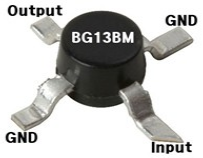
BG13BM

5-4000 MHz Cascadable InGaP HBT Gain Block

Device Features

- OIP3 = 36.5 dBm @ 1900 MHz
- Gain = 12.7 dB @ 1900 MHz
- Output P1 dB = 18.8 dBm @ 1900 MHz
- 50 Ω Cascadable
- Patented temperature compensation
- Lead-free/RoHS-compliant SOT-86 SMT package



Product Description

BeRex's BG13BM is a high performance InGaP/GaAs HBT MMIC amplifier is internally matched to 50 Ohms and uses a patented ***temperature compensation*** circuit to provide stable current over the operating temperature range without the need for external components. The BG13BM is designed for high linearity gain block applications that require excellent gain flatness. It is packaged in a RoHS-compliant with SOT-86 surface mount package.

Typical Performance[1]

Parameter	Frequency					Unit
	900	1900	2140	2450	3500	MHz
Gain	13.1	12.7	12.4	12.0	9.6	dB
S11	-14.2	-14.1	-14.5	-15.9	-13.5	dB
S22	-11.3	-14.4	-15.3	-14.7	-8.3	dB
OIP3[2]	37.0	36.5	35.0	35.0	31.0	dBm
P1dB	18.7	18.8	18.9	18.7	18.1	dBm
Noise Figure	8.1	8.3	8.3	8.4	8.6	dB

[1] Device performance _ measured on a BeRex evaluation board at 25°C, 50 Ω system.

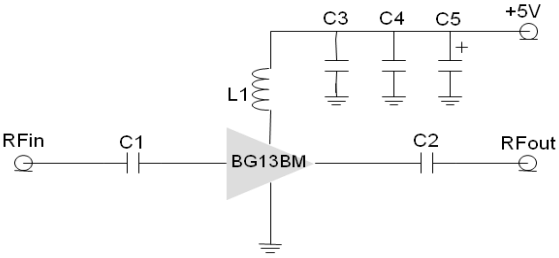
[2] OIP3 _ measured with two tones at an output of 5 dBm per tone separated by 1 MHz.

Applications

- Base station Infrastructure/PA Driver
- Cellular/PCS/GSM/UMTS/Wireless Data
- Satellite Receivers/RFID

	Min.	Typical	Max.	Unit
Bandwidth	5		4000	MHz
I_C @ (Vc = 5V)		73		mA
V_C		5.0		V
dG/dT		-0.004		dB/°C
R_{TH}		85		°C/W

Applications Circuit



*C1, C2, C3 =100 pF ± 5%; C4 = 1000 pF ± 5%; C5 = 10uF; L1 = 15nH

Absolute Maximum Ratings

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

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

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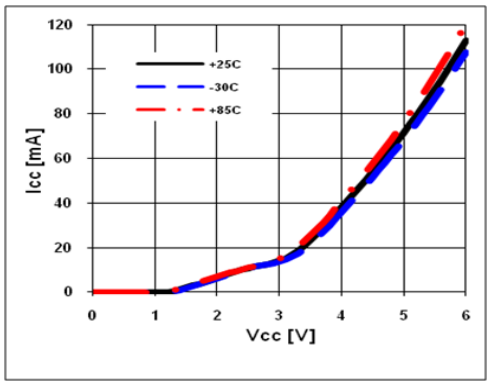
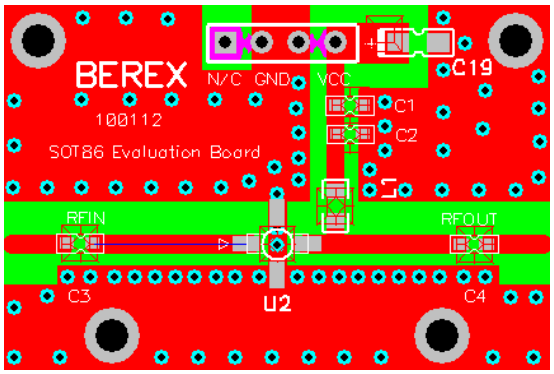
5-4000 MHz Cascadable InGaP HBT Gain Block

