Product Features

Frequency: 0.05GHz ~ 3GHz

Gain: 18.5dB@1620MHz

OIP3: 45.0dBm@1620MHz

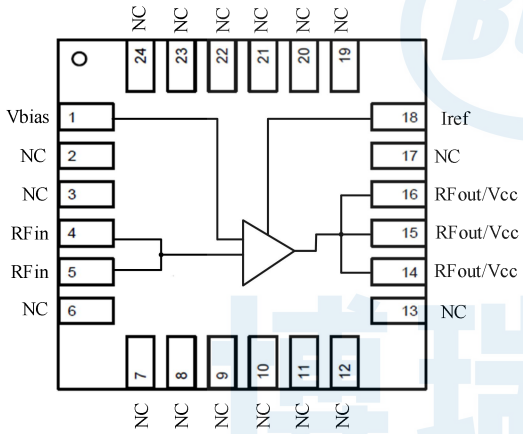
P1dB Compression: 32.8 dBm@1620MHz

Noise Figure: 4.9dB@1620MHz

Vdd=+5V, static current 446mA

Package: QFN24 (4mm×4mm)

Functional Block Diagram



General Description

BR9544FP is a high linear single-chip drive amplifier constructed with GaAs process. The product is housed in a QFN24 package, small signal gain 18.5dB at 1620MHz, achieves a peak power of 32.8dBm P1dB and 45dBm OIP3. Product matching is flexible, peripheral components can be adjusted reasonably in the application frequency band, the drive amplifier can be matched in any frequency band, Achieve high linearity output or high efficiency output of the product. The product is suitable for wireless communication infrastructure, FDD/TDD base station, radar, high power amplifier driver stage or final stage and other applications.

Ordering Information

Part Number	Package	Description
BR9544FP	QFN24	0.05GHz to 3GHz 2W Drive Amplifier

Typical Performance (EVB test results +5V)

Parameters	Test Conditions	Min.	Typ.	Max.	Units
Gain	1620MHz	—	18.5	—	dB
	2200MHz	—	15.6	—	dB
	2300MHz	—	16.6	—	dB
Input Return Loss	1620MHz	—	-20.2	—	dB
	2200MHz	—	-5.7	—	dB
	2300MHz	—	-11.4	—	dB
Output Return Loss	1620MHz	—	-13.8	—	dB
	2200MHz	—	-13.1	—	dB
	2300MHz	—	-10.7	—	dB
Isolation	1620MHz	—	-27.1	—	dB
	2200MHz	—	-27.4	—	dB
	2300MHz	—	-25.9	—	dB
Noise Figure	1620MHz	—	4.9	—	dB
	2200MHz	—	4.6	—	dB
	2300MHz	—	4.2	—	dB
P1dB	1620MHz	—	32.8	—	dBm
	2200MHz	—	32.3	—	dBm
	2300MHz	—	31.5	—	dBm
OIP3	1620MHz	—	45.0	—	dBm
	2200MHz	—	46.6	—	dBm
	2300MHz	—	44.3	—	dBm
Supply Voltage	—	—	5	—	V
Quiescent Current	—	—	446	—	mA

Test Conditions: Vdd=+5V, OIP3 spacing=1MHz (Pout=19dBm/tone@1600MHz~1650MHz, Pout=18dBm/tone@2200MHz~2400MHz)

TA=+25℃

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +6.5V

Maximum RF input Power: +30dBm

ESD Rating: Class 1C (< 1800V)

Recommended Operating Conditions

Power Supply Voltage: +5V

Static Operating Current: 446mA

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.

