

### Device Features

- Single Fixed 3.3V supply
- Gain = 13.4 dB @ 850MHz
- Output IP3 = 32.3 dBm @ 850MHz
- 5G NR ACLR = 5.3 dBm @ 850MHz
- Internally matched to 50 ohms
- RoHS2-compliant SOT-363 SMT package

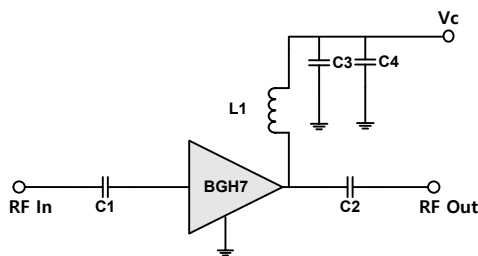
### Product Description

The BGH7 is a BroadBand, HBT Amplifier that is ideal for applications demanding high linearity in a wideband of 10-4200 MHz. The BGH7 is internally matched to 50 Ohms and requires no external matching components. It is available in RoHS2-compliant SOT363 SMT package. These devices are 100% DC and RF tested to assure quality and performance.

### Applications

- Mobile Infrastructure
- LTE / WCDMA / EDGE / 5G NR / WIFI
- General Purpose Wireless

### Applications Circuit



Application Circuit Values Example			
Freq.	0.01 ~ 0.6GHz	0.6 ~ 2.4GHz	2.4 ~ 4.2GHz
C1	1 nF	100 pF	12 pF
C2	1 nF	100 pF	2 pF
C3	100 pF	100 pF	100 pF
C4	1 nF	1 nF	1 nF
L1	1.2 uH	100 nH	15 nH

### Part Marking (XX:Wafer number)



Pin Description	
RF IN	3
RF OUT	6
GND	1,2,4,5

### Electrical Specifications

Device performance \_ measured on a BeRex evaluation board at 25°C, Vc=3.3V, 50 Ω system.

Parameter	Conditions	Min	Typ	Max	Unit
Operational Frequency Range		10		4200	MHz
Test Frequency			850		MHz
Gain		11.9	13.4		dB
Input Return Loss			-10.5		dB
Output Return Loss			-16.0		dB
Output IP3	0 dBm / tone , Δf=1 MHz	29.3	32.3		dBm
Output P1dB		14.0	15.0		dBm
5G NR ACLR*		4.3	5.3		dBm
Noise Figure			4.9		dB

\*ACLR Channel Power measured at -50dBc.

- 5G set-up: 3GPP 5G NR, 100MHz BW, ±100MHz offset, PAR 9.5 at 0.01% Prob.

### Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit
Bandwidth	10		4200	MHz
I <sub>c</sub> @ (V <sub>c</sub> = 3.3V)	44	55	66	mA
V <sub>c</sub>	3.0	3.3	3.6	V
dG/dT		-0.0008		dB/°C
R <sub>TH</sub>		72.3		°C/W
Operating Case Temperature	-40		+105	°C

Electrical specifications are measured at specified test conditions.

Specifications are not guaranteed over all recommended operating conditions.

### Absolute Maximum Ratings

Parameter	Rating	Unit
Storage Temperature	-55 to +155	°C
Junction Temperature	125	°C
Supply Voltage	+4	V
Supply Current	170	mA
Input RF Power	24	dBm

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

### Typical Performance (Vc=3.3V, Ic=55mA, T=25°C)

Parameter	Frequency							Unit
	70	500	850	1950	2140	2600	3500	
Gain	13.6	13.4	13.4	13.0	12.8	13.0	13.3	dB
S11	-11.0	-11.3	-10.7	-13.4	-15.0	-15.4	-16.3	dB
S22	-15.0	-15.8	-16.2	-32.7	-30.1	-13.3	-12.9	dB
OIP3	33.0	33.0	33.3	28.3	27.6	28.0	23.7	dBm
P1dB	14.7	14.8	15.0	14.7	14.4	14.4	13.0	dBm
LTE 20M ACLR*	5.5	5.5	5.3	4.6	4.3	4.5	-	dBm
5G NR ACLR*	-	-	-	-	-	-	0.5	dBm
Noise Figure	4.57	4.77	4.85	5.70	5.87	5.81	6.71	dB

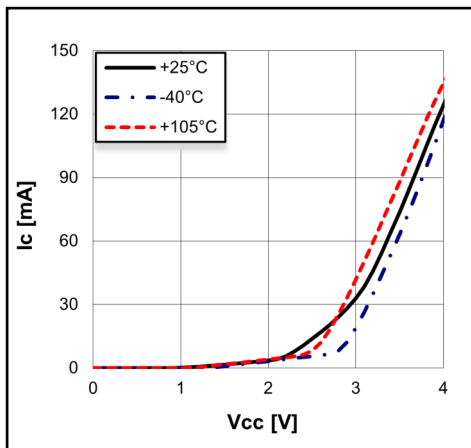
\*ACLR Channel Power measured at -50dBc.

- LTE set-up: 3GPP LTE, FDD E-TM3.1, 20MHz BW, ±20MHz offset, PAR 9.75 at 0.01% Prob.

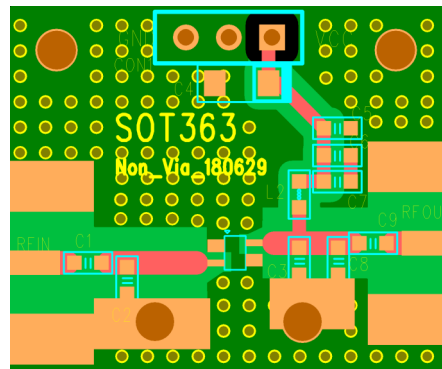
- 5G set-up: 3GPP 5G NR, 100MHz BW, ±100MHz offset, PAR 9.5 at 0.01% Prob.

Preliminary Datasheet

### V-I Characteristics



### BeRex SOT-363 Evaluation Board

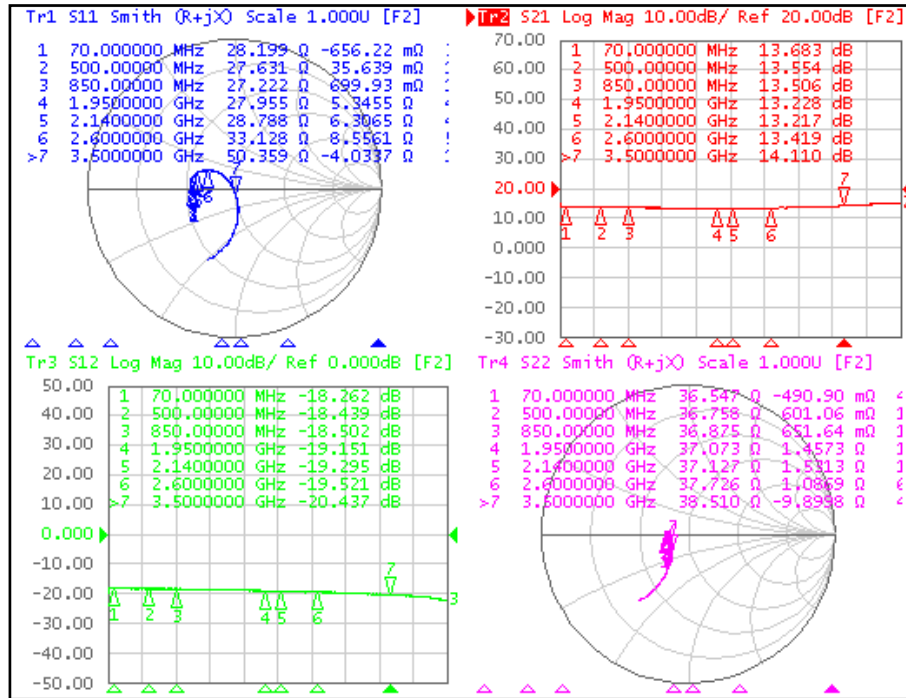


\*Dielectric constant \_ 4.2 \*RF pattern width 52mil \*31mil thick FR4

\*Without vias under device degrade device performance.

