(LS)-180RN	Y	N	BLS6G3135(S)-120	Y	N
BLF6G27-10(G)	Y	N	BLS6G3135(S)-20	Y	N

4.3 Application notes

http://www.nxp.com/products/all_appnotes/

For the application notes we refer you to chapter 1 of this manual. For each application, we have given the recommended application notes which are available on the internet (with interactive link) or via your local NXP representative or authorized distributor (look at the last chapter: Web Links and Contacts).

4.4 Demo boards



BGA2001 demo board

4.4.1 IC, MMIC and SiGe:C transistor demo boards

RF Small Signal demo boards are available (although limited) via your local NXP representative or authorized distributor (look at the last chapter: Web Links and Contacts).

RF small signal demo boards			
BFU725F/N1	BGA2776	BGM1011	TFF11096HN
BGA2001	BGA2800	BGM1012	TFF11101HN
BGA2003	BGA2801	BGM1013	TFF11105HN
BGA2011	BGA2815	BGM1014	TFF11110HN
BGA2012	BGA2816	BGU7003	TFF11115HN
BGA2031	BGA2850	BGU7005	TFF11121HN
BGA2709	BGA2865	TFF1003HN	TFF11126HN
BGA2711	BGA2866	TFF11070HN	TFF11132HN
BGA2712	BGA6289	TFF11073HN	TFF11139HN
BGA2714	BGA6489	TFF11077HN	TFF11145HN
BGA2715	BGA6589	TFF11080HN	TFF11152HN
BGA2716	BGA6589	TFF11084HN	
BGA2748	BGA7024	TFF11088HN	
BGA2771	BGA7124	TFF11092HN	



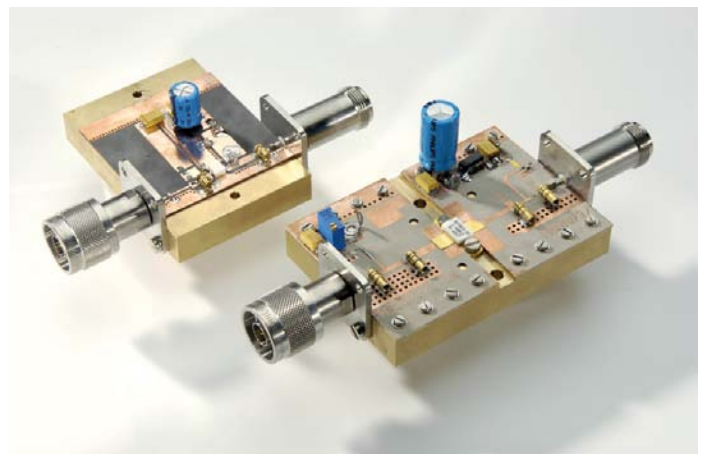
BGU7005 demo board



BGA7124 demo board

4.4.2 RF power transistor demo boards

Demo boards are available (although limited) via your local NXP representative (see the last chapter: Web Links and Contacts).



4.4.3 High Speed Converter demo boards

High Speed Converter demo boards are available (although limited) via your local NXP representative or authorized distributor (look at the last chapter; Web Links and Contacts).

ADC Demo Boards

Type
ADC1006S series
ADC1010S series
ADC1015S series
ADC1113D125
ADC1115S125
ADC1206S series
ADC1207S080
ADC1210S series
ADC1212D series
ADC1213D series
ADC1215S series
ADC1410S series
ADC1412D series
ADC1413D series
ADC1415S series
ADC1610S series
ADC1613D series

DAC Demo Boards

Type
DAC1001D125
DAC1003D160
DAC1005D series
DAC1201D125
DAC1203D160
DAC1401D125
DAC1403D160
DAC1405D series
DAC1205D series
DAC1408D series
DAC1208D series
DAC1008D series

Different versions available via NXP sales representative

4.5 Samples of products in development

For development samples, please ask your local NXP representative or authorized distributor (see last chapter: Web Links and Contacts) to order the latest versions at the RF development team.

4.6 Samples of released products

For all released and most non-released products for RF power, samples are available in the sample warehouse. Look on the home page of the NXP web site for the link to the online sample store: www.nxp.com

4.7 Datasheets

For all released and most non-released products for RF power, datasheets are available on the NXP Semiconductors internet. Simply 'clicking' on a product type (in this manual chapter 1 or 2) takes you to the corresponding product information page on the NXP Semiconductors website.

4.8 Design-in support

If you need special design-in support from our design-in engineers, please ask your local NXP representative or authorized distributor (see last chapter: Web Links and Contacts), to pass on your request to the RF development teams.

4.9 NEW: interactive selection guides

For all RF product groups, you can find easy-to-use parametric filters to help you to choose the right device for your design, e.g. www.nxp.com/mmics, click on selection guide.

5. Cross-references & replacements

NXP cross-references:

<http://www.nxp.com/search/>

NXP end-of-life:

<http://www.nxp.com/products/eol/>

5.1 Cross-references: Manufacturer types versus NXP types

In alphabetical order of manufacturer type

Abbreviations:

BS diode	Band Switch Diode
CATV PD	CATV Power Doubler
CATV PPA	CATV Push Pull Amplifier
CATV PPA/HG	CATV Push Pull Amplifier High Gain
CATV RA	CATV Reverse Amplifier
FET	Field Effect Transistor
Standard	Standard
MMIC	Monolithic Microwave Integrated Circuit
Varicap	Varicap Diode
WB trs 1-4	Wideband Transistor 1-4 generation
WB trs 5-7	Wideband Transistor 5-7 generation

Manufacturer type	Manufacturer	NXP type	Product family
10500	Microsemi	BLA6H0912-500	Microwave
10502	Microsemi	BLA6H0912-500	Microwave
0910-150M	Microsemi	BLF871	Broadcast
0910-300M	Microsemi	BLF878	Broadcast
0910-60M	Microsemi	BLF878	Broadcast
0912-45	Microsemi	BLL6H0514-25	Microwave
1011LD200	Microsemi	BLA6G1011-200R	Microwave
1011LD300	Microsemi	BLA6G1011-200R	Microwave
1015MP	Microsemi	BLL6H0514-25	Microwave
1035MP	Microsemi	BLL6H0514-25	Microwave
1214-30	Microsemi	BLL6H0514-25	Microwave
1214-32L	Microsemi	BLL6H0514-26	Microwave
1SS314	Toshiba	BA591	BS diode
1SS356	Rohm	BA591	BS diode
1SS381	Toshiba	BA277	BS diode
1SS390	Rohm	BA891	BS diode
1SV172	Toshiba	BAP50-04	PIN diode
1SV214	Toshiba	BB149	Varicap
1SV214	Toshiba	BB149A	Varicap
1SV215	Toshiba	BB153	Varicap
1SV228	Toshiba	BB201	Varicap
1SV231	Toshiba	BB152	Varicap
1SV232	Toshiba	BB148	Varicap
1SV233	Sanyo	BAP70-03	PIN diode
1SV234	Sanyo	BAP64-04	PIN diode
1SV239	Toshiba	BB145B	Varicap
1SV241	Sanyo	BAP64-02	PIN diode
1SV246	Sanyo	BAP64-04W	PIN diode
1SV247	Sanyo	BAP70-02	PIN diode
1SV248	Sanyo	BAP50-02	PIN diode
1SV249	Sanyo	BAP50-04W	PIN diode
1SV250	Sanyo	BAP50-03	PIN diode
1SV251	Sanyo	BAP50-04	PIN diode
1SV252	Toshiba	BAP50-04W	PIN diode

Manufacturer type	Manufacturer	NXP type	Product family
1SV254	Toshiba	BB179	Varicap
1SV263	Sanyo	BAP50-02	PIN diode
1SV264	Sanyo	BAP50-04W	PIN diode
1SV266	Sanyo	BAP50-03	PIN diode
1SV267	Sanyo	BAP50-04	PIN diode
1SV269	Toshiba	BB148	Varicap
1SV270	Toshiba	BB156	Varicap
1SV271	Toshiba	BAP50-03	PIN diode
1SV278	Toshiba	BB179	Varicap
1SV279	Toshiba	BB179	Varicap
1SV282	Toshiba	BB178	Varicap
1SV282	Toshiba	BB187	Varicap
1SV283	Toshiba	BB178	Varicap
1SV283	Toshiba	BB187	Varicap
1SV284	Toshiba	BB156	Varicap
1SV288	Toshiba	BB152	Varicap
1SV290	Toshiba	BB182	Varicap
1SV294	Sanyo	BAP70-03	PIN diode
1SV305	Toshiba	BB202	Varicap
1SV307	Toshiba	BAP51-03	PIN diode
1SV308	Toshiba	BAP51-02	PIN diode
1SV322	Toshiba	BB202LX	Varicap
1T362	PEC	BB149	Varicap
1T362A	PEC	BB149A	Varicap
1T363A	PEC	BB153	Varicap
1T368A	PEC	BB148	Varicap
1T369	PEC	BB152	Varicap
1T379	PEC	BB131	Varicap
1T397	PEC	BB152	Varicap
1T399	PEC	BB148	Varicap
1T402	PEC	BB179B	Varicap
1T403	PEC	BB178	Varicap
1T404A	PEC	BB187	Varicap
1T405A	PEC	BB187	Varicap

Manufacturer type	Manufacturer	NXP type	Product family
1T406	PEC	BB182	Varicap
1T408	PEC	BB187	Varicap
2729-125	Microsemi	BLS6G2731-120	Microwave
2729-170	Microsemi	BLS6G2731-120	Microwave
2731-100M	Microsemi	BLS6G2731-120	Microwave
2931-150	Microsemi	BLS6G2731-120	Microwave
2F1G20DS	RFHIC	CGD1042H	CATV PD
2F1G20P	RFHIC	CGY1041	CATV PP
2F1G22DS	RFHIC	CGD1042H	CATV PD
2F1G23P	RFHIC	CGY1043	CATV PP
2F1G24DS	RFHIC	CGD1044H	CATV PD
2F722DS	RFHIC	BGD816L	CATV PD
2F8718P	RFHIC	BGY885A	CATV PP
2F8719DS	RFHIC	BGD812	CATV PD
2F8720DS	RFHIC	BGD814	CATV PD
2F8723P	RFHIC	BGY887	CATV PP
2F8734P	RFHIC	CGY888C	CATV PP
2N3330	Standard	J176	FET
2N3331	Standard	J176	FET
2N4220	Standard	BF245A	FET
2N4856	Standard	BSR56	FET
2N4857	Standard	BSR57	FET
2N4858	Standard	BSR58	FET
2N5114	Standard	J174	FET
2N5115	Standard	J175	FET
2N5116	Standard	J175	FET
2N5432	Standard	J108	FET
2N5433	Standard	J108	FET
2N5434	Standard	J109	FET
2N5457	Standard	BF245A	FET
2N5458	Standard	BF245A	FET
2N5459	Standard	BF245B	FET
2N5653	Standard	J112	FET
2N5654	Standard	J111	FET
2SC4094	NEC	BFG520/XR	WB trs 1-4
2SC4095	NEC	BFG520/XR	WB trs 1-4
2SC4182	NEC	BFS17W	WB trs 1-4
2SC4184	NEC	BFS17W	WB trs 1-4
2SC4185	NEC	BFS17W	WB trs 1-4
2SC4186	NEC	BFR92AW	WB trs 1-4
2SC4226	NEC	PRF957	WB trs 1-4
2SC4227	NEC	BFQ67W	WB trs 1-4
2SC4228	NEC	BFS505	WB trs 1-4
2SC4247	Toshiba	BFR92AW	WB trs 1-4
2SC4248	Toshiba	BFR92AW	WB trs 1-4
2SC4315	Toshiba	BFG520/XR	WB trs 1-4
2SC4320	Toshiba	BFG520/XR	WB trs 1-4
2SC4321	Toshiba	BFQ67W	WB trs 1-4
2SC4325	Toshiba	BFS505	WB trs 1-4
2SC4394	Toshiba	PRF957	WB trs 1-4
2SC4536	NEC	BFQ19	WB trs 1-4
2SC4537	Renesas	BFR93AW	WB trs 1-4
2SC4592	Renesas	BFG520/XR	WB trs 1-4
2SC4593	Renesas	BFS520	WB trs 1-4
2SC4703	NEC	BFQ19	WB trs 1-4
2SC4784	Renesas	BFS505	WB trs 1-4
2SC4807	Renesas	BFQ18A	WB trs 1-4
2SC4842	Toshiba	BFG540W/XR	WB trs 1-4
2SC4899	Renesas	BFS505	WB trs 1-4
2SC4900	Renesas	BFG520/XR	WB trs 1-4
2SC4901	Renesas	BFS520	WB trs 1-4
2SC4988	Renesas	BFQ540	WB trs 1-4
2SC5011	NEC	BFG540W/XR	WB trs 1-4
2SC5012	NEC	BFG540W/XR	WB trs 1-4
2SC5065	Toshiba	PRF957	WB trs 1-4
2SC5085	Toshiba	PRF957	WB trs 1-4
2SC5087	Toshiba	BFG520/XR	WB trs 1-4
2SC5088	Toshiba	BFG540W/XR	WB trs 1-4
2SC5090	Toshiba	BFS520	WB trs 1-4
2SC5092	Toshiba	BFG520/XR	WB trs 1-4
2SC5095	Toshiba	BFS505	WB trs 1-4
2SC5107	Toshiba	BFS505	WB trs 1-4
2SC5463	Toshiba	BFQ67W	WB trs 1-4
2SC5593	Renesas	BFG410W	WB trs 5-7
2SC5594	Renesas	BFG425W	WB trs 5-7
2SC5623	Renesas	BFG410W	WB trs 5-7

