

### Features

- SiGe Technology
- 16 dB Gain at 900 MHz
- +29 dBm P1dB
- +45 dBm Output IP3
- 3.3 dB Noise Figure
- ACPR= -50dBc@21dBm
- ACLR= -45dBc@21dBm
- Single +8 V Supply
- SOT-89 Surface Mount Package

### Description

The ASG402 is designed for high linearity, high gain, and low noise over a wide range of frequency, being suitable for use in both receiver and transmitter of wireless and wireline telecommunication systems. The product is manufactured using a state-of-the-art SiGe HBT process of the company's own, making it cost-effective and highly reliable. The amplifiers are available in a low cost SOT-89 package completing stringent DC and RF tests.



Package Style: SOT-89

### Specifications <sup>1)</sup>

Parameters	Units	Min.	Typ.	Max.
Frequency Range	MHz		250 - 2500	
Gain	dB		16	
Input VSWR	-		1.44	
Output VSWR	-		1.44	
Output IP3 <sup>2)</sup>	dBm	44	45	
Noise Figure	dB		3.3	
Output P1dB	dBm		29	
Supply Current	mA	260	275	290
Supply Voltage	V		8	
Thermal Resistance, R <sub>th</sub> <sup>4)</sup>	°C/W		24.1	

1) Measurement conditions are as follows: T = 25°C, V<sub>s</sub> = 6 V, Freq. = 900 MHz, 50 ohm system.

2) S11 & S22 can be improved, at a specific frequency, by moving an input shunt capacitor (C2) along an input transmission line.

3) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

4) The thermal resistance was determined at a DC power of 1.65 W (V<sub>CC</sub>=6 V, I<sub>C</sub>=275 mA) with RF signal and a lead temperature of 50.8 °C.

### Absolute Maximum Ratings

Parameters	Rating	Remarks
Operating device voltage	7V	
RF input power (continuous)	+2 dB above Input P1dB	
Supply current	300 mA	
Operating case temperature	-40 to + 85°C	
Storage temperature	-40 to + 150°C	

### Application Note

Application circuit for 900 MHz

Application circuit for 2 GHz

### Ordering Information

Part Number	Description
ASG402	High linearity medium power amplifier (Available in tape and reel)
EB-ASG402-900	Fully assembled evaluation kit (900 MHz)
EB-ASG402-2000	Fully assembled evaluation kit (2000 MHz)

### Applications

- CDMA, GSM, W-CDMA, PCS
- Power Amplifier
- Gain Block
- CATV Amplifier
- IF Amplifier

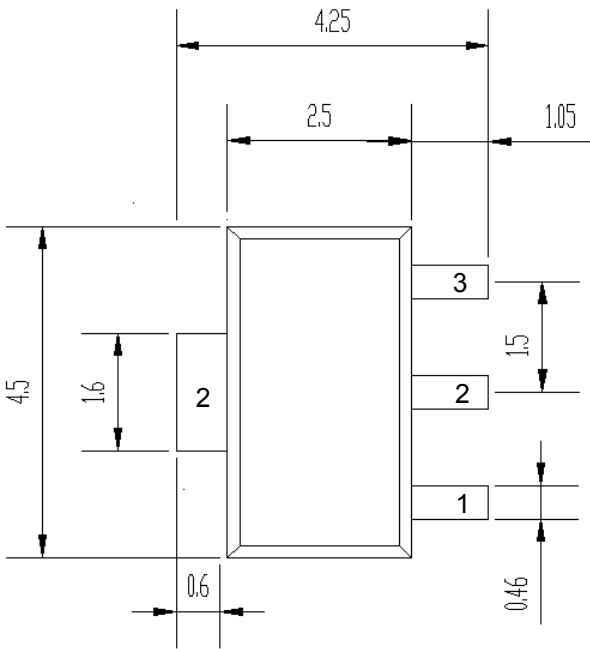
### More Information

Website: [www.asb.co.kr](http://www.asb.co.kr)  
E-mail: [sales@asb.co.kr](mailto:sales@asb.co.kr)

