

Product Features

Frequency: 30MHz ~ 4.5GHz

Noise Figure: 0.8dB@2GHz

Gain: 16.7dB@2GHz

Output Third-Order Interception:

36.8dBm@2GHz

Output Power for 1dB Compression:

20.5dBm@2GHz

Vdd=+5V, Quiescent Current: 77mA

Vdd=+5V (Low-power Operation Mode),

Quiescent Current: 48mA

Vdd=+3.3V, Quiescent Current: 39mA

Vdd=+3.3V (Low-power Operation Mode),

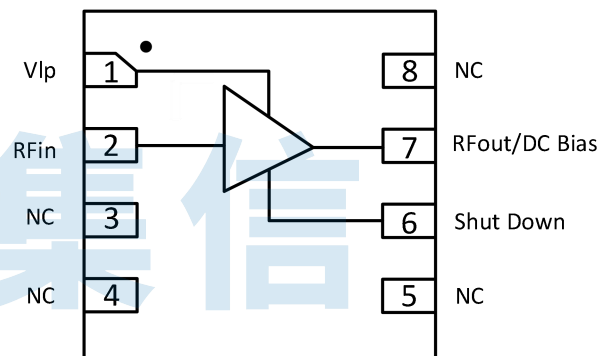
Quiescent Current: 23mA

Package: DFN8 (2mm * 2mm)

General Description

The BR9392DAJ is a low noise amplifier with an integrated shutdown function. At 2 GHz, it typically provides a small-signal gain of 16.7 dB, an output P1dB of 20.5 dBm, a noise figure of 0.8 dB, and a quiescent current of 77 mA. The device incorporates an integrated shutdown bias function, enabling operation in TDD systems. Featuring low noise figure and high linearity across a wide bandwidth, this product is suitable for applications requiring high linearity and low noise performance.

Functional Block Diagram



Apply

Repeater

Mobile Infrastructure

Defense & Aerospace

LTE / WCDMA / CDMA

General Wireless Applications

Ordering Information

Part Number	Package	Description
BR9392DAJ	DFN8	30MHz~4.5GHz Low Noise Amplifier

Electrical Specifications (+5V Supply)

Parameters	Test Condition	Min.	Typ.	Max.	Units
Gain	2000MHz	-	16.7	-	dB
	4500MHz	-	10.7	-	
Output Power for 1dB Compression	2000MHz	-	20.5	-	dBm
	4500MHz	-	20.5	-	
Output Third-Order Interception	2000MHz	-	36.8	-	dBm
	4500MHz	-	37.9	-	
Noise Figure	2000MHz	-	0.8	-	dB
	4500MHz	-	1.3	-	
Input Return Loss	2000MHz	-	-21.2	-	dB
	4500MHz	-	-14.8	-	
Output Return Loss	2000MHz	-	-11.2	-	dB
	4500MHz	-	-12.8	-	
Reverse Isolation	2000MHz	-	-23.6	-	dB
	4500MHz	-	-19.7	-	
Supply Voltage	-	-	+5	-	V
Power Switch	ON	0	—	0.9	V
	OFF	1.3	—	Vdd	
Supply Current	ON	-	77	-	mA
	OFF	-	5	-	
Switching Time	LNA ON to OFF	-	20.4	-	ns
	LNA OFF to ON	-	20.2	-	
Test conditions: Vdd=+5V, I=77mA, OIP3 spacing=1MHz, Pout=+5dBm/tone, TA=+25°C					

Absolute Maximum Ratings

Maximum Supply Voltage : +7V

Maximum Input Power: 23dBm

ESD Rating: Class 1A

Recommended Operating Conditions

Supply Voltage: +5V

Supply Current: 77mA

Operating Temperature: -55°C ~ +125°C

Storage Temperature: -65°C ~ +150°C

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

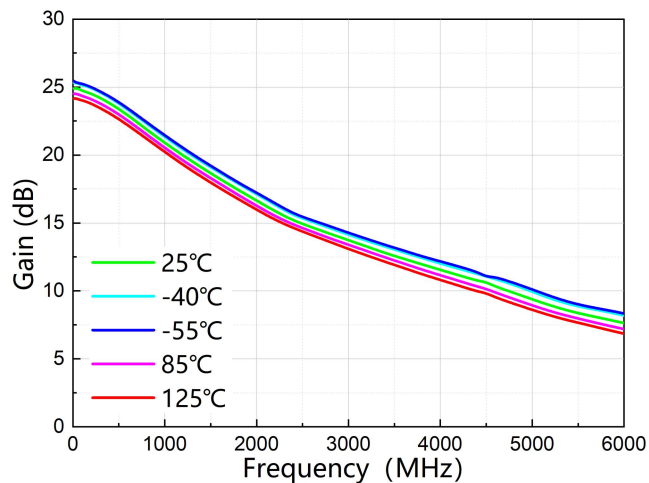
ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