Manufacturer type	Manufacturer	NXP type	Product family
2SC5624	Renesas	BFG425W	WB trs 5-7
2SC5631	Renesas	BFQ540	WB trs 1-4
2SC6023	Sanyo	BFG424W	WB trs 5-7
2SJ105GR	Standard	J177	FET
2SK163-K	Renesas	J113	FET
2SK163-L	Renesas	J113	FET
2SK163-M	Renesas	J113	FET
2SK163-N	Renesas	J113	FET
2SK210BL	Renesas	PMBFJ309	FET
2SK370BL	Renesas	J109	FET
2SK370GR	Renesas	J109	FET
2SK370V	Renesas	J109	FET
2SK381	Renesas	J113	FET
2SK43	Renesas	J113	FET
2SK435	Renesas	J113	FET
2SK508	Renesas	PMBFJ308	FET
3SK290	Renesas	BF998WR	FET
BA592	Infineon	BA591	BS diode
BA595	Infineon	BAP51-03	PIN diode
BA595	Infineon	BAP70-03	PIN diode
BA597	Infineon	BAP70-03	PIN diode
BA885	Infineon	BAP70-03	PIN diode
BA892	Infineon	BA891	BS diode
BA892-02V	Infineon	BA277	PIN diode
BA892-02V	Infineon	BA891	PIN diode
BA892V-02V-GS08	Vishay	BA891	PIN diode
BA895	Infineon	BAP70-02	PIN diode
BAR14-1	Infineon	BAP70-03	PIN diode
BAR15-1	Infineon	BAP70-03	PIN diode
BAR16-1	Infineon	BAP70-03	PIN diode
BAR17	Infineon	BAP50-03	PIN diode
BAR50-02L	Infineon	BAP50LX	PIN diode
BAR50-02V	Infineon	BAP50-02	PIN diode
BAR50-02V	Infineon	BAP50-03	PIN diode
BAR50-02V	Infineon	BAP50-05	PIN diode
BAR50-03W	Infineon	BAP70-02	PIN diode
BAR60	Infineon	BAP50-03	PIN diode
BAR61	Infineon	BAP50-03	PIN diode
BAR63	Infineon	BAP63-03	PIN diode
BAR63-02L	Infineon	BAP63-02	PIN diode
BAR63-02L	Infineon	BAP63LX	PIN diode
BAR63-02V	Infineon	BAP63-02	PIN diode
BAR63-02W	Infineon	BAP63-02	PIN diode
BAR63-03W	Infineon	BAP63-03	PIN diode
BAR63-05	Infineon	BAP63-05W	PIN diode
BAR63-05W	Infineon	BAP63-05W	PIN diode
BAR63V-02V-GS08	Vishay	BAP63-02	PIN diode
BAR63V-05W-GS08	Vishay	BAP63-05W	PIN diode
BAR64-02LRH	Infineon	BAP64LX	PIN diode
BAR64-02V	Infineon	BAP64-02	PIN diode
BAR64-02W	Infineon	BAP64-02	PIN diode
BAR64-03W	Infineon	BAP64-03	PIN diode
BAR64-04	Infineon	BAP64-04	PIN diode
BAR64-04W	Infineon	BAP64-04W	PIN diode
BAR64-05	Infineon	BAP64-05	PIN diode
BAR64-05W	Infineon	BAP64-05W	PIN diode
BAR64-06	Infineon	BAP64-06	PIN diode
BAR64-06W	Infineon	BAP64-06W	PIN diode
BAR64V-02V-GS08	Vishay	BAP64-02	PIN diode
BAR64V-04-GS08	Vishay	BAP64-04	PIN diode
BAR64V-05-GS08	Vishay	BAP64-05	PIN diode
BAR64V-06-GS08	Vishay	BAP64-06	PIN diode
BAR64V-06W-GS08	Vishay	BAP64-06W	PIN diode
BAR65-02L	Infineon	BAP65LX	PIN diode
BAR65-02V	Infineon	BAP65-02	PIN diode
BAR65-02W	Infineon	BAP65-02	PIN diode
BAR65-03W	Infineon	BAP65-03	PIN diode
BAR65V-02V-GS08	Vishay	BAP65-02	PIN diode
BAR66	Infineon	BAP1321-04	PIN diode
BAR67-02W	Infineon	BAP1321-02	PIN diode
BAR67-03W	Infineon	BAP1321-03	PIN diode
BAT18-04	Infineon	BAT18	PIN diode
BB304C	Renesas	BF1201WR	FET
BB304M	Renesas	BF1201R	FET
BB305C	Renesas	BF1201WR	FET
BB305M	Renesas	BF1201R	FET

Manufacturer type	Manufacturer	NXP type	Product family
BB403M	Renesas	BF909R	FET
BB501C	Renesas	BF1202WR	FET
BB501M	Renesas	BF1202R	FET
BB502C	Renesas	BF1202WR	FET
BB502M	Renesas	BF1202R	FET
BB503C	Renesas	BF1202WR	FET
BB503M	Renesas	BF1202R	FET
BB535	Infineon	BB149	Varicap
BB545	Infineon	BB149A	Varicap
BB555	Infineon	BB179B	Varicap
BB565	Infineon	BB179	Varicap
BB601M	Renesas	BF1202	FET
BB639	Infineon	BB148	Varicap
BB639	Infineon	BB153	Varicap
BB640	Infineon	BB152	Varicap
BB641	Infineon	BB152	Varicap
BB659	Infineon	BB178	Varicap
BB664	Infineon	BB178	Varicap
BB664	Infineon	BB187	Varicap
BB669	Infineon	BB152	Varicap
BB814	Infineon	BB201	Varicap
BB831	Infineon	BB131	Varicap
BB833	Infineon	BB131	Varicap
BB835	Infineon	BB131	Varicap
BBY58-02V	Infineon	BB202	Varicap
BBY65	Infineon	BB202	Varicap
BF1005S	Infineon	BF1105	FET
BF1009S	Infineon	BF1109	FET
BF1009SW	Infineon	BF1109WR	FET
BF2030	Infineon	BF1101	FET
BF2030R	Infineon	BF1101R	FET
BF2030W	Infineon	BF1101WR	FET
BF244A	Standard	BF245A	FET
BF244B	Standard	BF245B	FET
BF244C	Standard	BF245C	FET
BF247A	Standard	J108	FET
BF247B	Standard	J108	FET
BF247C	Standard	J108	FET
BF256A	Standard	BF245A	FET
BF256B	Standard	BF245B	FET
BF256C	Standard	BF245C	FET
BF770A	Infineon	BFR93A	WB trs 1-4
BF771	Infineon	PBR951	WB trs 1-4
BF771W	Infineon	BFS540	WB trs 1-4
BF772	Infineon	BFG540	WB trs 1-4
BF775	Infineon	BFR92A	WB trs 1-4
BF775A	Infineon	BFR92A	WB trs 1-4
BF775W	Infineon	BFR92AW	WB trs 1-4
BF851A	Standard	BF861A	FET
BF851B	Standard	BF861B	FET
BF851C	Standard	BF861C	FET
BF994S	Vishay	BF994S	FET
BF996S	Vishay	BF996S	FET
BF998	Infineon	BF998	FET
BF998	Vishay	BF998	FET
BF998-GS08	Vishay	BF998	FET
BF998R	Vishay	BF998R	FET
BF998R-GS08	Vishay	BF998R	FET
BF998RW	Vishay	BF998WR	FET
BF998W	Infineon	BF998WR	FET
BFG135A	Infineon	BFG135	WB trs 1-4
BFG193	Infineon	BFG198	WB trs 1-4
BFG194	Infineon	BFG31	WB trs 1-4
BFG196	Infineon	BFG541	WB trs 1-4
BFG19S	Infineon	BFG97	WB trs 1-4
BFG235	Infineon	BFG135	WB trs 1-4
BFP180	Infineon	BFG505/X	WB trs 1-4
BFP181	Infineon	BFG67/X	WB trs 1-4
BFP181T-GS08	Vishay	BFG67/X	WB trs 1-4
BFP182	Infineon	BFG67/X	WB trs 1-4
BFP183	Infineon	BFG520/X	WB trs 1-4
BFP183R	Infineon	BFG520/XR	WB trs 1-4
BFP183T-GS08	Vishay	BFG520/X	WB trs 1-4
BFP183TW-GS08	Vishay	BFG520W/X	WB trs 1-4
BFP193	Infineon	BFG540/X	WB trs 1-4
BFP193W	Infineon	BFG540W/XR	WB trs 1-4

Manufacturer type	Manufacturer	NXP type	Product family
BFP196T-GS08	Vishay	BFG540/X	WB trs 1-4
BFP196TR-GS08	Vishay	BFG540/XR	WB trs 1-4
BFP196TRW-GS08	Vishay	BFG540W/XR	WB trs 1-4
BFP196TW-GS08	Vishay	BFG540W/X	WB trs 1-4
BFP196W	Infineon	BFG540W/XR	WB trs 1-4
BFP280	Infineon	BFG505/X	WB trs 1-4
BFP405	Infineon	BFG410W	WB trs 5-7
BFP420	Infineon	BFG425W	WB trs 5-7
BFP450	Infineon	BFG480W	WB trs 5-7
BFP67-GS08	Vishay	BFG67/X	WB trs 1-4
BFP67R-GS08	Vishay	BFG67/X	WB trs 1-4
BFP740	Infineon	BFU725F	WB trs 5-7
BFP740F	Infineon	BFU725F	WB trs 5-7
BFP81	Infineon	BFG92A/X	WB trs 1-4
BFP92A-GS08	Vishay	BFG92A/X	WB trs 1-4
BFP93A	Infineon	BFG93A/X	WB trs 1-4
BFP93A-GS08	Vishay	BFG93A/X	WB trs 1-4
BFQ193	Infineon	BFQ540	WB trs 1-4
BFQ19S	Infineon	BFQ19	WB trs 1-4
BFQ67-GS08	Vishay	BFQ67W	WB trs 1-4
BFR106	Infineon	BFR106	WB trs 1-4
BFR180	Infineon	BFR505	WB trs 1-4
BFR180W	Infineon	BFS505	WB trs 1-4
BFR181	Infineon	BFR520	WB trs 1-4
BFR181T-GS08	Vishay	BFR520	WB trs 1-4
BFR181TW-GS08	Vishay	BFS520	WB trs 1-4
BFR181W	Infineon	BFS520	WB trs 1-4
BFR182	Infineon	PBR941	WB trs 1-4
BFR182W	Infineon	PRF947	WB trs 1-4
BFR183	Infineon	PBR951	WB trs 1-4
BFR183T-GS08	Vishay	PBR951	WB trs 1-4
BFR183TW-GS08	Vishay	PRF957	WB trs 1-4
BFR183W	Infineon	PRF957	WB trs 1-4
BFR193	Infineon	PBR951	WB trs 1-4
BFR193TW-GS08	Vishay	PRF957	WB trs 1-4
BFR193W	Infineon	PRF957	WB trs 1-4
BFR196T-GS08	Vishay	BFR540	WB trs 1-4
BFR196TW-GS08	Vishay	BFS540	WB trs 1-4
BFR35AP	Infineon	BFR92A	WB trs 1-4
BFR92AL	Freescale	BFR92A	WB trs 1-4
BFR92AW-GS08	Vishay	BFR92AW	WB trs 1-4
BFR92P	Infineon	BFR92A	WB trs 1-4
BFR92W	Infineon	BFR92AW	WB trs 1-4
BFR93A	Infineon	BFR93A	WB trs 1-4
BFR93AL	Freescale	BFR93A	WB trs 1-4
BFR93AW	Infineon	BFR93AW	WB trs 1-4
BFR93AW-GS08	Vishay	BFR93AW	WB trs 1-4
BFR93-GS08	Vishay	BFR93A	WB trs 1-4
BFS17-GS08	Vishay	BFS17	WB trs 1-4
BFS17-GS08	Vishay	BFS17A	WB trs 1-4
BFS17L	Freescale	BFS17	WB trs 1-4
BFS17P	Infineon	BFS17A	WB trs 1-4
BFS17W	Infineon	BFS17W	WB trs 1-4
BFS17W-GS08	Vishay	BFS17W	WB trs 1-4
BFS481	Infineon	BFM505	WB trs 1-4
BFS483	Infineon	BFM520	WB trs 1-4
BFT92	Infineon	BFT92	WB trs 1-4
BFT93	Infineon	BFT93	WB trs 1-4
BIC701C	Renesas	BF1105WR	FET
BIC701M	Renesas	BF1105R	FET
BIC702C	Renesas	BF1105WR	FET
BIC702M	Renesas	BF1105R	FET
BIC801M	Renesas	BF1105	FET
BSR111	Standard	PMBFJ111	FET
BSR112	Standard	PMBFJ112	FET
BSR113	Standard	PMBFJ113	FET
BSR174	Standard	PMBFJ174	FET
BSR175	Standard	PMBFJ175	FET
BSR176	Standard	PMBFJ176	FET
BSR177	Standard	PMBFJ177	FET
CA901	Standard	BGX885N	CATV PPA
CA901A	Standard	BGX885N	CATV PPA
CA922	Standard	BGD885	CATV PD
CA922A	Standard	BGD885	CATV PD
CMY91	Infineon	BGA2022	MMIC
CMY91	Infineon	BGA2022	WB trs 1-4

Manufacturer type	Manufacturer	NXP type	Product family
CXE1089Z	RFMD	BGA6489	MMIC
CXE1089Z	RFMD	BGA6589	MMIC
D5540185	Standard	BGD502	CATV PD
D7540185	Standard	BGD702	CATV PD
D7540200	Standard	BGD704	CATV PD
D8640185	Standard	BGD802	CATV PD
DME500	Microsemi	BLAH0912-500	Microwave
EC2C03C	Sanyo	BB145B	Varicap
F2046	POLYFET	BLF542	Broadcast
F2048	POLYFET	BLF543	Broadcast
F2247	POLYFET	BLF522	Broadcast
FSD273TA	Skyworks	BB148	Varicap
FSD273TA	Skyworks	BB178	Varicap
HBFP0405	Agilent	BFG410W	WB trs 5-7
HBFP0420	Agilent	BFG425W	WB trs 5-7
HBFP0450	Agilent	BFG480W	WB trs 5-7
HSC277	Renesas	BA277	BS diode
HSMP3800	Agilent	BAP70-03	PIN diode
HSMP3802	Agilent	BAP50-04	PIN diode
HSMP3804	Agilent	BAP50-05	PIN diode
HSMP3810	Agilent	BAP50-03	PIN diode
HSMP3814	Agilent	BAP50-05	PIN diode
HSMP381B	Agilent	BAP50-03	PIN diode
HSMP381C	Agilent	BAP50-05	PIN diode
HSMP381F	Agilent	BAP64-05W	PIN diode
HSMP3820	Agilent	BAP1321-03	PIN diode
HSMP3822	Agilent	BAP1321-04	PIN diode
HSMP3830	Agilent	BAP64-03	PIN diode
HSMP3832	Agilent	BAP64-04	PIN diode
HSMP3833	Agilent	BAP64-06	PIN diode
HSMP3834	Agilent	BAP64-05	PIN diode
HSMP3860	Agilent	BAP50-03	PIN diode
HSMP3862	Agilent	BAP50-04	PIN diode
HSMP3864	Agilent	BAP50-05	PIN diode
HSMP386B	Agilent	BAP50-02	PIN diode
HSMP386E	Agilent	BAP50-04W	PIN diode
HSMP386L	Agilent	BAP50-05W	PIN diode
HSMP3880	Agilent	BAP51-03	PIN diode
HSMP3890	Agilent	BAP51-03	PIN diode
HSMP3892	Agilent	BAP64-04	PIN diode
HSMP3894	Agilent	BAP64-05	PIN diode
HSMP3895	Agilent	BAP51-02	PIN diode
HSMP389B	Agilent	BAP51-02	PIN diode
HSMP389C	Agilent	BAP64-04	PIN diode
HSMP389F	Agilent	BAP51-05W	PIN diode
HVB14S	Renesas	BAP50-04W	PIN diode
HVC131	Renesas	BAP65-02	PIN diode
HVC132	Renesas	BAP51-02	PIN diode
HVC200A	Renesas	BB178	Varicap
HVC200A	Renesas	BB187	Varicap
HVC202A	Renesas	BB179	Varicap
HVC202B	Renesas	BB179B	Varicap
HVC300A	Renesas	BB182	Varicap
HVC300B	Renesas	BB182	Varicap
HVC306A	Renesas	BB187	Varicap
HVC306B	Renesas	BB187	Varicap
HVC355B	Renesas	BB145B	Varicap
HVC359	Renesas	BB202	Varicap
HVC363A	Renesas	BB178	Varicap
HVC376B	Renesas	BB198	Varicap
HVC376B	Renesas	BB202	Varicap
HVD132	Renesas	BAP51-02	PIN diode
HVU131	Renesas	BAP65-03	PIN diode
HVU132	Renesas	BAP51-03	PIN diode
HVU202(A)	Renesas	BB149	Varicap
HVU202(A)	Renesas	BB149A	Varicap
HVU300A	Renesas	BB152	Varicap
HVU307	Renesas	BB148	Varicap
HVU315	Renesas	BB148	Varicap
HVU316	Renesas	BB131	Varicap
HVU363A	Renesas	BB148	Varicap
HVU363A	Renesas	BB153	Varicap
HVU363B	Renesas	BB148	Varicap
IB0810M100	Integra	BLF871	Broadcast
IB0912L30	Integra	BLA6H0514-25	Microwave
IB0912L70	Integra	BLA6H0514-25	Microwave

