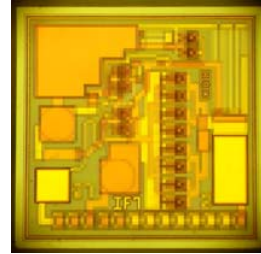


## 50-800 MHz Internally Matched IF Amplifier

### Device Features

- 40 dBm Output IP3 at 70MHz, 14dBm/tone
- 27.0 dB Gain at 70MHz
- 21.0 dBm P1dB at 70 MHz
- Highly Reliable InGaP/GaAs HBT Technology
- Patented over voltage protection circuit
- Application: commercial wireless system



### Target Device Performance ( $T_a = 25^\circ\text{C}$ )

Symbols	Parameters Test Conditions	Min	Typ	Max	Unit
Gain	70MHz	26.0	27.0		dB
	140MHz	25.8	26.8		
	250MHz	25.	26.7		
	500MHz	24.9	25.9		
S11	70MHz		-30.8		dB
	140MHz		-32.4		
	250MHz		-29.4		
	500MHz		-27.8		
S22	70MHz		-12.5		dB
	140MHz		-12.5		
	250MHz		-11.6		
	500MHz		-8.6		
OIP3	70MHz	39.2	41.2		dBm
	140MHz	38.5	40.8		
	250MHz	41.6	43.6		
	500MHz	39.4	41.4		
P1dB	70MHz	20.3	21.3		dBm
	140MHz	20.8	21.8		
	250MHz	20.7	21.7		
	500MHz	19.2	20.2		
Ic	Vc = 5.0V	85	95	105	mA
Vc			5.0		V
dG/dT			-0.003		$^\circ\text{C}$
Rth	Thermal Resistance		50		$^\circ\text{C}/\text{W}$

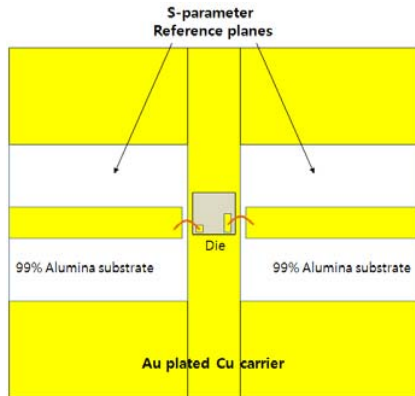
Test conditions unless otherwise noted.

1. Device performance is measured on BeRex evaluation board at  $25^\circ\text{C}$ , 50 ohm system.
2. OIP3 is measured on an eval-board with two tones separated by 1 MHz.

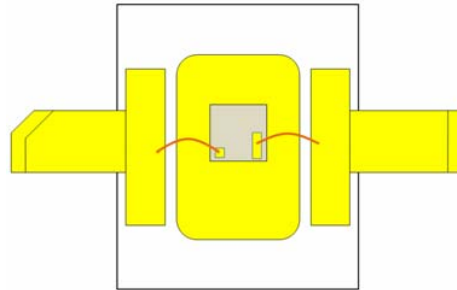
### Absolute Maximum Ratings

Parameter	Rating
Operating Case temperature	-40 to $+85^\circ\text{C}$
Storage Temperature	-40 to $+155^\circ\text{C}$
Supply Voltage	6.0V
Max. Device Current	160mA
Input RF Power	23dBm

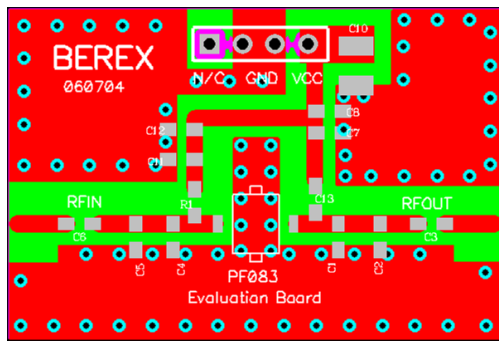
Operation of this device above any of these parameters may result in permanent damage.



