SJM PREWELL

PW290-63

Wideband Gain Block

Features

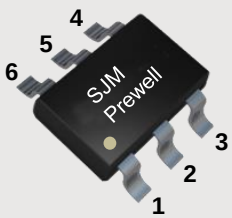
- 5 to 3000MHz
- Gain 14.0dB @ 75MHz
- P1dB 15.1dBm @ 900MHz
- OIP3 31.8dBm @ 75MHz
- Lead-free / Green / RoHS compliant SOT-363 Package

Applications

- Base station / Repeater / Mobile / Automotive / Military
  - FDD-LTE, TD-LTE, TDS-CDMA, CDMA, WCDMA, WiMAX, PCS, GSM, GPS, GPRS, TETRA
- IoT / Broadcasting / WLAN
  - FM, DMB, DVB, ISM

Functional Diagram

RF IN	**3**	RF OUT /	**6**
GND	**1,2,4,5**	Bias	



ESD/MSL

1 ESD sensitive device. Observe handling precautions.

2 HBM: Class 2 , JESD22-A114

3 CDM: Class C3 , JESD22-C101F

4 MSL 3, J-STD-020

Description

The PW290-63 is a high performance InGaP HBT MMIC Amplifier and consists of Darlington pair amplifiers. The features of PW290-63 are high linear performance, wideband operation and high reliability. The PW290-63 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-mounted plastic SOT-363 package. All devices are 100% RF and DC tested.

Specifications

Parameter	Units	Frequency (MHz)				
		75	900	1900	2300	2600
S21	dB	14.0	14.0	13.7	13.3	12.7
S11	dB	-14	-16	-20	-17	-15
S22	dB	-10	-14	-14	-13	-13
P1dB	dBm	15.3	15.3	15.2	15.1	14.9
OIP3	dBm	31.8	31.4	29.2	28.4	27.7
NF	dB	3.42	3.51	3.58	3.69	3.84
V / I	V/mA	4.3 / 45				
Rth	°C/W	77				

1) Test Conditions : T=25°C, Supply Voltage=5V, Rbias=15ohm, 50ohm System
2) OIP3 measured with two tones at an output power of -3dBm/tone separated by 1MHz.

Absolute Maximum Ratings

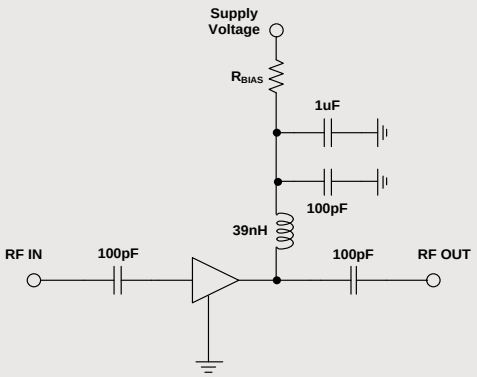
Parameter	Rating	Unit
Device Voltage	8.5	V
Device Current	170	mA
RF Power Input	20	dBm
Storage Temperature	-55 to 150	°C
Ambient Operating Temperature	-40 to 85	°C
Junction Temperature	187	°C

1) Stresses above the maximum values listed have may cause permanent damage to the device.
2) MTTF is more than 100 years.

