

5-4000 MHz Cascadeable InGaP HBT Gain Block

Device Features

- 37dBm Output IP3 at 5dBm/tone at 900MHz
- 12.7dB Gain at 1900MHz
- 18.8dBm P1dB at 1900MHz
- Highly Reliable InGaP/GaAs HBT Technology
- Temperature Compensation Circuit patent
- SOT-86 Surface Mount Package
- 50ohm Cascadeable
- Lead-free/Green/RoHS compliant
- Application: PA Driver Amplifier, Cellular, PCS, GSM, UMTS, Wireless Data, Satellite Receivers



Electrical Specifications ($T_a = 25^\circ\text{C}$, $V_s = 5\text{V}$)

Parameters	Test Conditions	Min	Typ	Max	Unit
Frequency Range		5		4000	MHz
Gain	900 MHz		13.1		dB
	1900 MHz		12.7		
	2140 MHz		12.4		
	2450 MHz		12.0		
	3500 MHz		9.6		
S11	900 MHz		-14.2		dB
	1900 MHz		-14.1		
	2140 MHz		-14.5		
	2450 MHz		-15.9		
	3500 MHz		-13.5		
S22	900 MHz		-11.3		dB
	1900 MHz		-14.4		
	2140 MHz		-15.3		
	2450 MHz		-14.7		
	3500 MHz		-8.3		
OIP3	900 MHz		37.0		dBm
	1900 MHz		36.5		
	2140 MHz		35.0		
	2450 MHz		35.0		
	3500 MHz		31.0		
P1dB	900 MHz		18.7		dBm
	1900 MHz		18.8		
	2140 MHz		18.9		
	2450 MHz		18.7		
	3500 MHz		18.1		
Ic	Vc = 5.0V		73		mA
Vc			5.0		V
dG/dT			-0.004		dB/°C
Rth	Thermal Resistance		85		°C/W

Test conditions unless otherwise noted.

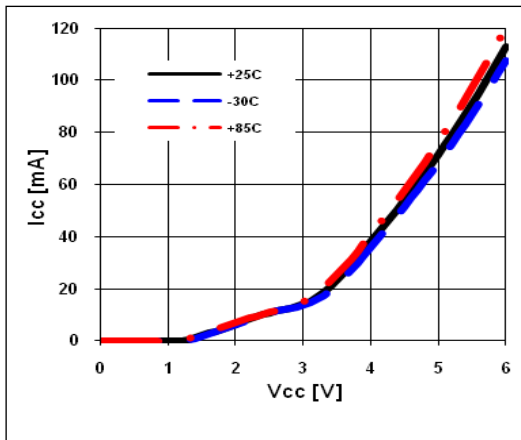
1. Device performance is measured on BeRex evaluation board at 25C, 50 ohm system
2. OIP3 measured with two tones at an output power of 5dBm/tone separated by 1MHz.

Absolute Maximum Ratings

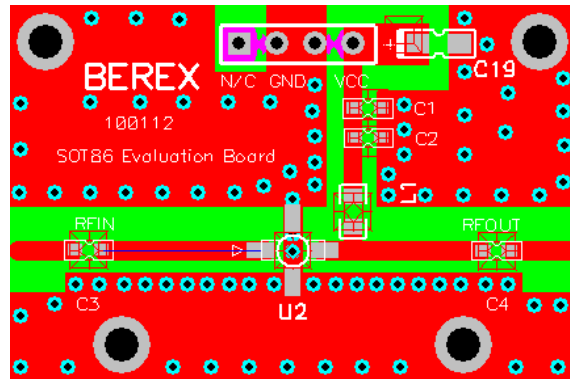
Parameters	Rating
Operating Case temperature	-40 to +85°C
Storage Temperature	-55 to +155°C
Junction Temperature	+220°C
Operating Voltage	+5.5V
Supply Current	150mA
Input RF Power	23dBm

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

[I-V Characteristics]



[Generic SOT89 Evaluation Board]



