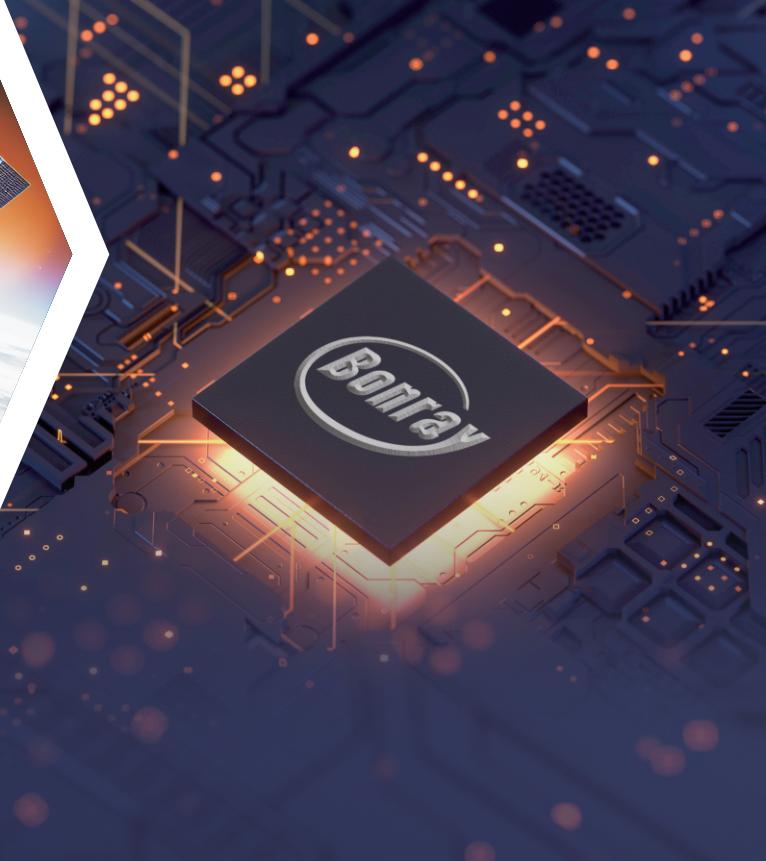




PRODUCTS SELECTION GUIDE

2024.Q4 V1.1



Make Independent Control High-level Core Chips Accessible To Everyone .



About Us

Bonray (Xi'an) Integrated Information Electronics Technology Co., Ltd. is a leading provider of independent controllable core chips and special communication equipment in China. We focus on the R&D, production, testing and sales of whole set equipment and core chips in communications, radar, avionics and other fields by providing completely independent and controllable innovative technologies and a whole package of product solutions, which can meet the personalized needs of different users and the requirements for quick response to innovation and upgradation.

The company headquarters boasts a R&D site of nearly 10000 square meters, a first-class super-clean workshop, and a complete micro-assembly production line, with table sticking, adhesive, bonding, sealing, assembly, testing and other production capacity. Our main products are Monolithic Microwave Integrated Circuit (MMIC) and Mixed Signal Integrated Circuit manufactured by GaAs, GaN, CMOS and other processes. With frequency coverage up to DC-50GHz, the integrated circuits possess such advantages as wide

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Chips Accessible To Everyone .



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frequency band, low power consumption, high integration, high reliability, short supply cycle, etc. These featured products have been widely used in special communications, Beidou Navigation Satellite System, radar and other market fields. Equipped with complete qualifications in special industry, we have undertaken nearly 100 projects of national, provincial and ministerial-level, and declared and been authorized with nearly 100 intellectual property rights. We have been identified as the National Specialized and New Enterprise, Xi'an Academician Workstation, Xi'an Engineering and Technology Research Center, etc.

Bonray is committed to creating value for customers in the field of special communication systems and core chips and enhancing the core competitiveness of the electronic information industry.



Selection Guide

Make Independent Control High-level Core Chips Accessible To Everyone .

IPR

Bonray

Since its establishment, it has obtained 39 authorizations for inventions and 30 authorizations for actual examination. 51 IC Layout Protections and many utility model patents.



R&D
capacity

Bonray

Relying on the talent team of top universities in China, the core technology is independent and controllable, with high level of chip R&D and design capability.

- RFIC Product Design Technology
- Integrated Circuit Device Modeling Technology
- 3D package simulation technology
- Microwave communication system integration design capability





Relying on High quality packaging & test production line. Capability of plastic encapsulated QFN, DFN, SOT, SOP series products and high reliability ceramic / metal shell packaging.

- High-precision fully automated thermal ultrasonic gold wire bonding capability, solder wire diameter 18μm-50μm, Key Accuracy $\pm 2.0\mu m@3\sigma$, suitable for multi-layer chip stacking, high-low differential chip bonding
- Laser sealing, editable encapsulation paths, hazardous materials, encapsulation of stainless steel, Al&Si and other metallic materials, leakage rates $\leq 5\times 10^9 \text{ pa m}^3/\text{s}$
- Fully automated micron-level measurement equipment, panoramic depth multi-angle imaging, flatness analysis, measurement accuracy of 0.1um
- Full-process manufacturing management system, traceable to every chip



Bonray All kinds of packaging, can provide Die, plastic, pottery, gold and other different forms.