Typical RF Performance for 1.9GHz Tuned Application Circuit

Supply Bias Voltage = 5V, R(bias)= 15 ohm, Current=45mA

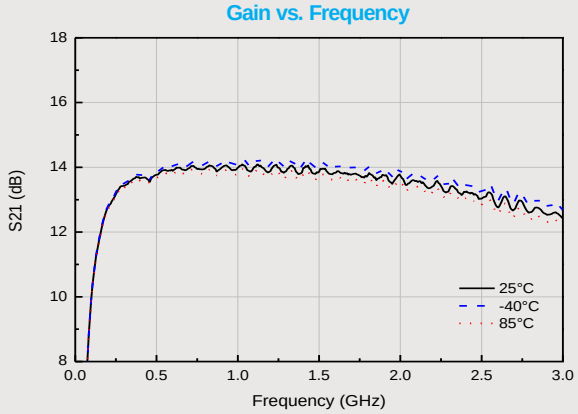
Parameters	Units	Frequency (MHz)						
		500	900	1500	1900	2300	2600	3000
S21	dB	13.8	14.0	13.9	13.7	13.3	12.7	12.4
S11	dB	-12	-16	-20	-20	-17	-15	-12
S22	dB	-11	-14	-14	-14	-13	-13	-13
P1dB	dBm	15.1	15.3	15.1	15.2	15.1	14.9	14.5
OIP3 @ -3dBm	dBm	31.4	31.4	30.2	29.2	28.4	27.7	26.9
NF	dB	3.58	3.51	3.53	3.58	3.69	3.84	3.97



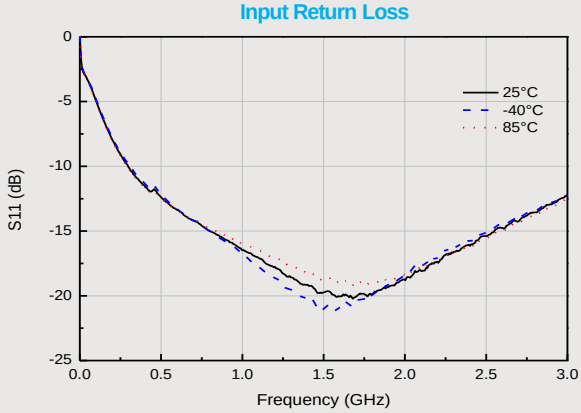
Recommended Bias Values

Supply Voltage (V)	R bias Value (ohm)	Size
5	15.0	0805
6	37.0	0805
7	59.4	1210
8	81.5	1210
9	103.5	2010
10	126.0	2010
12	170.0	2512