S-parameter test circuit

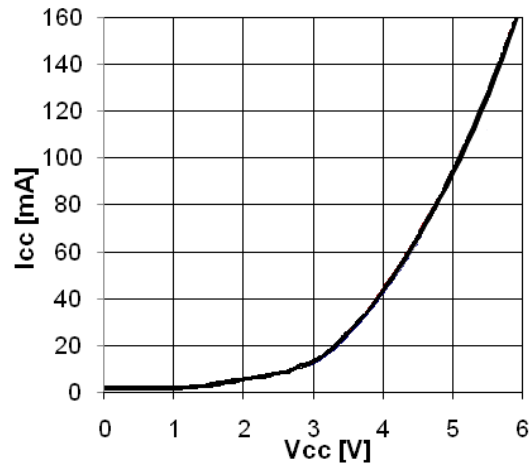


Chip attachment on PF083



31mil thick FR4 PCB

Generic PF083 Evaluation Board



I-V Characteristics

### Application Circuit: 50-800 MHz

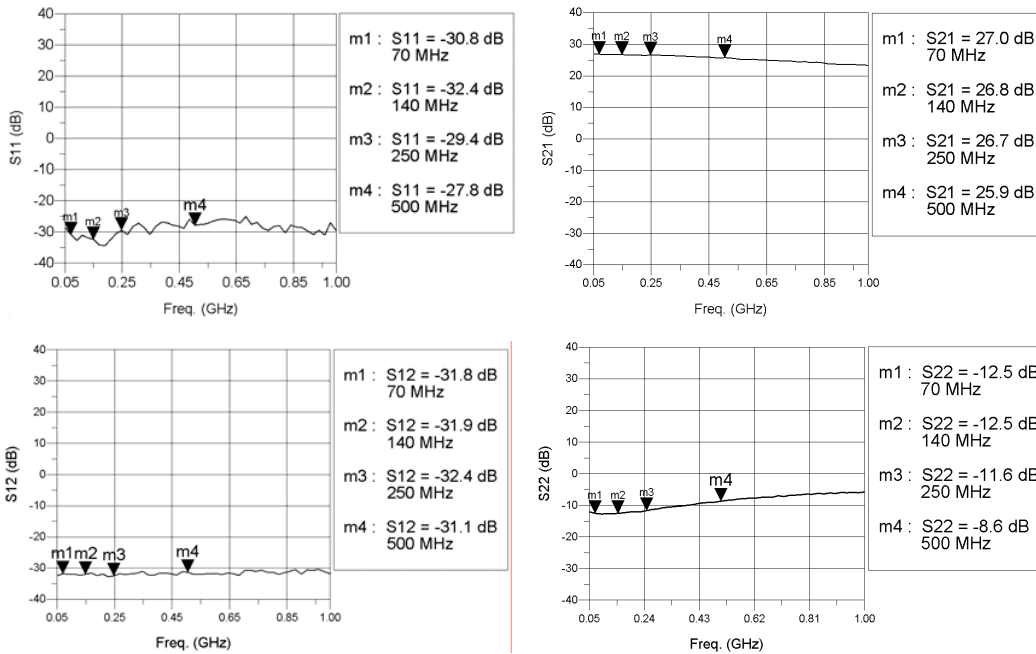
Typical Performance (Vdevice = 5V, Ic = 95 mA, Ta = 25°C)

Freq	MHz	70	140	250	500
S21	dB	27.0	26.8	26.7	25.9
S11	dB	-30.8	-32.4	-29.4	-27.8
S22	dB	-12.5	-12.5	-11.6	-8.64
P1	dBm	21.3	21.8	21.7	20.2
OIP3	dBm	41.2	40.8	43.6	41.4

Schematic Diagram		BOM	Tolerance
		C1	100nF *100pF ± 5%
		C2	100nF *100pF ± 5%
		C3	100pF ± 5%
		C4	1000pF ± 5%
		C5	10uF ± 20%
		L1	1uH *12nH ±5%
*Application for RF Bandwidth			

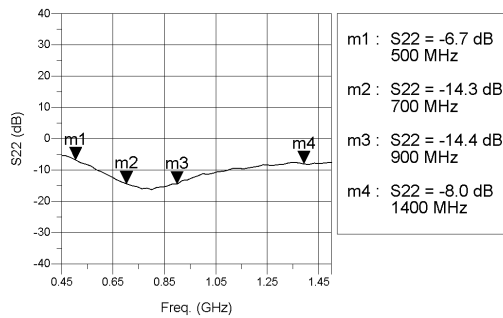
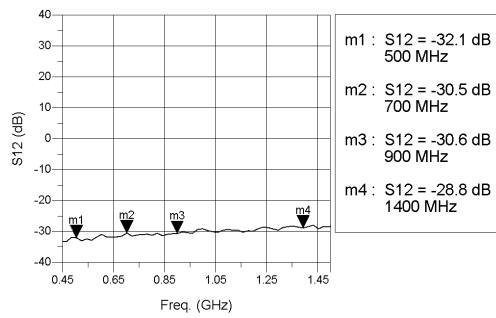
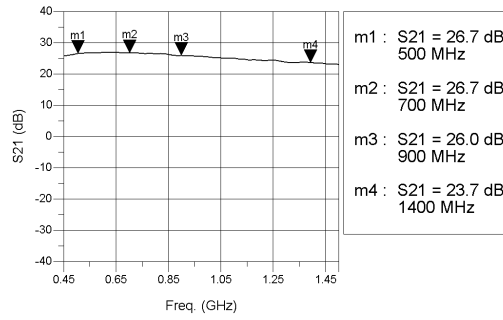
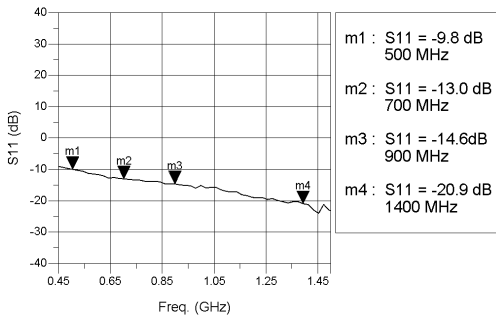
### Typical Device Data