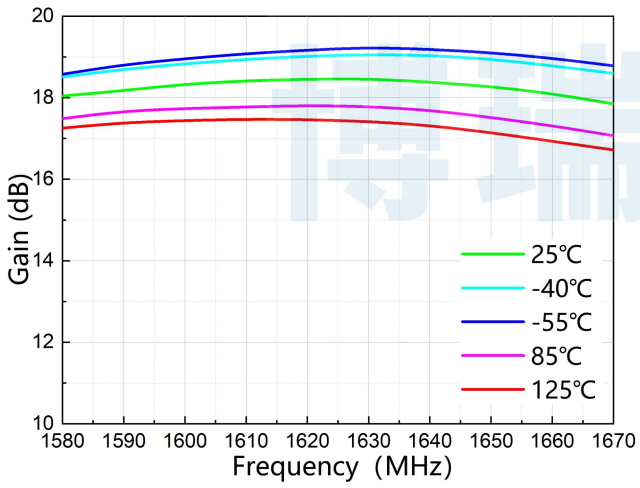
ESD WARNING

ELECTROSTATIC SENSITIVE DEVICE

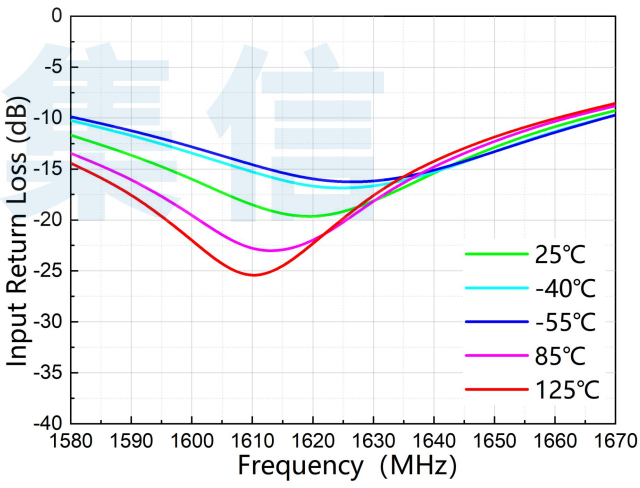
OBSERVE HANDLING PRECAUTIONS

Typical Performance (EVB test results+8V,1600MHz~1650MHz)

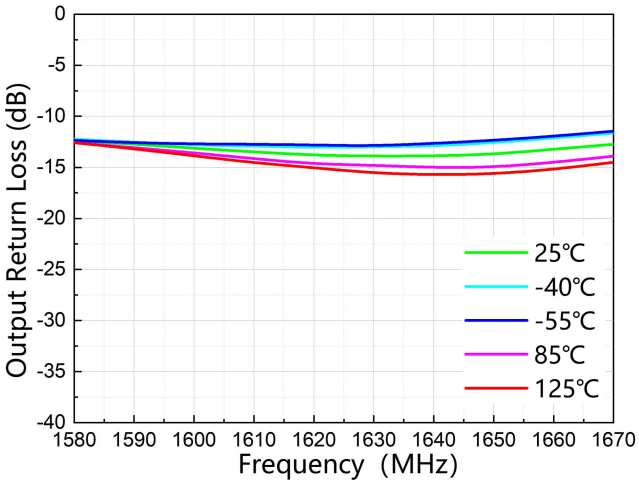
Parameters	Typ,						Units
Frequency	1600	1610	1620	1630	1640	1650	MHz
Gain	18.3	18.4	18.5	18.5	18.4	18.3	dB
Input Return Loss	-15.9	-18.7	-20.2	-18.3	-15.3	-12.8	dB
Output Return Loss	-13.1	-13.5	-13.8	-13.9	-13.9	-13.7	dB
Isolation	-27.3	-27.3	-27.1	-27.0	-27.1	-27.2	dB
Noise Figure	4.8	4.9	4.9	4.9	5.0	5.1	dB
P1dB	33.2	33.1	32.8	32.5	32.5	32.7	dBm
OIP3	44.9	45.1	45.0	44.0	43.1	41.9	dBm
Psat	35.5	35.3	35.0	34.9	34.8	34.8	dBm
PAE@Psat	56.2%	56.8%	56.8%	57.6%	57.5%	57.6%	-
Test Conditions: Vdd=+5V, I=440mA; OIP3 spacing=1MHz,Pout=19dBm/tone; TA=+25℃							



