PNW234

InGaP HBT Gain Block Amplifier

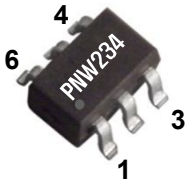
Features

- 500 - 3000MHz
- 18 dB Gain at 1900MHz
- +19 dBm P1dB
- 33 dBm Output IP3
- Single 3.3V Supply Voltage
- Supply Current 35mA
- Lead-free / Green / RoHS-compliant SOT-363 Package

Applications

- Broadband Gain Block
- Mobile Infrastructure
- Cellular, GSM
- PCS, WCDMA, WiBro, WiMax
- W-LAN / ISM
- RFID / Fixed Wireless

Functional Diagram



*** Marking : *P23**

Function	Pin No.
RF IN	3
RF OUT / Bias	6
Ground	1,2,4,5

Description

The PNW234 is a high performance InGaP HBT MMIC Amplifier and high linearity gain block amplifier in a high quality SOT-363 package. The device features excellent Input and output return loss, highly linear performance. The device can be easily matched to obtain optimum power and linearity. The product is targeted for use as low-current gain block amplifier for wireless infrastructure applications. The PNW234 operates from a single +3.3 voltage supply and has an internal active bias. All devices are 100% RF and DC tested.

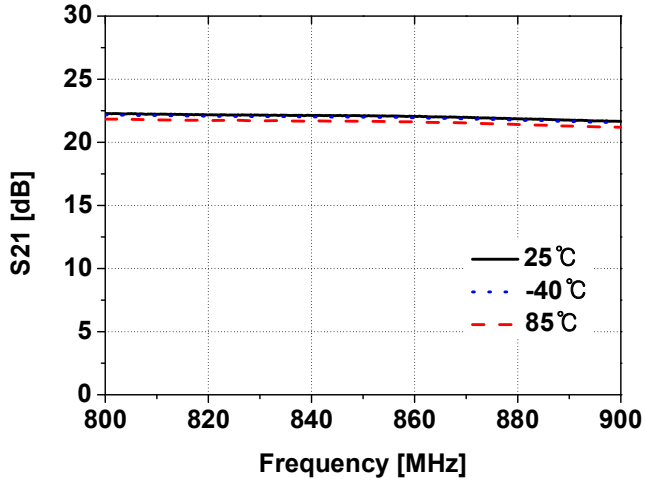
Specifications

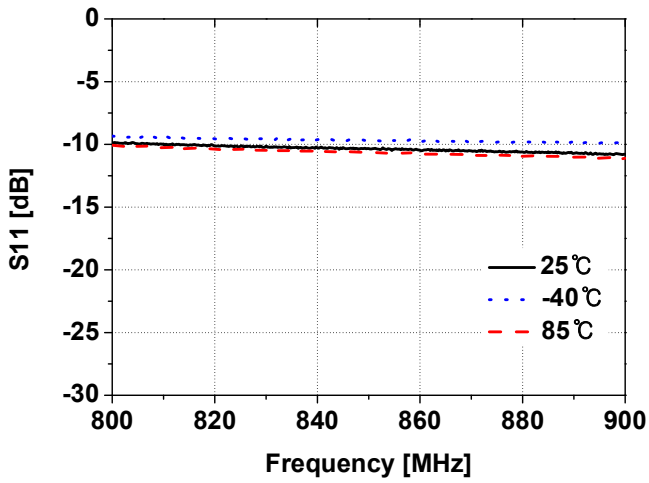
Symbol	Units	Freq.	Min.	Typ.	Max.
S21	dB	900 MHz 1900 MHz 2100 MHz 2600 MHz		21.5 18.0 17.2 15.2	
S11	dB	900 MHz 1900 MHz 2100 MHz 2600 MHz		-10 -20 -17 -14	
S22	dB	900 MHz 1900 MHz 2100 MHz 2600 MHz		-13 -20 -24 -14	
P1dB	dBm	900 MHz 1900 MHz 2100 MHz 2600 MHz		19.5 19.0 18.5 18.5	
OIP3	dBm	900 MHz 1900 MHz 2100 MHz 2600 MHz		29.0 33.0 30.0 30.0	
NF	dB	900 MHz 1900 MHz 2100 MHz 2600 MHz		2.4 2.4 2.5 2.9	
Icc	mA			35	
Vcc	V			3.3	
Rth	°C/W			39	

