

Features

- 19 dB Gain at 2 GHz
- 22 dBm P1dB at 2 GHz
- 35 dBm Output IP3 at 2 GHz
- 1.7 dB NF at 2 GHz
- MTTF > 100 Years
- Single Supply

Description

The ASW208, a gain block amplifier MMIC, has a low noise, high gain, and high linearity over a wide range of frequency, being suitable for use in both receiver and transmitter of telecommunication systems up to 6 GHz. The amplifier is available in an SOT-89 package and passes through the stringent DC, RF, and reliability tests.



Package Style: SOT-89

Typical

Parameters	Units	Typical				
		50	900	2000	2700	3000
Frequency	MHz	50	900	2000	2700	3000
Gain	dB	21	21	19	17	16.2
S11	dB	-9	-14	-12	-11	-13
S22	dB	-18	-12	-12	-12	-11
Output IP3 ¹⁾	dBm	32 ¹⁾	37 ²⁾	35 ²⁾	33 ²⁾	29 ³⁾
Noise Figure	dB	5.2	1.6	1.7	1.9	2.4
Output P1dB	dBm	23	22	22	21	20
Current	mA	80	80	80	80	80
Device Voltage	V	5.5	5.5	5.5	5.5	5

1) OIP3 is measured with two tones at an output power of +10 dBm/tone separated by 1 MHz.

2) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1 MHz.

3) OIP3 is measured with two tones at an output power of +5 dBm/tone separated by 1 MHz.

Application Circuit

- 500 ~ 3500 MHz (5.5 V)
- 500 ~ 3500 MHz (5 V)
- IF / 50 ~ 450 MHz (5.5 V)
- IF / 50 ~ 450 MHz (5 V)
- 3000 ~ 4500 MHz (5 V)
- SMATV / 950 ~ 2150 MHz (5.5 V)
- SMATV / 950 ~ 2150 MHz (5 V)
- 50 ~ 2600 MHz (5 V, 75ohm)
- 1000 ~ 2600 MHz (5 V, 45mA, 75ohm)

Product Specifications

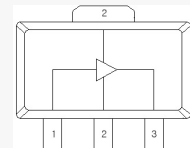
Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		2000	
Gain	dB	18	19	
S11	dB	-9	-12	
S22	dB	-9	-12	
Output IP3	dBm	32	35	
Noise Figure	dB		1.7	2.0
Output P1dB	dBm	20.5	22	
Current	mA	60	80	100
Device Voltage	V		5.5	

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

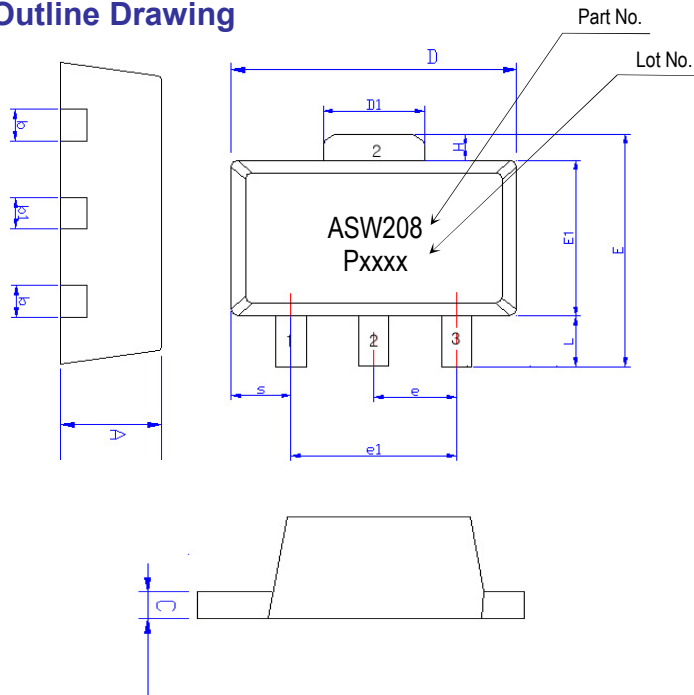
* Please find the max. input power data from http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf

Pin Configuration



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

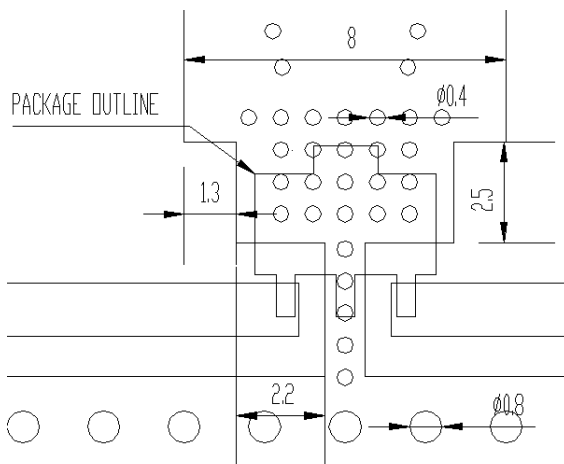
Outline Drawing



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.