Package	Size (units: mm)	Pictures
SMO-8C	12.2*12.2*5	
SOT89	4.5*4.1*1.5	
DFN6	2*1.3*0.75	
	1.5*1.2*0.75	
DFN8	2*2*0.8	
DFN8L	4.9*6*0.9	
SOT343	2.1*2.25*0.95	
SOT23-6	2.92*2.8*1.15	
MSOP8	3*4.9*1	
eMSOP8	3*4.9*1	
QFN16	3*3*0.8	
	4*4*0.75	
QFN20	4*4*1	

Package	Size (units: mm)	Pictures
QFN48	7*7*1.7	
QFN64	9*9*1.7	
	4*4*0.8	
QFN24	5*5*0.8	
QFN32	5*5*0.8	
PD	5.1*4.1*3.05	
PG	14*4.1*3.05	
PC	20.3*5.8*3.88	
PF	29*5.8*3.88	
PN	34*9.8*4.7	
PH	18*8.7*2.34	
PJ	24*17.4*4.5	



Reliability test

Failure analysis and reliability testing capabilities:

- High-definition micrographics: supports 2000x magnification and 3D visualization.
- High-power X-ray penetration equipment: support for thick substrate, large signal product inspection
- Ultra-high resolution SAM device: support T-SCAN plasticized layering, cavity inspection
- High and Low Temperature RF Probe Stations: Supporting DC and RF on-chip high and low temperature testing of bare die performance





Product Portfolio

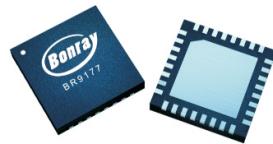
Small Signal Products

- Low Noise Amplifier
- Low Phase Noise Amplifier
- Gain Block/Amplifier
- Anti-blocking Amplifier
- RF Switch
- Attenuator
- Mixer
- Limiter
- Equalizer
- RMS Detector



Frequency Source & Timing Products

- PLL with Integrated VCO
- Prescaler
- Direct Digital Synthesis (DDS)
- Fanout Buffer
- SPI



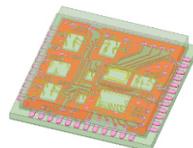
Large Signal Products

- GaN Transistor
- Internal Matched PA
- Driver Amplifier
- GaN MMIC
- GaN Switch



Integrated Products

- Variable Gain Amplifier
- Amplitude limiting & Phase shift SIP
- Bilateral Amplifier
- Beamforming Chip for K-band
- Micro Module



Product feature:

- Comprehensive coverage of short wave, ultrashort wave to microwave, millimeter wave.
- The device boasts a wide frequency spectrum, minimal power consumption, superior integration levels, and enhanced reliability.
- With small signal, large signal, Frequency Source & Timing, sip and other characteristic product, can provide a complete solution.





Selection Guide

Make Independent Control High-level Core Chips Accessible To Everyone .

Small Signal Products »

The series of products features a wide range of categories, excellent performance, and high reliability. It covers the entire frequency band from shortwave to microwave millimeter wave. The products are available in both bare die and packaged die forms.

Low Noise Amplifier

Part Number	Features	Freq. (GHz)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	NF (dB)	Vs (V)	I _s (mA)	Package	Product Lifecycle
HOT BR8121AF	Low noise, High linearity, High IP1	0.02~1	10.7	19.1	37.2	1.5	5.0	61.0	SMO-8C	Production
HOT BR8122AFF	Low noise, High linearity, High IP1	0.02~0.7	10.9	24.1	43.6	1.2	5.0	100~160	SMO-8C	Production
HOT BR8123AFF	Low noise, High linearity, High IP1	0.02~0.7	16.2	24.0	42.3	1.0	5.0	100~160	SMO-8C	Production
BR9555TA	Low noise, High linearity	0.03~1	27.8	23.9	38.6	0.7	5.0	117.0	SOT89	Production
BR9562FD	High linearity, Universal amplifier	0.03~1	20.7	22.4	37.5	1.2	5.0	92.0	QFN16	Production
HOT BR9518TA	Excellent gain flatness, Low power	0.03~2.5	19.1	21.4	27.6	1.2	5.0	22.0	SOT89	Production
BR9513TA	Short wave, High linearity	0.001~1	17.1	21.6	33.0	1.8	5.0	68.0	SOT89	Production
HOT BR9335DA	Low noise, High linearity, High IP1	1~1.7	13.5	20.9	37.0	0.6	5.0	60.0	DFN8	Production
HOT BR9533DC	Low noise, Low power	0.03~2	18.7	19.3	18.3	0.6	5.0	14.0	DFN6	Production
BR9116TA	Low power, Middle Gain	0.03~3	15.0	17.1	28.9	1.7	5.0	36.0	SOT89	Production
BR9537DA	Ultra low noise	0.3~3	19.1	20.9	32.9	0.5	5.0	63.0	DFN8	Production
HOT BR9118TC	Low power, Ultra low noise	0.03~4	16.6	22.3	31.1	0.7	5.0	43.0	SOT343	Production
BR95321TCJ	Ultra low noise, High linearity	0.03~4	18.0	20.5	33.3	0.7	5.0	54.0	SOT343	Production
HOT BR9123TA	Low power, Ultra low noise	0.03~4	18.9	22.1	32.4	0.7	5.0	46.0	SOT89	Production
BR9123TC	High linearity, Ultra low noise	0.03~4	16.6	22.3	31.1	0.7	5.0	43.0	SOT343	Production
BR9038TA	Low power, Low noise	0.03~4	14.6	21.5	27.1	1.0	5.0	45.0	SOT89	Production
BR9549TA	High linearity, Low noise	0.03~4	19.4	22.7	36.5	1.2	5.0	81.0	SOT89	Production
BR9549FD	High linearity, Low noise	0.03~4	19.6	22.4	36.3	1.3	5.0	81.0	QFN16	Production
HOT BR9112TA	High linearity, Low noise	0.001~4	22.7	23.2	35.9	1.2	5.0	130.0	SOT89	Production
HOT BR9115TA	High gain, Low noise	0.001~4	31.7	15.1	25.3	1.2	5.0	67.0	SOT89	Production
BR9103TA	High linearity, Low power	0.03~4	20.0	20.0	30.0	1.5	5.0	60.0	SOT89	Production
BR9122TC	Ultra-low power, Low noise	0.03~4	17.5	11.6	21.0	1.4	2.7	20.0	SOT343	Production
BR91221TCJ	Ultra-low power, Low noise	0.03~4	17.9	12.5	23.3	1.4	2.7	19.0	SOT343	Production
BR9105TA	Low power, Low noise	0.03~4	16.6	15.0	27.7	1.4	5.0	38.0	SOT89	Production
HOT BR9124TA	Excellent gain flatness, High linearity	0.05~4	14.6	19.9	35.1	1.5	5.0	52.0	SOT89	Production
BR91241TAJ	Excellent gain flatness, High linearity	0.03~4	14.7	21.6	32.2	1.6	5.0	55.0	SOT89	Production
BR9104TA	High linearity, High IP1	0.03~4	17.3	20.3	35.1	1.7	5.0	66.0	SOT89	Production
BR9534TA	Broadband, Low power	0.001~4	22.5	14.9	21.9	2.0	3.3	37.0	SOT89	Production
HOT BR9515TA	Broadband, High Gain	0.001~4	26.9	16.4	27.7	1.9	5.0	82.0	SOT89	Production
BR9554FD	High linearity, Excellent gain flatness	0.03~4	15.4	20.9	36.6	2.2	5.0	95.0	QFN16	Production
HOT BR9554TA	High linearity, Excellent gain flatness	0.03~4	15.1	20.8	35.9	2.2	5.0	94.0	SOT89	Production
BR9339TAJ	Low power, Excellent gain flatness	0.03~4	14.7	20.3	29.5	1.5	5.0	35.0	SOT89	Production
NEW BR9371DAJ	Low noise, Excellent gain flatness, Low power	0.03~4	22.3	23.1	29.8	0.7	5.0	43 /21	DFN8	Production
NEW BR9372FDJ	Low noise, Excellent gain flatness	0.03~4.5	30.5	19.2	30.6	0.8	5.0	95 /75	QFN16	Production
HOT BR9511DA	Turn-off function, Ultra low noise	0.6~4.2	20.8	19.1	35.5	0.6	5.0	67.0	DFN8	Production
HOT BR9625FDA	Turn-off function, Ultra low noise	0.7~6	18.0	21.8	35.4	0.5	5.0	77.0	DFN8	Production
HOT BR9617DAJ	Ultra broadband, Excellent gain flatness	0.02~8	23.2±1.0	20.0	36.0	1.1	5.0	87.0	DFN8	Production
NEW BR9373LDZ	High gain, Excellent gain flatness, Low noise	2~8	26.0	17.8	30.1	1.0	5	86 /56	Die	Production
NEW BR9373FDJ	High gain, Excellent gain flatness, Low noise	2~8	26.2	18.3	30.0	1.0	5	84 /55	QFN16	Production
NEW BR9375LDZ	Excellent gain flatness, Low noise	4~8	22.3	18.1	29.5	1.21	5	68 /45	Die	Production
NEW BR9375FDJ	Excellent gain flatness, Low noise	4~8	22.5	18.3	28.9	1.32	5	68 /45	QFN16	Production

