Linear Amplifier SG207

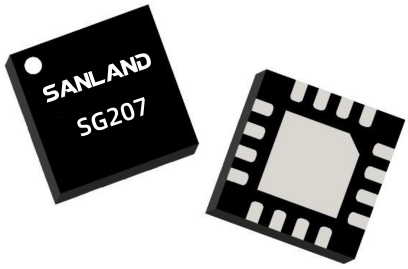
DESCRIPTION

Sanland's SG207 is a GaAs pHEMT single ended MMIC RF amplifier IC featuring 21dB of gain and low noise. This high linearity IC is designed for applications in the Upstream from 5 MHz to 684 MHz and in the Downstream from 47 MHz to 1800 MHz. The SG207 is powered by a single 5V to 7V supply and packaged in 3 x 3 QFN.

KEY FEATURES

- 5 MHz to 1800 MHz Operation
- 5 V ＆7V Operation
- Gain: 21 dB Typical
- Noise Figure: 1.6 dB @1800MHz
- RoHS Compliant

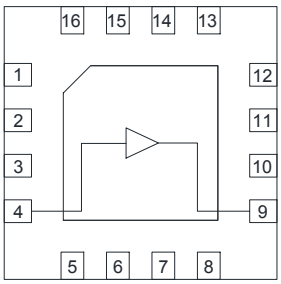
Pb RoHS Compliant & Green Package



Major Applications

- DOCSIS 3.1 and 4.0
- Downstream Applications, 47 to 1800 MHz
- Upstream Applications, 5 to 684 MHz
- Optical Nodes
- Head End CMTS Equipment
- FTTH GPON and GEPON
- Cable Modem and Home Gateways
- Single Ended Gain Block
- Satellite Low Noise Amplifier

Pin Assignment



Pin Details

Pin	Name	Function
4	RF in	RF Input
9	RF out	RF Output/Bias
1,2,3,5,6,7,8,10, 11,12,13,14,15,16	GND	Ground

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage (VDD)	+10	V
Supply Current (I_{DD})	170	mA
Maximum RF Input Level	+60	dBmV
Operating Ambient Temperature	-40~100	℃
Storage Temperature	-65~150	℃
Max. Junction Temp. (TJ)	+150	℃

Important Note:

The information provided in this datasheet is deemed to be accurate and reliable only at present time. Sanland Technology Corp. reserves the right to make any changes to the specifications in this datasheet without prior notice.

Caution: ESD Sensitive
Appropriate precaution in handling, packaging And testing devices must be observed.

Electrical Specifications at +5 V , 47-1800MHz _

Temp = +25 ° C, VDD = +5 V, 75 Ω system, Full band unless otherwise noted

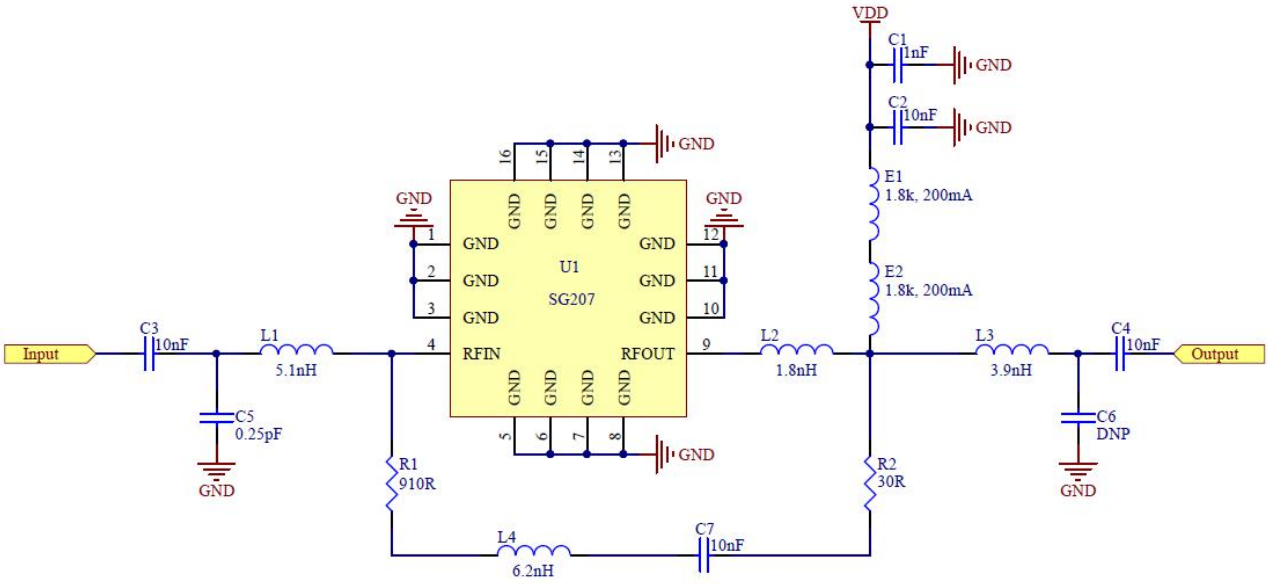
Parameter	Specification			Unit	Notes
	Min	Typ.	Max		
Frequency	47	-	1800	MHz	
Supply Voltage (VDD)		5		V	
Supply Current (IDD)		71		mA	
Gain		21		dB	
Gain Slope		1		dB	
Reverse Isolation		25		dB	
Input return loss	17	18		dB	
Output return loss	16	20		dB	
Noise Figure		1.0	1.6	dB	
OIP2L		50		dBm	Tone Spacing=50MHz F1=400MHz, F2=450MHz, +5dBm / tone output
OIP2U		50		dBm	
OIP3	32	36		dBm	Tone Spacing=1MHz, +5dBm / tone output
OP1dB	19	20		dBm	
Thermal Resistance		57		˚C/W	