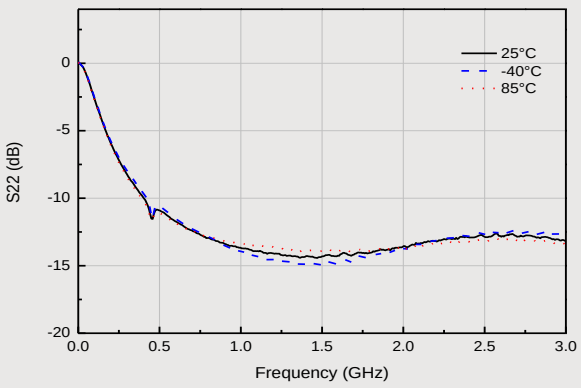
Gain vs. Frequency



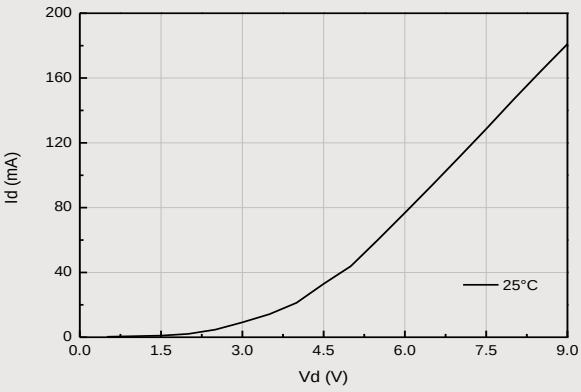
Input Return Loss



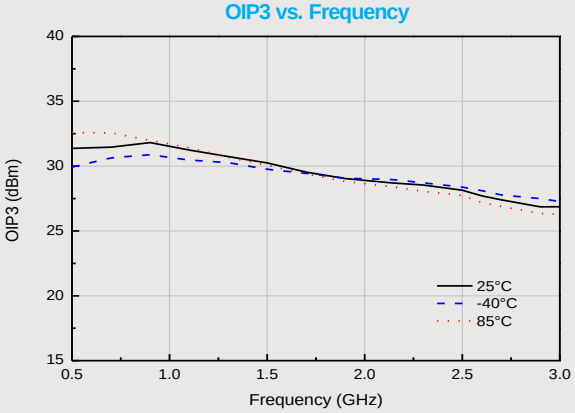
Output Return Loss



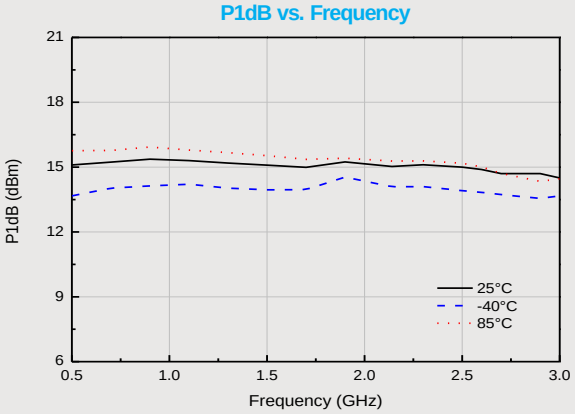
Vd vs. Id



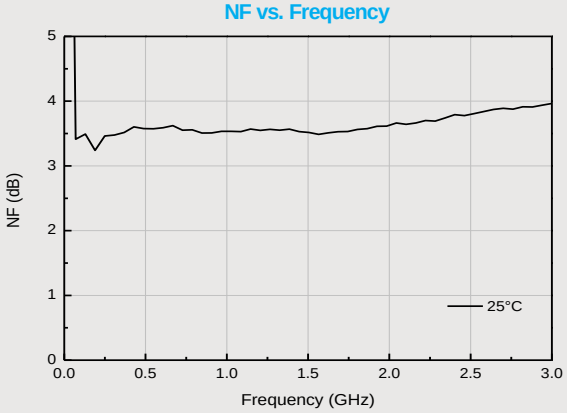
OIP3 vs. Frequency



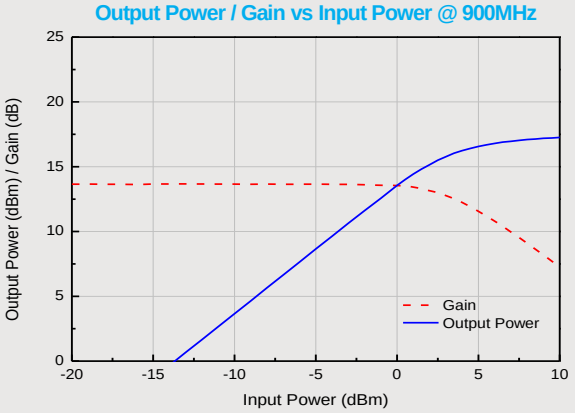
P1dB vs. Frequency



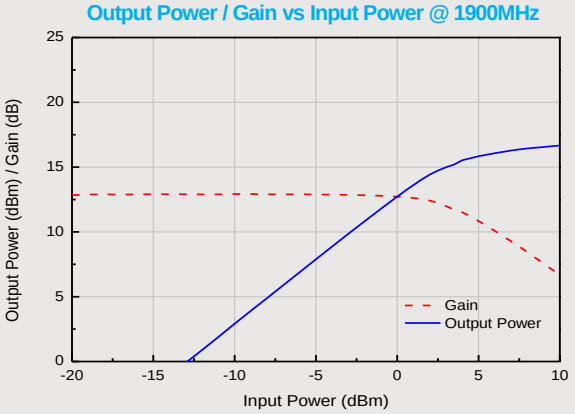
NF vs. Frequency



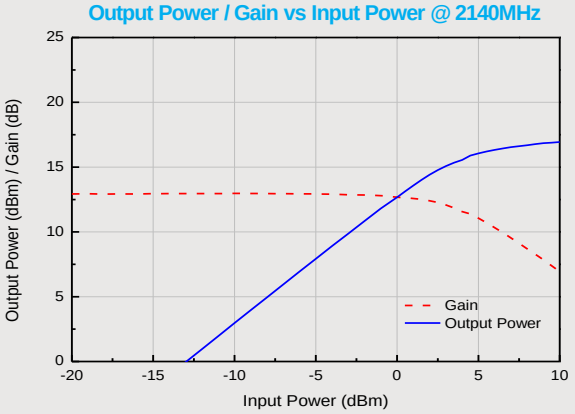
Output Power / Gain vs Input Power @ 900MHz