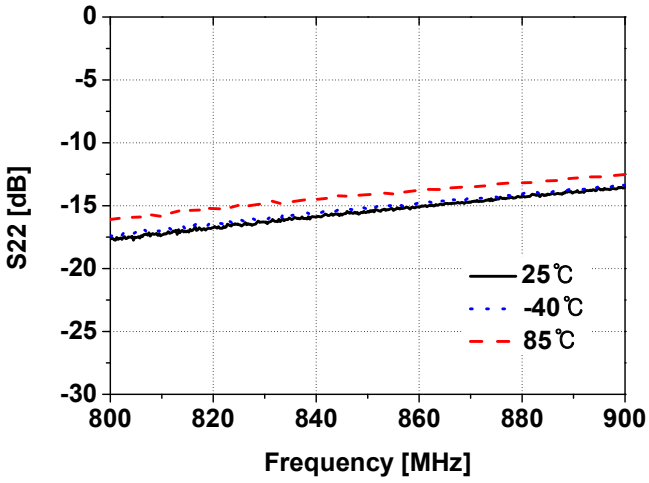
Test Conditions : T=25°C, Supply Voltage=+3.3V, 50ohm System, OIP3 measured with two tones at an output power of -2dBm/tone separated by 1MHz.

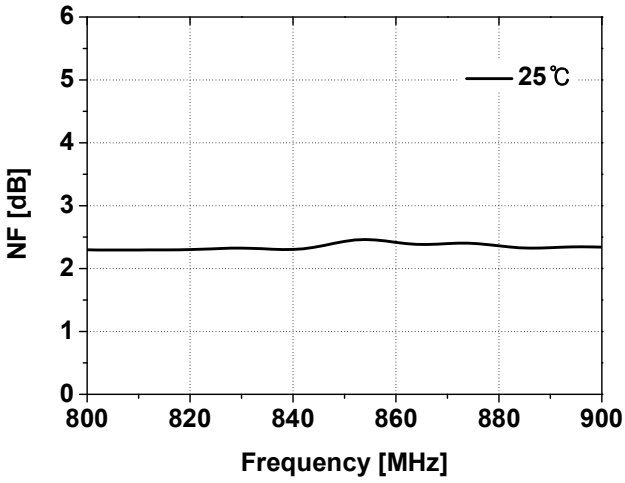
Typical RF Performance for 900MHz Tuned Application Circuit

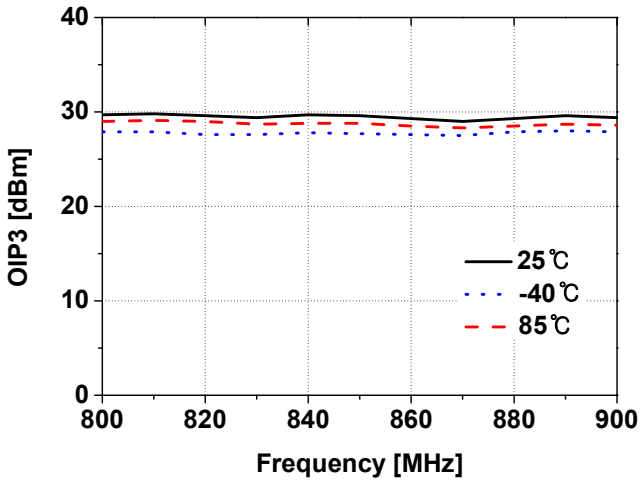
Frequency	MHz	800	900
S21	dB	22.0	21.5
S11	dB	-10	-10
S22	dB	-17	-13
P1dB	dBm	19	19.5
OIP3 @-2dBm	dBm	29.0	29.0
Noise Figure	dB	2.4	2.4

