2019.02 Prelimilary

DC -3.5 GHz Broadband Amplifier

DESCRIPTION

The SG117 is GaAs, pHEMT broadband amplifier with an active bias, high linearity,superior gain, and industry leading noise figure (NF) performance from DC to 3500 MHz.

At 2 GHz, theSG117 offers a small-signal gain of 25.5 dB, output P1dB of 6 dBm and 17 dBm output third order intercept point. It is suitable for use as buffer amplifiers for wideband applications. They are designed for low cost gain blocks in cellular applications, DBS tuners, LNB and other wireless communications systems.

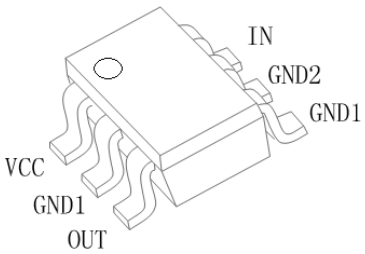
KEY FEATURES

- Operating frequency: DC ~ 3.5 GHz
- 24.5 dB gain@1GHz
- VSWR < 2.0 throughout operating frequency
- 9.8 dBm output P1dB@1GHz
- 2.7 dB noise figure@1GHz
- Unconditionally stable
- Single 5V supply (Id = 25 mA)
- Lead-free option available

Major Applications

Amplifier for cellular, cordless, special mobile radio, PCS, ISM, wireless LAN, DBS, TVRO, and TV tuner applications

Pin Assignment



Pin Details

Pin Number	Name	Description
1	Vcc	Bias voltage for input gate
6	RF in	RF input. DC blocking capacitor required.
3	RFOUT/ Vcc	RF output. Apply Vcc through RF choke inductor. DC blocking capacitor required.
2,4,5	GND	GND

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Absolute Maximum Ratings

Parameter	Rating	Unit
DC Power Supply	+5.5	V
Quiescent supply current	50	mA
RF Input Power	-10	dBm
Operating Temperature	-40 to +105	℃
Storage Temperature	-40 to +150	℃
Electrostatic discharge: Charged Device Model (CDM), Class 4 Human Body Model (HBM), Class 1A Machine Model (MM), Class A	 1000 250 30	 V V V
Operation beyond any one of these limits may cause permanent damage.		

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.

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Electrical Characteristics for Application

Thermal Data

Parameter	Specification			Units	Notes
	Min	Typ.	Max		
Thermal resistance		110		˚C/W	
Channel temperature @ +85 ˚C reference (package heat slug)		98.5		˚C	VDD = 5 V, IDQ = 25mA, no RF applied,dissipated power=0.125W
Test Conditions：VDD = 5 V, TA = +25 ˚C, Characteristic Impedance [ZO] = 50 Ω,Unless Otherwise Noted.					

Parameter	Specification			Units	Notes
	Min	Typ.	Max		
RF Specifications					
NF		2.8	3.0	dB	2500 MHz, includes Evaluation Board loss
S21		24.5		dB	2500MHz
S11		-14		dB	2500MHz
S22		-12		dB	2500MHz
S12		-32		dB	2500MHz
OIP3		+21		dBm	1000MHz, Δf = 1 MHz, Pout = –5 dBm/tone
OP1dB		+10		dBm	1000MHz
DC Specifications					
VDD		5		V	
IDQ		25		mA	Set with external resistor
Test Conditions：VDD = 5 V, TA = +25 ˚C, Characteristic Impedance [ZO] = 50 Ω, Unless Otherwise Noted					