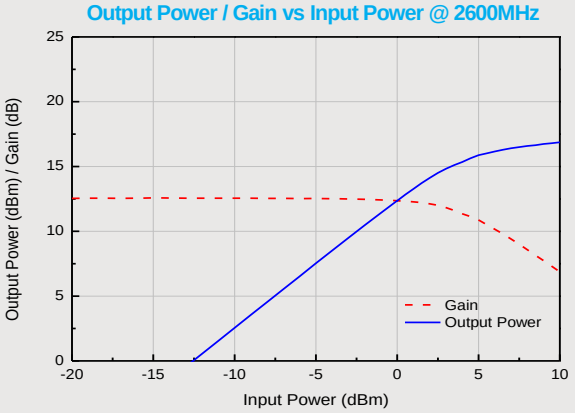
Output Power / Gain vs Input Power @ 1900MHz



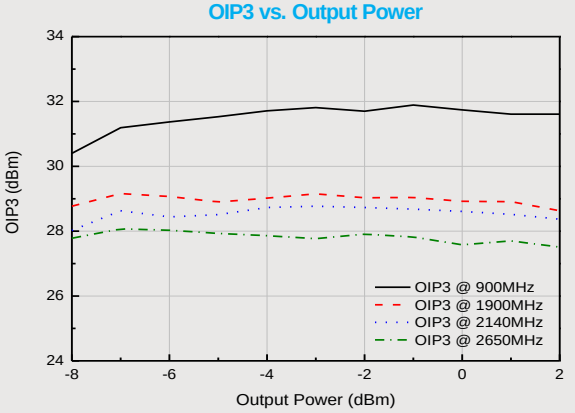
Output Power / Gain vs Input Power @ 2140MHz