博瑞集信

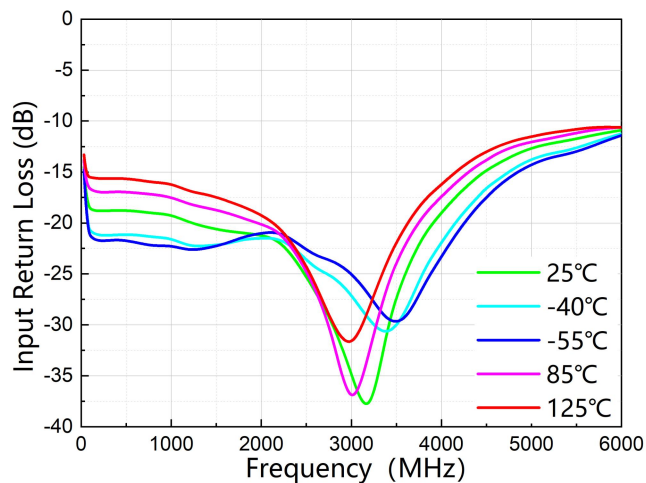
Typical Performance (EVB Test Results)

Parameters	Operation Mode	Typ.										Units
Frequency		30	1000	1500	2000	2500	3000	3500	4000	4200	4500	MHz
Gain	5V	24.9	20.9	18.7	16.7	15.0	13.9	12.8	11.6	11.2	11.0	dB
	5V Low-power	24.4	20.4	18.2	16.3	14.7	13.5	12.4	11.1	10.7	10.4	
	3.3V	24.1	19.9	17.5	15.8	14.0	12.9	11.8	10.7	10.3	9.4	
	3.3V Low-power	23.1	18.9	16.8	15.0	13.3	12.2	10.9	9.9	9.5	8.8	
Input Return Loss	5V	-14.5	-19.1	-20.5	-21.2	-25.0	-34.7	-24.7	-19.0	-17.0	-14.8	dB
	5V Low-power	-13.1	-15.5	-16.7	-18.7	-22.0	-32.1	-21.0	-16.5	-14.9	-13.1	
	3.3V	-12.4	-14.5	-16.7	-18.4	-20.0	-24.8	-19.0	-15.0	-13.7	-11.7	
	3.3V Low-power	-10.4	-11.3	-12.4	-14.7	-17.0	-19.0	-15.0	-12.7	-11.6	-10.5	
Output Return Loss	5V	-14.1	-18.5	-14.6	-11.1	-10.8	-10.8	-11.9	-12.6	-12.9	-12.8	dB
	5V Low-power	-16.2	-18.0	-13.0	-10.9	-10.7	-11.0	-11.7	-12.2	-12.3	-12.0	
	3.3V	-15.5	-21.5	-14.7	-12.4	-12.0	-12.2	-13.5	-14.6	-15.0	-14.7	
	3.3V Low-power	-20.6	-16.6	-13.6	-11.2	-11.2	-11.6	-12.6	-12.9	-13.1	-12.7	
Output Power for 1dB Compression	5V	21.2	20.7	20.7	20.5	20.2	20.3	20.4	20.5	20.4	20.5	dBm
	5V Low-power	21.1	20.3	20.2	20.0	19.9	19.8	19.9	19.9	19.6	19.8	
	3.3V	16.7	16.2	16.3	16.3	15.8	16.0	16.1	16.0	16.2	16.0	
	3.3V Low-power	12.0	15.7	15.5	15.0	14.6	14.6	14.4	14.3	13.4	13.2	
Output Third-Order Interception	5V	38.3	36.3	36.8	36.8	36.5	37.5	37.0	37.1	37.8	37.9	dBm
	5V Low-power	34.9	32.5	32.6	33.3	33.1	32.7	32.9	32.5	32.9	32.4	
	3.3V	30.1	28.9	28.6	29.1	29.0	28.9	28.7	29.0	28.5	28.0	
	3.3V Low-power	29.9	25.2	24.6	24.7	24.3	24.2	24.5	24.4	24.4	24.3	
Noise Figure	5V	2.0	0.7	0.8	0.8	0.9	0.9	1.1	1.1	1.0	1.3	dB
	5V Low-power	1.9	0.7	0.7	0.8	0.8	0.9	1.0	1.5	1.0	1.3	
	3.3V	2.0	0.7	0.8	0.8	0.9	0.9	1.1	1.1	1.0	1.3	
	3.3V Low-power	1.9	0.7	0.8	0.9	0.9	1.0	1.1	1.6	1.2	1.5	
Quiescent Current	5V	77										mA
	5V Low-power	48										
	3.3V	39										
	3.3V Low-power	23										
Test Conditions: Vdd=+5V, I=77mA, OIP3 spacing=1MHz, Pout=+5dBm/tone, TA=+25°C												

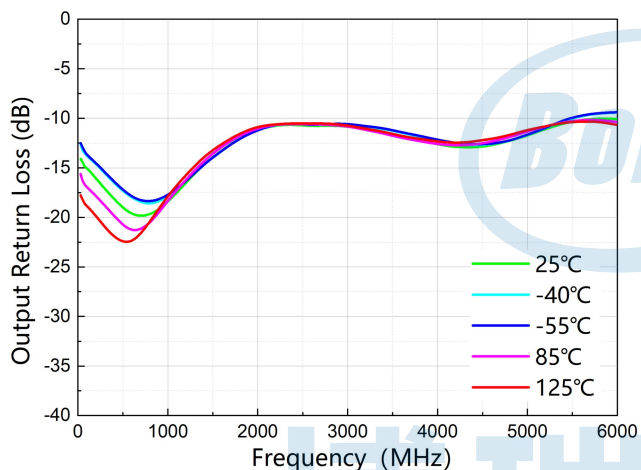
Typical Performance (EVB Test Results +5V Supply)