### Typical Device Data

S-parameters ( $V_c=3.3V$ ,  $I_c=55mA$ ,  $T=25^\circ C$ , Bias Tee Data)

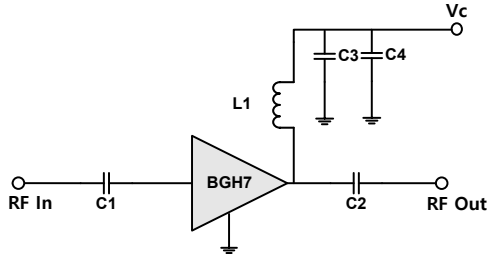


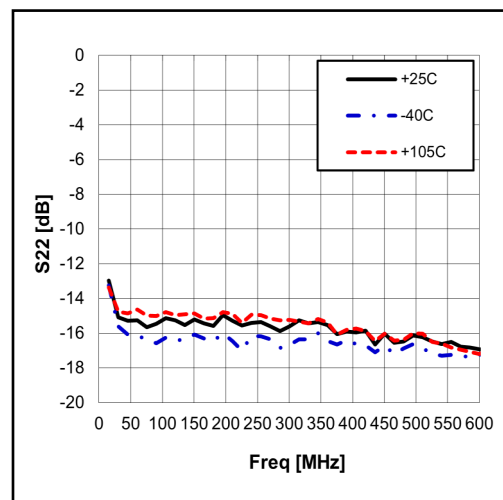
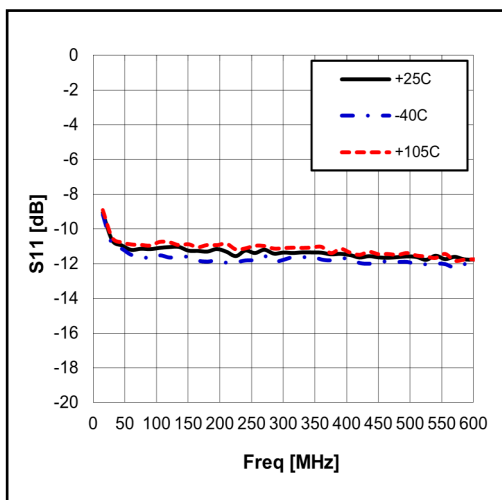
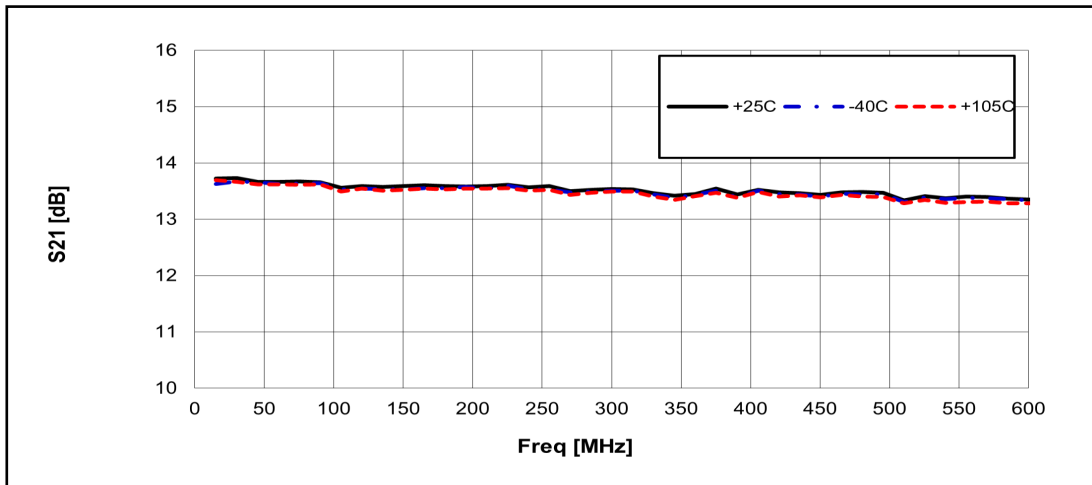
### S-Parameter

( $V_c = 3.3V$ ,  $I_c = 55mA$ ,  $T = 25^\circ C$ , calibrated to device leads, Bias Tee Data)

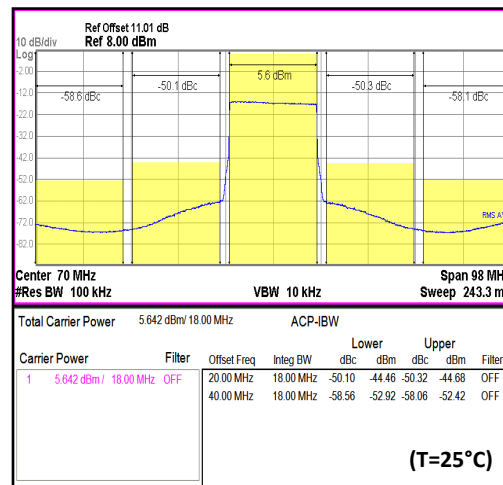
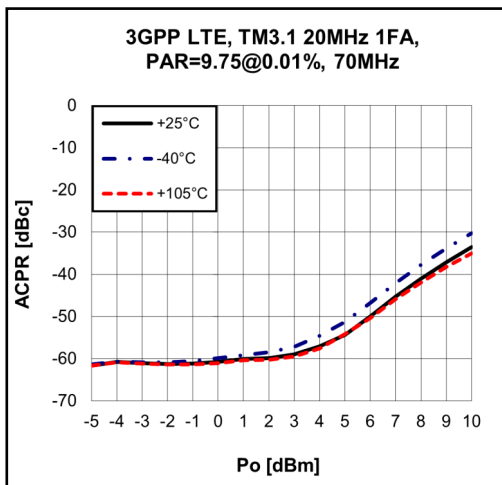
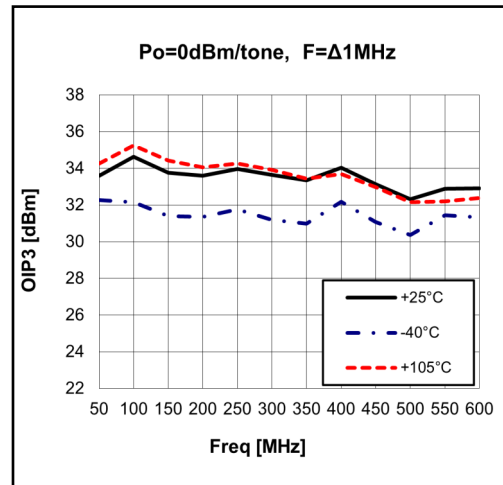
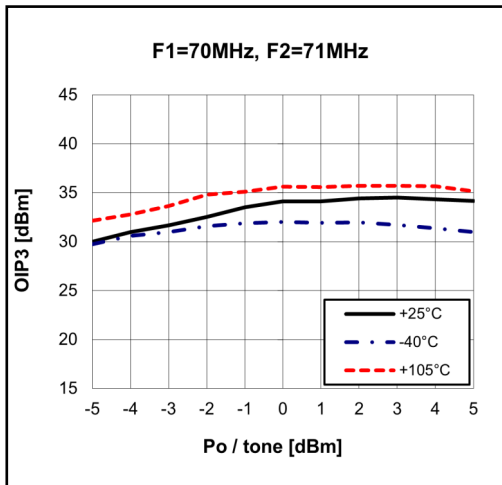
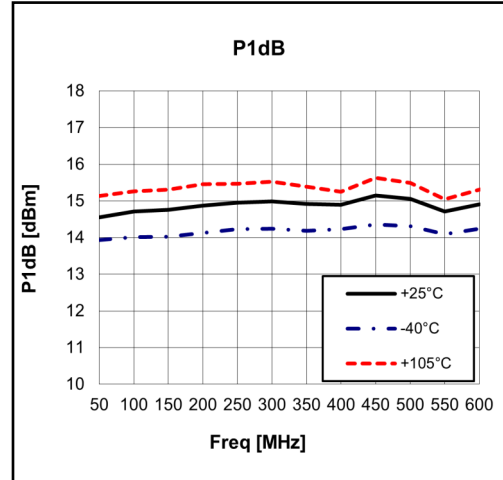
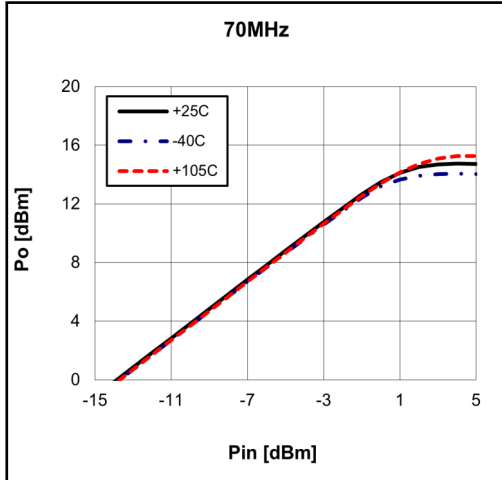
Freq [MHz]	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
100	0.28	-178.33	4.82	-175.44	0.12	-0.93	0.16	-178.65
500	0.29	179.74	4.75	160.21	0.12	-6.21	0.15	177.57
1000	0.30	176.50	4.72	141.52	0.12	-12.53	0.15	176.31
1500	0.30	169.67	4.64	122.36	0.11	-19.24	0.15	174.26
2000	0.29	161.45	4.58	104.32	0.11	-25.96	0.15	172.66
2500	0.24	150.35	4.65	85.89	0.11	-32.64	0.14	172.78
3000	0.14	134.58	4.79	65.86	0.10	-43.19	0.12	-174.44
3500	0.04	-81.94	5.09	43.29	0.09	-56.55	0.17	-132.56
4000	0.35	-95.22	5.59	14.18	0.09	-81.16	0.41	-120.74
4200	0.51	-110.87	5.51	-2.00	0.07	-95.40	0.56	-127.10

