

PL08

GaAs p-HEMT LNA



Features

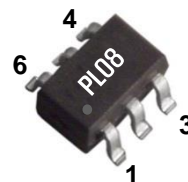
- 5 - 3000MHz
- 19.5 dB Gain at 900 MHz
- +33.0 dBm Output IP3 at 1900 MHz
- 0.79 dB Noise Figure at 900 MHz
- Single 3 V Supply Voltage
- Lead-free / Green / RoHS-compliant SOT-363 Package



Applications

- Mobile Infrastructure
- PCS, WCDMA, WiBro
- W-LAN / ISM
- RFID / Fixed Wireless

Functional Diagram



* Marking : N32

Function	Pin No.
RF IN	3
RF OUT / Bias	6
Ground	1,2,4,5

Description

The PL08 is a high performance GaAs p-HEMT LNA (Low Noise Amplifier) in a high quality SOT-363 package. The device features high linear performance, low noise figure, low power consumption and high reliability. The PL08 can be easily matched to obtain optimum power and linearity. The PL08 operates from a single +3 voltage supply and have an internal active bias. All devices are 100% RF and DC tested.

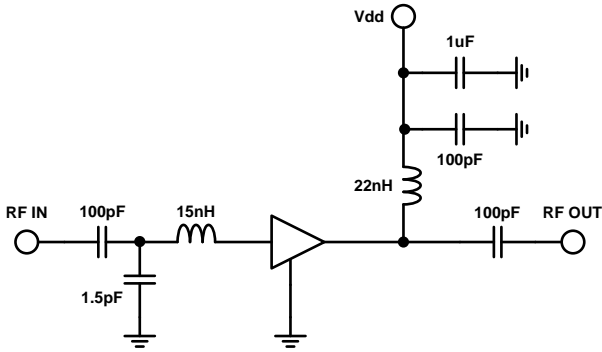
Specifications

Symbol	Units	Freq.	Min.	Typ.	Max.
S21	dB	900 MHz 1900 MHz 2140 MHz 2600 MHz		19.5 14.5 13.5 12.0	
S11	dB	900 MHz 1900 MHz 2140 MHz 2600 MHz		-17 -18 -17 -15	
S22	dB	900 MHz 1900 MHz 2140 MHz 2600 MHz		-14 -18 -16 -18	
P1dB	dBm	900 MHz 1900 MHz 2140 MHz 2600 MHz		16.5 16.5 16.5 16.5	
OIP3	dBm	900 MHz 1900 MHz 2140 MHz 2600 MHz		30.0 33.0 33.0 33.0	
NF	dB	900 MHz 1900 MHz 2140 MHz 2600 MHz		0.79 0.92 0.96 1.15	
Icc	mA			45	
Vcc	V			3.0	
Rth	°C/W			40	

Test Conditions : T=25°C, Supply Voltage=+3V, 50ohm System, OIP3 measured with two tones at an output power of +3dBm/tone separated by 1MHz.