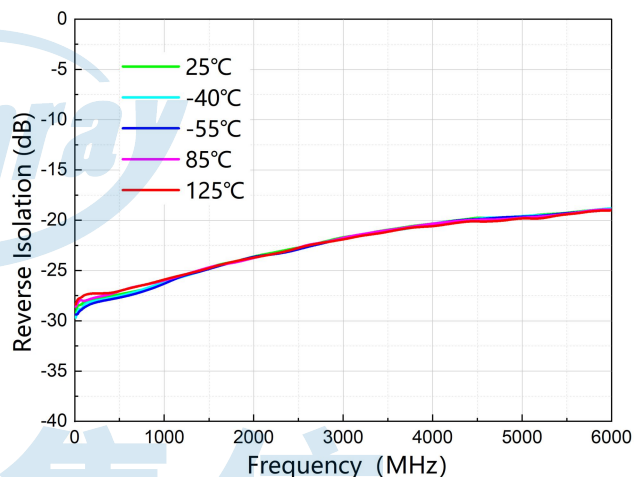
Gain vs. Freq



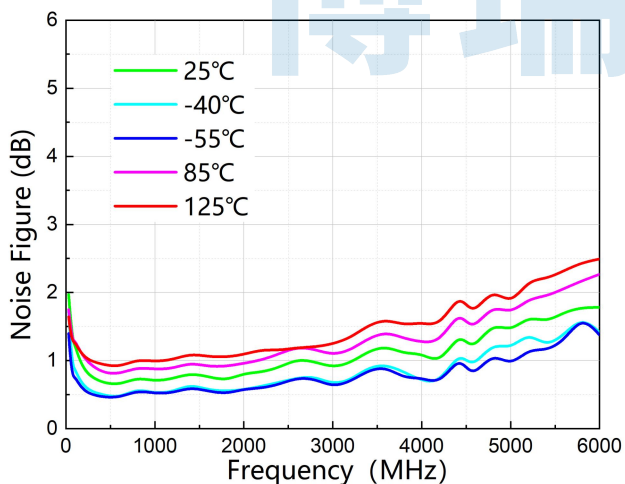
Input Return Loss vs. Freq



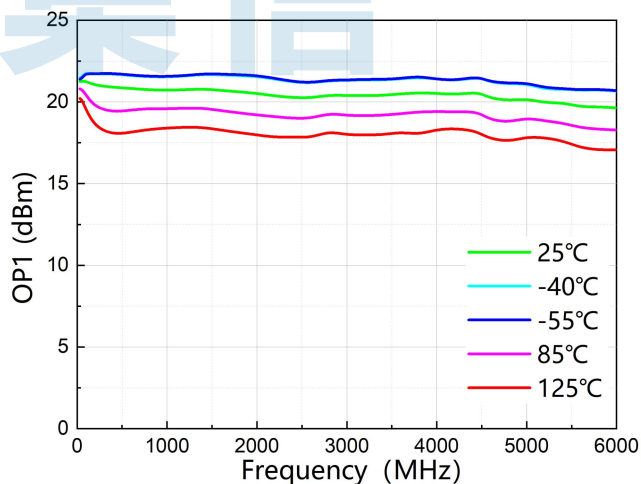
Output Return Loss vs. Freq



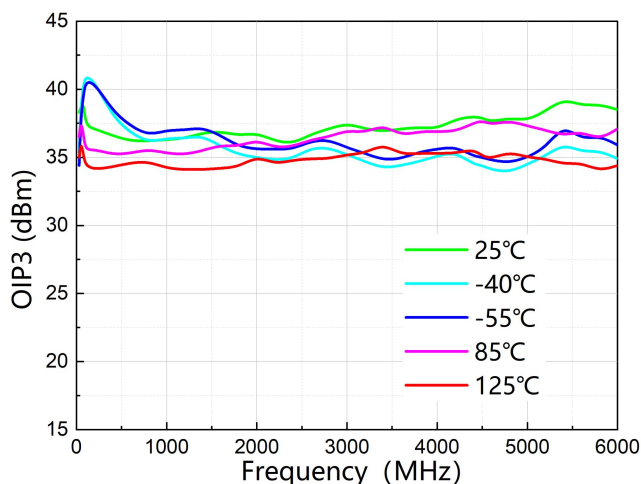
Reverse Isolation vs. Freq



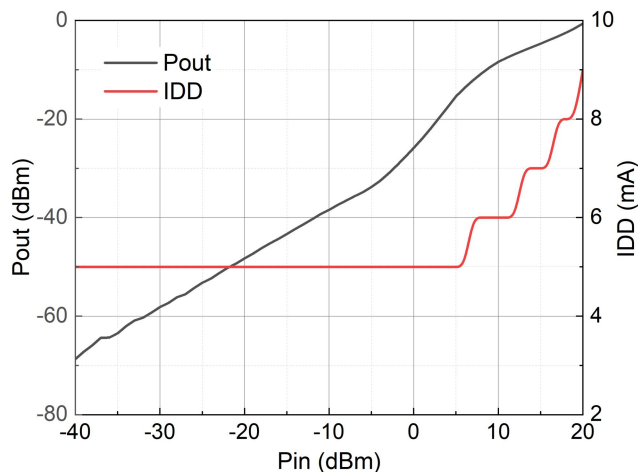
Noise Figure vs. Freq