Manufacturer type	Manufacturer	NXP type	Product family
IB0912M210	Integra	BLA6H0514-25	Microwave
IB0912M500	Integra	BLA6H0912-500	Microwave
IB0912M600	Integra	BLA6H0912-500	Microwave
IB1011L15	Integra	BLA6H0514-25	Microwave
IB1011L220	Integra	BLA6G1011-200R	Microwave
IB1011L40	Integra	BLA6H0514-25	Microwave
IB1011L470	Integra	BLA6H0912-500	Microwave
IB1011M140	Integra	BLA6G1011-200R	Microwave
IB1011M190	Integra	BLA6G1011-200R	Microwave
IB1011M250	Integra	BLA6G1011-200R	Microwave
IB1011S190	Integra	BLA6G1011-200R	Microwave
IB1011S250	Integra	BLA6G1011-200R	Microwave
IB1012S10	Integra	BLA6H0514-25	Microwave
IB1012S20	Integra	BLA6H0514-25	Microwave
IB2729M5	Integra	BLS6G2731-6G	Microwave
IB2729M90	Integra	BLS6G2731-120	Microwave
IB2731M110	Integra	BLS6G2731-120	Microwave
IB2731MH110	Integra	BLS6G2731-120	Microwave
IB2931MH155	Integra	BLS6G2731-120	Microwave
IB3134M100	Integra	BLS6G3135S-120	Microwave
IB3135MH100	Integra	BLS6G3135S-120	Microwave
IBP1214M700	Integra	BLL6H1214-500	Microwave
IBP1214M700	Integra	BLL6H1214-500	Microwave
IBP3135M150	Integra	BLS6G3135S-120	Microwave
IDM175CW300	Integra	BLF278	Broadcast
IDM500CW150	Integra	BLF881	Broadcast
IDM500CW200	Integra	BLF888	Broadcast
IDM500CW300	Integra	BLF878	Broadcast
IDM500CW80	Integra	BLF871	Broadcast
ILD1011M15	Integra	BLL6H0514-25	Microwave
ILD1011M150	Integra	BLA6G1011-200R	Microwave
ILD1011M15HV	Integra	BLA6H0514-25	Microwave
ILD1011M160HV	Integra	BLA6G1011-200R	Microwave
ILD1011M250	Integra	BLA6G1011-200R	Microwave
ILD1011M30	Integra	BLA6H0514-25	Microwave
ILD1011M400	Integra	BLA6H0912-500	Microwave
ILD1011M450HV	Integra	BLA6H0912-500	Microwave
ILD1011M550HV	Integra	BLA6H1011-600	Microwave
ILD1214M10	Integra	BLL6H0514-25	Microwave
ILD2731M140	Integra	BLS6G2731-120	Microwave
ILD3135M120	Integra	BLS6G3135S-120	Microwave
ILP1214EL200	Integra	BLS7G2933P-200	Microwave
INA-51063	Agilent	BGA2001	MMIC
J270	Standard	J177	FET
J308	Standard	J108	FET
J309	Standard	J109	FET
J310	Standard	J110	FET
JDP2S01E	Toshiba	BAP65-02	PIN diode
JDP2S01U	Toshiba	BAP65-03	PIN diode
JDP2S02AFS	Toshiba	BAP51-02	PIN diode
JDP2S02AS	Toshiba	BAP51-03	PIN diode
JDP2S02T	Toshiba	BAP63-02	PIN diode
JDP2S04E	Toshiba	BAP50-02	PIN diode
JDS2S03S	Toshiba	BA891	BS diode
JTDA150A	Microsemi	BLF177	Broadcast
KP2310R	Toko	BAP64-04W	PIN diode
KTK920BT	KEC	BF1108	FET
KTK920T	KEC	BF1108R	FET
KV1835E	Toko	BB199	Varicap
LC421	POLYFET	BLF544	Broadcast
MA2S077	Standard	BA277	BS diode
MA2S357	Matsushita	BB178	Varicap
MA2S357	Matsushita	BB187	Varicap
MA2S372	Matsushita	BB179	Varicap
MA2S374	Matsushita	BB182	Varicap
MA2SV01	Renesas	BB202	Varicap
MA357	Matsushita	BB153	Varicap
MA366	Matsushita	BB148	Varicap
MA368	Matsushita	BB131	Varicap
MA372	Matsushita	BB149	Varicap
MA372	Matsushita	BB149A	Varicap
MA4CP101A	Matsushita	BAP65-03	PIN diode
MA4P274-1141	Matsushita	BAP51-03	PIN diode
MA4P275-1141	Matsushita	BAP65-03	PIN diode
MA4P275CK-287	Matsushita	BAP65-05	PIN diode
MA4P277-1141	Matsushita	BAP70-03	PIN diode

Manufacturer type	Manufacturer	NXP type	Product family	Manufacturer type	Manufacturer	NXP type	Product family
MA4P278-287	Matsushita	BAP70-03	PIN diode	MHW7222A	Freescale	BGY787	CATV PPA
MA4P789-1141	Matsushita	BAP1321-03	PIN diode	MHW7222B	Freescale	BGY787	CATV PPA
MA4P789ST-287	Matsushita	BAP1321-04	PIN diode	MHW7242A	Freescale	BGE787B	CATV PPA/HG
MAX2659	Maxim	BGU7005	MMIC	MHW7272A	Freescale	BGE787B	CATV PPA/HG
MC7712	NEC	BGY785A	CATV PPA	MHW7292	Freescale	BGE787B	CATV PPA/HG
MC7716	NEC	BGY787	CATV PPA	MHW7292A	Freescale	BGE787B	CATV PPA/HG
MC7722	NEC	BGY785A	CATV PPA	MHW7292AN	Freescale	BGE787B	CATV PPA/HG
MC7726	NEC	BGY787	CATV PPA	MHW7342	Freescale	BGE788	CATV PPA/HG
MC-7831	NEC	BGY885A	CATV PP	MHW8142	Freescale	BGY883	CATV PPA
MC-7831-HA	NEC	BGY1085A	CATV PP	MHW8182B	Freescale	BGY885A	CATV PPA
MC-7832	NEC	BGY887	CATV PP	MHW8182C	Freescale	BGY885A	CATV PPA
MC-7832-HA	NEC	CGY1041	CATV PP	MHW8182CN	Freescale	BGY885A	CATV PP
MC-7833	NEC	BGY887B	CATV PP	MHW8185	Freescale	BGD814	CATV PD
MC-7836	NEC	BGY887B	CATV PP	MHW8185L	Freescale	BGD812	CATV PD
MC-7836	NEC	CGY1047	CATV PP	MHW8188AN	Freescale	CGD942C	CATV PD
MC-7845	NEC	BGD802	CATV PD	MHW8205	Freescale	BGD814	CATV PD
MC-7846	NEC	CGD942C	CATV PD	MHW820L	Freescale	BGD814	CATV PD
MC-7847	NEC	CGD944C	CATV PD	MHW8222BN	Freescale	BGY887	CATV PP
MC7852	NEC	BGY885A	CATV PPA	MHW8227A	Freescale	CGD942C	CATV PD
MC7866	NEC	BGD816L	CATV PD	MHW8227AN	Freescale	CGD942C	CATV PD
MC-7881	NEC	BGD802	CATV PD	MHW8247A	Freescale	CGD944C	CATV PPA
MC-7882	NEC	BGD814	CATV PD	MHW8247AN	Freescale	CGD944C	CATV PD
MC-7883	NEC	CGD942C	CATV PD	MHW8292	Freescale	BGY887B	CATV PPA
MC-7884	NEC	CGD944C	CATV PD	MHW8342	Freescale	BGY888	CATV PPA
MC-7891	NEC	CGD1042H	CATV PD	MHW8342N	Freescale	CGY888C	CATV PP
MC-7893	NEC	CGD1042H	CATV PD	MHW9146	Freescale	BGY883	CATV PPA
MC-7894	NEC	CDG1044H	CATV PD	MHW9182B	Freescale	BGY1085A	CATV PPA
MC-7896	NEC	CGD1044H	CATV PD	MHW9182C	Freescale	BGY1085A	CATV PPA
MCH4009	Sanyo	BFG424F	WB trs 5-7	MHW9182CN	Freescale	BGY1085A	CATV PP
MD7P19130	Freescale	BLF6G20LS-110	Base Station	MHW9186	Freescale	BGY885A	CATV PPA
MD7P19130H	Freescale	BLF6G20LS-75	Base Station	MHW9186A	Freescale	BGY885A	CATV PPA
MD7P19130H (2)	Freescale	BLF6G20(LS)-180RN	Base station	MHW9187N	Freescale	CGD942C	CATV PD
MDS400	Microsemi	BLA6H0912-500	Microwave	MHW9188AN	Freescale	CGD942C	CATV PD
MDS800	Microsemi	BLA6H1011-600	Microwave	MHW9188N	Freescale	CGD942C	CATV PD
MHW10186N	Freescale	BGY1085A	CATV PP	MHW9227AN	Freescale	CGD942C	CATV PD
MHW10236N	Freescale	CGY1043	CATV PP	MHW9242A	Freescale	CGD1042	CATV PD
MHW10247AN	Freescale	CGD1044H	CATV PD	MHW9247	Freescale	CGD944C	CATV PD
MHW10276N	Freescale	CGY1047	CATV PP	MHW9247A	Freescale	CGD944C	CATV PD
MHW1224	Freescale	BGY67	CATV RA	MHW9247AN	Freescale	CGD944C	CATV PD
MHW1244	Freescale	BGY67A	CATV RA	MHW9247N	Freescale	CGD944C	CATV PD
MHW1253LA	Freescale	BGY67A	CATV RA	MHWJ5272A	Freescale	BGY587B	CATV PPA
MHW1254L	Freescale	BGY68	CATV RA	MHWJ7185A	Freescale	BGD712	CATV PD
MHW1254LA	Freescale	BGY68	CATV RA	MHWJ7205A	Freescale	BGD714	CATV PD
MHW1304L	Freescale	BGY68	CATV RA	MHWJ7292	Freescale	BGE787B	CATV PPA/HG
MHW1304LA	Freescale	BGY68	CATV RA	MHWJ9182	Freescale	BGY1085A	CATV PPA
MHW1304LAN	Freescale	BGY68	CATV RA	MMBF4391	Freescale	PMBF4391	FET
MHW1346	Freescale	BGY67A	CATV RA	MMBF4392	Freescale	PMBF4392	FET
MHW1353LA	Freescale	BGY67A	CATV RA	MMBF4393	Freescale	PMBF4393	FET
MHW1354LA	Freescale	BGY68	CATV RA	MMBF4860	Freescale	PMBFJ112	FET
MHW5182A	Freescale	BGY585A	CATV PPA	MMBF5484	Freescale	BFR31	FET
MHW5185B	Freescale	BGD502	CATV PD	MMBFJ113	Freescale	PMBFJ113	FET
MHW5222A	Freescale	BGY587	CATV PPA	MMBFJ174	Freescale	PMBFJ174	FET
MHW5272A	Freescale	BGY587B	CATV PPA/HG	MMBFJ175	Freescale	PMBFJ175	FET
MHW5342A	Freescale	BGY588N	CATV PPA/HG	MMBFJ176	Freescale	PMBFJ176	FET
MHW5342T	Freescale	BGY588N	CATV PPA/HG	MMBFJ177	Freescale	PMBFJ177	FET
MHW6182	Freescale	BGY585A	CATV PPA	MMBFJ308	Freescale	PMBFJ308	FET
MHW6182-6	Freescale	BGY685A	CATV PPA	MMBFJ309	Freescale	PMBFJ309	FET
MHW6182T	Freescale	BGY585A	CATV PPA	MMBFJ310	Freescale	PMBFJ310	FET
MHW6185B	Freescale	BGD502	CATV PD	MMBFU310	Freescale	PMBFJ310	FET
MHW6185T	Freescale	BGD502	CATV PD	MMBR5031L	Freescale	BFS17	WB trs 1-4
MHW6205	Freescale	BGD704	CATV PD	MMBR5179L	Freescale	BFS17A	WB trs 1-4
MHW6222	Freescale	BGY587	CATV PPA	MMBR571L	Freescale	PBR951	WB trs 1-4
MHW6222B	Freescale	BGY687	CATV PPA	MMBR901L	Freescale	BFR92A	WB trs 1-4
MHW6222T	Freescale	BGY587	CATV PPA	MMBR911L	Freescale	BFR93A	WB trs 1-4
MHW6272	Freescale	BGY587B	CATV PPA	MMBR920L	Freescale	BFR93A	WB trs 1-4
MHW6272T	Freescale	BGY587B	CATV PPA	MMBR931L	Freescale	BFT25A	WB trs 1-4
MHW6342	Freescale	BGY588N	CATV PPA	MMBR941BL	Freescale	PBR941	WB trs 1-4
MHW6342T	Freescale	BGY588N	CATV PPA	MMBR941L	Freescale	PBR941	WB trs 1-4
MHW7182B	Freescale	BGY785A	CATV PPA	MMBR951AL	Freescale	PBR951	WB trs 1-4
MHW7182C	Freescale	BGY785A	CATV PPA	MMBR951L	Freescale	PBR951	WB trs 1-4
MHW7185C2	Freescale	BGD712	CATV PD	MMBV105GLT1	ONSemicond.	BB156	Varicap
MHW7185CL	Freescale	BGD712	CATV PD	MMBV109LT1	ONSemicond.	BB148	Varicap
MHW7205C	Freescale	BGD714	CATV PD	MMG2001NT1	Freescale	BGD816L	CATV PD
MHW7205CL	Freescale	BGD714	CATV PD	MMG2001T1	Freescale	BGD816L	CATV PD
MHW7205CLN	Freescale	BGD714	CATV PD	MPAL2731M15	Integra	BLS6G2731-6G	Microwave
MHW7222	Freescale	BGY787	CATV PPA	MPAL2731M30	Integra	BLS6G2731-6G	Microwave