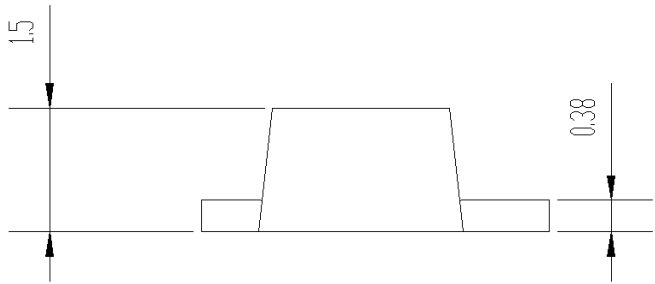
Tel: (82) 42-528-7220  
Fax: (82) 42-528-7222

ASB Inc., 4th Fl. Venture Town  
Bldg., 367-17 Goijeong-Dong,  
Seo-Gu, Daejeon 302-716, Korea

Outline Drawing



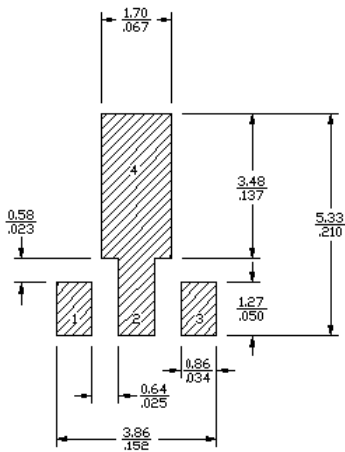
(Unit: mm)



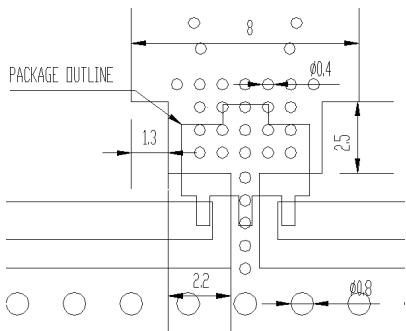
Pin Description

Function	Pin No.
Input	1
Ground	2
Output	3

Land Pattern



Mounting Configuration



(Unit: mm)

Note: 1. The number and size of ground via holes in a circuit board is critical for thermal and RF grounding considerations.  
2. We recommend that the ground via holes be placed on the bottom of lead pin 2 for better RF and thermal performance, as shown in the drawing at the left side.

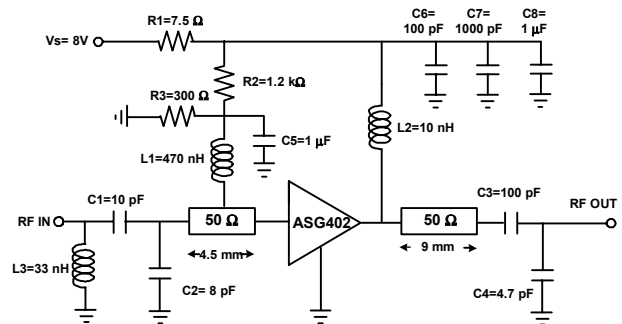
## Application Circuit: 900 MHz

### Typical Performance

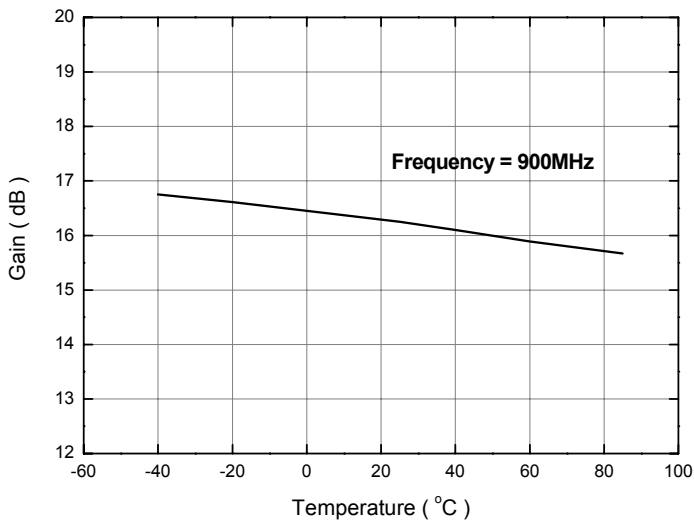
Frequency	900 MHz
Magnitude S21	16 dB
Magnitude S11 <sup>1)</sup>	-15 dB
Magnitude S22 <sup>1)</sup>	-15 dB
Output P1dB	29 dBm
Output IP3 <sup>2)</sup>	45 dBm
Noise Figure	3.3 dB
Device Operating Voltage	6 V
Current	275 mA
Supply Voltage	8 V