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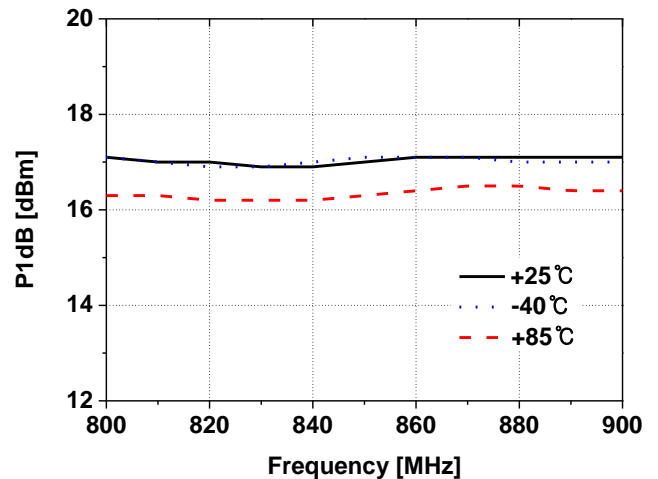
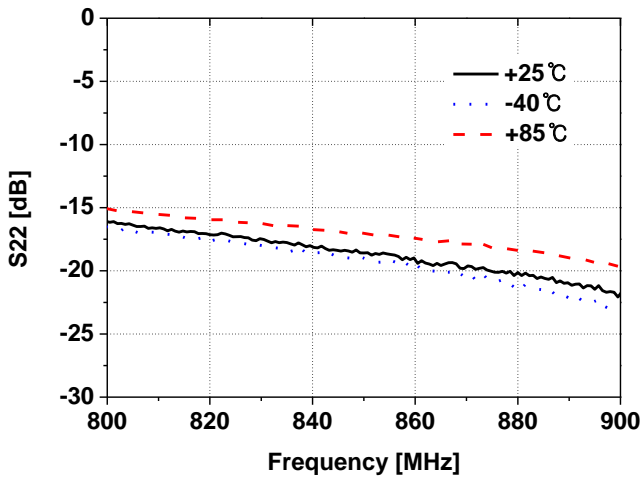
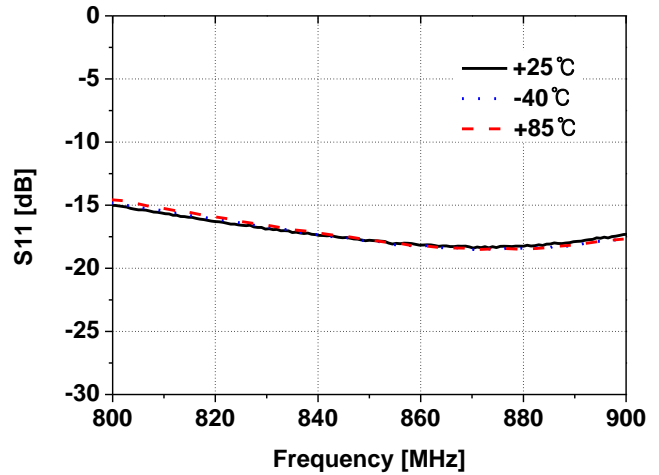
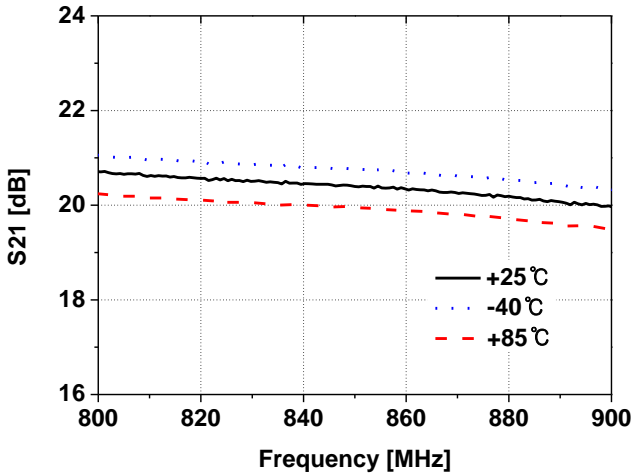
800 MHz – 900 MHz Application Circuit



Frequency[MHz]	800	900
S21[dB]	20.5	19.5
S11[dB]	-14	-17
S22[dB]	-15	-21
P1dB[dBm]	+16.8	+16.8
Output IP3[dBm] ⁽¹⁾	+30.0	+30.0
NF[dB]	0.79	0.79
Vcc[V]	3	
Icc[mA]	45	

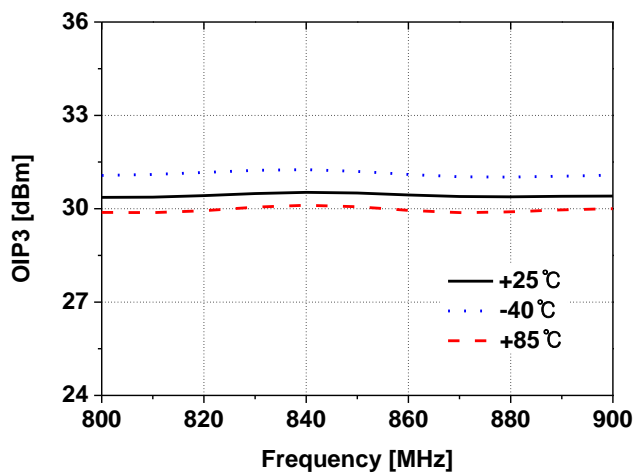
Note:

1. OIP3 measured with two tones at an output power of +3dBm/tone



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Noise Figure Temperature Variation Characteristic

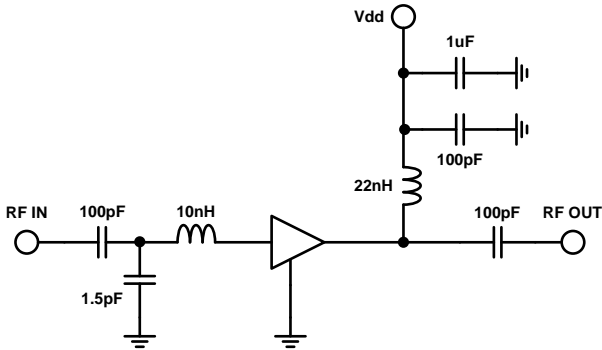
Frequency [MHz]		900	1900	2140	2600
Temperature [°C]	-40	0.5	0.57	0.6	0.78
	25	0.79	0.92	0.96	1.15
	85	1.18	1.2	1.33	1.68