Manufacturer type	Manufacturer	NXP type	Product family
MPAL3035M15	Integra	BLS6G2731-6G	Microwave
MPAL3035M30	Integra	BLS6G2731-6G	Microwave
MPF102	Standard	BF245A	FET
MPF970	Standard	J174	FET
MPF971	Standard	J176	FET
MRF10005	M/A- COM	BLA6H0912-500	Microwave
MRF1000MB	M/A- COM	BLA6H0912-500	Microwave
MRF10031	M/A- COM	BLA6H0912-500	Microwave
MRF1004MB	M/A- COM	BLA6H0912-500	Microwave
MRF10120	M/A- COM	BLA6H0912-500	Microwave
MRF10150	M/A- COM	BLL6H0514-25	Microwave
MRF10350	M/A- COM	BLL6H0514-25	Microwave
MRF10502	M/A- COM	BLL6H0514-25	Microwave
MRF1090MB	M/A- COM	BLA6H0912-500	Microwave
MRF1150MA	M/A- COM	BLA6H0912-500	Microwave
MRF1150MB	M/A- COM	BLA6H0912-500	Microwave
MRF134	M/A- COM	BLF871	Broadcast
MRF136	M/A- COM	BLF871	Broadcast
MRF136Y	M/A- COM	BLF881	Broadcast
MRF137	M/A- COM	BLF881	Broadcast
MRF140	M/A- COM	BLF177	Broadcast
MRF141	M/A- COM	BLF177	Broadcast
MRF141G	M/A- COM	BLF278	Broadcast
MRF148A	M/A- COM	BLF175	Broadcast
MRF150	M/A- COM	BLF177	Broadcast
MRF151	M/A- COM	BLF177	Broadcast
MRF151A	M/A- COM	BLF177	Broadcast
MRF151G	M/A- COM	BLF278	Broadcast
MRF154	M/A- COM	BLF574	Broadcast
MRF157	M/A- COM	BLF574	Broadcast
MRF158	M/A- COM	BLF871	Broadcast
MRF160	M/A- COM	BLF871	Broadcast
MRF166C	M/A- COM	BLF871	Broadcast
MRF166W	M/A- COM	BLF881	Broadcast
MRF171A	M/A- COM	BLF881	Broadcast
MRF173	M/A- COM	BLF871	Broadcast
MRF173CQ	M/A- COM	BLF871	Broadcast
MRF174	M/A- COM	BLF881	Broadcast
MRF175GU	M/A- COM	BLF881	Broadcast
MRF175GV	M/A- COM	BLF278	Broadcast
MRF175LU	M/A- COM	BLF871	Broadcast
MRF176GU	M/A- COM	BLF881	Broadcast
MRF176GV	M/A- COM	BLF573S	Broadcast
MRF177	M/A- COM	BLF871	Broadcast
MRF18030ALR3(1)	Freescale	BLF6G21-30	Base Station
MRF18030ALR3(1)	Freescale	BLF6G20-45	Base Station
MRF18030ALSR3(1)	Freescale	BLF6G21-30	Base Station
MRF18030ALSR3(1)	Freescale	BLF6G20-45	Base Station
MRF18030BLR3(1)	Freescale	BLF6G21-30	Base Station
MRF18030BLR3(1)	Freescale	BLF6G20-45	Base Station
MRF18030BLSR3(1)	Freescale	BLF6G21-30	Base Station
MRF18030BLSR3(1)	Freescale	BLF6G20-45	Base Station
MRF18060AL(2)	Freescale	BLC6G20-75	Base Station
MRF18060BL(2)	Freescale	BLC6G20-75	Base Station
MRF18085AL(2)	Freescale	BLC6G20-75	Base Station
MRF18085BL(2)	Freescale	BLF7G20(LS)-300P	Base station
MRF18085BL(2)	Freescale	BLC6G20-75	Base Station
MRF18090AR3(1)	Freescale	BLF6G20-110	Base Station
MRF18090B(2)	Freescale	BLF7G20(LS)-300P	Base station
MRF18090B(2)	Freescale	BLF6G20-110	Base Station
MRF19030L(2)	Freescale	BLF6G21-30	Base Station
MRF19030L(2)	Freescale	BLF6G20-45	Base Station
MRF19045L(2)	Freescale	BLF6G20-45	Base Station
MRF19060L(2)	Freescale	BLF6G20-45	Base Station
MRF19085LR3(1)	Freescale	BLF6G20-110	Base Station
MRF19085LSR3(1)	Freescale	BLF6G20-110	Base Station
MRF19090R3(1)	Freescale	BLF7G20(LS)-300P	Base station
MRF19090R3(1)	Freescale	BLF6G20-110	Base Station
MRF19090SR3(1)	Freescale	BLF7G20(LS)-300P	Base station
MRF19090SR3(1)	Freescale	BLF6G20-110	Base Station
MRF19125(2)	Freescale	BLF6G20(LS)-110	Base station
MRF19125(2)	Freescale	BLF6G20-140	Base Station
MRF21010LR1(1)	Freescale	BLF3G21-6	Base Station
MRF21010LSR1(1)	Freescale	BLF3G21-6	Base Station
MRF21030LR3(1)	Freescale	BLF6G22-30	Base Station
MRF21030LSR3(1)	Freescale	BLF6G22-45	Base Station

Manufacturer type	Manufacturer	NXP type	Product family
MRF21045LR3(1)	Freescale	BLF6G22-45	Base Station
MRF21045LSR3(1)	Freescale	BLF6G22-45	Base Station
MRF21060L(2)	Freescale	BLF6G22-75	Base Station
MRF21085L(2)	Freescale	BLF6G22-100	Base Station
MRF21090(2)	Freescale	BLF6G22-100	Base Station
MRF21120R6(1)	Freescale	BLF6G22-130	Base Station
MRF21125(2)	Freescale	BLF6G22-130	Base Station
MRF21125SR3(1)	Freescale	BLF6G22-130	Base Station
MRF21180R6(1)	Freescale	BLF6G22-180	Base Station
MRF275G	M/A- COM	BLF881	Broadcast
MRF275L	M/A- COM	BLF871	Broadcast
MRF281SR1(1)	Freescale	BLF6G21-6	Base Station
MRF281ZR1(1)	Freescale	BLF6G21-6	Base Station
MRF282SR1(1)	Freescale	BLF1822-10	Base Station
MRF282ZR1(1)	Freescale	BLF1822-10	Base Station
MRF284LR1(1)	Freescale	BLF3G21-30	Base Station
MRF284LSR1(1)	Freescale	BLF6G21-30	Base Station
MRF313	M/A- COM	BLF871	Broadcast
MRF314	M/A- COM	BLF881	Broadcast
MRF316	M/A- COM	BLF871	Broadcast
MRF317	M/A- COM	BLF871	Broadcast
MRF321	M/A- COM	BLF871	Broadcast
MRF323	M/A- COM	BLF871	Broadcast
MRF327	M/A- COM	BLF871	Broadcast
MRF372(3)	Freescale	BLF881	Base station
MRF373ALR1(2)	Freescale	BLF878	Base station
MRF374A(1)	Freescale	BLF881	Base station
MRF377H(2)	Freescale	BLF878	Base station
MRF377H(2)	Freescale	BLF872	Broadcast
MRF392	M/A- COM	BLF881	Broadcast
MRF393	M/A- COM	BLF871	Broadcast
MRF421	M/A- COM	BLF871	Broadcast
MRF422	M/A- COM	BLF177	Broadcast
MRF426	M/A- COM	BLF871	Broadcast
MRF428	M/A- COM	BLF177	Broadcast
MRF429	M/A- COM	BLF177	Broadcast
MRF448	M/A- COM	BLF573S	Broadcast
MRF454	M/A- COM	BLF871	Broadcast
MRF455	M/A- COM	BLF871	Broadcast
MRF577	Freescale	PRF957	WB trs 1-4
MRF5811L	Freescale	BFG93A/X	WB trs 1-4
MRF5P20180HR6(1)	Freescale	BLF6G20-180P	Base Station
MRF5P21045NR1(1)	Freescale	BLD6G22(LS)-50	Base station
MRF5P21180HR6(1)	Freescale	BLF6G22(LS)-180RN	Base station
MRF5P21180HR6(1)	Freescale	BLF6G20-180P	Base Station
MRF5S19060N(2)	Freescale	BLF6G20-75	Base Station
MRF5S19090HR3(1)	Freescale	BLF6G20-110	Base Station
MRF5S19090HSR3(1)	Freescale	BLF6G20-110	Base Station
MRF5S19100H(2)	Freescale	BLF7G20(LS)-140P	Base station
MRF5S19100H(2)	Freescale	BLF6G20-110	Base Station
MRF5S19130H(2)	Freescale	BLF6G20(LS)-110	Base station
MRF5S19130H(2)	Freescale	BLF6G20-140	Base Station
MRF5S19150H(2)	Freescale	BLF6G20LS-140	Base station
MRF5S19150H(2)	Freescale	BLF6G22-150P	Base Station
MRF5S21045N(2)	Freescale	BLD6G22(LS)-50	Base station
MRF5S21045N(2)	Freescale	BLF1822-10	Base Station
MRF5S21090HR3(1)	Freescale	BLF6G22-100	Base Station
MRF5S21090HSR3(1)	Freescale	BLF6G22-100	Base Station
MRF5S21100HR3(1)	Freescale	BLF6G22-100	Base Station
MRF5S21100HSR3(1)	Freescale	BLF6G22-100	Base Station
MRF5S21130HR3(1)	Freescale	BLF6G22-130	Base Station
MRF5S21130HSR3(1)	Freescale	BLF6G22-130	Base Station
MRF5S21150H(2)	Freescale	BLF6G22-150P	Base Station
MRF5S9150H(2)	Freescale	BLF6G10(LS)-160RN	Base station
MRF6P18190HR6(1)	Freescale	BLF6G20-180P	Base Station
MRF6P21190HR6(1)	Freescale	BLF7G22LS-130	Base station
MRF6P21190HR6(1)	Freescale	BLF6G20-180P	Base Station
MRF6P3300H(2)	Freescale	BLF888	Base station
MRF6P3300H(2)	Freescale	BLF878	Broadcast
MRF6S18060N(2)	Freescale	BLF6G20-75	Base Station
MRF6S18100N(2)	Freescale	BLF6G20-110	Base Station
MRF6S18140H(2)	Freescale	BLF6G20-140	Base Station
MRF6S19060N(2)	Freescale	BLF6G20-75	Base Station
MRF6S19100H(2)	Freescale	BLF7G20(LS)-140P	Base station
MRF6S19100H(2)	Freescale	BLF6G20-110	Base Station
MRF6S19100N(2)	Freescale	BLF6G20-110	Base Station

Manufacturer type	Manufacturer	NXP type	Product family
MRF6S19120H (2)	Freescale	BLF7G20L(S)-140P	Base station
MRF6S19120H(2)	Freescale	BLF6G20-110	Base Station
MRF6S19140H (2)	Freescale	BLF6G20LS-75	Base station
MRF6S19140H(2)	Freescale	BLF6G20-140	Base Station
MRF6S19200H (2)	Freescale	BLF6G20-180PN, BLF7G20L(S)-200	Base station
MRF6S20010	Freescale	BLM6G22-30	Base Station
MRF6S20010	Freescale	BLM6G22-30G	Base Station
MRF6S20010N (2)	Freescale	BLM6G22-30	Base station
MRF6S20010N(2)	Freescale	BLF6G21-6	Base Station
MRF6S20010N(2)	Freescale	BLF1822-10	Base Station
MRF6S21050L(2)	Freescale	BLF6G22-45	Base Station
MRF6S21060N (2)	Freescale	BLF6G22LS-75	Base station
MRF6S21060N(2)	Freescale	BLF6G22-75	Base Station
MRF6S21100H (2)	Freescale	BLF6G22LS-100	Base station
MRF6S21100H(2)	Freescale	BLF6G22-100	Base Station
MRF6S21100N (2)	Freescale	BLF6G22LS-100	Base station
MRF6S21100N(2)	Freescale	BLF6G22-100	Base Station
MRF6S21140H (2)	Freescale	BLF6G22L(S)-130	Base station
MRF6S21140H(2)	Freescale	BLF6G22-130	Base Station
MRF6S21190H	Freescale	BLF6G22-180P	Base Station
MRF6S21190H	Freescale	BLF6G22-180PN	Base Station
MRF6S21190H (2)	Freescale	BLF7G22L(S)-200	Base station
MRF6S23100H (2)	Freescale	BLF7G27L(S)-75P	Base station
MRF6S23100H (2)	Freescale	BLF7G27L(S)-75P	Base station
MRF6S27015N	Freescale	BLF6G27-10	Base Station
MRF6S27015N (2)	Freescale	BLF6G27-10(G)	Base station
MRF6S27015N (2)	Freescale	BLF6G27-10(G)	Base station
MRF6S27050HR3	Freescale	BLF6G27-45	Base station
MRF6S27050HSR3	Freescale	BLF6G27S-45	Base station
MRF6S27085H	Freescale	BLF6G27LS-135	Base Station
MRF6S27085H (2)	Freescale	BLF7G27L(S)-140	Base station
MRF6S27085HR3	Freescale	BLF6G27-135	Base station
MRF6S27085HS	Freescale	BLF6G27LS-75	Base Station
MRF6S27085HSR3	Freescale	BLF6G27LS-135	Base station
MRF6V2010N (2)	Freescale	BLF571	Base station
MRF6V2010N(2)	Freescale	BLF244	Broadcast
MRF6V2010NBR1(18a)	Freescale	BLF872	Broadcast
MRF6V2010NR1(18a)	Freescale	BLF871	Broadcast
MRF6V2150N (2)	Freescale	BLF871	Base station
MRF6V2150N(2)	Freescale	BLF177	Broadcast
MRF6V2150NBR1(18a)	Freescale	BLF882	Broadcast
MRF6V2150NR1(18a)	Freescale	BLF881	Broadcast
MRF6V2300N (2)	Freescale	BLF573S	Base station
MRF6V2300N(2)	Freescale	BLF369	Broadcast
MRF6V2300N(2)	Freescale	BLF378	Broadcast
MRF6V4300N (2)	Freescale	BLF573S	Base station
MRF6VP11KH (1)	Freescale	BLF578	Base station
MRF6VP21KH (1)	Freescale	BLF578	Base station
MRF6VP2600H (1)	Freescale	BLF871	Base station
MRF6VP2600HR6(18o)	Freescale	BLF881	Broadcast
MRF6VP3450	Freescale	BLF878	Broadcast
MRF6VP3450H (4)	Freescale	BLF878	Base station
MRF6VP41KH (2)	Freescale	BLF578	Base station
MRF7S15100H (2)	Freescale	BLF6G15L(S)-40BRN/ BLF6G15L(S)-250PBRN	Base station
MRF7S18125AHS	Freescale	BLF6G20LS-140	Base Station
MRF7S18170H (2)	Freescale	BLF7G20L(S)-200	Base station
MRF7S18170H(2)	Freescale	BLF6G22-180	Base Station
MRF7S19080H (2)	Freescale	BLF6G20(LS)-110	Base station
MRF7S19080H(2)	Freescale	BLF6G20-110	Base Station
MRF7S19080HS	Freescale	BLF6G20LS-75	Base Station
MRF7S19100	Freescale	BLF6G20LS-110	Base Station
MRF7S19100N (2)	Freescale	BLF6G20LS-75	Base station
MRF7S19100N(2)	Freescale	BLF6G20-110	Base Station
MRF7S19120N(1)	Freescale	BLF6G20-110	Base Station
MRF7S19120NR1 (1)	Freescale	BLF6G20LS-140	Base station
MRF7S19170H (2)	Freescale	BLF6G20-180PN, BLF7G20L(S)-200	Base station
MRF7S19170H(2)	Freescale	BLF6G20-180	Base Station
"MRF7S19210H"			
PTFA192401F"	Freescale	BLF6G20-230PRN	Base Station
MRF7S21080H (2)	Freescale	BLF6G22LS-100	Base station
MRF7S21110H (2)	Freescale	BLF6G22L(S)-130	Base station
MRF7S21110HS	Freescale	BLF6G22LS-100	Base Station
MRF7S21150H (2)	Freescale	BLF7G22LS-130	Base station