- 1) S11 & S22 can be improved, at a specific frequency, by moving an input shunt capacitor (C2) along an input transmission line.  
 2) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

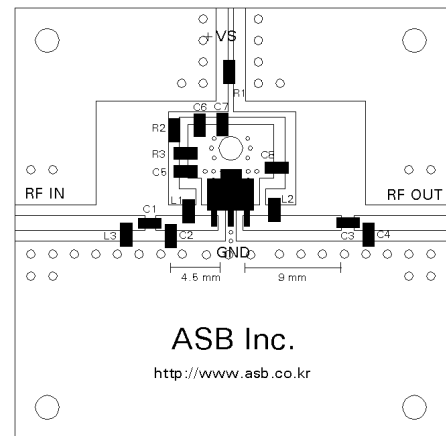
### Schematic



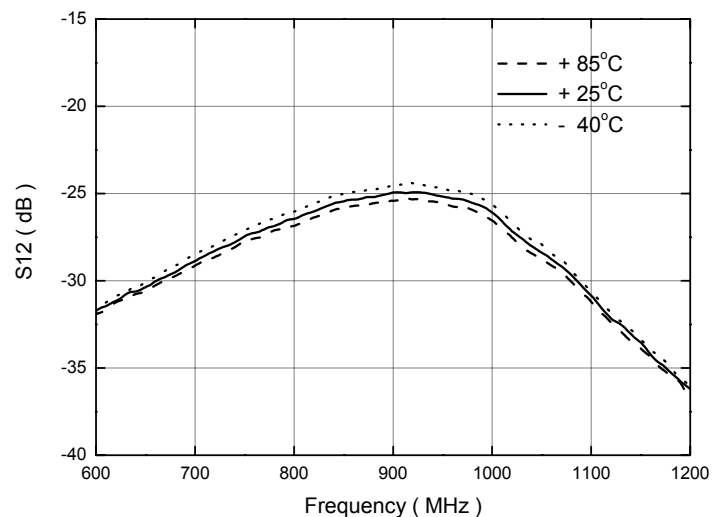
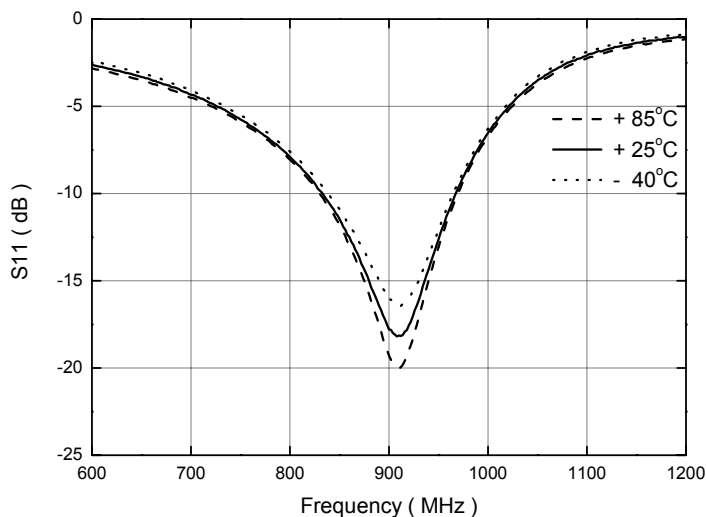
### Gain vs. Temperature