Low Noise Amplifier

Part Number	Features	Freq. (GHz)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	NF (dB)	V _s (V)	I _s (mA)	Package	Product Lifecycle
NEW BR9376LDZ	Excellent gain flatness, Low noise	6~13	21.5±1.0	17.1	24.6	1.4	5	66 /41	Die	Production
NEW BR9376FDJ	Excellent gain flatness, Low noise	5~14	21.7±1.0	17.0	24.8	1.25	5	66 /43	QFN16	Production
NEW BR9377LDZ	High gain, Low noise	8~12	25.2	16.0	27.8	1.65	5	73 /48	Die	Production
NEW BR9377FDJ	High gain, Low noise	8~12	26.2±0.5	16.6	29.1	1.6	5	73 /47	QFN16	Production
NEW BR9379LDZ	Positive gain slope, Low noise, Low power	6~18	19.6	9.8	24.1	1.5	5	27.0	Die	Production
NEW BR9381LDZ	High gain, Excellent gain flatness, Low noise	6~20	28.8	13.7	28.6	1.1	5	53.0	Die	Production
BR9845	Ultra broadband, High linearity	0.05~6	17.0	23.3	39.0	2.5	5	145	DFN4	Samples
BR9616LD	Excellent gain flatness, Low noise	1~9	22.3±0.3	20.5	33.1	1.2	5	85	Die	Samples
NEW BR9616FDJ	Excellent gain flatness, Low noise	1~9	22.3±0.5	20.5	33.1	1.2	5	85	QFN16	Samples
BR9618LD	Low gain, High IP1	6~18	26.9±2.0	17.7	29.4	1.4	5	71	Die	Samples
NEW BR9618FDJ	Low gain, High IP1	6~18	26.5±1.0	17.7	28.5	1.4	5	82	QFN16	Samples
BR9615LD	High gain, Low noise	0.1~20	17.0±0.5	13.9	24.2	1.2	5	48.5	Die	Samples
NEW BR9615FLJ	High gain, Low noise	0.1~20	17.0±1.0	13.9	24.2	1.2	5	48.5	QFN32	Samples
BR9614LD	Ultra broadband, Excellent gain flatness	2~20	16.1±1.5	18.0	28.1	1.7	5	70	Die	Samples
NEW BR9614FLJ	Ultra broadband, Excellent gain flatness	2~20	16.1±1.5	18.0	28.1	1.7	5	70	QFN32	Samples
BR9619LD	Ultra broadband, Excellent gain flatness	18~26	21.0±0.4	15.8	20.0	1.8	5	55	Die	Samples
NEW BR9619FDJ	Ultra broadband, Excellent gain flatness	18~26	21.0±0.75	15.8	20.0	1.8	5	55	QFN16	Samples
BR9374FDJ	Excellent gain flatness	4~8	11.5	15.5	16.4	2.0	3.3	23	QFN16	Samples
BR9374LDZ	Excellent gain flatness	4~8	12.5	15.8	14.1	2.0	3.3	23	Die	Samples
BR9379FDJ	Positive gain slope, Low noise, Low power	6~18	20.0±1.0	11.0	24.0	1.5	5	34	QFN16	Pre-release
BR9381FDJ	High gain, Positive gain slope, Low noise, Low power	6~20	28.0±1.0	14.5	20.0	1.4	5	61	QFN16	Pre-release
BR9382LDZ	High gain, Positive gain slope, Low noise, Low power	6~18	24.0±1.5	14.0	-	1.5	5	35	Die	Pre-release
BR9382FDJ	Ultra broadband, High gain, Excellent gain flatness	6~18	24.0±2.0	14.0	-	1.5	5	35	QFN16	Pre-release
BR9384LDZ	Ultra broadband, High gain, Excellent gain flatness	0.1~20	23.5±0.5	11.0	21.0	1.7	5	55	Die	Pre-release
BR9384FLJ	High gain, Excellent gain flatness, Low noise	0.1~20	23.5±1.0	11.0	21.0	1.7	5	55	QFN32	Pre-release
BR9383LDZ	Positive gain slope, Low noise, Low power	18~32	19.0±0.5	6.5	-	1.8	3	28	Die	Pre-release
BR9383FDJ	Positive gain slope, Low noise, Low power	18~32	19.0±0.8	6.5	-	1.8	3	28	QFN16	Pre-release

