AWB207

5 ~ 4000 MHz MMIC Amplifier

Features

- 16 dB Gain at 2000 MHz
- 18 dBm P1dB
- 37.5 dBm Output IP3
- 2.7 dB NF
- MTTF > 100 Years
- Single Supply
- Minimal External Components

Description

The AWB207, a gain block amplifier MMIC, has a high linearity, high gain, and high efficiency over a wide range of frequency, being suitable for use in both receiver and transmitter of telecommunication systems up to 4 GHz. It has an active bias network for stable current over temperature and process variation. The amplifier is available in a SOT89 package and passes through the stringent DC, RF, and reliability tests.

RoHS-compliant GREEN Package

Package Style: SOT89

Typical Performance

(Supply Voltage = +5 V, T_A = +25 °C, Z_0 = 50 Ω)

Parameters	Units	Typical	
Frequency	MHz	900	2000
Gain	dB	16.6	16.0
S11	dB	-15	-14
S22	dB	-11	-15
Output IP3[1)]	dBm	37.5	37.5
Noise Figure	dB	2.3.	2.7
Output P1dB	dBm	21	18
Current	mA	74	74
Device Voltage	V	+5	+5

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

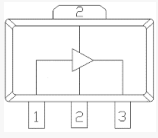
Applications

- CDMA & GSM (900 MHz)
- WCDMA (2000 MHz)
- CATV (50 ~ 1000 MHz, 50 ohm)
- SMATV (950 ~ 2150 MHz)
- SMATV & Wideband (500 ~ 3000 MHz)

Product Specifications

Parameters	Units	Min	Typ.	Max
Testing Frequency	MHz		2000	
Gain	dB		16.0	
S11	dB		-14	
S22	dB		-15	
Output IP3	dBm		37.5	
Noise Figure	dB		2.7	
Output P1dB	dBm		18	
Current	mA		74	
Device Voltage	V		+5	

Pin Configuration



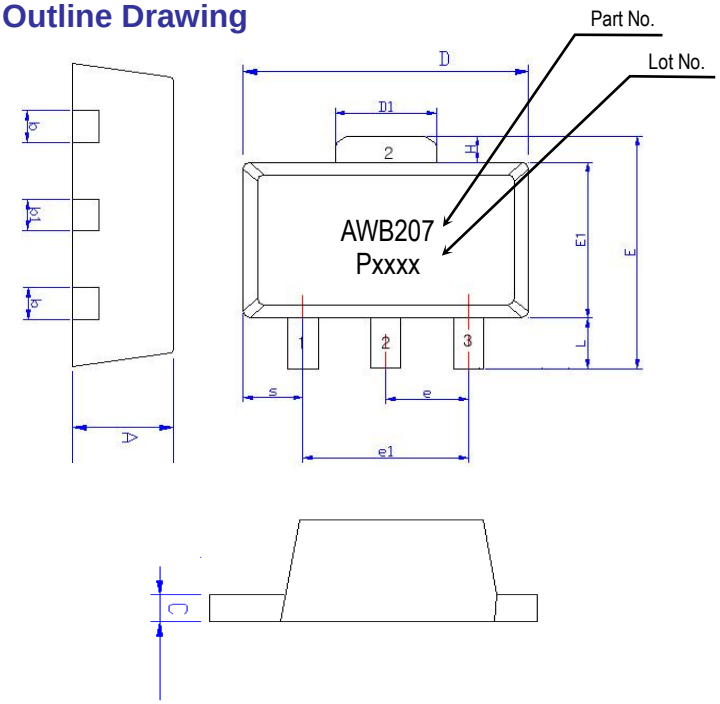
Pin No.	Function
1	RF IN
2	GND
3	RF OUT & Bias

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-40 to +150 °C
Device Voltage	+6 V
Operating Junction Temperature	+150 °C
Input RF Power (Continuous)	+22 dBm

* Please find the max. input power data from http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf

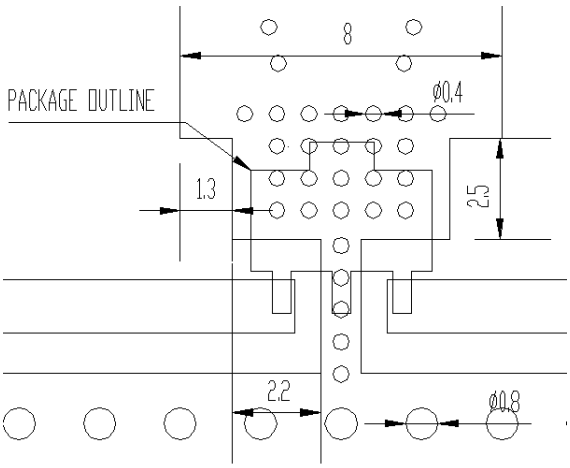
Outline Drawing



Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	1.40	1.50	1.60
L	0.89	1.04	1.20
b	0.36	0.42	0.48
b1	0.41	0.47	0.53
C	0.38	0.40	0.43
D	4.40	4.50	4.60
D1	1.40	1.60	1.75
E	3.64	---	4.25
E1	2.40	2.50	2.60
e1	2.90	3.00	3.10
H	0.35	0.40	0.45
S	0.65	0.75	0.85
e	1.40	1.50	1.60

Pin No.	Function
1	RF IN
2	GND
3	RF OUT & Bias

Mounting Recommendation (In 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 the lead pin 2 and exposed pad of the device for better RF and thermal performance, as shown in the drawing at the left side.

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APPLICATION CIRCUIT

CDMA & GSM

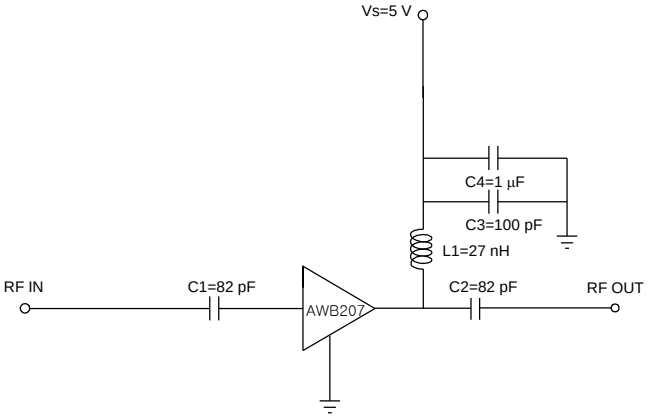
900

+5 V

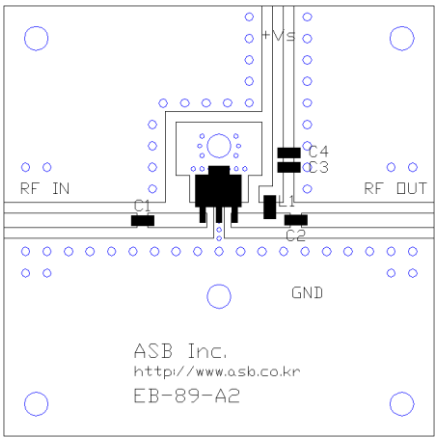
Frequency (MHz)	900
Magnitude S21 (dB)	16.6
Magnitude S11 (dB)	-15
Magnitude S22 (dB)	-11
Output P1dB (dBm)	21
Output IP3[1)] (dBm)	37.5
Noise Figure (dB)	2.3
Device Voltage (V)	+5
Current (mA)	74