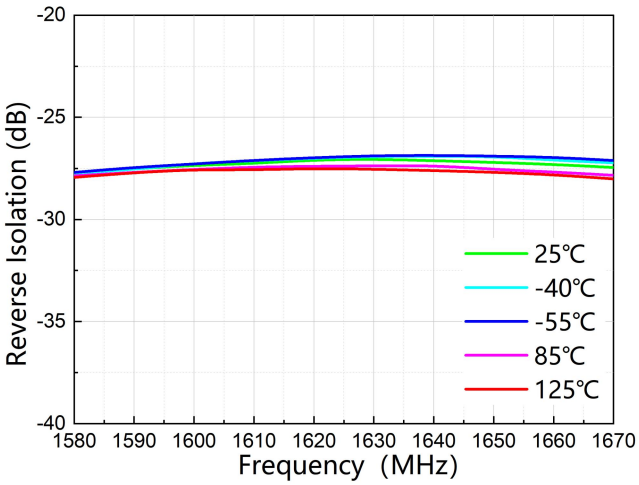
Gain vs. Freq



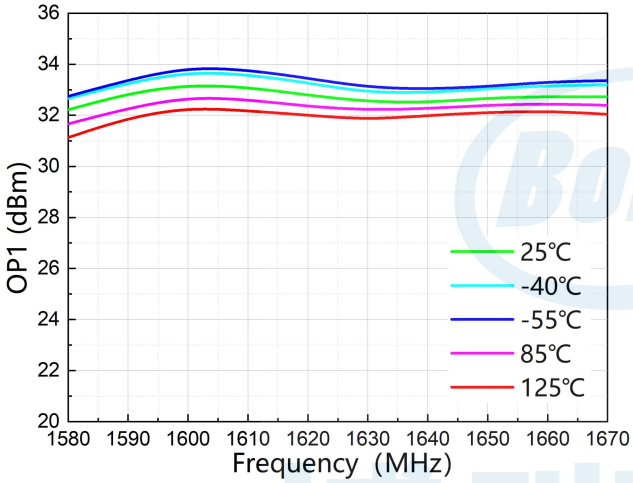
Input Return Loss vs. Freq



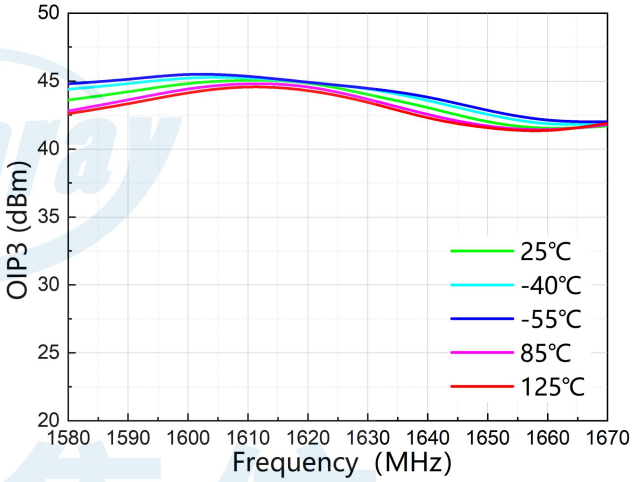
Output Return Loss vs. Freq



Reverse Isolation vs. Freq

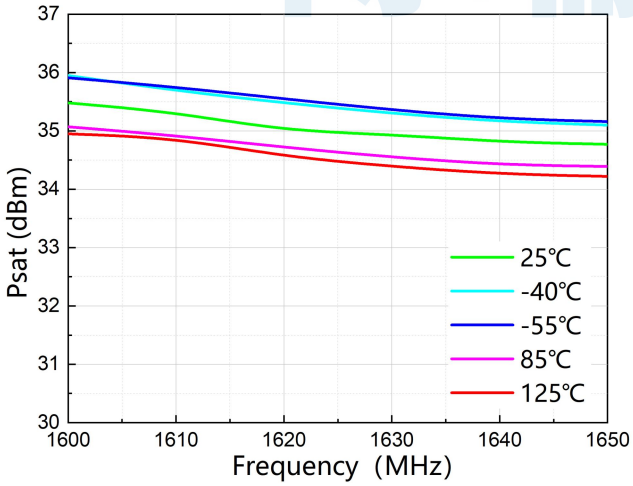


Output Power for 1dB Compression vs. Freq

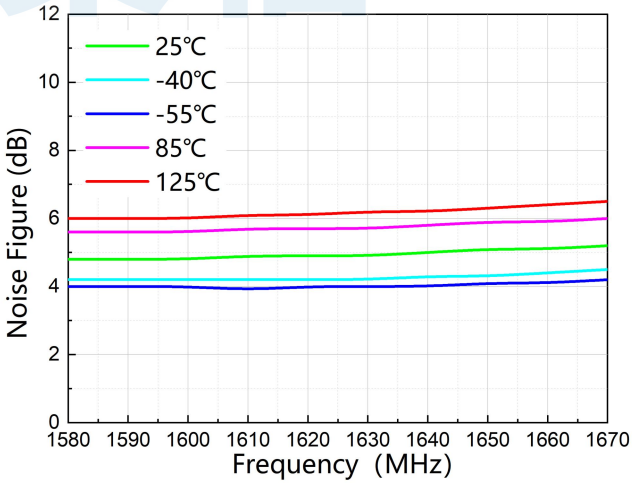


Output Third-Order Interception vs. Freq

Pout=19dBm/tone, fspacing=1MHZ



Psat vs. Freq



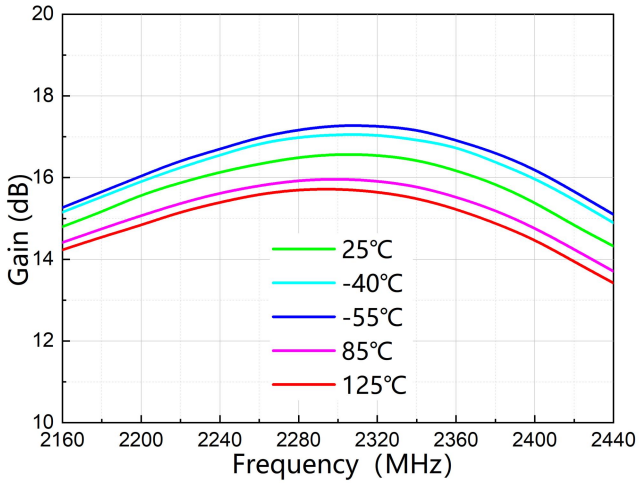
Noise Figure vs. Freq