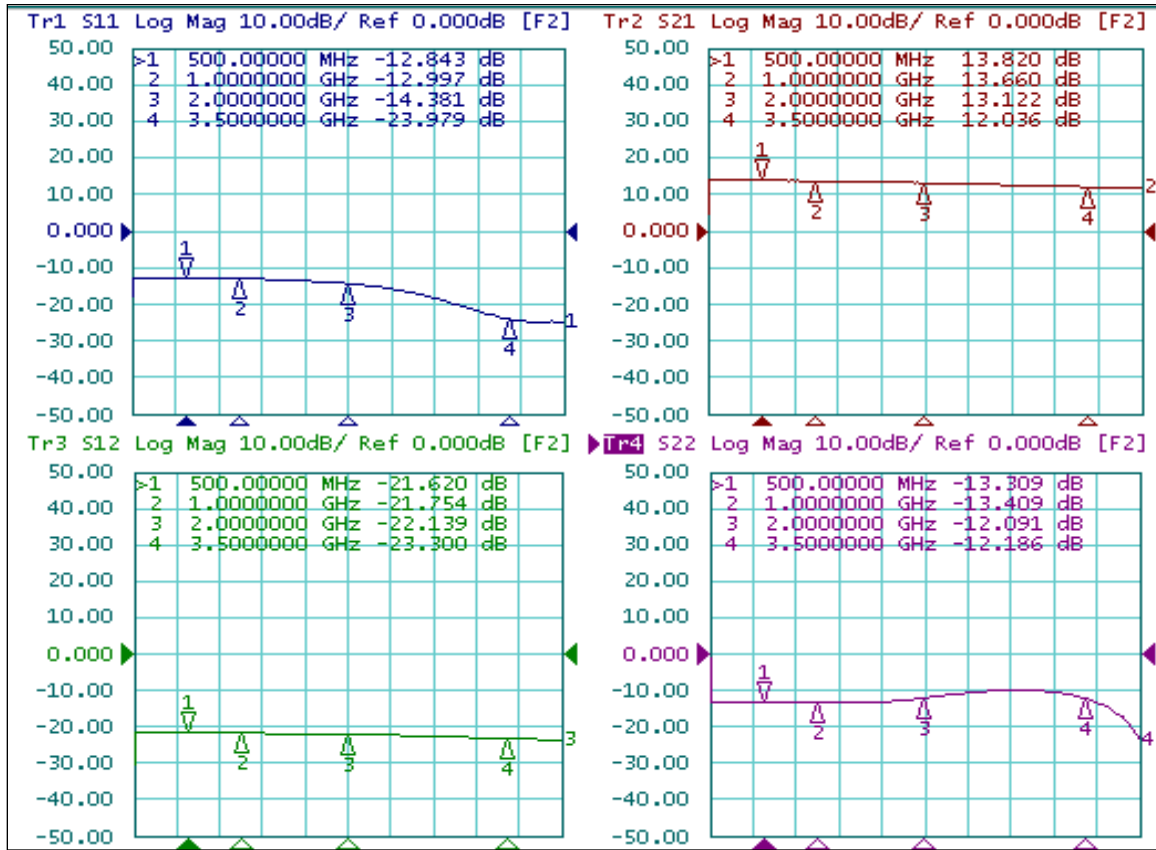
- *Dielectric constant is 4.2
- *RF pattern width 52mil
- *31mil thick FR4 PCB

Application Circuit: 5-4000 MHz

Schematic Diagram	BOM	Tolerance
	C1	100pF ±5%
	C2	100pF ±5%
	C3	100pF ±5%
	C4	1000pF ±5%
	C5	10uF ±20%
	L1	15nH ±5%

Typical Device Data

S-parameters (Vc=5V, Ic=73mA, T=25°C)