Output Power for 1dB Compression vs. Freq

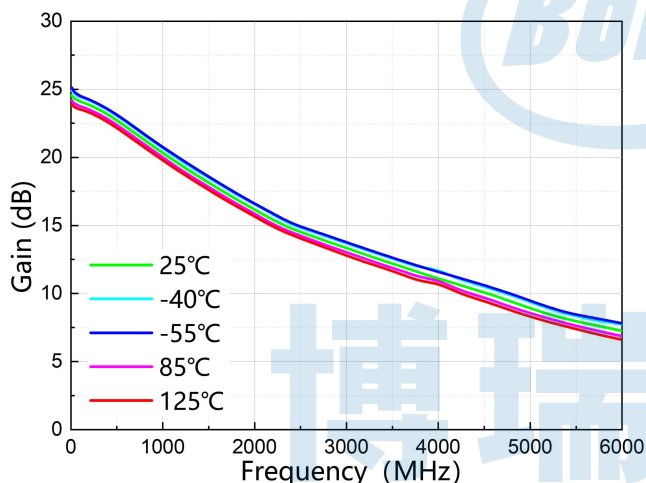


Output Third-Order Interception vs. Freq

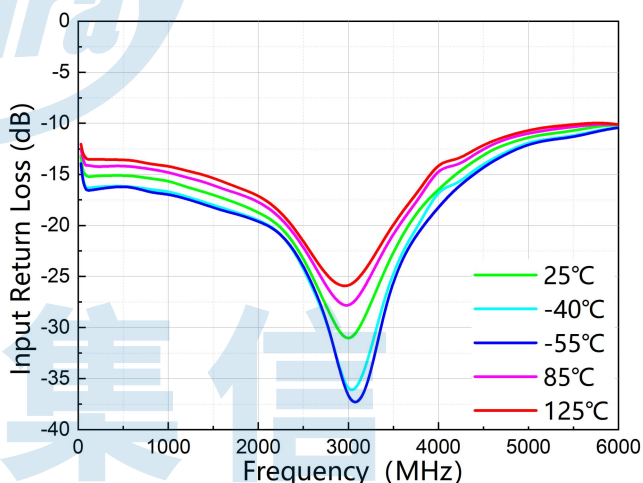


P_{out} and IDD vs. P_{in}
(OFF State, 2GHz)

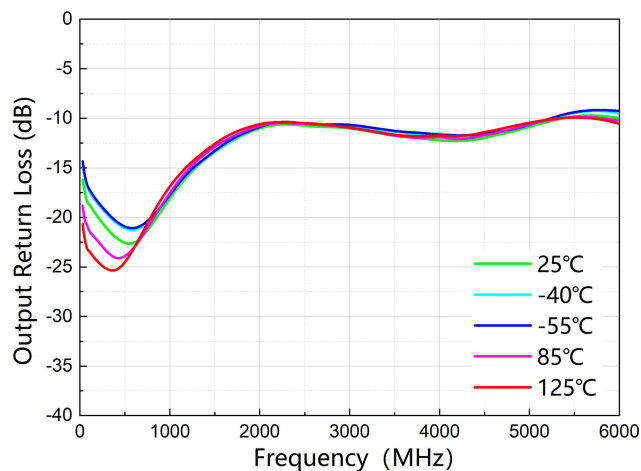
Typical Performance (EVB Test Results at Low-power Operation Mode, +5V Supply)



