SJM PREWELL

PG771

Wideband Gain Block

Features

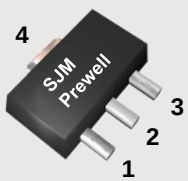
- 5 to 4000MHz
- Gain 17.3dB @ 75MHz
- P1dB 18.2dBm @ 1900MHz
- OIP3 37.7dBm @ 75MHz
- Lead-free / Green / RoHS compliant SOT-89 Package

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 **1** RF OUT / Bias **3**
GND **2,4**



ESD/MSL

1 ESD sensitive device. Observe handling precautions.

2 HBM: Class 1C, JESD22-A114

3 CDM: Class C3 , JESD22-C101F

4 MSL 3, J-STD-020

Description

The PG771 is a high performance InGaP HBT MMIC Amplifier and consists of Darlington pair amplifiers. The PG771 features high linear performance, wideband operation and high reliability. The PG771 is designed for enabling to stable performance over temperature using an internal active bias and temperature compensated circuit. The PG771 operates from a single voltage supply and requires only two DC-blocking capacitors and an inductor for operation. A bias resistor is not required, the device biased directly from single supply voltage. The device is a general purpose buffer amplifier that offers high dynamic range in a low cost surface-mounted plastic SOT-89 package. All devices are 100% RF and DC tested.

Specifications

Parameter	Units	Frequency (MHz)					
		75	900	1900	2300	2600	3600
S21	dB	17.3	17.1	16.1	15.4	14.9	14.9
S11	dB	-26	-22	-23	-20	-16	-18
S22	dB	-10	-12	-10	-9	-8	-15
P1dB	dBm	19.2	19.4	18.2	18.4	18.4	17.9
OIP3	dBm	37.7	36.9	33.7	32.8	32.3	29.3
NF	dB	4.2	4.5	4.8	5.0	5.1	5.5
V / I	V/mA	5 / 75					
Rth	°C/W	73					

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

Absolute Maximum Ratings

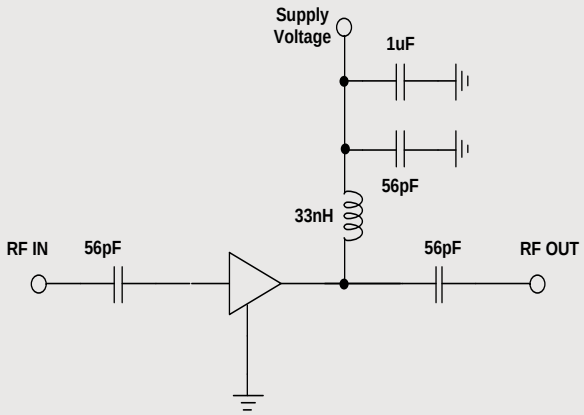
Parameter	Rating	Unit
Device Voltage	7	V
Device Current	170	mA
RF Power Input	8	dBm
Storage Temperature	-55 to 150	°C
Ambient Operating Temperature	-40 to 85	°C
Junction Temperature	185	°C

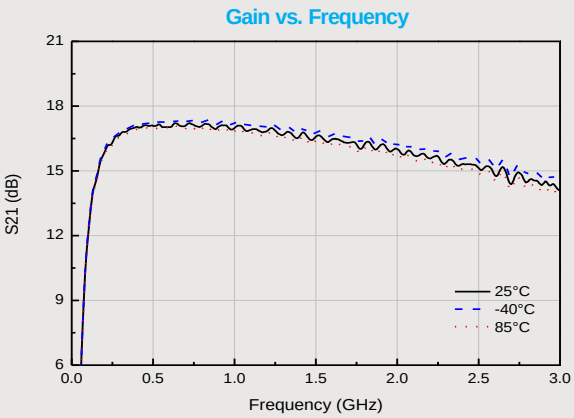
1) Stresses above the maximum values listed have may cause permanent damage to the device.
2) MTTF is more than 100 years.