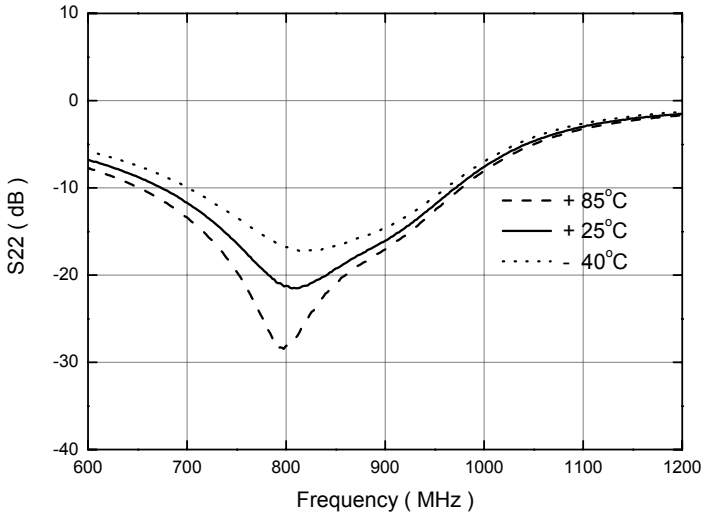
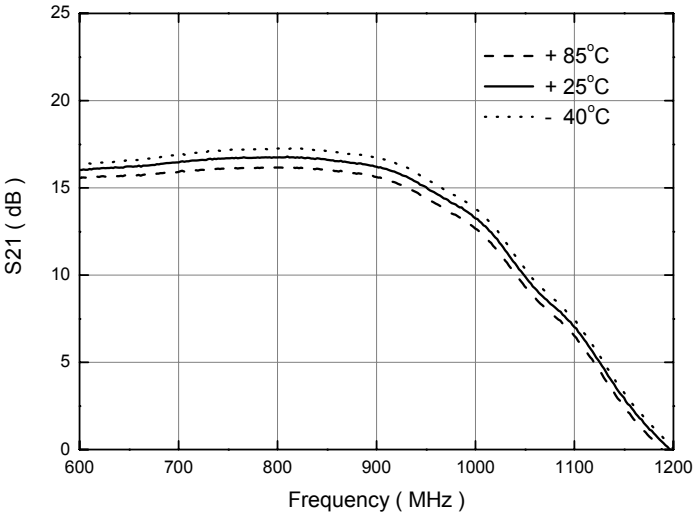