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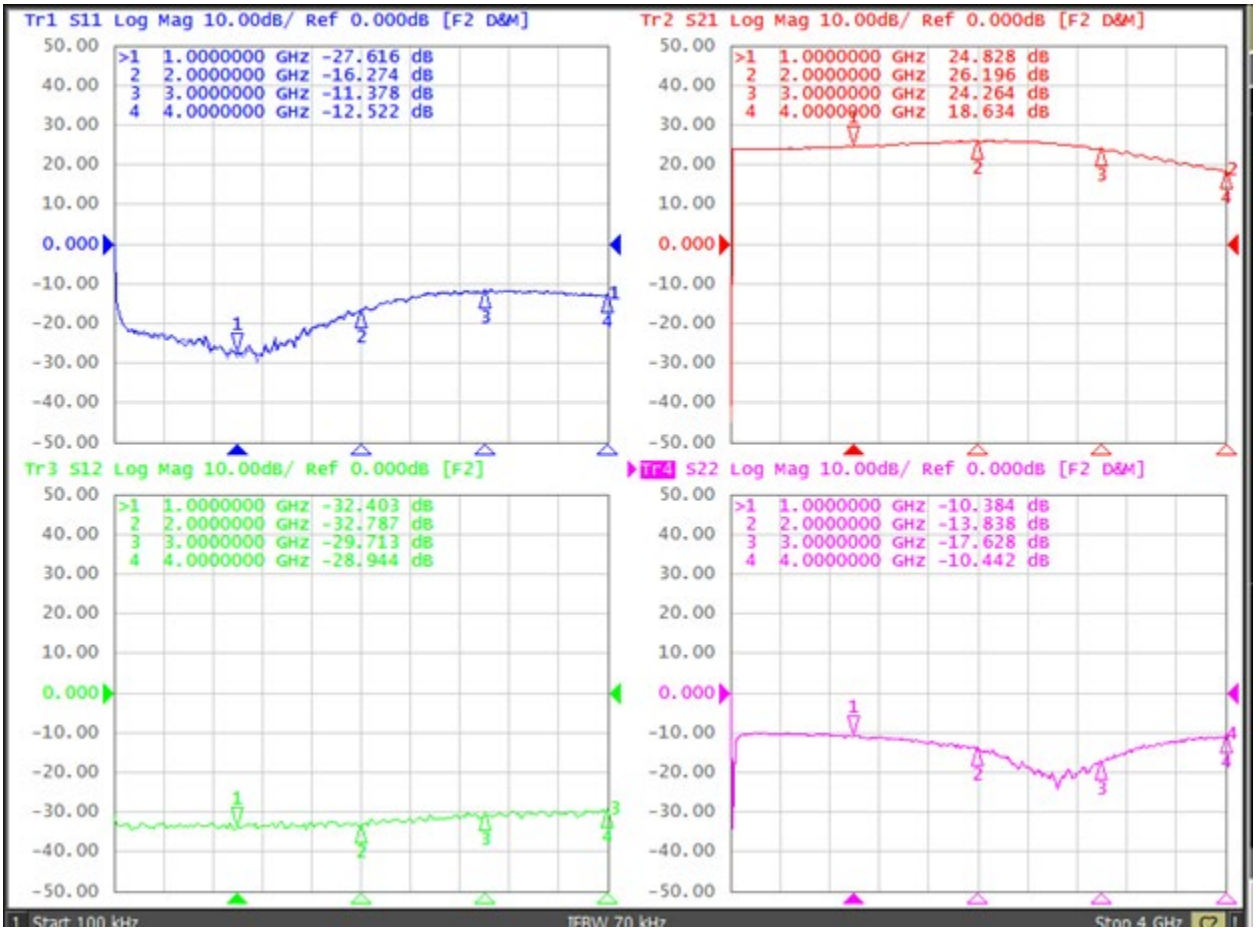

S-Parameter vs Frequency

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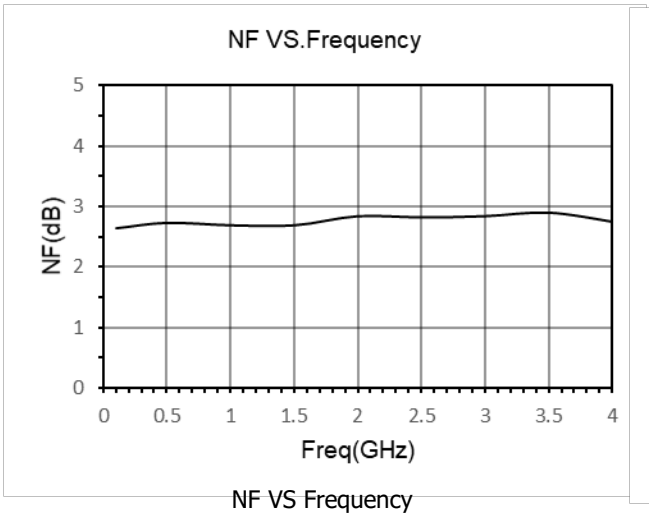
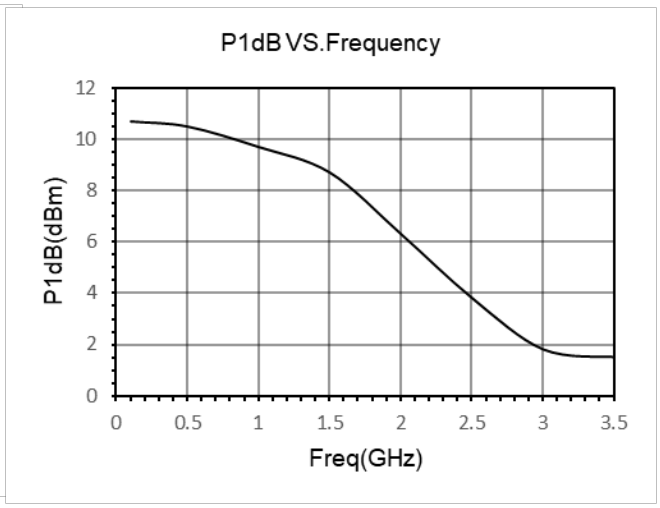
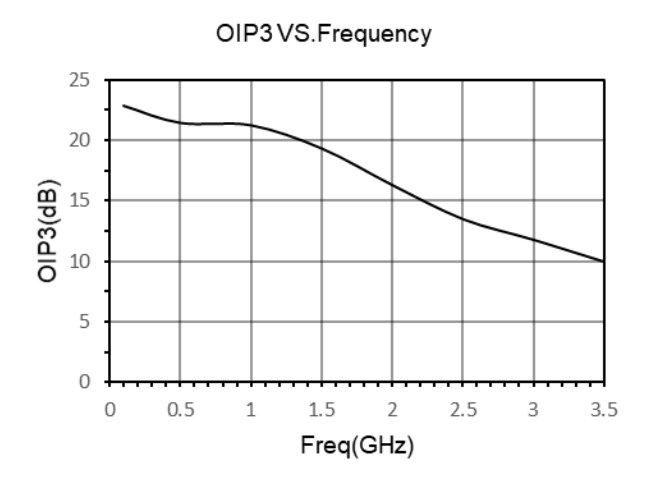