Electrical Specifications at +7 V , 47-1800MHz _

Temp = +25 ° C, VDD = +7 V, 75 Ω system, Full band unless otherwise noted

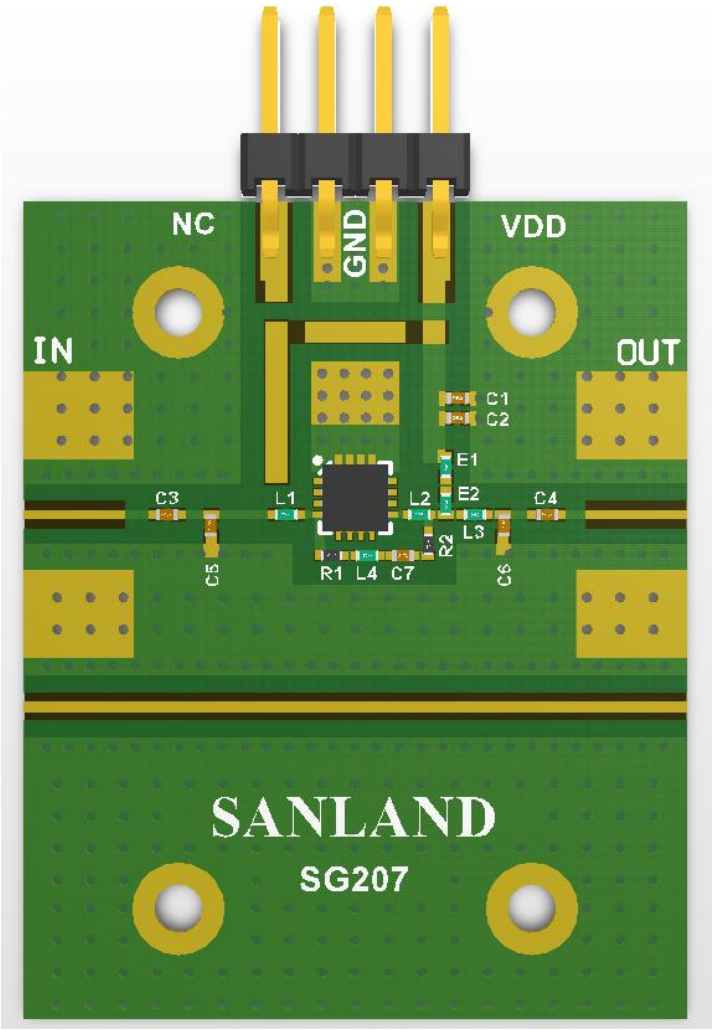
Parameter	Specification			Unit	Notes
	Min	Typ.	Max		
Frequency	47	-	1800	MHz	
Supply Voltage (VDD)		7		V	
Supply Current (IDD)		101		mA	
Gain		21.4		dB	
Gain Slope		1		dB	
Reverse Isolation		25		dB	
Input return loss	18	20		dB	
Output return loss	15	20		dB	
Noise Figure		1.0	1.6	dB	
OIP2L		55		dBm	Tone Spacing=50MHz F1=400MHz, F2=450MHz, +5dBm / tone output
OIP2U		50		dBm	
OIP3	35	39		dBm	Tone Spacing=1MHz, +5dBm / tone output
OP1dB	21.5	23		dBm	
Thermal Resistance		57		˚C/W	

Application Circuit , 47-1800MHz



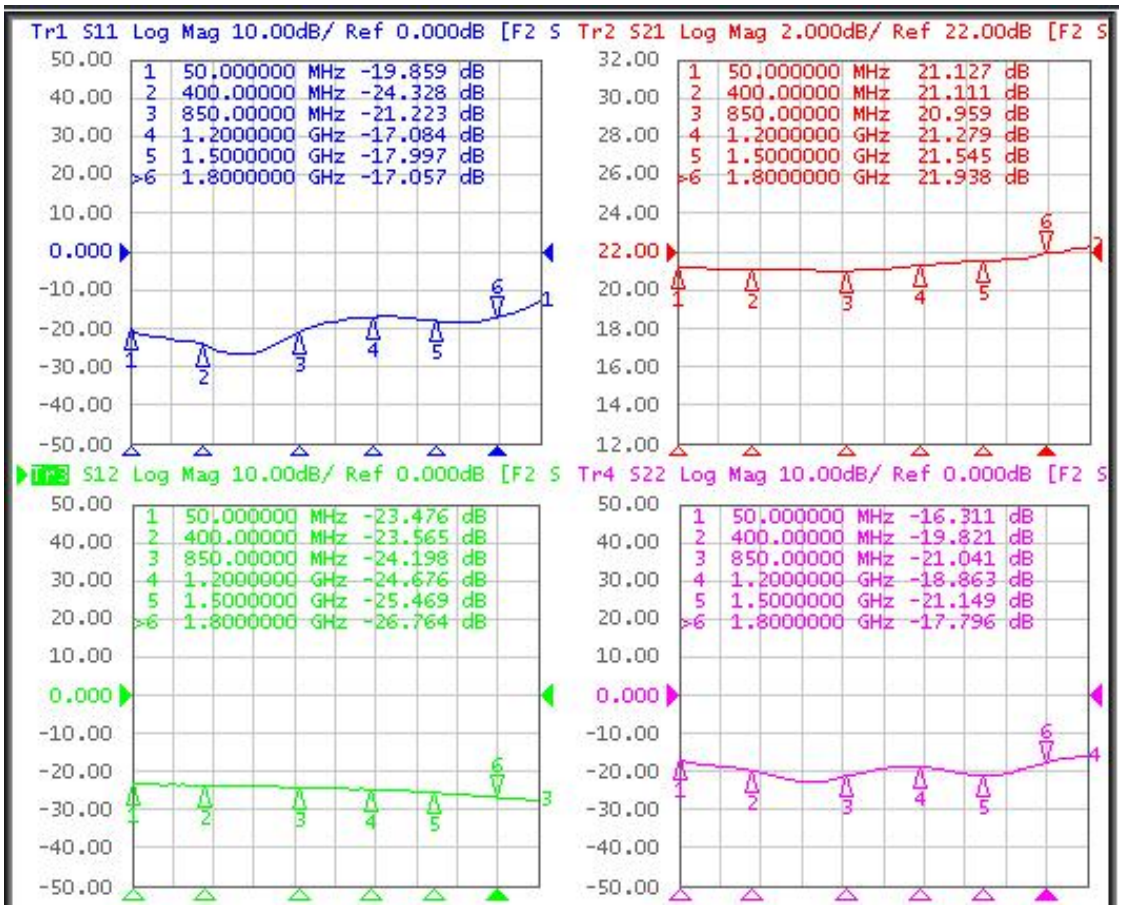
Component	Value	Size	Vendor	Part Number
U1	-	-	SANLAND	SG207
PCB	-	-	SANLAND	-
C1	1nF	0402	MURATA	GRM1555C1H102JA01D
C2,C3,C4,C7	10nF	0402	MURATA	GRM1555C1E103JE01D
C5	0.25pF	0402	MURATA	GJM1555C1HR25RB12D
E1,E2	1.8kΩ，200mA	0402	MURATA	BLM15HD182SN1D
L1	5.1nH	0402	MURATA	LQG15HS5N1S02D
L2	1.8nH	0402	MURATA	LQG15HS1N8S02D
L3	3.9nH	0402	MURATA	LQG15HS3N9S02D
L4	6.2nH	0402	MURATA	LQG15HS6N2S02D
R1	910R	0402	UNI-ROYAL	0402WGF9100TCE
R2	30R	0402	UNI-ROYAL	0402WGF300JTCE
C6	Not Populated			