### Board Layout (FR4, 40x40 mm<sup>2</sup>, 0.8T)

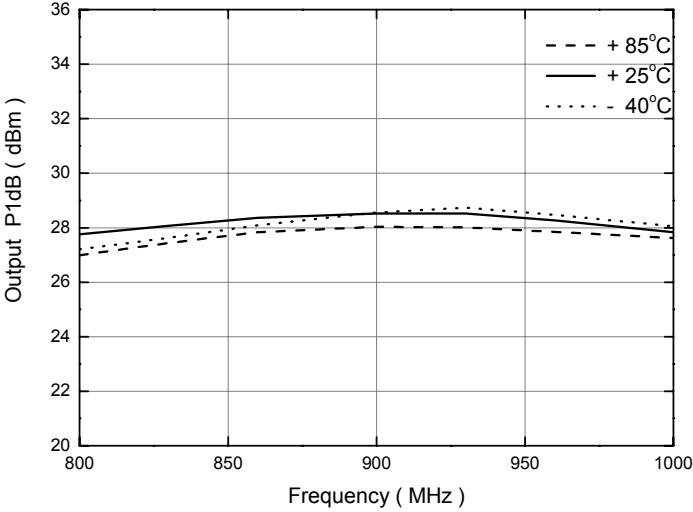


### S-parameters

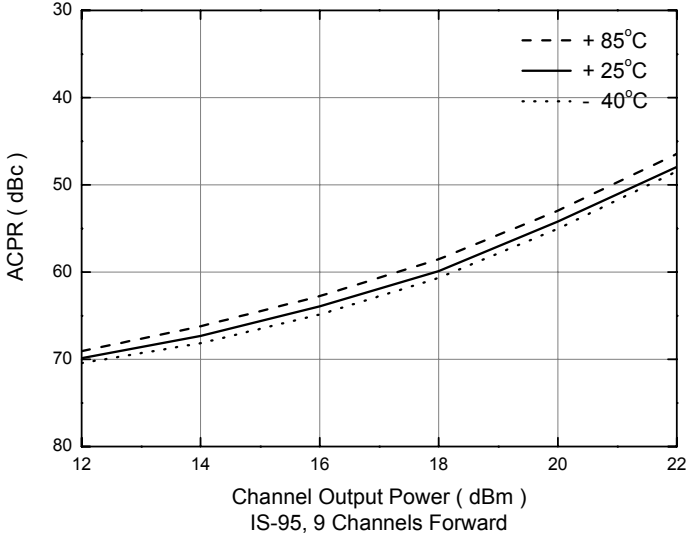




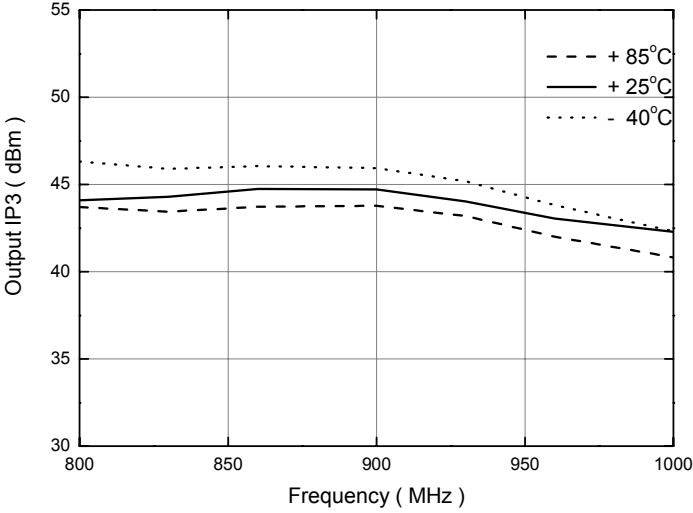
OP1 vs. Frequency



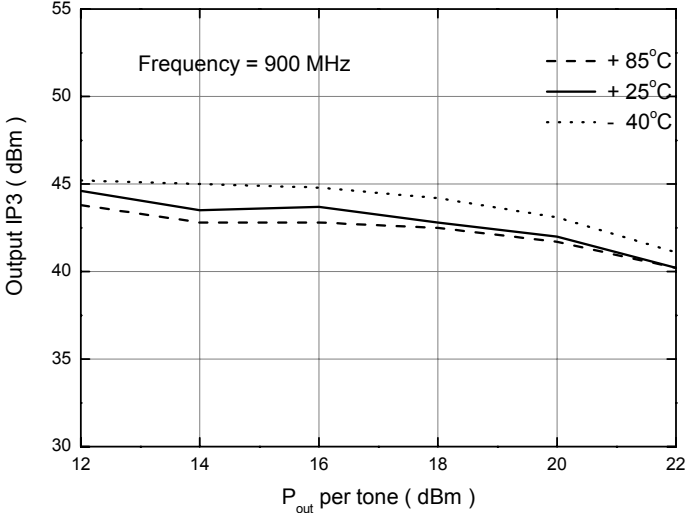
ACPR vs. Channel Power  
( Offset = 750kHz )



Output IP3 vs. Frequency  
( P<sub>out</sub> per tone = 14dBm )