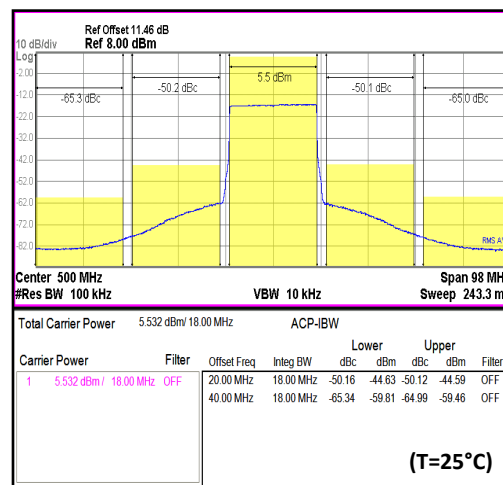
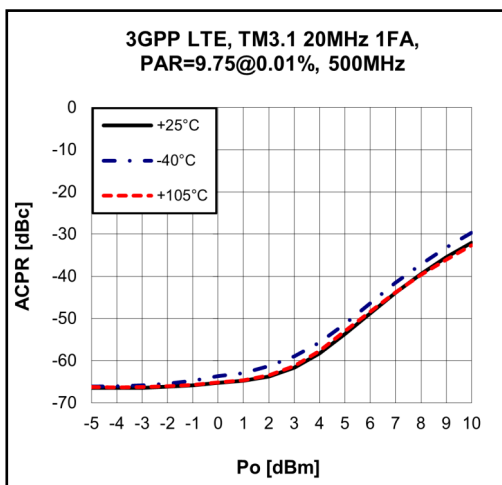
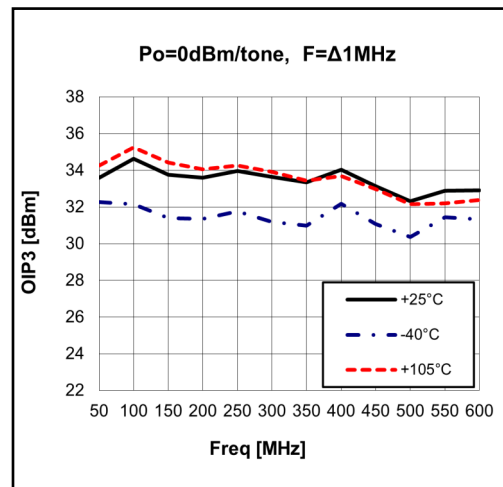
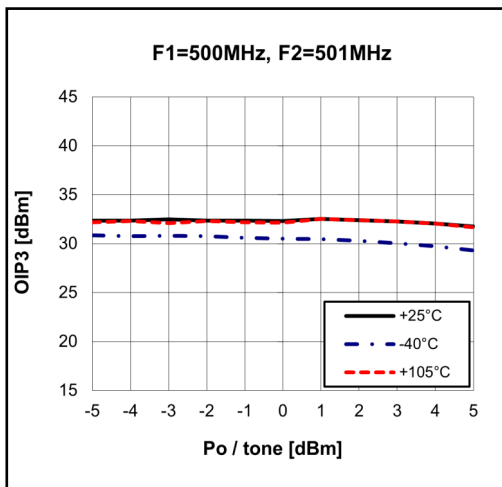
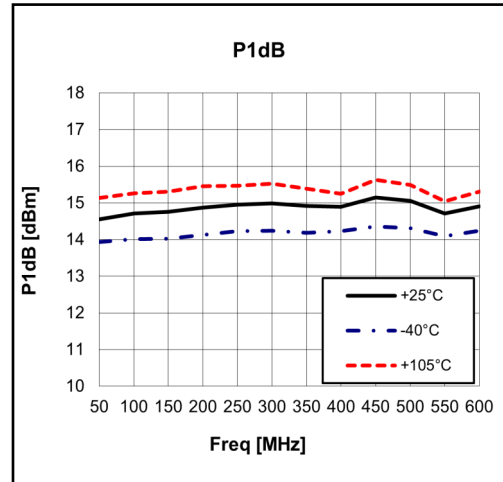
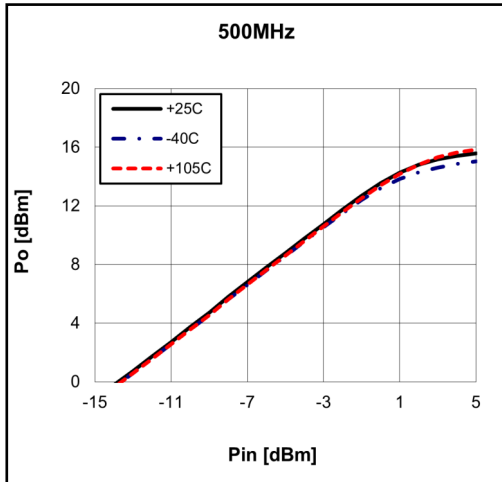
**RF Application Circuit: 10 – 600MHz**