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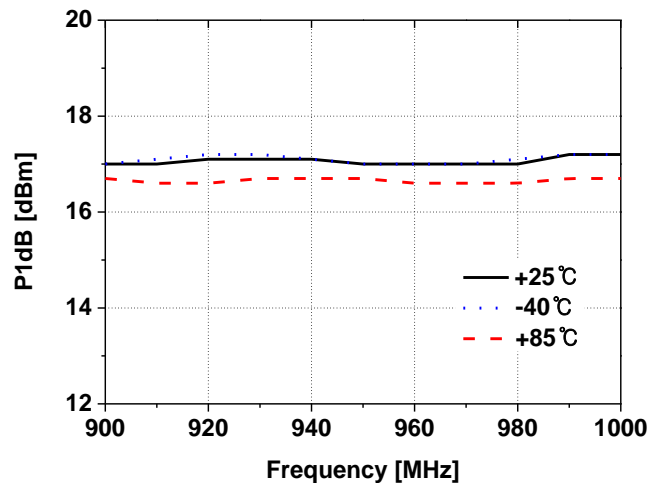
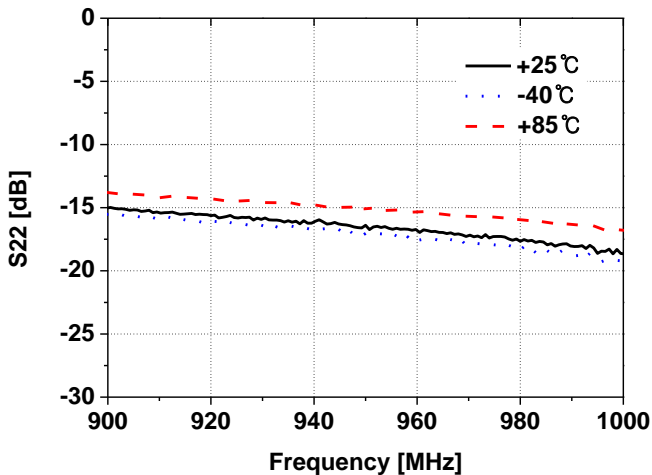
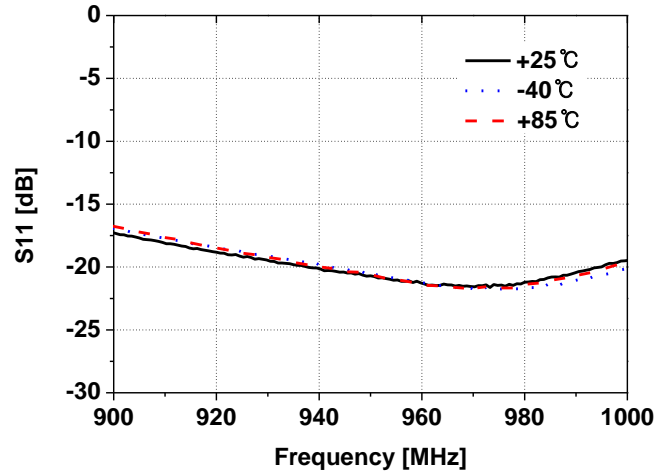
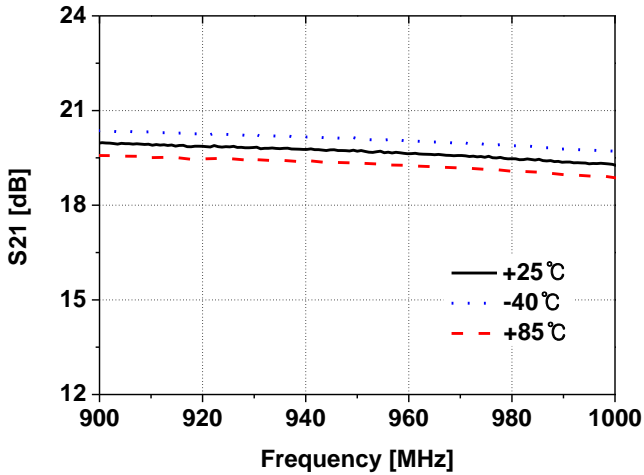
900 MHz – 1000 MHz Application Circuit



Frequency[MHz]	900	1000
S21[dB]	19.5	19.0
S11[dB]	-17	-19
S22[dB]	-14	-18
P1dB[dBm]	+16.8	+16.8
Output IP3[dBm] ⁽¹⁾	+30.5	+31.0
NF[dB]	0.79	0.83
Vcc[V]	3	
Icc[mA]	45	

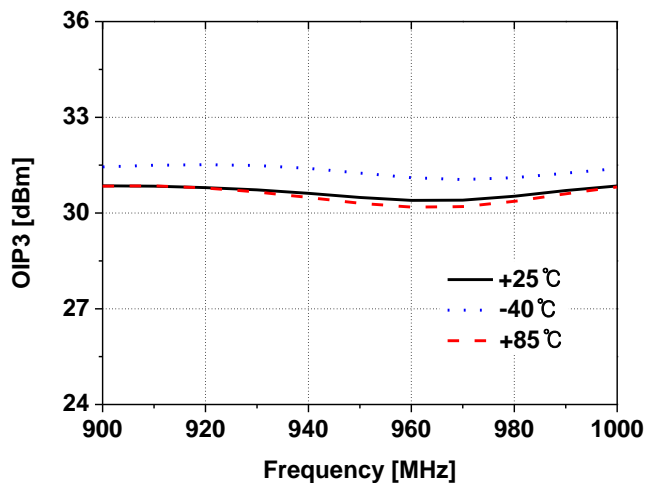
Note:

1. OIP3 measured with two tones at an output power of +3dBm/tone



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Noise Figure Temperature Variation Characteristic

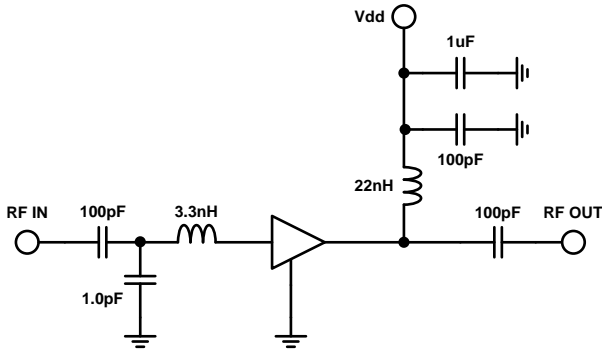
Frequency [MHz]	900	1900	2140	2600
Temperature [°C]				
-40	0.5	0.57	0.6	0.78
25	0.79	0.92	0.96	1.15
85	1.18	1.2	1.33	1.68

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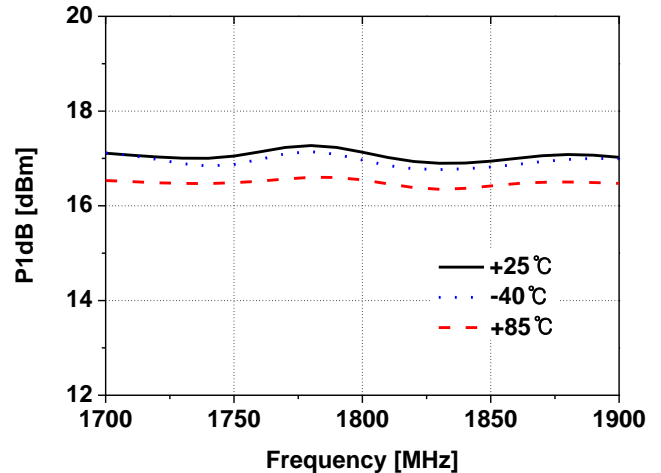
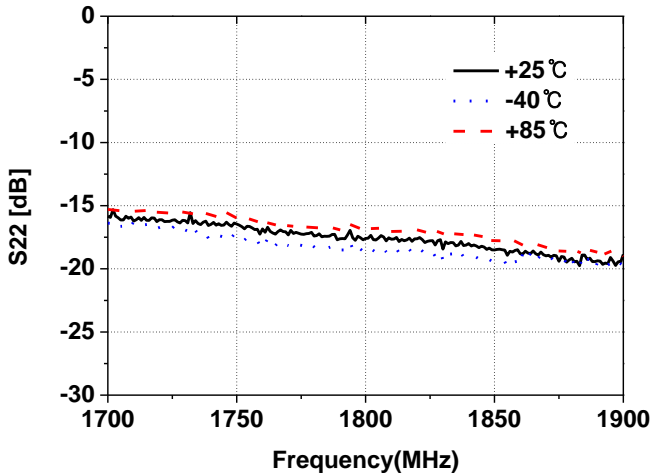
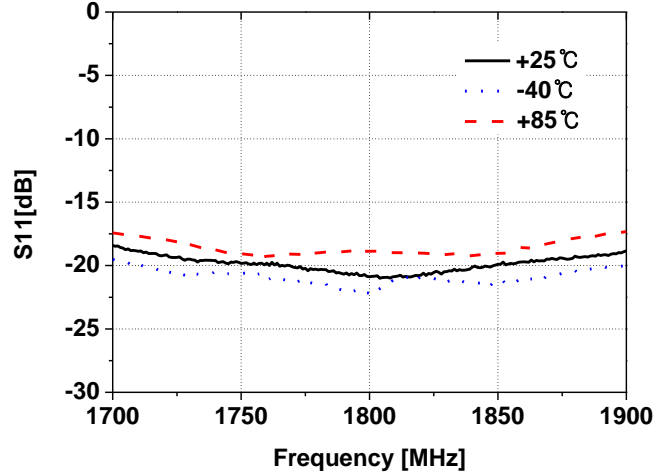
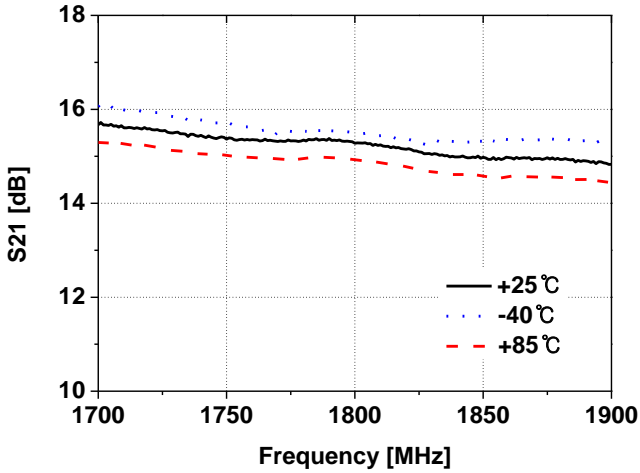
1700 MHz – 1900 MHz Application Circuit



