Product Features

Frequency: 1MHz ~ 2GHz

Gain : 20.2dB@500MHz

P1dB Compression: 31.6dBm@500MHz

OIP3: 49.5dBm@500MHz

Vdd=+12V, I_{DQ}=270mA

Package: QFN24（4mm×4mm）

Application

Shortwave / VHF/UHF Radio Station

Unmanned Equipment

Data Link

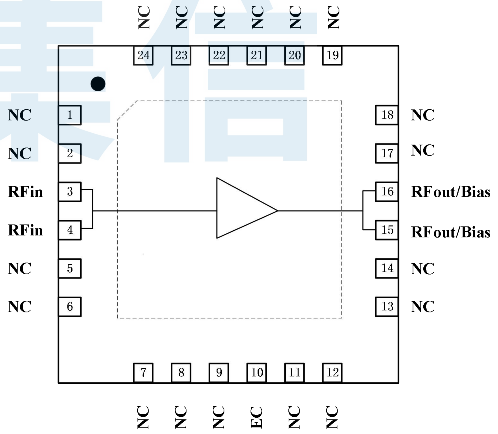
Ordering Information

Part Number	Package	Description
BR9547FPJ	QFN24	1MHz to 2GHz High Linearity Driver Amplifier

General Description

This product covers a frequency range of 1 MHz to 2 GHz. Under a +12 V supply, the quiescent current is 270 mA. At a typical frequency of 500 MHz, it delivers a 1 dB compression point of 31.6 dBm and a third-order intercept point (IP3) of 49.5 dBm, providing both high dynamic range and excellent linearity. Featuring outstanding performance and integration, this product is widely suitable for applications demanding wideband linearity, such as shortwave / VHF/UHF radio stations, unmanned equipment, and data links.

Functional Block Diagram



Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Test Condition
Gain	-	20.2	-	dB	500MHz
Input Return Loss	-	-10.0	-	dB	500MHz
Output Return Loss	-	-12.1	-	dB	500MHz
Isolation	-	-24.3	-	dB	500MHz
P1dB Compression	-	31.6	-	dBm	500MHz
OIP3	-	49.5	-	dBm	500MHz
Noise Figurer	-	2.0	-	dB	500MHz
Test Conditions: Vdd=+12V, I_{DQ}=270mA, OIP3 spacing=1MHz, Pout=20dBm per tone, Temp=+25℃					

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +14V

Maximum RF input Power: +22dBm

Recommended Operating Conditions

Power Supply : +12V

Quiescent Current: 270mA

Storage Temperature: -65℃ ~ +150℃

Operating Temperature: -55℃ ~ +125℃

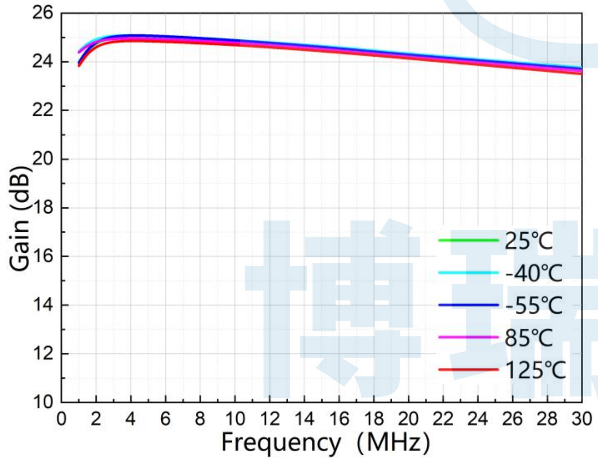
ESD WARNING

ELECTROSTATIC SENSITIVE DEVICE

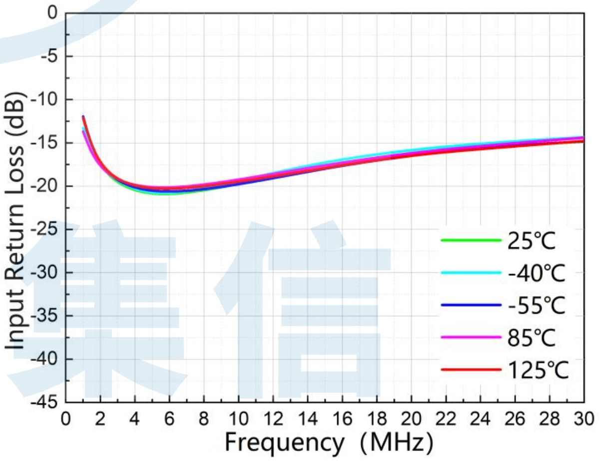
OBSERVE HANDLING PRECAUTIONS

Typical Performance (EVB test results +12V 1MHz-30MHz)