Output IP3 vs. Tone Power



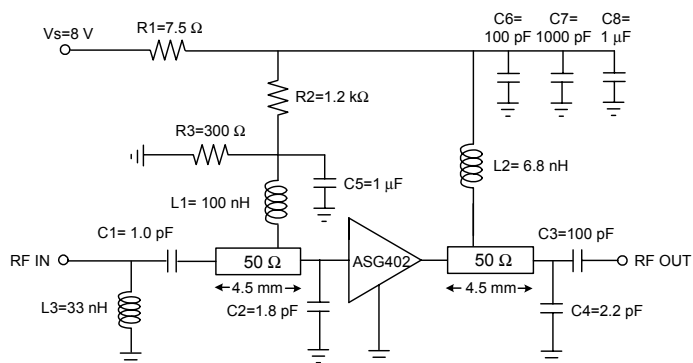
## Application Circuit: 2000 MHz

### Typical Performance

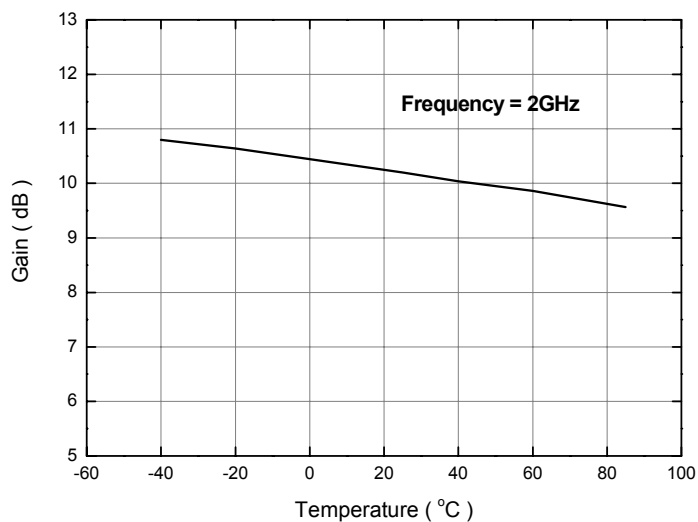
Frequency	2000 MHz
Magnitude S21	9 dB
Magnitude S11 <sup>1)</sup>	-15dB
Magnitude S22 <sup>1)</sup>	-14 dB
Output P1dB	28 dBm
Output IP3 <sup>2)</sup>	44 dBm
Noise Figure	5.0 dB
Device Operating Voltage	6 V
Current	275 mA
Supply Voltage	8 V

- 1) S11 & S22 can be improved, at a specific frequency, by moving an input shunt capacitor (C2) along an input transmission line.  
 2) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