Manufacturer type	Manufacturer	NXP type	Product family
MRF7S21170	Freescale	BLF6G22LS-100	Base Station
MRF7S21170H (2)	Freescale	BLF6G22-180PN	Base station
MRF7S21210H (2)	Freescale	BLF7G22L(S)-250P	Base station
MRF7S27130H (2)	Freescale	BLF7G27L(S)-140	Base station
MRF7S38010H	Freescale	BLF6G38-10G	Base Station
MRF7S38010H (2)	Freescale	BLF6G38(S)-25	Base station
MRF7S38040H	Freescale	BLF6G38LS-50	Base Station
MRF7S38040H (2)	Freescale	BLF6G38(LS)-50	Base station
MRF7S38040HR3	Freescale	BLF6G28-50	Base station
MRF7S38040HSR3	Freescale	BLF6G28LS-51	Base station
MRF8S18120H (2)	Freescale	BLF7G20L(S)-250P	Base station
MRF9030L (2)	Freescale	BLF6G10(LS)-160RN	Base station
MRF9030N (2)	Freescale	BLF6G10(LS)-160RN	Base station
MRF9135L (2)	Freescale	BLF6G10(LS)-135RN	Base station
MRF917	Freescale	BFQ67W	WB trs 1-4
MRF9200L (2)	Freescale	BLF6G10L(S)-260PRN	Base station
MRF9210R3 (1)	Freescale	BLF6G10L(S)-260PRN	Base station
MRF927	Freescale	BFS25A	WB trs 1-4
MRF9411L	Freescale	BFG520/X	WB trs 1-4
MRF947	Freescale	BFS520	WB trs 1-4
MRF947A	Freescale	PRF947	WB trs 1-4
MRF9511L	Freescale	BFG540/X	WB trs 1-4
MRF957	Freescale	PRF957	WB trs 1-4
MRFE6P3300H	Freescale	BLF878	Broadcast
MRFE6S9125N	Freescale	BLF6G10LS-135R	Base Station
MRFE6S9125N (2)	Freescale	BLF6G10(LS)-135RN	Base station
MRFE6S9130H (2)	Freescale	BLF6G10(LS)-135RN	Base station
MRFE6S9135H (2)	Freescale	BLF6G10(LS)-200RN	Base station
MRFE6S9135HS	Freescale	BLF6G10LS-135R	Base Station
MRFE6S9160H (2)	Freescale	BLF6G10(LS)-160RN	Base station
MRFE6S9201H (2)	Freescale	BLF6G10(LS)-200RN	Base station
MRFE6S9205HS	Freescale	BLF6G10LS-200RN	Base Station
MS1003	Microsemi	BLF645	Broadcast
MS1004	Microsemi	BLF888	Broadcast
MS1007	Microsemi	BLF871	Broadcast
MS1008	Microsemi	BLF871	Broadcast
MS1011	Microsemi	BLF888	Broadcast
MS1051	Microsemi	BLF871	Broadcast
MS1076	Microsemi	BLF888	Broadcast
MS1078	Microsemi	BLF871	Broadcast
MS1079	Microsemi	BLF888	Broadcast
MS1204	Microsemi	BLF645	Broadcast
MS1277	Microsemi	BLF888	Broadcast
MS1278	Microsemi	BLF888	Broadcast
MS1279	Microsemi	BLF888	Broadcast
MS1280	Microsemi	BLF888	Broadcast
MS1329	Microsemi	BLF878	Broadcast
MS1453	Microsemi	BLF881	Broadcast
MS1503	Microsemi	BLF871	Broadcast
MS1506	Microsemi	BLF881	Broadcast
MS1507	Microsemi	BLF881	Broadcast
MS1509	Microsemi	BLF871	Broadcast
MS1511	Microsemi	BLF878	Broadcast
MS1533	Microsemi	BLF645	Broadcast
MS2001	Microsemi	BLF6G22-45	Broadcast
MS2003	Microsemi	BLF6G22-45	Broadcast
MS2003	Microsemi	BLF6G22-45	Broadcast
MS2005	Microsemi	BLF6G22-45	Broadcast
MS2010	Microsemi	BLF6G22-45	Broadcast
MS2176	Microsemi	BLF878	Broadcast
MS2200	Microsemi	BLA6H0912-500	Microwave
MS2207	Microsemi	BLA6H0912-500	Microwave
MS2210	Microsemi	BLA6G1011-200R	Microwave
MS2215	Microsemi	BLF177	Broadcast
MS2267	Microsemi	BLA6G1011-200R	Microwave
MS2321	Microsemi	BLL6H0514-25	Microwave
MS24221	Microsemi	BLA6G1011-200R	Microwave
MS2441	Microsemi	BLAH0912-500	Microwave
MS2472	Microsemi	BLAH0912-500	Microwave
MS2473	Microsemi	BLA6H1011-600	Microwave
MS2553	Microsemi	BLL6H0514-25	Microwave
MS2575	Microsemi	BLL6H0514-25	Microwave
MS3024	Microsemi	BLF6G22-45	Broadcast
MSC1015MP	Microsemi	BLL6H0514-25	Microwave
MSC1175M	Microsemi	BLA6G1011-200R	Microwave
MSC1400M	Microsemi	BLAH0912-500	Microwave

Manufacturer type	Manufacturer	NXP type	Product family	Manufacturer type	Manufacturer	NXP type	Product family
MSC1450M	Microsemi	BLA6H0912-500	Microwave	PTFA 210301E - 30 W	Infineon	BLD6G22L(S)-50	Base Station
MT4S200T	Toshiba	BFG424W	WB trs 5-7	PTFA 210701E - 70 W	Infineon	BLF6G22LS-75	Base Station
MT4S200U	Toshiba	BFG425W	WB trs 5-7	PTFA 210701F - 70 W	Infineon	BLF6G22LS-75	Base Station
MT4S34U	Toshiba	BFG410W	WB trs 5-7	PTFA 211001E - 100 W	Infineon	BLF6G22LS-100	Base Station
MV2109G	ONSemicond.	BB182LX	Varicap	PTFA 211801E - 180 W	Infineon	BLF7G22L(S)-250P	Base Station
MW6IC2240N (2)	Freescale	BLF6G22LS-75	Base station	PTFA 211801F - 180 W	Infineon	BLF7G22L(S)-250P	Base Station
MW6S004NT1 (1)	Freescale	BLF6G21-10G	Base station	PTFA 212001E - 200 W	Infineon	BLF6G22-180PN	Base Station
MW7IC2725GNR1	Freescale	BLF6G27-10G	Base station	PTFA 212001F - 200 W	Infineon	BLF6G22-180PN	Base Station
MW7IC2725N	Freescale	BLF6G27-10G	Base Station	PTFA 212002E - 200 W	Infineon	BLF7G22LS-130	Base Station
MW7IC2725N	Infineon	BLF6G27-10G	Base Station	PTFA 212401E - 240 W	Infineon	BLF6G22-180PN	Base Station
MW7IC2725NB	Freescale	BLF6G27-10	Base station	PTFA 212401F - 240 W	Infineon	BLF6G22-180PN	Base Station
MW7IC2725NR1	Freescale	BLF6G27-10	Base station	PTFA 2124051E - 45 W	Infineon	BLF7G27L(S)-100	Base Station
MW7IC2750GNR1	Freescale	BLF6G27LS-75	Base station	PTFA 260451E - 45 W	Infineon	BLF6G27L(S)-75	Base Station
MW7IC2750N (3)	Freescale	BLF6G27(LS)-75	Base station	PTFA 260851E - 85 W	Infineon	BLF6G27L(S)-45BN	Base Station
MW7IC2750NR1	Freescale	BLF6G27-75	Base station	PTFA 260851F - 85 W	Infineon	BLF6G27(LS)-135	Base Station
MW7IC3825GN	Freescale	BLF6G38S-25	Base station	PTFA 261301E - 130 W	Infineon	BLF7G27L(S)-200P	Base Station
MW7IC3825N	Freescale	BLF6G38-25	Base station	PTFA 261301F - 130 W	Infineon	BLF7G27L(S)-100	Base Station
MW7IC3825N (3)	Freescale	BLF6G38(S)-25	Base station	PTFA 261702E - 170 W	Infineon	BLF7G27L(S)-140	Base Station
MW7IC3825NB	Freescale	BLF6G38-25	Base station	PTFA043002E-300W	Infineon	BLF878	Broadcast
MW7IC915N (1)	Freescale	BLF6G10L(S)-260PRN	Base station	PTFA043002E-300W	Infineon	BLF878	Broadcast
NESG3032M14	NEC	BFU725F	WB trs 5-7	PTFA080551E-55W	Infineon	BLF6G10-45	Base Station
NESG3032M14	Infineon	BFU725F	WB trs 5-7	PTFA080551F-55W	Infineon	BLF6G10-45	Base Station
PD55012-E	ST	BLF571	Broadcast	PTFA081501E-150W	Infineon	BLF6G10-160	Base Station
PD55025-E	ST	BLF571	Broadcast	PTFA081501F-150W	Infineon	BLF6G10-160	Base Station
PD55035-E	ST	BLF571	Broadcast	PTFA091201E-120W	Infineon	BLF4G10-120	Base Station
PD57018-E	ST	BLL6H0514-25	Microwave	PTFA091201F-120W	Infineon	BLF4G10-120	Base Station
PD57030-E	ST	BLL6H0514-25	Microwave	PTMA 210452EL - 45 W	Infineon	BLF6G22(S)-45	Base Station
PD57045-E	ST	BLL6H0514-25	Microwave	PTMA 210452FL - 45 W	Infineon	BLF6G22(S)-45	Base Station
PD57060-E	ST	BLL6H0514-25	Microwave	PZFJ108	Standard	J108	FET
PD57070-E	ST	BLL6H0514-25	Microwave	PZFJ109	Standard	J109	FET
PD85015-E	ST	BLF571	Broadcast	PZFJ110	Standard	J110	FET
PD85025C	ST	BLF571	Broadcast	R0605250L	Standard	BGY66B	CATV RA
PD85025-E	ST	BLF571	Broadcast	R0605300L	Standard	BGY68	CATV RA
PD85035C	ST	BLF571	Broadcast	R2005240	Standard	BGY67A	CATV RA
PD85035-E	ST	BLF571	Broadcast	RN142G	Rohm	BAP1321-03	PIN diode
PRF134	POLYFET	BLF242	Broadcast	RN142S	Rohm	BAP1321-02	PIN diode
PRF134	Infineon	BLF242	Broadcast	RN242CS	Rohm	BAP51LX	PIN diode
PRF136	POLYFET	BLF244	Broadcast	RN731V	Rohm	BAP50-03	PIN diode
PRF136	Infineon	BLF244	Broadcast	RN739D	Rohm	BAP50-04	PIN diode
PRF947B	Motorola	PRF947	WB trs 1-4	RN739F	Rohm	BAP50-04W	PIN diode
PRF947B	Infineon	PRF947	WB trs 1-4	S505T	Vishay	BF1101	FET
PTF 180101S - 10 W	Infineon	BLF6G20-40	Base Station	S505TR	Vishay	BF1101R	FET
PTF 191601E - 160 W	Infineon	BLF7G20L(S)-300P	Base Station	S505TRW	Vishay	BF1101WR	FET
PTF 210101M - 10 W	Infineon	BLD6G22L(S)-50	Base Station	S5540220	Standard	BGY587	CATV PPA
PTF 210451E - 45 W	Infineon	BLF7G22L(S)-200	Base Station	S595T	Vishay	BF1105	FET
PTF 210451F - 45 W	Infineon	BLF7G22L(S)-200	Base Station	S595TR	Vishay	BF1105R	FET
PTF 240101S - 10 W	Infineon	BLF7G27L(S)-100	Base Station	S595TRW	Vishay	BF1105WR	FET
PTF041501E-150W	Infineon	BLF647	Broadcast	S7540185	Standard	BGY785A	CATV PPA
PTF041501E-150W	Infineon	BLF647	Broadcast	S7540215	Standard	BGY787	CATV PPA
PTF041501F-150W	Infineon	BLF647	Broadcast	S8740190	Standard	BGD812	CATV PD
PTF041501F-150W	Infineon	BLF647	Broadcast	S8740220	Standard	BGD814	CATV PD
PTF080101M-10W	Infineon	BLF1043	Base Station	S8740230	Standard	BGD816L	CATV PD
PTF080101M-10W	Infineon	BLF1043	Base Station	S949T	Vishay	BF1109	FET
PTF080101S-10W	Infineon	BLF1043	Base Station	S949TR	Vishay	BF1109R	FET
PTF080101S-10W	Infineon	BLF1043	Base Station	S949TRW	Vishay	BF1109WR	FET
PTF081301E-130W	Infineon	BLF4G10-120	Base Station	S974T	Vishay	BF1109	FET
PTF081301E-130W	Infineon	BLF4G10-120	Base Station	S974T-GS08	Vishay	BF1109	FET
PTF081301F-130W	Infineon	BLF4G10-120	Base Station	S974TR	Vishay	BF1109R	FET
PTF081301F-130W	Infineon	BLF4G10-120	Base Station	S974TR-GS08	Vishay	BF1109R	FET
PTF082001E-200W	Infineon	BLF6G10-200	Base Station	S974TRW	Vishay	BF1109WR	FET
PTF082001E-200W	Infineon	BLF6G10-200	Base Station	S974TRW-GS08	Vishay	BF1109WR	FET
PTF180101	Freescale	BLF6G21-10G	Base Station	SA701	POLYFET	BLF145	Broadcast
PTF180101	Infineon	BLF6G21-10G	Base Station	SA701	POLYFET	BLF245	Broadcast
PTFA 142401EL - 240 W	Infineon	BLF6G15L(S)-250PBRN	Base Station	SA741	POLYFET	BLF175	Broadcast
PTFA 142401FL - 240 W	Infineon	BLF6G15L(S)-250PBRN	Base Station	SD1018	Microsemi	BLF881	Broadcast
PTFA 180701E - 70 W	Infineon	BLF6G20(LS)-110	Base Station	SD1018-06	Microsemi	BLF881	Broadcast
PTFA 180701F - 70 W	Infineon	BLF6G20(LS)-110	Base Station	SD1019-05	Microsemi	BLF645	Broadcast
PTFA 181001E - 100 W	Infineon	BLF6G20(LS)-180RN	Base Station	SD1422	Microsemi	BLF871	Broadcast
PTFA 181001F - 100 W	Infineon	BLF6G20(LS)-180RN	Base Station	SD1485	Microsemi	BLF888	Broadcast
PTFA 181001GL - 100 W	Infineon	BLF6G20(LS)-180RN	Base Station	SD56120	ST	BLF871	Broadcast
PTFA 191001E - 100 W	Infineon	BLF6G20(LS)-110	Base Station	SD56120M	ST	BLF881	Broadcast
PTFA 191001F - 100 W	Infineon	BLF6G20(LS)-110	Base Station	SD57030	ST	BLL6H0514-25	Microwave
PTFA 192001E - 200 W	Infineon	BLF6G20-180PN	Base Station	SD57030-01	ST	BLL6H0514-25	Microwave
PTFA 192001F - 200 W	Infineon	BLF6G20-180PN	Base Station	SD57120	ST	BLF578	Broadcast
PTFA 192401E - 240 W	Infineon	BLF6G20-180PN	Base Station	SD702	POLYFET	BLF246B	Broadcast
PTFA 192401F - 240 W	Infineon	BLF6G20-180PN	Base Station	SDV701Q	AUK	BB179	Varicap

