ASG402

DC-3000 MHz SiGe HBT Amplifier

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 [1)]

Parameters	Units	Min.	Typ.	Max.
Frequency Range	MHz		250 - 2500	
Gain	dB		16	
Input VSWR	-		1.44	
Output VSWR	-		1.44	
Output IP3 [2)]	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_{th} [4)]	°C/W		24.1	

1) Measurement conditions are as follows: T = 25°C, Vs = 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_{CC}=6 V, I_C=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

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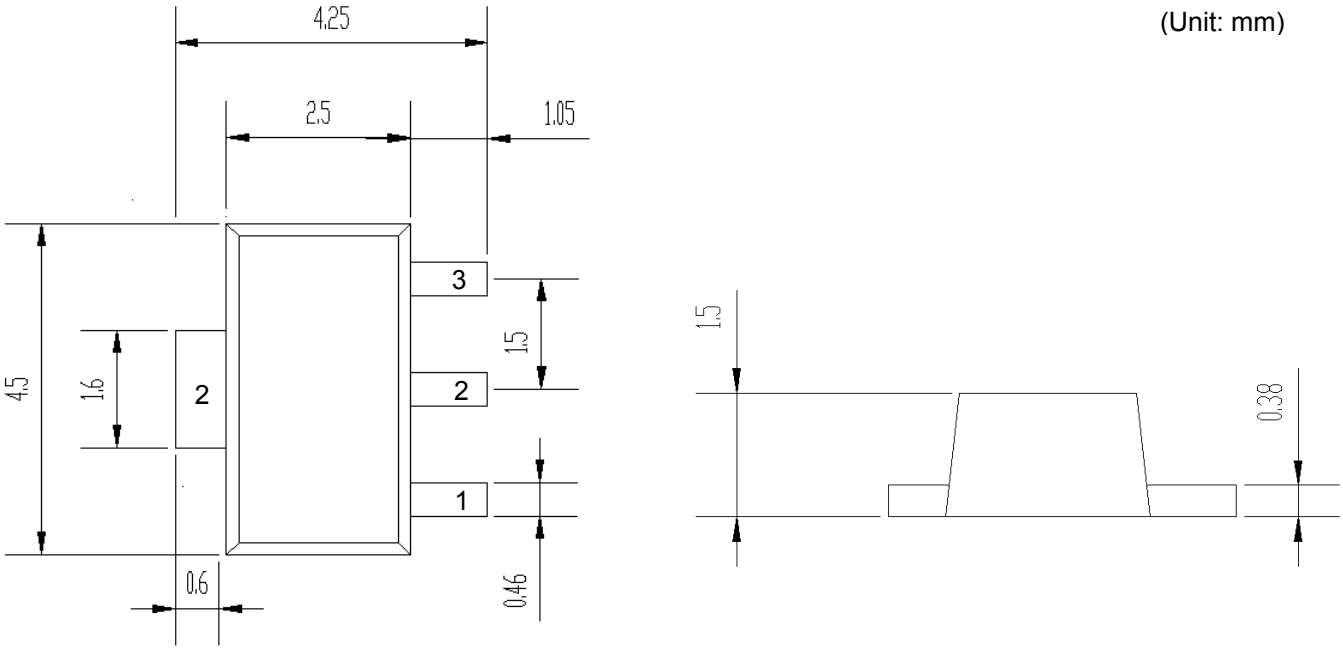
E-mail: sales@asb.co.kr

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

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

Outline Drawing

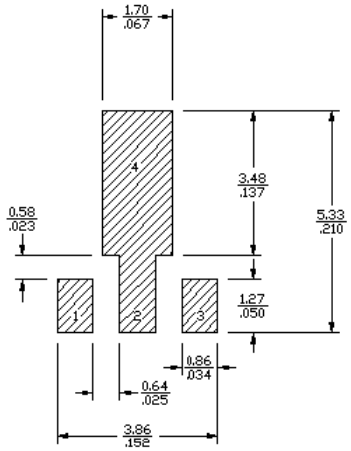
(Unit: mm)



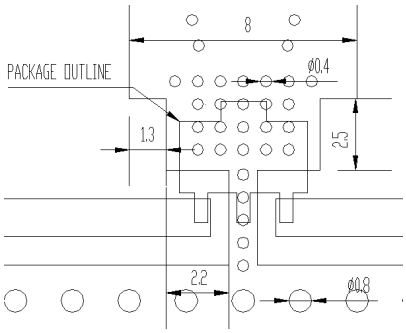
Pin Description

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.