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

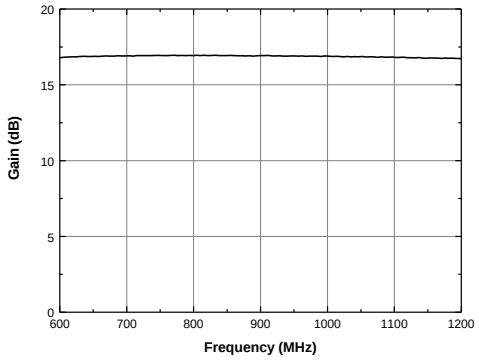
Schematic

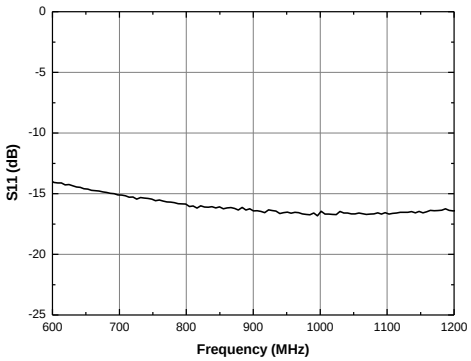


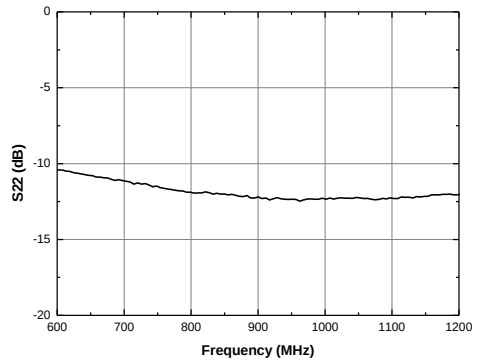
Board Layout (FR4, 40x40 mm², 0.8T)

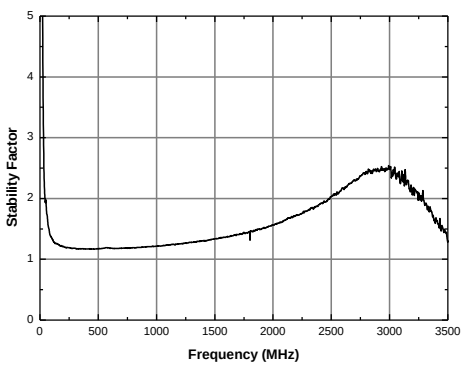


S-parameters & K-factor









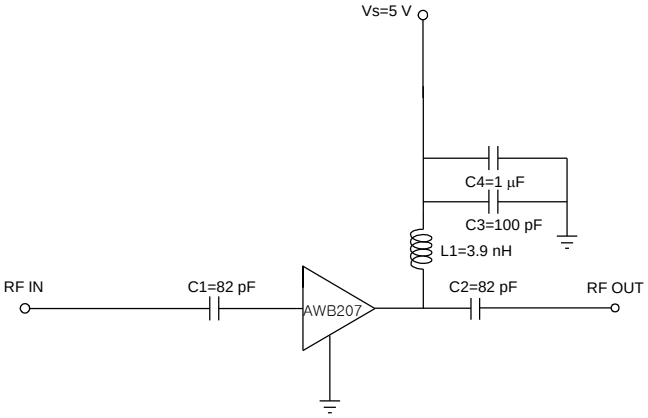
APPLICATION CIRCUIT

WCDMA
2000
+5 V

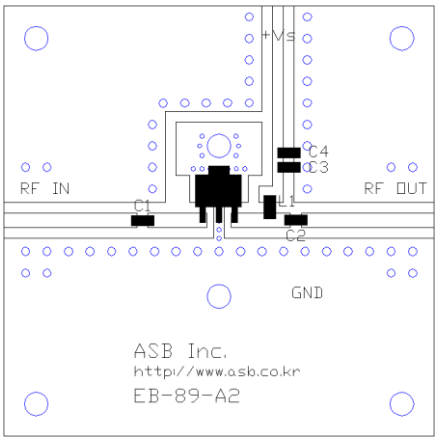
Frequency (MHz)	2000
Magnitude S21 (dB)	16.0
Magnitude S11 (dB)	-14
Magnitude S22 (dB)	-15
Output P1dB (dBm)	18
Output IP3[1] (dBm)	37.5
Noise Figure (dB)	2.7
Device Voltage (V)	+5
Current (mA)	74