Manufacturer type	Manufacturer	NXP type	Product family
SDV704Q	AUK	BB178	Varicap
SDV705Q	AUK	BB182	Varicap
SE701	POLYFET	BLF245B	Broadcast
SGA8343Z	Sirenza	BFG425W	WB trs 5-7
SK701	POLYFET	BLF544B	Broadcast
SK701	POLYFET	BLF545	Broadcast
SK702	POLYFET	BLF546	Broadcast
SM341	POLYFET	BLF177	Broadcast
SM704	POLYFET	BLF147	Broadcast
SM704	POLYFET	BLF246	Broadcast
SMP1302-004	Skyworks	BAP50-05	PIN diode
SMP1302-005	Skyworks	BAP50-04	PIN diode
SMP1302-011	Skyworks	BAP50-03	PIN diode
SMP1302-074	Skyworks	BAP50-05W	PIN diode
SMP1302-075	Skyworks	BAP50-04W	PIN diode
SMP1302-079	Skyworks	BAP50-02	PIN diode
SMP1304-001	Skyworks	BAP70-03	PIN diode
SMP1304-011	Skyworks	BAP70-03	PIN diode
SMP1307-001	Skyworks	BAP70-03	PIN diode
SMP1307-011	Skyworks	BAP70-03	PIN diode
SMP1320-004	Skyworks	BAP65-05	PIN diode
SMP1320-011	Skyworks	BAP65-03	PIN diode
SMP1320-074	Skyworks	BAP65-05W	PIN diode
SMP1321-001	Skyworks	BAP1321-03	PIN diode
SMP1321-005	Skyworks	BAP1321-04	PIN diode
SMP1321-011	Skyworks	BAP1321-03	PIN diode
SMP1321-075	Skyworks	BAP1321-04	PIN diode
SMP1321-079	Skyworks	BAP1321-02	PIN diode
SMP1322-004	Skyworks	BAP65-05	PIN diode
SMP1322-011	Skyworks	BAP65-03	PIN diode
SMP1322-074	Skyworks	BAP65-05W	PIN diode
SMP1322-079	Skyworks	BAP65-02	PIN diode
SMP1340-011	Skyworks	BAP63-03	PIN diode
SMP1340-079	Skyworks	BAP63-02	PIN diode
SMP1352-011	Skyworks	BAP64-03	PIN diode
SMP1352-079	Skyworks	BAP64-02	PIN diode
SMV1235-004	Skyworks	BB181	Varicap
SMV1236-004	Skyworks	BB156	Varicap
SR341	POLYFET	BLF378	Broadcast
SR341	POLYFET	BLF278	Broadcast
SR401	POLYFET	BLF248	Broadcast
SR401	POLYFET	BLF348	Broadcast
SR401	POLYFET	BLF368	Broadcast
SR703	POLYFET	BLF547	Broadcast
SR704U	POLYFET	BLF548	Broadcast
SST111	Standard	PMBFJ111	FET
SST112	Standard	PMBFJ112	FET
SST113	Standard	PMBFJ113	FET
SST174	Standard	PMBFJ174	FET
SST175	Standard	PMBFJ175	FET
SST176	Standard	PMBFJ176	FET
SST177	Standard	PMBFJ177	FET
SST201	Standard	BFT46	FET
SST202	Standard	BFR31	FET
SST203	Standard	BFR30	FET
SST308	Standard	PMBFJ308	FET
SST309	Standard	PMBFJ309	FET
SST310	Standard	PMBFJ310	FET
SST4391	Standard	PMBF4391	FET
SST4392	Standard	PMBF4392	FET
SST4393	Standard	PMBF4393	FET
SST4856	Standard	BSR56	FET
SST4857	Standard	BSR57	FET
SST4859	Standard	BSR56	FET
SST4860	Standard	BSR57	FET
SST4861	Standard	BSR58	FET

Manufacturer type	Manufacturer	NXP type	Product family
ST704	POLYFET	BLF346	Broadcast
ST744	POLYFET	BLF276	Broadcast
ST744	POLYFET	BLF277	Broadcast
SVC201SPA	Sanyo	BB187	Varicap
TAN150	Microsemi	BLF177	Broadcast
TAN250A	Microsemi	BLA6G1011-200R	Microwave
TAN300	Microsemi	BLA6G1011-200R	Microwave
TBB1016	Renesas	BF1204	FET
TCS450	Microsemi	BLA6H0912-500	Microwave
TCS800	Microsemi	BLA6H1011-600	Microwave
TMF3201J	AUK	BF1204	FET
TMF3202Z	AUK	BF1202WR	FET
TMPF4091	Standard	PMBF4391	FET
TMPF4092	Standard	PMBF4392	FET
TMPF4093	Standard	PMBF4393	FET
TMPF4391	Standard	PMBF4391	FET
TMPF4392	Standard	PMBF4392	FET
TMPF4393	Standard	PMBF4393	FET
TMPFB246A	Standard	BSR56	FET
TMPFB246B	Standard	BSR57	FET
TMPFB246C	Standard	BSR58	FET
TMPFJ111	Standard	PMBFJ111	FET
TMPFJ112	Standard	PMBFJ112	FET
TMPFJ113	Standard	PMBFJ113	FET
TMPFJ174	Standard	PMBFJ174	FET
TMPFJ175	Standard	PMBFJ175	FET
TMPFJ176	Standard	PMBFJ176	FET
TMPFJ177	Standard	PMBFJ177	FET
TPR400	Microsemi	BLAH0912-500	Microwave
TPR500	Microsemi	BLA6H0912-501	Microwave
TPR500A	Microsemi	BLA6H0912-502	Microwave
TSDF54040	Vishay	BF1102	FET
TSDF54040-GS08	Vishay	BF1102	FET
TSDF54040X-GS08	Vishay	BF1102	FET
TSDF54040XR-GS08	Vishay	BF1102R	FET
UF2805B	M/A- COM	BLF871	Broadcast
UF28100H	M/A- COM	BLF871	Broadcast
UF28100M	M/A- COM	BLF871	Broadcast
UF28100V	M/A- COM	BLF871	Broadcast
UF2810P	M/A- COM	BLF871	Broadcast
UF28150J	M/A- COM	BLF881	Broadcast
UF2815B	M/A- COM	BLF871	Broadcast
UF2820P	M/A- COM	BLF871	Broadcast
UF2820R	M/A- COM	BLF871	Broadcast
UF2840G	M/A- COM	BLF881	Broadcast
UF2840P	M/A- COM	BLF881	Broadcast
UMIL100	Microsemi	BLF871	Broadcast
UMIL100A	Microsemi	BLF871	Broadcast
UMIL60	Microsemi	BLF878	Broadcast
UMIL80	Microsemi	BLF878	Broadcast
uPC2709	NEC	BGA2709	MMIC
uPC2711	NEC	BGA2711	MMIC
uPC2712	NEC	BGA2712	MMIC
uPC2745	NEC	BGA2001	MMIC
uPC2746	NEC	BGA2001	MMIC
uPC2748	NEC	BGA2748	MMIC
uPC2771	NEC	BGA2771	MMIC
uPC8112	NEC	BGA2022	MMIC
UTV200	Microsemi	BLF571	Broadcast
UTV8100B	Microsemi	BLF645	Broadcast
VAM80	Microsemi	BLF878	Broadcast
VMIL100	Microsemi	BLF645	Broadcast
VRF148A	Microsemi	BLF881	Broadcast
VRF150	Microsemi	BLF177	Broadcast
VRF151	Microsemi	BLF177	Broadcast
VRF151G	Microsemi	BLF878	Broadcast

5.2 Cross-references: NXP discontinued types versus NXP replacement types

In alphabetical order of manufacturer discontinued type

Abbreviations:



BS diode	Band Switch Diode
CATV	Community Antenna Television System
FET	Field Effect Transistor
Varicap	Varicap Diode
WB trs	Wideband Transistor
OM	Optical Module


























NXP discontinued type	Product family NXP	Replacement type NXP	NXP discontinued type	Product family NXP	Replacement type NXP
BA277-01	BS diode	BA277	BFR93R	WB trs	BFR93A
BA792	BS diode	BA591	BFU510	WB trs	BFU725F/N1
BAP142L	PIN diode	BAP142LX	BFU540	WB trs	BFU725F/N1
BAP51-01	PIN diode	BAP51LX	BGA2031	WB trs	BGA2031/1
BAP51L	PIN diode	BAP51LX	BGD102/02	CATV	BGD502
BAP55L	PIN diode	BAP55LX	BGD102/04	CATV	BGD502
BB132	Varicap	BB152	BGD104	CATV	BGD704
BB145	Varicap	BB145B	BGD104/04	CATV	BGD704
BB145B-01	Varicap	BB145B	BGD502/01	CATV	BGD502
BB151	Varicap	BB135	BGD502/01	CATV	BGD502
BB157	Varicap	BB187	BGD502/01	CATV	BGD502
BB178L	Varicap	BB178LX	BGD502/01	CATV	BGD502
BB179BL	Varicap	BB179BLX	BGD502/03	CATV	BGD502
BB179L	Varicap	BB179LX	BGD502/03	CATV	BGD502
BB181L	Varicap	BB181LX	BGD502/05	CATV	BGD502
BB182B	Varicap	BB182	BGD502/07	CATV	BGD502
BB182L	Varicap	BB182LX	BGD502/6M	CATV	BGD702
BB187L	Varicap	BB187LX	BGD502/C7	CATV	BGD502
BB190	Varicap	BB149	BGD502/R	CATV	BGD502
BB202L	Varicap	BB202LX	BGD504	CATV	BGD704
BB804	Varicap	BB207	BGD504/01	CATV	BGD704
BBY42	Varicap	BBY40	BGD504/02	CATV	BGD704
BF1203	FET	BF1203	BGD504/09	CATV	BGD704
BF689K	WB trs	BFS17	BGD602	CATV	BGD702
BF763	WB trs	BFS17	BGD602/02	CATV	BGD702
BF851A	FET	BF861A	BGD602/07	CATV	BGD702
BF851A	FET	BF861A	BGD602/09	CATV	BGD702
BF851C	FET	BF861C	BGD602/14	CATV	BGD702
BF851C	FET	BF861C	BGD602D	CATV	BGD712
BF992/01	FET	BF992	BGD702D	CATV	BGD712
BFC505	WB trs	BFM505	BGD702D/08	CATV	BGD712
BFC520	WB trs	BFM520	BGD704/01	CATV	BGD704
BFET505	WB trs	BFM505	BGD704/07S	CATV	BGD704
BFET520	WB trs	BFM520	BGD704/S9	CATV	BGD704
BFG17A	WB trs	BFS17A	BGD704N	CATV	BGD714
BFG197	WB trs	BFG198	BGD802/09	CATV	BGD802
BFG197/X	WB trs	BFG198	BGD802N	CATV	BGD812
BFG25AW/XR	WB trs	BFG25AW/X	BGD802N	CATV	BGD812
BFG410W/CA	WB trs	BFG410W	BGD802N/07	CATV	BGD812
BFG425W/CA	WB trs	BFG425W	BGD802N/07	CATV	BGD812
BFG425W/CA	WB trs	BFG425W	BGD804N	CATV	BGD814
BFG505/XR	WB trs	BFG505/X	BGD804N	CATV	BGD814
BFG505W/XR	WB trs	BFG505	BGD804N/02	CATV	BGD814
BFG520W/XR	WB trs	BFG520W/X	BGD804N/02	CATV	BGD814
BFG590/XR	WB trs	BFG590/X	BGD902	CATV	BGD812
BFG590W	WB trs	BFG590	BGD902/07	CATV	BGD902
BFG590W/XR	WB trs	BFG590	BGD902L	CATV	BGD812
BFG67/XR	WB trs	BFG67	BGD904	CATV	BGD814
BFG92A	WB trs	BFG92A/X	BGD904/02	CATV	BGD904
BFG92A/XR	WB trs	BFG92A/X	BGD904/07	CATV	BGD904
BFG93A/XR	WB trs	BFG93A/X	BGD904L	CATV	BGD814
BFQ34/01	WB trs	BFG35	BGD906	CATV	CGD942C
BFR92	WB trs	BFR92A	BGD906/02	CATV	BGD906
BFR92AR	WB trs	BFR92A	BGE847BO	CATV	BGO827
BFR92AT	WB trs	BFR92AW	BGE847BO	CATV	BGO827
BFR93	WB trs	BFR92A	BGE847BO	CATV	BGO827
BFR93AT	WB trs	BFR93AW	BGE847BO/FC	CATV	BGO827/SC0

NXP discontinued type	Product family NXP	Replacement type NXP	NXP discontinued type	Product family NXP	Replacement type NXP
BGE847BO/FC0	CATV	BGO827/SC0	BGY687B/02	CATV	BGE787B
BGE847BO/FC0	CATV	BGO827/SC0	BGY785A/07	CATV	BGY785A
BGE847BO/FC1	CATV	BGO827/SC0	BGY785A/09	CATV	BGY785A
BGE847BO/SC	CATV	BGO827/SC0	BGY785AD	CATV	BGY785A
BGE847BO/SC0	CATV	BGO827/SC0	BGY785AD/06	CATV	BGY785A
BGE847BO/SC0	CATV	BGO827/SC0	BGY785AD/8M	CATV	BGY885A
BGE887BO	CATV	BGO827	BGY785AD/8M	CATV	BGY885A
BGE887BO/FC	CATV	BGO827/SC0	BGY787/02	CATV	BGY787
BGE887BO/FC1	CATV	BGO827/SC0	BGY787/07	CATV	BGY787
BGE887BO/SC	CATV	BGO827/SC0	BGY787/09	CATV	BGY787
BGO847/01	CATV	BGO847	BGY847BO	CATV	BGO827
BGO847/01	CATV	BGO847	BGY847BO/SC	CATV	BGO827/SC0
BGO847/FC0	CATV	BGO827/SC0	BGY84A	CATV	BGY585A
BGO847/FC0	CATV	BGO827/SC0	BGY84A/04	CATV	BGY585A
BGO847/FC01	CATV	BGO827/SC0	BGY84A/05	CATV	BGY585A
BGO847/FC01	CATV	BGO827/SC0	BGY85	CATV	BGY585A
BGO847/SC0	CATV	BGO827/SC0	BGY85A	CATV	BGY585A
BGQ34/01	WB	BFG35	BGY85A/04	CATV	BGY585A
BGU2003	WB trs	BGA2003	BGY85A/05	CATV	BGY585A
BGX885/02	CATV	BGX885N	BGY85H/01	CATV	BGY585A
BGY1085A/07	CATV	BGY1085A	BGY86	CATV	BGY587
BGY584A	CATV	BGY585A	BGY86/05	CATV	BGY587
BGY585A/01	CATV	BGY585A	BGY87	CATV	BGY587
BGY586	CATV	BGY587	BGY87/J1	CATV	BGY587
BGY586/05	CATV	BGY587	BGY87B	CATV	BGY587B
BGY587/01	CATV	BGY587	BGY88	CATV	BGY588N
BGY587/01	CATV	BGY587	BGY88/04	CATV	BGY588N
BGY587/02	CATV	BGY587	BGY88/04	CATV	BGY588N
BGY587/02	CATV	BGY587	BGY88/07	CATV	BGY588N
BGY587/07	CATV	BGY587	BGY887/02	CATV	BGY887
BGY587/09	CATV	BGY587	BGY887BO	CATV	BGO827
BGY587B/01	CATV	BGY587B	BGY887BO/FC	CATV	BGO827/FC0
BGY587B/02	CATV	BGY587B	BGY887BO/SC	CATV	BGO827/SC0
BGY587B/09	CATV	BGY587B	CGD914	CATV	CGD1042H
BGY588	CATV	BGY588N	CGY887A	CATV	CGY1043
BGY588/04	CATV	BGY588N	CGY887B	CATV	CGY1047
BGY66B/04	CATV	BGY66B	GD923	CATV	CGD942C
BGY67/04	CATV	BGY67	ON4520/09	CATV	BGY687
BGY67/09	CATV	BGY67	ON4520/2	CATV	BGY687
BGY67/14	CATV	BGY67	ON4594/M5	CATV	BGY585A
BGY67/19	CATV	BGY67	ON4749	CATV	BGY588N
BGY67A/04	CATV	BGY67A	ON4749	CATV	BGY588N
BGY67A/14	CATV	BGY67A	ON4831-2	CATV	BGY885A
BGY68/01	CATV	BGY68	ON4869	CATV	BGY587
BGY685A/07	CATV	BGY685A	ON4876	CATV	BGY1085A
BGY685AD	CATV	BGY785A	ON4890	CATV	BGD712
BGY685AD	CATV	BGY785A	ON4890	CATV	BGD712
BGY685AL	CATV	BGY785A	ON4990	CATV	BGD885
BGY687/07	CATV	BGY687	PMBT3640/AT	WB trs	BFS17
BGY687/14	CATV	BGY687	PN4392	FET	PMBF4392
BGY687B	CATV	BGE787B	PN4393	FET	PMBF4393