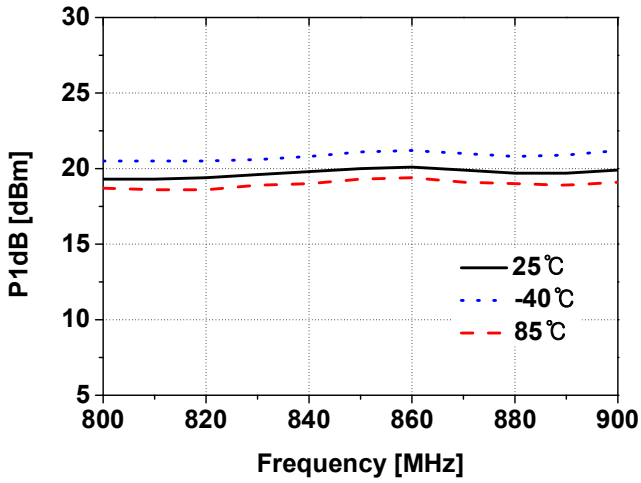




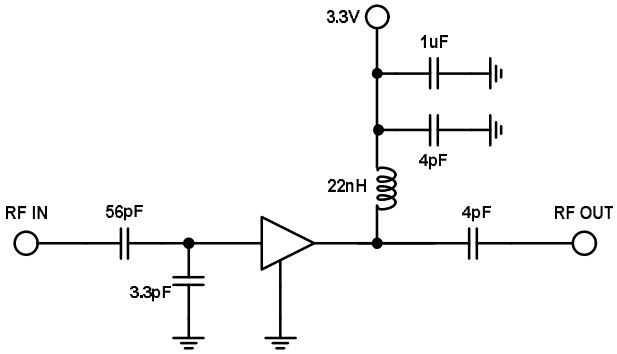






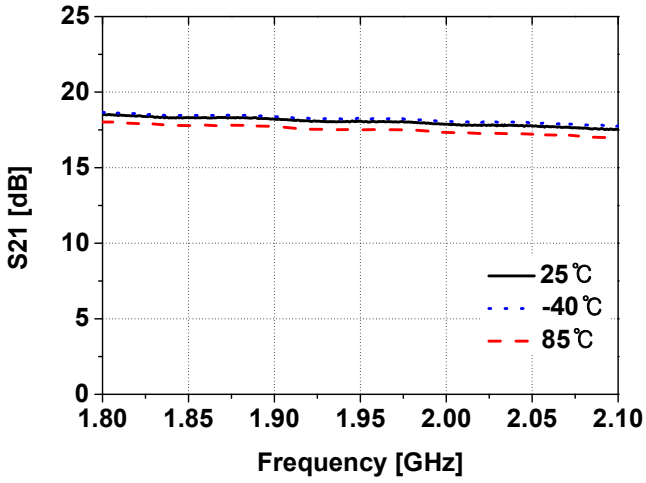


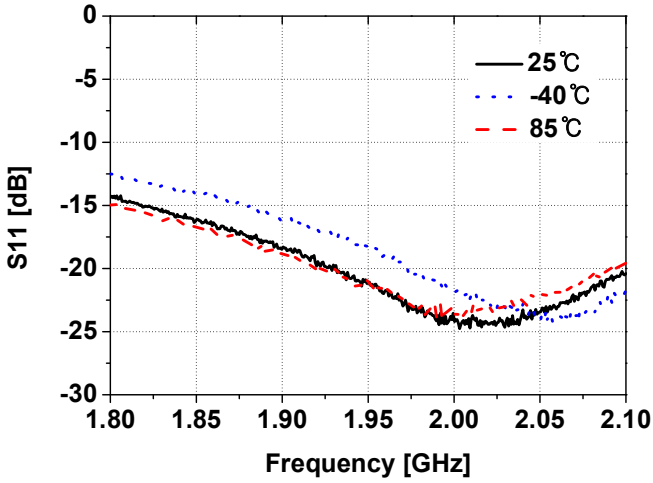
900MHz Tuned Application Circuit

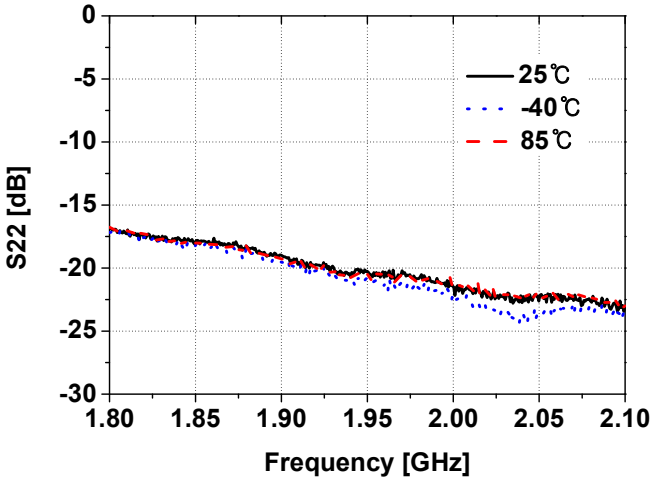


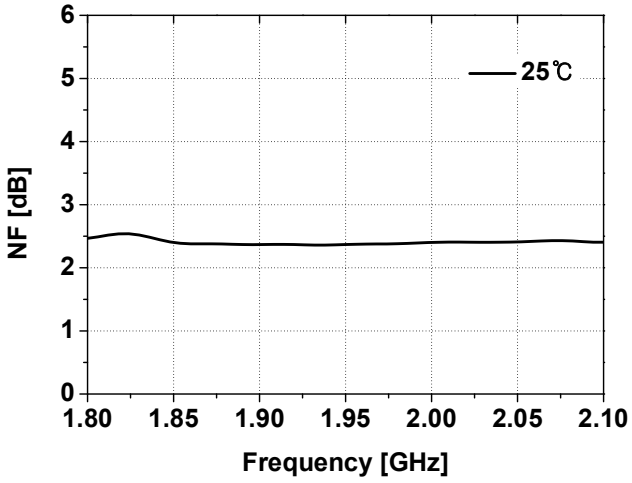