Evaluation Board Assembly Drawing , 47-1800MHz



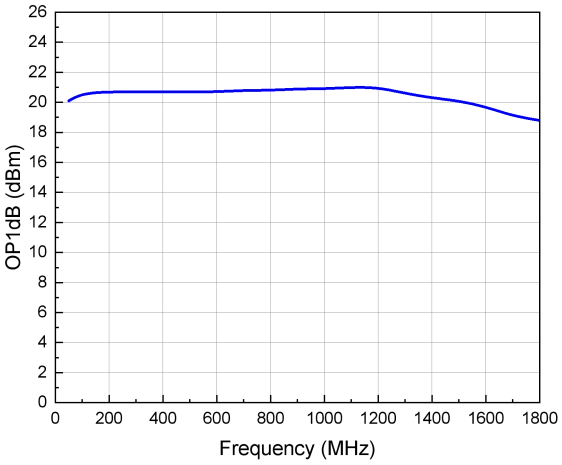
Performance Data at +5V , 47-1800MHz

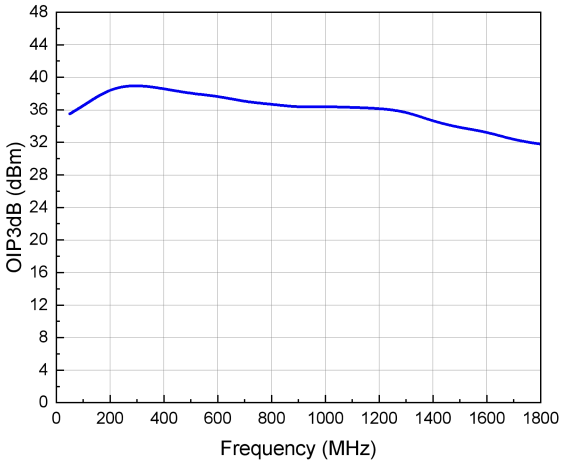
(VDD = +5V, Temp = +25C, Zo = 75Ω)

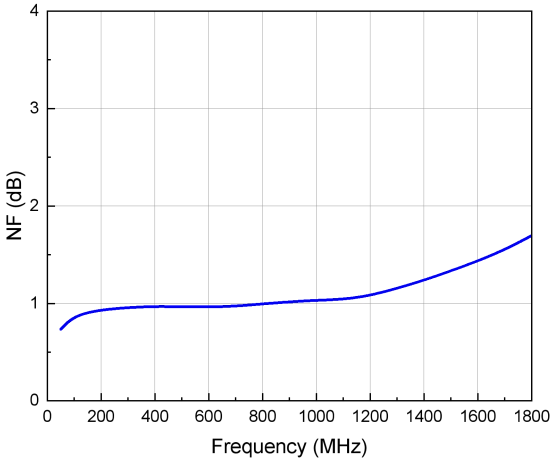


Performance Data at +5V , 47-1800MHz

(VDD = +5V, Temp = +25C, Zo = 75Ω)