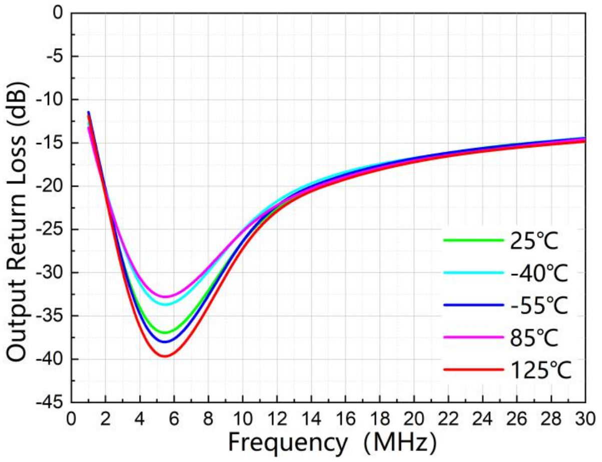
Parameters	**Typ.**								**Units**
Frequency	**1**	**2**	**5**	**10**	**15**	**20**	**25**	**30**	**MHz**
Gain	23.9	25	25	24.8	24.6	24.2	23.9	23.6	dB
Input Return Loss	-12.1	-19.0	-21.6	-19.7	-17.8	-16.1	-15.3	-14.8	dB
Output Return Loss	-11.9	-21.3	-44.1	-23.7	-19.2	-16.7	-15.2	-14.4	dB
P1dB Compression	31.4	31.5	31.5	31.3	31.3	31.3	31.3	31.1	dBm
OIP3	48.6	47.7	48.4	48.5	50.7	51.0	52.6	51.5	dBm
Noise Figure	/	/	/	1.3	1.3	1.2	1.1	1.1	dB
Isolation	-28.1	-27.2	-26.9	-27.0	-26.2	-26.7	-26.3	-25.7	dB
Test Conditions: Vdd=+12V，I=270mA，OIP3 spacing=600Hz, Pout=+20dBm/tone, TA=+25℃									