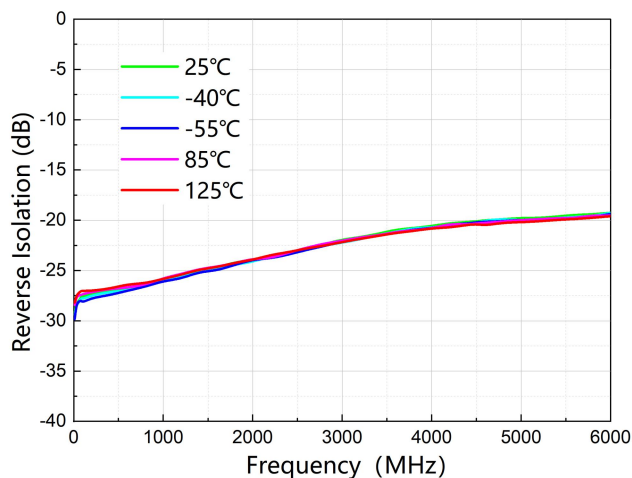
Gain vs. Freq



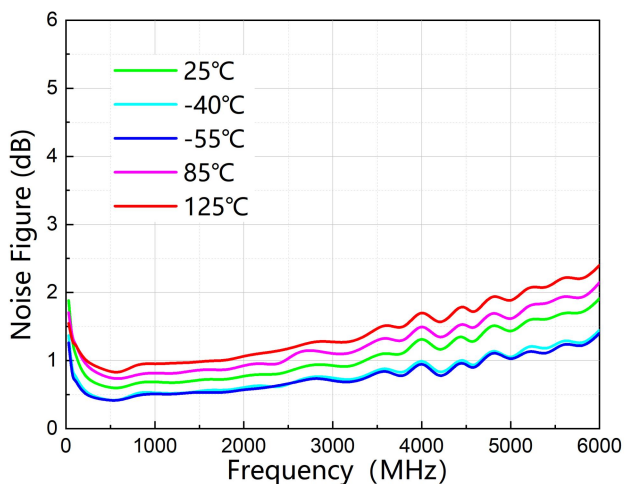
Input Return Loss vs. Freq



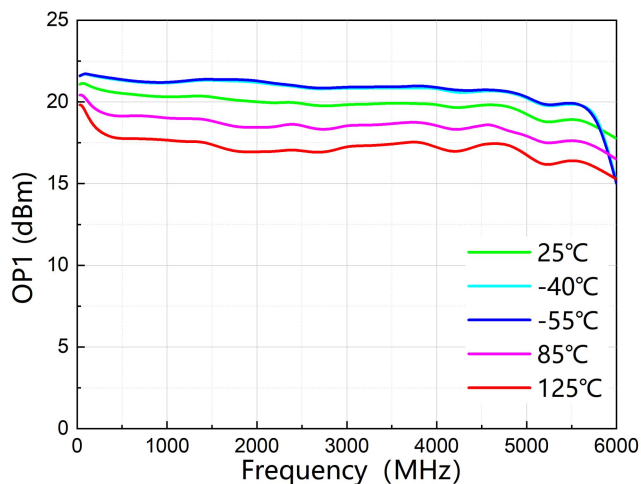
Output Return Loss vs. Freq



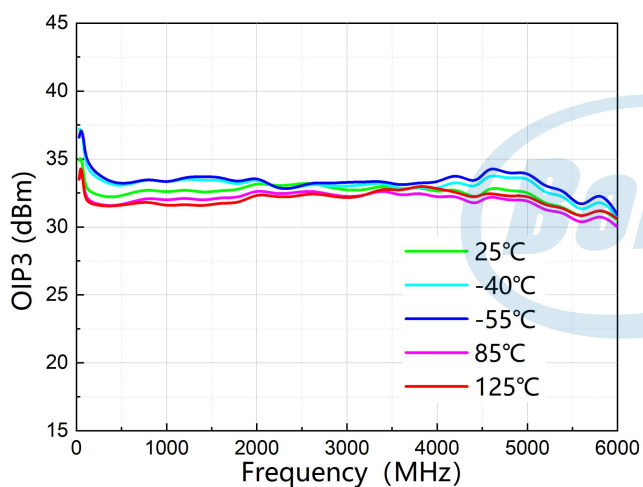
Reverse Isolation vs. Freq



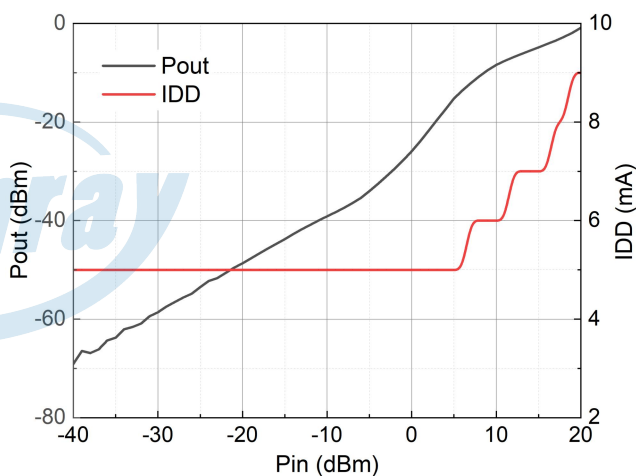
Noise Figure vs. Freq