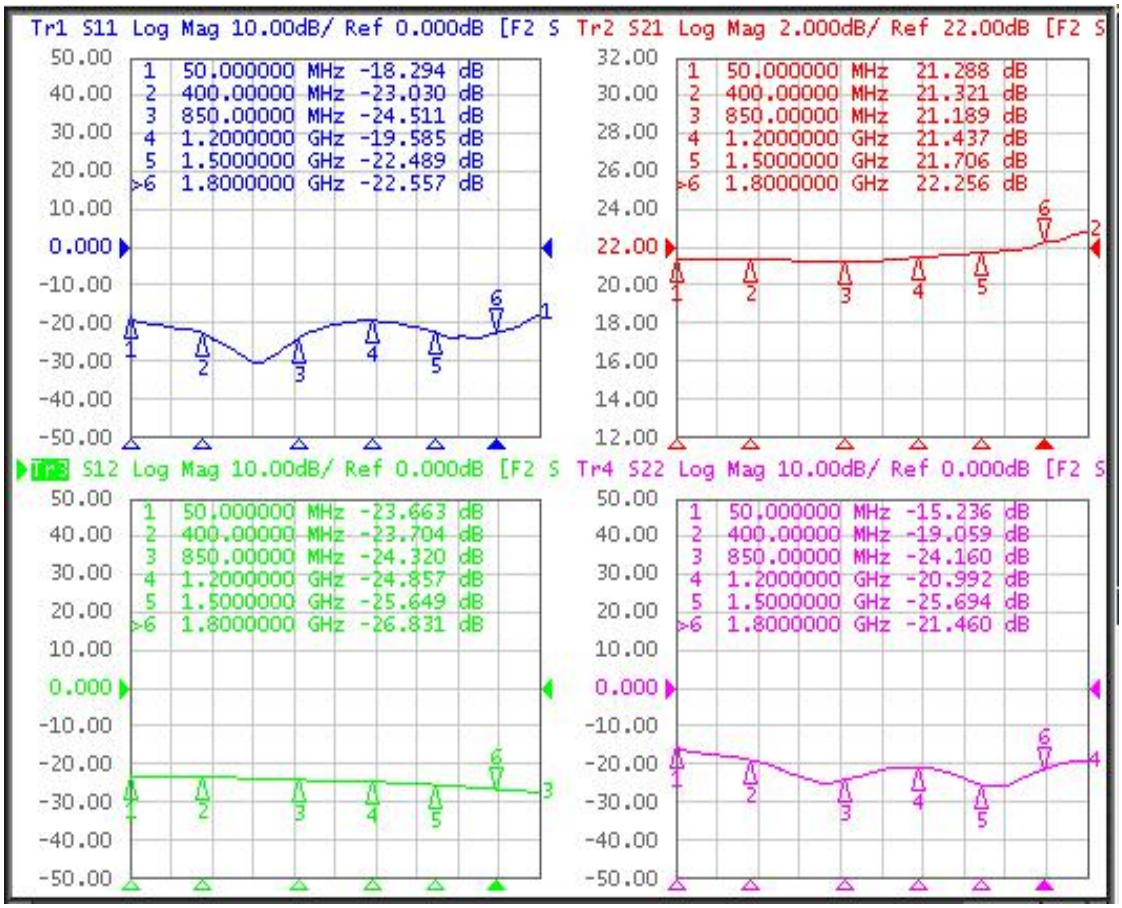


Note:

(1) OIP3: +5dBm / tone output

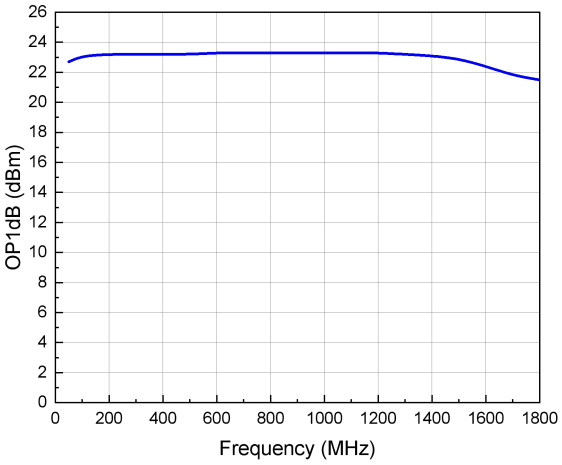
Performance Data at +7V , 47-1800MHz

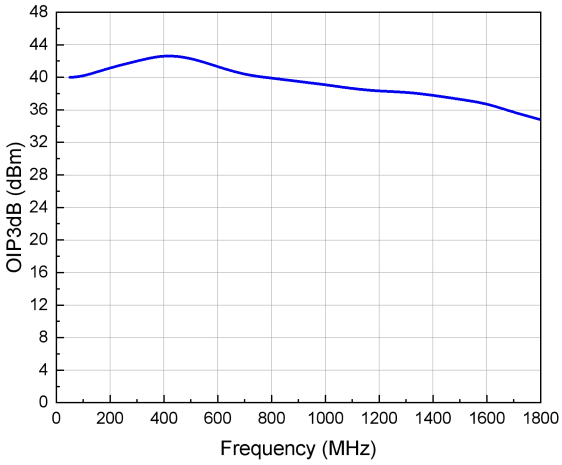
(VDD = +7V, Temp = +25C, Zo = 75Ω)

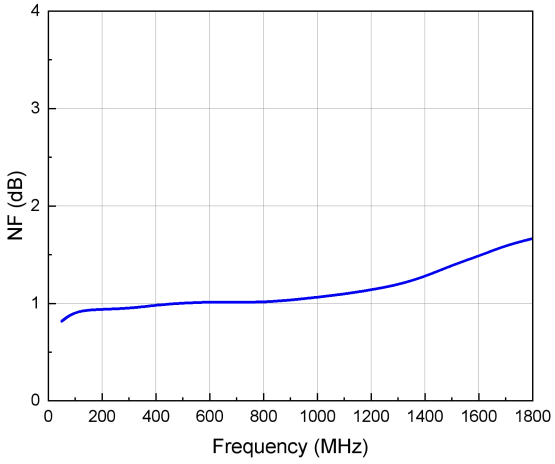


Performance Data at +7V , 47-1800MHz

(VDD = +7V, Temp = +25C, Zo = 75Ω)