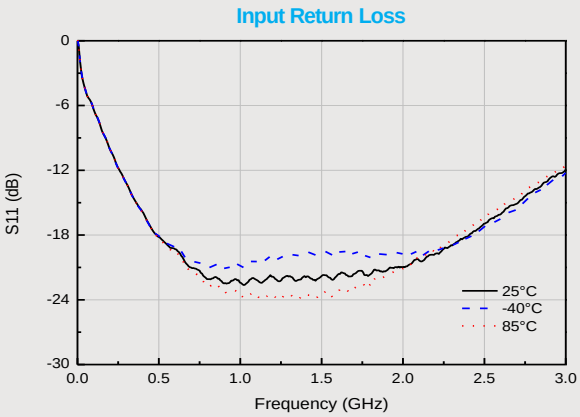
Typical RF Performance for 1.9GHz Tuned Application Circuit

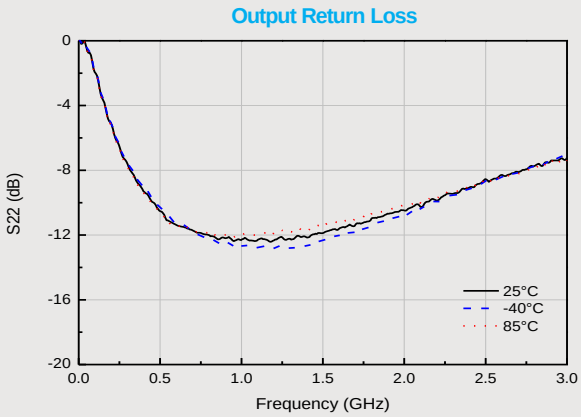
Supply Bias Voltage = 5V, Current= 75mA

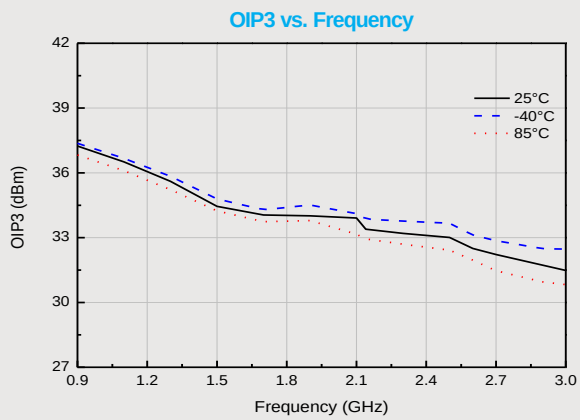
Parameters	Units	Frequency (MHz)						
		500	900	1500	1900	2300	2600	3000
S21	dB	17.0	17.1	16.6	16.1	15.4	14.9	14.4
S11	dB	-18	-22	-23	-23	-20	-16	-12
S22	dB	-10	-12	-11	-10	-9	-8	-7
P1dB	dBm	19.2	19.4	19.4	18.2	18.5	18.5	18.2
OIP3 @ 3dBm	dBm	36.6	36.9	34.9	33.7	32.8	32.3	31.0
NF	dB	4.6	4.5	4.7	4.8	5.0	5.1	5.1