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

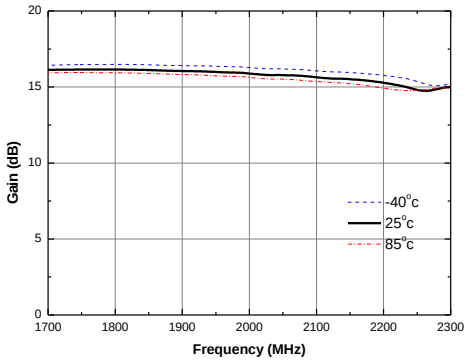
Schematic

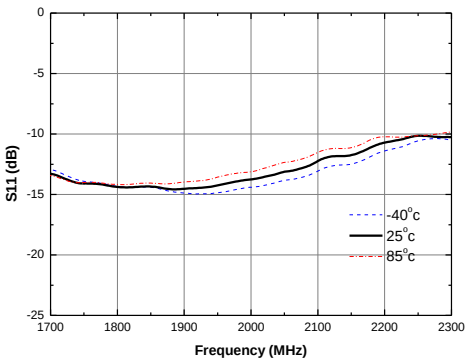


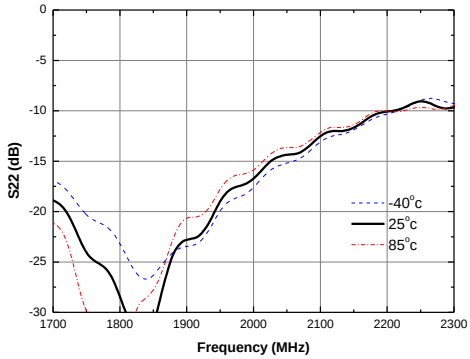
Board Layout (FR4, 40x40 mm², 0.8T)