Output Power / Gain vs Input Power @ 2600MHz

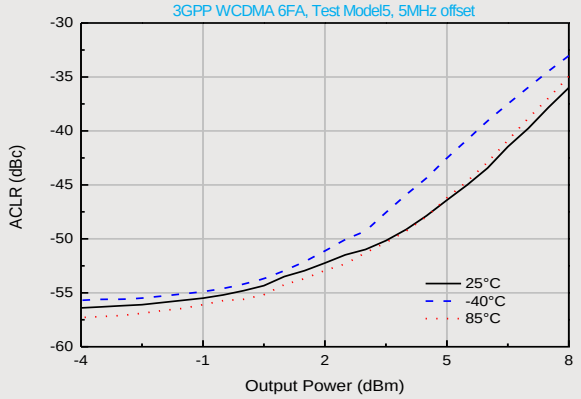


OIP3 vs. Output Power



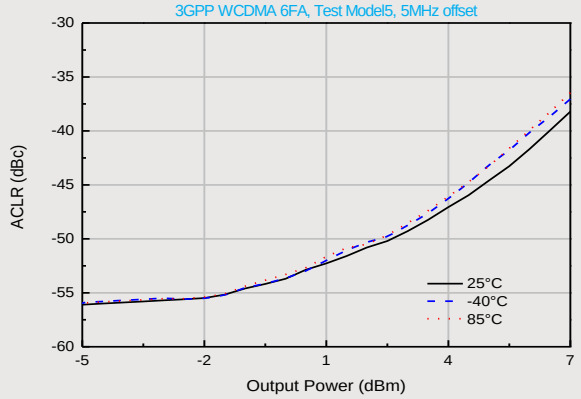
WCDMA ACLR vs. Output Power @ 1850MHz

3GPP WCDMA 6FA, Test Model5, 5MHz offset



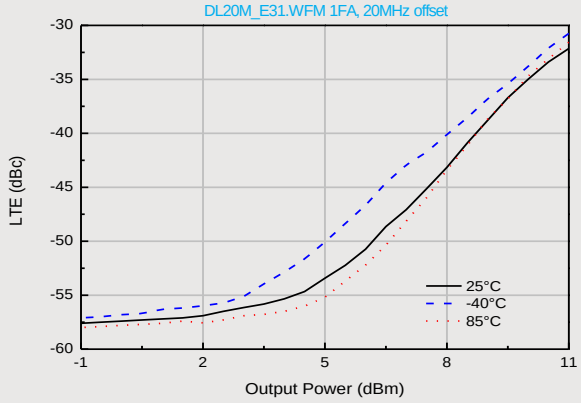
WCDMA ACLR vs. Output Power @ 2140MHz

3GPP WCDMA 6FA, Test Model5, 5MHz offset



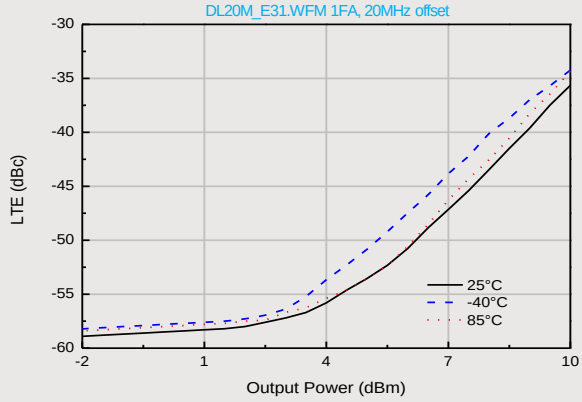
LTE ACLR vs. Output Power @ 900MHz

DL20M_E31.WFM 1FA, 20MHz offset



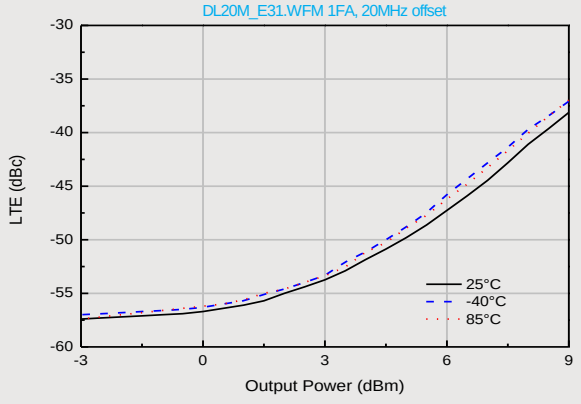
LTE ACLR vs. Output Power @ 1850MHz

DL20M_E31.WFM 1FA, 20MHz offset