S-parameters (Vc=5V, Ic=95mA, T=25°C)



### IF Bandwidth Application

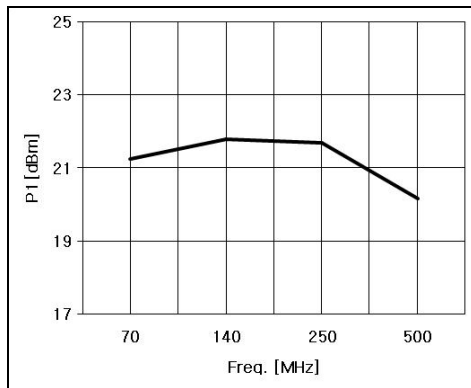
S-parameters (Vc=5V, Ic=95mA, T=25°C)



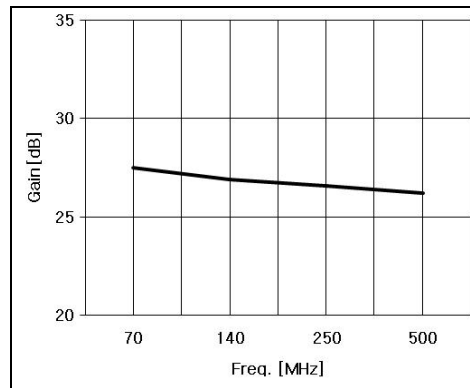
RF Bandwidth Application

Device Performance

P1dB-Gain

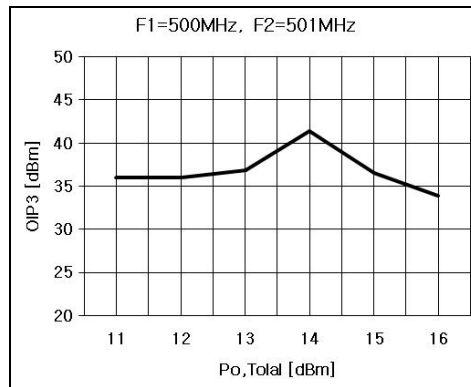
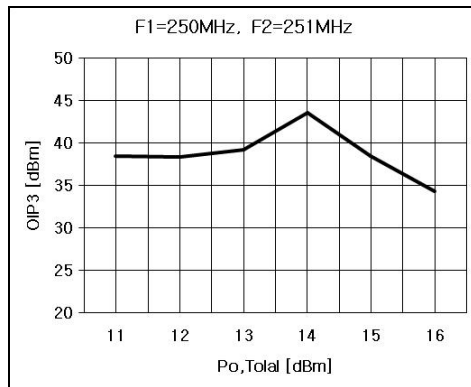
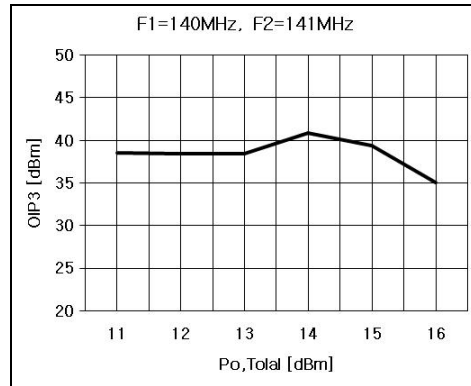
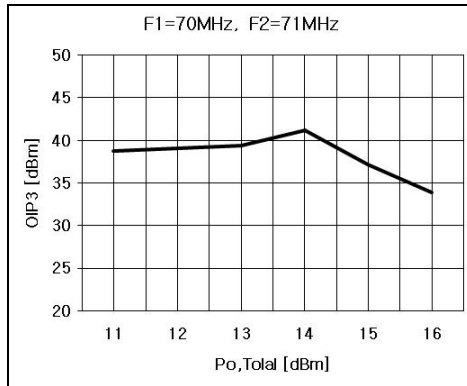


P1



Gain

### OIP3



### S-Parameter

IF Bandwidth Application (Vc=5V, Ic=95mA, T=25°C)

