

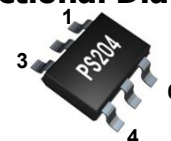
### Features

- ➔ DC - 3000MHz
- ➔ 21.5 dB Gain at 0.9GHz
- ➔ +13 dBm P1dB
- ➔ +25.5 dBm Output IP3
- ➔ Single Voltage Supply
- ➔ Lead-free / Green / RoHS-compliant SOT-363 Package

### Applications

- ➔ Broadband Gain Block
- ➔ Mobile Infrastructure
- ➔ Cellular, PCS, GSM, GPRS, WCDMA, WiBro, WiMAX
- ➔ W-LAN / DMB / ISM
- ➔ CATV / DBS
- ➔ RFID / Fixed Wireless

### Functional Diagram



\* Marking : 24C / 34C

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

### Description

The PS204-63 is a high performance InGaP HBT MMIC Amplifier and consists of Darlington pair amplifiers. The amplifier features high linear performance, wideband operation, and high reliability. The PS204-63 operates from a single voltage supply and requires only two DC-blocking capacitors, a bias resistor and an inductor for operation. The device is a general purpose buffer amplifier that offers high dynamic range in a low cost surface-mountable plastic SOT-363 packages.

### Specifications for Vd=3.53V, Ic=45mA

Symbol	Parameters	Units	75MHz	900MHz	1900MHz	2300MHz
S21	Gain	dB	23.7	22.2	19.3	18.2
S11	Input Return Loss	dB	-18	-13	-14	-15
S22	Output Return Loss	dB	-15	-14	-12	-10
P1dB	Output Power @1dB compression	dBm	15.5	15.0	11.5	10.5
OIP3	Output Third Order intercept	dBm	29.0	27.7	24.4	22.8
NF	Noise Figure	dB	2.1	2.3	2.3	2.3
V / I	Device voltage / current	V/mA	3.53/45			
Rth	Thermal Resistance	°C/W	76			

Test Conditions : T=25°C, Supply Voltage=+4.5V, Rbias=21ohm, 50ohm System, OIP3 measured with two tones at an output power of -5dBm/tone separated by 1MHz.