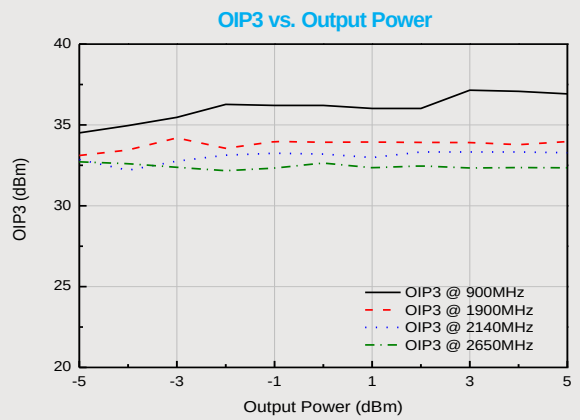




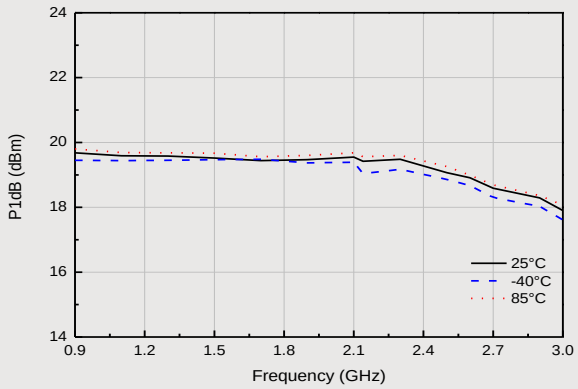




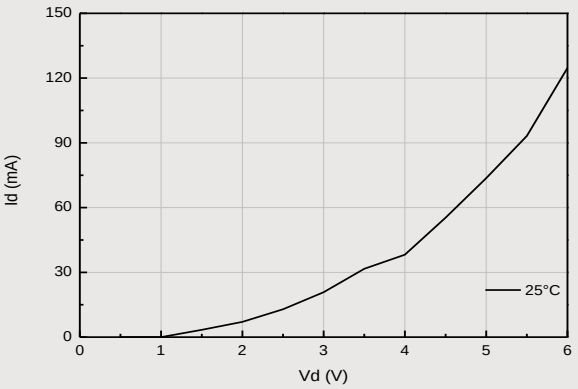




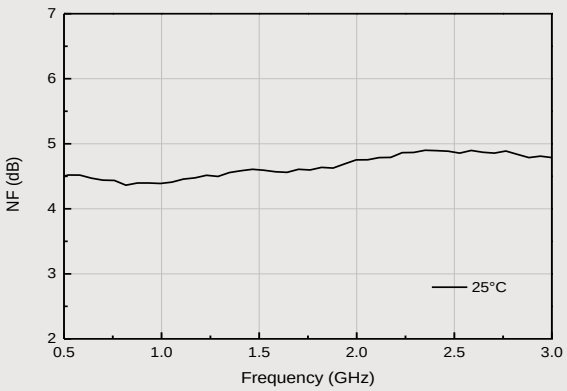
P1dB vs. Frequency



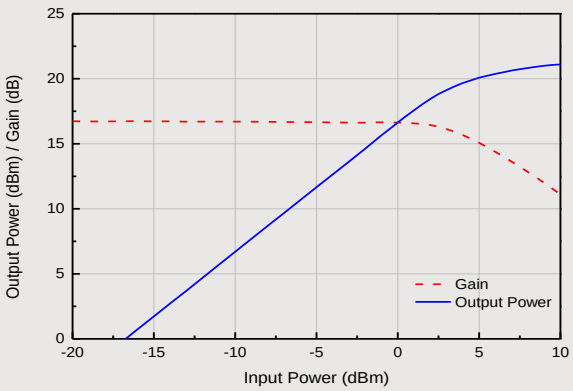
Id vs. Vd



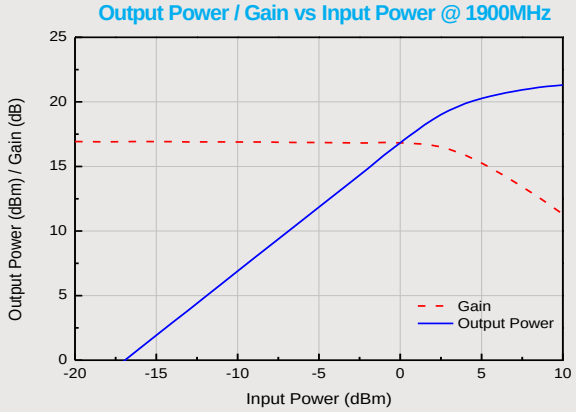
NF vs. Frequency



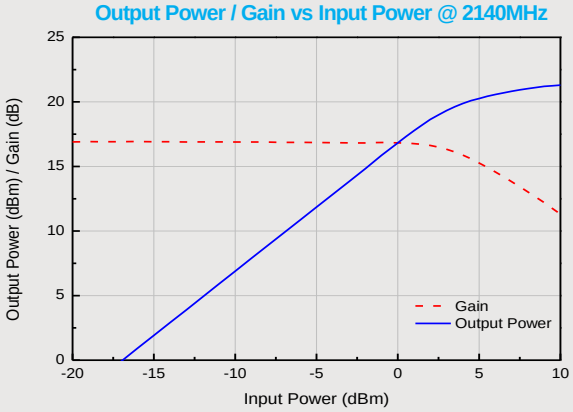
Output Power / Gain vs Input Power @ 900MHz



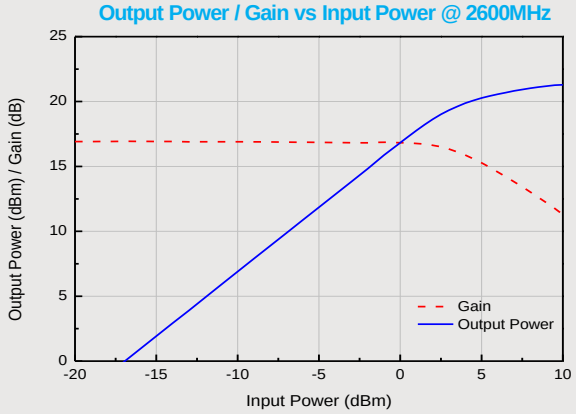
Output Power / Gain vs Input Power @ 1900MHz