6. Packing and packaging information

6.1 Packing quantities per package with relevant ordering code

	Package	Package dimensions L x W x H	Packing quantity	Product 12NC ending	Packing method
	SOD323/SC-76	1.7 x 1.25 x 0.9	3,000	115	8 mm tape and reel
			10,000	135	8 mm tape and reel
	SOD523/SC-79	1.2 x 0.8 x 0.6	3,000	115	8 mm tape and reel
			10,000	135	8 mm tape and reel
			8,000	315	2 mm pitch tape and reel
			20,000	335	2 mm pitch tape and reel
	SOD882T	1.0 x 0.6 x 0.4	15,000	315	8 mm tape and reel
	SOT23	2.9 x 1.3 x 0.9	3,000	215	8 mm tape and reel
			10,000	235	8 mm tape and reel
	SOT54	4.6 x 3.9 x 5.1	5,000	112	bulk, delta pinning
			5,000	412	bulk, straight leads
			10,000	116	tape and reel, wide pitch
			10,000	126	tape ammpack, wide pitch
	SOT89/SC-62	4.5 x 2.5 x 1.5	1,000	115	12 mm tape and reel
			4,000	135	12 mm tape and reel
	SOT115	44.5 x 13.65 x 20.4	100	112	4 tray/box
	SOT121B	28.45 x 28.45 x 7.27	20	112	blister, tray
	SOT143(N/R)	2.9 x 1.3 x 0.9	3,000	215	8 mm tape and reel
			10,000	235	8 mm tape and reel
	SOT223/SC-73	6.7 x 3.5 x 1.6	1,000	115	12 mm tape and reel
			4,000	135	12 mm tape and reel
	SOT307	10 x 10 x 1.75	1,500	518	13" tape and reel dry pack
			96	551	1 tray dry pack
			480	557	5 tray dry pack
	SOT323/SC-70	2.0 x 1.25 x 0.9	3,000	115	8 mm tape and reel
			10,000	135	8 mm tape and reel
	SOT341	5.3 x 10.2	1,000	118	13" tape and reel
			658	112	tube
	SOT343(N/R)	2.0 x 1.25 x 0.9	3,000	115	8 mm tape and reel
			10,000	135	8 mm tape and reel
	SOT343F	2.1 x 1.25 x 0.7	3,000	115	8 mm tape and reel
	SOT360	6.5 x 4.4 x 0.9	2,500	118	16 mm tape and reel
	SOT363/SC-88	2.0 x 1.25 x 0.9	3,000	115	8 mm tape and reel
			10,000	135	8 mm tape and reel
	SOT401	5 x 5 x 1.4	2,000	118	13" tape and reel
			360	151	1 tray
	SOT403	5.0 x 4.4 x 0.9	2,500	118	12 mm tape and reel
	SOT416/SC-75	1.6 x 0.8 x 0.75	3,000	115	8 mm tape and reel
	SOT467B	9.78 x 18.29 x 4.67	60	112	blister, tray
			20	112	blister, tray
	SOT467C	20.45 x 18.54 x 4.67	60	112	blister, tray
			20	112	blister, tray
	SOT502A	19.8 x 9.4 x 4.1	60	112	blister, tray
			300	135	reel
	SOT502B	19.8 x 9.4 x 4.1	60	112	blister, tray
			100	118	reel

	Package	Package dimensions L x W x H	Packing quantity	Product 12NC ending	Packing method
	SOT538A	5.1 x 4.1 x 2.6	160	112	blister, tray
	SOT539A	31.25 x 9.4 x 4.65	60 300	112 135	blister, tray reel
	SOT540A	21.85 x 10.2 x 5.4	60	112	blister, tray
	SOT608A	10.1 x 10.1 x 4.2	60 60 300	112 112 135	blister, tray blister, tray reel
	SOT608B	10.1 x 10.1 x 4.2	60 100 300	112 118 135	blister, tray reel reel
	SOT616	4.0 x 4.0 x 0.85	6,000 1,500 100	118 115 551	12 mm tape and reel 8 mm tape and reel tray
	SOT617	5 x 5 x 0.85	6,000	118	Tape and reel
	SOT618	6 x 6 x 0.85	4,000 1,000 490 2,450	118 515 551 157	13" tape and reel 7" tape and reel dry pack 1 tray dry pack 5 tray
	SOT638	14 x 14 x 1	1,000 90 450	518 551 557	13" tape and reel dry pack 1 tray dry pack 5 tray dry pack
	SOT666	1.6 x 1.2 x 0.7	4,000	115	8 mm tape and reel
	SOT684	8 x 8 x 0.85	1,000 260 260 1,300	518 151 551 157	13" tape and reel dry pack 1 tray 1 tray dry pack 5 tray dry pack
	SOT724	8.7 x 3.9 x 1.47	2,500	118	16 mm tape and reel
	SOT753	2.9 x 1.5 x 1.0	3,000	125	8 mm tape and reel
	SOT778	6.0 x 6.0 x 0.85	490 4,000	551 518	tray multiple trays
	SOT822-1	15.9 x 11 x 3.6	180	127	tube
	SOT834-1	15.9 x 11 x 3.15	180	127	tube
	SOT886	1.45 x 1.0 x 0.5	5000	115	8 mm tape and reel
	SOT891	1.0 x 1.0 x 0.5	5000	132	8 mm tape and reel
	SOT908	3.0 x 3.0 x 0.85	6000	118	12 mm tape and reel
	SOT922-1	17.4 x 9.4 x 3.88	60	112	blister, tray
	SOT975B	6.5 x 6.5 x 3.3	180 100	112 118	blister, tray Tape and reel
	SOT975C	6.5 x 6.5 x 3.3	180 100	112 118	blister, tray Tape and reel
	SOT979A	31.25 x 10.2 x 5.3	60	112	blister, tray
	SOT1110A	41.28 x 17.12 x 5.36	60 100	112 118	blister, tray reel
	SOT1121A	34.16 x 19.94 x 4.75	60 100	112 118	blister, tray reel
	SOT1121B	20.70 x 19.94 x 4.75	60 100	112 118	blister, tray reel
	SOT1130A	20.45 x 17.12 x 4.65	60	112	blister, tray
	SOT1130B	9.91 x 17.12 x 4.65	60	112	blister, tray
	SOT1135A	20.45 x 19.94 x 4.65	60 100	112 118	blister, tray reel

6.2 Marking codes list

Search online on marking code: <http://www.nxp.com/package/>

In alphabetical order of marking code

In case a '%' is given in the marking code, it means this type can be assembled at different assembly sites.

Instead of a '%', you will find:

p = made in Hong-Kong

t = made in Malaysia

W = made in China

Marking code	Type	Package	Marking code	Type	Package	Marking code	Type	Package
10%	BAT18	SOT23	%M7	BF904A	SOT143	A5	BAP51-03	SOD323
13%	BB207	SOT23	%M8	BF904AR	SOT143	A5%	BGA2011	SOT363
20%	BF545A	SOT23	%M9	BSS83	SOT143	A6%	BGA2012	SOT363
21%	BF545B	SOT23	%MA	BF991	SOT143	A7%	BFG310W/XR	SOT343
22%	BF545C	SOT23	%MB	BF992	SOT143	A8	BAP50-03	SOD323
24%	BF556A	SOT23	%MC	BF904	SOT143	A8%	BFG325W/XR	SOT343
25%	BF556B	SOT23	%MD	BF904R	SOT143	A8%	PMBFJ620	SOT363
26%	BF556C	SOT23	%ME	BFG505	SOT143	A9	BAP70-03	SOD323
28%	BF861A	SOT23	%MF	BFG520	SOT143	AC	BGU7005	SOT886
29%	BF861B	SOT23	%MG	BFG540	SOT143	B3	BGU7003	SOT891
30%	BF861C	SOT23	%MH	BFG590	SOT143	B6-	BGA2715	SOT363
31%	BFR505	SOT23	%MK	BFG505/X	SOT143	B6%	BFU725F	SOT343F
32%	BFR520	SOT23	%ML	BFG520/X	SOT143	B7%	BGA2716	SOT363
33%	BFR540	SOT23	%MM	BFG540/X	SOT143	BC%	BFQ591	SOT89
34%	BFT25A	SOT23	%MN	BFG590/X	SOT143	BFG135	BFG135	SOT223
38%	PMBFJ108	SOT23	%MP	BFG520/XR	SOT143	BFG198	BFG198	SOT223
39%	PMBFJ109	SOT23	%MR	BFG540/XR	SOT143	BFG31	BFG31	SOT223
40%	PMBFJ110	SOT23	%MS	BFG10	SOT143	BFG35	BFG35	SOT223
41%	PMBFJ111	SOT23	%MT	BFG10/X	SOT143	BFG541	BFG541	SOT223
42%	PMBFJ112	SOT23	%MU	BFG520A/X	SOT143	BFG591	BFG591	SOT223
47%	PMBFJ113	SOT23	%MV	BFG67/X	SOT143	BFG94	BFG94	SOT223
48%	PMBFJ308	SOT23	%MW	BFG92A/X	SOT143	BFG97	BFG97	SOT223
49%	PMBFJ309	SOT23	%MX	BFG93A/X	SOT143	BLT50	BLT50	SOT223
50%	PMBFJ310	SOT23	%MY	BF1100	SOT143	BLT70	BLT70	SOT223
1	BA277	SOD523	%MZ	BF1100R	SOT143	BLT80	BLT80	SOT223
2	BB182	SOD523	1B%	BGA2717	SOT363	BLT81	BLT81	SOT223
7	BA891	SOD523	1C%	BAP50-05	SOT23	C1%	BGM1011	SOT363
8	BB178	SOD523	1N%	BAP70-04W	SOT323	C2%	BGM1012	SOT363
9	BB179	SOD523	2A%	BF862	SOT23	C4%	BGM1013	SOT363
%1W	BAP51-05W	SOT323	2L	BF1208	SOT666	C5%	BGM1014	SOT363
%3A	BGA6289	SOT89	2N	BF1206F	SOT666	D1	BFU610F	SOT343F
%4A	BGA6489	SOT89	2R	BF1207F	SOT666	D2	BFU630F	SOT343F
%5A	BGA6589	SOT89	4A	BF1208D	SOT666	D2	BAP63-03	SOD323
%6G	PMBF4393	SOT23	4K%	BAP64-04	SOT23	D3	BFU660F	SOT343F
%6J	PMBF4391	SOT23	4L%	BAP50-04	SOT23	D3	BAP65-03	SOD323
%6K	BGA7024	SOT89	4W%	BAP64-04W	SOT323	D4	BFU690F	SOT343F
%6K	PMBF4392	SOT23	5K%	BAP64-05	SOT23	D4%	BFR30/B	SOT23
%6L	BGA7027	SOT89	5W%	BAP64-05W	SOT323	D5	BFU710F	SOT343F
%6S	PMBFJ176	SOT23	6F%	BAP1321-04	SOT23	D6	BFU730F	SOT343F
%6W	PMBFJ175	SOT23	6K%	BAP64-06	SOT23	D7	BFU760F	SOT343F
%6X	PMBFJ174	SOT23	6W%	BAP50-04W	SOT323	D8	BFU790F	SOT343F
%6Y	PMBFJ177	SOT23	7K%	BAP65-05	SOT23	E1%	BFS17	SOT23
%AB	BF1210	SOT363	8K%	BAP70-05	SOT23	E1%	BFS17/FD	SOT23
%E7	BGA2800	SOT363	A1	BA591	SOD323	E1%	BFS17W	SOT323
%E8	BGA2801	SOT363	A1	BB208-02	SOD523	E2%	BFS17A	SOT23
%E9	BGA2815	SOT363	A1	BGA2001	SOT343	E2%	BGA2712	SOT363
%EA	BGA2816	SOT363	A1	BAP64Q	SOT753	E3%	BGA2709	SOT363
%EB	BGA2850	SOT363	A2	BAP70Q	SOT753	E6%	BFG17A	SOT23
%EC	BGA2865	SOT363	A2	BAT18	SOT23	FB	BFQ19	SOT89
%ED	BGA2866	SOT363	A2	BB184	SOD523	FF	BFQ18A	SOT89
%M1	BF908	SOT143	A2	BB208-03	SOD323	FG	BFQ149	SOT89
%M2	BF908R	SOT143	A2%	BGA2022	SOT363	G2	BA278	SOD523
%M3	BF909	SOT143	A3	BAP64-03	SOD323	G2%	BGA2711	SOT363
%M4	BF909R	SOT143	A3	BB198	SOD523	G3%	BGA2748	SOT363
%M5	BF909A	SOT143	A3	BGA2003	SOT343	G4%	BGA2771	SOT363
%M6	BF909AR	SOT143	A3%	BGA2031/1	SOT363	G5%	BGA2776	SOT363

Marking code	Type	Package	Marking code	Type	Package	Marking code	Type	Package
K1	BAP51-02	SOD523	ME	BF909WR	SOT343	P7	BB147	SOD523
K2	BAP51-05W	SOD523	MF	BF1100WR	SOT343	P8	BB148	SOD323
K4	BAP50-02	SOD523	MG	BF909AWR	SOT343	P9	BB149	SOD323
K5	BAP63-02	SOD523	MG%	BF994S	SOT143	PB	BB152	SOD323
K6	BAP65-02	SOD523	MH	BF904AWR	SOT343	PC	BB153	SOD323
K7	BAP1321-02	SOD523	MH%	BF996S	SOT143	PE	BB155	SOD323
K8	BAP70-02	SOD523	MK	BF1211WR	SOT343	PF	BB156	SOD323
K9	BB199	SOD523	ML	BF1212WR	SOT343	PL	BB149A	SOD323
L1	BB202LX	SOD882T	MO%	BF998	SOT143	R2%	BFR93A	SOT23
L2	BAP51LX	SOD882T	MO%	BF998R	SOT143	R2%	BFR93AW	SOT323
L2	BB202	SOD523	N	BB181	SOD523	R5	BFR93AR	SOT23
L2%	BF1203	SOT363	N0	BFR505T	SOT416	R7%	BFR106	SOT23
L3	BB178LX	SOD882T	N0%	BFM505	SOT363	R8%	BFG93A	SOT143
L3%	BF1204	SOT363	N0%	BFS505	SOT323	S	BAP64-02	SOD523
L4	BB179LX	SOD882T	N1	BFG505W/X	SOT343	S1%	BFG310/XR	SOT143
L4%	BF1205	SOT363	N2	BFR520T	SOT416	S2%	BBY40	SOT23
L5	BB179BLX	SOD882T	N2%	BFM520	SOT363	S2%	BFG325/XR	SOT143
L6	BB181LX	SOD882T	N2%	BFS520	SOT323	S3%	BF1107	SOT23
L6%	BF1206	SOT363	N3	BFG520W	SOT343	S6%	BF510	SOT23
L7	BB182LX	SOD882T	N4	BFG520W/X	SOT343	S7%	BF511	SOT23
L8	BB187LX	SOD882T	N4	BFQ540	SOT89	S8%	BF512	SOT23
L9%	BF1208	SOT363	N4%	BFS540	SOT323	S9%	BF513	SOT23
LA	BF1201WR	SOT343	N6%	BFS25A	SOT323	SB%	BF1214	SOT363
LA%	BF1201	SOT143	N7	BFG540W/X	SOT343	SC%	BGU7031	SOT363
LB%	BF1201R	SOT143	N8	BFG540W/XR	SOT343	SC%	BB201	SOT23
LD%	BF1202	SOT143	N9	BFG540W	SOT343	SD%	BGU7032	SOT363
LE	BF1202WR	SOT343	N9%	BAP70AM	SOT363	SE%	BGU7033	SOT363
LE%	BF1202R	SOT143	NA	BF1105WR	SOT343	T5	BFG10W/X	SOT343
LF%	BF1211	SOT143	NA%	BF1105R	SOT143	V1	BFG25AW/X	SOT343
LG%	BF1212	SOT143	NB	BF1109WR	SOT343	V1%	BFT25	SOT23
LH%	BF1211R	SOT143	NB%	BF1109R	SOT143	V10	BFT25A	SOT23
LK%	BF1212R	SOT143	NC	BF1101WR	SOT343	V2%	BFQ67	SOT23
M08	PMBFJ308	SOT23	NC%	BF1101R	SOT143	V2%	BFQ67W	SOT323
M09	PMBFJ309	SOT23	ND	BFG424W	SOT343	V3%	BFG67	SOT143
M1%	BFR30	SOT23	ND%	BF1101	SOT143	V4%	BAP64-06W	SOT323
M10	PMBFJ310	SOT23	NE	BFG424F	SOT343	V6%	BAP65-05W	SOT323
M2%	BF1207	SOT363	NE%	BF1105	SOT143	V8	BAP1321-03	SOD323
M2%	BFR31	SOT23	NF%	BF1109	SOT143	VA	BF1217WR	SOT343
M3%	BFT46	SOT23	NG%	BF1108	SOT143	VB	BF1118W	SOT343
M33	BF861A	SOT23	NH%	BF1108R	SOT143	VC	BF1118WR	SOT343
M34	BF861B	SOT23	P08	PMBFJ108	SOT23	VC%	BF1118	SOT143
M35	BF861C	SOT23	P09	PMBFJ109	SOT23	VD%	BF1118R	SOT143
M4%	BF1215	SOT363	P1	BFG21W	SOT343	W1	BF1102	SOT363
M5%	BF1216	SOT363	P1	BB131	SOD323	W1%	BFT92	SOT23
M6%	BF1205C	SOT363	P10	PMBFJ110	SOT23	W1%	BFT92W	SOT323
M65	BF545A	SOT23	P11	PMBFJ111	SOT23	W2%	BF1102R	SOT363
M66	BF545B	SOT23	P12	PMBFJ112	SOT23	W4%	BAP50-05W	SOT323
M67	BF545C	SOT23	P13	PMBFJ113	SOT23	W6%	BAP51-04W	SOT323
M7%	BF1218	SOT363	P2%	BFR92A	SOT23	W7%	BAP51-06W	SOT323
M84	BF556A	SOT23	P2%	BFR92AW	SOT323	W9%	BAP63-05W	SOT323
M85	BF556B	SOT23	P3	BFG403W	SOT343	X	BB187	SOD523
M86	BF556C	SOT23	P4	BFG410W	SOT343	X1%	BFT93	SOT23
MB	BF998WR	SOT343	P5	BB135	SOD323	X1%	BFT93W	SOT323
MC	BF904WR	SOT343	P5	BFG425W	SOT343			
MD	BF908WR	SOT343	P6	BFG480W	SOT343			