Note:
Distance from input blocking capacitor(100pF) to PL08 input pin: 6mm

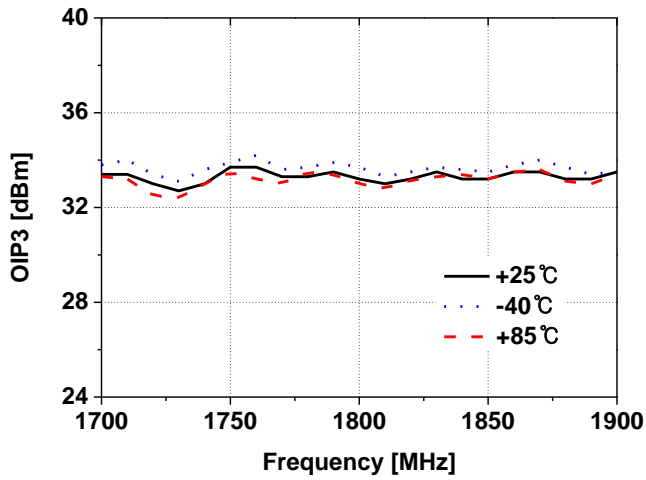
Frequency[MHz]	1700	1900
S21[dB]	15.5	14.5
S11[dB]	-18	-18
S22[dB]	-15	-18
P1dB[dBm]	+16.8	+16.8
Output IP3[dBm] ⁽¹⁾	+33.0	+33.0
NF[dB]	0.87	0.92
Vcc[V]	3	
Icc[mA]	45	

Note:
1. OIP3 measured with two tones at an output power of +3dBm/tone



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Noise Figure Temperature Variation Characteristic

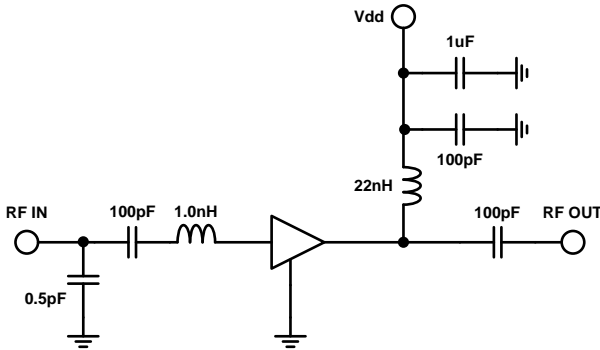
Frequency [MHz]	900	1900	2140	2600	
Temperature [°C]	-40	0.5	0.57	0.6	0.78
	25	0.79	0.92	0.96	1.15
	85	1.18	1.2	1.33	1.68