Schematic Diagram		BOM		Size(inch)
		C1	1 nF	0603
		C2	1 nF	0603
		C3	100 pF	0603
		C4	1 nF	0603
		L1	1.2 uH	0603

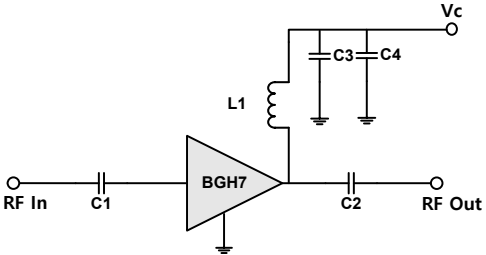
**Typical Performance**
 $V_c = 3.3V, I_c = 55mA, T = 25^\circ C$ 


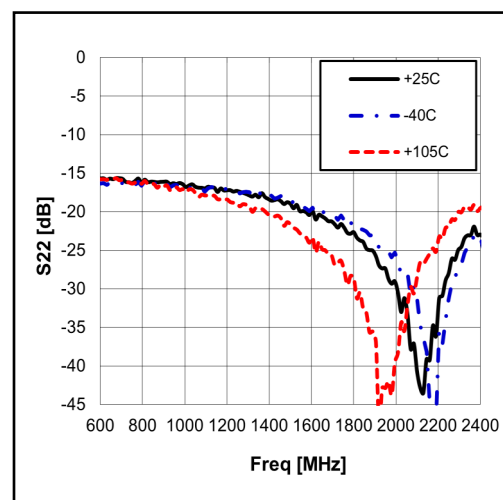
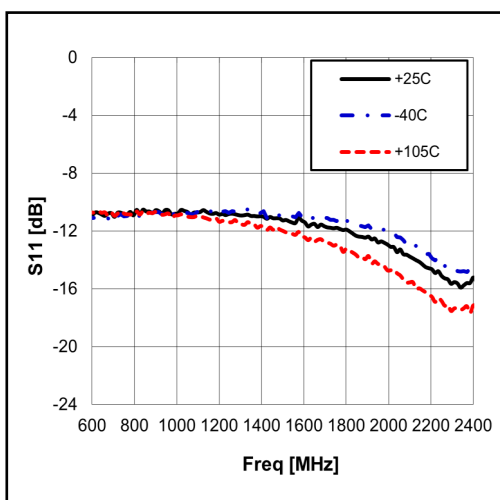
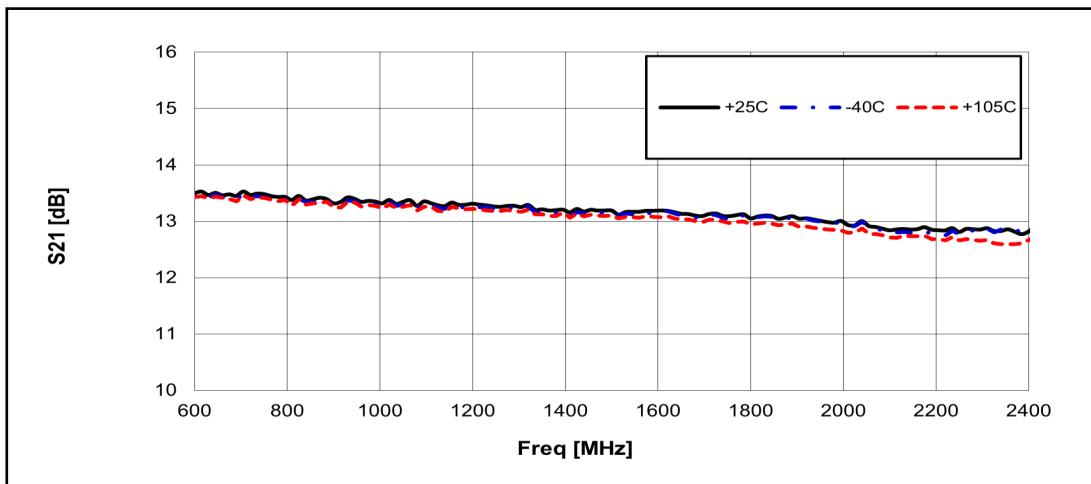
Preliminary Datasheet



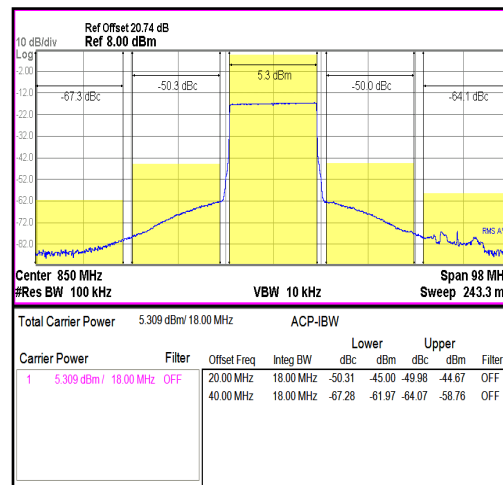
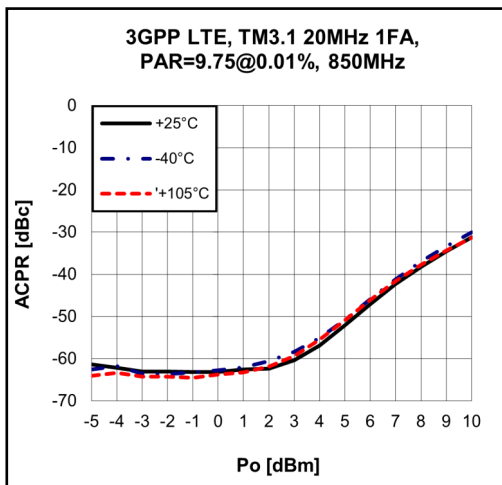
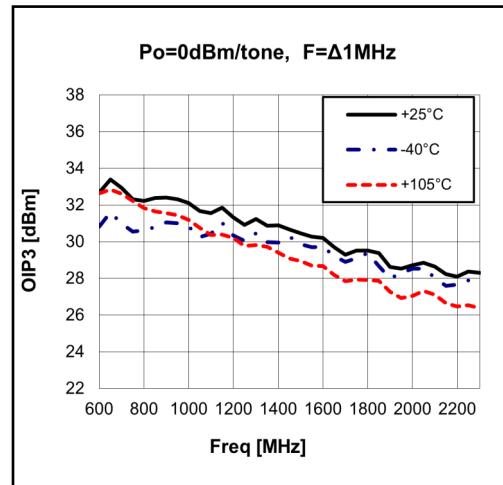
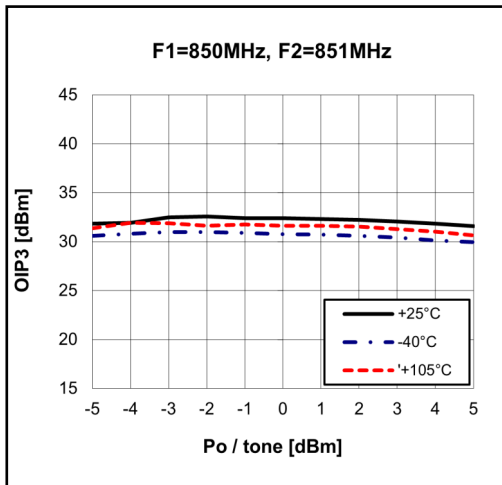
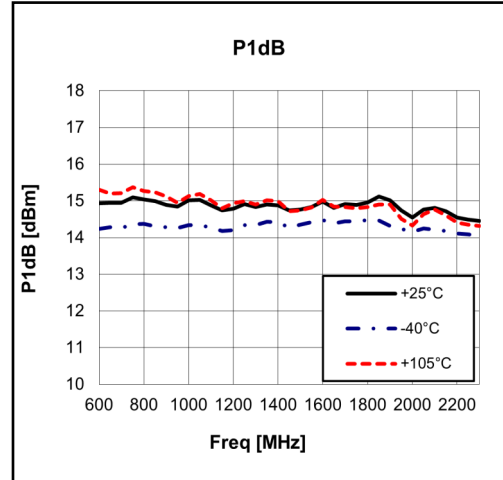
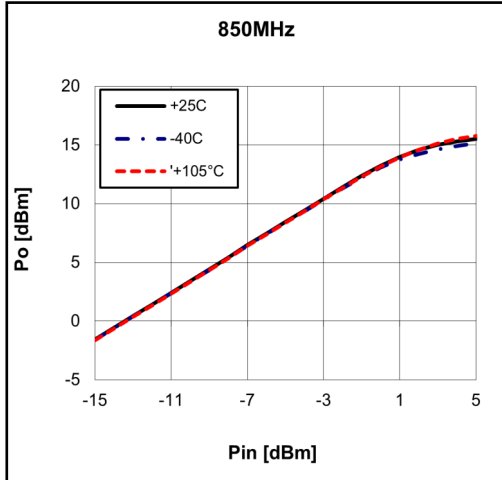


