

1500-4000 MHz Wideband Drive Amplifier

Device Features

- 40.5dBm Output IP3 at 11dBm/tone at 1900MHz
- 19dB Gain at 1900MHz
- 23dBm P1dB at 2450 MHz
- Highly Reliable InGaP/GaAs HBT Technology
- Lead-free/Green/RoHS compliant SOT89 package
- Patented over voltage protection circuit
- Application: commercial, space, military wireless system



Electrical Specifications ($T_a = 25^\circ\text{C}$, $V_s = 5.0\text{V}$)

Parameters	Test Conditions	Min	Typ	Max	Unit
Frequency Range		1500		4000	MHz
Gain	1900MHz	18.0	19.0		dB
	2100MHz	17.0	18.0		
	2450MHz	15.5	16.5		
	3500MHz	11.7	13.7		
S11	1900MHz		-18.5		dB
	2100MHz		-15.6		
	2450MHz		-26.1		
	3500MHz		-22.0		
S22	1900MHz		-14.9		dB
	2100MHz		-19.1		
	2450MHz		-19.4		
	3500MHz		-20.0		
OIP3	1900MHz	38.5	40.5		dBm
	2100MHz	36	38		
	2450MHz	36	38		
	3500MHz	37	39		
P1dB	1900MHz	21.7	22.7		dBm
	2100MHz	21.0	22.0		
	2450MHz	22.2	23.2		
	3500MHz	22.5	23.5		
IS-95 CH Power @-45dBc ACPR	1900MHz		15.8		dBm
	2100MHz		15		
NF	1900MHz		3.9		dB
	2100MHz		4.0		
	2450MHz		4.2		
Ic	$V_c = 5.0\text{V}$	75	85	95	mA
Vc			5.0		V
Rth	Thermal Resistance		50		$^\circ\text{C/W}$

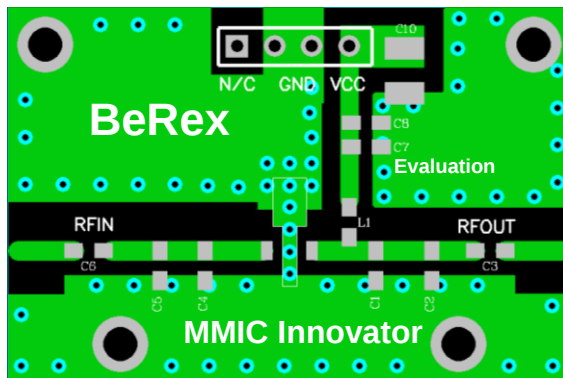
Test conditions unless otherwise noted.

1. Device performance is measured on BeRex evaluation board at 25°C , 50 ohm system.
2. OIP3 measured with two tones at an output power of 11dBm 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
Supply Voltage	6.0V
Max. Device Current	180mA
Input RF Power	23dBm

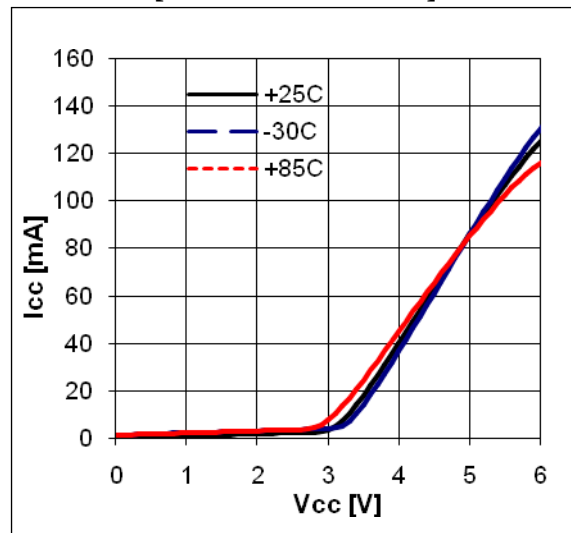
Operation of this device above any of these parameters may result in permanent damage.

[Generic SOT89 Evaluation Board]