Low Phase Noise Amplifier

Part Number	Features	Freq. (GHz)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	Excess Phase Noise (10KHz Freq Offset) (dBc/Hz)	NF (dB)	V _s (V)	I _s (mA)	Package	Product Lifecycle
HOT BR9192TA	High linearity, Low phase noise, Excellent gain flatness	0.03~1	20.1	21.1	39.8	-165	3.4	5	89	SOT89	Production
BR9192DA	High linearity, Low phase noise, Excellent gain flatness	0.03~1	20.2	20.8	41.0	-165	3.1	5	92	DFN8	Production
HOT BR9191TA	High linearity, Low phase noise	0.05~1	23.1	19.9	33.5	-165	3.3	5	75	SOT89	Production
HOT BR9108TA	High linearity, Low phase noise	0.03~4	19.7	21.1	30.9	-165	4.0	5	72	SOT89	Production





Selection Guide

Make Independent Control High-level Core Chips Accessible To Everyone .

Gain Block/Amplifier

Part Number	Features	Freq. (GHz)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	NF (dB)	Vs (V)	I _s (mA)	Package	Product Lifecycle
HOT BR9035TA	High Gain, Low power	0.03~3	21.0	11.8	23.0	4.3	5	39	SOT89	Production
HOT BR9613TC	Broadband, Low power	0.03~4	13.8	15.3	29.6	1.9	5	42	SOT343	Production
HOT BR9522TA	High linearity, Excellent gain flatness	0.03~4	21.4	19.9	38.6	2.2	5	81	SOT89	Production
BR9612TC	Broadband, Ultra-low power	0.03~5	12.1	6.5	21.2	2.8	5	24	SOT343	Production
BR9034DC	Broadband, Low power	0.03~8	17.5	14.0	26.1	4.2	5	45	DFN6	Production
BR9035DC	Broadband, Low power	0.03~8	21.7	11.0	24.4	3.9	5	38	DFN6	Production
NEW BR9641LDZ	Ultra broadband, Excellent gain flatness, High Pout	0.02~8	16.9	19.5	29.3	3.1	5	97 /62	Die	Production
NEW BR9641FDJ	Ultra broadband, Excellent gain flatness, High Pout	0.02~8	16.8	21.1	34.6	2.7	5	97 /60	QFN16	Production
NEW BR9642LDZ	Excellent gain flatness	6~12	16.5	17.1	29.1	1.4	5	54	Die	Production
NEW BR9642FDJ	Excellent gain flatness	6~12	16.2	16.6	28.9	1.4	5	53	QFN16	Production
NEW BR9643LDZ	Ultra broadband, Positive gain slope, Low power	2~20	15.0	16.6	25.4	2.1	5	48	Die	Production
NEW BR9644LDZ	Ultra broadband, Excellent gain flatness, Low power	2~20	20.5	12.1	24.7	2.8	5	40	Die	Production
BR9643FLJ	Ultra broadband, Low power	2~20	15.0±0.6	18.0	29.0	2.7	5	49	QFN32	Pre-release
BR9644FLJ	Ultra broadband, Excellent gain flatness, Low power	2~20	20.0±1.0	14.0	25.0	2.5	5	39	QFN32	Pre-release
BR9646LDZ	Excellent gain flatness, Low power	18~40	16.0±0.5	13.0	-	3.1	5	50	Die	Pre-release
BR9646FLJ	Excellent gain flatness, Low power	18~40	16.0±1.0	13.0	-	3.1	5	50	QFN32	Pre-release
BR9647LDZ	Positive gain slope, Low power	18~40	11.0±0.75	15.0	-	2.9	5	50	Die	Pre-release
BR9647FLJ	Positive gain slope, Low power	18~40	11.0±1.5	15.0	-	2.9	5	50	QFN32	Pre-release