**RF Application Circuit: 600 – 2400MHz**

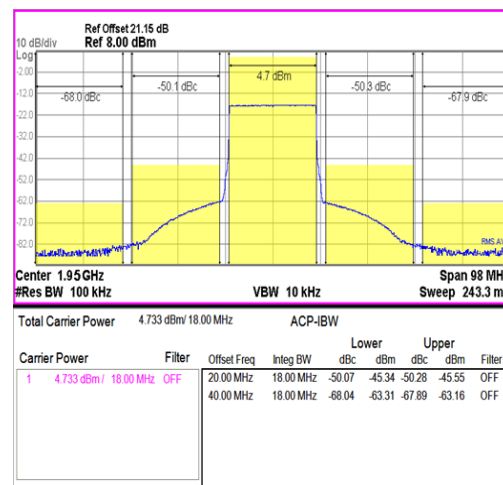
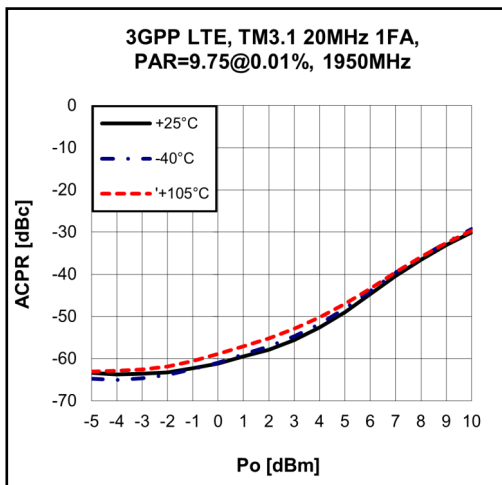
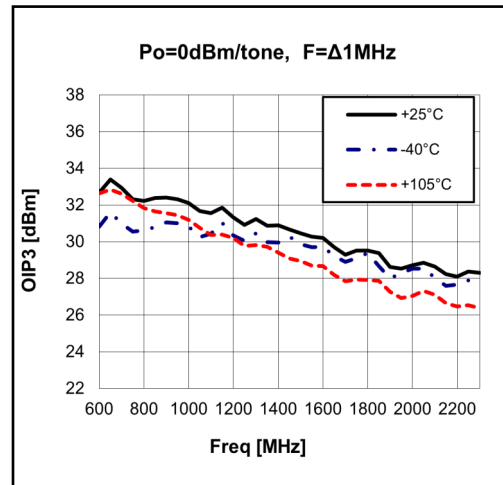
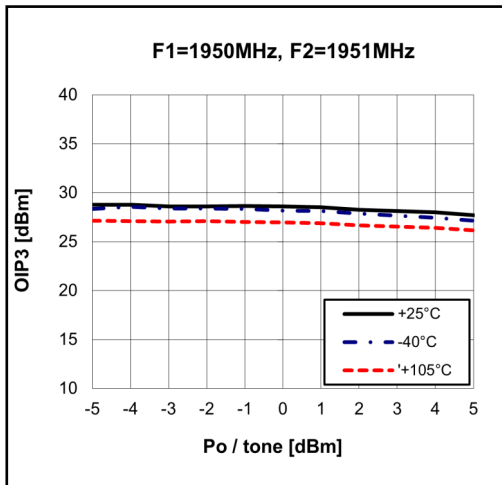
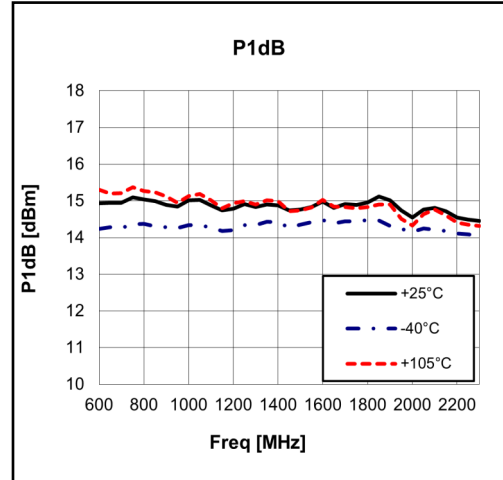
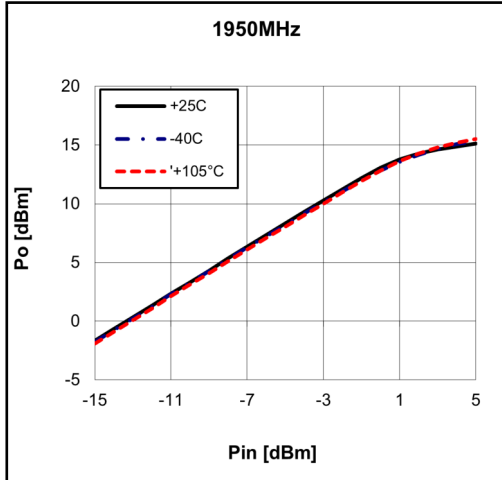
Schematic Diagram		BOM		Size(inch)
	C1	100 pF	0603	
	C2	100 pF	0603	
	C3	100 pF	0603	
	C4	1 nF	0603	
	L1	100 nH	0603	