+5V power supply Demo board harmonic suppression (2200MHz~2400MHz)

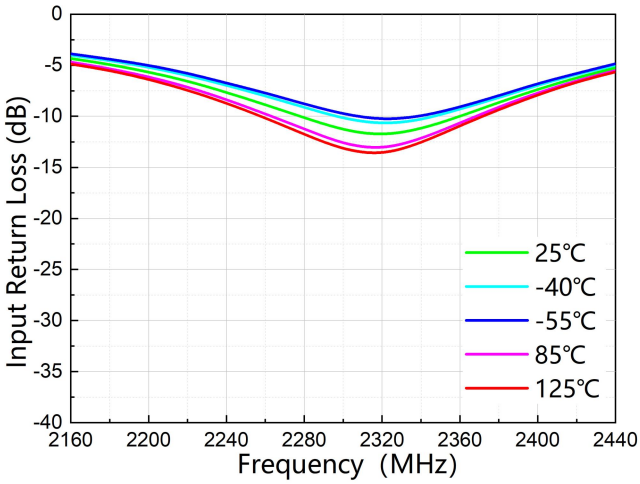
Parameters	Typ.											Units
Frequency	2200	2220	2240	2260	2280	2300	2320	2340	2360	2380	2400	MHz
2nd Harmonic	-40.6	-34.9	-28.7	-26.5	-25.3	-26.6	-24.6	-19.1	-19.1	-18.6	-18.9	dBm
	-73.6	-67.9	-61.7	-59.5	-58.3	-59.6	-57.6	-52.1	-52.1	-51.6	-51.9	dBc
3rd Harmonic	-29.1	-30.1	-30.9	-31.4	-29.3	-27.6	-26.8	-25.4	-23.8	-20.9	-19.8	dBm
	-62.1	-63.1	-63.9	-64.4	-62.3	-60.6	-59.8	-58.4	-56.8	-53.9	-52.8	dBc
Vcc=+5V, Pout=33dBm.												