Output Power for 1dB Compression vs. Freq

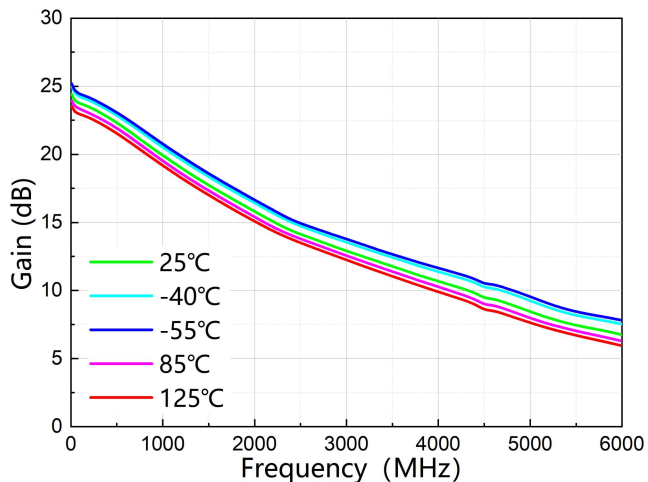


Output Third-Order Interception vs. Freq

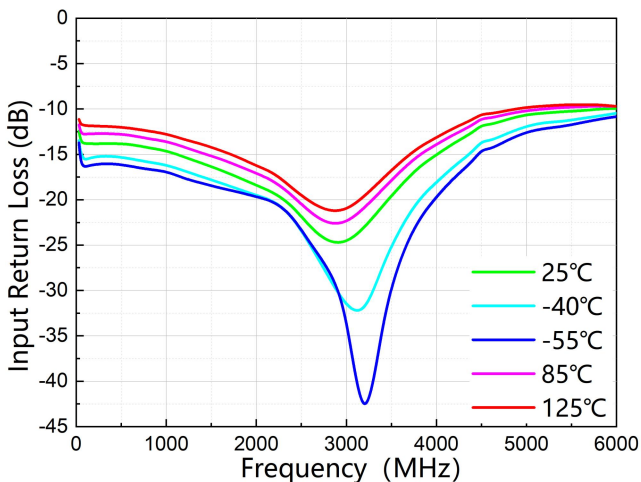


P_{out} and I_{DD} vs. P_{in}
(OFF State, 2GHz)

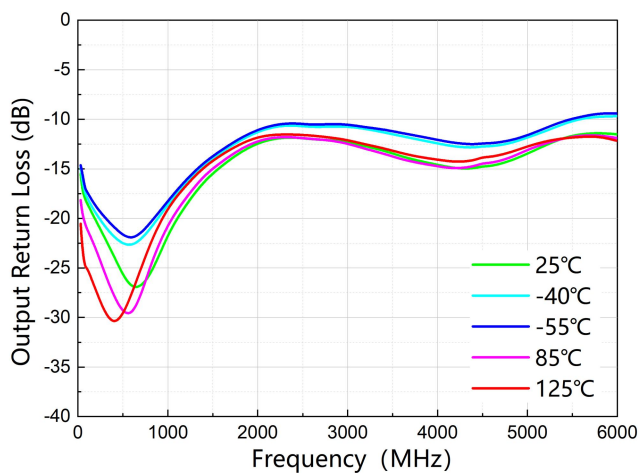
Typical Performance (EVB Test Results +3.3V Supply)