Typical RF Performance for 1.9GHz Tuned Application Circuit

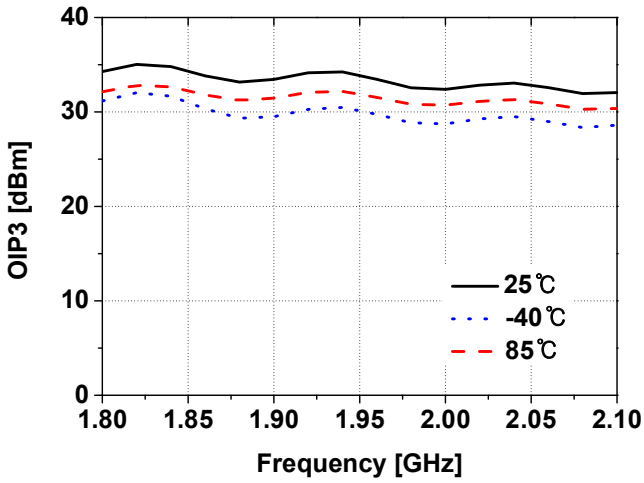
Frequency	MHz	1800	1900	2100
S21	dB	18.3	18.0	17.2
S11	dB	-15	-20	-17
S22	dB	-17	-20	-24
P1dB	dBm	19.2	19.0	18.5
OIP3 @-2dBm	dBm	33.0	33.0	30.0
Noise Figure	dB	2.4	2.4	2.5