Output Power / Gain vs Input Power @ 2140MHz

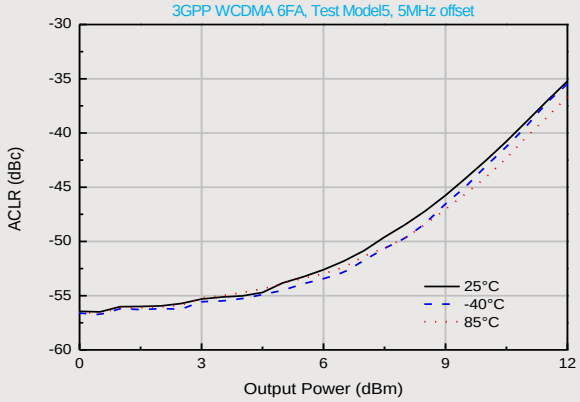


Output Power / Gain vs Input Power @ 2600MHz



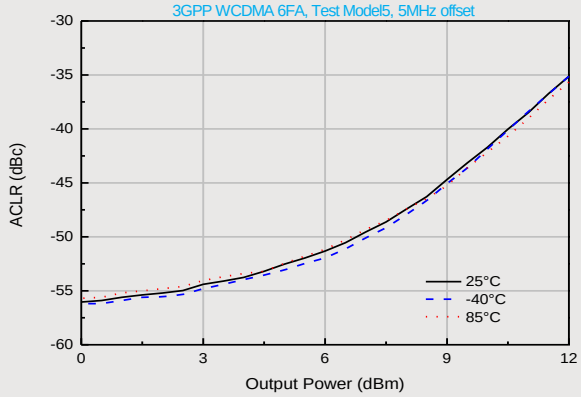
WCDMA ACLR vs. Output Power @ 1850MHz

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



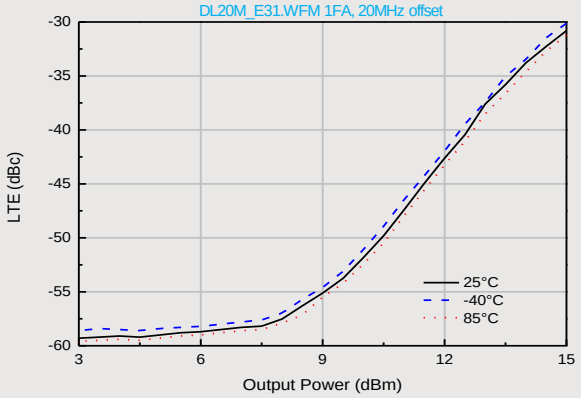
WCDMA ACLR vs. Output Power @ 2140MHz

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



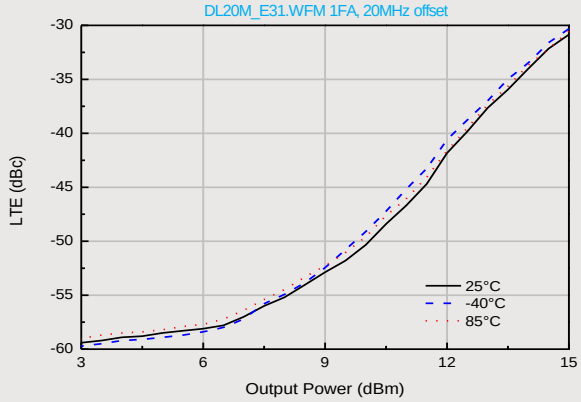
LTE ACLR vs. Output Power @ 900MHz

DL20M_E31.WFM 1FA, 20MHz offset



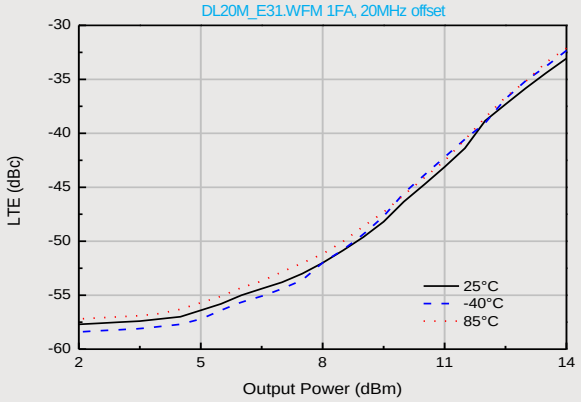
LTE ACLR vs. Output Power @ 1850MHz