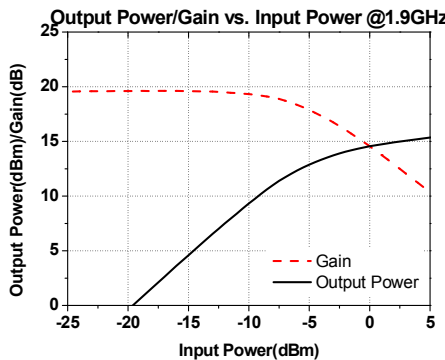
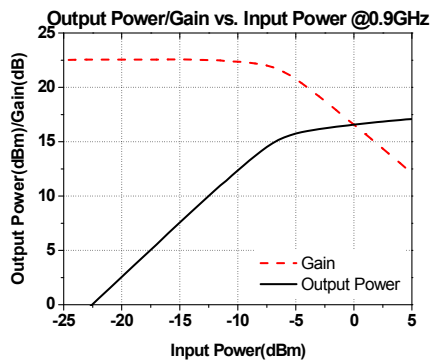
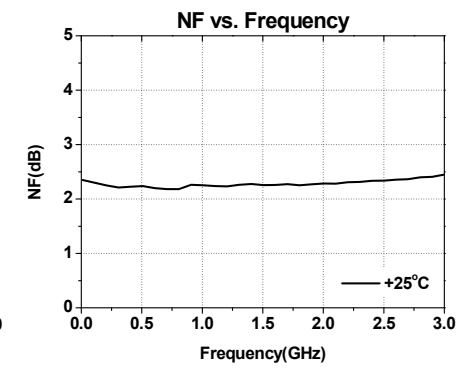
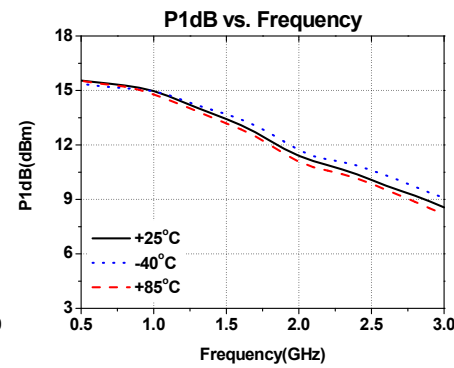
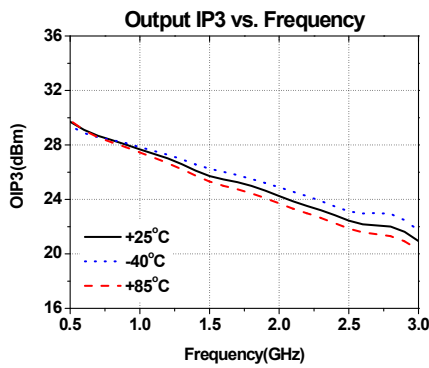
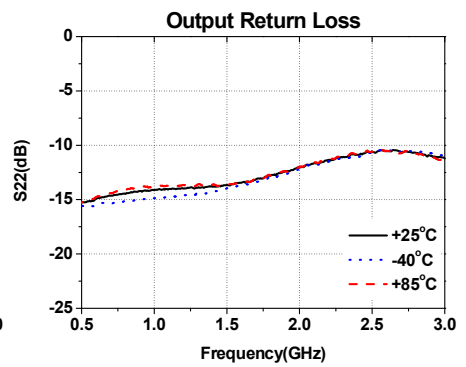
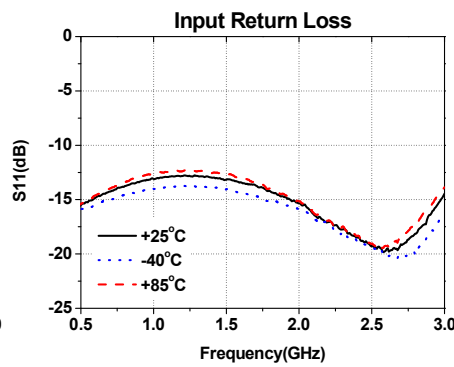
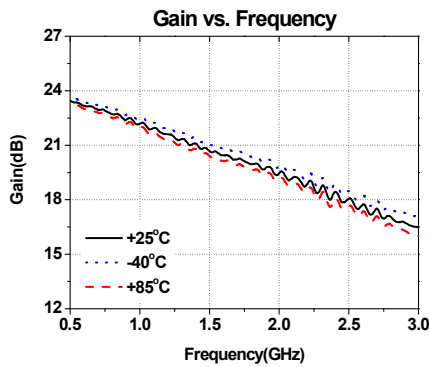
### Specifications for Vd=3.47V, Ic=34mA

Symbol	Parameters	Units	75MHz	900MHz	1900MHz	2300MHz
S21	Gain	dB	23.4	21.8	19.4	18.3
S11	Input Return Loss	dB	-16	-12	-13	-15
S22	Output Return Loss	dB	-15	-13	-13	-11
P1dB	Output Power @1dB compression	dBm	14.0	13.1	11.3	10.3
OIP3	Output Third Order intercept	dBm	27.2	26.0	23.0	21.5
NF	Noise Figure	dB	2.1	2.1	2.2	2.2
V / I	Device voltage / current	V/mA	3.47/34			
Rth	Thermal Resistance	°C/W	92			

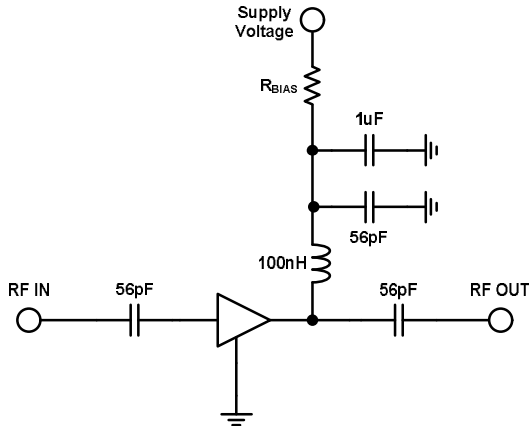
Test Conditions : T=25°C, Supply Voltage=+4.5V, Rbias=33ohm, 50ohm System, OIP3 measured with two tones at an output power of -5dBm/tone separated by 1MHz.