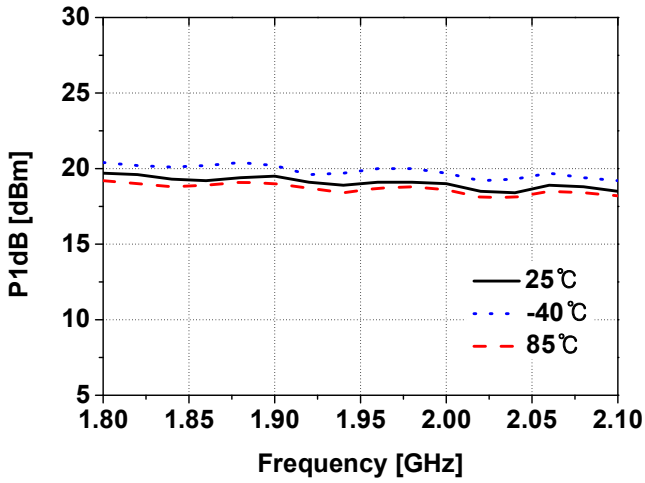




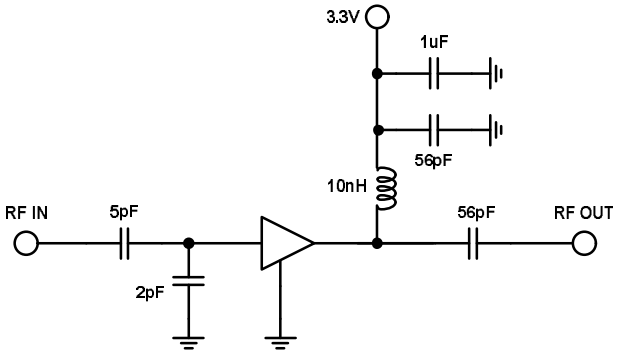






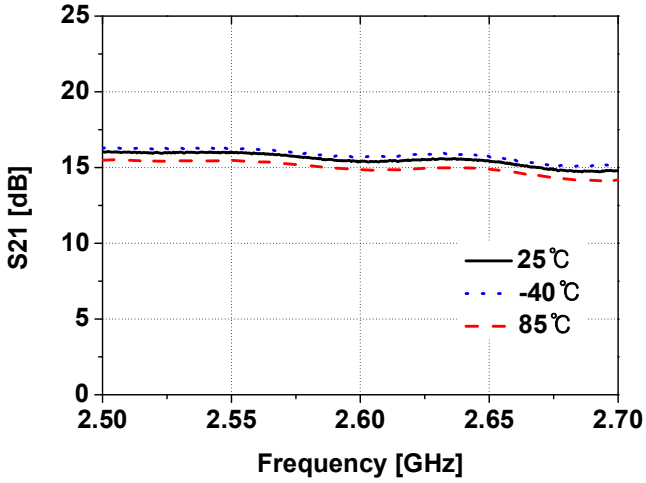


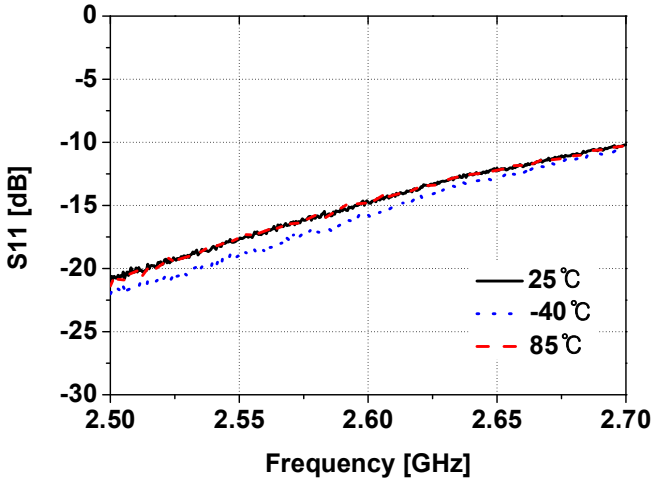
1.9GHz Tuned Application Circuit

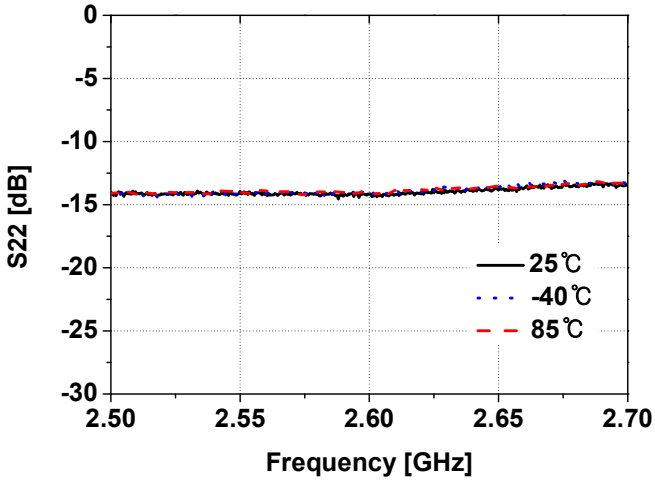


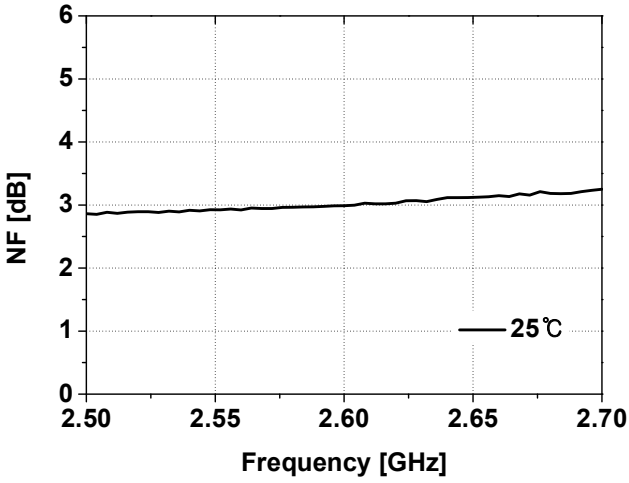