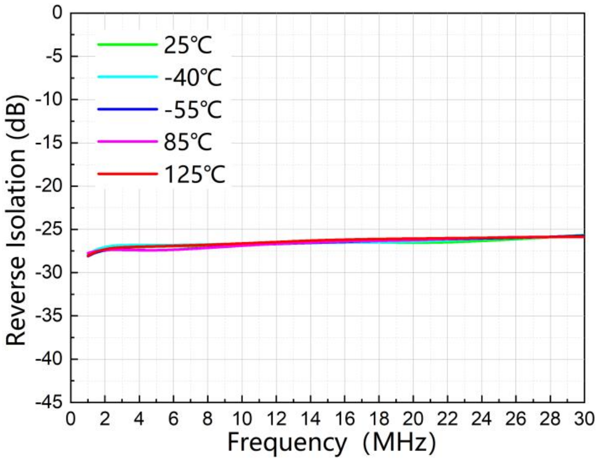
Gain



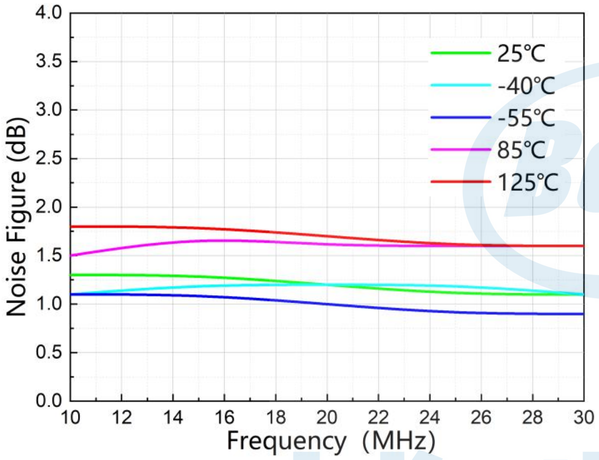
Input Return Loss



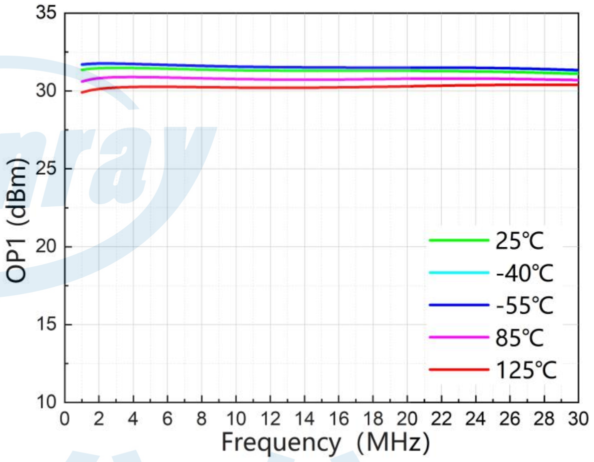
Output Return Loss



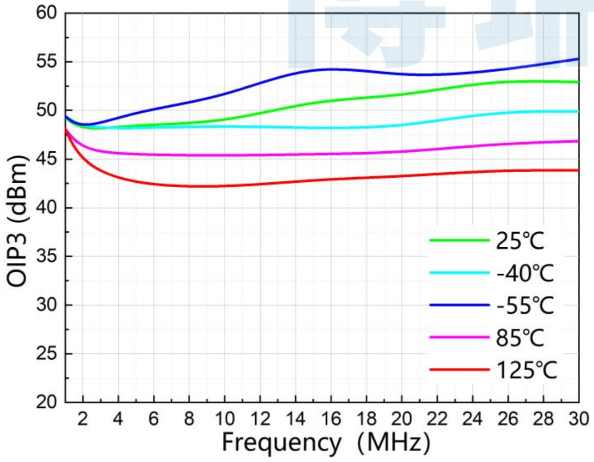
Reverse Isolation



Noise Figure



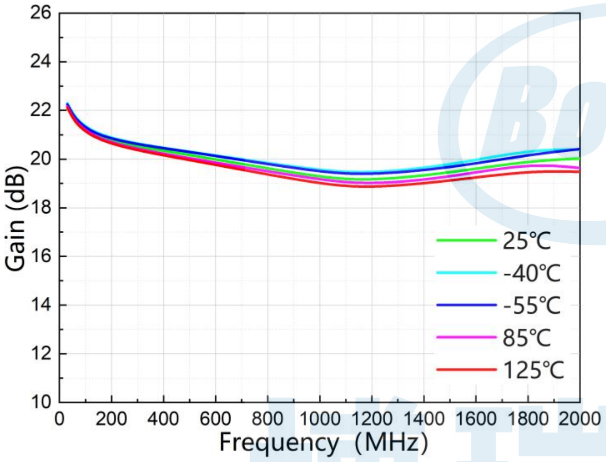
Output Power for 1dB Compression



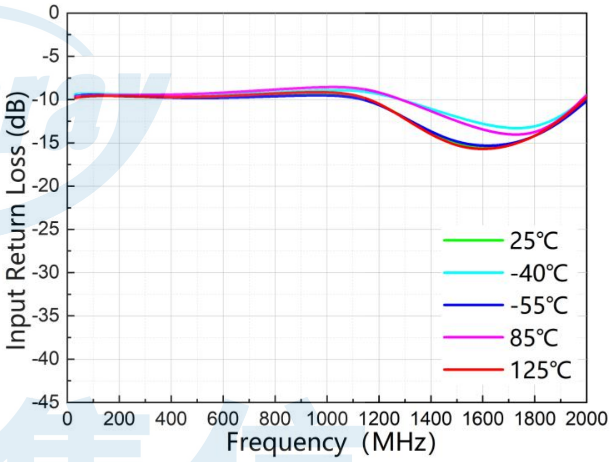
Output Third-Order Intercept

Typical Performance (EVB test results +12V 30MHz-2700MHz)