NF VS Frequency



P-1dB vs Frequency



OIP3 VS Frequency

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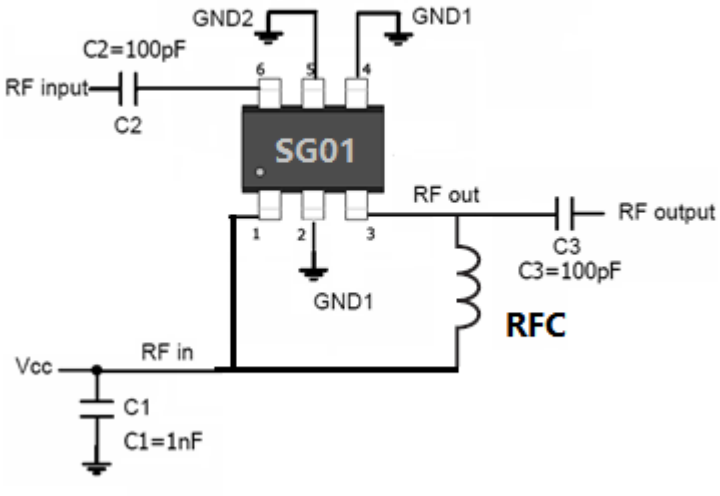

Evaluation Board Schematic (1000 to 2500 MHz)

Evaluation Board Bill of Materials

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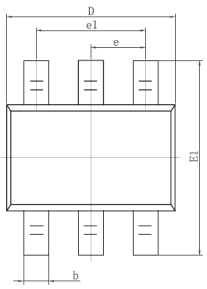

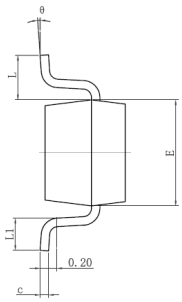

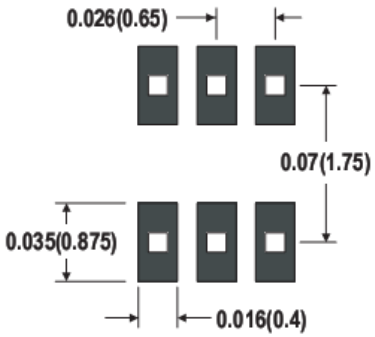

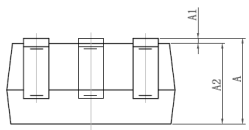

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Package Dimensions

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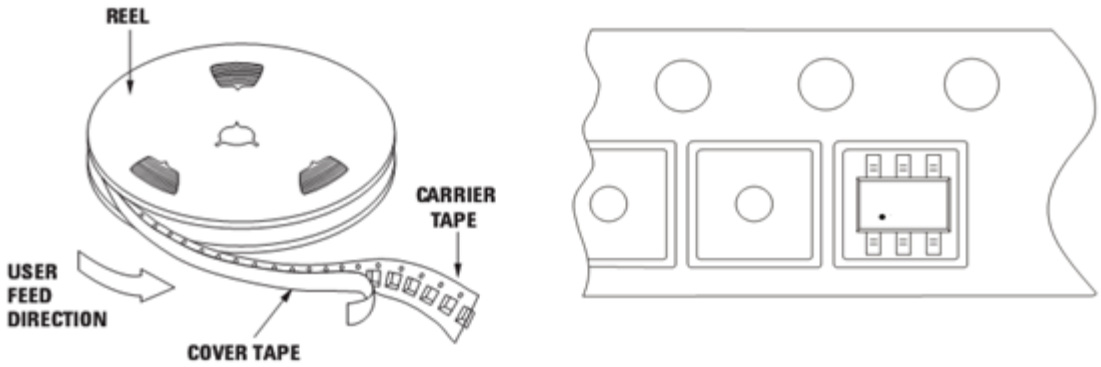

Tape and Reel Dimensions

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