ESD Classification & Moisture Sensitivity Level

ESD Classification

HBM	Class 1B
	Voltage Level: 550 V
MM	Class A
	Voltage Level: 50 V

CAUTION: ESD-sensitive device!

Moisture Sensitivity Level (MSL)

Level 3 at 260°C reflow

APPLICATION CIRCUIT

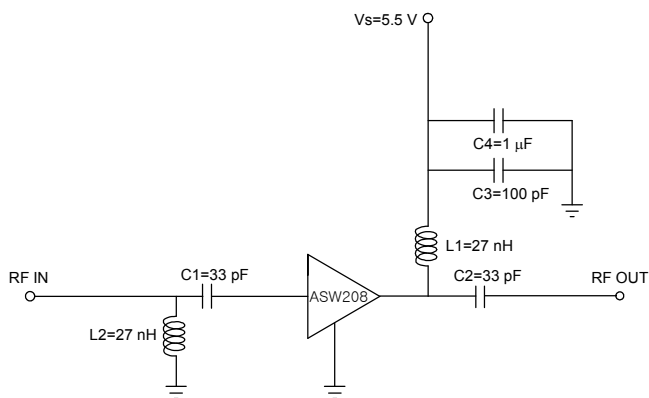
500 ~ 3500 MHz

+5.5 V

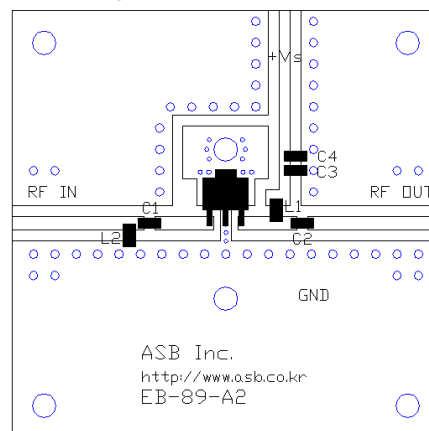
Frequency (MHz)	900	2000	2700
Magnitude S21 (dB)	21	19	17
Magnitude S11 (dB)	-14	-12	-11
Magnitude S22 (dB)	-12	-12	-12
Output P1dB (dBm)	22	22	21
Output IP3 ¹⁾ (dBm)	37	35	33
Noise Figure (dB)	1.6	1.7	1.9
Device Voltage (V)	5.5	5.5	5.5
Current (mA)	80	80	80

1) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1MHz.

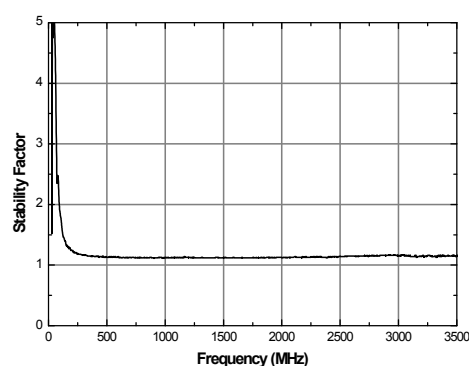
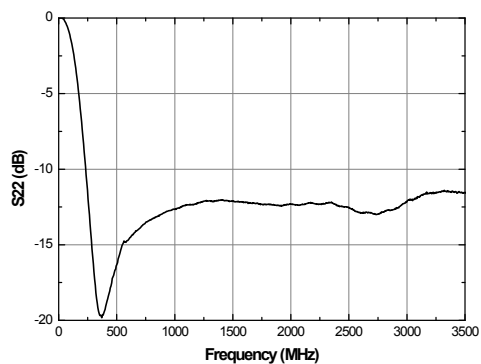
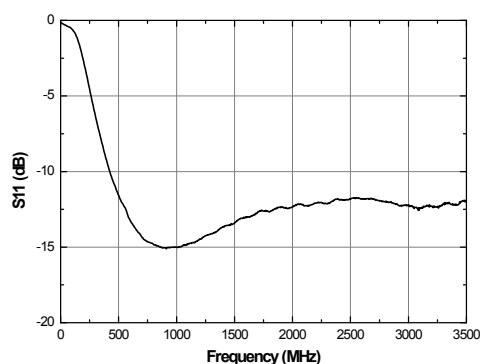
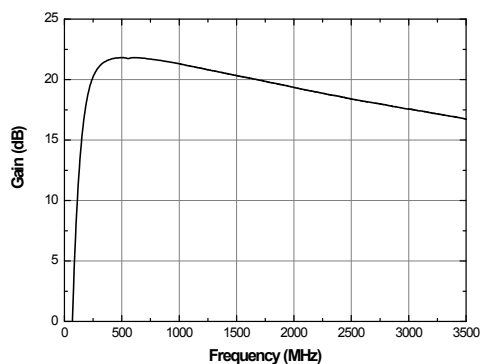
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