LTE ACLR vs. Output Power @ 2650MHz

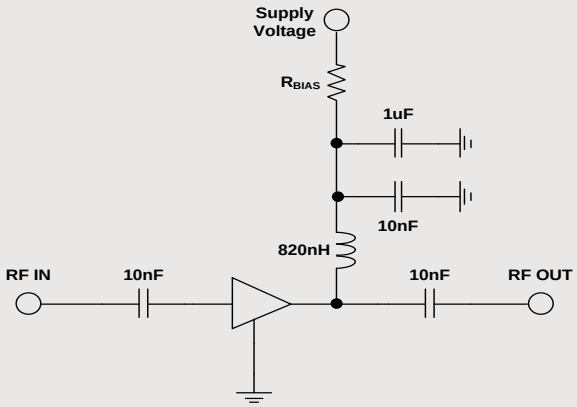
DL20M_E31.WFM 1FA, 20MHz offset

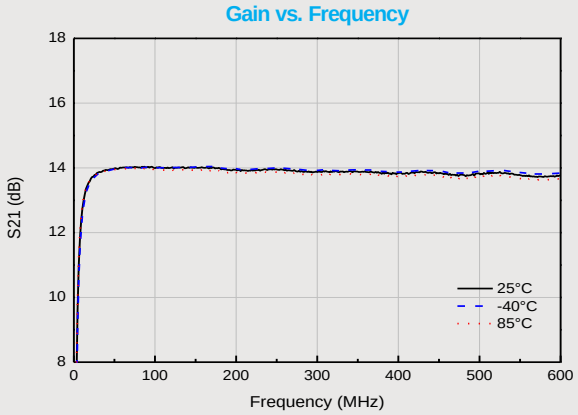


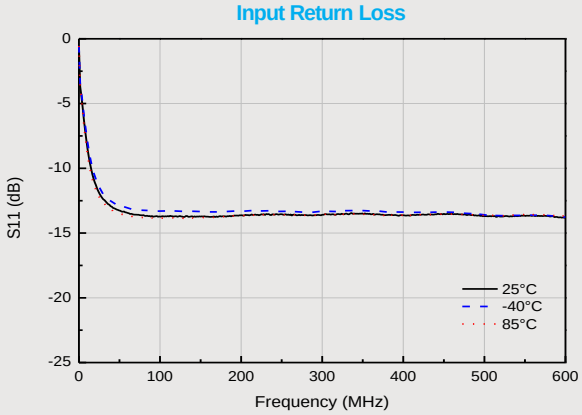
Typical RF Performance for 50 - 500MHz Tuned Application Circuit

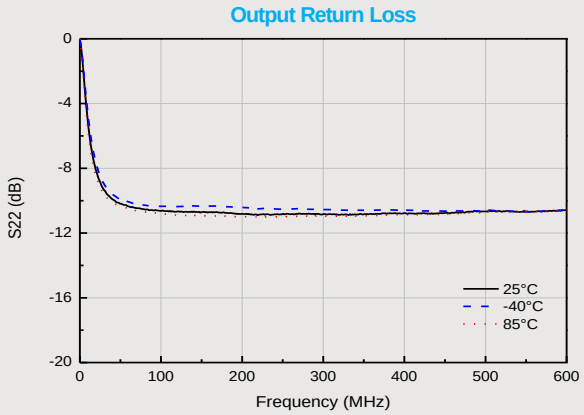
Supply Bias Voltage = 5V, R(bias)= 15 ohm, Current=45mA

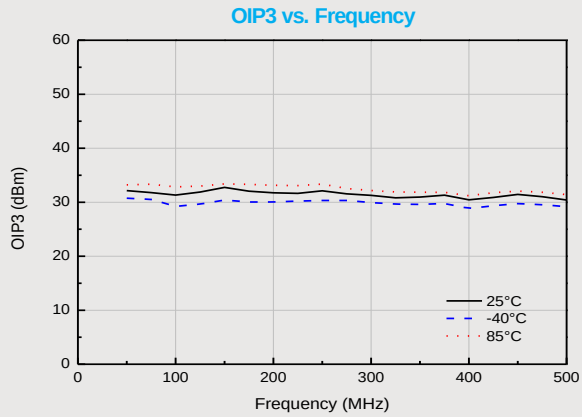
Parameters	Units	Frequency (MHz)			
		75	125	300	500
S21	dB	14.0	14.0	13.9	13.8
S11	dB	-14	-14	-14	-14
S22	dB	-10	-11	-11	-11
P1dB	dBm	15.3	15.2	15.3	15.2
OIP3 @ -3dBm	dBm	31.8	31.9	31.3	30.4
NF	dB	3.2	3.3	3.4	3.5