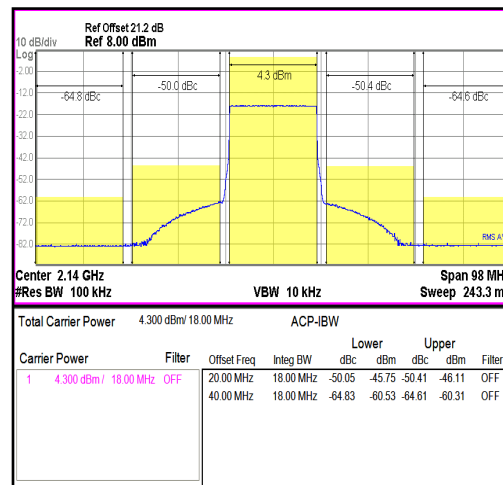
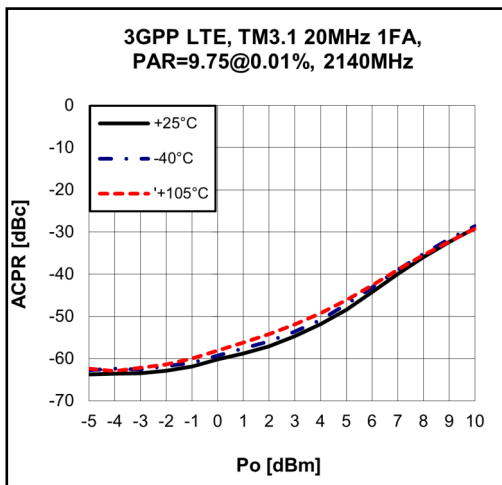
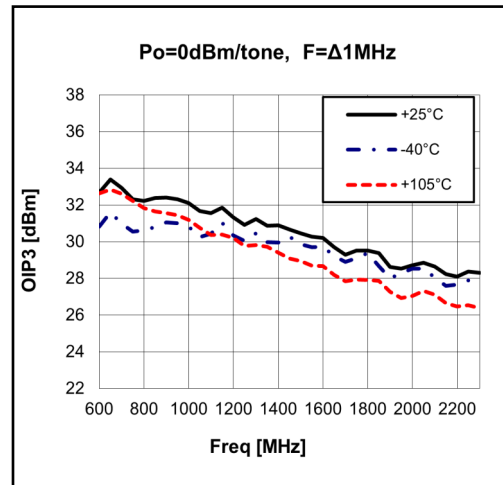
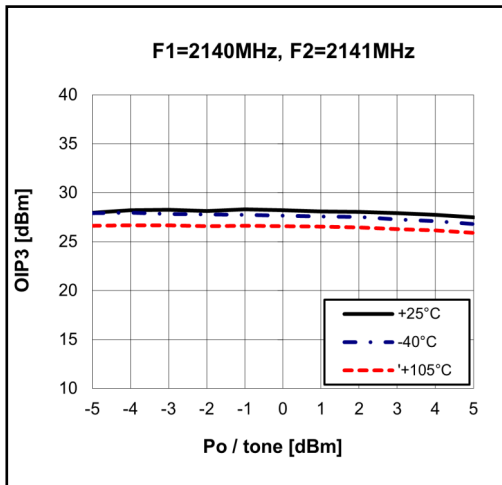
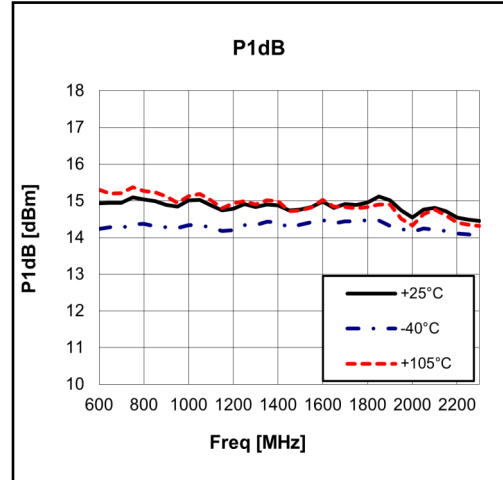
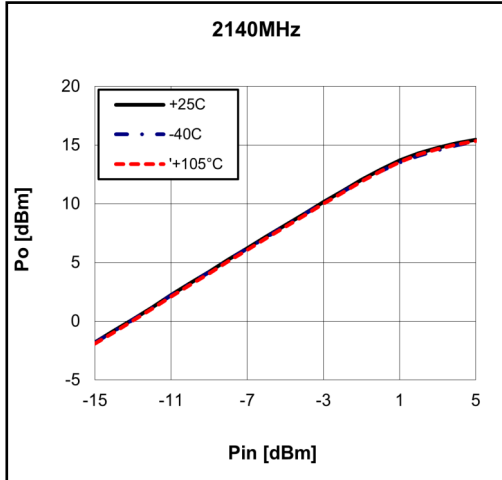
**Typical Performance**
 $V_c = 3.3V, I_c = 55mA, T = 25^\circ C$ 


Preliminary Datasheet







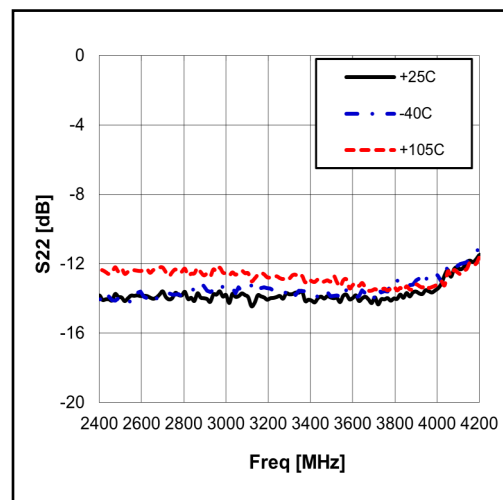
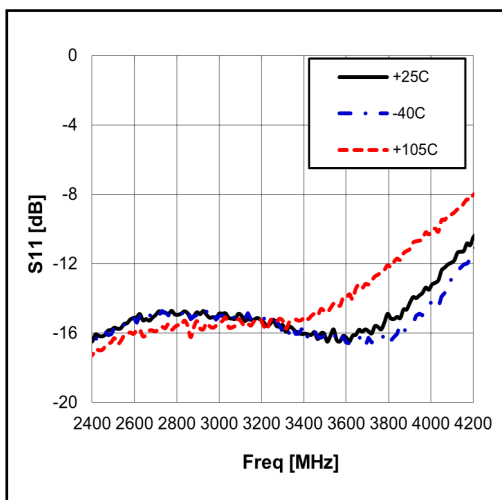
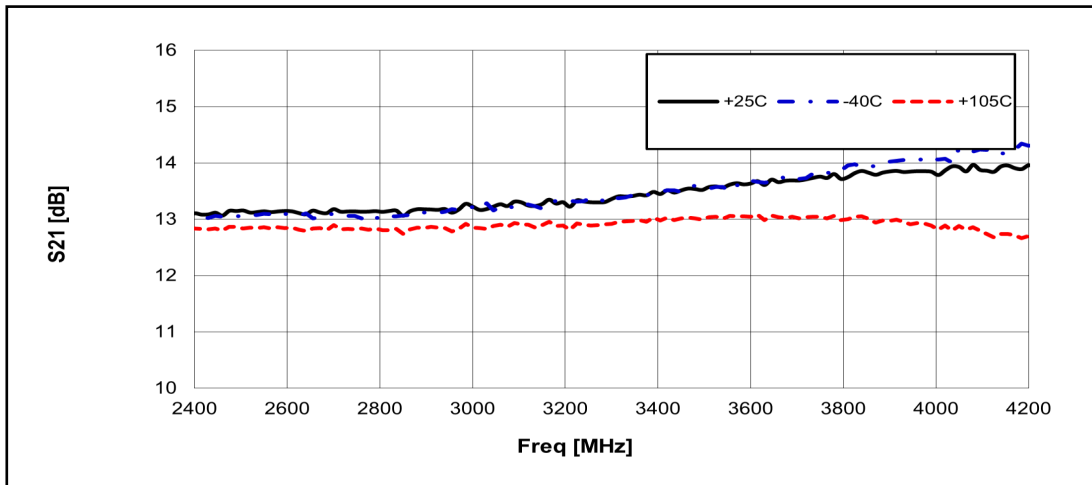