+5V power supply Demo board test results (2200MHz~2400MHz)

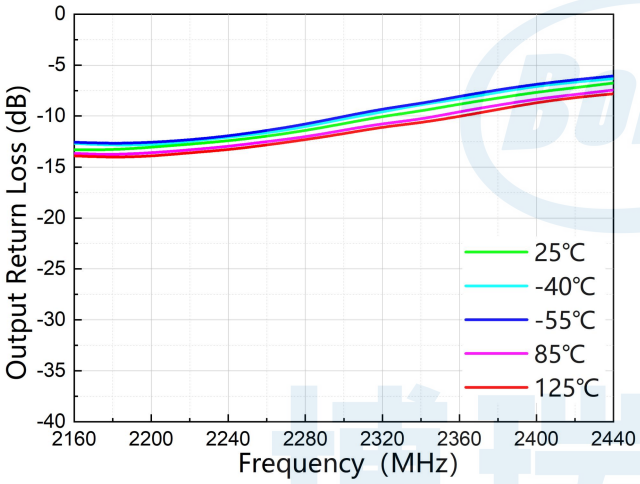
Parameters	Typ.											Units
Frequency	2200	2220	2240	2260	2280	2300	2320	2340	2360	2380	2400	MHz
Gain	15.6	15.9	16.1	16.3	16.5	16.6	16.6	16.4	16.2	15.8	15.4	dB
Input Return Loss	-5.7	-6.5	-7.6	-8.9	-10.1	-11.4	-11.9	-11.3	-10.0	-8.6	-7.4	dB
Output Return Loss	-13.1	-12.8	-12.4	-12.0	-11.4	-10.7	-10.0	-9.5	-8.8	-8.2	-7.6	dB
Isolation	-27.4	-27.0	-26.7	-26.3	-26.2	-25.9	-25.9	-26.0	-26.1	-26.5	-26.8	dB
Noise Figure	4.6	4.4	4.3	4.2	4.2	4.2	4.2	4.2	4.3	4.4	5.1	dB
OIP3	46.6	45.4	45.0	46.1	45.8	44.3	44.0	45.2	46.5	45.9	45.2	dBm
Psat	34.3	34.2	33.8	33.6	33.9	34.0	33.7	33.3	33.1	33.3	33.4	dBm
PAE@Psat	52.5%	53.9%	55.4%	53.6%	53.8%	55.6%	56.2%	55.6%	56.1%	55.9%	55.4%	-
Test Conditions: Vdd=+5V, I=451mA; OIP3 spacing=1MHz,Pout=18dBm/tone; TA=+25℃												