V-I Characteristics



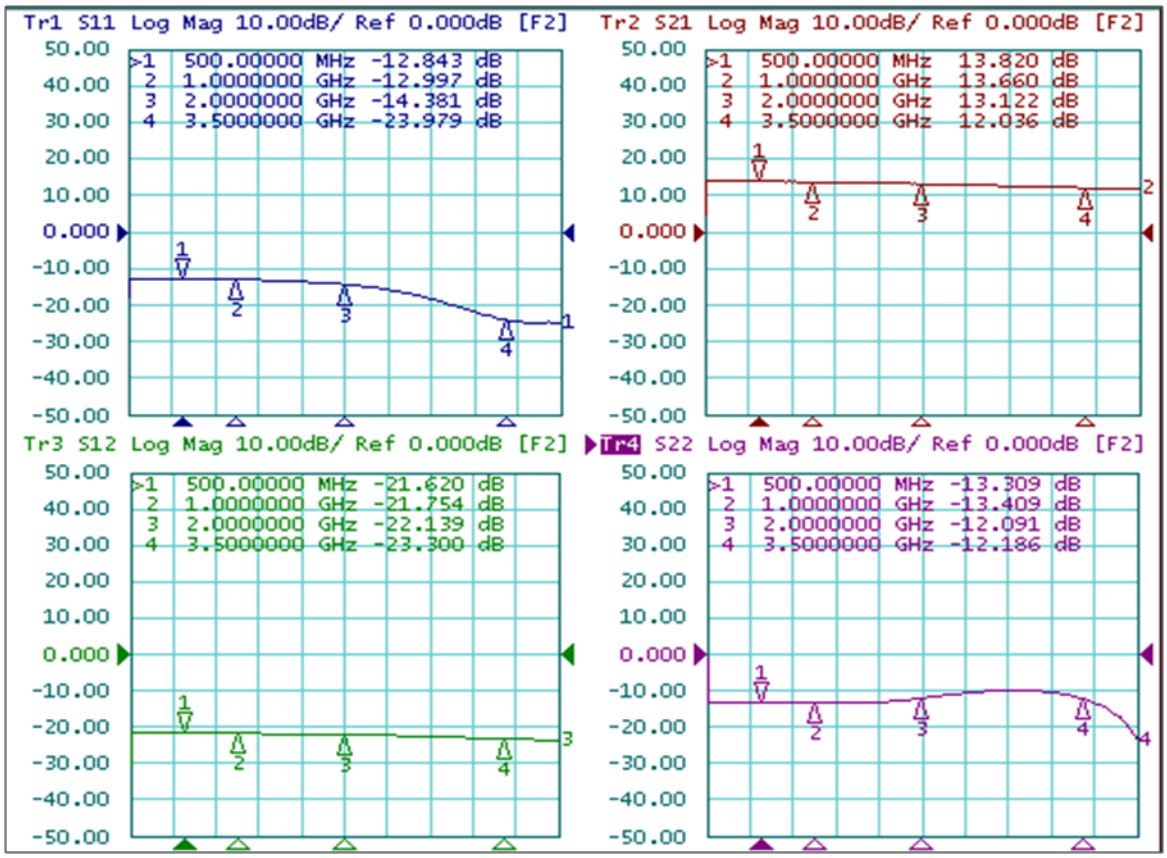
BeRex SOT89 Evaluation Board



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

Typical Device Data

S-parameters (Vc=5V, Ic=73mA, T=25°C)