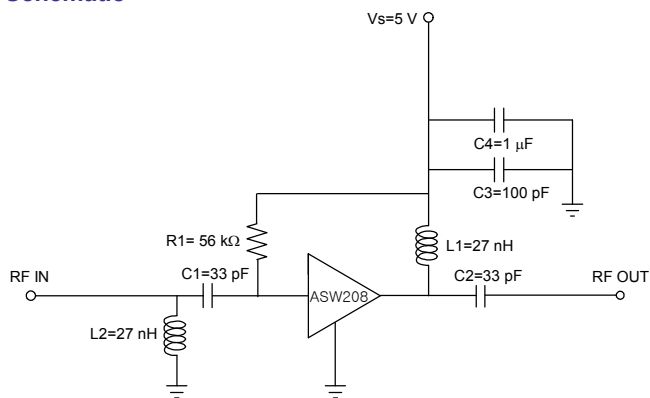
500 ~ 3500 MHz

+5 V

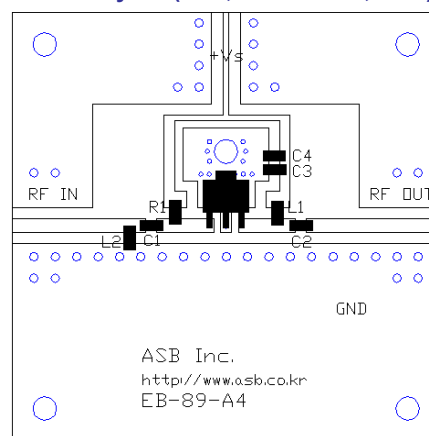
Frequency (MHz)	900	2000	2700
Magnitude S21 (dB)	21	19	17
Magnitude S11 (dB)	-14	-11	-11
Magnitude S22 (dB)	-12	-11	-10
Output P1dB (dBm)	22	22	21
Output IP3 ¹⁾ (dBm)	37	35	33
Noise Figure (dB)	1.6	1.7	1.9
Device Voltage (V)	5	5	5
Current (mA)	80	80	80

1) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1MHz.

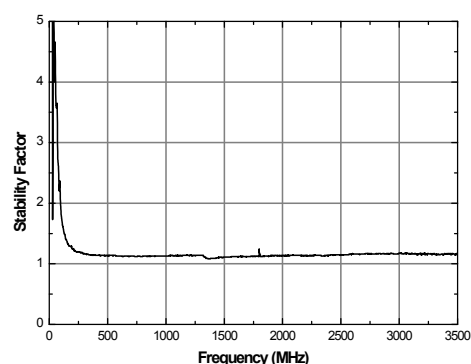
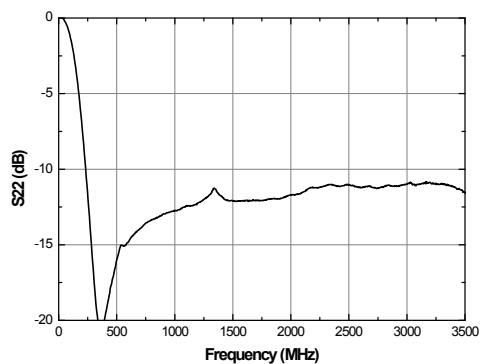
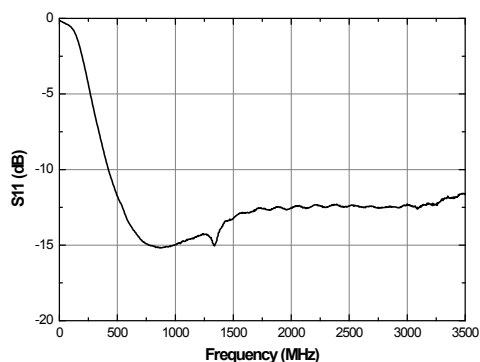
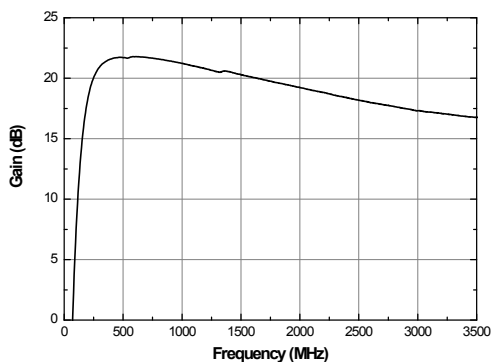
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