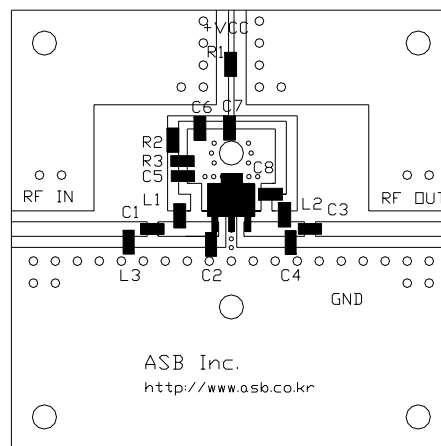
### Schematic



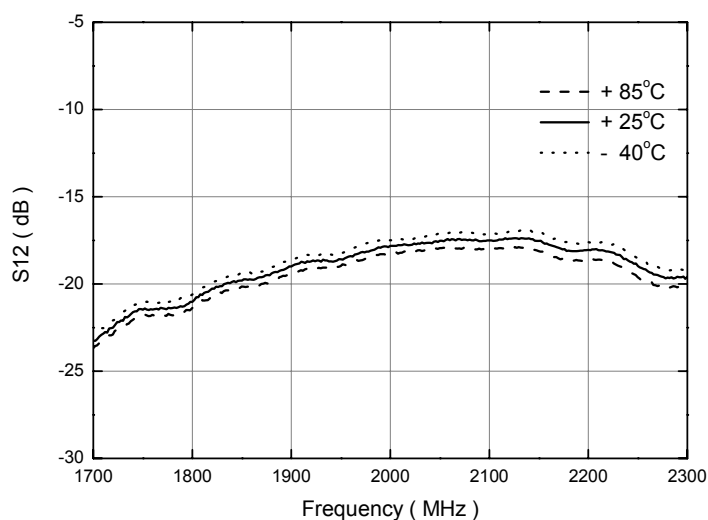
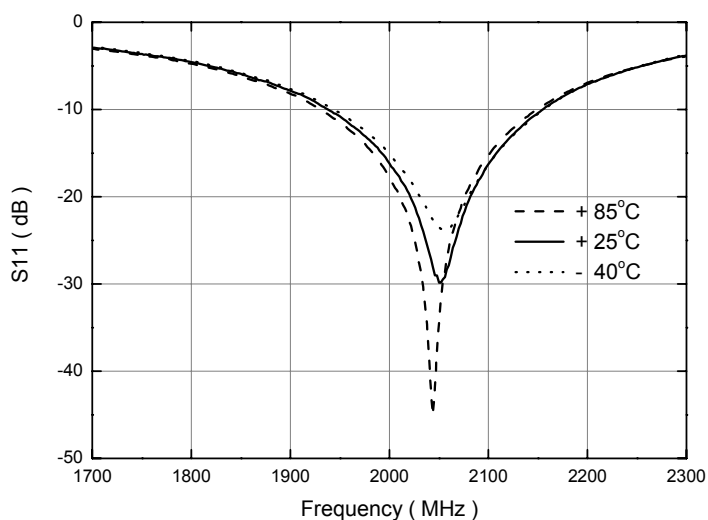
### Gain vs. Temperature

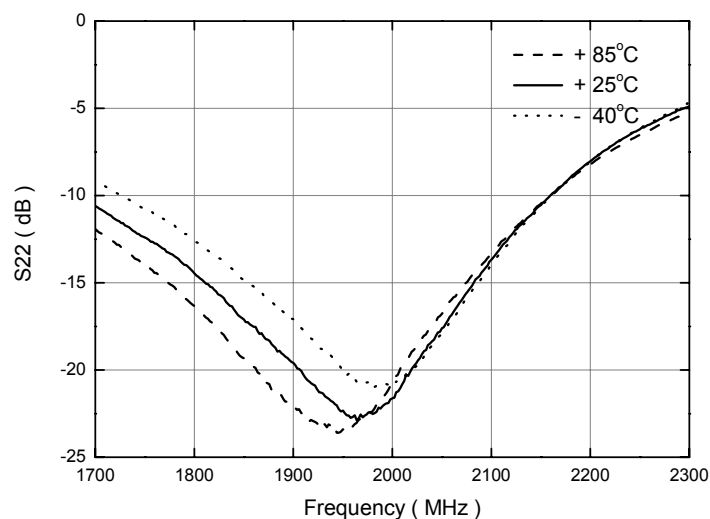
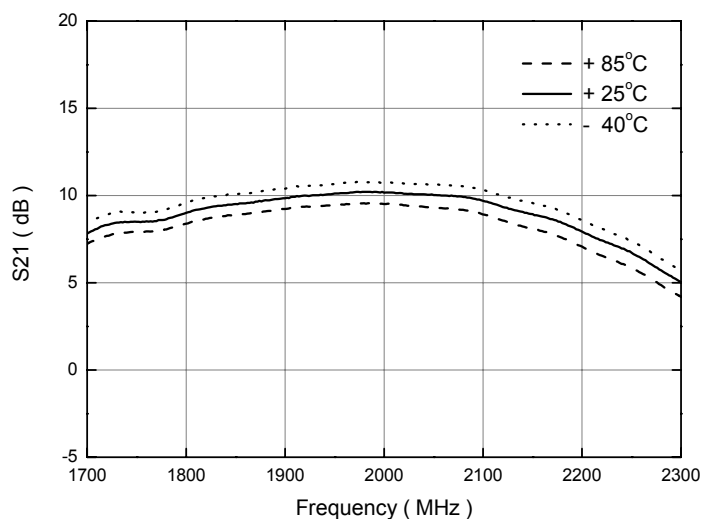