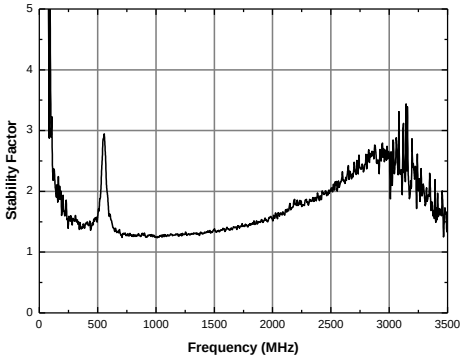


S-parameters & K-factor

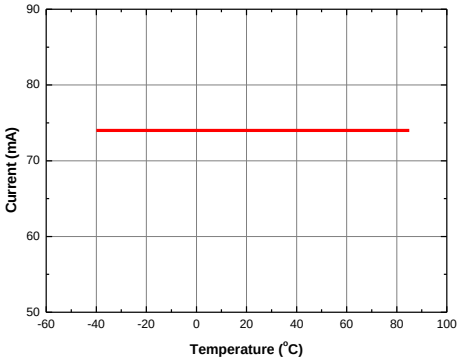




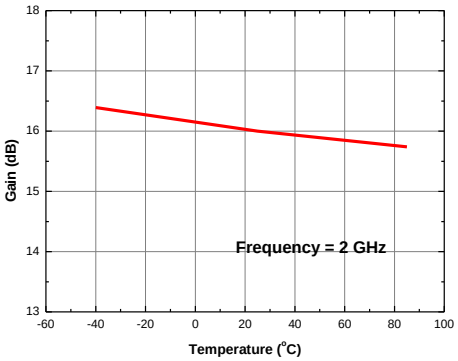




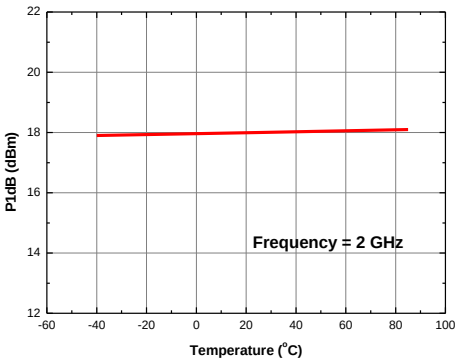
Current vs. Temperature



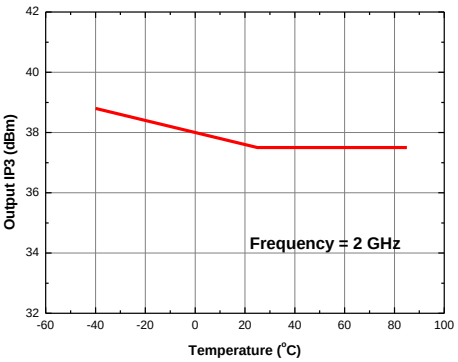
Gain vs. Temperature



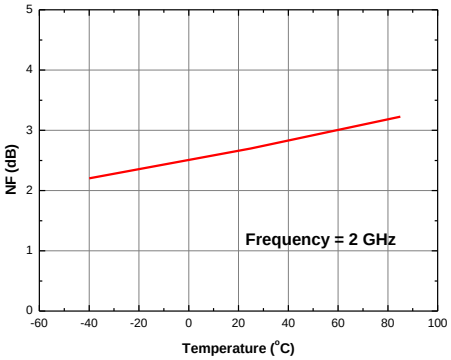
P1dB vs. Temperature



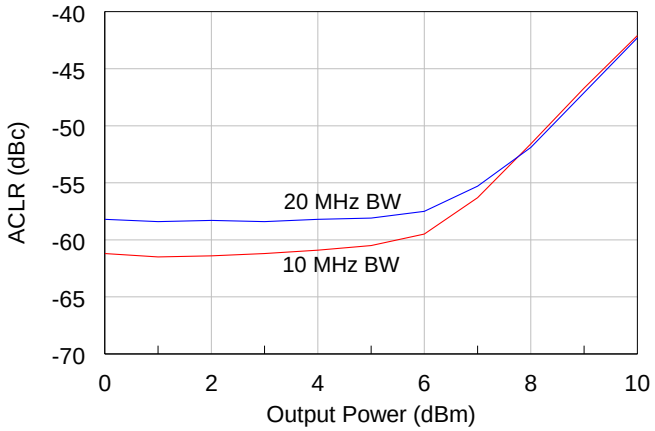
Output IP3 vs. Temperature



NF vs. Temperature

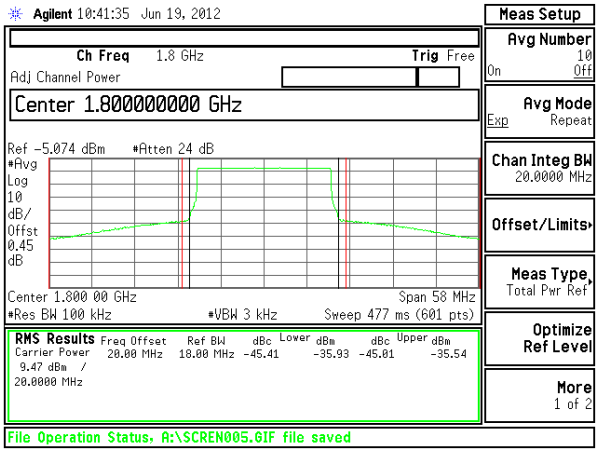


LTE ACLR – 10 MHz & 20 MHz



1) Test Source : LTE_FDD_test model 3.1, BW: 10 MHz & 20 MHz, Test Frequency: 1.8 GHz