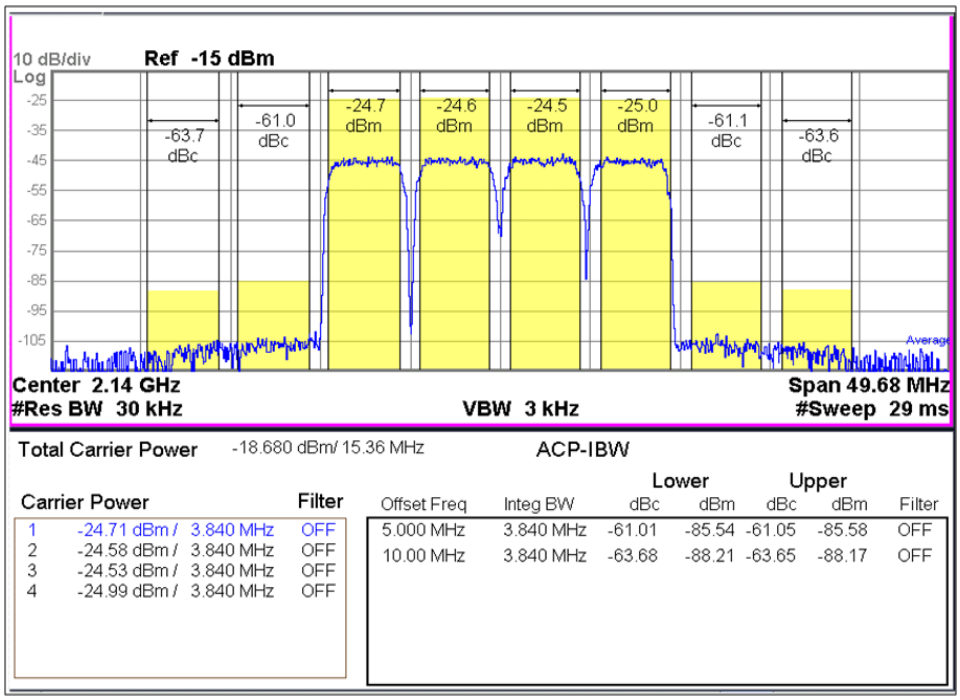


S-Parameter

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

Freq	S11	S11	S21	S21	S12	S12	S22	S22
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



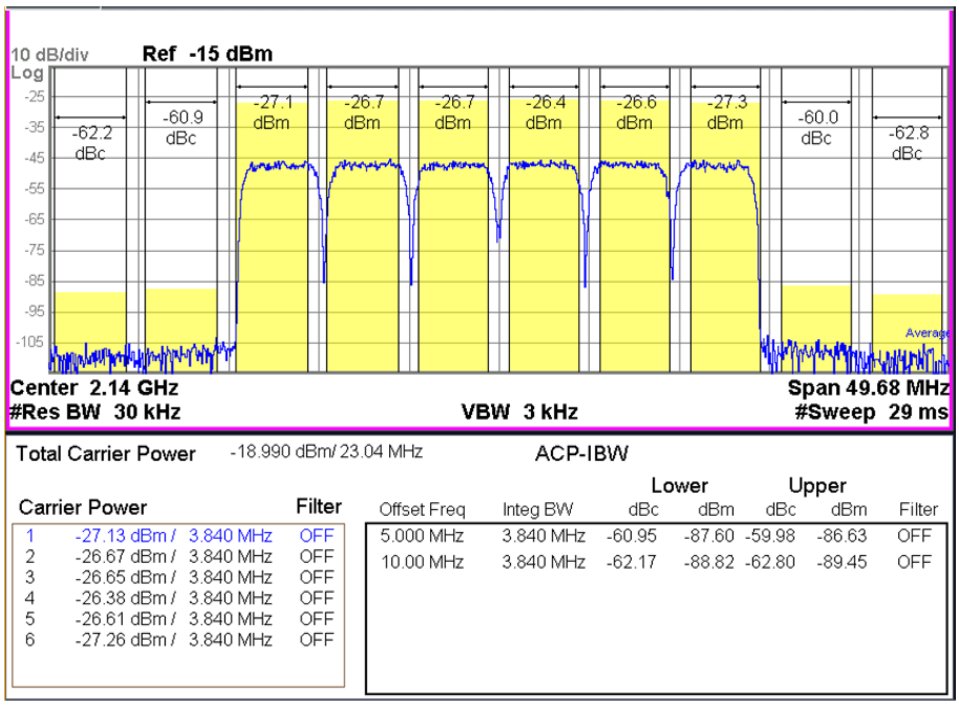
Total Carrier Power -18.680 dBm/ 15.36 MHz