### Board Layout (FR4, 40x40 mm<sup>2</sup>, 0.8T)

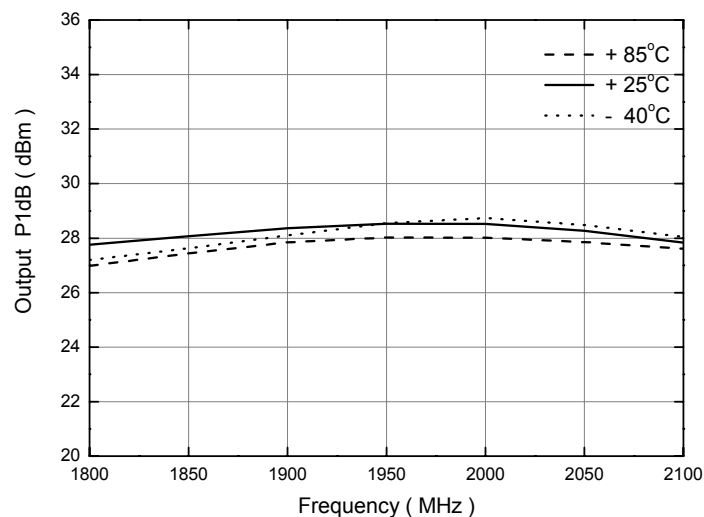


### S-parameters

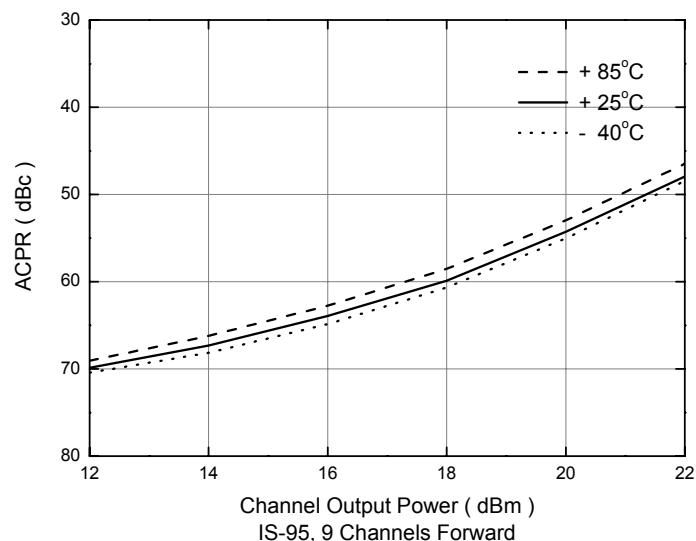




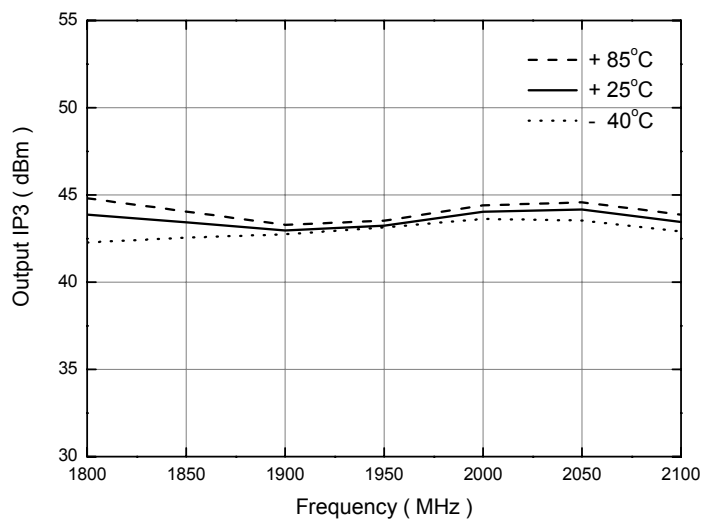
OP1 vs. Frequency



ACPR vs. Channel Power  
( Offset = 750 kHz )



Output IP3 vs. Frequency  
( P<sub>out</sub> per tone = 14 dBm )



Output IP3 vs. Tone Power