### RF Application Circuit: 2400 – 4200MHz

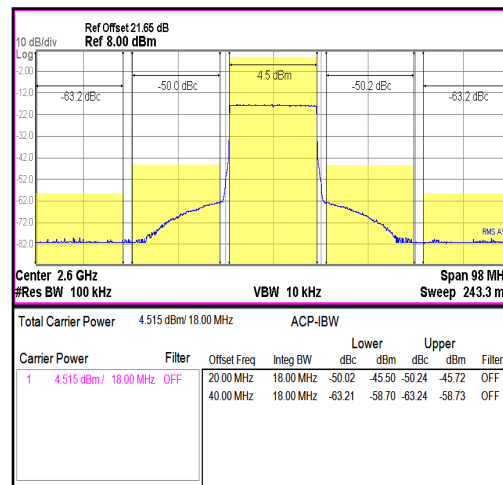
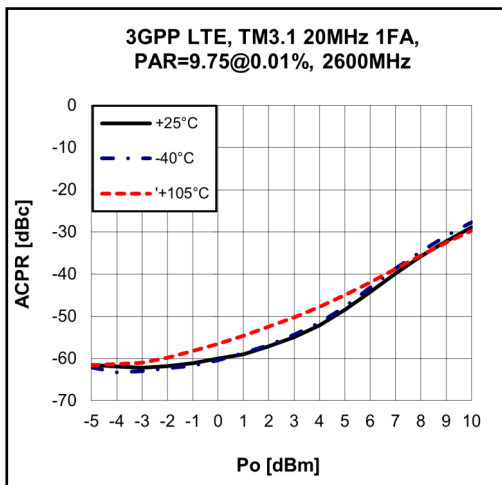
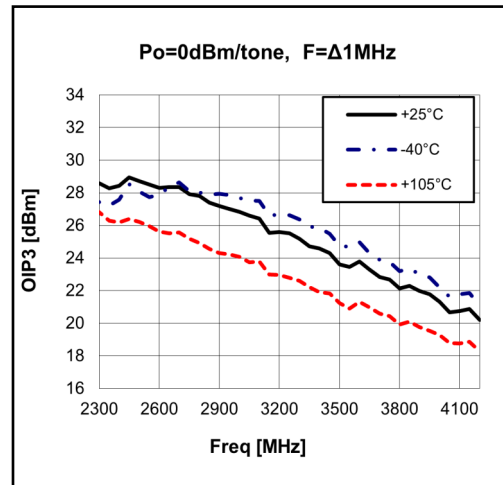
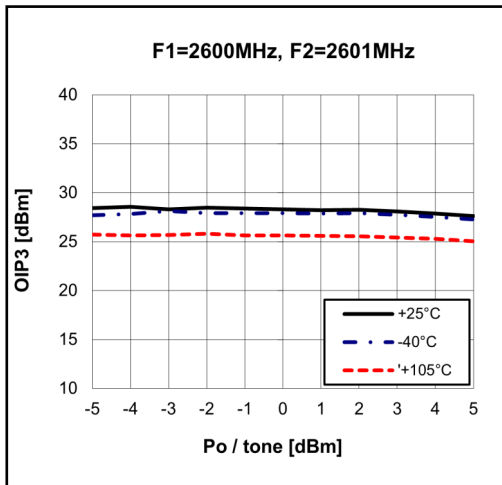
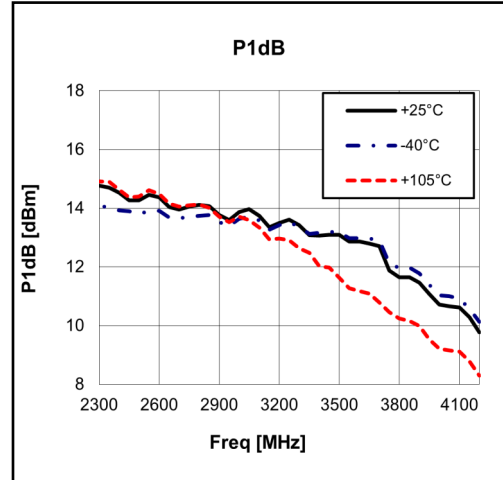
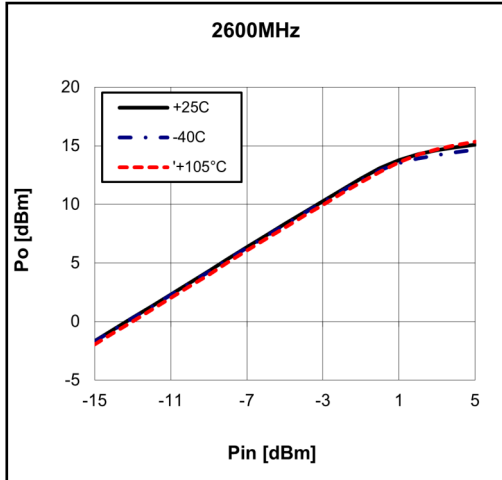
Schematic Diagram		BOM		Size(inch)
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	C3	100 pF	0603	
	C4	1 nF	0603	
	L1	15 nH	0603	

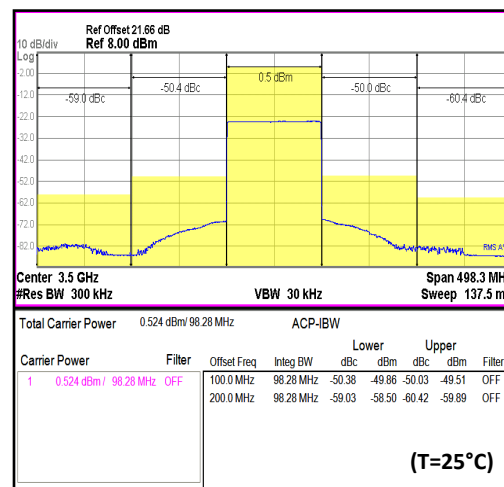
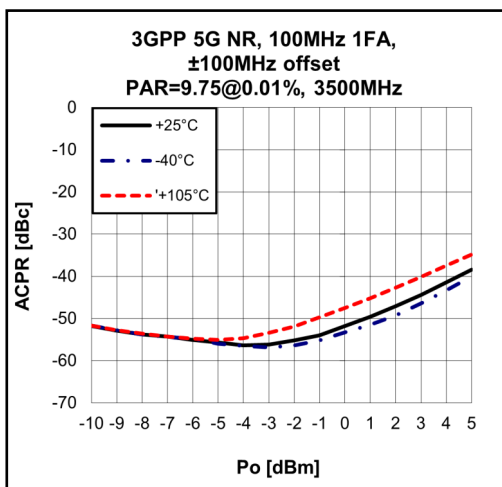
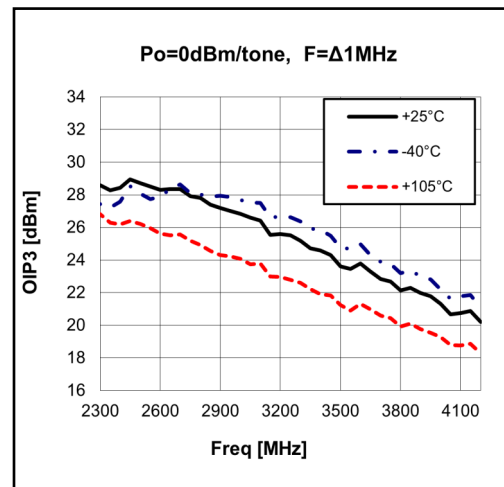
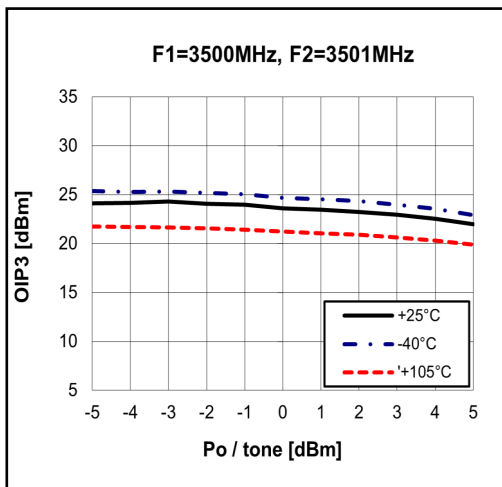
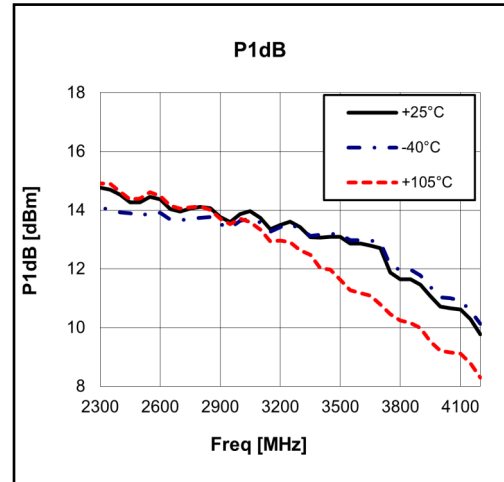
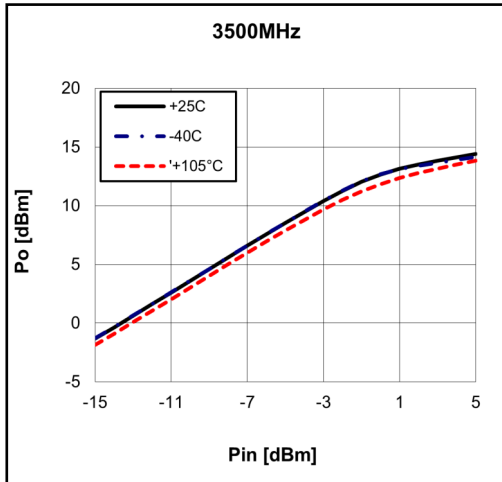
### Typical Performance