**Typical RF Performance**  
**for 900MHz Tuned Application Circuit (Vd=3.53V, Ic=45mA)**  
Supply Bias Voltage = 4.5V, R(bias)= 21 ohm, Current= 44mA

Frequency	MHz	500	900	1500	1900	2300	3000
S21	dB	23.3	22.3	20.5	19.5	18.5	16.3
S11	dB	-15	-13	-13	-14	-17	-14
S22	dB	-15	-14	-13	-12	-11	-11
P1dB	dBm	15.4	15.0	13.3	11.5	10.5	8.5
OIP3	dBm	29.5	27.8	25.5	24.5	23.0	20.7
Noise Figure	dB	2.2	2.3	2.3	2.3	2.3	2.5



**900MHz Tuned Application Circuit**

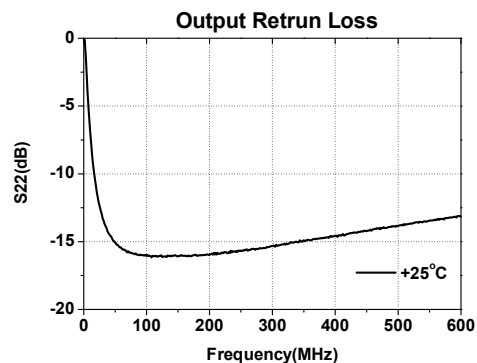
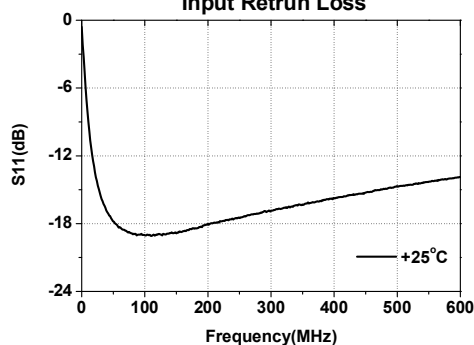
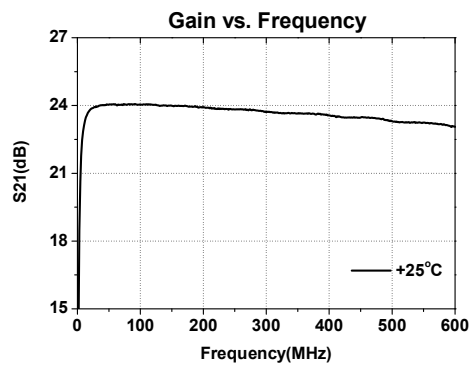
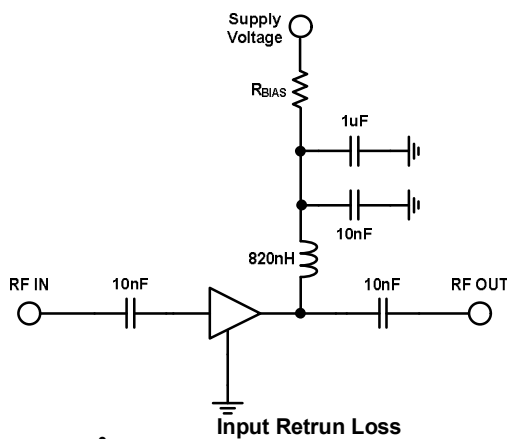


**Recommended Bias Values**

Supply Voltage	R bias Value	Size
4.5 V	21.0 Ω	0805
5 V	32.0 Ω	1210
6 V	53.5 Ω	1210
7 V	75.0 Ω	2010
8 V	97.0 Ω	2010
10 V	140.0 Ω	2010
12 V	183.0 Ω	2512