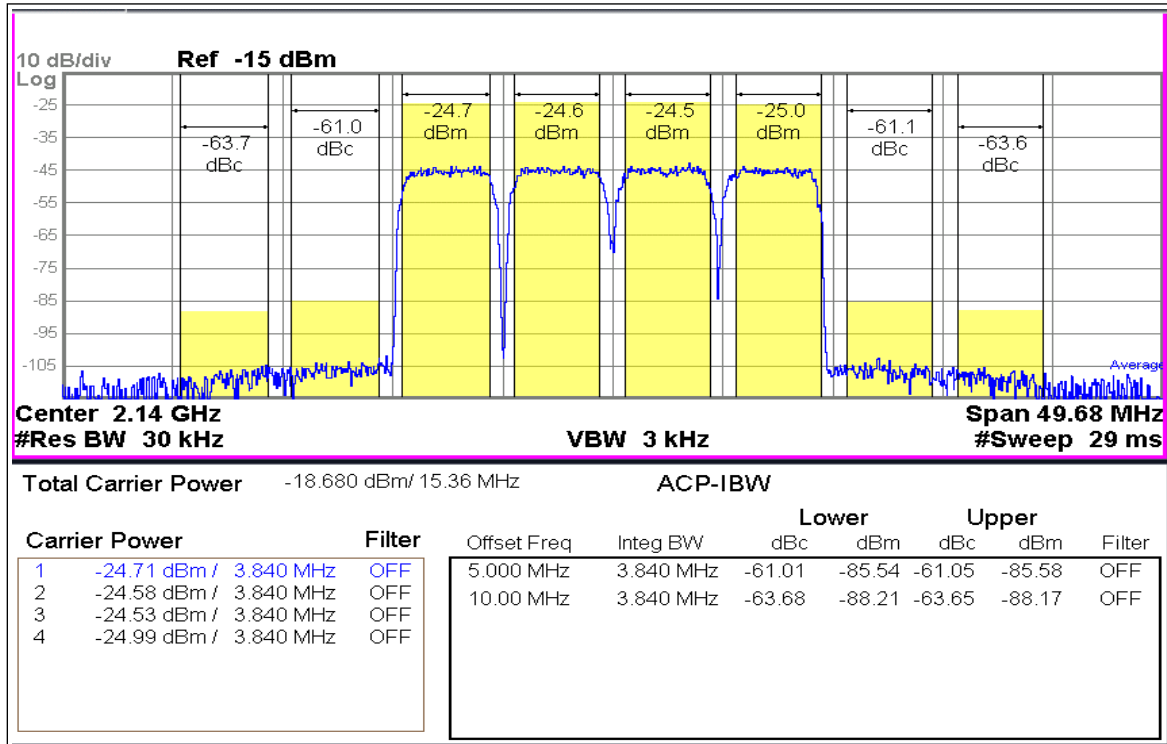


S-Parameter

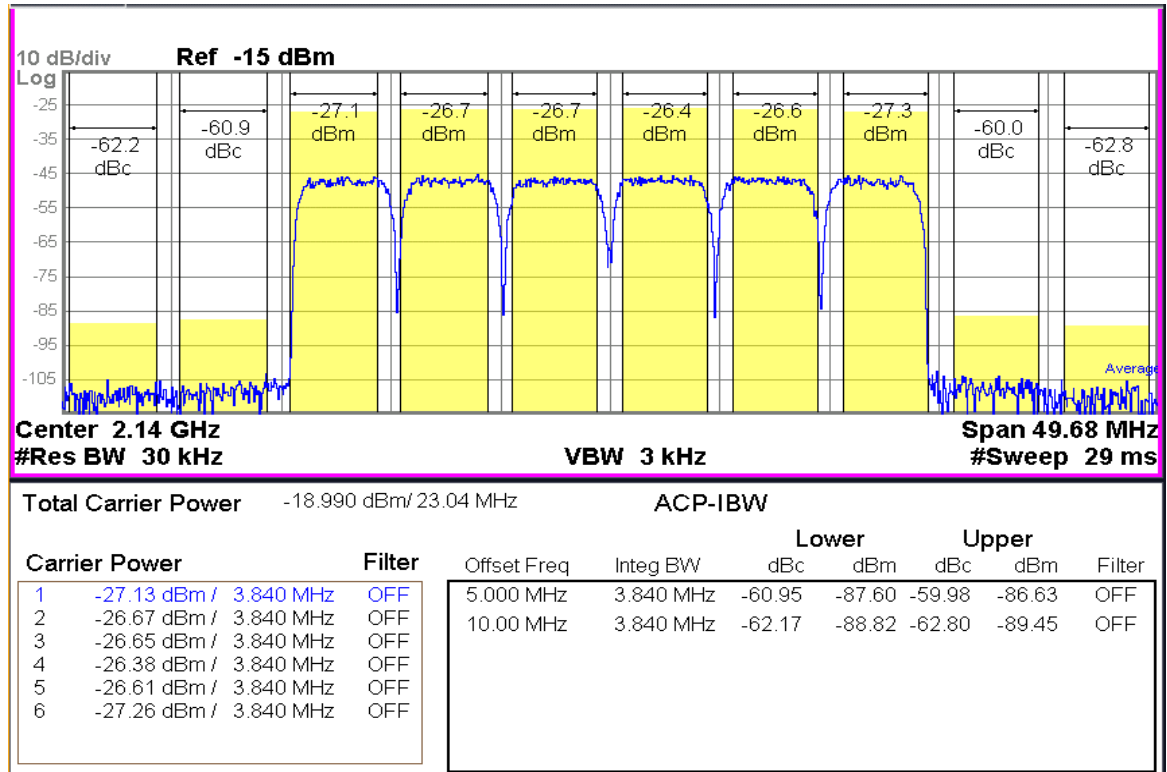
(Vdevice = 5.0V, Icc = 73mA, T = 25 °C, calibrated to device leads)