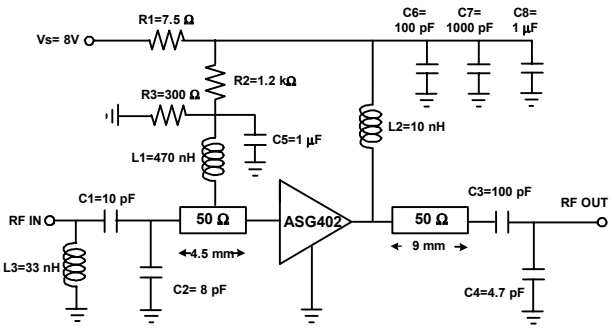
Application Circuit: 900 MHz

Typical Performance

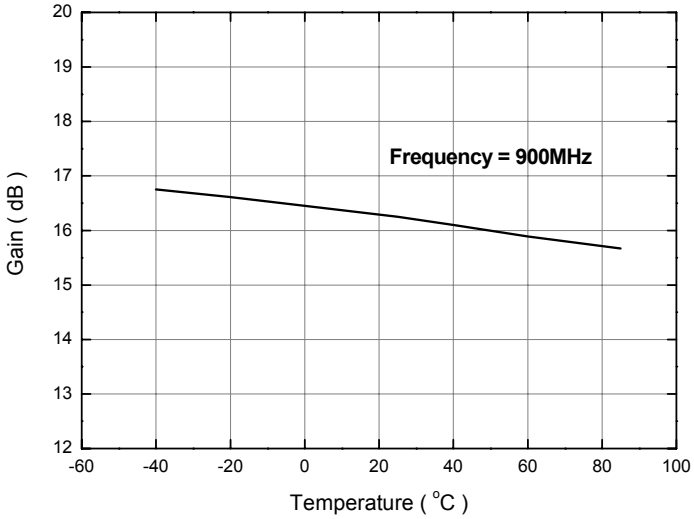
Frequency	900 MHz
Magnitude S21	16 dB
Magnitude S11 [1)]	-15 dB
Magnitude S22 [1)]	-15 dB
Output P1dB	29 dBm
Output IP3 [2)]	45 dBm
Noise Figure	3.3 dB
Device Operating Voltage	6 V
Current	275 mA
Supply Voltage	8 V

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.