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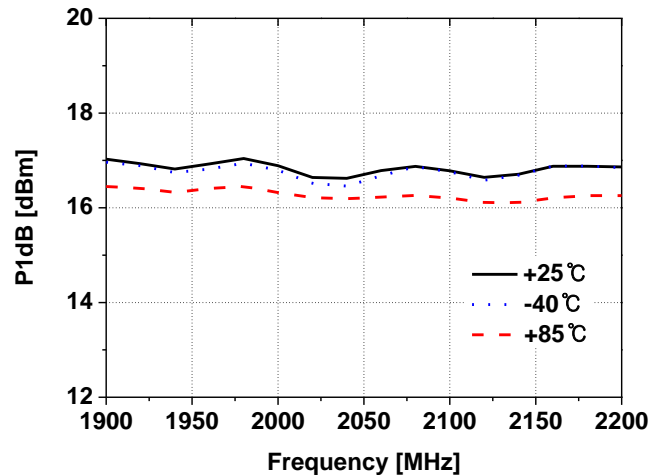
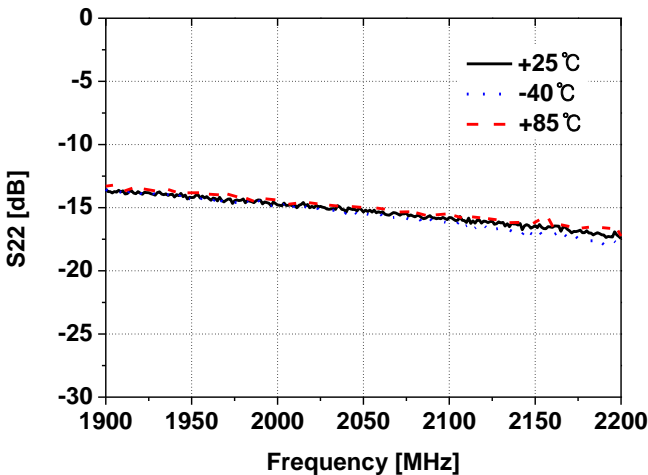
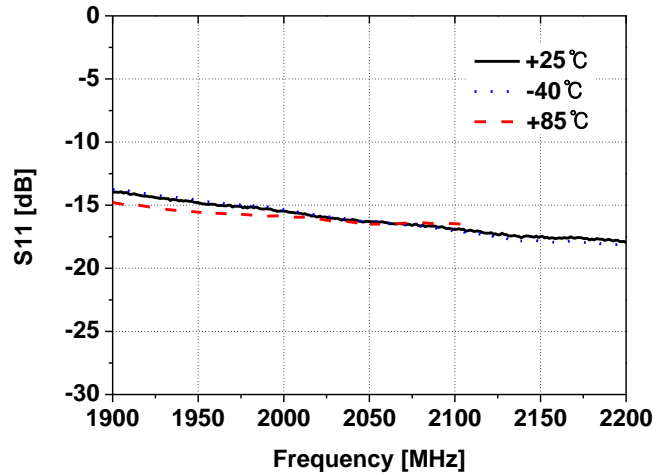
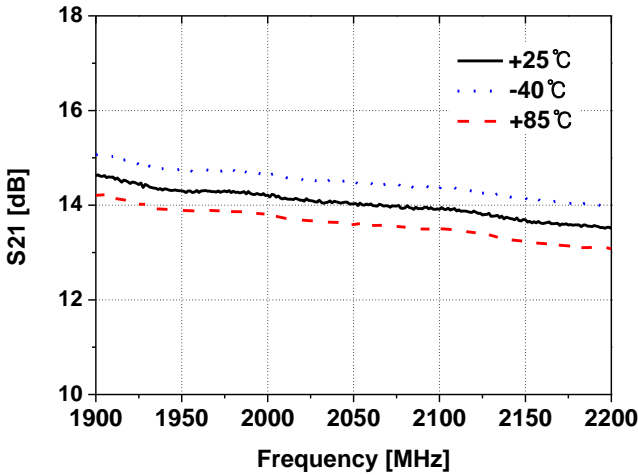
1900 MHz – 2200 MHz Application Circuit



Note:
 Distance from input blocking capacitor(100pF) to PL08 input pin: 6mm
 Distance from output blocking capacitor(100pF) to PL08 output pin: 6mm
 Input capacitor(0.5pF) is located as close as possible input blocking capacitor(100pF)

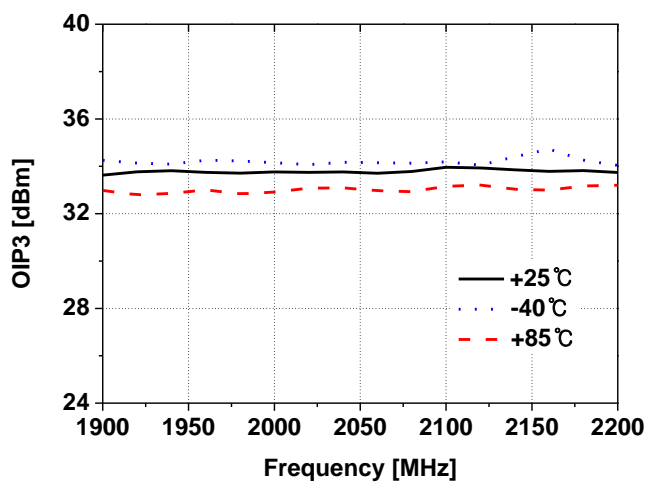
Frequency[MHz]	1900	2140
S21[dB]	14.5	13.5
S11[dB]	-13	-17
S22[dB]	-13	-16
P1dB[dBm]	+16.5	+16.5
Output IP3[dBm] ⁽¹⁾	+33.0	+33.5
NF[dB]	0.92	0.96
Vcc[V]	3	
Icc[mA]	45	

Note:
 1. OIP3 measured with two tones at an output power of +3dBm/tone



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Noise Figure Temperature Variation Characteristic