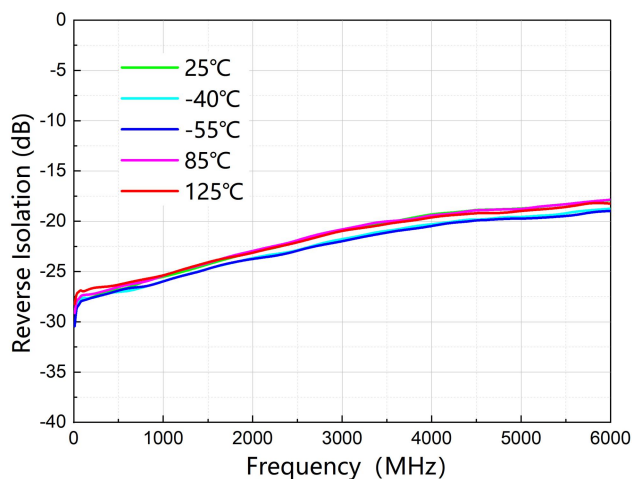
Gain vs. Freq



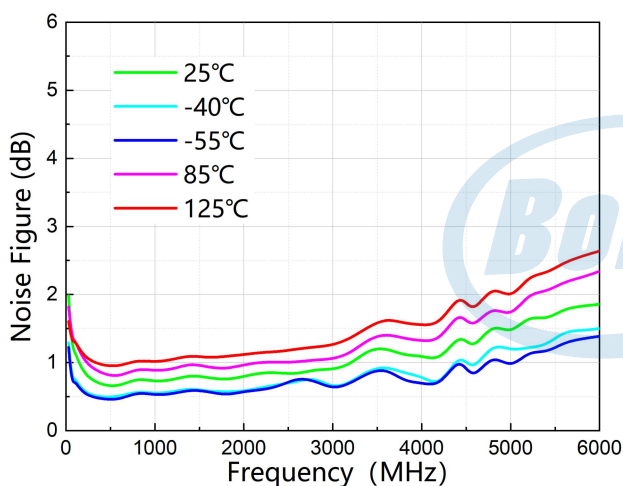
Input Return Loss vs. Freq



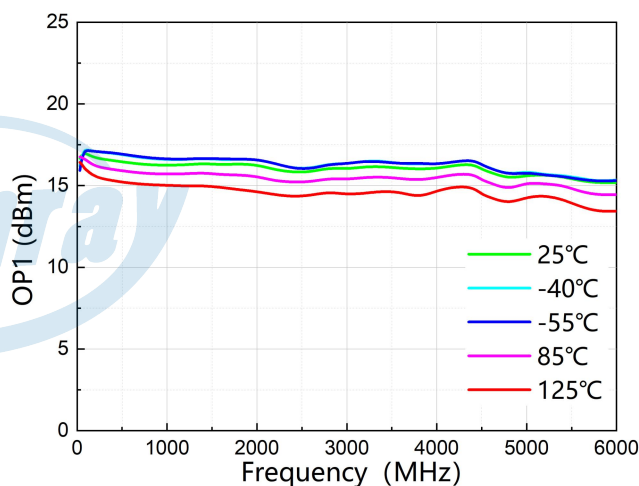
Output Return Loss vs. Freq



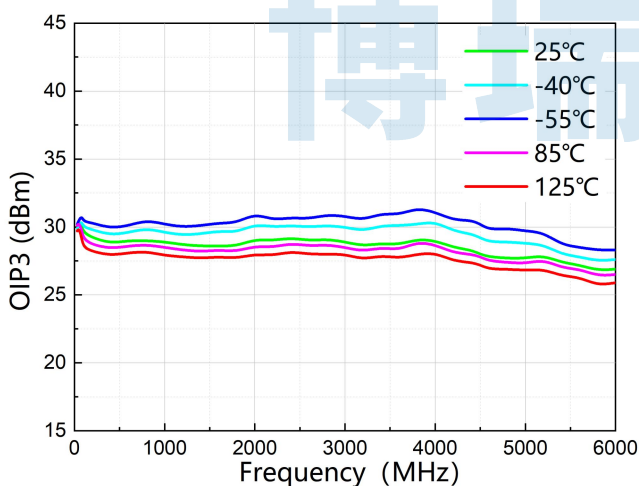
Reverse Isolation vs. Freq



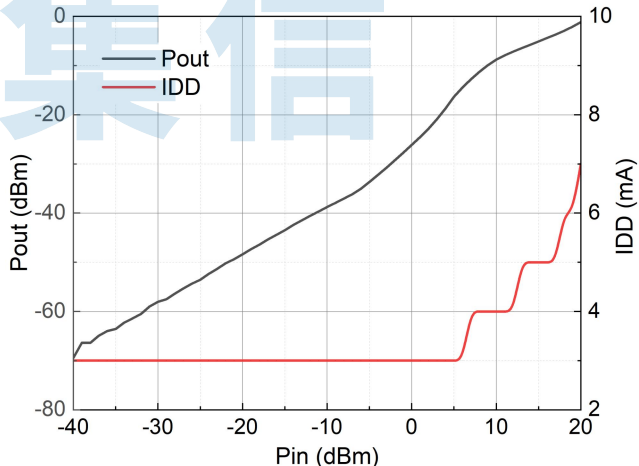
Noise Figure vs. Freq



Output Power for 1dB Compression vs. Freq

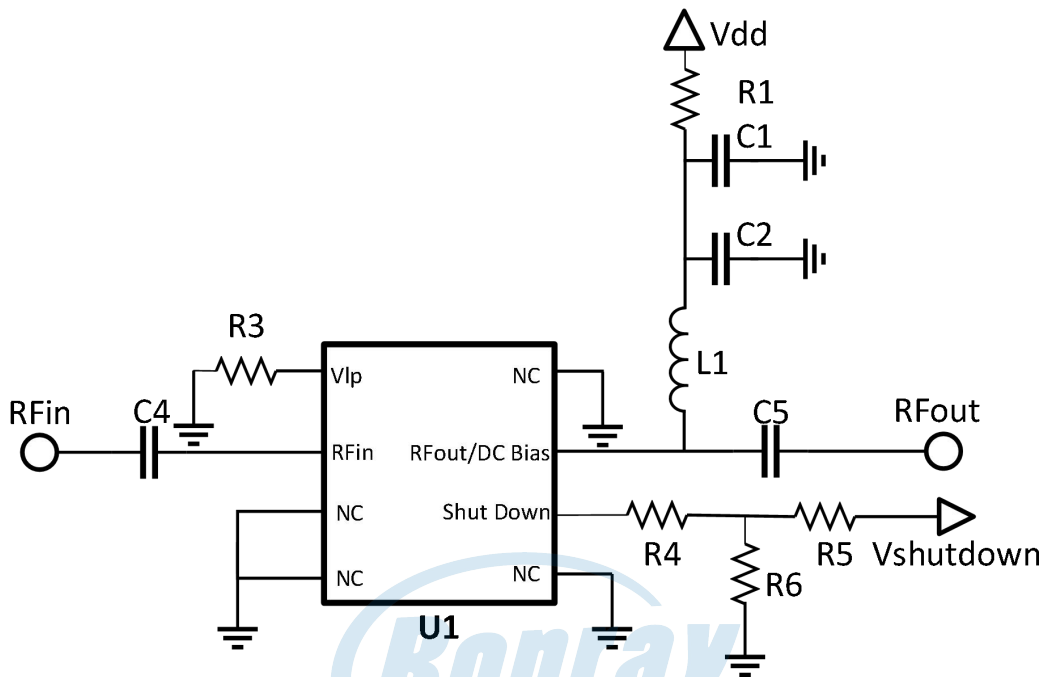


Output Third-Order Interception vs. Freq



P_{out} and I_{DD} vs. P_{in}
(OFF State, 2GHz)