*Dielectric constant is 4.2

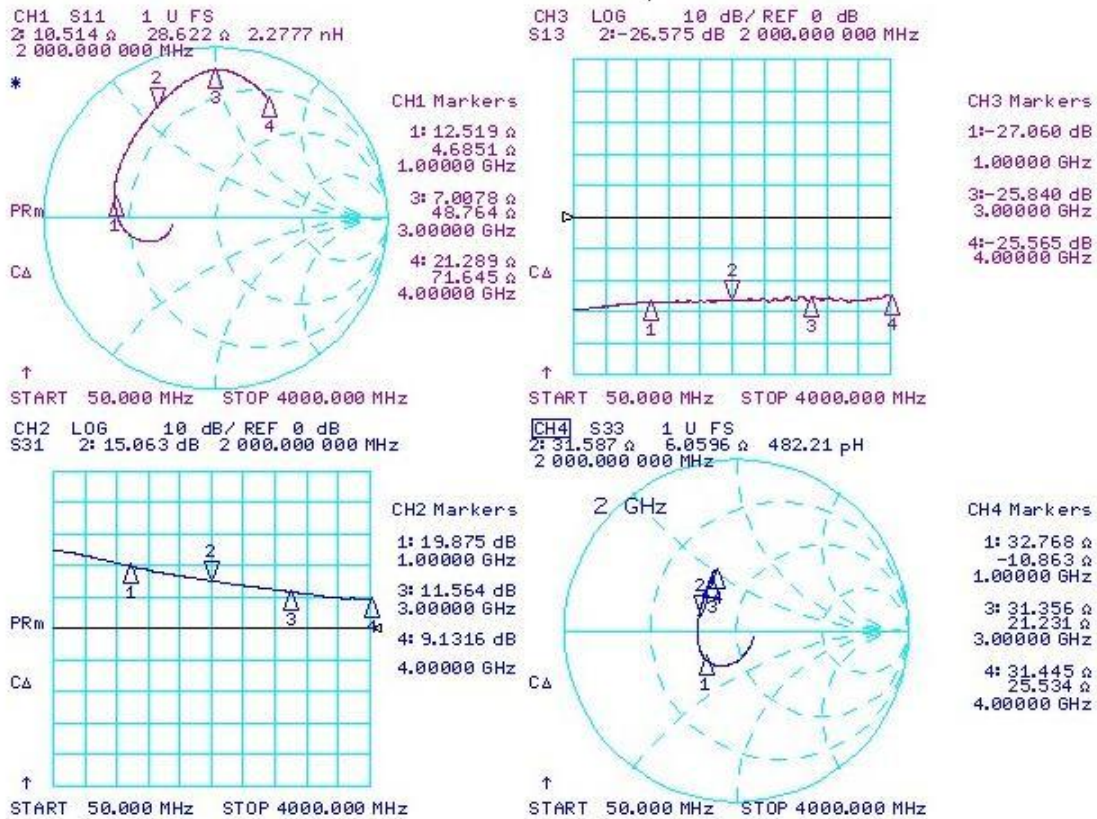
*RF pattern width 52mil

*31mil thick FR4 PCB

[I-V Characteristics]

Typical Device Data

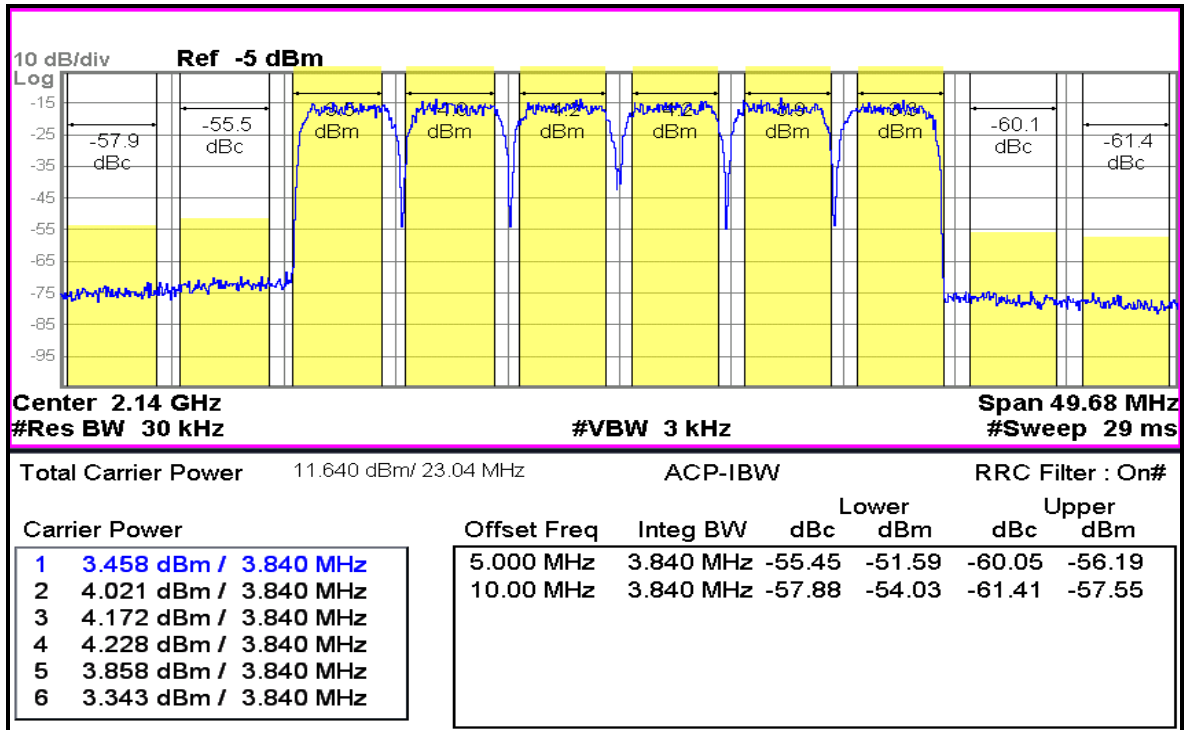
S-parameters (Vdevice=5V, Ic=90mA, T=25°C)