DL20M_E31.WFM 1FA, 20MHz offset



LTE ACLR vs. Output Power @ 2650MHz

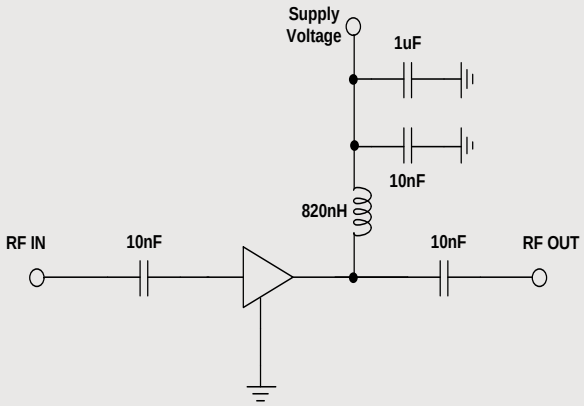
DL20M_E31.WFM 1FA, 20MHz offset

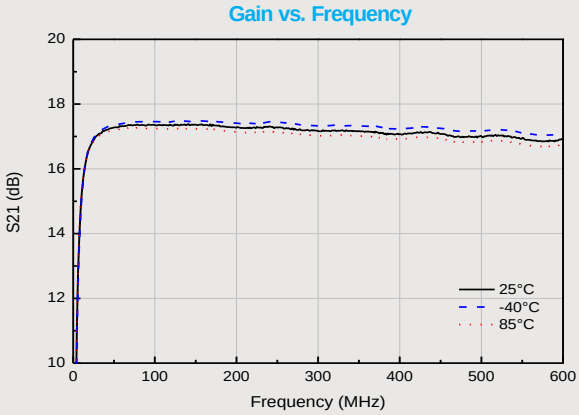


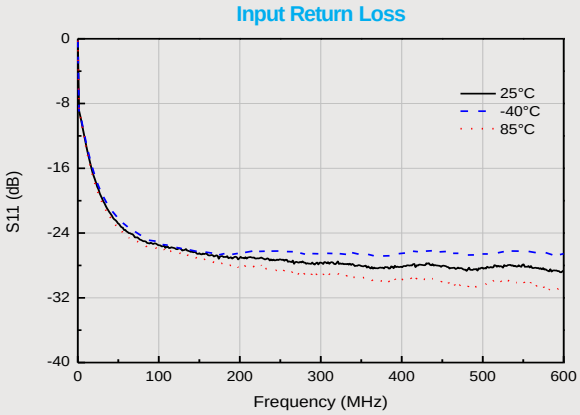
Typical RF Performance for 50 – 500MHz Tuned Application Circuit

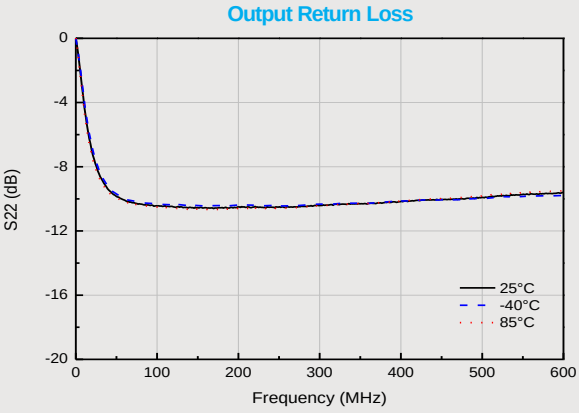
Supply Bias Voltage = 5V, Current= 75mA

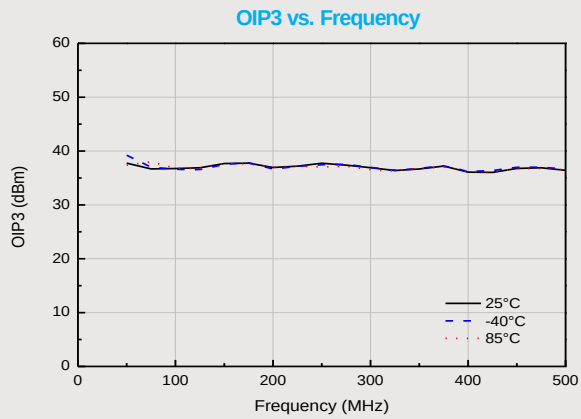
Parameters	Units	Frequency (MHz)			
		75	125	300	500
S21	dB	17.3	17.3	17.1	17.0
S11	dB	-26	-29	-31	-30
S22	dB	-10	-10	-11	-10
P1dB	dBm	19.2	19.3	19.4	19.3
OIP3 @ 3dBm	dBm	37.7	37.4	36.9	36.7
NF	dB	4.2	4.2	4.4	4.5