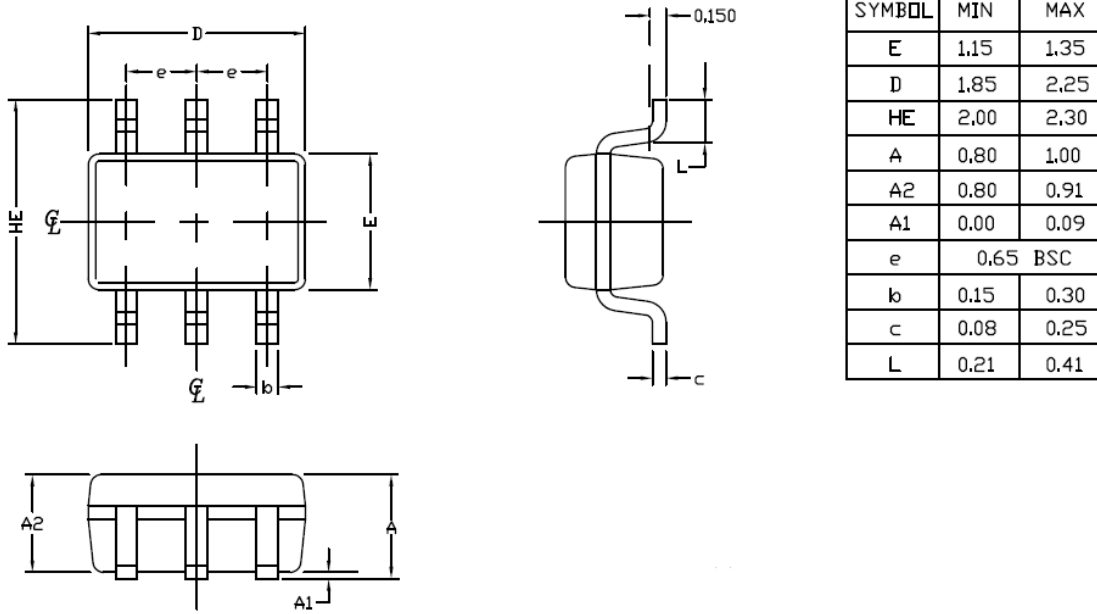
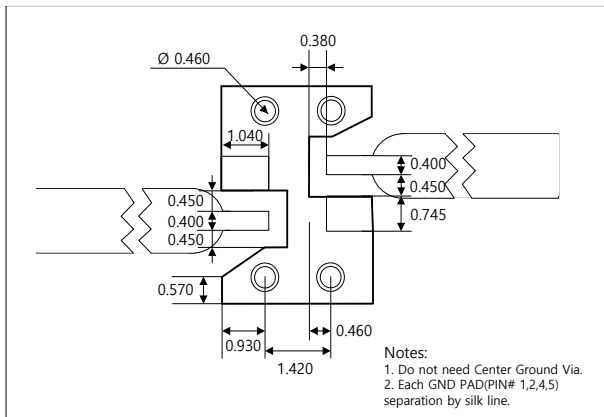
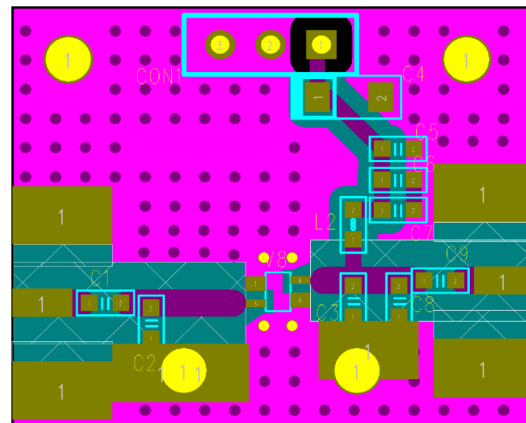
$V_c = 3.3V, I_c = 55mA, T = 25^\circ C$



Preliminary Datasheet

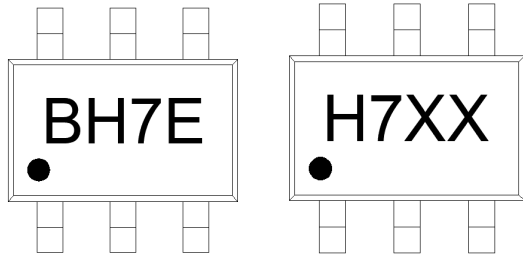




**Package Outline Dimension**

**Suggested PCB Land Pattern and PAD Layout**
**PCB Land Pattern**

**PCB Mounting**


Note : All dimension \_ millimeters

PCB lay out \_ on BeRex website

**Package Marking**


H7 = Product No.  
XX = Wafer No.

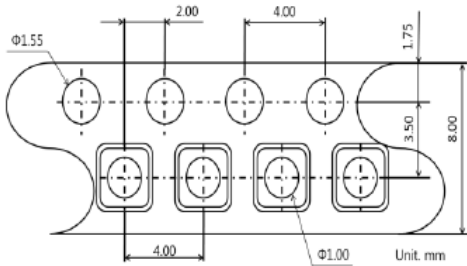
Pin 1

Pin 1

**Tape & Reel**

SOT-363

Packaging information:



Tape Width (mm): 8  
 Reel Size (inches): 7  
 Device Cavity Pitch (mm): 4  
 Devices Per Reel: 3000

**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.)

Preliminary Datasheet

### MSL / 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 JS-001-2017
<b>MSL Rating:</b>	Level 1 at +260°C convection reflow
<b>Standard:</b>	JEDEC Standard J-STD-020



Proper ESD procedures should be followed when handling this device.

### RoHS Compliance

This part is compliant with Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2011/65/EU as amended by Directive 2015/863/EU.

This product also is compliant with a concentration of the Substances of Very High Concern (SVHC) candidate list which are contained in a quantity of less than 0.1%(w/w) in each components of a product and/or its packaging placed on the European Community market by the BeRex and Suppliers.

### NATO CAGE code:

2	N	9	6	F
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