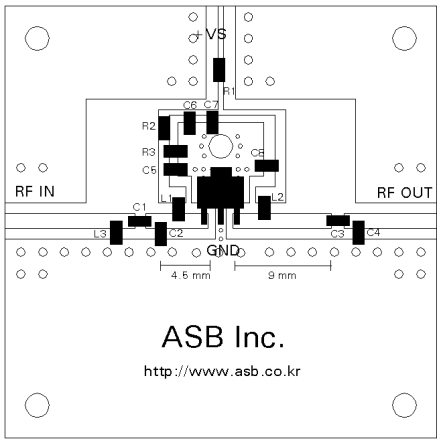
Schematic



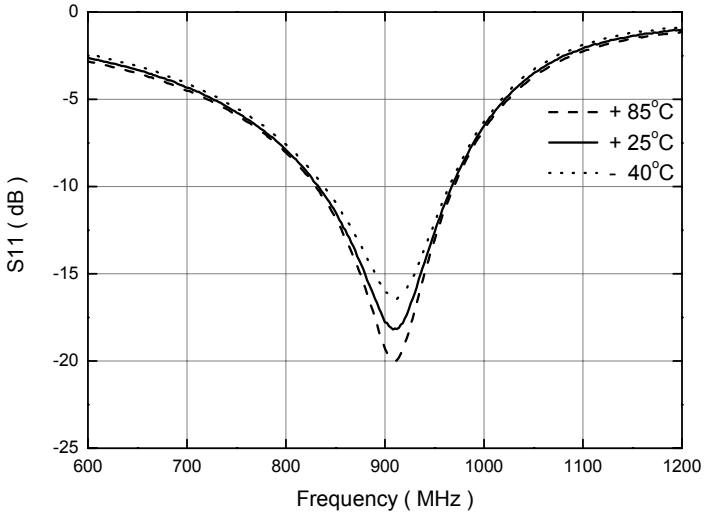
Gain vs. Temperature

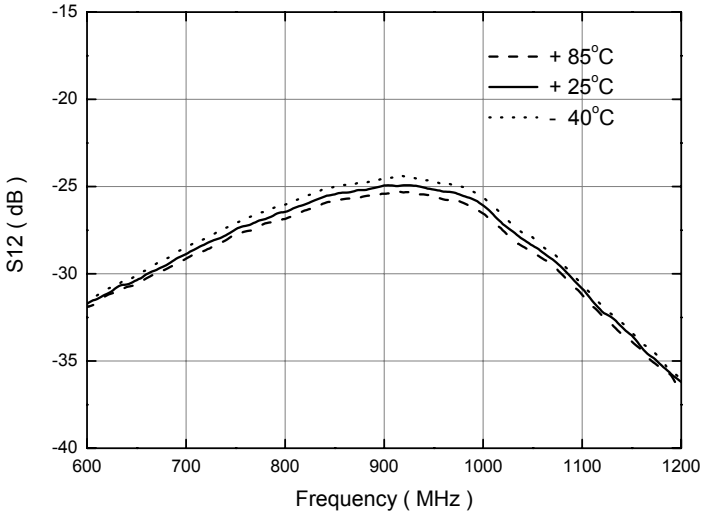


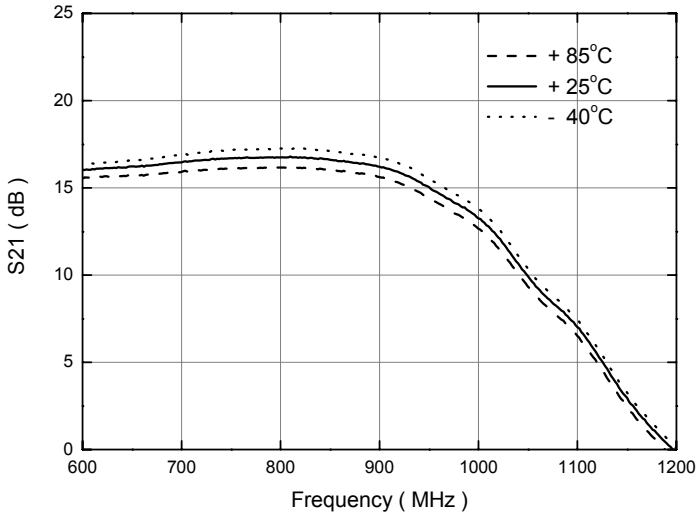
Board Layout (FR4, 40x40 mm^2, 0.8T)

