

Features

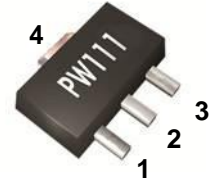
- ➔ 5 - 1000MHz
- ➔ 25 dB Gain at 200MHz
- ➔ +19 dBm P1dB
- ➔ +34.5 dBm Output IP3
- ➔ Single Voltage Supply
- ➔ Lead-free / Green / RoHS-compliant SOT-89 Package



Applications

- ➔ Broadband Gain Block
- ➔ Mobile Infrastructure
- ➔ IF Amplifier
- ➔ CATV / DBS
- ➔ RFID / Fixed Wireless

Functional Diagram



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

Description

The PW111 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 PW111 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-89 packages.

Specifications

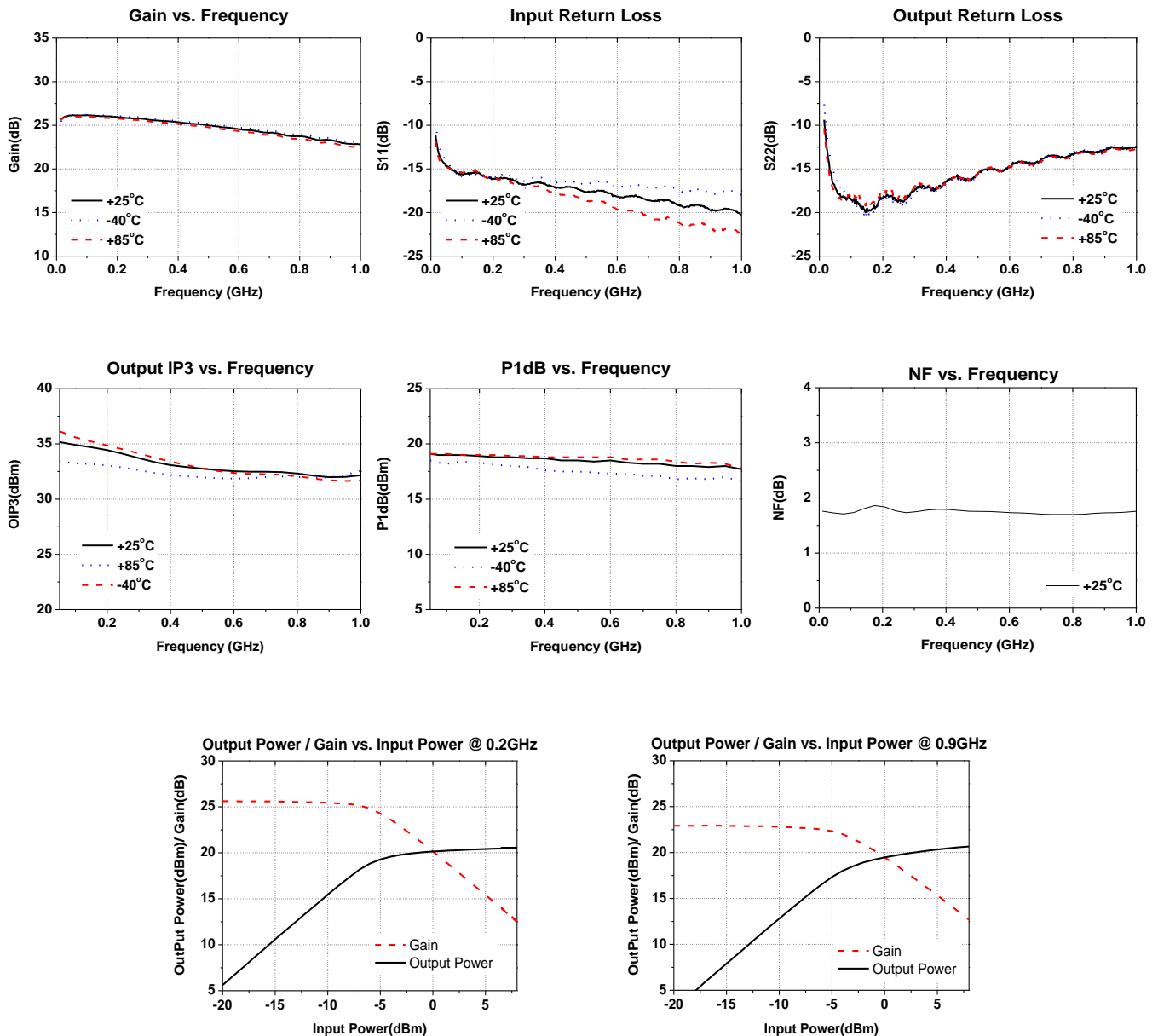
Symbol	Parameters	Units	Freq.	Min.	Typ.	Max.
S21	Gain	dB	75 MHz 200 MHz 500 MHz 900 MHz		25.5 25.4 25.6 22.8	
S11	Input Return Loss	dB	75 MHz 200 MHz 500 MHz 900 MHz		-14 -14 -17 -18	
S22	Output Return Loss	dB	75 MHz 200 MHz 500 MHz 900 MHz		-17 -17 -16 -11	
P1dB	Output Power @1dB compression	dBm	75 MHz 200 MHz 500 MHz 900 MHz		18.9 18.8 18.5 18.1	
OIP3	Output Third Order intercept	dBm	75 MHz 200 MHz 500 MHz 900 MHz		34.8 34.3 32.2 32.2	
NF	Noise Figure	dB	75 MHz 200 MHz 500 MHz 900 MHz		1.7 1.8 1.7 1.7	
V / I	Device voltage / current	V/mA			4.74/69	
Rth	Thermal Resistance	°C/W			63	