Freq [MHz]	S11 [Mag]	S11 [Ang]	S21 [Mag]	S21 [Ang]	S12 [Mag]	S12 [Ang]	S22 [Mag]	S22 [Ang]
100	-12.07	-69.82	13.08	-104.92	-33.37	77.61	-0.95	-170.94
500	-13.93	161.74	12.57	142.58	-22.88	-23.98	-7.52	48.58
1000	-14.27	62.84	13.17	57.48	-22.23	-95.57	-11.84	-59.62
1500	-14.06	-16.31	13.00	-17.52	-22.28	-157.73	-13.04	-144.51
2000	-14.20	-94.61	12.67	-90.58	-22.57	142.36	-14.81	136.30
2500	-16.12	-176.82	11.96	-162.15	-23.16	82.88	-14.39	42.24
3000	-18.56	90.35	11.01	128.35	-24.09	26.44	-10.86	-33.69
3500	-13.51	-10.85	9.68	56.08	-25.19	-34.08	-8.39	-89.01
4000	-17.58	-145.12	9.62	6.00	-25.88	-69.05	-7.03	-127.02

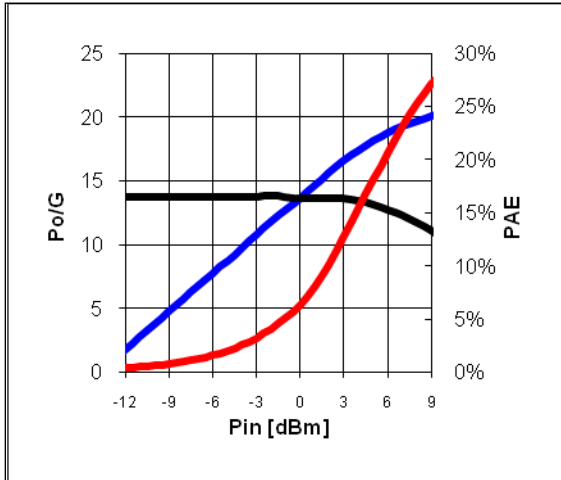
WCDMA 4FA 2140 -60dBc



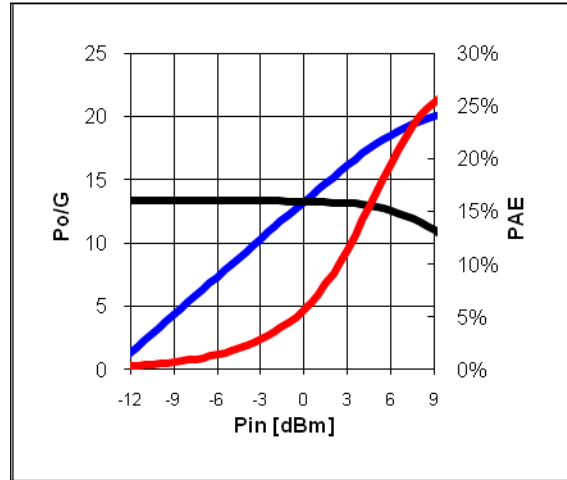
WCDMA 6FA 2140 -60dBc



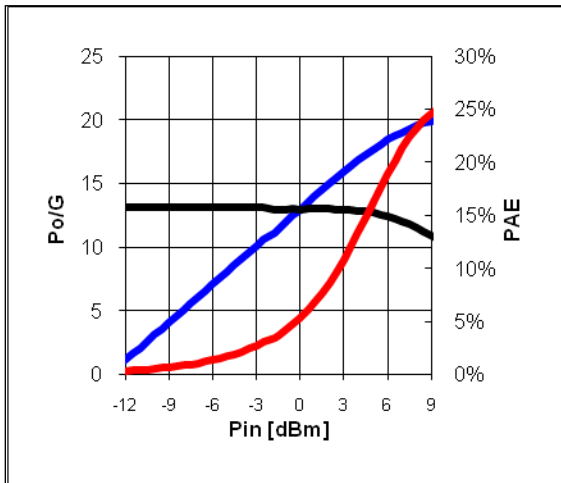