Note:

(1) OIP3: +5dBm / tone output

Electrical Specifications at +5 V, 5-700MHz_

Temp = +25 ° C, VDD = +5 V, 75 Ω system, Full band unless otherwise noted

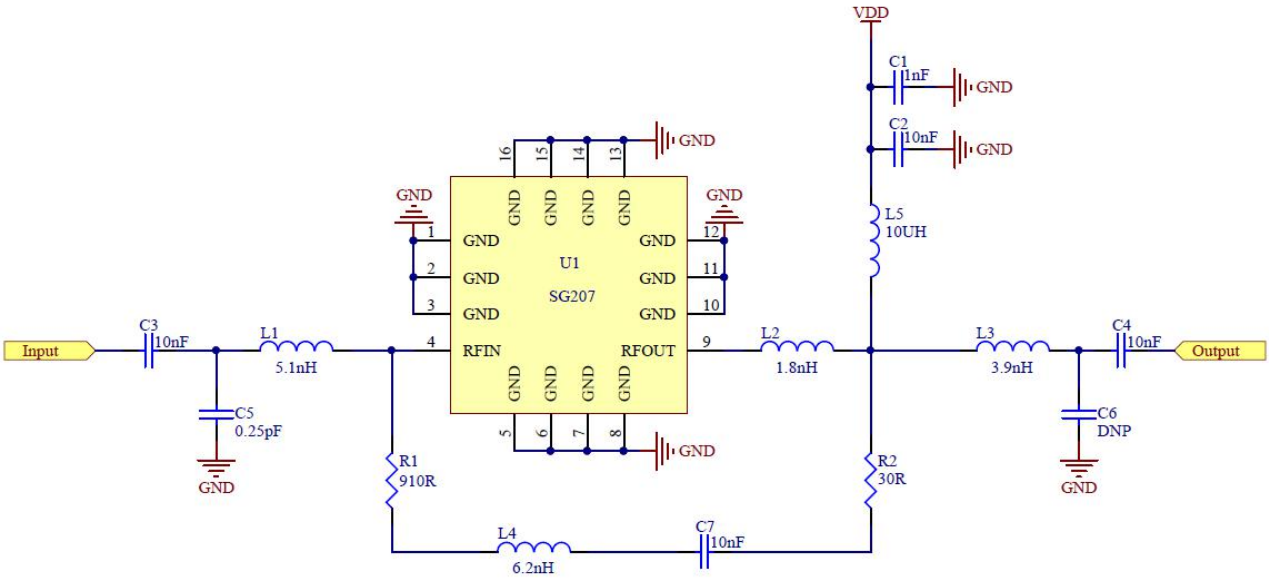
Parameter	Specification			Unit	Notes
	Min	Typ.	Max		
Frequency	5	-	700	MHz	
Supply Voltage (VDD)		5		V	
Supply Current (IDD)		70		mA	
Gain		21		dB	
Gain Slope		0.2		dB	
Reverse Isolation		23		dB	
Input return loss		21		dB	
Output return loss	16	20		dB	
Noise Figure		0.9	1.0	dB	
OIP2L		50		dBm	Tone Spacing=6MHz F1=300MHz, F2=306MHz, +5dBm / tone output
OIP2U		52		dBm	
OIP3	32	35		dBm	Tone Spacing=1MHz, +5dBm / tone output
OP1dB	16.7	20		dBm	
Thermal Resistance		57		˚C/W	

Electrical Specifications at +7 V, 5-700MHz _

Temp = +25 ° C, VDD = +7 V, 75 Ω system, Full band unless otherwise noted

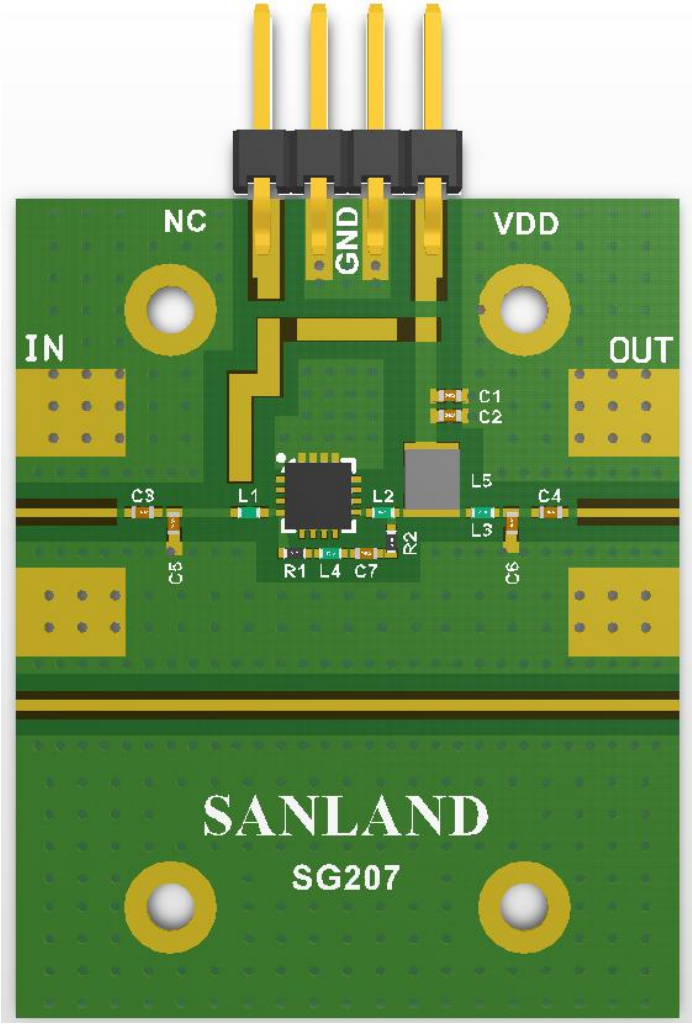
Parameter	Specification			Unit	Notes
	Min	Typ.	Max		
Frequency	5	-	700	MHz	
Supply Voltage (VDD)		7		V	
Supply Current (IDD)		100		mA	
Gain		21.3		dB	
Gain Slope		0.2		dB	
Reverse Isolation		23		dB	
Input return loss		22		dB	
Output return loss	16	19		dB	
Noise Figure		0.9	1.2	dB	
OIP2L		57		dBm	Tone Spacing=6MHz F1=300MHz, F2=306MHz, +5dBm / tone output
OIP2U		57		dBm	
OIP3	37	40		dBm	Tone Spacing=1MHz, +5dBm / tone output
OP1dB	20.4	23		dBm	
Thermal Resistance		57		˚C/W	