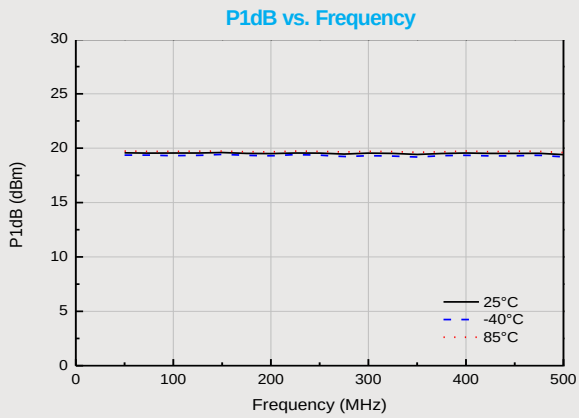




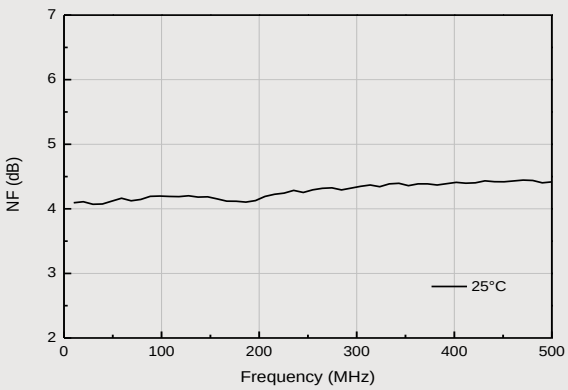








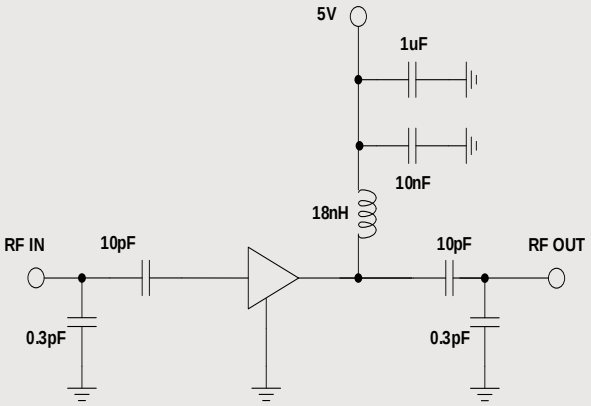
NF vs. Frequency

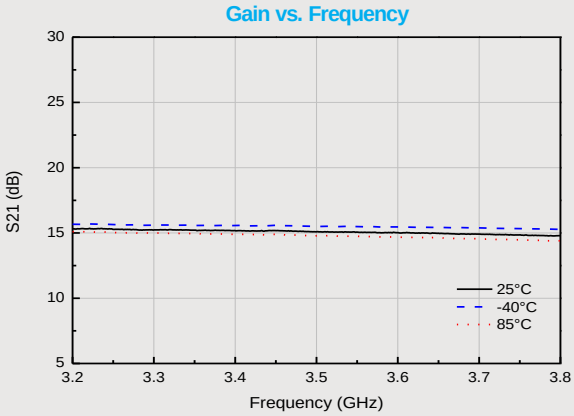


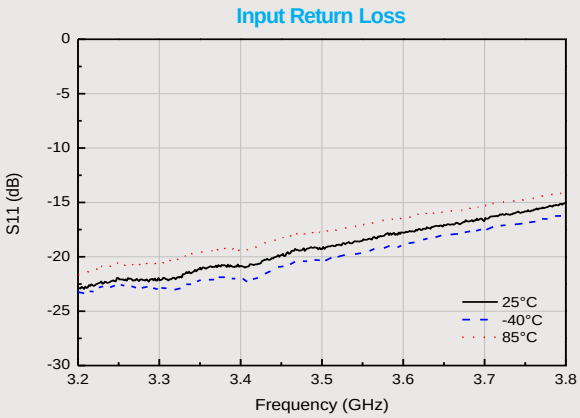
Typical RF Performance for 3.5GHz Tuned Application Circuit