ACP-IBW

Carrier Power			Filter
1	-24.71 dBm /	3.840 MHz	OFF
2	-24.58 dBm /	3.840 MHz	OFF
3	-24.53 dBm /	3.840 MHz	OFF
4	-24.99 dBm /	3.840 MHz	OFF

		Lower		Upper		
Offset Freq	Integ BW	dBc	dBm	dBc	dBm	Filter
5.000 MHz	3.840 MHz	-61.01	-85.54	-61.05	-85.58	OFF
10.00 MHz	3.840 MHz	-63.68	-88.21	-63.65	-88.17	OFF

WCDMA 6FA 2140 -60dBc



Total Carrier Power -18.990 dBm/ 23.04 MHz

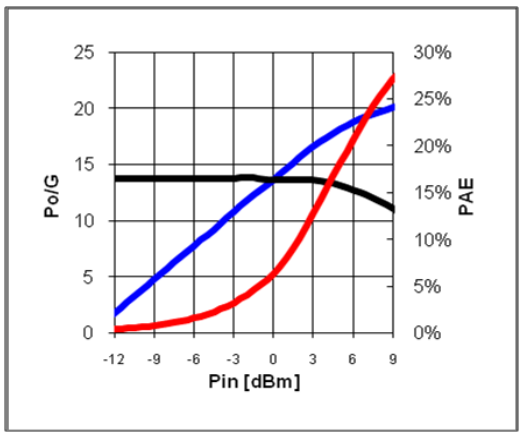
ACP-IBW

Carrier Power			Filter
1	-27.13 dBm /	3.840 MHz	OFF
2	-26.67 dBm /	3.840 MHz	OFF
3	-26.65 dBm /	3.840 MHz	OFF
4	-26.38 dBm /	3.840 MHz	OFF
5	-26.61 dBm /	3.840 MHz	OFF
6	-27.26 dBm /	3.840 MHz	OFF

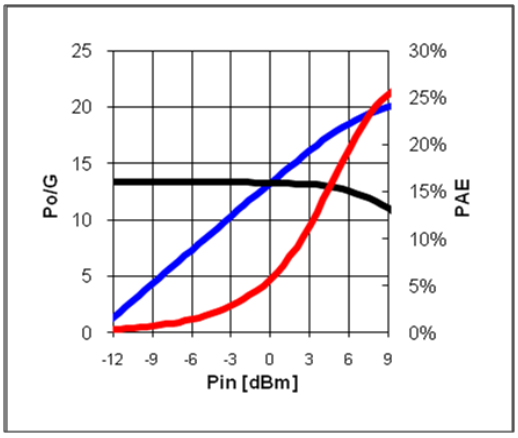
		Lower		Upper		
Offset Freq	Integ BW	dBc	dBm	dBc	dBm	Filter
5.000 MHz	3.840 MHz	-60.95	-87.60	-59.98	-86.63	OFF
10.00 MHz	3.840 MHz	-62.17	-88.82	-62.80	-89.45	OFF

Device Performance

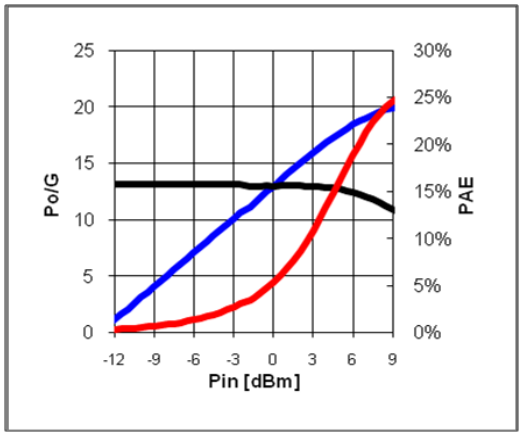
Pin-Pout-Gain



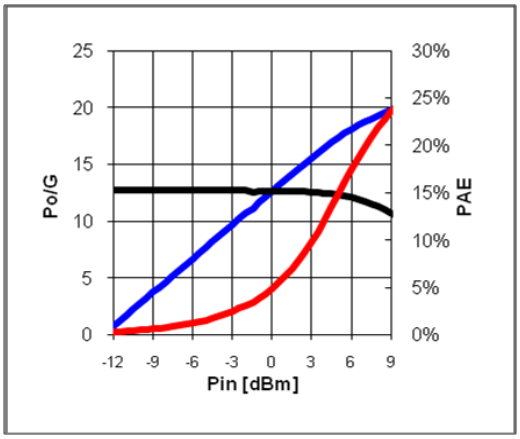
900MHz, 5V/73mA



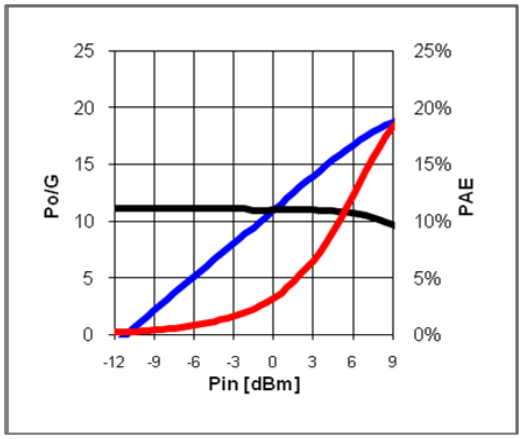
1900 MHz, 5V/73mA



2140MHz, 5V/73mA

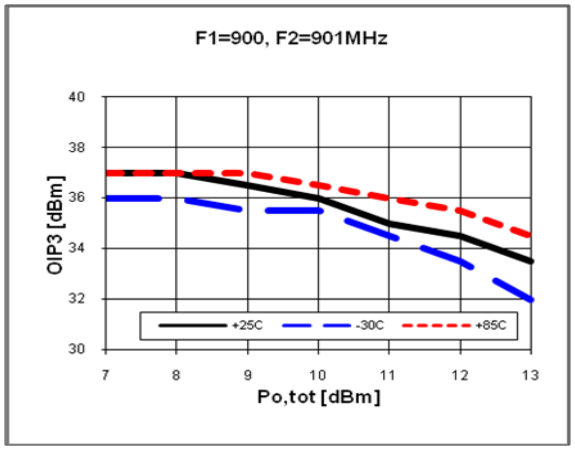


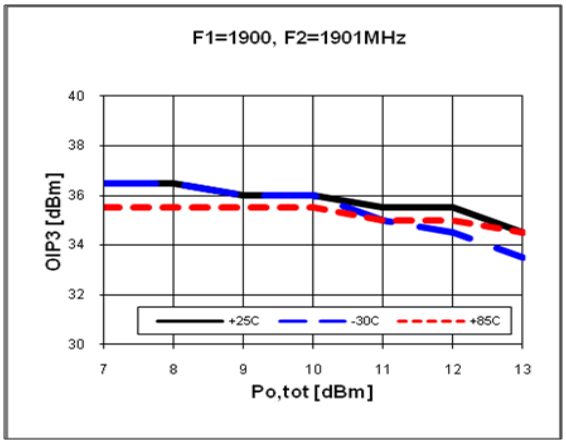
2450 MHz, 5V/73mA

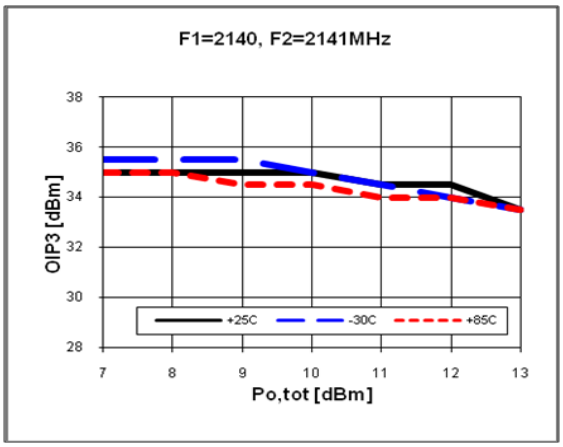


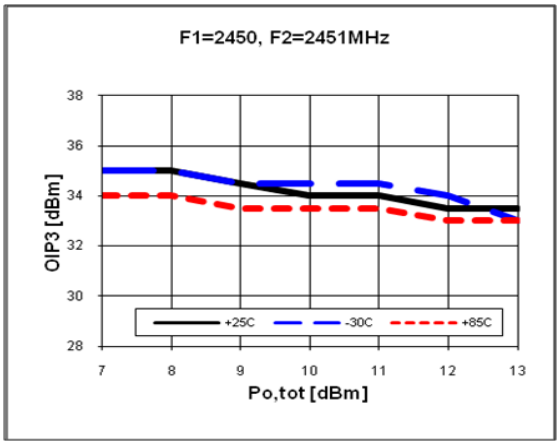
3500MHz, 5V/73mA

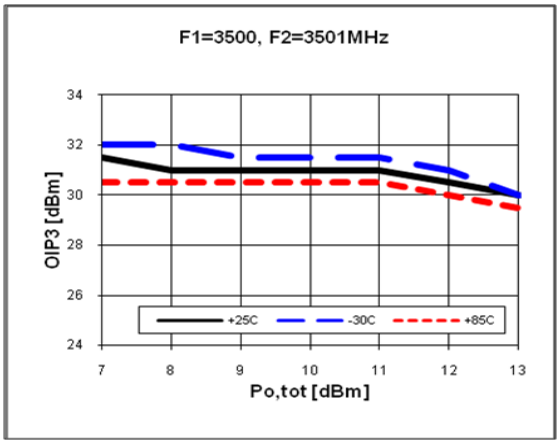
OIP3

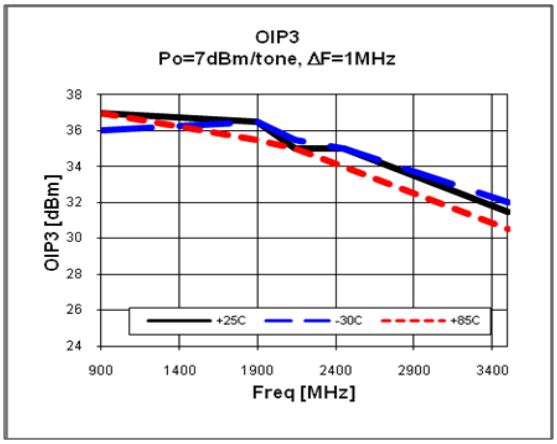




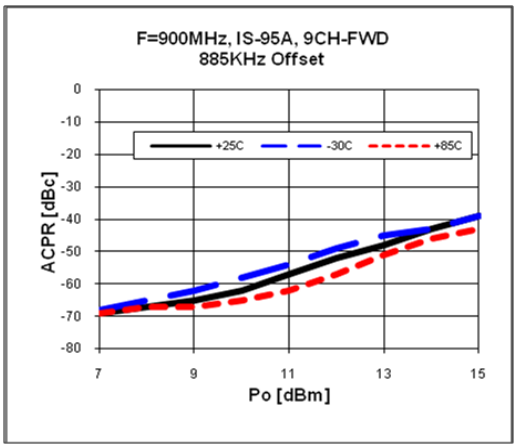


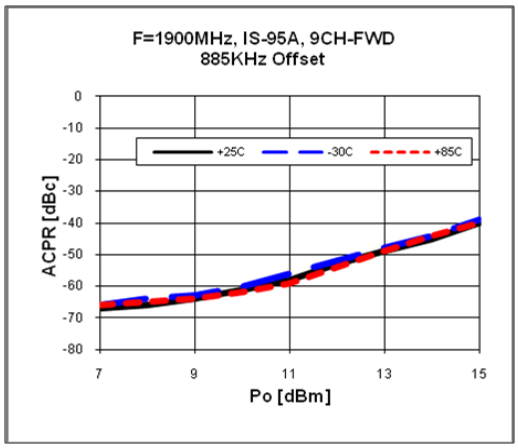


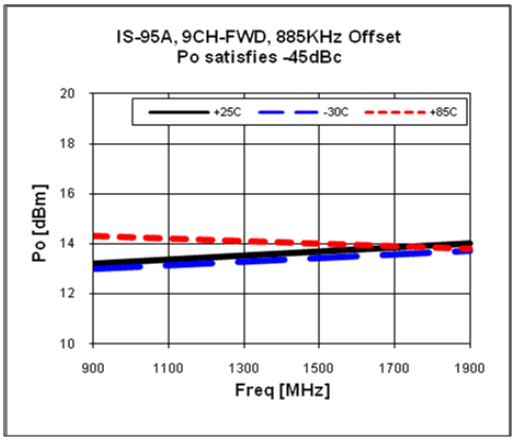




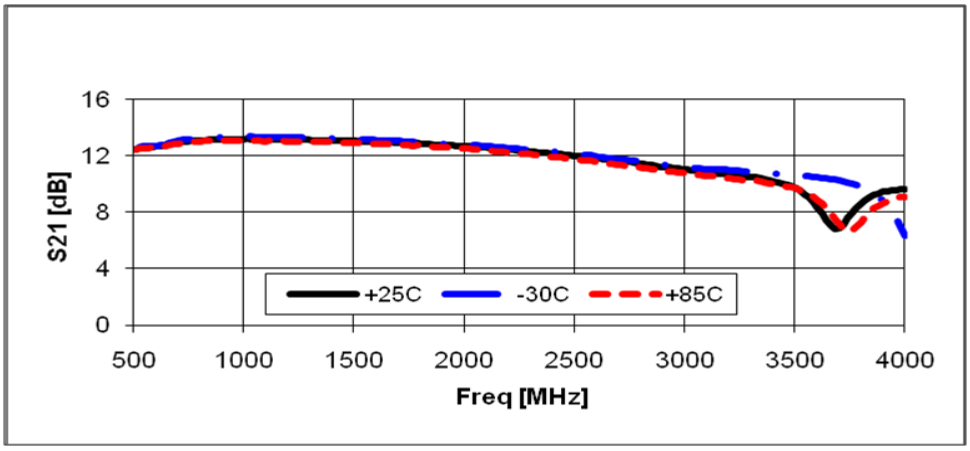
ACPR



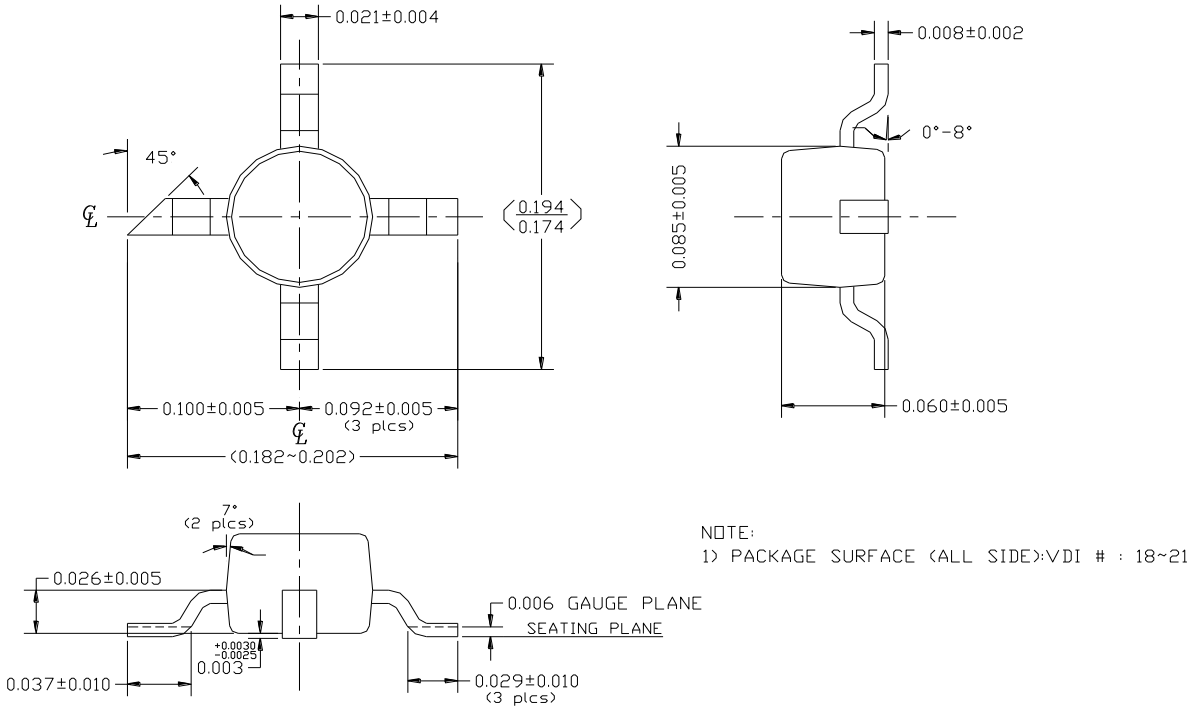




Gain Flatness



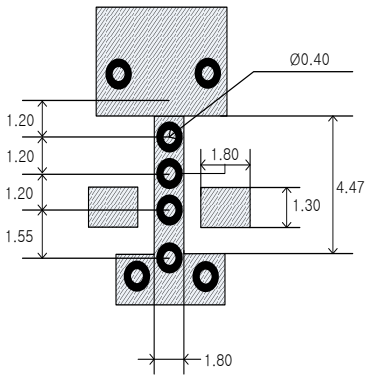
Package Outline Dimension



NOTE:
1) PACKAGE SURFACE (ALL SIDE):VDI # : 18~21

Suggested PCB Land Pattern and PAD Layout

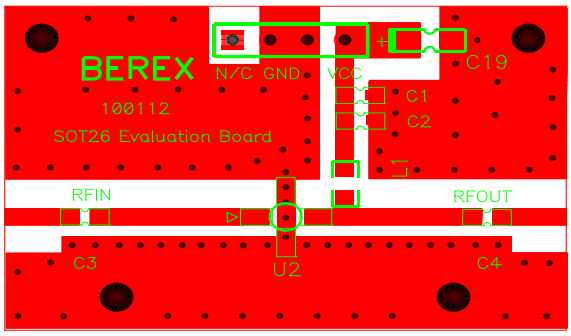
PCB Land Pattern



Note : All dimension _ millimeters

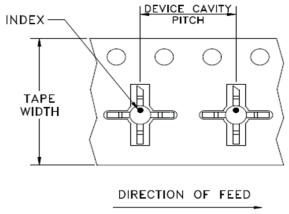
PCB lay out _ on BeRex website

PCB Mounting



Tape & Reel

SOT86



Packaging information:

Tape Width (mm): 12

Reel Size (inches): 7

Device Cavity Pitch (mm): 8

Devices Per Reel: 1000

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:

2	**N**	**9**	**6**	**F**