Application Circuit, 5-700MHz



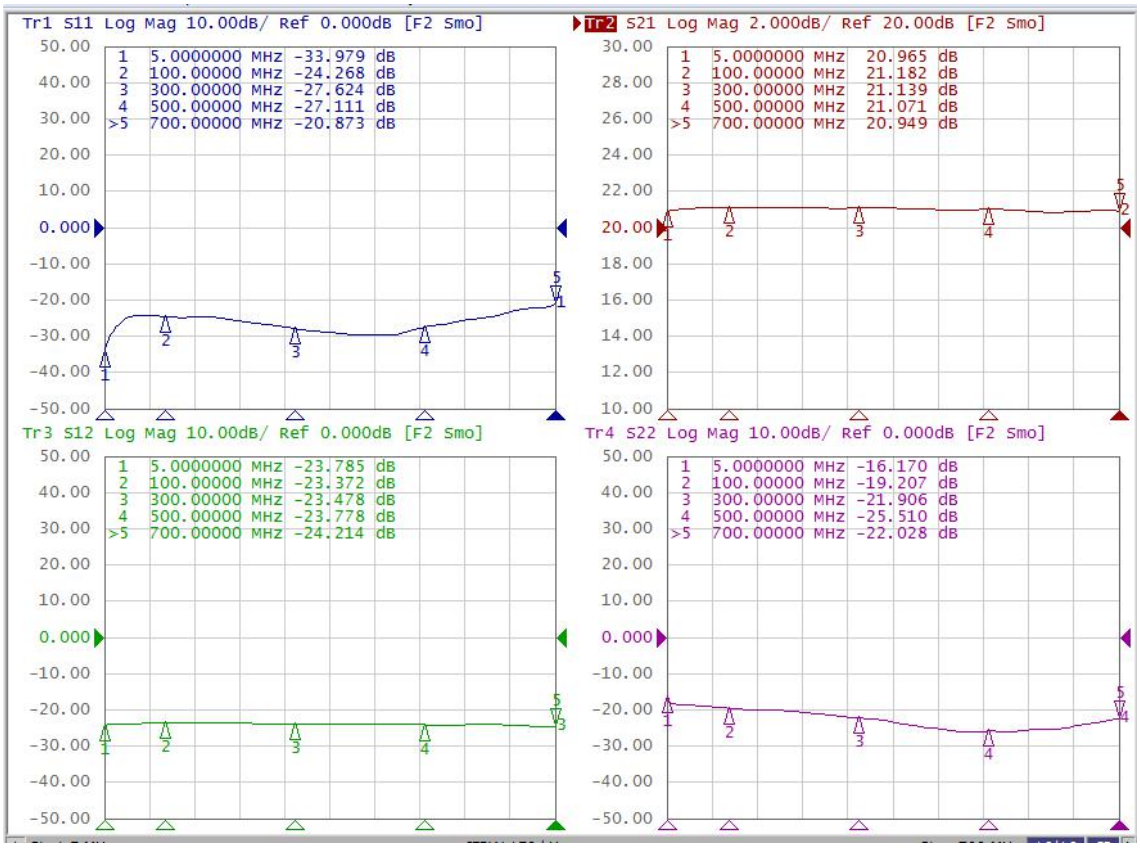
Component	Value	Size	Vendor	Part Number
U1	-	-	SANLAND	SG207
PCB	-	-	SANLAND	-
C1	1nF	0402	MURATA	GRM1555C1H102JA01D
C2,C3,C4,C7	10nF	0402	MURATA	GRM1555C1E103JE01D
C5	0.25pF	0402	MURATA	GJM1555C1HR25RB12D
L5	10UH	1008	COILCRAFT	1008LS-103XJLC
L1	5.1nH	0402	MURATA	LQG15HS5N1S02D
L2	1.8nH	0402	MURATA	LQG15HS1N8S02D
L3	3.9nH	0402	MURATA	LQG15HS3N9S02D
L4	6.2nH	0402	MURATA	LQG15HS6N2S02D
R1	910R	0402	UNI-ROYAL	0402WGF9100TCE
R2	30R	0402	UNI-ROYAL	0402WGF300JTCE
C6	Not Populated			