7. Abbreviations

3-way	Doherty design using 3 discrete transistors	MPPM	Main and peak device realized in same push pull transistor (2 times)
AM	Amplitude Modulation	MoCA	Multimedia over Coax Alliance
ASIC	Application Specific Integrated Circuit	MOSFET	Metal–Oxide–Semiconductor Field Effect Transistor
ASYM	Asymmetrical design of Doherty (main and peak device are different)	MPA	Medium Power Amplifier
BPF	Band Pass Filter	MRI	Magnetic resonance imaging
BUC	Block Up Converter	NF	Noise Figure
CATV	Community Antenna Television	NIM	Network Interface Module
CDMA	Code Division Multiple Access	NMR	Nuclear magnetic resonance
CMMB	Chinese Multimedia Mobile Broadcasting	PA	Power Amplifier
CMOS	Complementary Metal Oxide Semiconductor	PAR	Peak to Average Ratio
CQS	Customer Qualification Samples	PEP	Peak Envelope Power
DAB	Digital Audio Broadcasting	pHEMT	pseudomorphic High Electron Mobility Transistor
DECT	Digital Enhanced Cordless Telecommunications	PLL	Phase Locked Loop
DiSEqC	Digital Satellite Equipment Control	QUBiC	Quality BiCMOS
DSB	Digital Signal Processor	RF	Radio Frequency
DVB	Digital Video Broadcasting	RFS	Release for Supply
EDGE	Enhanced Data Rates for GSM Evolution	RoHS	Restriction of Hazardous Substances
ESD	Electro Static Device	RX	Receive
FET	Field Effect Transistor	SARFT	State Administration for Radio, Film and Television
FM	Frequency Modulation	SER	Serializer
GaAs	Gallium Arsenide	SiGe:C	Silicon Germanium Carbon
GaN	Gallium Nitride	SMATV	Satellite Master Antenna Television
Gen	Generation	SMD	Surface Mounted Device
GPS	Global Positioning System	SPDT	Single Pole, Double Throw
GSM	Global System for Mobile communications	SYM	Symmetrical design of Doherty (main and peak device are the same type of transistor)
HBT	Heterojunction Bipolar Transistor	TD-SCDMA	Time Division-Synchronous Code Division Multiple Access
HDTV	High Definition Television	TCAS	Traffic Collision Avoidance Systems
HF	High Frequency (3-30 MHz)	TMA	Tower Mounted Amplifier
HFC	Hybrid Fiber Coax	TTF	Time to first fix
HFET	Heterostructure Field Effect Transistor	TX	Transmit
HPA	High Power Amplifier	UHF	Ultra High Frequency (470-860MHz)
HVQFN	Plastic thermally enhanced Very thin Quad Flat pack No leads	UMTS	Universal Mobile Telecommunications System
IF	Intermediate Frequency	VCO	Voltage Controlled Oscillator
ISM	Industrial, Scientific, Medical - reserved frequency bands	VGA	Variable Gain Amplifier
LDMOS	Laterally Diffused Metal-Oxide-Semiconductor	VHF	Very High Frequency (30-300MHz)
LNA	Low Noise Amplifier	VoIP	Voice over Internet Protocol
LNB	Low Noise Block	VSAT	Very Small Aperture Terminal
LO	Local Oscillator	WCDMA	Wideband Code Division Multiple Access
LPF	Low Pass Filter	WiMAX	Worldwide Interoperability for Microwave Access
MESFET	Metal Semiconductor Field Effect Transistor	WLAN	Wireless Local Area Network
MMIC	Monolithic Microwave Integrated Circuit		
MMPP	Main and peak devices realized separately in halves of push pull transistor		

8. Contacts and web links

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Web links

NXP Semiconductors:

<http://www.nxp.com>

NXP RF Manual web page:

<http://www.nxp.com/rfmanual>

NXP varicaps:

<http://www.nxp.com/varicaps>

NXP RF PIN diodes:

<http://www.nxp.com/pindiodes>

NXP RF Schottky diodes:

<http://www.nxp.com/rfschottkydiodes>

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http://www.nxp.com/all_appnotes

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<http://www.standardics.nxp.com/quality/handbook>

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<http://www.nxp.com/products/discretes/documentation>

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NXP High Speed Converters

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9. Product index

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ADC1015S series	3.8.1	BB152	3.2.1	BF1215	3.5.2	BFM520	3.3.1
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BAP70-02	3.2.2	BF1205C	3.5.2	BFG505W/X	3.3.1	BGA2771	3.4.1
BAP70-03	3.2.2	BF1206	3.5.2	BFG520(X)	3.3.1	BGA2776	3.4.1
BAP70-04W	3.2.2	BF1206	3.5.2	BFG520W(X)	3.3.1	BGA2800	3.4.1
BAP70-05	3.2.2	BF1207	3.5.2	BFG540(X)	3.3.1	BGA2801	3.4.1
BAP70AM	3.2.2	BF1208	3.5.2	BFG540W(X/XR)	3.3.1	BGA2815	3.4.1
BAP70Q	3.2.2	BF1208D	3.5.2	BFG541	3.3.1	BGA2816	3.4.1
BAT17	3.2.4	BF1210	3.5.2	BFG590(X)	3.3.1	BGA2850	3.4.1
BAT18	3.2.3	BF1211	3.5.2	BFG591	3.3.1	BGA2865	3.4.1
BB131	3.2.1	BF1211R	3.5.2	BFG67(X)	3.3.1	BGA2866	3.4.1
BB135	3.2.1	BF1211WR	3.5.2	BFG92A(X)	3.3.1	BGA6289	3.4.1
BB145B	3.2.1	BF1212	3.5.2	BFG93A(X)	3.3.1	BGA6489	3.4.1
BB148	3.2.1	BF1212R	3.5.2	BFG94	3.3.1	BGA6589	3.4.1

Type	Portfolio chapter	Type	Portfolio chapter	Type	Portfolio chapter	Type	Portfolio chapter
BGA7024	3.4.1	BLD6G21LS-50	3.7.1	BLF871	3.7.2	OM7670	3.6.2
BGA7027	3.4.1	BLD6G22L-50	3.7.1	BLF871S	3.7.2	PBR941	3.3.1
BGA7030	3.4.1	BLD6G22LS-50	3.7.1	BLF878	3.7.2	PBR951	3.3.1
BGA7033	3.4.1	BLF571	3.7.2	BLF881	3.7.2	PMBD353	3.2.4
BGA7124	3.4.1	BLF573	3.7.2	BLF888	3.7.2	PMBD354	3.2.4
BGA7127	3.4.1	BLF573	3.7.2.1	BLF888A(S)	3.7.2	PMBF4391	3.5.1
BGA7202	3.4.1	BLF573S	3.7.2	BLL6H0514-25	3.7.3	PMBF4392	3.5.1
BGA7203	3.4.1	BLF574	3.7.2	BLL6H1214-500	3.7.3	PMBF4393	3.5.1
BGA7204	3.4.1	BLF578	3.7.2	BLM6G10-30	3.7.1	PMBFJ108	3.5.1
BGA7350	3.4.1	BLF645	3.7.2	BLM6G10-30G	3.7.1	PMBFJ109	3.5.1
BGA7351	3.4.1	BLF6G07L(S)-260PBM	3.7.1.1	BLM6G22-30	3.7.1	PMBFJ110	3.5.1
BGD502	3.6.3	BLF6G10-135RN	3.7.1	BLM6G22-30G	3.7.1	PMBFJ111	3.5.1
BGD702	3.6.3	BLF6G10-160RN	3.7.1	BLS6G2731-120	3.7.3	PMBFJ112	3.5.1
BGD702N	3.6.3	BLF6G10-200RN	3.7.1	BLS6G2731-6G	3.7.3	PMBFJ113	3.5.1
BGD704	3.6.3	BLF6G10-45	3.7.1	BLS6G2731S-120	3.7.3	PMBFJ174	3.5.1
BGD712	3.6.3	BLF6G10L(S)-260PRN	3.7.1.1	BLS6G2933P-200	3.7.3	PMBFJ175	3.5.1
BGD712C	3.6.3	BLF6G10L(S)-40BRN	3.7.1.1	BLS6G2933S-130	3.7.3	PMBFJ176	3.5.1
BGD714	3.6.3	BLF6G10LS-135RN	3.7.1	BLS6G3135-120	3.7.3	PMBFJ177	3.5.1
BGD802	3.6.3	BLF6G10LS-160RN	3.7.1	BLS6G3135-20	3.7.3	PMBFJ308	3.5.1
BGD804	3.6.3	BLF6G10LS-200RN	3.7.1	BLS6G3135S-120	3.7.3	PMBFJ309	3.5.1
BGD812	3.6.3	BLF6G10S-45	3.7.1	BLS6G3135S-20	3.7.3	PMBFJ310	3.5.1
BGD814	3.6.3	BLF6G20-110	3.7.1	BLS7G2729-300P	3.7.3	PMBFJ620	3.5.1
BGD816L	3.6.3	BLF6G20-180PN	3.7.1	BLS7G2729S-300	3.7.3	PRF947	3.3.1
BGD885	3.6.3	BLF6G20-180RN	3.7.1	BLT50	3.3.1	PRF949	3.3.1
BGE787B	3.6.2	BLF6G20-230PRN	3.7.1	BLT70	3.3.1	PRF957	3.3.1
BGE788	3.6.2	BLF6G20-40	3.7.1	BLT80	3.3.1	TFF1003HN	3.4.2
BGE788C	3.6.2	BLF6G20-45	3.7.1	BLT81	3.3.1	TFF1007HN	3.4.2
BGE885	3.6.2	BLF6G20-75	3.7.1	BSR56	3.5.1	TFF11070HN	3.4.2
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BGM1012	3.4.1	BLF6G20LS-140	3.7.1	BSR58	3.5.1	TFF11077HN	3.4.2
BGM1013	3.4.1	BLF6G20LS-180RN	3.7.1	BSS83	3.5.2	TFF11080HN	3.4.2
BGM1014	3.4.1	BLF6G20LS-75	3.7.1	CGD1040Hi	3.6.3	TFF11084HN	3.4.2
BGO807	3.6.4	BLF6G20S-45	3.7.1	CGD1042Hi	3.6.3	TFF11088HN	3.4.2
BGO807/FC0	3.6.4	BLF6G21-10G	3.7.1	CGD1042Hi	3.6.3	TFF11092HN	3.4.2
BGO807/SC0	3.6.4	BLF6G22-180PN	3.7.1	CGD1044H	3.6.3	TFF11096HN	3.4.2
BGO807C	3.6.4	BLF6G22-180RN	3.7.1	CGD1044Hi	3.6.3	TFF11101HN	3.4.2
BGO807C/FC0	3.6.4	BLF6G22-45	3.7.1	CGD1046Hi	3.6.3	TFF11105HN	3.4.2
BGO807C/SC0	3.6.4	BLF6G22LS-100	3.7.1	CGD914	3.6.3	TFF11110HN	3.4.2
BGO807CE	3.6.4	BLF6G22LS-130	3.7.1	CGD923	3.6.3	TFF11115HN	3.4.2
BGO827	3.6.4	BLF6G22LS-180RN	3.7.1	CGD942C	3.6.3	TFF11121HN	3.4.2
BGO827/SC0	3.6.4	BLF6G22LS-75	3.7.1	CGD944C	3.6.3	TFF11126HN	3.4.2
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BGU7005	3.4.1	BLF6G27-10	3.7.1	CGY1041	3.6.2	TFF11139HN	3.4.2
BGU7006	3.4.1	BLF6G27-10G	3.7.1	CGY1043	3.6.2	TFF11145HN	3.4.2
BGU7007	3.4.1	BLF6G27-135	3.7.1	CGY1049	3.6.2	TFF11152HN	3.4.2
BGU7031	3.4.1	BLF6G27-45	3.7.1	CGY887A	3.6.2		
BGU7032	3.4.1	BLF6G27-75	3.7.1	CGY887B	3.6.2		
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BGY585A	3.6.2	BLF6G27LS-75	3.7.1	DAC1003D160	3.8.2		
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BGY687	3.6.2	BLF7G20L(S)-200	3.7.1.2	DAC1408D series	3.8.2		
BGY785A	3.6.2	BLF7G20L(S)-250P	3.7.1.2	J108	3.5.1		
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BGY835C	3.6.2	BLF7G22L-130	3.7.1	J110	3.5.1		
BGY883	3.6.2	BLF7G22L(S)-250P	3.7.1.3	J111	3.5.1		
BGY885A	3.6.2	BLF7G22LS-130	3.7.1	J112	3.5.1		
BGY887	3.6.2	BLF7G24L(S)-100(G)	3.7.1.4	J113	3.5.1		
BGY887B	3.6.2	BLF7G27L-200P	3.7.1	J174	3.5.1		
BGY888	3.6.2	BLF7G27L(S)-100	3.7.1.4	J175	3.5.1		
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BLA6H1011-600	3.7.3	BLF7G27L(S)-75P	3.7.1.4	J177	3.5.1		
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