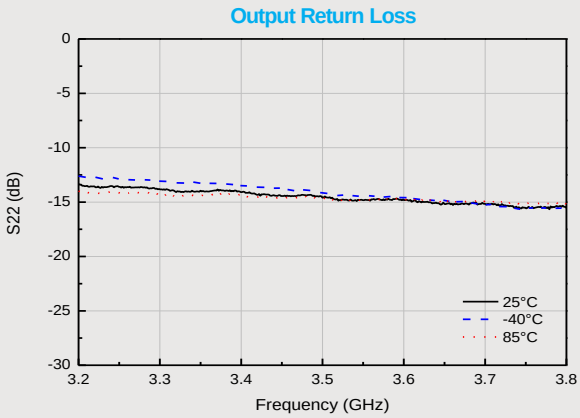
Supply Bias Voltage = 5V, Current= 75mA

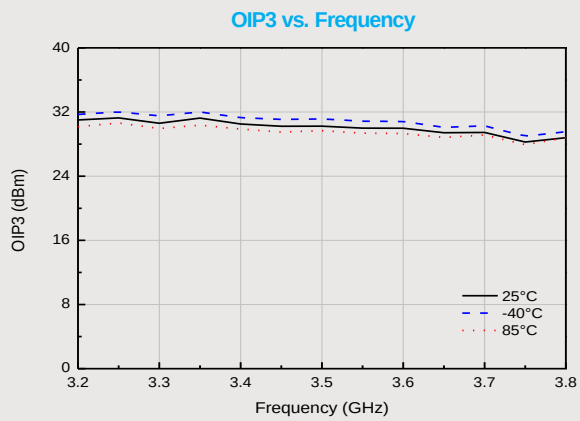
Parameters	Units	Frequency (MHz)			
		3200	3400	3600	3800
S21	dB	15.4	15.3	14.9	14.9
S11	dB	-25	-21	-18	-15
S22	dB	-13	-14	-15	-16
P1dB	dBm	19.0	18.6	17.9	17.3
OIP3 @ 3dBm	dBm	31.2	30.3	29.3	28.5
NF	dB	5.2	5.4	5.5	5.3