Test Conditions : T=25°C, Supply Voltage=+6V, Rbias=18.6ohm, 50ohm System, OIP3 measured with two tones at an output power of +3dBm/tone separated by 1MHz.

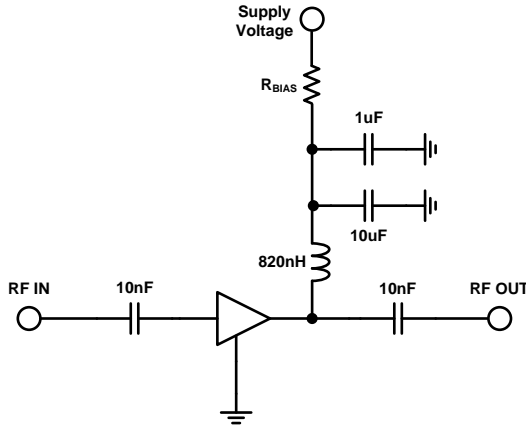
Typical RF Performance for 200MHz Tuned Application Circuit

Supply Bias Voltage = 6V, R(bias)=18.6 ohm, Current= 69mA

Frequency	MHz	75	200	500	700	900
S21	dB	25.8	25.7	25.9	24.0	23.1
S11	dB	-15	-15	-14	-18	-19
S22	dB	-18	-18	-17	-13	-12
P1dB	dBm	18.9	18.8	18.4	19.5	18.1
OIP3 @3dBm	dBm	35.1	34.6	32.5	32.6	32.5
Noise Figure	dB	1.7	1.8	1.7	1.7	1.7



200MHz Tuned Application Circuit



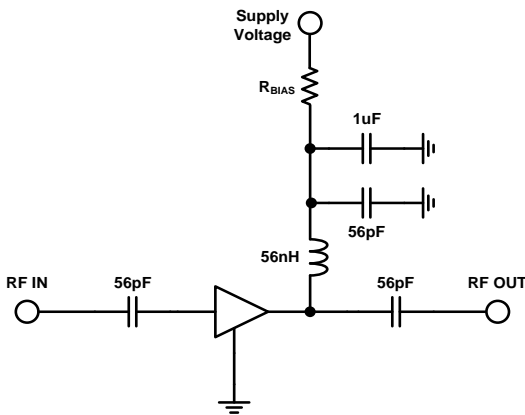
Recommended Bias Values

Supply Voltage	R bias Value	Size
6 V	18.6 Ω	1210
8 V	47.2 Ω	1210
10 V	76.5 Ω	2010
12 V	105.6 Ω	2512

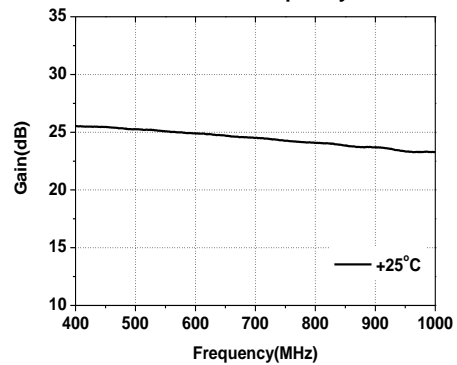
Typical RF Performance for 500 - 900MHz Tuned Application Circuit