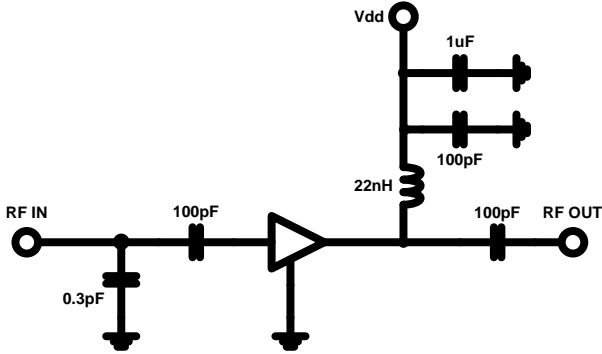
Frequency [MHz]	900	1900	2140	2600	
Temperature [°C]	-40	0.5	0.57	0.6	0.78
	25	0.79	0.92	0.96	1.15
	85	1.18	1.2	1.33	1.68

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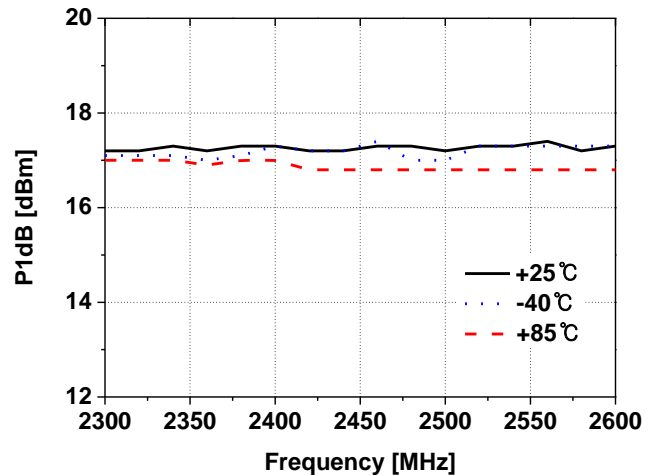
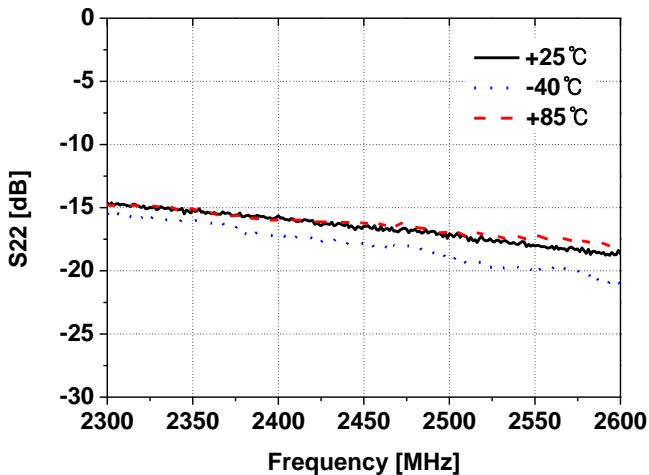
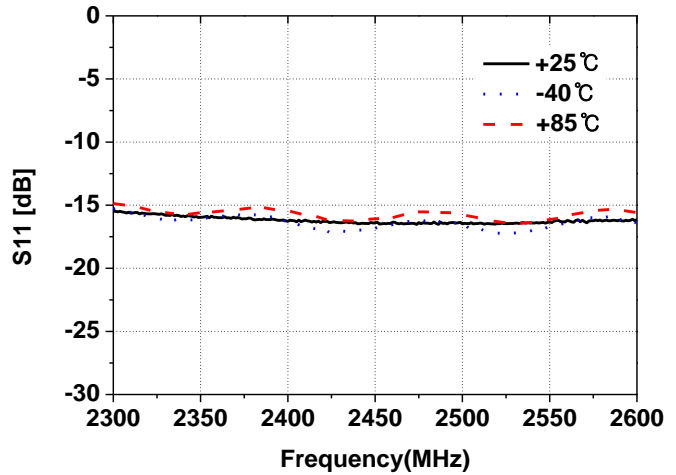
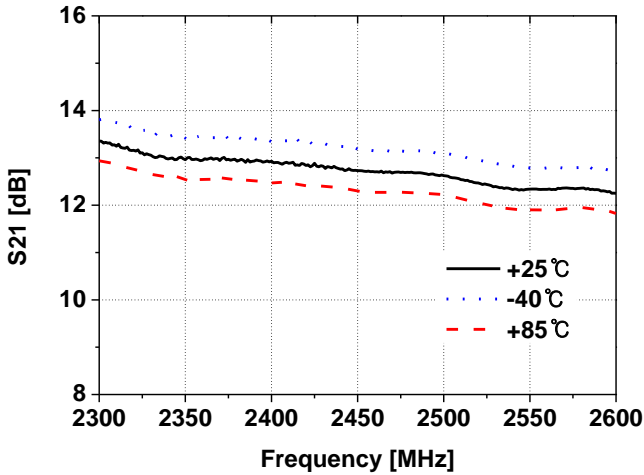
2300 MHz – 2600 MHz Application Circuit