Typical Application Schematic

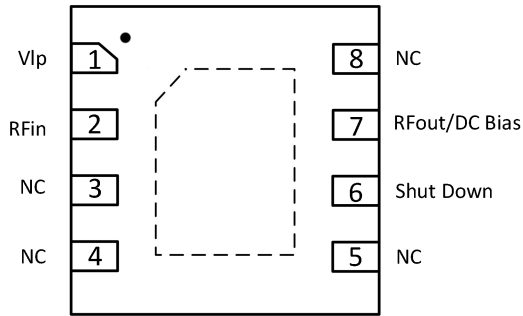


Bill of Material

Designator	Package	Description	Part Number
U1	DFN8	Low Noise Amplifier	BR9392DAJ
L1	1008	1.1uH	1.1uH,±5%,1200mA
C1	0402	1uF	GRM188R61C105KA93D
C2	0402	100pF	GRM15504025C1H101JA01
C4、C5	0402	1nF	GRM1555C1H102JA01D
R1	0402	0Ω	RC0402FR-070RL
R3 (Low-power Operation Mode)	0402	0Ω	RC0402FR-070RL
R3	/	Float	/
R4	/	Solder short	/
R5	0402	1.3KΩ	RC0402JR-071K3L
R6	0402	30KΩ	RT0402BRE0730KL

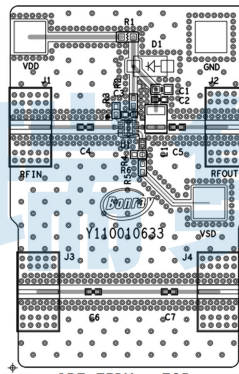
Note: Under normal operation, the R3 position should be left floating. A 0 Ω resistor can be soldered at this position to switch the device into low-power operation mode.

Pin Configuration and Description

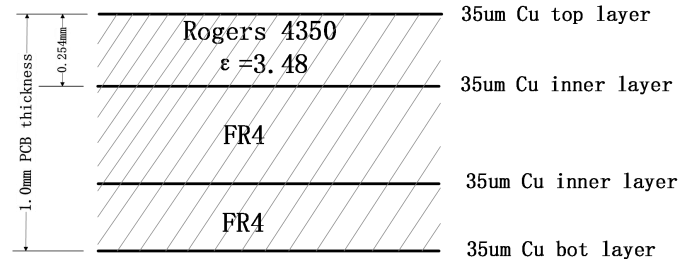


Pin Number	Pin Name	Description
2	RFin	RF input pin. DC-coupled and internally matched to 50 ohms. Only an external DC-blocking capacitor is required.
6	Shut Down	Controls device power state. • Device OFF: Voltage > 1.5V. • Device ON: Voltage < 0.6V.
7	RFout/DC Bias	RF output pin. DC-coupled and internally matched to 50 ohms. Only an external DC-blocking capacitor is required.
1	Vlp	Quiescent bias setting pin. • Normal mode: Leave floating. • Low-power mode: Connect to ground.
3,4,5,8	NC	No electrical connection. This pin and the package substrate must be connected to the RF/DC ground.
-	EP	Connect to RF/DC ground.

PCB Evaluation Board

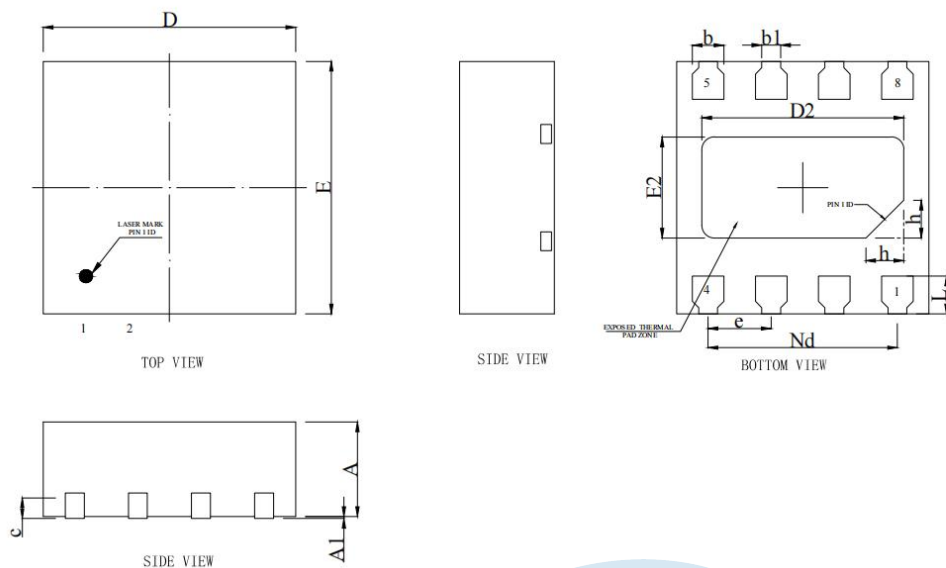


PCB



50 Ω line: width=0.53mm, spacing=0.6mm

Package Dimensions (mm)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.20	0.25	0.30
b1	0.15REF		
c	0.203REF		
D	1.90	2.00	2.10
D2	1.50	1.60	1.70
e	0.508SC		
h	1.508SC		
E	1.90	2.00	2.10
E2	0.70	0.80	0.90
L	0.20	0.30	0.40
h	0.20	0.30	0.40



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