Supply Bias Voltage = 6V, R(bias)= 18.6 ohm, Current= 69mA

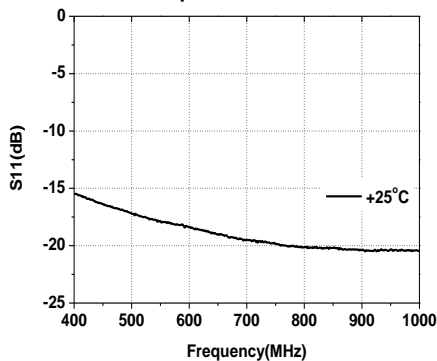
Frequency	MHz	500	700	900
S21 : Gain	dB	24.8	24.5	23.3
S11 : Input Return Loss	dB	-15	-16	-17
S22 : Output Return Loss	dB	-17	-15	-14
Output P1dB	dBm	18.4	18.2	18.1
Output IP3 @3dBm	dBm	32.6	31.7	30.8
Noise Figure	dB	1.7	1.7	1.7



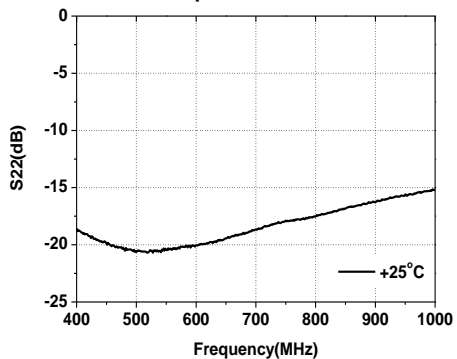
Gain vs. Frequency



Input Return Loss



Output Return Loss



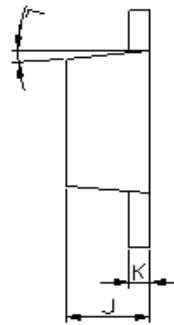
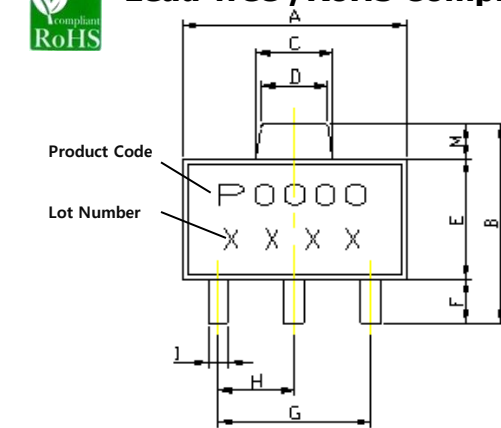
Absolute Maximum Ratings

Parameter	Rating	Unit
Device Voltage	+5	V
Device Current	150	mA
RF Power Input	10	dBm
Storage Temperature	-55 to +125	°C
Ambient Operating Temperature	-40 to +85	°C
Junction Temperature for >10 ⁶ hours MTF	188	°C

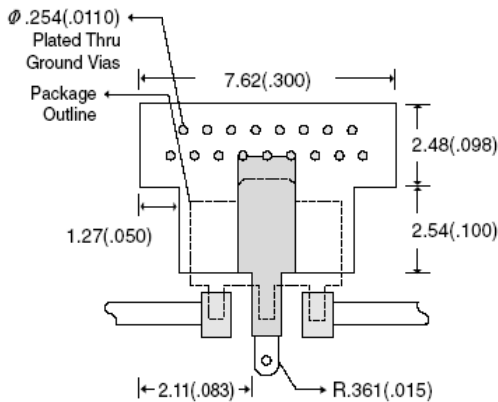
Operation of this device above any of these parameters may cause permanent damage.



Lead-free / RoHS Compliant / Green SOT-89 Package Outline



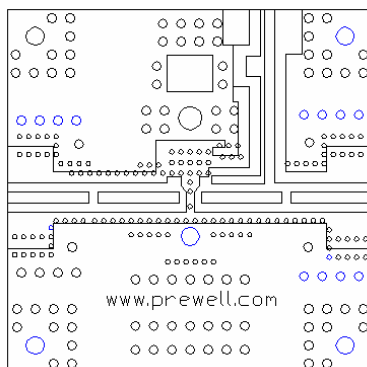
REF	DIMENSIONS	
	Millimeters	
	Min.	Max.
A	4.40	4.60
B	4.05	4.25
C	1.50	1.70
D	1.30	1.50
E	2.40	2.60
F	0.89	1.20
G	3.00 REF.	
H	1.50 REF.	
I	0.40	0.52
J	1.40	1.60
K	0.35	0.41
L	5° TYP.	
M	0.70 REF.	



ESD / MSL Ratings

1. ESD sensitive device.
Observe Handling Precautions.
2. ESD Rating : Class 2 (Passes at 2000V 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.

<http://www.prewell.com>