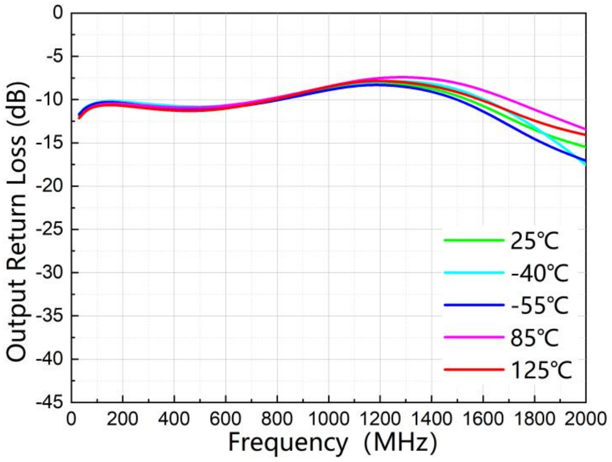
Parameters	**Typ.**								**Units**
Frequency	**30**	**100**	**500**	**1000**	**1200**	**1500**	**1800**	**2000**	**MHz**
Gain	22.2	20.8	20.2	19.2	19.1	19.4	19.9	20.0	dB
Input Return Loss	-9.7	-9.3	-10.0	-9.0	-9.9	-16.2	-15.0	-10.0	dB
Output Return Loss	-11.9	-9.6	-12.1	-8.5	-7.7	-9.0	-13.8	-15.5	dB
P1dB Compression	30.3	31.3	31.6	31.4	31.4	31.5	31.1	30.2	dBm
OIP3	49.4	48.3	49.5	46.1	46	45.7	45.1	43.7	dBm
Noise Figure	1.2	1.4	2.0	2.4	2.5	2.6	2.6	3.2	dB
Isolation	-25.0	-24.4	-24.3	-25.0	-25.4	-25.6	-26.1	-26.9	dB
Test Conditions: Vdd=+12V，I=270mA，OIP3 spacing=1MHz, Pout=+20dBm/tone, TA=+25℃									