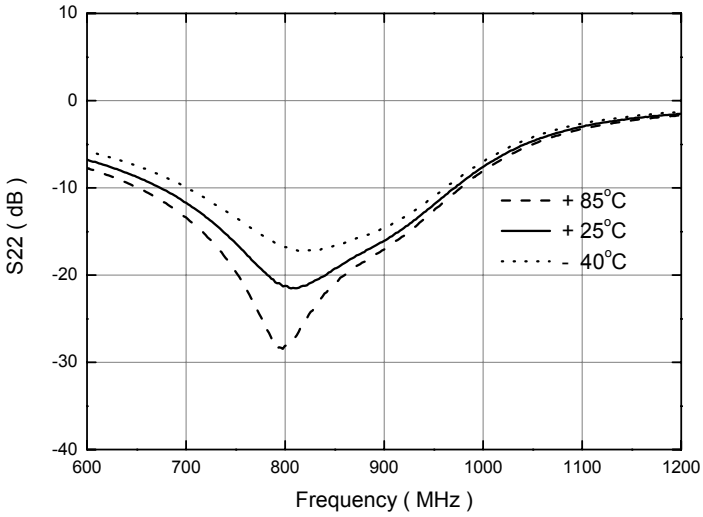


S-parameters

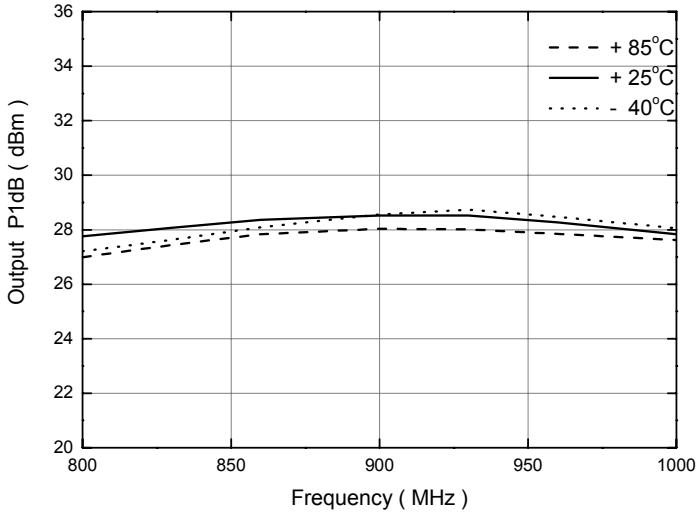




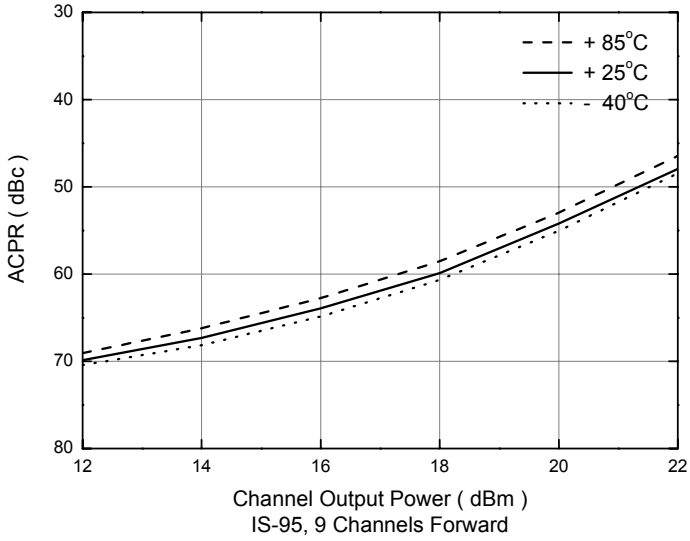




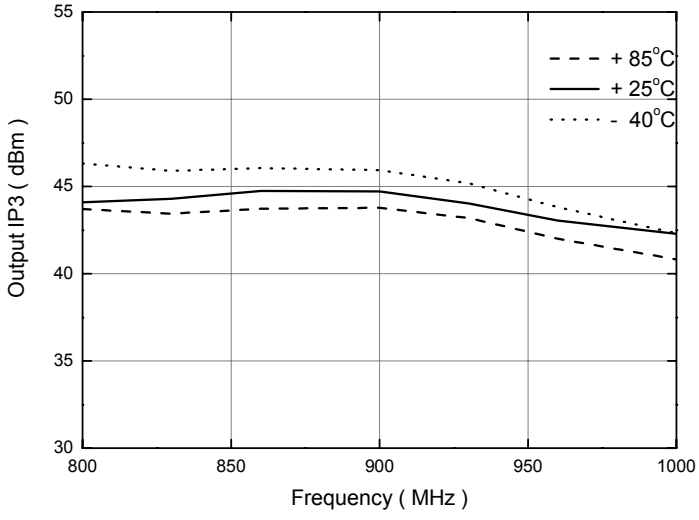
OP1 vs. Frequency



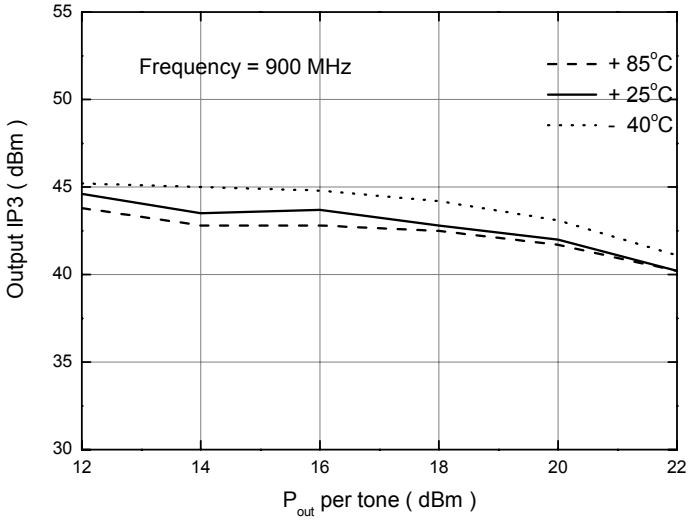
ACPR vs. Channel Power
(Offset = 750kHz)



Output IP3 vs. Frequency
(P_{out} per tone = 14dBm)