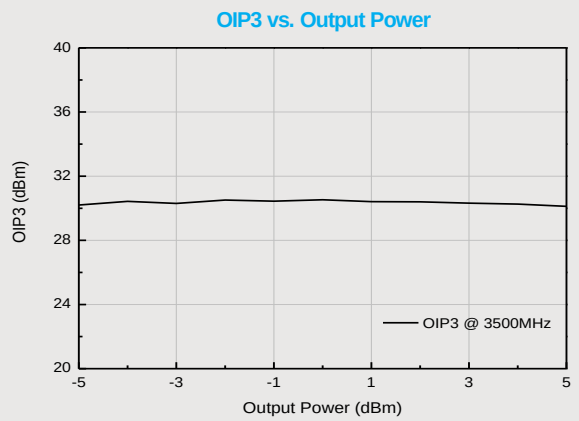




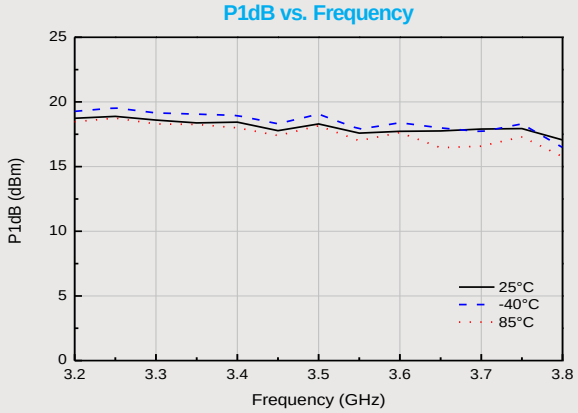




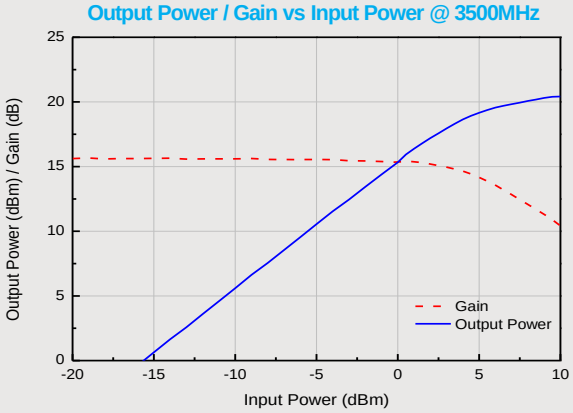




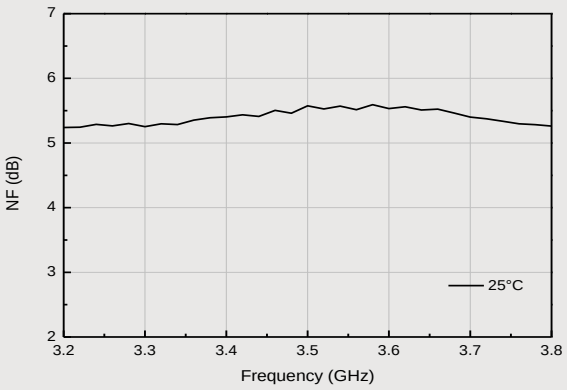
P1dB vs. Frequency



Output Power / Gain vs Input Power @ 3500MHz

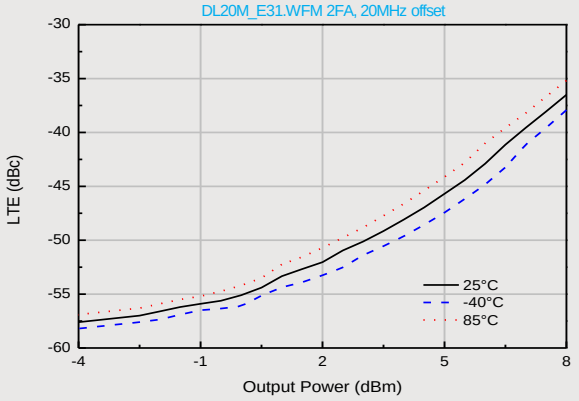


NF vs. Frequency

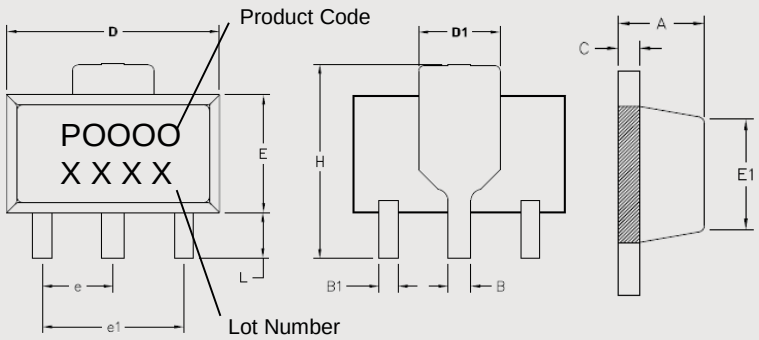


LTE ACLR vs. Output Power @ 3500MHz

DL20M_E31.WFM 2FA, 20MHz offset

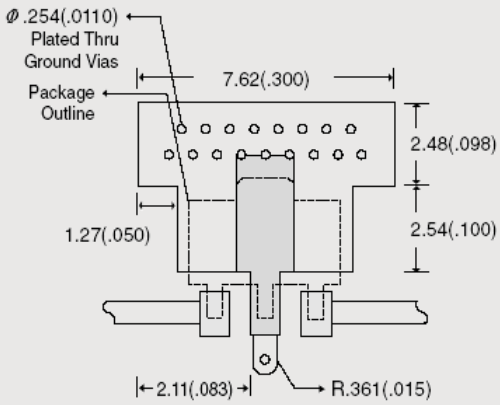


Lead-free /RoHS Compliant / Green SOT-89 Package Outline

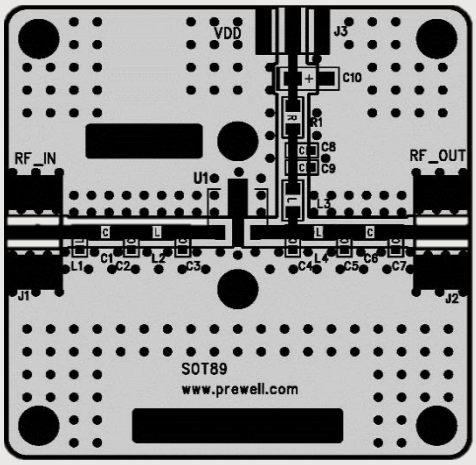


REF.	DIMENSIONS (mm)	
	Min.	Max.
A	1.40	1.60
B	0.43	0.58
B1	0.36	0.54
C	0.35	0.46
D	4.30	4.70
D1	1.50	1.87
E	2.29	2.70
E1	2.13	2.18
e	1.5	
e1	3.0	
H	3.43	5.10
L	0.74	1.20

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.