Switch

Part Number	Features	Freq. (GHz)	IL. (dB)	Iso. (dB)	IP1dB (dBm)	IIP3 (dBm)	Control Voltage(V)	Switching Time(ns)	Package	Product Lifecycle
BR9572TD	Reflective, Low insertion loss, SPDT	0.001~2.5	0.2	28.6	34.9	>40	0/+3/+5	220	SOT23-6	Production
BR9573TDJ	Reflective , Low insertion loss, SPDT	0.001~2.5	0.22	28.6	35.6	>40	0/+3/+5	320	SOT23-6	Production
BR9142TD	Reflective, Low insertion loss, SPDT	0.02~3	0.6	27.0	34.0	56.0	0/+3/+5/+8	90	SOT23-6	Production
BR9502TD	Reflective, Low insertion loss, SPDT	0.001~4	0.6	28.5	33.1	47.0	0/+3/+5	66	SOT23-6	Production
BR9146FD	Reflective, Fast switching, SPDT	0.03~4	0.6	46.0	33.0	45.0	0/+3/+5/+8	25	QFN16	Production
BR9503DA	Absorption, High isolation, SPST	0.03~4	0.6	45.4	31.7	49.5	0/+3/+5	100	DFN8	Production
HOT BR9147EA	Absorption, High isolation, SPDT	0.01~4	0.9	51.4	34.0	54.3	0/+3/+5	140	eMSOP8	Production
HOT BR9147FD	Absorption, High isolation, SPDT	0.01~6	0.6	52.0	34.0	48.0	0/+3/+5	130	QFN16	Production
HOT BR9508TD	3W, Low insertion loss, T/R SPDT	DC~3	0.3	32.3	38.2	-	0/+3/+5/+8	30	SOT23-6	Production
BR9509FD	Absorption, High isolation, SP4T	0.01~4	1.0	50.0	28.3	42.6	0/+3/+5	100	QFN16	Production
BR9506EA	10W, Low insertion loss, T/R SPDT	0.01~4	0.4	30.0	39.6	-	0/+3/+5/+8	55	eMSOP8	Production
HOT BR9505EA	Fast switching, Broadband, T/R SPDT	DC~6	0.7	33.5	33.1 @IP0.3dB	-	0/+3/+5	7	eMSOP8	Production
BR9575LDZ	Absorption, SPDT	DC~20	2.0	40	25.0	-	0/+5	20	Die	Pre-release
BR9575FPJ	Absorption, SPDT	DC~20	2.5	38	24.0	-	0/+5	20	QFN24	Pre-release
BR9576LDZ	Absorption, SP4T	DC~20	2.5	40	22.0	-	0/+5	30	Die	Pre-release
BR9576FPJ	Absorption, SP4T	DC~20	3.0	37	22.0	-	0/+5	30	QFN24	Pre-release



Attenuator												
Part Number	Features			Freq. (GHz)	IL. (dB)	Peak Attenuation (dB)	Step (dB)	Interface	Vs (V)	Is (mA)	Package	Product Lifecycle
BR9158FP	7bit, Short wave, Parallel control			0.001~0.5	0.33	31.75	0.25	TTL/CMOS	5	3	QFN24	Production
BR9155FP	6bit, High precision, Parallel control			0.01~4	1.3	31.5	0.5	TTL/CMOS	5	3	QFN24	Production
BR9155S	6bit, High precision, Serial and parallel control			0.1~4	1.6	31.5	0.5	TTL/CMOS, SPI	5	4	QFN24	Production
BR9153S	6bit, High precision, Serial and parallel control			DC~8	1.2	31.5	0.5	TTL/CMOS, SPI	5	3	QFN24	Production
NEW BR9153FPJ	6bit, High precision, Parallel control			DC~8	1.3	31.5	0.5	TTL/CMOS	5	3	QFN24	Production
HOT BR9153FP	6bit, High precision, Parallel control			DC~8	1.3	31.5	0.5	TTL/CMOS	5	2	QFN24	Production
HOT BR9154FD	5bit, High precision, Parallel control			0.001~8	1.2	31.0	1.0	TTL/CMOS	5	2	QFN16	Production
NEW BR9361FPJ	7bit, High precision, Serial and parallel control			0.01~8	1.2	31.75	0.25	TTL/CMOS, SPI	5	3	QFN24	Production
BR9156FD	6bit, Broadband, Parallel control			2~8	2.0	31.5	0.5	TTL/CMOS	5	2	QFN16	Production
NEW BR9363FPJ	6bit, active high, Low additional phase shift, Parallel control			0.05~10	1.6	31.5	0.5	TTL/CMOS	5	2	QFN24	Production
BR7052-2/3/4 /6/8/10/20	Fixed attenuator			DC~40	-	2/3/4/6/8 /10/20	-	-	-	-	Die	Production
BR9364LDZ	6bit, High precision, Parallel control			0.2~20	3.0	31.5	0.5	TTL/CMOS	5	5	Die	Pre-release
BR9364FPJ	6bit, High precision, Parallel control			0.2~20	4.0	31.5	0.5	TTL/CMOS	5	5	QFN24	Pre-release

Coaxial Attenuator											
Part Number	Features	Freq. (GHz)	Attenuation (dB)		Maximum attenuation accuracy (dB)	Max VSWR (: 1)	Max P-in(average) (W)	Max P-in(peak) (W)	Connector Type	Product Lifecycle	
BR8491B	Coaxial fixed attenuator	DC-18	3, 6, 10, 20, 30, 40, 50, 60		±2.0	1.5	2	100	N(m, f)	Samples	
BR8493B	Coaxial fixed attenuator	DC-18	3, 6, 10, 20, 30		±1.0	1.5	2	100	SMA(m, f)	Samples	
BR8498A	Coaxial fixed attenuator	DC-18	30		±1.0	1.3	30	500	N(m, f)	Samples	
BR8493C	Coaxial fixed attenuator	DC-26.5	3, 6, 10, 20, 30, 40		±1.3	1.25	2	100	3.5mm(m, f)	Samples	
BR8490D	Coaxial fixed attenuator	DC-50	3, 6, 10, 20, 30, 40		-1.8/+1.5	1.1/1.45	1	100	2.4mm(m, f)	Samples	

Equalizer											
Part Number	Features	Freq. (GHz)	IL. (dB)	Equalization (dB)		VSWR (: 1)	Package		Product Lifecycle		
BR9313DA	2dB equalization		0.5~3	0.5		2	1.2		DFN8		Production
BR9314DA	3dB equalization		0.5~3	0.5		3	1.1		DFN8		Production
BR9315DA	4dB equalization		0.5~3	0.5		4	1.2		DFN8		Production
BR9316DA	5dB equalization		0.5~3	0.4		5	1.2		DFN8		Production
BR9317DA	6dB equalization		0.5~3	0.5		6	1.2		DFN8		Production
HOT BR9311DA	3dB equalization		DC~6	0.4		3	1.2		DFN8		Production
HOT BR9312DA	5dB equalization		DC~6	0.8		5	1.1		DFN8		Production
BR9318LD	3dB equalization		2~18	0.5		3	1.5		Die		Production
BR9319LD	6dB equalization		2~18	0.5		6	1.5		Die		Production
BR9318DAJ	3dB equalization		2~18	0.6		3	1.5		DFN8		Pre-release
BR9319DAJ	6dB equalization		2~18	0.6		6	1.5		DFN8		Pre-release





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Limiter

Part Number	Features	Freq. (GHz)	IL. (dB)	Response Time (ns)	Flat Leakage (dBm)	Maximum Input Power (dBm)	Package	Product Lifecycle
BR9301DA	Low insertion loss, Low flat Leakage power	0.01~1	0.36@500MHz	2.4	11.0	30.0	DFN8	Production
HOT BR93011DAJ	Low insertion loss, Low threshold	0.01~3	0.39@1GHz	2.4	12.0	30.0	DFN8	Production
NEW BR9309FPJ	High Input Power, broadband	DC~4	0.3@2GHz	3.2	13.3	47.0	QFN24	Production
BR9306FVJ	Low insertion loss, Low threshold	0.03~4	0.07@3GHz	3.3	14.0	35.0	DFN2	Production
BR9307FPJ	High Input Power, broadband	0.03~4	0.3@2GHz	3.7	14.0	40.0	QFN24	Production
HOT BR9308FPJ	High Input Power, broadband	0.03~6	0.27@3GHz	3.2	14.0	37.0	QFN24	Production
BR9308LDZ	Ultra broadband, High Input Power, Low insertion loss	0.03~18	0.17@4GHz	11.7	14.0	37.0	Die	Production
BR9731FPJ	High Input Power, Ultra broadband	0.03~18	0.35	11.7	14.0	36.0	QFN24	Pre-release

RMS Detector

Part Number	Features	Freq. (GHz)	Dynamic Range (dB)	RMS Conversion Gain (V/Vrms)	Vs (V)	I _s (mA)	Package	Product Lifecycle
BR9261	RMS response, Multiple operation mode	0.002~2.5	27	8~18	+2.7~+5.5	0.45@3V;0.6@5V	MSOP8	Production
HOT BR9262EAJ	RMS response, Multiple operation mode	0.002~1.8	25~28	4.0~10.5	+2.7~+5.5	3.8@3V;8@5V	eMSOP8	Production

Mixer

Part Number	Features	RF Freq. (GHz)	IF Freq. (GHz)	LO Freq. (GHz)	CL (dB)	IP1dB (dBm)	IIP3 (dBm)	LO Power (dBm)	Package	Product Lifecycle
HOT BR9133EA	Integrate LO Driver, High linearity	1.0~3.5	DC~0.5	1.0~3.5	7.5	18.0	26.0	-2/0/2	eMSOP8	Production
BR9134EA	Double balanced passive mixer	1.5~4.5	DC~1.5	1.5~4.5	7.5	12.1	19.0	11/13/15	eMSOP8	Production
HOT BR9132EA	Double balanced passive mixer	3~8	DC~3	3~8	7.1	11.3	17.8	11/13/15	eMSOP8	Production
BR9136LD	Double balanced passive mixer	10~20	DC~6	10~20	7.6	13.8	20.9	13/15	Die	Production
NEW BR9136FDJ	Double balanced passive mixer	10~20	DC~6	10~20	7.6	13.8	20.9	13/15	QFN16	Production

Phase shifter

Part Number	Features	RF Freq. (GHz)	Insertion Loss (dB)	Return loss (dB)	Step (°)	Precision (°)	Amplitude (dB)	Package	Product Lifecycle
BR9591LDZ	6 bit, High precision, Parallel control	5~6	6	15	5.625	1.0	1.0	Die	Pre-release
BR9591FPJ	6 bit, High precision, Parallel control	5~6	6	15	5.625	1.0	1.0	QFN24	Pre-release
BR9592LDZ	6 bit, High precision, Parallel control	8~12	10	10	5.625	2.0	2.0	Die	Pre-release
BR9592FPJ	6 bit, High precision, Parallel control	8~12	10	10	5.625	2.0	2.0	QFN24	Pre-release
BR9593LDZ	6 bit, High precision, Parallel control	14~18	10	10	5.625	3.0	3.0	Die	Pre-release
BR9593FPJ	6 bit, High precision, Parallel control	14~18	10	10	5.625	3.0	3.0	QFN24	Pre-release

Large Signal Products »

Bonray has a proven track record in providing power amplifier (PA) solutions across many frequency and power levels. Our PAs support demanding system requirements for mobile Infrastructure, radar, satcom and data chain.

GaN Transistor										
Part Number	Features	Freq. (GHz)	Psat (W)	Gain (dB)	PAE (%)	Vd (V)	Product Lifecycle	Package	Pictures	
BR9274FL	Pre-matched, Broadband, Power amplifier transistor	0.01~2.8	10	19.1	50.4	28	Production	QFN32		
HOT BRGM060015PD	Multi-application, Broadband, High PAE	DC~6	15	18.4	47.5	28	Production	PD		
HOT BRGM060025PD	Multi-application, Broadband, High PAE	DC~6	25	17.3	62.4	28	Production	PD		
BRGM060015PG	Flange package, Broadband, High PAE	DC~6	15	18.4	47.5	28	Production	PG		
BRGM060025PG	Flange package, Broadband, High PAE	DC~6	25	17.3	62.4	28	Production	PG		
BRGM060025PGG	Flange package, Broadband, High PAE	DC~6	25	17.3	62.4	28	Production	PG		
HOT BRGM040050PC	Multi-application, Broadband, High PAE	DC~4	50	19.2	57.1	28	Production	PC		
BRGP040050PC	Pre-Matched, Ultra broadband	DC~4	50	15.7	52.7	28	Production	PC		
BRGM032080PC	Multi-application, Broadband, High PAE	DC~3.2	80	18	51.4	28	Production	PC		
BRGP038080PC	Multi-application, Ultra broadband application	DC~3.8	80	17.8	53.6	28	Production	PC		
BRGP035110PC	Multi-application, Ultra broadband application	DC~3.5	110	15.6	49.1	28	Production	PC		
BRGP040070PFD	Two-channel, Pre-Matched, Ultra broadband application	DC~4	70	15.1	48.6	28	Production	PF		
BRGP025250PND	Two-channel, Pre-Matched, Ultra broadband application	DC~2.5	250	16.4	61	28	Production	PN		
BRGM060006PGD	Multi-application, Broadband, High PAE	DC~6	6	20.5	66.1	28	Production	PG		
HOT BRGM060006FPJ	Multi-application, Broadband, High PAE	DC~6	6	20.5	67	28	Production	QFN24		
BRGM032120PF	Two-channel, Broadband, High PAE	DC~3.2	120	18.9	54	28	Samples	PF		
BRGM030150PF	Two-channel, Broadband, High PAE	DC~3.0	150	18.6	50.8	28	Samples	PF		
BRGM060015FPJ	Multi-application, Broadband, High PAE	DC~6	15	18.4	60	28	Pre-release	QFN24		

Driver Amplifier										
Part Number	Features	Freq. (GHz)	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	NF (dB)	Vs (V)	I _s (mA)	Package	Product Lifecycle
HOT BR9548TA	Short Wave, Low noise, High linearity	0.001~1	22.1	27.7	42.0	1.35	8	220	SOT89	Production
HOT BR9322TA	Internal matched, Low noise, High linearity	0.03~2	22.3	28.1	41.8	1.1	8	230	SOT89	Production
BR9536TA	Internal matched, Ultra broadband, High linearity	0.03~2	15.1	26.3	45.3	3.6	9	177	SOT89	Production
HOT BR9321TA	Internal matched, Ultra broadband, High linearity	0.03~6	13.5	26.9	38.8	4.2	9	175	SOT89	Production
BR9535DA	Internal matched, Ultra broadband, High linearity	0.03~2.7	17.4	30.2	49.4	3.1	11	339	DFN8L	Production
BR9211FE	Broadband, High Gain, +5V supply voltage	1.1~1.9	28.7	30.1	41.6	5.7	5	253	QFN20	Production
BR9212FE	Broadband, High Gain, +5V supply voltage	1.4~3.4	25.0	30.2	38.6	5.4	5	249	QFN20	Production
BR9541TAJ	Multi-application, High linearity, +5V supply voltage	0.4~5	13.1	24.2	41.1	-	5	89	SOT89	Production
BR9542TAJ	Multi-application, High linearity, +5V supply voltage	0.4~5	11.5	28.3	40.0	-	5	89	SOT89	Production
HOT BR9543TA	Multi-application, High linearity, +5V supply voltage	0.4~4	17.4	30.1	44.6	-	5	245	SOT89	Production
HOT BR9544FP	Multi-application, High linearity, +5V supply voltage	0.05~3	18.5	32.8	45.0	4.9	5	446	QFN24	Production
BR9545TA	Multi-application, High linearity, +5V supply voltage	0.05~1.5	17.7	31.9	42.2	-	5	251	SOT89	Production
BR9546FPJ	High Power, High Gain, +5V supply voltage	1.5~2.4	35.7	36.2	45.0	-	5	99	QFN24	Production
BR9213FPJ	Broadband, High Gain, Low supply voltage	2~6	25.0	27.0	38.0	-	5	200	QFN24	Pre-release
BR9214FPJ	Broadband, High Gain, Low supply voltage	4.4~6	25.0	30.0	40.0	-	5	200	QFN24	Pre-release
BR9215FPJ	Broadband, High Gain, Low supply voltage	4~8	25.0	27.0	38.0	-	5	200	QFN24	Pre-release





Selection Guide

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Internal Matched PA

Part Number	Features	Freq. (GHz)	Psat (W)	Power Gain (dB)	PAE (%)	Vd(V)	Package	Product Lifecycle	Pictures
HOT	BRGF010010FLJ	Internal matched, Ultra broadband High PAE	0.01~1	10	15.6	59.9	28	QFN32	Production
	BRGF010010PHG	Internal matched, Ultra broadband High PAE	0.01~1	10	16.1	60.6	28	PH	Production
	BRGF027010FLJ	Internal matched, Ultra broadband High linearity	0.03~2.7	10	12.7	45.9	28	QFN32	Production
HOT	BRGF027010PHG	Internal matched, Ultra broadband High linearity	0.03~2.7	10	14.2	54.5	28	PH	Production
	BRGF016030PHG	Internal matched, High PAE, Compact package	1.6~1.65	30	16	73	28	PH	Production
	BRGF021050PJG	Internal matched, High PAE, Compact package	1.9~2.2	50	14	61.5	28	PJ	Production
NEW	BRGF024025PHG	Internal matched, High PAE, Compact package	1.9~2.4	25	14.2	59.5	28	PH	Production
	BRGF024050PJG	Internal matched, High PAE, Compact package	2~2.4	50	14.5	62.9	28	PJ	Production
	BRGF060010PHG	Internal matched, Broadband High Gain	2~6	10	17	49.1	28	PH	Production
NEW	BRGF060010LD	Internal matched, Broadband High Gain	2~6	10	18.2	44.5	28	Die	Production
	BRGF060020LD	Internal matched, Broadband High Gain	2~6	20	17	32.1	28	Die	Production
	BRGF035012FWJ	Internal matched, High Gain	2.5~4	12	25.5	50.4	28	QFN24	Production
NEW	BRGF035025PHG	Internal matched, High PAE, Compact package	2.7~3.5	25	13.3	59.2	28	PH	Production
	BRGF035050PJG	Internal matched, High PAE, Compact package	2.7~3.5	50	11.8	55.7	28	PJ	Production
	BRGF042050PJG	Internal matched, High PAE, Compact package	3.7~4.2	50	11.9	51.7	28	PJ	Production
NEW	BRGF024025PHG	Internal matched, High PAE, Compact package	1.9~2.4	25	14.2	61.5	28	PH	Pre-release
	BRGF039020FWJ	Internal matched, High Gain, Compact package	2.7~3.9	20	25	50	28	QFN24	Pre-release
	BRGF039020PHG	Internal matched, High PAE, High Gain	2.7~3.9	20	25	50	28	PH	Pre-release
NEW	BRGF045020PHG	Internal matched, High PAE, High Gain	3.7~4.5	20	23	50	28	PH	Pre-release
	BRGF059020PHG	Internal matched, High PAE, High Gain	4.4~6	20	22	50	28	PH	Pre-release
	BRGF021100PJG	Internal matched, High PAE, Compact package	1.9~2.1	100	11	45	28	PJ	Pre-release
NEW	BRGF042100PJG	Internal matched, High PAE, Compact package	3.7~4.2	100	10	45	28	PJ	Pre-release
	BRGF050050PJG	Internal matched, High PAE, Compact package	4.4~5	50	12	50	28	PJ	Pre-release
	BRGF050100PJG	Internal matched, High PAE, Compact package	4.4~5	100	10	45	28	PJ	Pre-release
NEW	BRGF060050PJG	Internal matched, High PAE, Compact package	5~6	50	12	50	28	PJ	Pre-release

GaN Switch

Part Number	Features	Freq. (GHz)	IL. (dB)	Iso. (dB)	IP1dB (dBm)	IIP3 (dBm)	Control Voltage (V)	Switching Time (ns)	Package	Product Lifecycle
BR9148FP	50W, Low insertion loss, SPDT, GaN	DC~4	0.3	40.0	47.0	-	0~40	50	QFN24	Production



Frequency Source & Timing Products »»

The product series includes PLL, VCO, etc. The PLL integrated with VCO features fast locking, low power consumption, and high cost-performance, meeting various application scenarios. It can be used for generating local oscillator signals and supports FM modulation.

PLL with Integrated VCO

Part Number	Features	Freq. (GHz)	Pout (dBm)	Phase Noise(10kHz offset@1.62GHz) (dBc/Hz)	Phase Noise(100kHz offset@1.62GHz) (dBc/Hz)	VDD (V)	IDD (mA)	Package	Product Lifecycle
HOT BR9177FL	Fractional-N/Integer-N Synthesizer with Integrated VCO	0.025~3.24	2	-102	-97	3.3	125	QFN32	Production
BR9068FPJ	Low power, Fractional-N/Integer-N Synthesizer with Integrated VCO	0.025~3.24	0	-90	-103	1.8/2.5	47@1.8V; 15@2.5V	QFN24	Samples

Prescaler

Part Number	Features	Freq. (GHz)	Input Signal Swing (mV)	Frequency Dividing Ratio	VDD (V)	IDD (mA)	Package	Product Lifecycle
BR9071	Ultra-Low Power Programmable Prescaler	0.1~1.1	400~1000	10, 20, 40, 80	5	4	CSOP08	Samples

Direct Digital Synthesis (DDS)

Part Number	Features	Reference Clock	DAC Resolution (bit)	Integral Nonlinearity (LSB)	Differential Nonlinearity (LSB)	VDD (V)	Power (mW)	Package	Product Lifecycle
BR9818	Low power, Programmable Waveform Generator	0.1Hz~25MHz	10	±1LSB	±0.5LSB	2.3~5.5	27	CSOP10	Samples

Fanout Buffer

Part Number	Features	Maximum Operation Frequency (GHz)	Propagation Delay (ps)	Output Swing (mV)	RMS Phase Jitter (fsRMS)	Vcc (V)	Icc (mA)	Package	Product Lifecycle
BR9293	1:4 LVPECL Fan-Out buffer->1:4 LVPECL Timing buffer	2	230	1560	150	3.3	420	QFN16	Samples

SPI

Part Number	Features	Data Rate (MHz)	Output High Voltage (V)	Output Low Voltage (V)	Response Time (ns)	Package	Product Lifecycle
BR9341LD	6bit, S/P Convert	10	Vdd-0.5	0.8	-	Die	Samples
BR9342LD	7bit, S/P Convert	10	Vdd-0.5	0.8	-	Die	Samples

VCO

Part Number	Features	Output Frequency (RFOUT) (GHz)	Output Power(RFOUT) (dBm)	Output Frequency (RFout/2) (GHz)	Output Frequency (RFout/4) (GHz)	Phase Noise dBc/Hz	Power (mA)	Package	Product Lifecycle
BR9184FL	MMIC VCO	13~14.9	≥4	6.5~7.45	3.25~3.725	≤103	≤300	QFN32	Samples

Integrated Products »»

The product series includes multifunctional SIP and SOC chips. Leveraging our expertise in chip development, packaging design, board-level debugging, and a rich library of bare die resources, we can provide customers with professional customized solutions.

Variable Gain Amplifier

Part Number	Features	Freq. (GHz)	Gain Control Range (dB)	Gain Control Step (dB)	OIP3 (dBm)	NF (dB)	Interface	Vs (V)	Is (mA)	Package	Product Lifecycle
BR9032FL	6-bit Parallel Variable Gain Amplifier	0.03~1	13.5~45	0.5	33.0	1.8	TTL/CMOS	5	126	QFN32	Production
BR9032S	6-bit Serial Variable Gain Amplifier	0.03~1	13.5~45	0.5	34.2	1.8	SPI	5	130	QFN32	Production
BR9606FP	6-bit Parallel Variable Gain Amplifier	0.5~4.2	-11.5~20	0.5	36.1@2GHz	1.9@2GHz	TTL/CMOS	5	144	QFN24	Production
BR9607FM	6-bit Parallel Dual-Channel Variable Gain Amplifier	0.175~1.15	-12~19.5	0.5	33.1	3.6	TTL/CMOS	5	75	QFN48	Samples

Limiting Amplifier

Part Number	Features	Freq. (GHz)	Gain (dB)	Dynamic Range (dB)	Gain Flatness (dB)	OIP3 (dBm)	NF (dB)	Limiting Output (dBm)	Vs (V)	Is (mA)	Package	Product Lifecycle
BR9608FR	High Input Dynamic Range	0.08~1.15	39.3	37	±0.6	27.7	5.3	≤12.3	5	150	QFN64	Production



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