Output IP3 vs. Tone Power



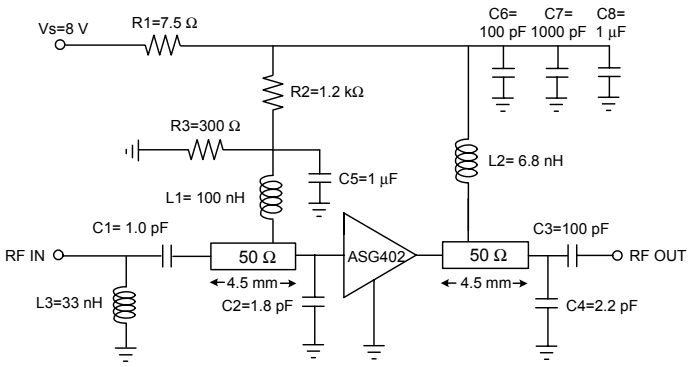
Application Circuit: 2000 MHz

Typical Performance

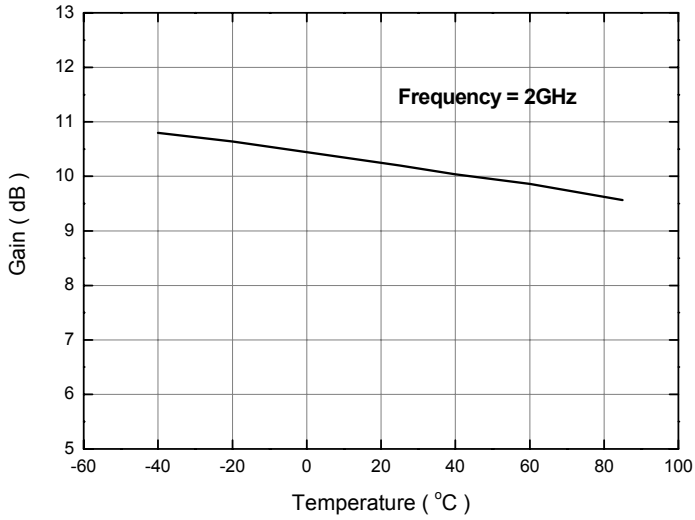
Frequency	2000 MHz
Magnitude S21	9 dB
Magnitude S11 [1)]	-15dB
Magnitude S22 [1)]	-14 dB
Output P1dB	28 dBm
Output IP3 [2)]	44 dBm
Noise Figure	5.0 dB
Device Operating Voltage	6 V
Current	275 mA
Supply Voltage	8 V