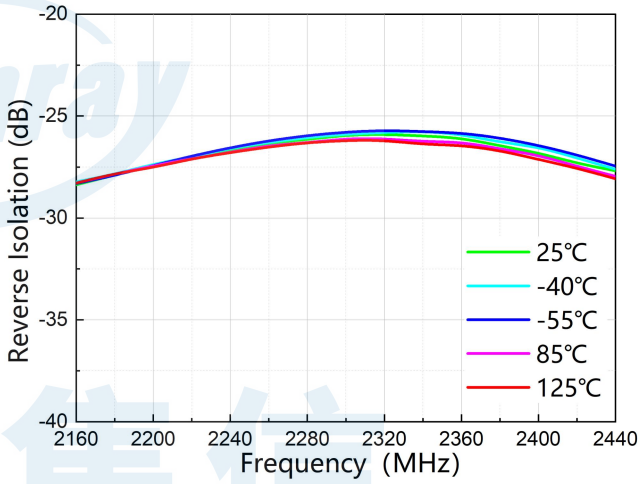
Gain vs. Freq



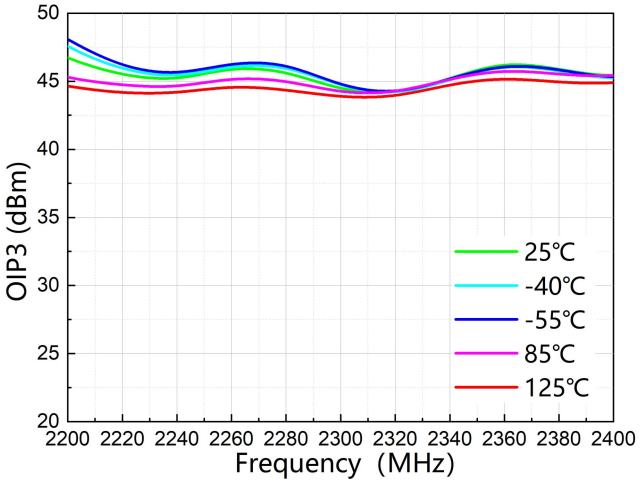
Input Return Loss vs. Freq



Output Return Loss vs. Freq

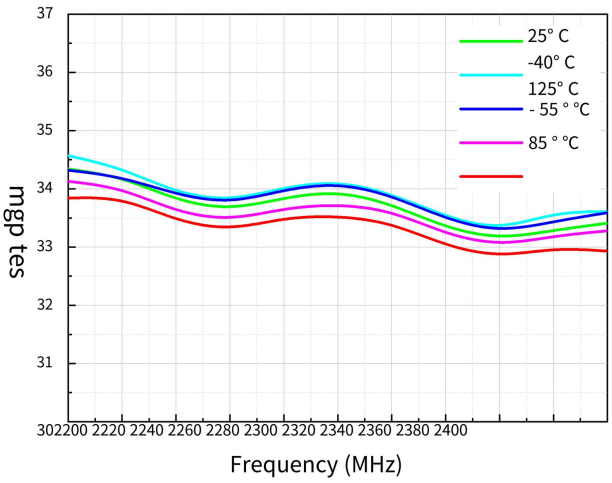


Reverse Isolation vs. Freq

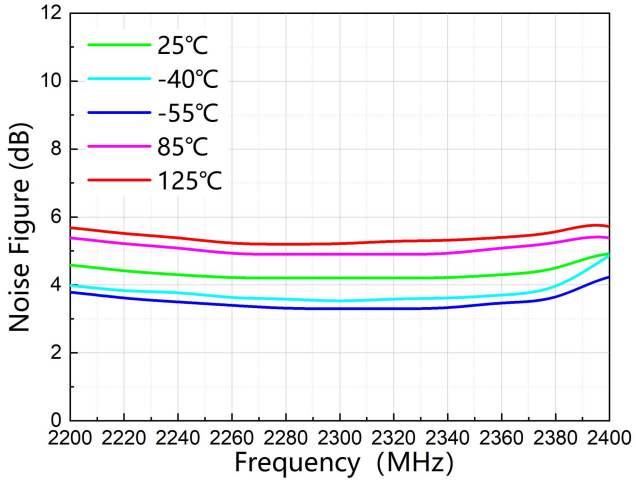


Output Third-Order Interception vs. Freq

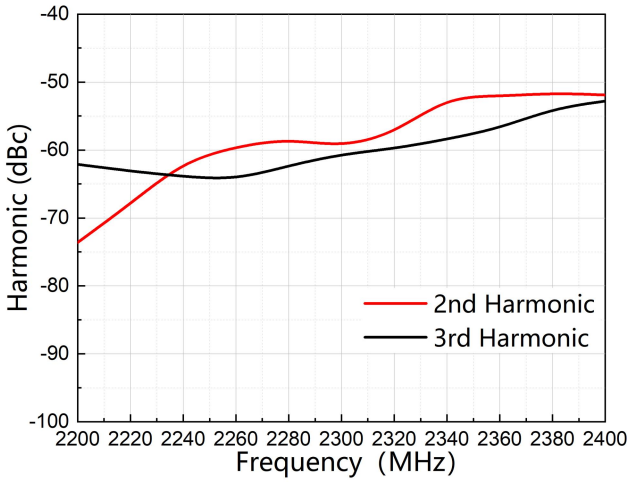
Pout=18dBm/tone, fspacing=1MHZ



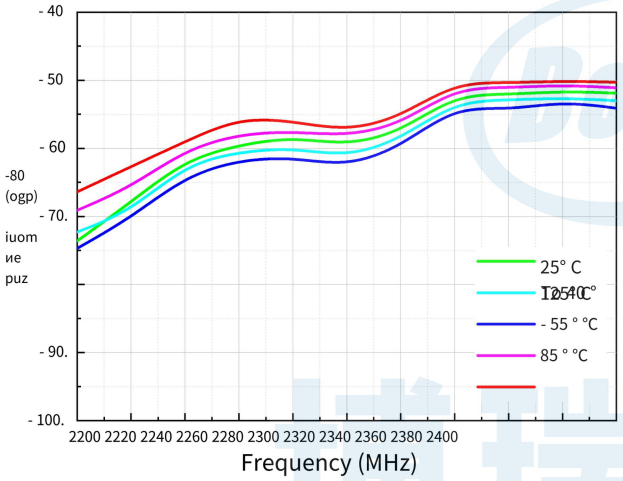
PAE vs. Freq



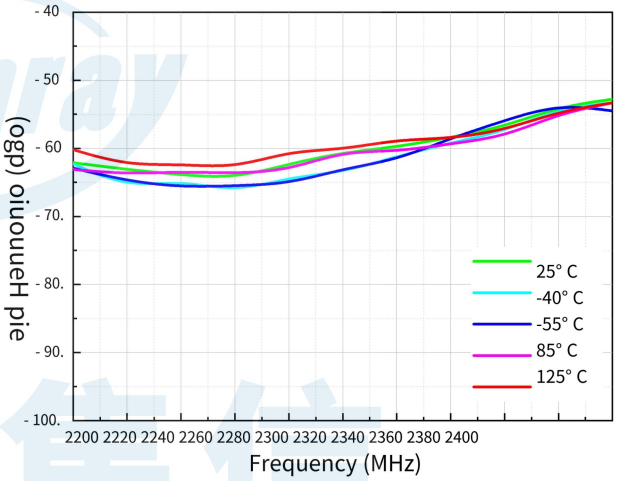
Noise Figure vs. Freq



Second/Third Harmonics vs. Freq@Pout=33dBm

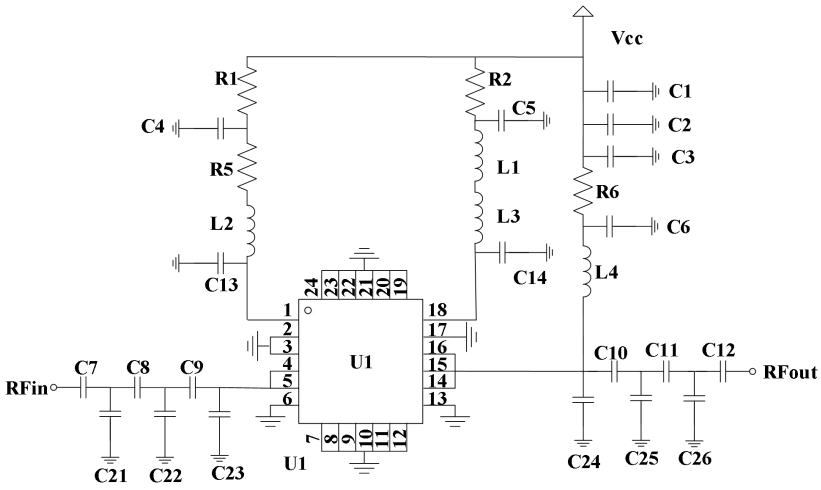


Second Harmonic vs. Freq @Pout=33dBm



Third Harmonic vs. Freq @Pout=33dBm

Typical Application Schematic



Bill of Material (1600MHz~1650MHz)

Designator	Description	Part Number
U1	2W High linear drive amplifier	BR9544FP
C1	10μF, ±20%	GRM188D71A106MA73D
C2	0.1uF capacitor	0603B104J160NT
R5, R6, L2	±5% 0Ω	RC0603JR-070RL
R2	±5% 62Ω	RC0402JR-0762RL
L1	±5% 36Ω	RC0402JR-0736RL
L3, L4	±5% 10nH	0603HP-10NXJEW
R1	±5% 220Ω	RC0402JR-07220RL
C6, C13	27pF ±5%	GRM1885C1H270JA01D
C9	20pF ±5% // ±5% 18Ω (patch capacitor // Patch resistor)	GRM1555C1H200JA01D // RC0402JR-0718RL
C8	1.6pF ±0.05pF	GRM1555C1H1R6WA01
C22	3.6 pF	GRM1555C1H3R6CA01D
C24	3.9pF ±0.25pF	GRM1555C1H3R9CA01D
C10	10pF ±5%	GRM1555C1H100JA01D
C26	2.7pF ±0.25pF	GRM1555C1H2R7CA01D
C7, C11, C12	*	/