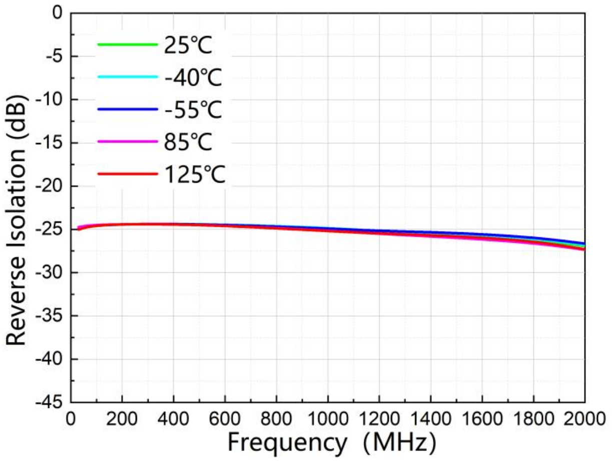
Gain



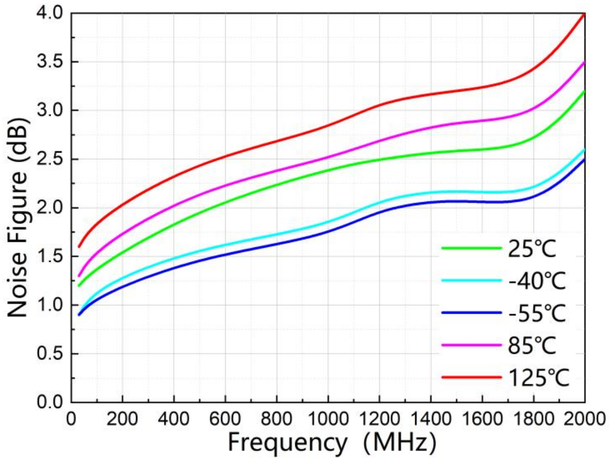
Input Return Loss



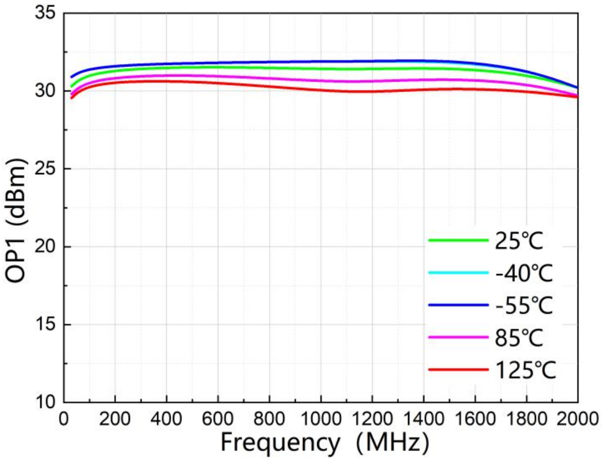
Output Return Loss



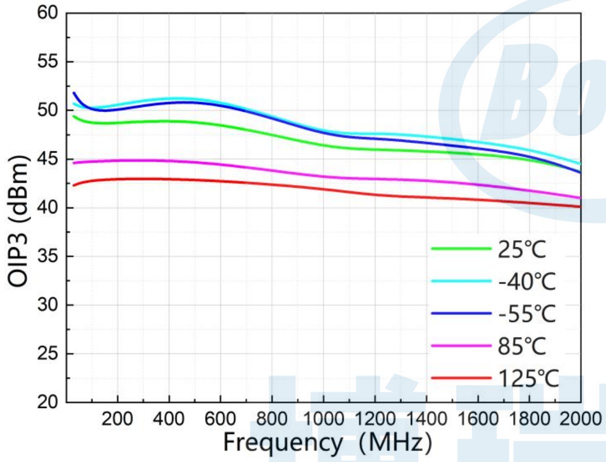
Reverse Isolation



Noise Figure

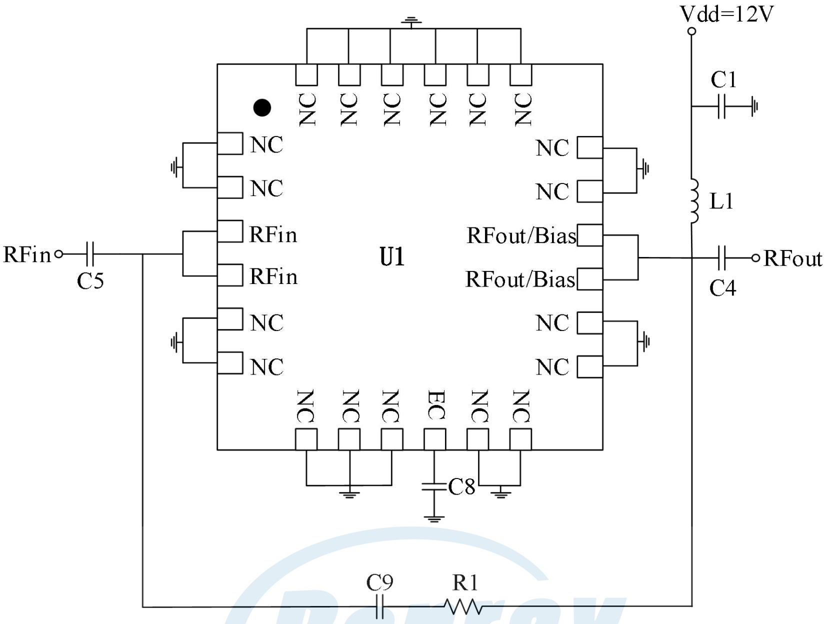


Output Power for 1dB Compression



Output Third-Order Intercept

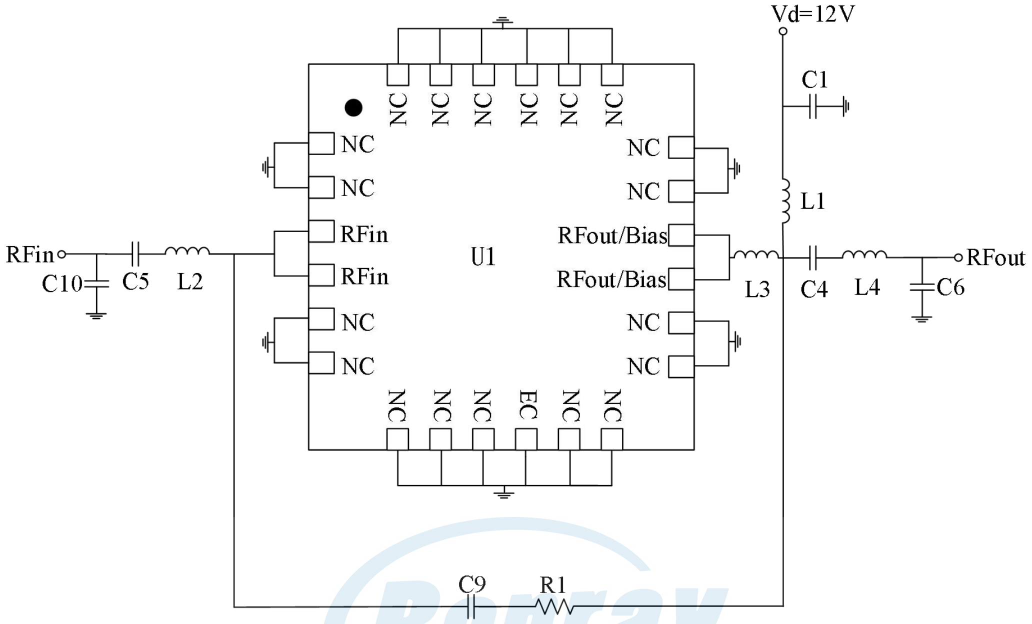
Application Information （1MHz~30MHz）



Bill of Material

Designator	Package	Description	Part Number
C1	0805	10uF	GRM219R61E106KA12#