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



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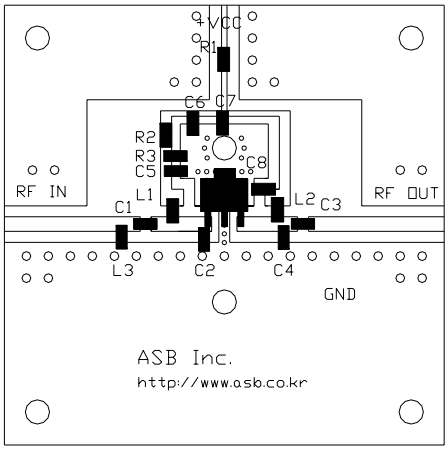
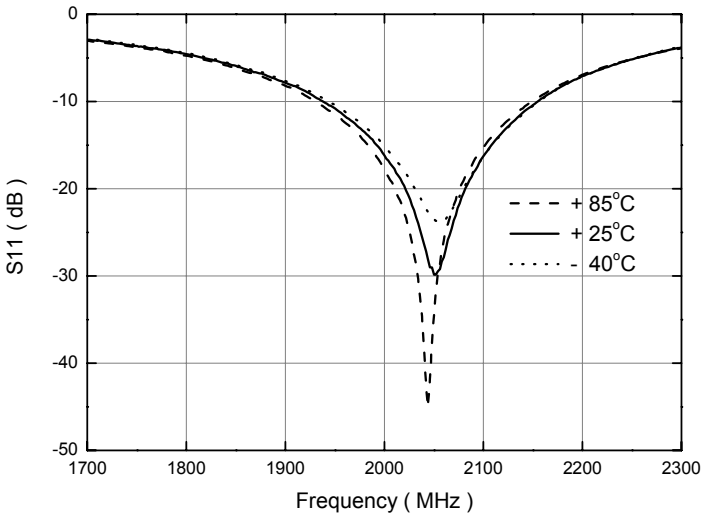
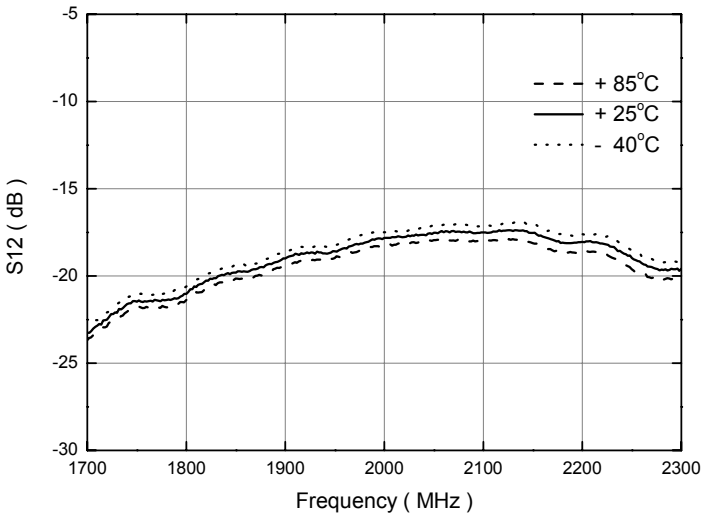
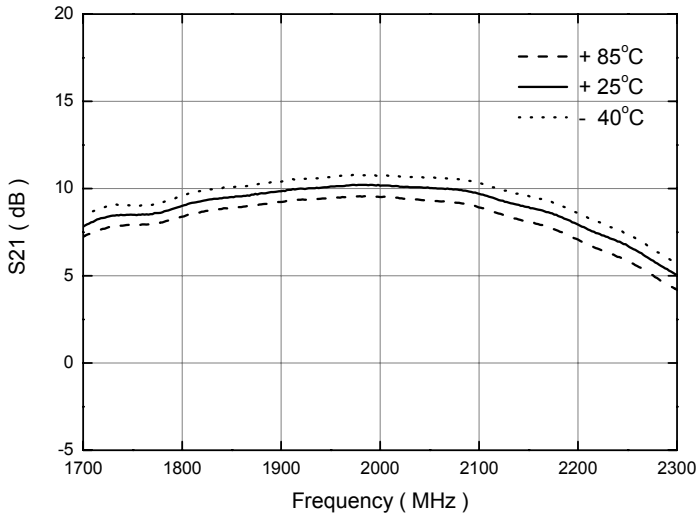
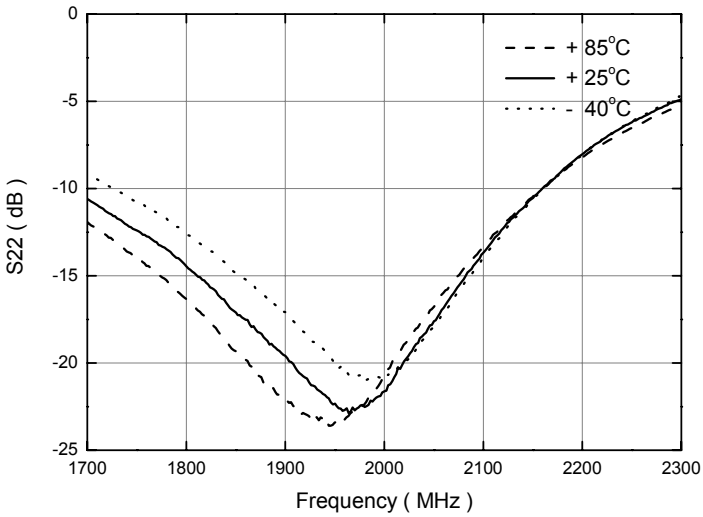