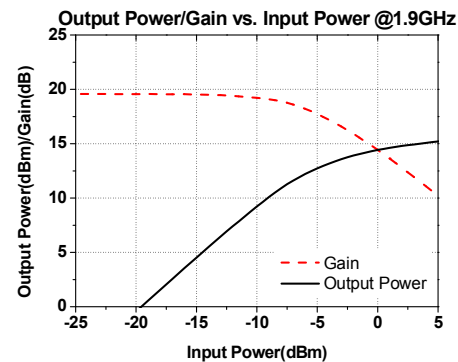
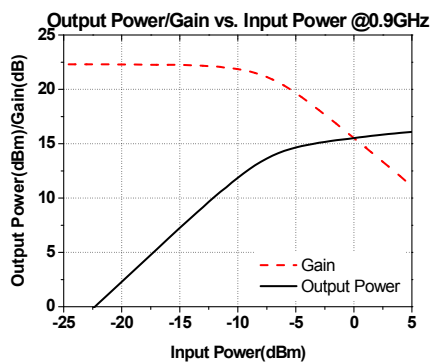
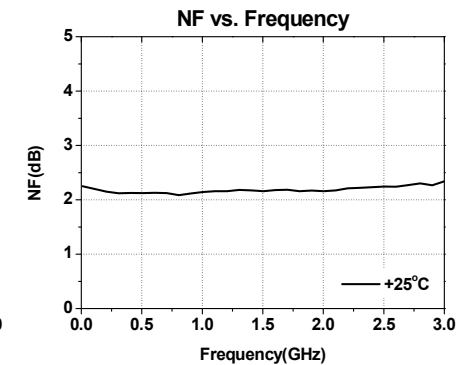
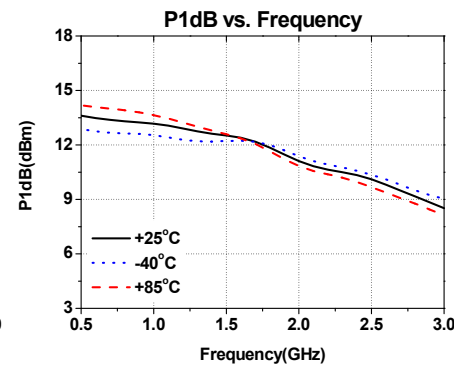
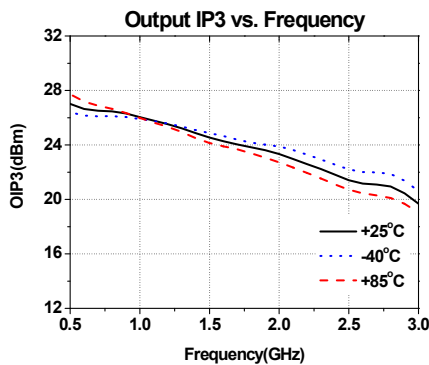
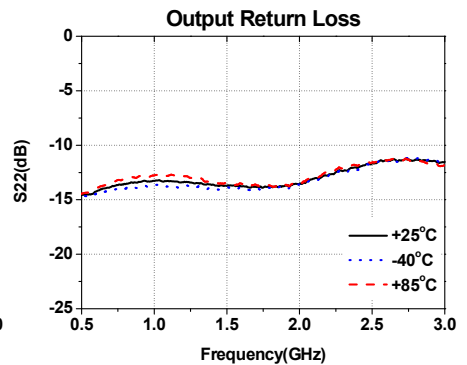
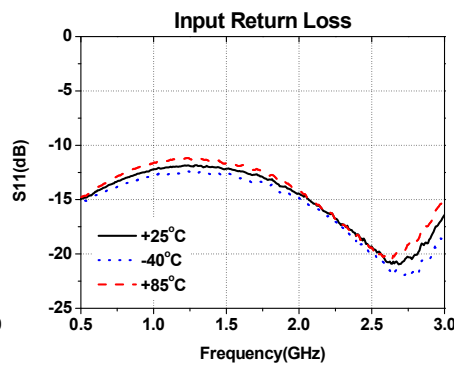
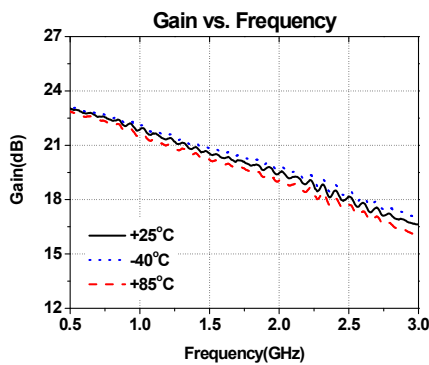
**Typical RF Performance  
for 50 -500MHz Tuned Application Circuit (Vc=3.53V, Ic=45mA)**  
Supply Bias Voltage = 4.5V, R(bias)= 21ohm, Current= 44mA