C4、C5、C9	0402	2.2uF	GRM155R61C225ME44D
C8	0402	1000pF	GRM1555C1H102JA01D
L1	1812	22uH	LQW43FT220M0H#
R1	0402	1.1kΩ	RC0402JR-071K1L

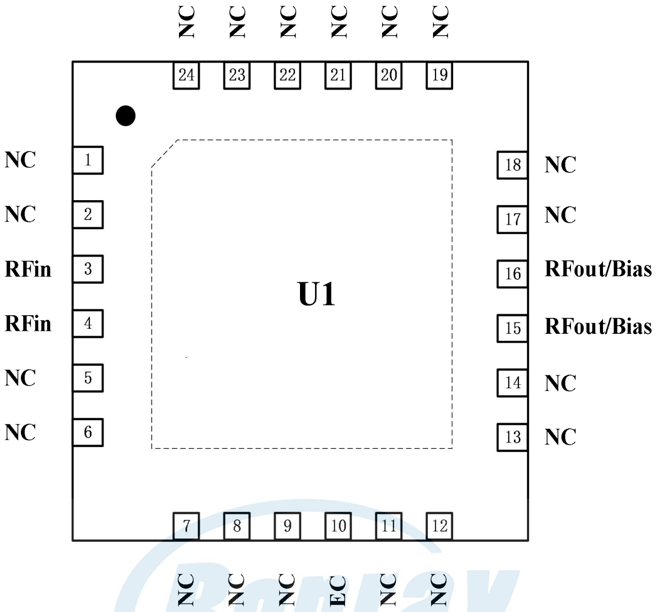
Application Information （30MHz~2MHz）



Bill of Material

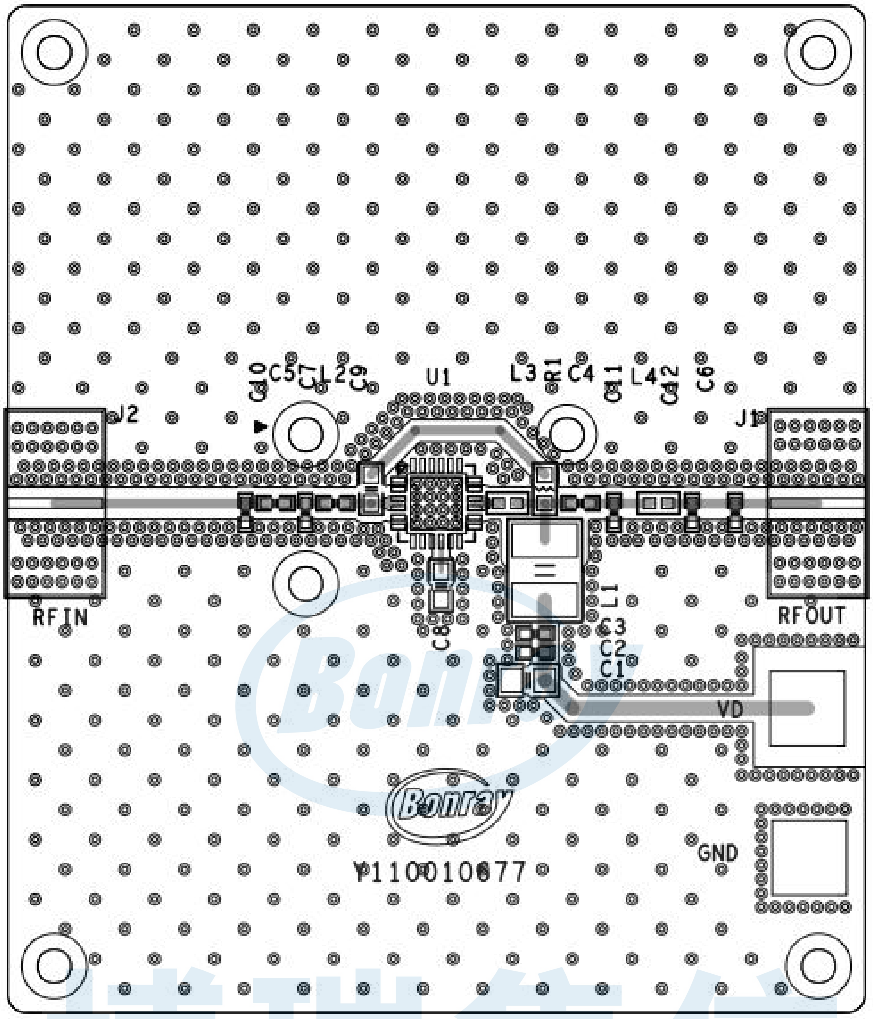
Designator	Package	Description	Part Number
C1	0805	10uF	GRM219R61E106KA12#
C4、C5、C9	0402	2.2uF	GRM155R61C225ME44D
C6	0402	0.5pF	GRM1555C1HR50BA01D
C10	0402	2.2pF	GRM1555C1H2R2CA01D
L1	1008	1.1uH	1008AF-112XJRB
L2~L4	0402	1.8nH	SDCL1005C1N8STDF
R1	0402	750Ω	RC0402JR-07750RL