Device Performance Pin-Pout-Gain



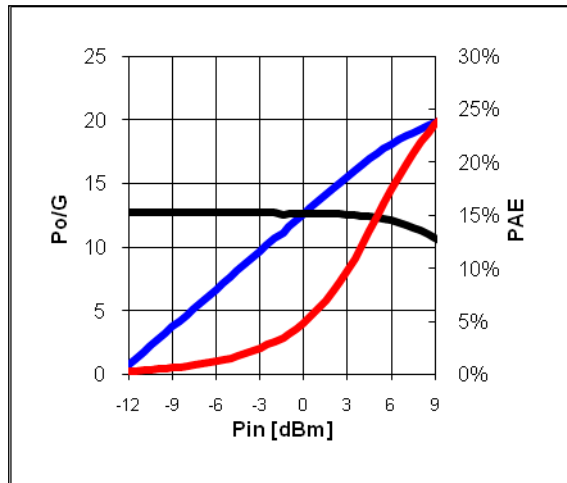
900MHz, 5V/73mA



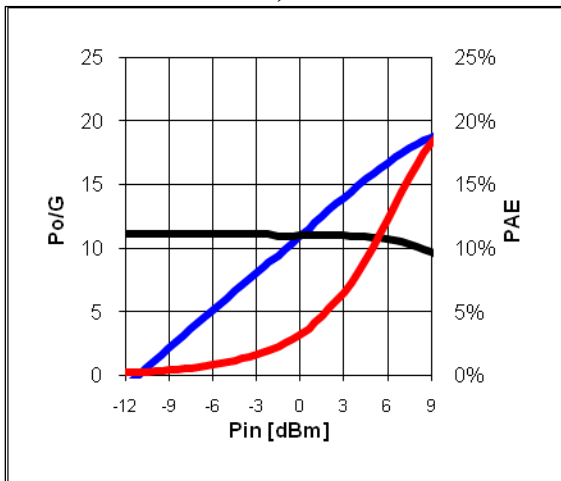
1900 MHz, 5V/73mA



2140MHz, 5V/73mA

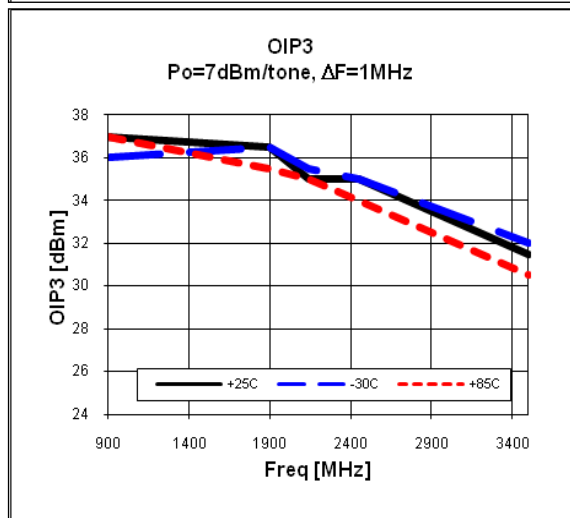
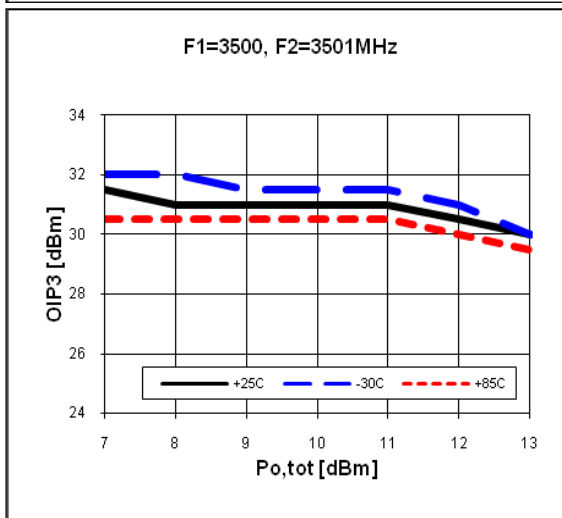
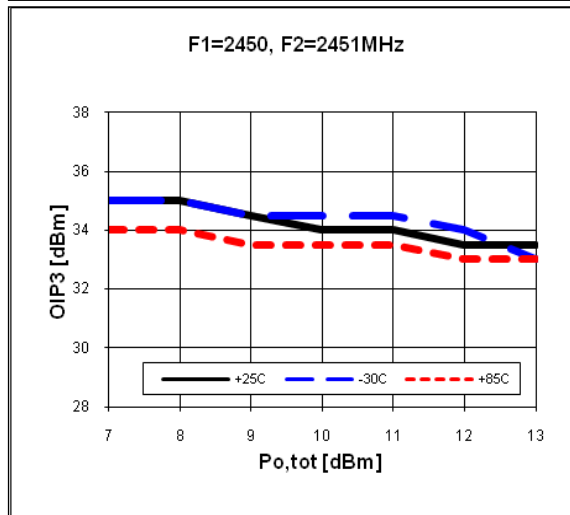
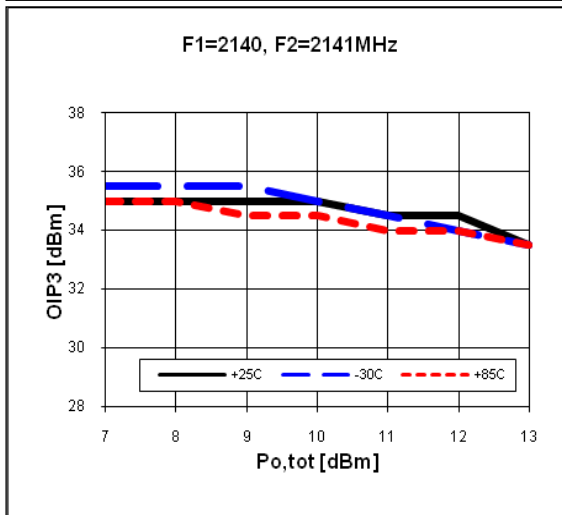
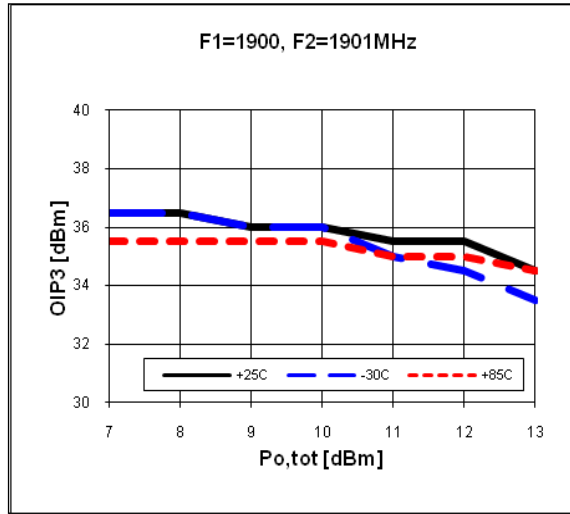
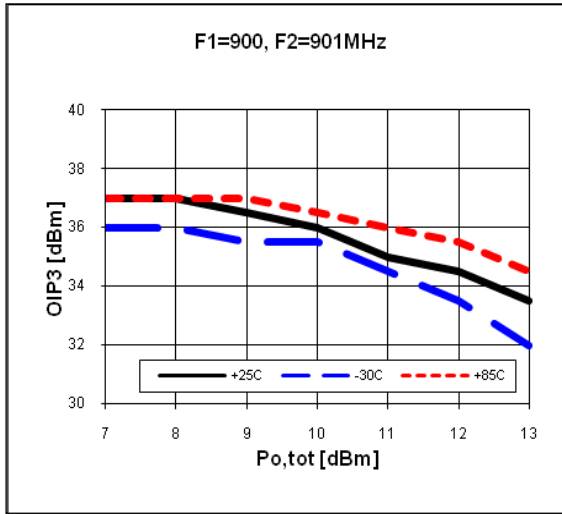