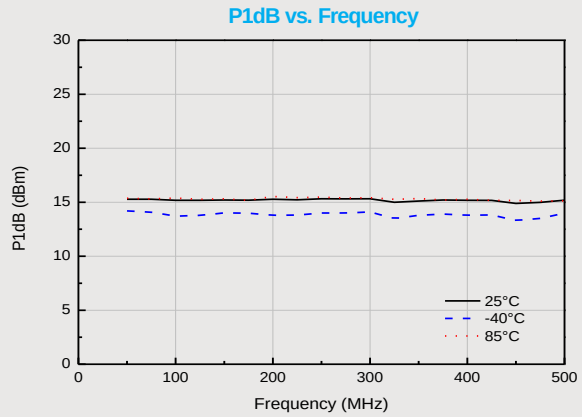




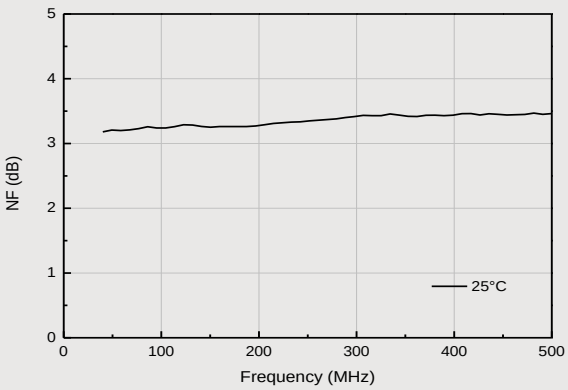




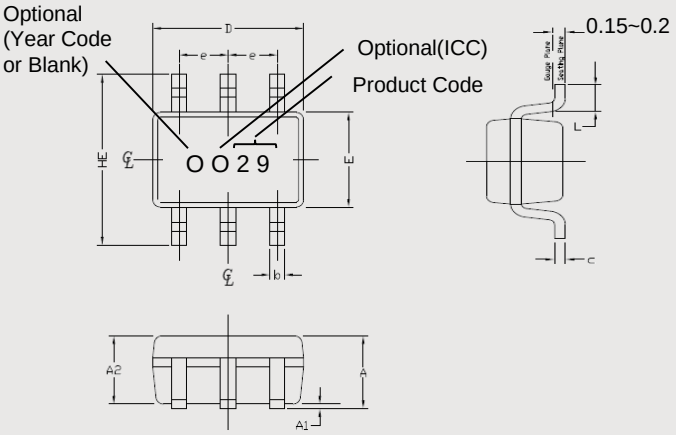




NF vs. Frequency

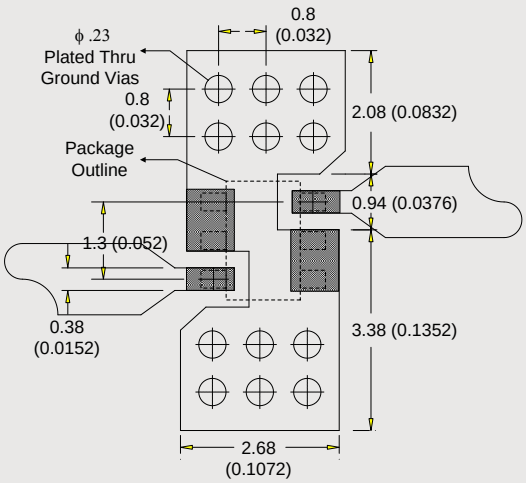


Lead-free /RoHS Compliant / Green SOT-363 Package Outline

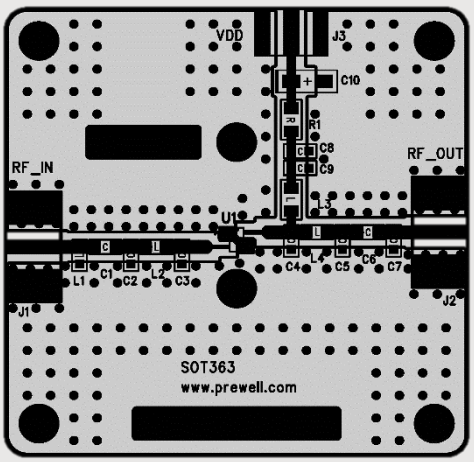


SYMBOL	MIN.	MAX.
E	1.15	1.35
D	1.85	2.25
HE	1.95	2.30
A	0.80	1.10
A2	0.70	1.00
A1	0.00	0.10
e	0.65 BSC	
b	0.15	0.40
c	0.08	0.25
L	0.21	0.26

Land Pattern



Evaluation Board Layout (40x40)



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. RF trace width depends on the board material and construction.
5. Add mounting screws near the part to fasten the board to a heatsink.
6. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.