Frequency[MHz]	2300	2600
S21[dB]	13.0	12.0
S11[dB]	-15	-15
S22[dB]	-14	-18
P1dB[dBm]	+17.0	+17.0
Output IP3[dBm] ⁽¹⁾	+33.0	+33.0
NF[dB]	1.05	1.15
Vcc[V]	3	
Icc[mA]	45	

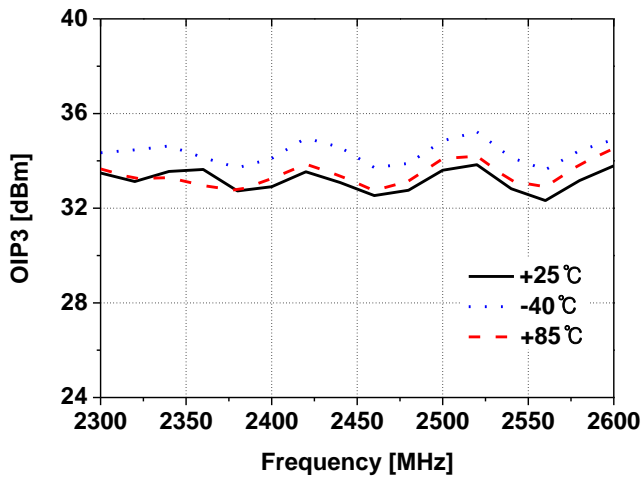
Note:

1. OIP3 measured with two tones at an output power of +3dBm/tone



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Noise Figure Temperature Variation Characteristic

Frequency [MHz]	900	1900	2140	2600	
Temperature [°C]	-40	0.5	0.57	0.6	0.78
	25	0.79	0.92	0.96	1.15
	85	1.18	1.2	1.33	1.68

Absolute Maximum Ratings

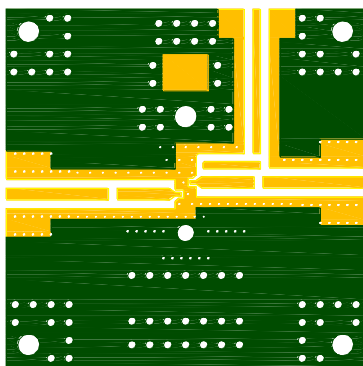
Parameter	Rating	Unit
Device Voltage	+6	V
Device Current	85	mA
RF Power Input	30	dBm
Storage Temperature	-55 to +125	°C
Ambient Operating Temperature	-40 to +85	°C
Junction Temperature for >10 ⁶ hours MTF	185	°C

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

ESD / MSL Ratings

1. ESD sensitive device. Observe Handling Precautions.
2. ESD Rating : Class 0(Passes at 150V max.) Human Body Model (HBM), JESD22-A114
3. ESD Rating : Class IV (Passes at 1000V min.) Charged Device Model (CDM), JESD22-C101
4. MSL (Moisture Sensitive Level) Rating : Level 1 at +260°C Convection reflow, J-STD-020

Evaluation Board Layout (4x4)



Mounting Instructions

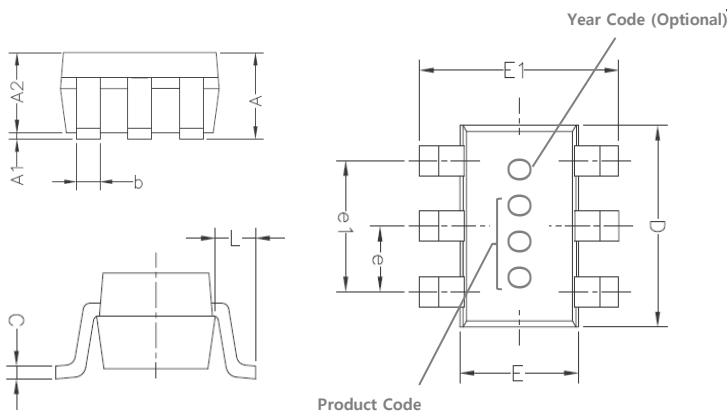
1. Use a large ground pad area with many plated through-holes as shown.
2. We recommend 1 oz copper minimum.
3. Measurement for our data sheet was made on 0.8mm thick FR-4 Board.
4. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
5. RF trace width depends on the board material and construction.
6. Add mounting screws near the part to fasten the board to a heatsink.

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Lead-free / RoHS Compliant / Green SOT-363 Package Outline



Symbol	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.90	1.10	.036	.044
A1	0.025	0.10	.001	.004
A2	0.875	1.00	.035	.040
b	0.20	0.40	.008	.016
C	0.10	0.15	.004	.006
D	1.90	2.10	.076	.084
E	1.15	1.35	.046	.054
E1	2.00	2.20	.080	.088
e	.65 BSC.		.026 BSC.	
e1	1.30 BSC.		.052 BSC.	
L	.425 REF.		.017 REF.	

Note:
 1. All dimensions are in millimeters, and the dimensions in inches are for reference only.
 2. 1mm=40mils=0.04inches