Pin Configuration and Description



Pin Number	Pin Name	Description
1~2、5~9、11~14、17~24	NC	No connection inside the pin
3、4	RFin	RF input pin
15、16	RFout/Bias	RF output pin, also used for external DC power supply.
10	EC	External capacitor pins are provided to enhance low-frequency performance.
/	Backside	Backside: back pad for RF grounding and heat dissipation

PCB Evaluation Board（10mil Rogers 4350B，double-layer board）



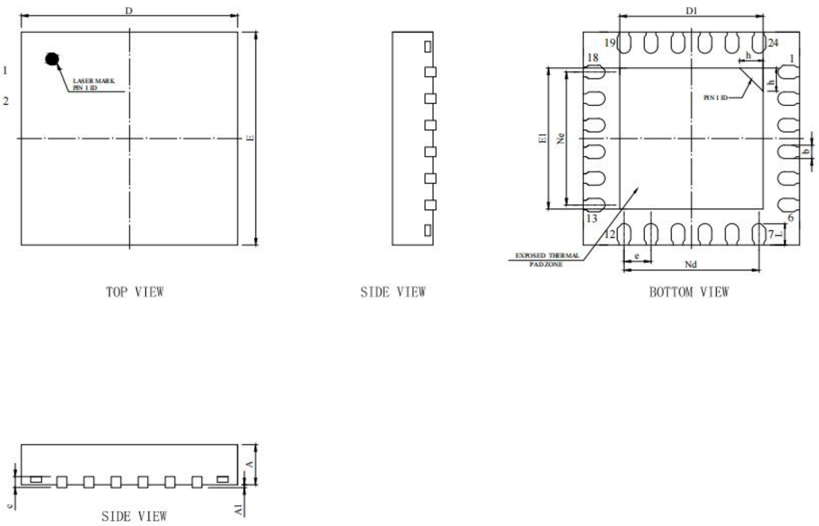
PCB Design Specification

1.The back pad of the chip is used for RF grounding and heat dissipation. The number of ground vias at the corresponding position should be as many as possible (e.g., ground vias with a diameter of 0.3 mm, with the number of ground vias ≥ 25, as shown in the figure above).

2.To ensure excellent heat dissipation and grounding performance, it is recommended to connect the bottom layer of the PCB to an external heat dissipation structure using thermal silicone grease.

3.Screws shall be used around the chip to secure it to the structural components.

Package Dimensions (mm)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	-	0.02	0.05
b	0.20	0.25	0.30
c	0.203REF		
D	3.90	4.00	4.10
D1	2.60	2.70	2.80
e	0.50BSC		
Ne	2.50BSC		
Nd	2.50BSC		
E	3.90	4.00	4.10
E1	2.60	2.70	2.80
L	0.35	0.40	0.45
h	0.30	0.40	0.45

Recommended Soldering Temperature Profile