LTE ACLR – 20 MHz



2) Test Source : LTE_FDD_test model 3.1, BW: 20 MHz, Test Frequency: 1.8 GHz

APPLICATION CIRCUIT

CATV(50 ohm)

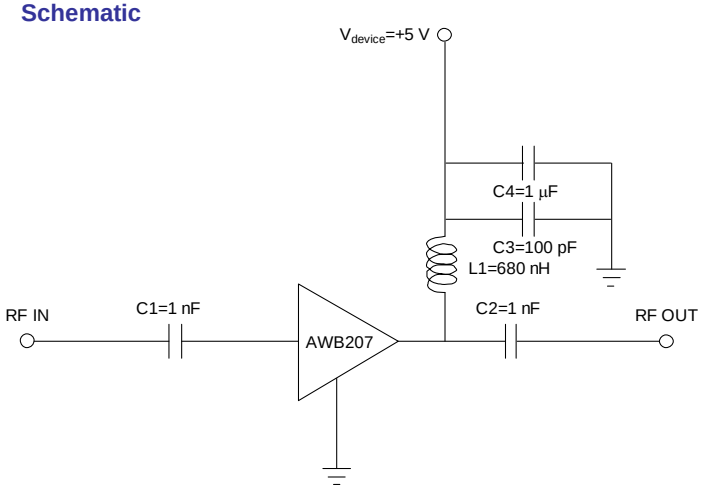
50 ~ 1000 MHz

+5 V

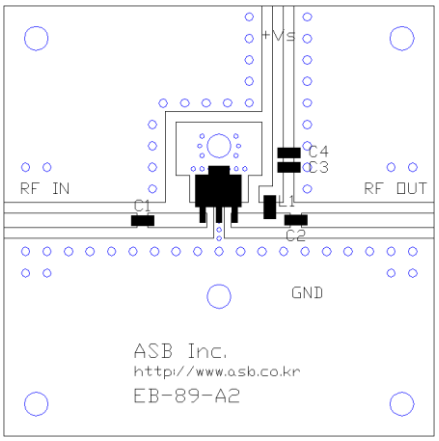
Frequency (MHz)	50	500	1000
Magnitude S21 (dB)	16.3	16.1	15.7
Magnitude S11 (dB)	-13	-18	-14
Magnitude S22 (dB)	-12	-12	-12
Output P1dB (dBm)	20	21	20
Output IP3[1)] (dBm)	35	36	35
Noise Figure (dB)	2.4	2.4	2.4
Device Voltage (V)	+5	+5	+5
Current (mA)	70	70	70

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

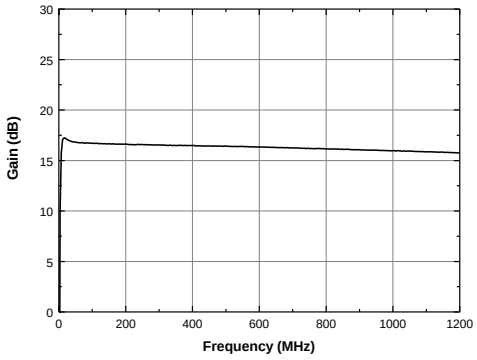
Schematic

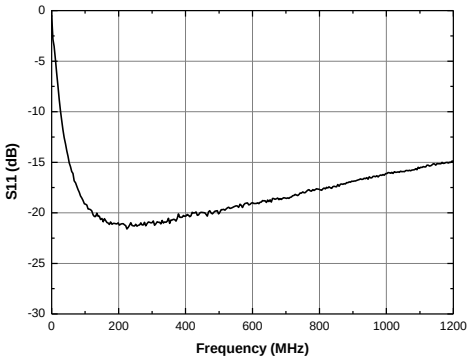


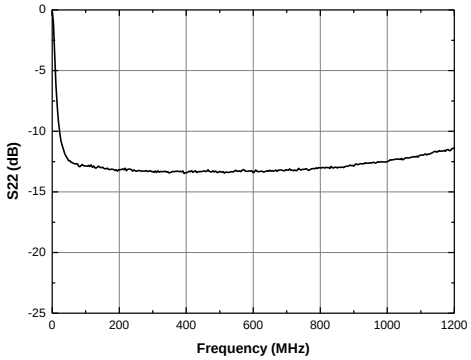
Board Layout (FR4, 40x40 mm², 0.8T)