S-parameters

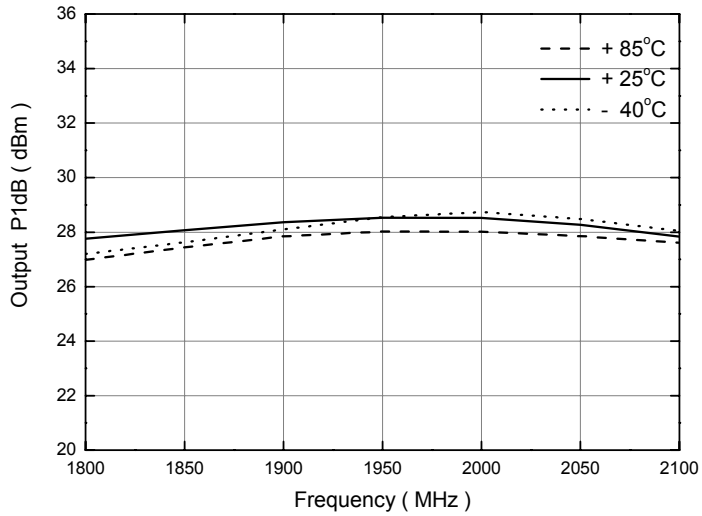




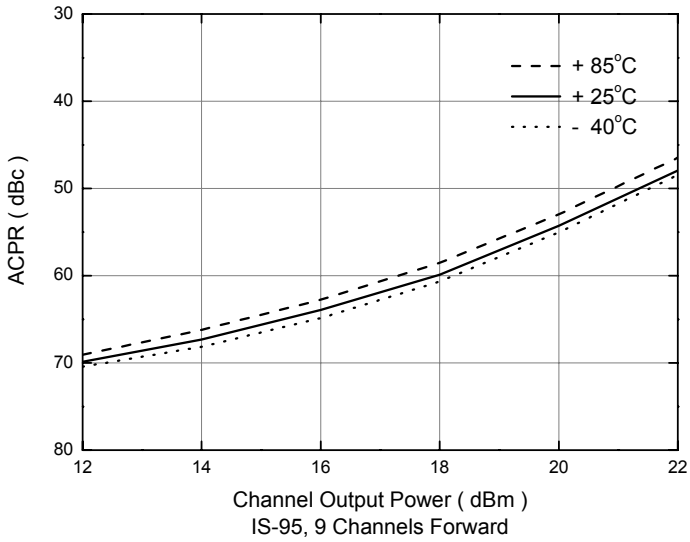




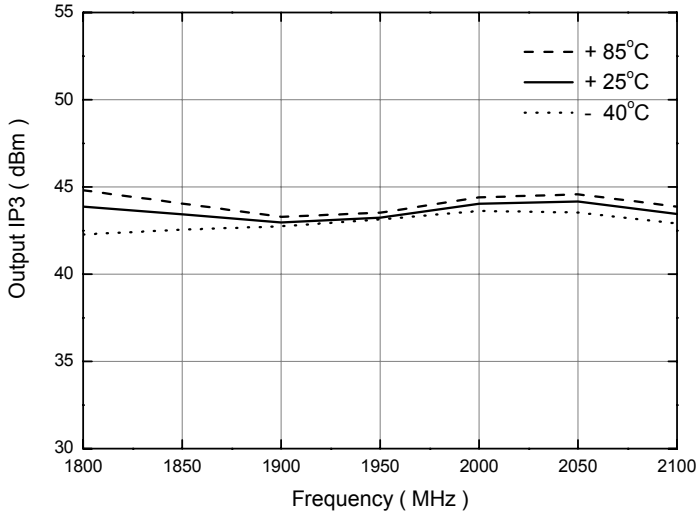
OP1 vs. Frequency



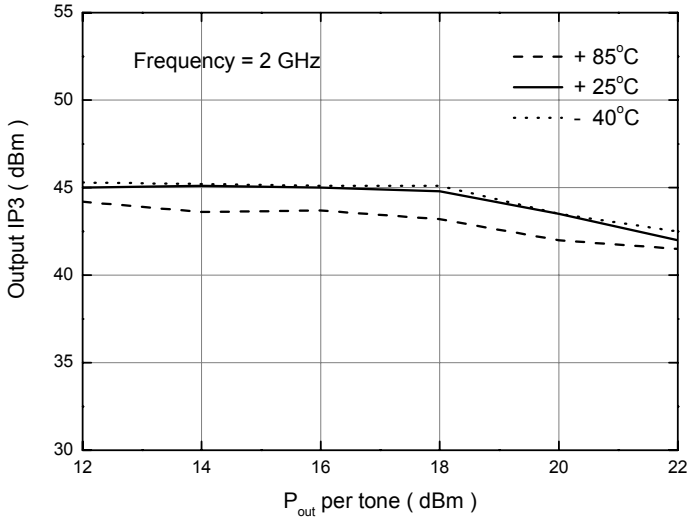
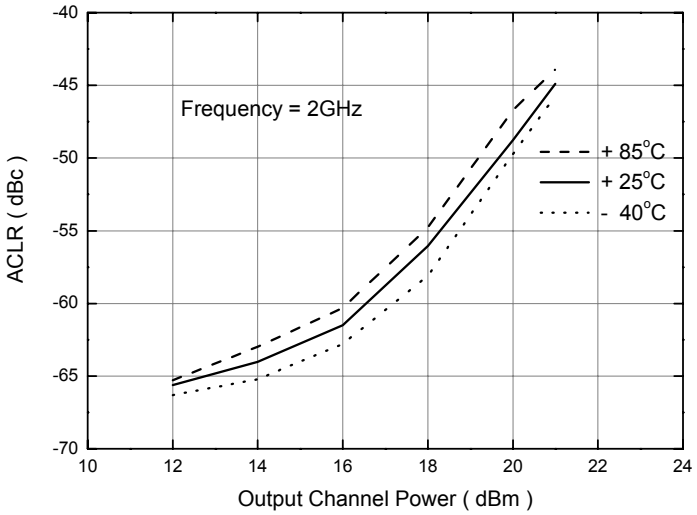
ACPR vs. Channel Power
(Offset = 750 kHz)



Output IP3 vs. Frequency
(P_{out} per tone = 14 dBm)



Output IP3 vs. Tone Power



W-CDMA ACLR vs. Channel Power
(3GPP W-CDMA, Test Model 1+64 DPCH, ±5MHz offset)