Freq [MHz]	S11 [dB]	S11 [Ang]	S21 [dB]	S21 [Ang]	S12 [dB]	S12 [Ang]	S22 [dB]	S22 [Ang]
50	-28.586	-106.642	27.021	176.006	-32.384	2.863	-12.028	22.476
150	-32.368	153.226	26.801	156.233	-31.914	-7.256	-12.467	-21.072
250	-29.436	103.952	26.672	135.931	-32.394	-13.069	-11.622	-41.718
350	-30.806	74.122	26.319	119.315	-30.952	-23.766	-10.324	-58.0256
450	-28.025	57.612	26.102	102.363	-31.721	-36.896	-9.144	-72.792
550	-27.358	39.511	25.497	85.096	-31.882	-41.929	-8.246	-58.005
650	-26.156	34.536	25.184	69.233	-31.562	-51.528	-7.420	-94.494
750	-28.741	16.783	24.699	56.366	-30.987	-55.955	-6.775	102.541
850	-28.388	26.499	23.915	36.370	-30.922	-65.779	-6.329	-113.462

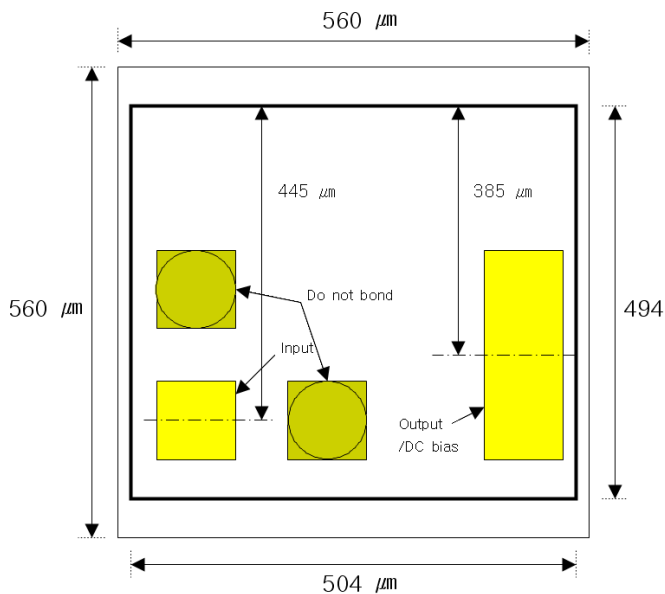
\* Note : S-parameter includes 1 mil thick and 16-mil long Au wire

RF Bandwidth Application ( $V_c=5V$ ,  $I_c=95mA$ ,  $T=25^\circ C$ )

Freq [MHz]	S11 [dB]	S11 [Ang]	S21 [dB]	S21 [Ang]	S12 [dB]	S12 [Ang]	S22 [dB]	S22 [Ang]
500	-9.933	-62.036	26.655	140.862	-32.054	5.690	-6.741	95.975
600	-11.592	-69.083	27.012	114.561	-30.891	-10.142	-10.421	66.190
700	-12.970	-75.467	26.862	90.690	-30.452	-21.447	-14.326	28.112
800	-13.821	-81.199	26.486	70.988	-31.196	-39.664	-16.186	-31.310
900	-14.577	-89.643	26.003	51.737	-30.634	-47.501	-14.438	-74.036
1000	-15.849	-105.713	25.350	31.493	-29.676	-65.002	-11.274	-101.616
1100	-16.947	-116.273	25.174	17.566	-29.279	-73.650	-9.931	-115.456
1200	-18.847	-127.822	24.486	3.151	-29.542	-89.241	-8.173	-139.546
1300	-19.853	-145.186	23.909	-13.503	-29.542	-89.241	-8.173	-139.546
1400	-20.891	-168.828	23.719	-27.530	-28.848	-96.767	-7.982	-149.506
1500	-22.903	162.772	23.175	-42.466	-28.517	-107.766	-7.466	-156.464

\* Note : S-parameter includes 1 mil thick and 16-mil long Au wire

## Die Outline



### NOTES:

- 1) DIE THICKNESS 100um
- 2) BONDPAD METAL THICKNESS 2.8um
- 3) BACKSIDE METAL Au, 5um
- 4) DEVICE IS GROUNDED THROUGH VIA HOLES

**ESD Rating**

<b>ESD Rating</b>	Class 1C
<b>Value</b>	Passes <2000V
<b>Test</b>	Human Body Model (HBM)
<b>Standard</b>	JEDEC Standard JESD22-A114B

**NATO CAGE code:**

<b>2</b>	<b>N</b>	<b>9</b>	<b>6</b>	<b>F</b>
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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.



Proper ESD procedures should be followed when handling this device.