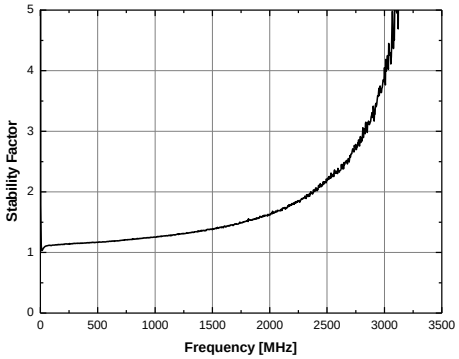


S-parameters & K-factor









APPLICATION CIRCUIT

SMATV

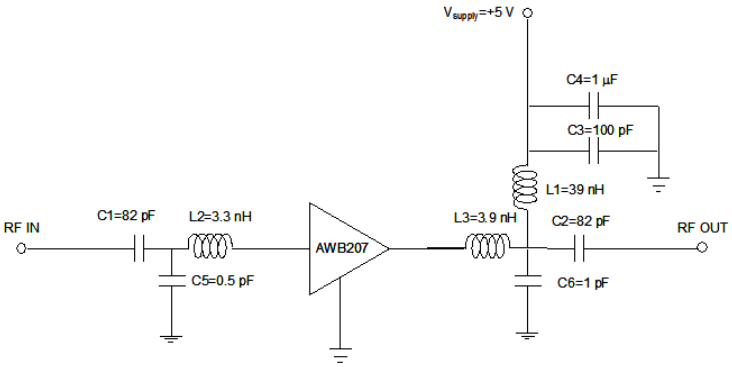
950 ~ 2150 MHz

+5 V

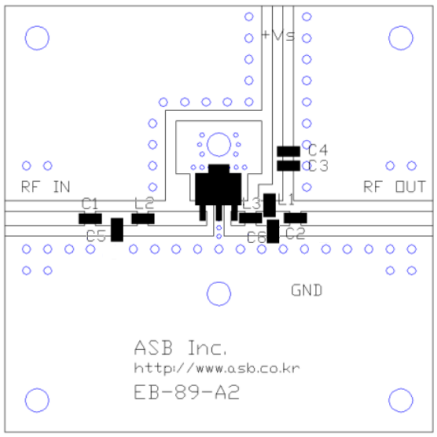
Frequency (MHz)	950	2150
Magnitude S21 (dB)	16.1	15.3
Magnitude S11 (dB)	-18	-14
Magnitude S22 (dB)	-13.5	-13
Output P1dB (dBm)	21	17.5
Output IP3[1] (dBm)	36	35
Noise Figure (dB)	2.4	3.1
Device Voltage (V)	+5	+5
Current (mA)	74	74