Typical RF Performance for 2.6GHz Tuned Application Circuit

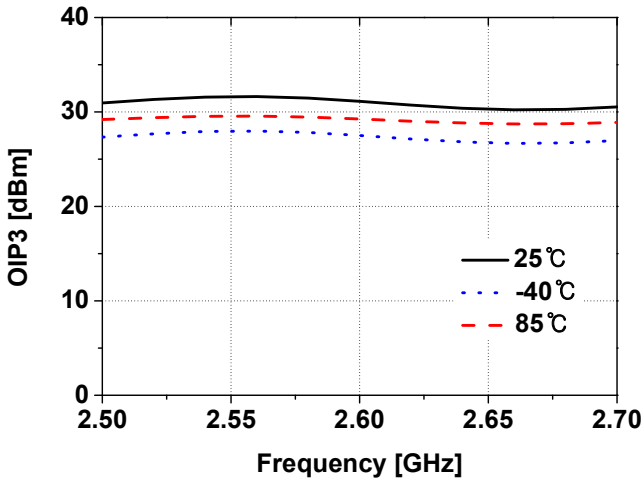
Frequency	MHz	2500	2600	2700
S21	dB	15.8	15.2	14.5
S11	dB	-20	-14	-10
S22	dB	-14	-14	-13
P1dB	dBm	19.0	18.5	18.5
OIP3 @-2dBm	dBm	30.5	30.0	30.0
Noise Figure	dB	2.8	2.9	3.2

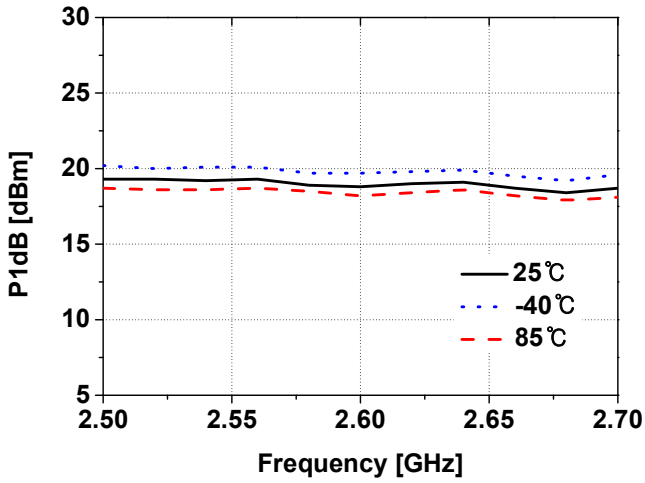




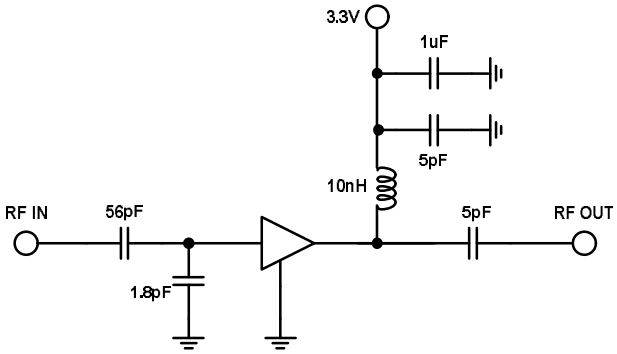








2.6GHz Tuned Application Circuit



Absolute Maximum Ratings

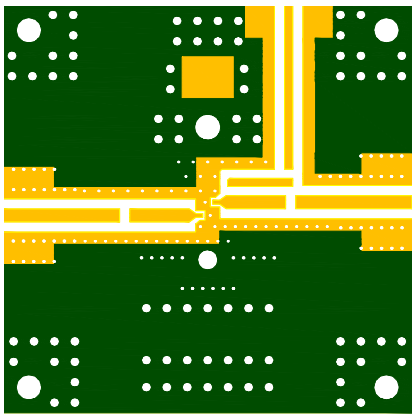
Parameter	Rating	Unit
Device Voltage	+3.9	V
Device Current	70	mA
RF Power Input	5	dBm
Storage Temperature	-55 to +150	°C
Ambient Operating Temperature	-40 to +85	°C
Junction Temperature for >10^6 hours MTTF	185	°C

Operation of this device above any of these parameters may cause permanent damage.

ESD / MSL Ratings

1. ESD sensitive device. Observe Handling Precautions.
2. ESD Rating : Class 1C (Passes at 1000V min.) Human Body Model (HBM), JESD22-A114
3. ESD Rating : Class IV (Passes at 1000V min.) Charged Device Model (CDM), JESD22-C101
4. MSL (Moisture Sensitive Level) Rating : Level 1 at +260°C Convection reflow, J-STD-020

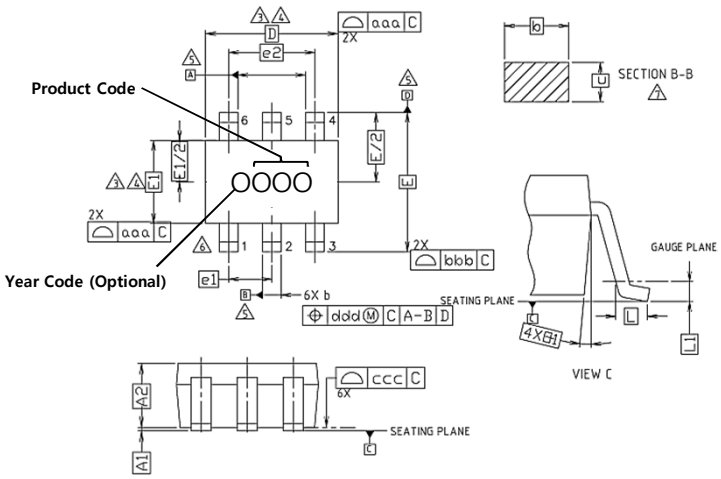
Evaluation Board Layout (4x4)



Mounting Instructions

1. Use a large ground pad area with many plated through-holes as shown.
2. We recommend 1 oz copper minimum.
3. Measurement for our data sheet was made on 0.8mm thick FR-4 Board.
4. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
5. RF trace width depends on the board material and construction.
6. Add mounting screws near the part to fasten the board to a heatsink.

Lead-free /RoHS Compliant / Green SOT-363 Package Outline



SYMBOL	MILLIMETERS MINIMUM	NOMINAL	MAXIMUM	NOTE	SYMBOL	TOLERANCES OF FORM AND POSITION	NOTE
A1	0.00	–	0.10		aaa	0.15	
A2	0.90	0.95	1.00		bbb	0.20	
b	0.25	–	0.40		ccc	0.10	
c	0.10	–	0.25		ddd	0.10	
D	1.90	2.00	2.10	3,4			
E	1.95	2.10	2.25				
E1	1.15	1.25	1.35	3,4			
e1	0.65 BSC						
e2	1.30 BSC						
L	0.25	–	–				
L1	0.15 BSC						

Land Pattern