Evaluation Board Assembly Drawing, 5-700MHz



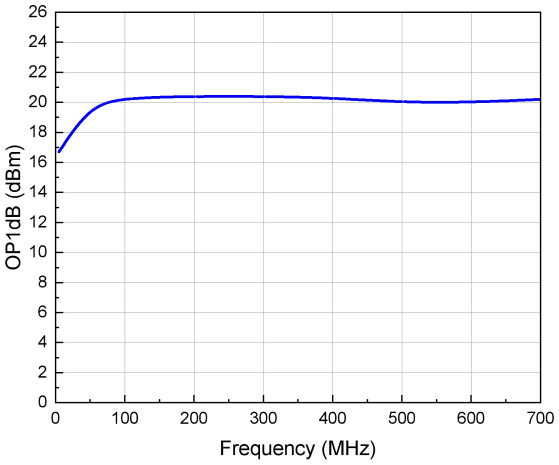
Performance Data at +5V, 5-700MHz

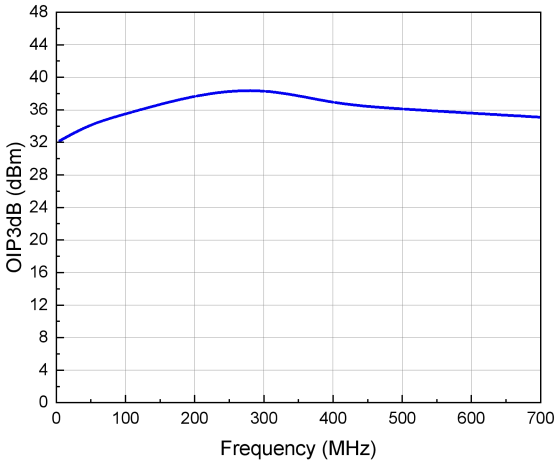
(VDD = +5V, Temp = +25C, Zo = 75Ω)

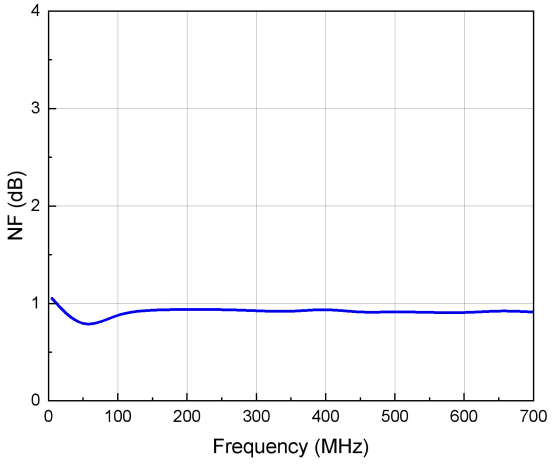


Performance Data at +5V, 5-700MHz

(VDD = +5V, Temp = +25C, Zo = 75Ω)





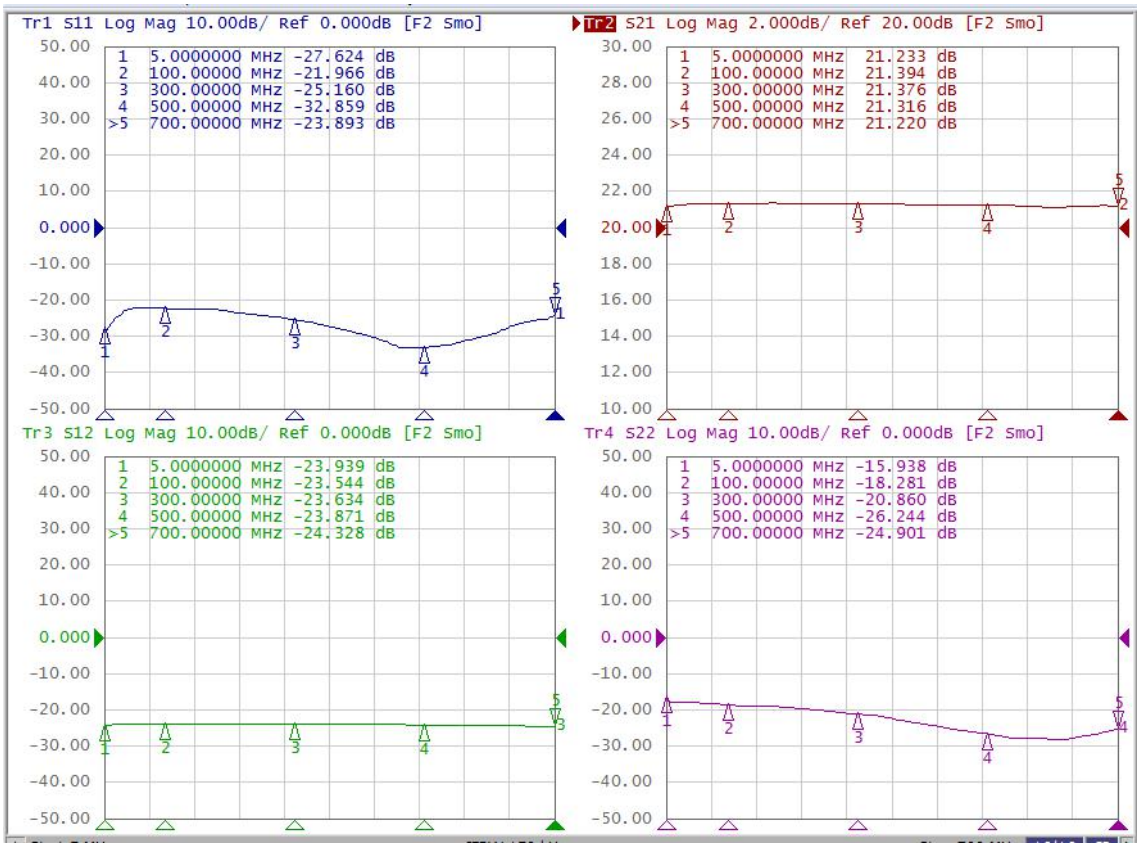


Note:

(1) OIP3: +5dBm / tone output

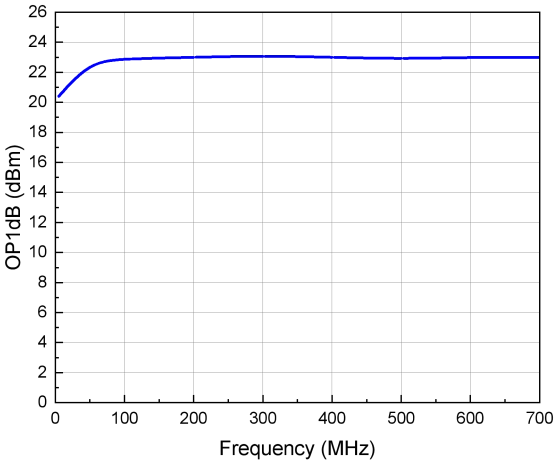
Performance Data at +7V, 5-700MHz

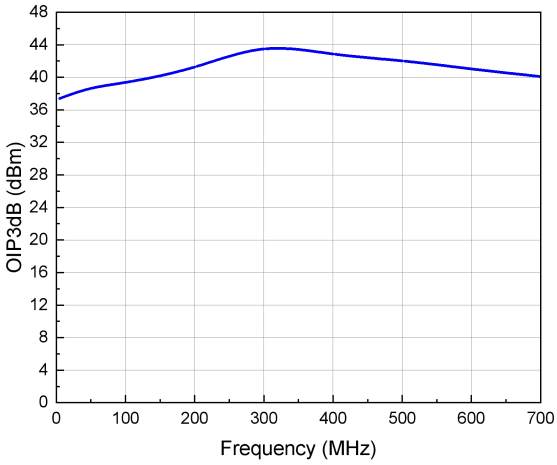
(VDD = +7V, Temp = +25C, Zo = 75Ω)

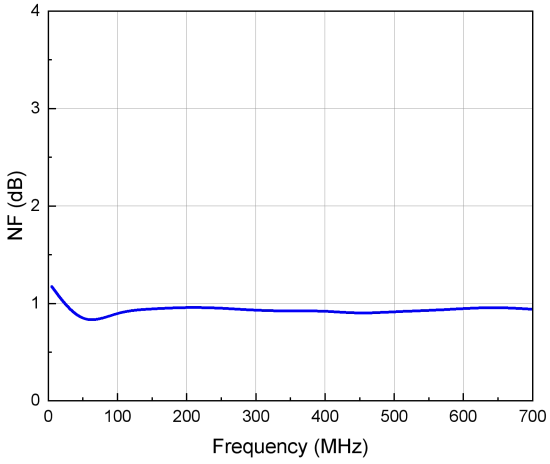


Performance Data at +7V, 5-700MHz

(VDD = +7V, Temp = +25C, Zo = 75Ω)



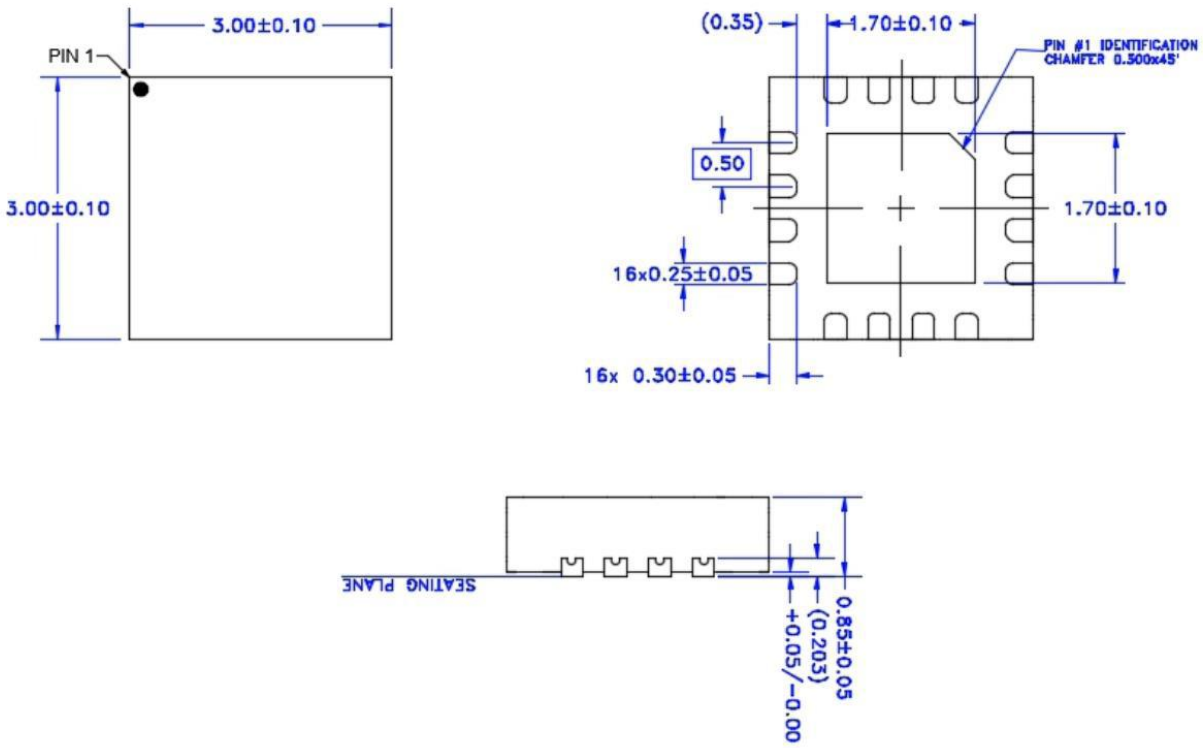




Note:

(1) OIP3: +5dBm / tone output

Package Outline



3 x 3 16–pin QFN

Recommended Mounting Pattern