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

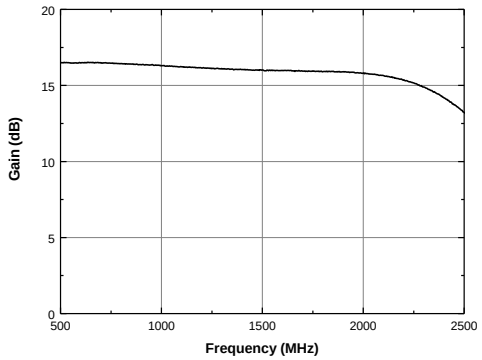
Schematic

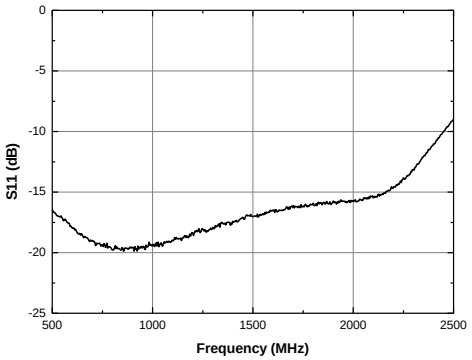


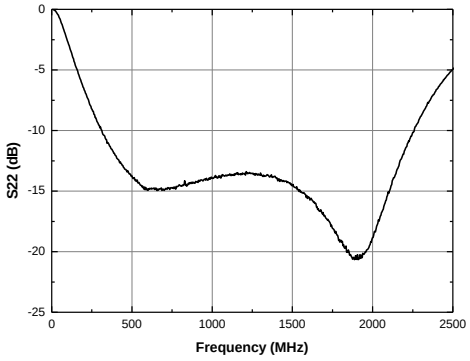
Board Layout (FR4, 40x40 mm², 0.8T)

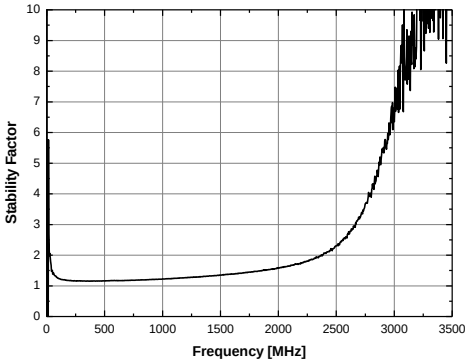


S-parameters & K-factor









APPLICATION CIRCUIT

SMATV & Wideband

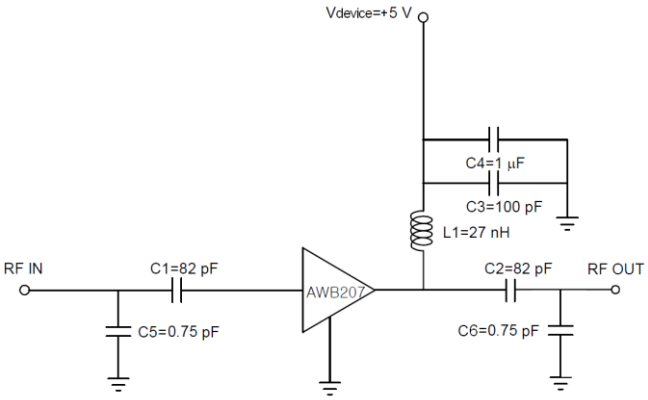
500 ~ 3000 MHz

+5 V

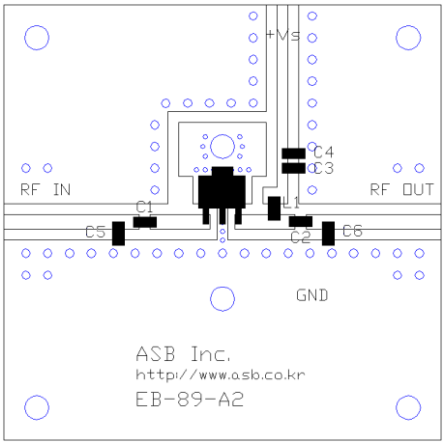
Frequency (MHz)	500	900	2000	3000
Magnitude S21 (dB)	16.0	15.5	14.5	15.3
Magnitude S11 (dB)	-10	-10	-8	-12
Magnitude S22 (dB)	-10	-9	-6	-10
Output P1dB (dBm)	21	20	20	18
Output IP3[1)] (dBm)	37	35	34	33
Noise Figure (dB)	2.4	2.3	2.5	2.9
Device Voltage (V)	+5	+5	+5	+5
Current (mA)	74	74	74	74

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor