Product Features

Frequency: 1.4GHz ~ 3.4GHz

Gain : 25.6dB@1.8GHz

Output P1dB Compression: 30.4dBm@1.8GHz

OIP3: 41.5dBm@1.8GHz

Vcc=+5V, I_{CQ} 249mA

Package: QFN20

Application

Wireless Infrastructure

FDD/TDD Base Stations

Test and Measurement Equipment

Commercial and Military Radars

High Power Amplifiers

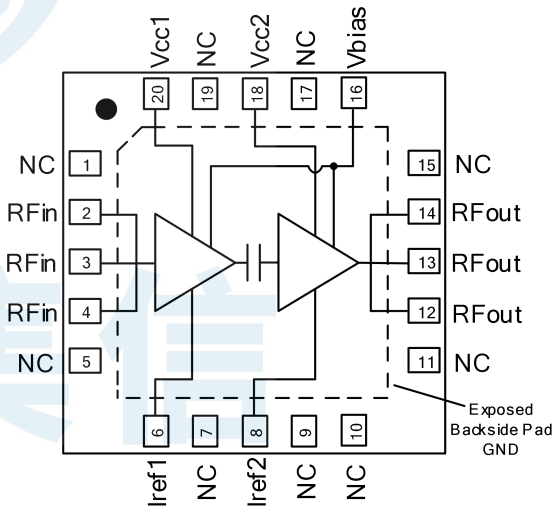
Ordering Information

Part Number	Package	Description
BR9212FE	QFN20	1.4GHz to 3.4GHz 1W Drive Amplifier

General Description

BR9212FE is a 1W drive constructed with GaAs process. The device is housed in a QFN20 package, the 1.8GHz small signal Power Gain 25.6dB, achieves a peak power of 30.4dBm P1dB, and 41.5dBm OIP3. The product is suitable for wireless communication infrastructure, FDD/TDD base station, radar, high power amplifier driver stage or final stage and other applications.

Functional Block Diagram



Electrical Specifications

Parameters	Test Conditions	Min.	Typ.	Max.	Units
Gain	2000MHz	-	25.3	-	dB
	3000MHz	-	25.7	-	dB
Input Return Loss	2000MHz	-	-10.9	-	dB
	3000MHz	-	-8.4	-	dB
Output Return Loss	2000MHz	-	-13.4	-	dB
	3000MHz	-	-12.7	-	dB
Reverse Isolation	2000MHz	-	-48.7	-	dB
	3000MHz	-	-49.9	-	dB
Output Power for 1dB Compression	2000MHz	-	30.7	-	dBm
	3000MHz	-	28.9	-	dBm
Output Third-Order Interception	2000MHz	-	40.0	-	dBm
	3000MHz	-	38.4	-	dBm
Supply Voltage	-	-	5	-	V
Static Working Current	-	-	249	-	mA
Test Condition: Vcc=VPD=+5V, I=249mA, OIP3 tested with spacing=1MHz, Pout=22dBm per tone, TA=+25℃					

Absolute Maximum Ratings

Maximum Operating Voltage (Vcc) : +6V

Maximum RF input Power: +15dBm

ESD Rating: Class 2 (< 3000V)

Recommended Operating Conditions

Power Supply Voltage: +5V

Storage Temperature: -65℃ ~ +150℃

Operating Temperature: -55℃ ~ +125℃

Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

ESD WARNING

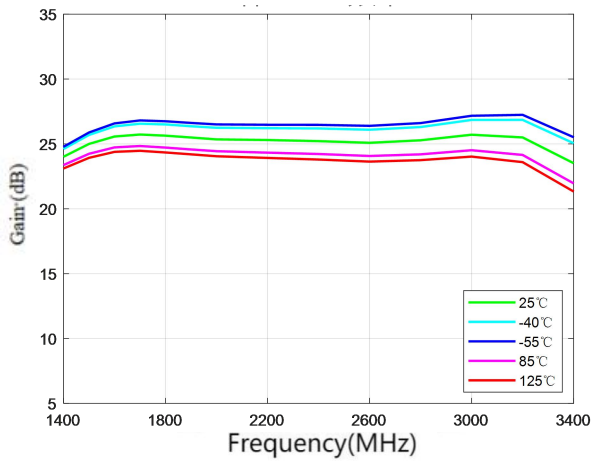
ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

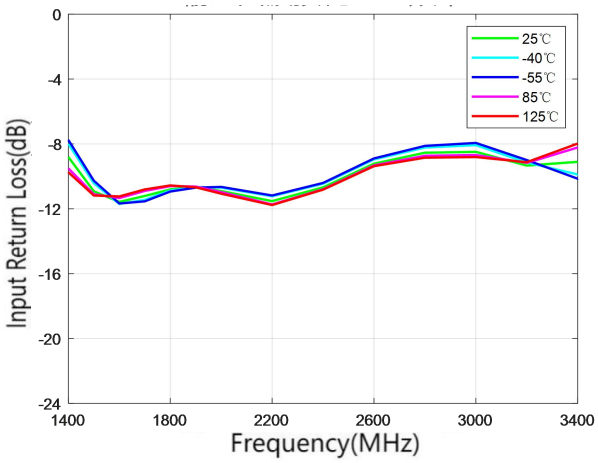
ESD Rating: Class 2B

Typical Performance (EVB test)

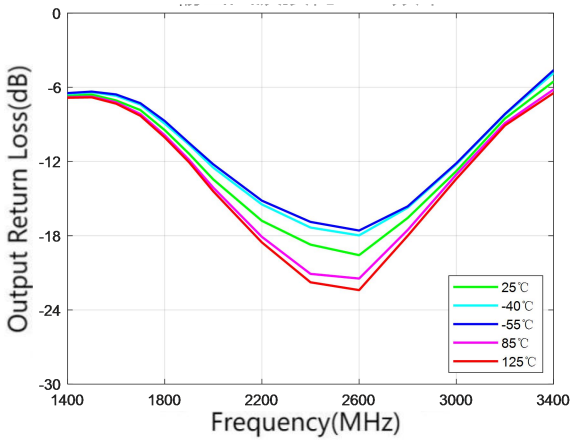
Parameters	Typical Value							Units
Frequency	1400	1500	1600	1700	1800	1900	2000	MHz
Gain	24.0	25.0	25.5	25.7	25.6	25.5	25.3	dB
Input Return Loss	-8.8	-10.9	-11.5	-11.2	-10.8	-10.6	-10.9	dB
Output Return Loss	-6.7	-6.5	-7.0	-7.8	-9.4	-11.3	-13.4	dB
Isolation	-51.5	-49.0	-47.6	-46.6	-46.6	-48.1	-48.7	dB
Output Power for 1dB Compression	28.4	29.2	29.5	30.1	30.4	30.8	30.7	dBm
Output Third-Order Interception	40.6	41.6	41.0	41.7	41.5	42.0	40.0	dBm
Psat	29.2	29.9	31.5	32.7	33.5	33.5	32.7	dBm
Parameters	**Typ.**							**Units**
Frequency	2200	2400	2600	2800	3000	3200	3400	MHz
Gain	25.3	25.2	25.0	25.2	25.7	25.5	23.5	dB
Input Return Loss	-11.5	-10.6	-9.2	-8.5	-8.4	-9.3	-9.1	dB
Output Return Loss	-16.7	-18.7	-19.5	-16.5	-12.7	-8.5	-5.5	dB
Isolation	-49.7	-48.6	-50.0	-47.9	-49.9	-47.4	-48.9	dB
P1dB	29.8	29.7	29.3	29.9	28.9	29.6	30.1	dBm
OIP3	39.1	39.4	37.4	36.4	38.4	41.1	38.4	dBm
Psat	31.6	32.5	32.3	32.5	32.0	31.0	30.5	dBm
Test Condition: Vcc=VPD=+5V, I=249mA, OIP3 spacing=1MHz, Pout=22dBm/tone, Temp=+25℃								



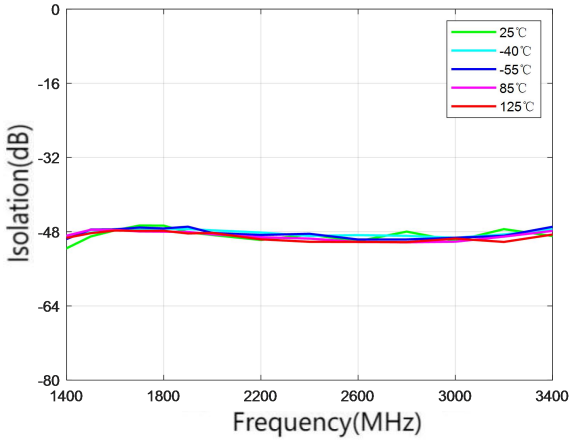
Gain



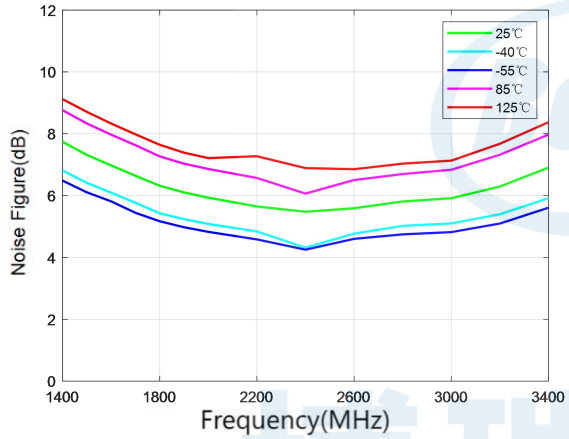
Input Return Loss



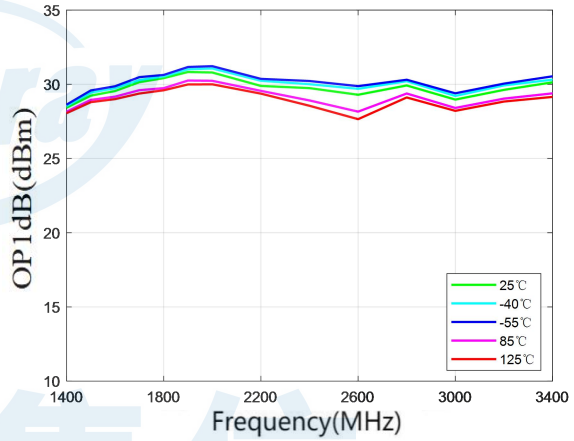
Output Return Loss



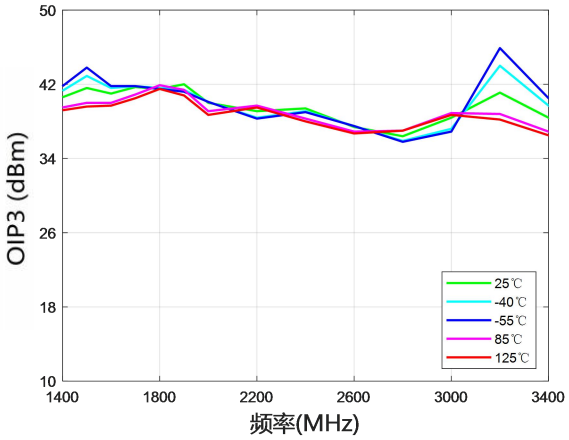
Reverse Isolation



Noise Figure

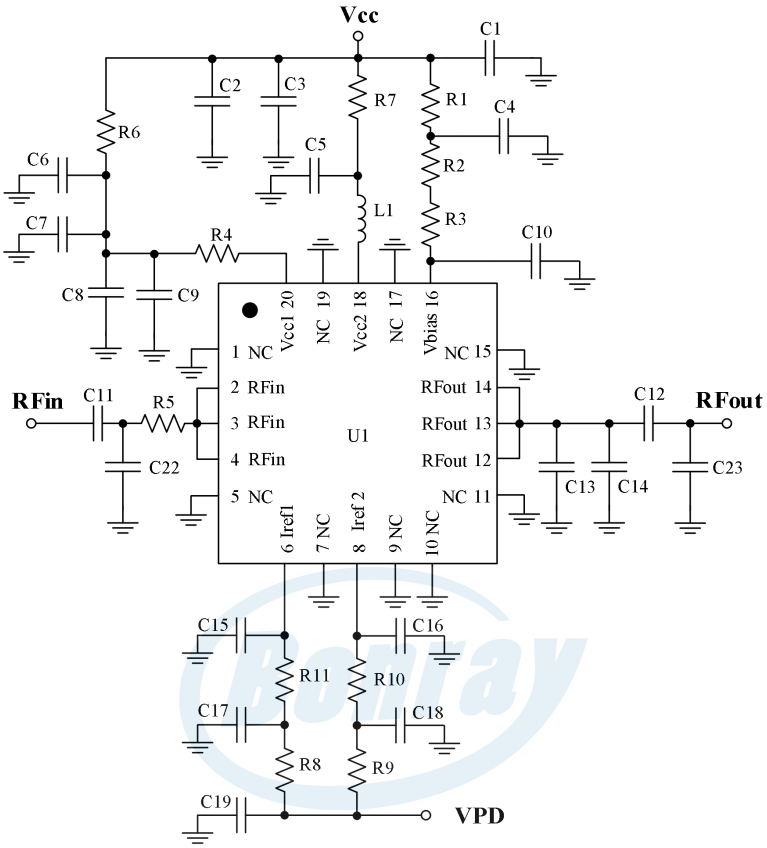


Output Power for 1dB Compression



Output Third-Order Intercept

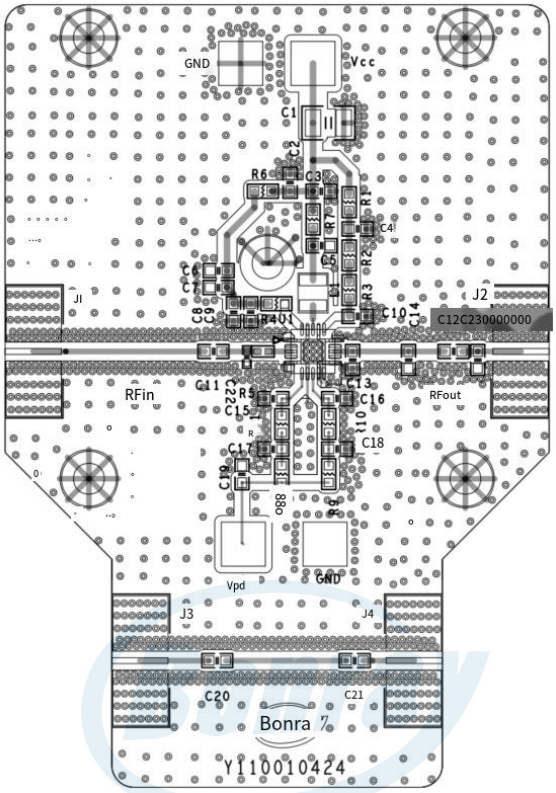
Typical Application Schematic

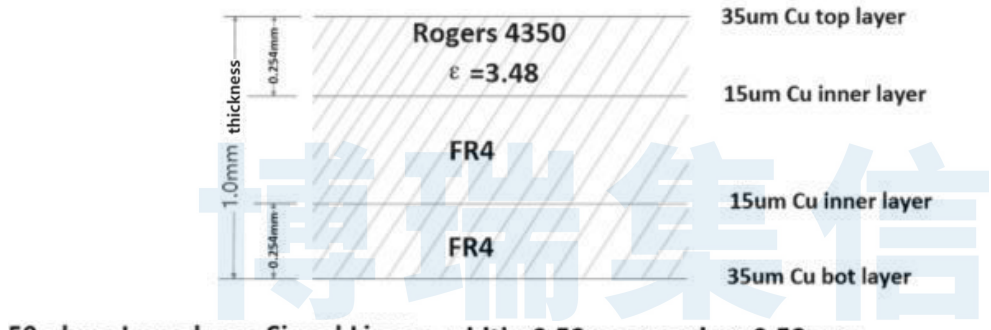


Bill of Material

Designator	Package	Description	Part Number
R1~R4, R6, R7, R10, R11	0402	0 Ω	RC0402FR-070RL
R8	0402	2.7 k Ω	RC0402JR-072K7L
R9	0402	1 k Ω	RC0402JR-071KL
C1	1210	10uF	GRM32ER71H106KA12L
C3~C6, C19	0402	1000pF	GRM1555C1H102JA01D
C2, C7, C10~C12	0402	100pF	GRM1555C1H101JA01D
C15~C18	0402	2200pF	GRM155R71H222JA01D
C22	0402	0.8 pF	GRM1555C1HR80WA01
C13	0402	2.2 pF	GRM1555C1H2R2CA01D
C14	0402	1pF	GRM1555C1H1R0CA01D
R5	0402	1.5 nH	LQW15AN1N5B00
L1	0603	3.3 nH	0603HP-3N3XGEW
C8, C9, C23	/	NC	/

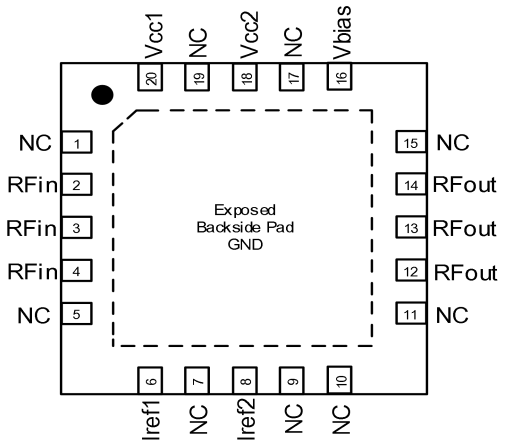
PCB Evaluation Board





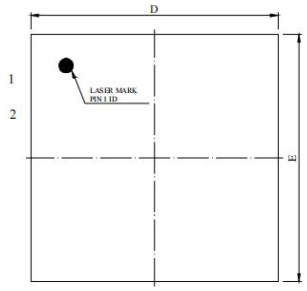
50 ohms Impedance Signal Lines： width=0.53mm,spacing=0.53mm

Pin Configuration and Description

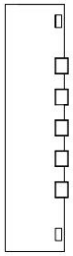


Pin Number	Pin Name	Description
1,5,7,9.10, 11,15,17,19	NC	The inside is not connected, and these ports need to be connected to an external RF ground or DC ground when testing to achieve RF isolation and good heat dissipation.
2 and 4	RFin	Rf input, External DC block required matching for best performance.
6	Iref1	Set the first stage amplifier bias current, which can also be used to power down the first stage amplifier.
8	Iref2	Set the second stage amplifier bias current, which can also be used to power down the second stage amplifier.
12 which	RFout	Rf output, requires external straightener capacitors and RF matching for best performance.
16	Vbias	Bias the Supply Voltage voltage of the circuit.
18	Vcc2	Second stage amplifier DC Supply Voltage voltage.
20	Vcc1	Dc Supply Voltage voltage of the first amplifier.
-	EP	Rf/DC ground. Reduce parasitic inductance and thermal resistance using the recommended through-hole type, see PCB Mount type.

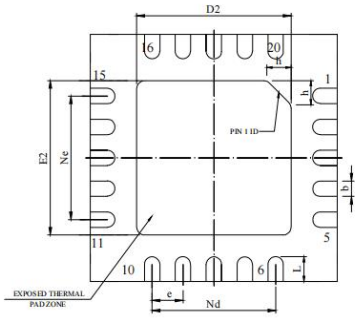
Package Dimensions (mm)



TOP VIEW

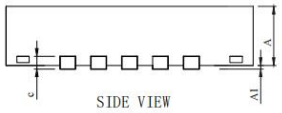


SIDE VIEW



BOTTOM VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.95	1.00	1.05
A1	0.01	0.02	0.05
b	0.20	0.25	0.30
e		0.203REF	
D	3.90	4.00	4.10
D2	2.55	2.65	2.75
e		0.50BSC	
Ne		2.00BSC	
Nd		2.00BSC	
E	3.90	4.00	4.10
E2	2.55	2.65	2.75
L	0.35	0.40	0.45
h	0.35	0.40	0.45



SIDE VIEW