Frequency	MHz	75	125	300	500
S21 : Gain	dB	23.8	23.8	23.5	23.0
S11 : Input Return Loss	dB	-18	-18	-16	-14
S22 : Output Return Loss	dB	-15	-15	-14	-13
Output P1dB	dBm	15.5	15.5	15.5	15.3
Output IP3 @-5dBm	dBm	29.2	30.2	30.1	29.0
Noise Figure	dB	2.1	2.1	2.1	2.2

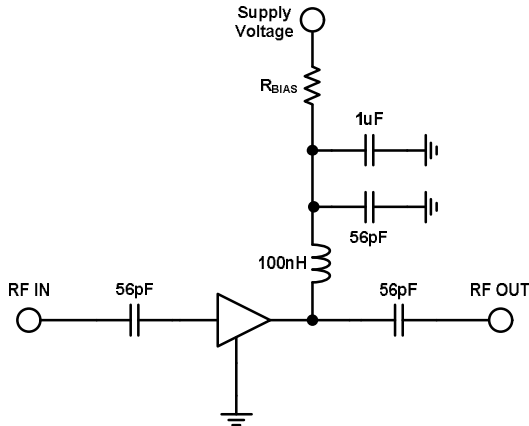


**Typical RF Performance**  
**for 900MHz Tuned Application Circuit (Vd=3.47V, Ic=34mA)**  
Supply Bias Voltage = 4.5V, R(bias)= 33 ohm, Current= 34mA

Frequency	MHz	500	900	1500	1900	2300	3000
S21	dB	23.0	21.9	20.4	19.5	18.5	16.4
S11	dB	-14	-12	-12	-13	-16	-15
S22	dB	-14	-13	-13	-13	-12	-11
P1dB	dBm	13.6	13.2	12.4	11.4	10.4	8.4
OIP3	dBm	27.0	26.1	24.3	23.3	22.0	19.5
Noise Figure	dB	2.1	2.1	2.1	2.2	2.2	2.3



**900MHz Tuned Application Circuit**

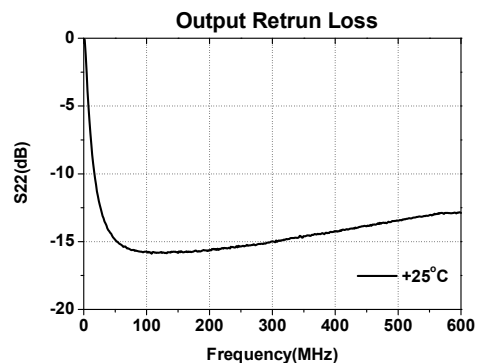
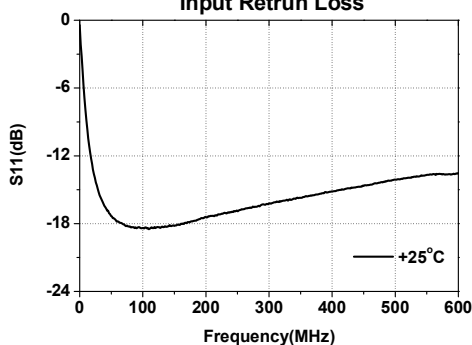
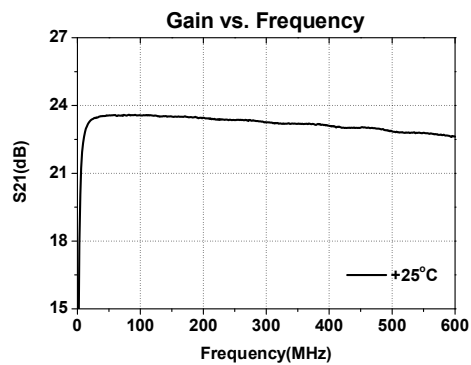
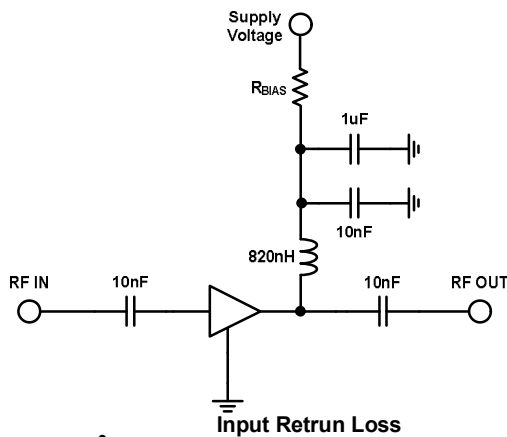