2450 MHz, 5V/73mA

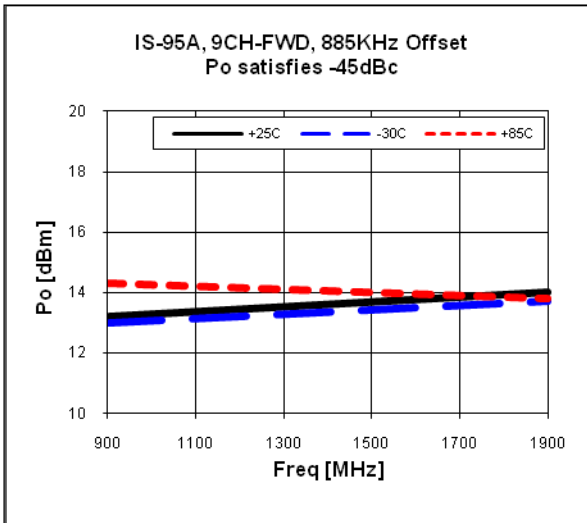
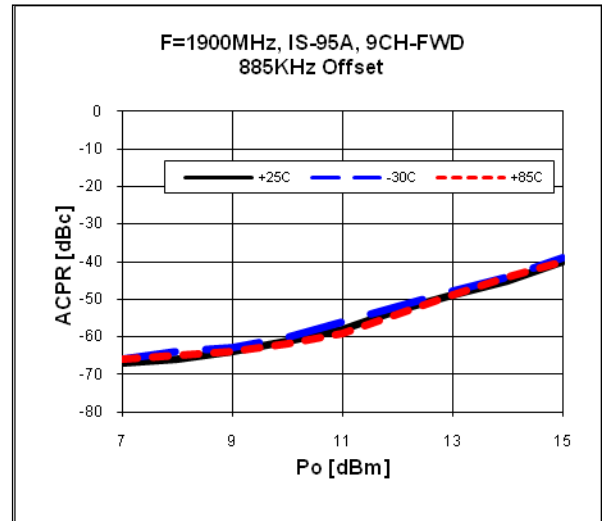
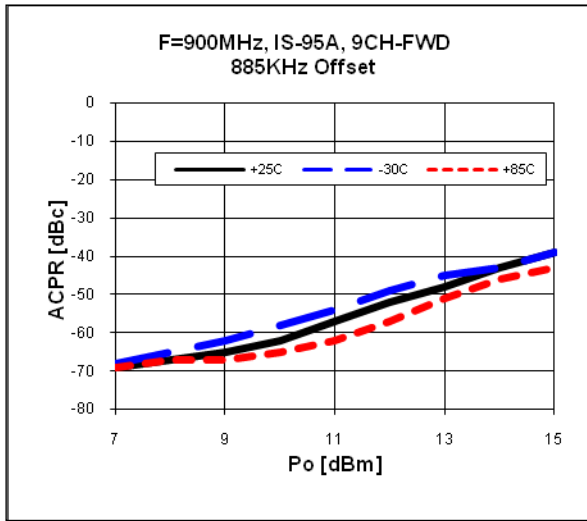