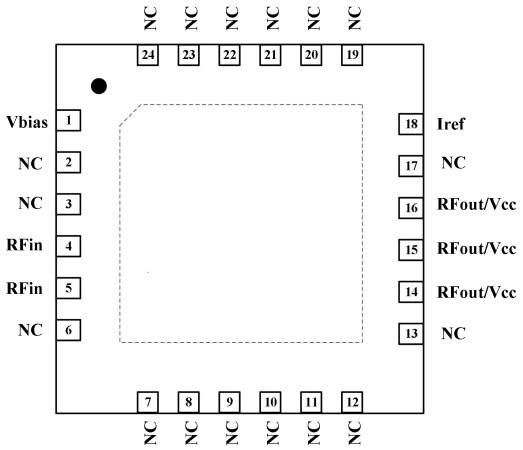
Note: * indicates that the bit number is not used in the BOM of the corresponding frequency band, and it is recommended to replace the corresponding bit number with a microstrip line in PCB design.

Bill of Material (2200MHz~2400MHz)

Designator	Description	Part Number
U1	2W High linear drive amplifier	BR9544FP
C1	10μF, ±20%	GRM188D71A106MA73D
C2	0.1uF capacitor	0603B104J160NT
R5, R6, L2	±5% 0Ω	RC0603JR-070RL
R2	±5% 62Ω	RC0402JR-0762RL
L1	±5% 36Ω	RC0402JR-0736RL
L3, L4	10nH ±5%	0603HP-10NXJEW
R1	±5% 220Ω	RC0402JR-07220RL
C9, C25	1pF ±0.1pF	GRM1555C1H1R0CA01D
C23	2.7pF ±0.25pF	GRM1555C1H2R7CA01D
C24	3.3pF ±0.25pF	GRM1555C1H3R3CA01D
C11	100pF ±5%	GCM1555C1H101JA16D
C10	1 nH + / - 0.3 nH	ASDCL1608C1N0STDFA01
C7, C8, C12	*	/

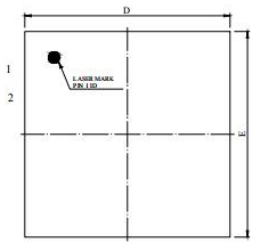
Note: * indicates that the bit number is not used in the BOM of the corresponding frequency band, and it is recommended to replace the corresponding bit number with a microstrip line in PCB design.

Pin Configuration and Description



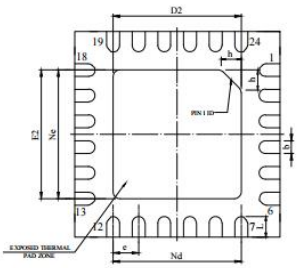
Pin Number	Pin Name	Description
1	Vbias	Voltage bias
2,17,19,3,6 ~ 13 ~ 24	NC	The interior is not connected, it is recommended to connect to RF/DC ground, performance will not be affected.
4, 5	RFin	Rf input
14,15,16	RFout/Vcc	Rf output/power supply Supply Voltage
18	Iref	Current bias
-	EP	Exposed pad, must be connected to RF/DC ground

Package Dimensions (mm)

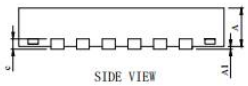


TOP VIEW

SIDE VIEW



BOTTOM VIEW



SIDE VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.75	0.80	0.85
A1	0.01	0.02	0.05
b	0.20	0.25	0.30
c		0.270REF	
D	3.90	4.00	4.10
D2	2.60	2.70	2.80
e		0.50BSC	
Ne		2.50BSC	
Nd		2.50BSC	
E	3.90	4.00	4.10
E2	2.60	2.70	2.80
L	0.35	0.40	0.45
h	0.35	0.40	0.45