**Recommended Bias Values**

Supply Voltage	R bias Value	Size
4.5 V	33.0 Ω	0805
5 V	47.5 Ω	1210
6 V	77.0 Ω	1210
7 V	106.0 Ω	2010
8 V	135.0 Ω	2010
10 V	194.0 Ω	2010
12 V	253.0 Ω	2512

**Typical RF Performance  
for 50 -500MHz Tuned Application Circuit (Vd=3.47V, Ic=34mA)**  
Supply Bias Voltage = 4.5V, R(bias)= 33ohm, Current= 34mA

Frequency	MHz	75	125	300	500
S21 : Gain	dB	23.5	23.5	23.2	22.8
S11 : Input Return Loss	dB	-17	-18	-16	-14
S22 : Output Return Loss	dB	-15	-15	-14	-13
Output P1dB	dBm	14	14	14	13
Output IP3 @-5dBm	dBm	27.4	28.0	28.5	26.8
Noise Figure	dB	2.1	2.1	2.1	2.1

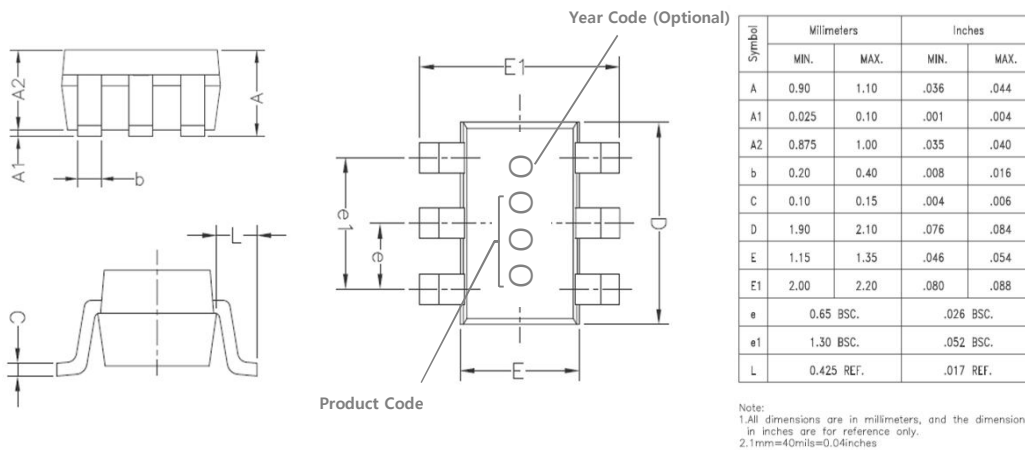


### Absolute Maximum Ratings

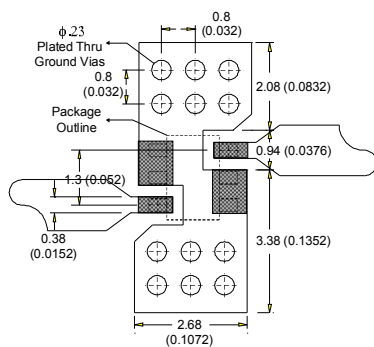
Parameter	Rating	Unit
Supply Voltage	+8	V
Supply Current	150	mA
RF Power Input	5	dBm
Storage Temperature	-55 to +125	°C
Ambient Operating Temperature	-40 to +85	°C

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

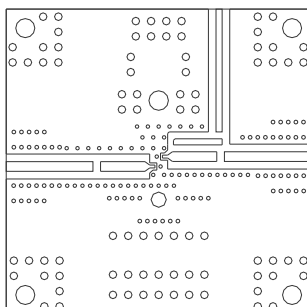
### Lead-free / RoHS Compliant / Green SOT-363 Package Outline



### Land Pattern



### Evaluation Board Layout (4x4)



### ESD / MSL Ratings

- ESD sensitive device. Observe Handling Precautions.
- ESD Rating : Class 2(Passes at 2000V min.) Human Body Model (HBM), JESD22-A114
- ESD Rating : Class IV (Passes at 1000V min.) Charged Device Model (CDM), JESD22-C101
- MSL (Moisture Sensitive Level) Rating : Level 3 at +260°C Convection reflow, J-STD-020

### Mounting Instructions

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

<http://www.prewell.com>