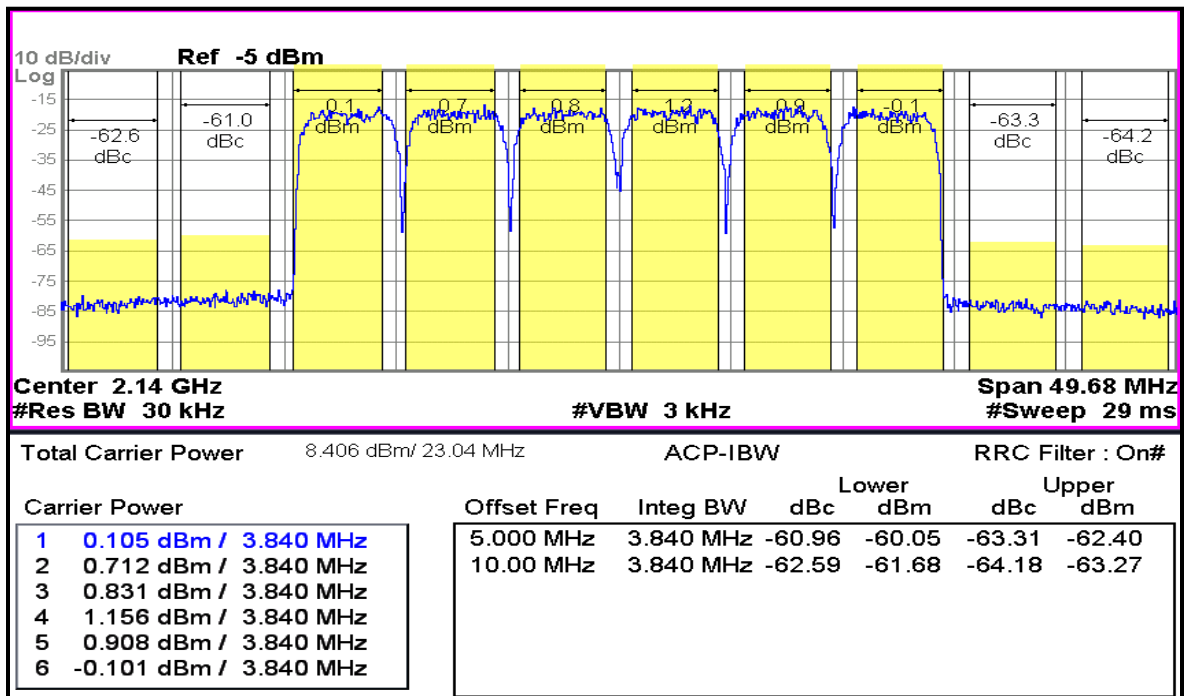
S-Parameter (5V/88mA)

Freq [MHz]	S11 [Mag]	S11 [Ang]	S21 [Mag]	S21 [Ang]	S12 [Mag]	S12 [Ang]	S22 [Mag]	S22 [Ang]
100	0.270	-166.495	17.095	169.234	0.034	2.969	0.112	-36.553
500	0.484	-165.550	13.796	134.745	0.039	9.708	0.209	-115.545
1000	0.603	169.297	9.839	107.471	0.045	8.523	0.243	-138.751
1500	0.649	142.996	7.265	89.329	0.046	6.978	0.224	-166.419
2000	0.727	119.846	5.645	75.285	0.047	7.094	0.232	159.675
2500	0.812	103.333	4.578	65.518	0.046	7.622	0.276	133.104
3000	0.860	91.901	3.760	57.542	0.050	4.871	0.326	118.486
3500	0.845	82.120	3.142	48.480	0.046	4.636	0.365	112.242
4000	0.768	68.638	2.817	40.568	0.054	0.845	0.369	110.182

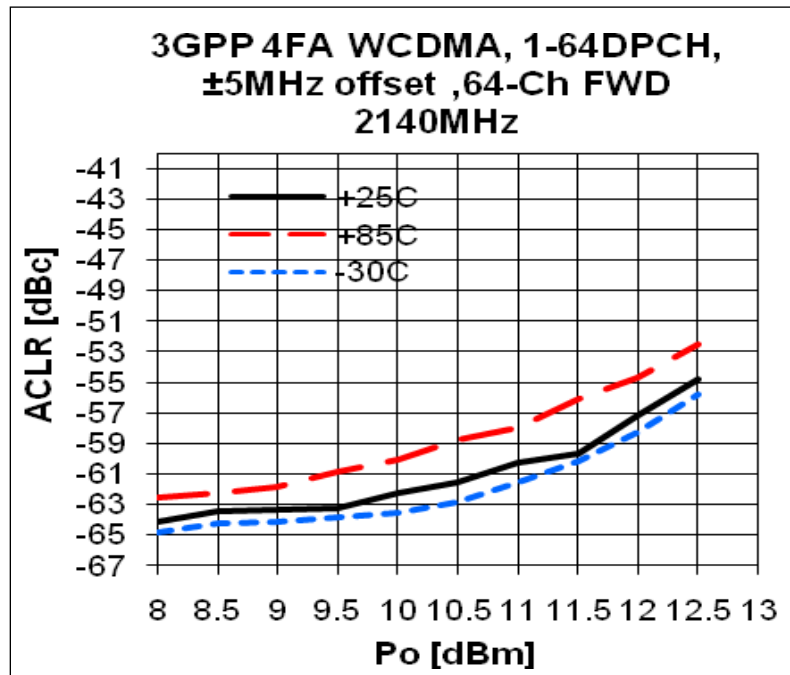
WCDMA 6FA 2140 -55dBc



WCDMA 6FA 2140 -60dBc



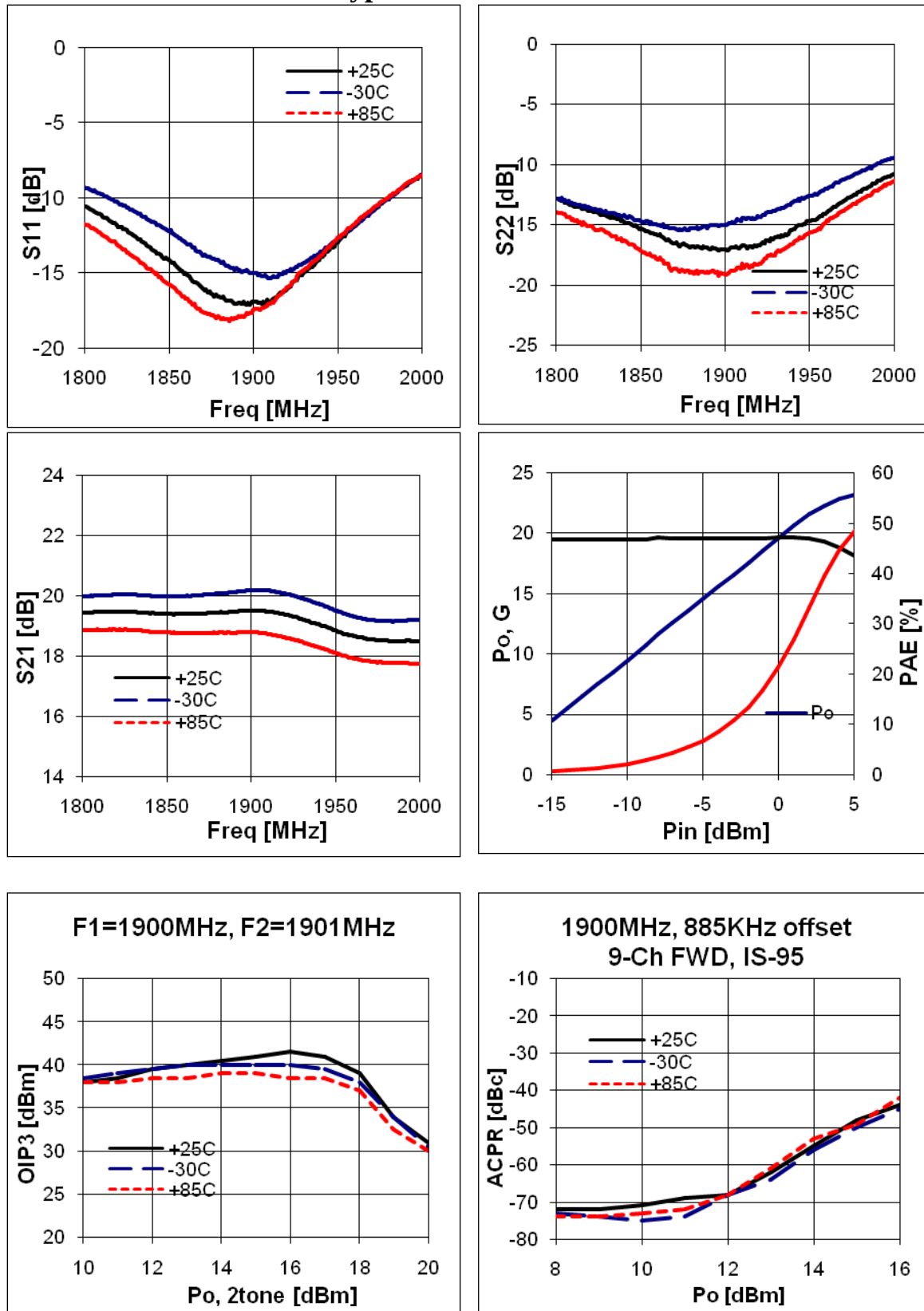
ACLR



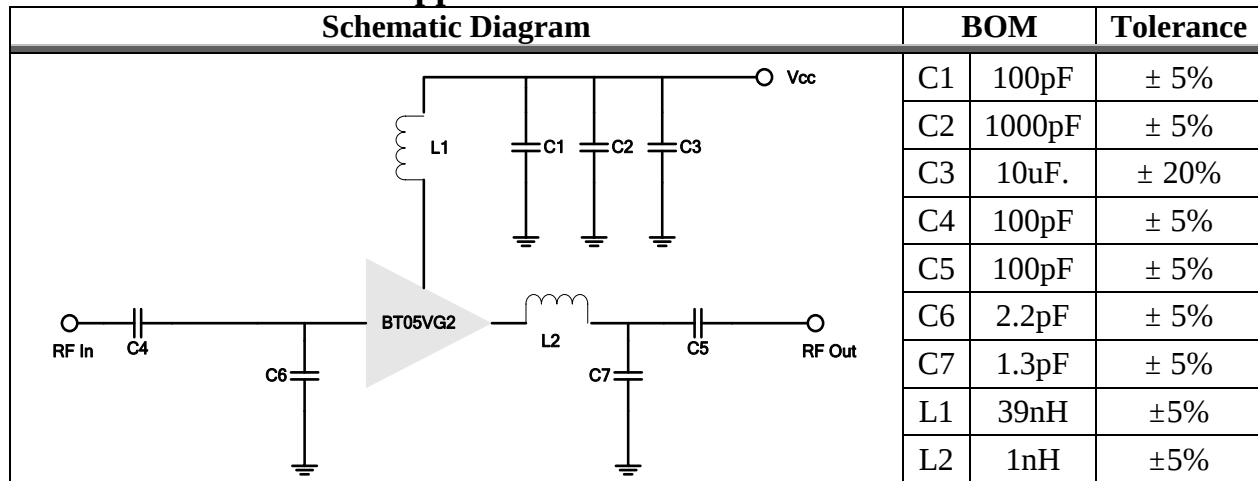
Application Circuit: 1900 MHz

Schematic Diagram	BOM		Tolerance
The schematic diagram shows an RF input (RF In) connected to a capacitor C4. The signal then passes through a matching network consisting of inductor L1 and capacitors C1, C2, and C3. The signal then enters the BT05VG2 amplifier. The output of the amplifier is connected to a matching network consisting of inductor L2 and capacitors C5, C6, and C7. The signal then passes through a capacitor C5 to the RF output (RF Out). The amplifier is powered by Vcc through a network of capacitors C1, C2, and C3.	C1	100pF	± 5%
	C2	1000pF	± 5%
	C3	10uF.	± 20%
	C4	100pF	± 5%
	C5	100pF	± 5%
	C6	2.7pF	± 5%
	C7	1.5pF	± 5%
	L1	39nH	±5%
L2	1.5nH	±5%	

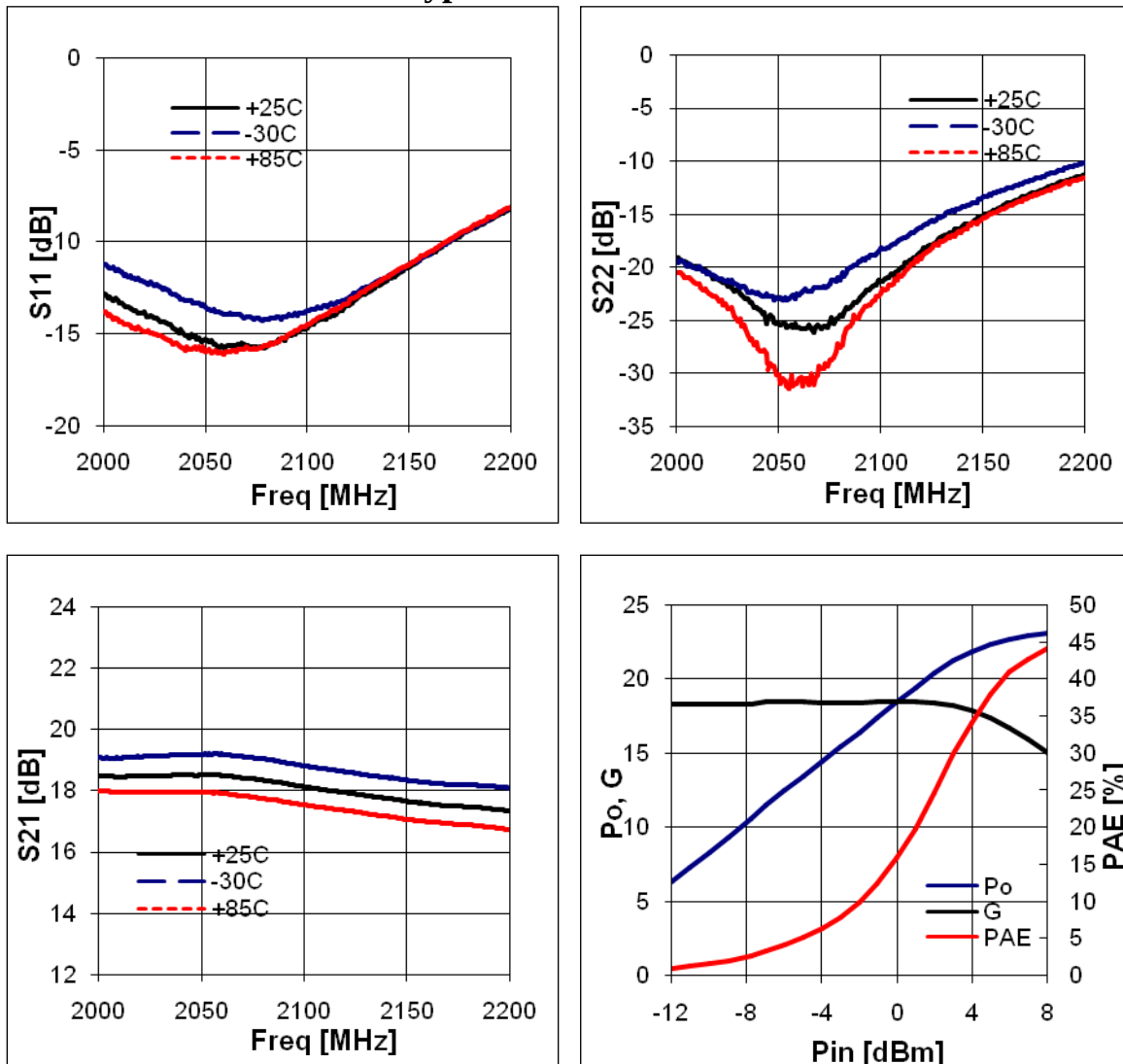
Typical Performance

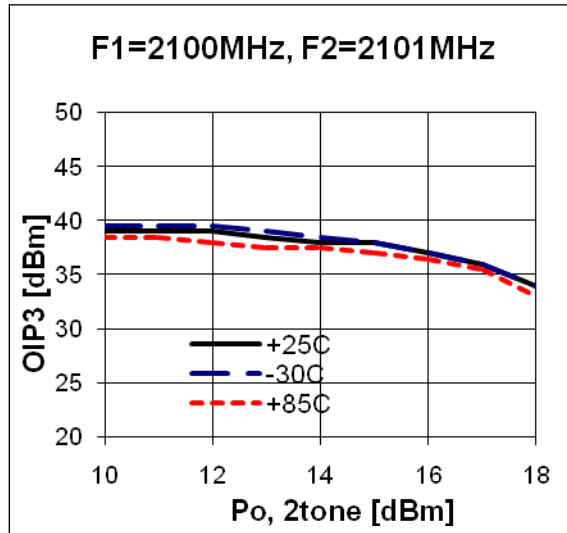


Application Circuit: 2100 MHz



Typical Performance

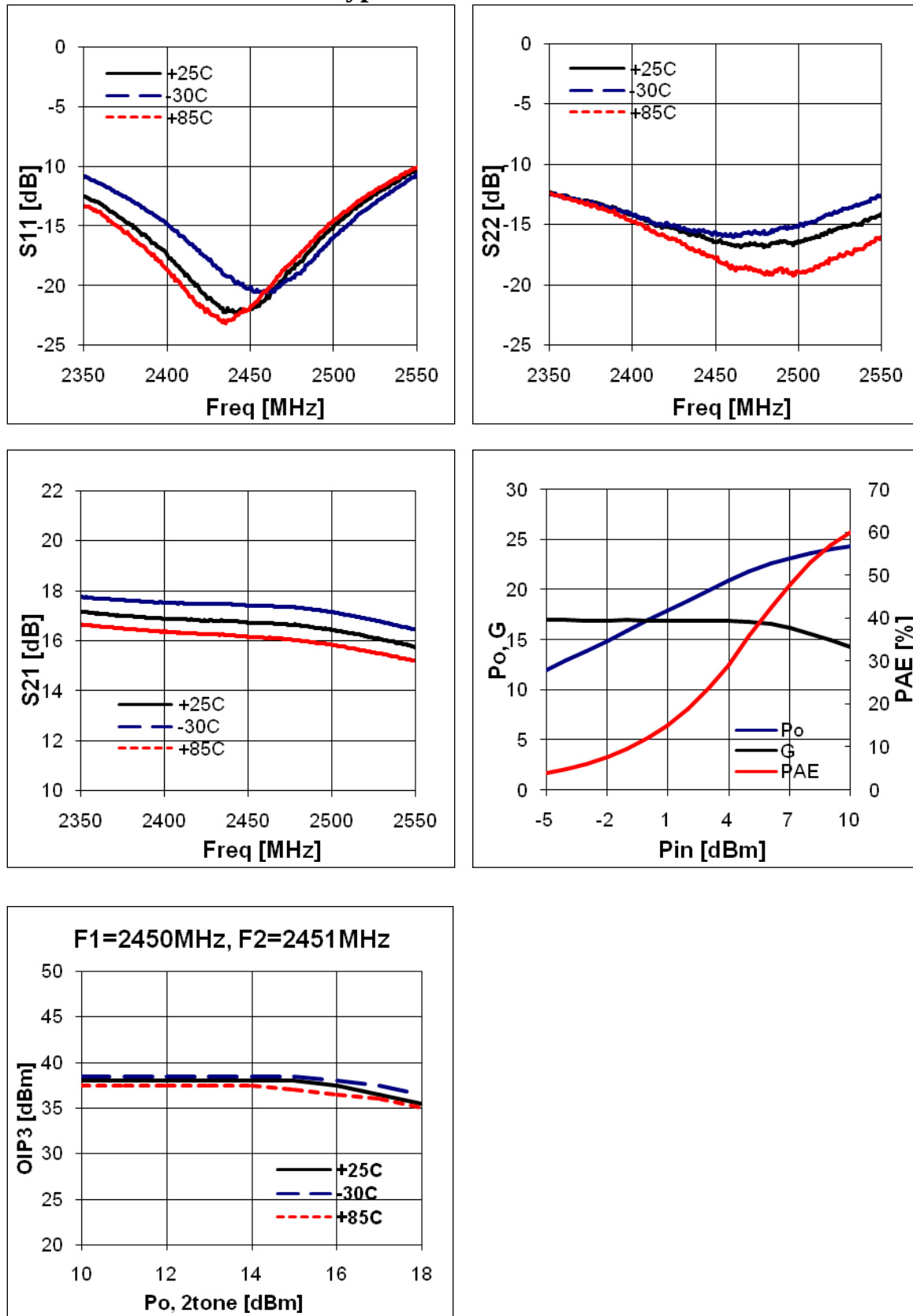




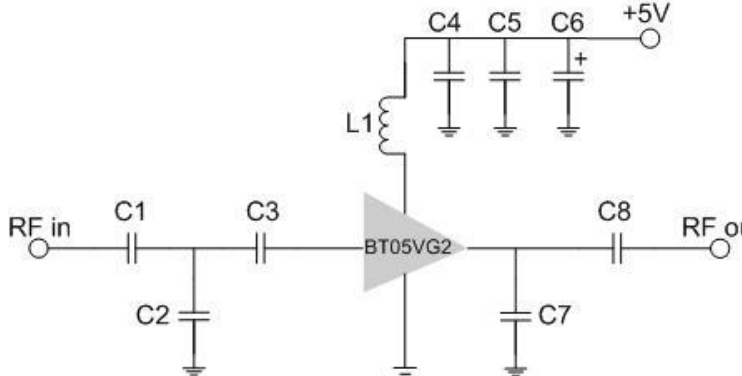
Application Circuit: 2450MHz

Schematic Diagram		BOM		Tolerance	
The schematic diagram shows an RF input (RF In) connected to a capacitor C4, followed by an inductor L2. The signal then enters the BT05VG2 device. The output of the device is connected to an inductor L3, followed by a capacitor C5, and finally the RF output (RF Out). The device is biased through an inductor L1 connected to Vcc, with three parallel capacitors C1, C2, and C3 connected to ground.		C1	100pF	± 5%	
		C2	1000pF	± 5%	
		C3	10uF.	± 20%	
		C4	100pF	± 5%	
		C5	1pF	± 5%	
		C6	1.2pF	± 5%	
		L1	39nH	±5%	
		L2	2.2nH	±5%	
		L3	1nH	±5%	

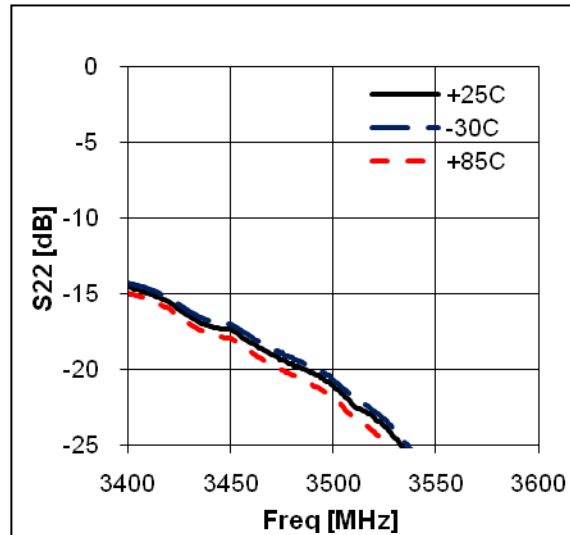
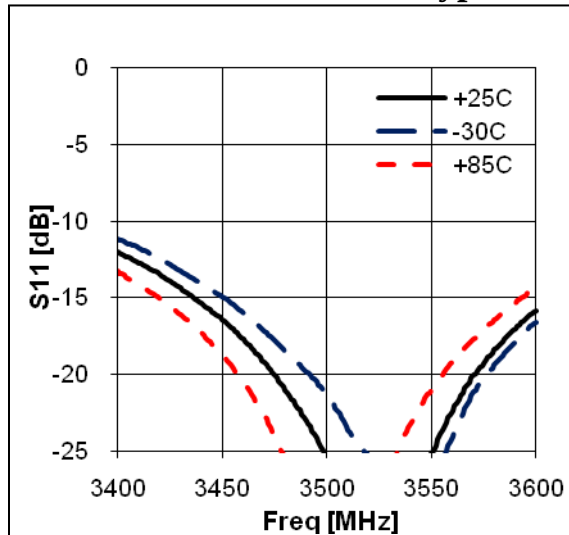
Typical Performance

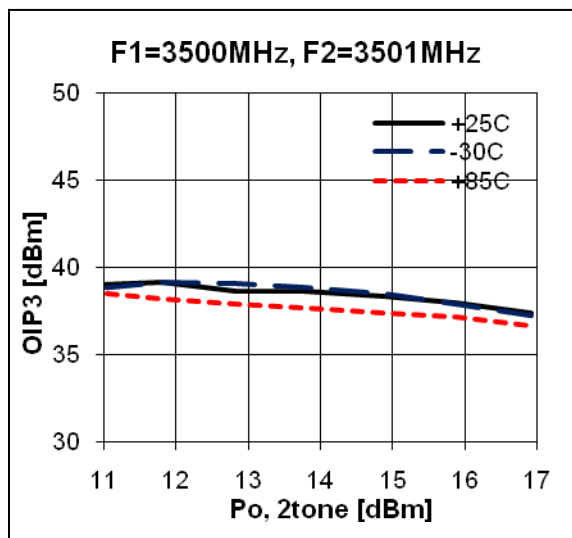
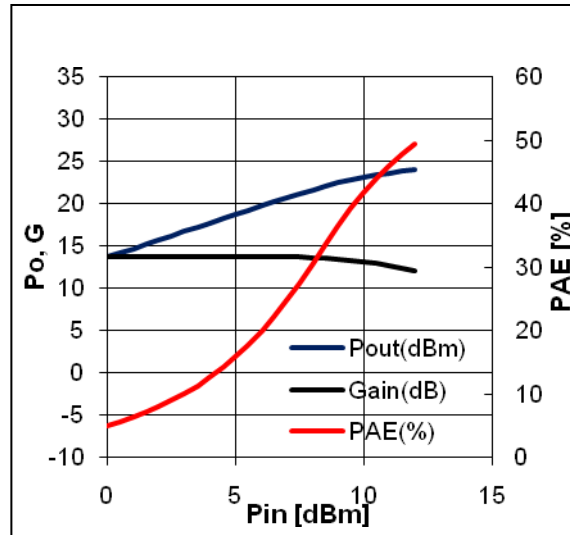
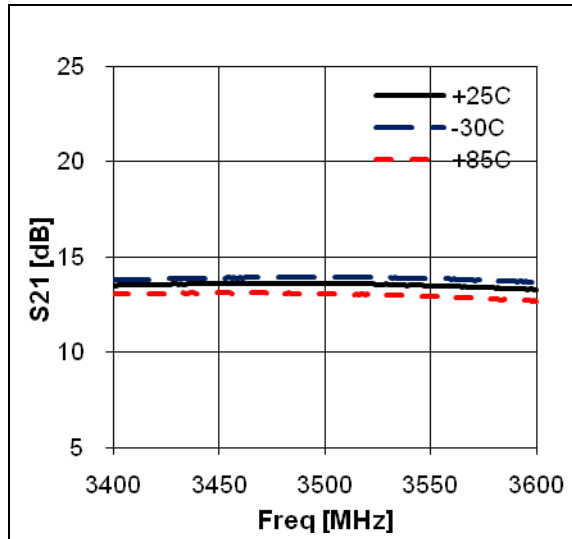


Application Circuit: 3500MHz

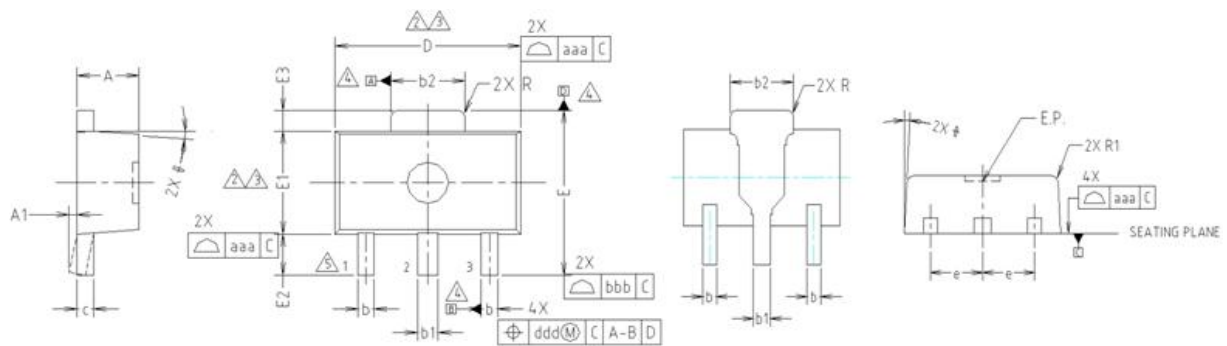
Schematic Diagram	BOM		Tolerance
	C1	22pF	± 5%
	C2	0.5pF	± 5%
	C3	0.5pF	± 5%
	C4	100pF	± 5%
	C5	1000pF	± 5%
	C6	10uF	± 20%
	C7	0.5pF	±5%
	C8	22pF	±5%
	L1	33nH	±5%

Typical Performance





Package Outline Dimension



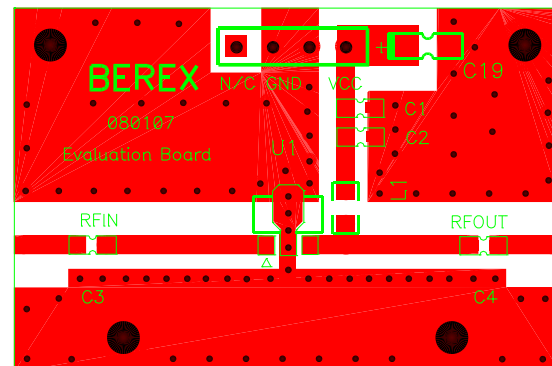
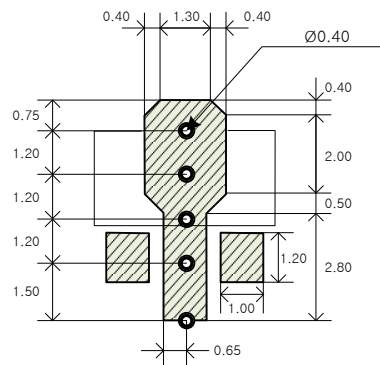
NOTE:

1. DIMENSIONS IN MILLIMETERS.

- 2. DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.5mm PER END. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.5mm PER SIDE.
- 3. DIMENSIONS D AND E1 ARE DETERMINED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
- 4. DATUMS A, B AND D TO BE DETERMINED 0.18mm FROM THE LEAD TIP.
- 5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.

SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	1.40	1.50	1.60	
A1	0.00	—	0.10	
b	0.38	0.42	0.48	
b1	0.48	0.52	0.58	
b2	1.79	1.82	1.87	
c	0.40	0.42	0.46	
D	4.40	4.50	4.70	2,3
E	3.70	4.00	4.30	
E1	2.40	2.50	2.70	2,3
E2	0.80	1.00	1.20	
E3	0.40	0.50	0.60	
e	1.50 TYP.			
φ	4° TYP.			
R	0.15 TYP.			
R1	—	—	0.20	
SYMBOL	TOLERANCES OF FORM AND POSITION		NOTE	
aaa	0.15			
bbb	0.20			
ccc	0.10			
ddd	0.10			

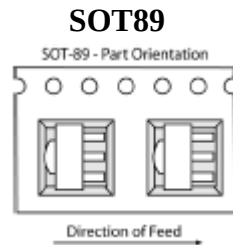
Suggested PCB Land Pattern and PAD Layout



Note : All dimension are in millimeters

Visit <http://www.berex.com> for PCB layout

Tape & Reel



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 1B
Value	Passes <1000V
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
---	---	---	---	---

NOTICE

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