3500MHz, 5V/73mA

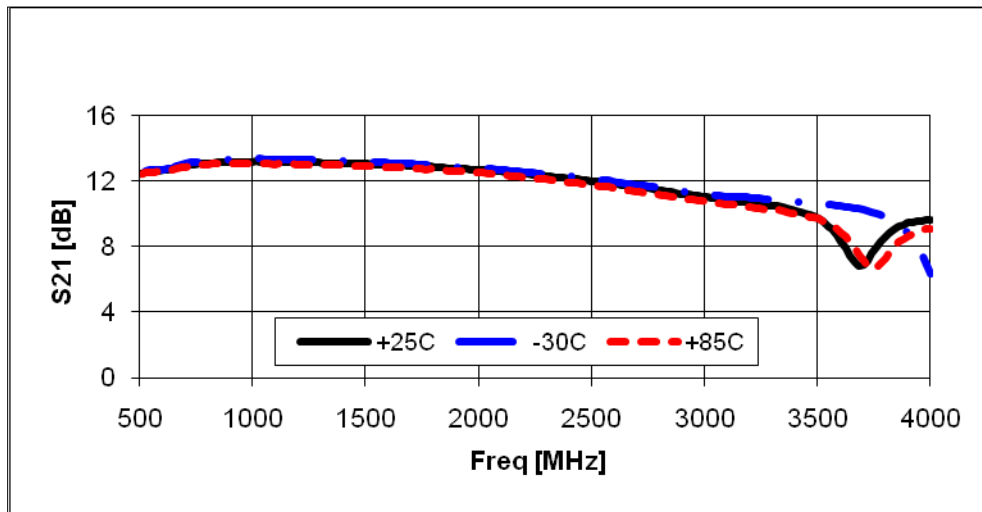
OIP3



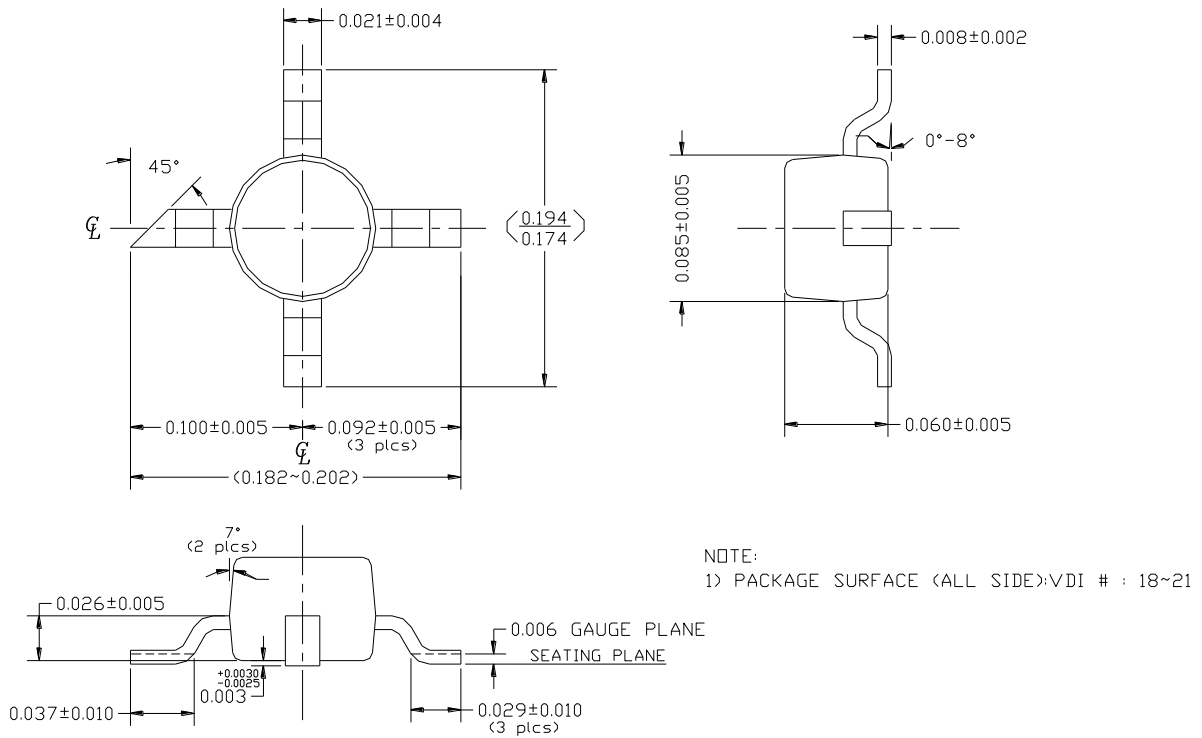
ACPR



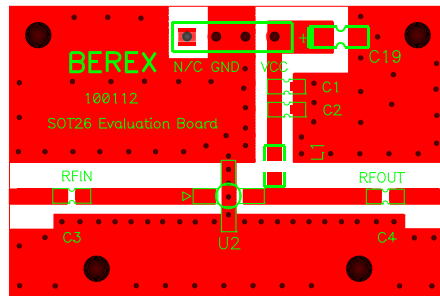
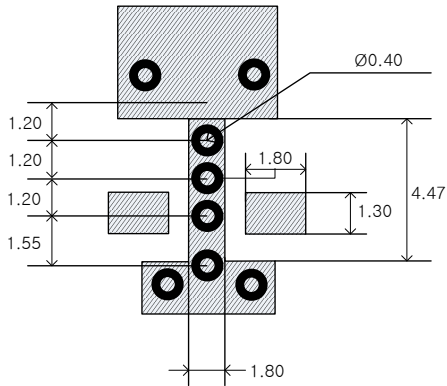
Gain Flatness



Package Outline Dimension



Suggested PCB Land Pattern and PAD Layout



Note : All dimension are in millimeters
Visit <http://www.berex.com> for PCB layout

Lead plating finish

100% Tin Matte finish.

(All BeRex products undergoes a 1 hour, 150 degree C, Anneal bake to eliminate thin whisker growth concerns)

MSL / ESD Rating

ESD Rating	Class 1A
Value	Passes <500V
Test	Human Body Model (HBM)
Standard	JEDEC Standard JESD22-A114B
MSL Rating	Level 1 at +265°C convection reflow
Standard	JEDEC Standard J-STD-020

NATO CAGE code:

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NOTICE

BeRex Corporation reserves the right to make changes of product specification or to discontinue product at any time without notice.