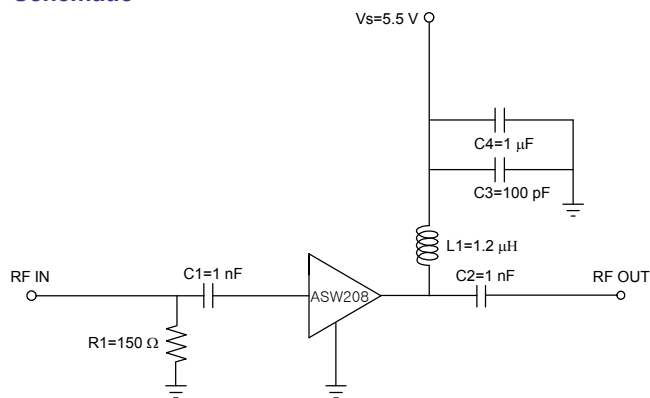
APPLICATION CIRCUIT

IF
 50 ~ 450 MHz
 +5.5 V

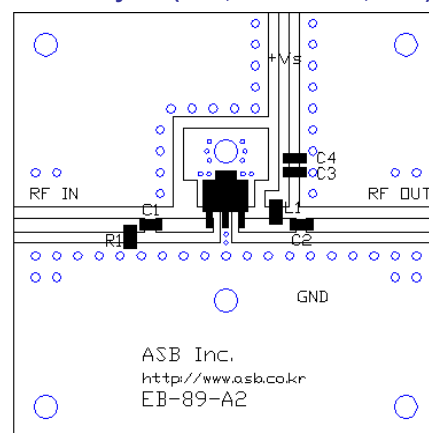
Frequency (MHz)	50	150	300	450
Magnitude S21 (dB)	21	20	20	19.5
Magnitude S11 (dB)	-9	-14	-15	-15
Magnitude S22 (dB)	-18	-18	-15	-15
Output P1dB (dBm)	23	23.5	23.5	23.5
Output IP3 ¹⁾ (dBm)	32	33	34	34
Noise Figure (dB)	5.2	3.4	3.2	3.2
Device Voltage (V)	5.5	5.5	5.5	5.5
Current (mA)	80	80	80	80

1) OIP3 is measured with two tones at an output power of +10 dBm/tone separated by 1MHz.

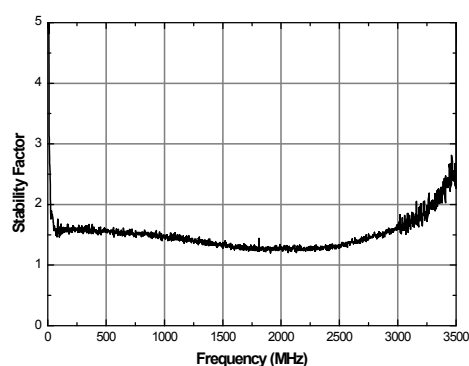
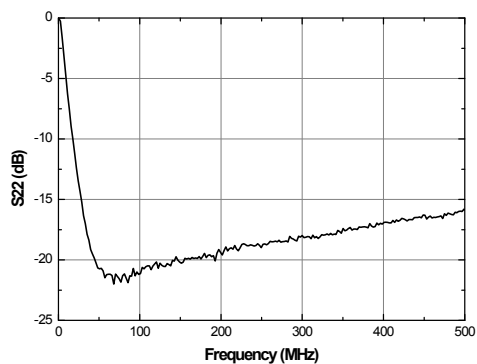
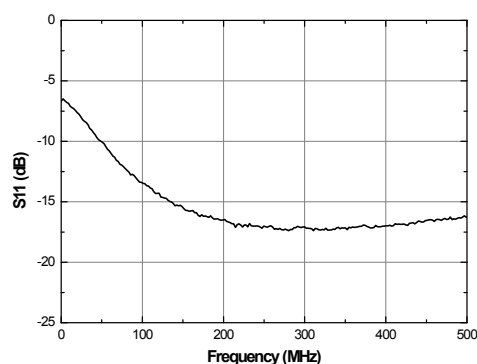
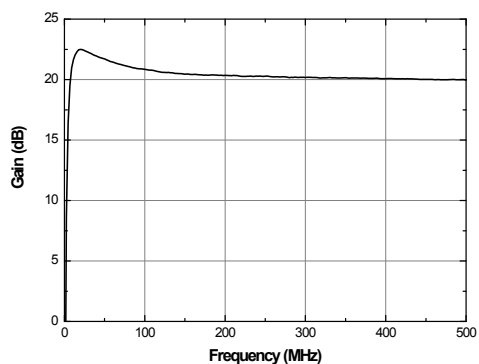
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



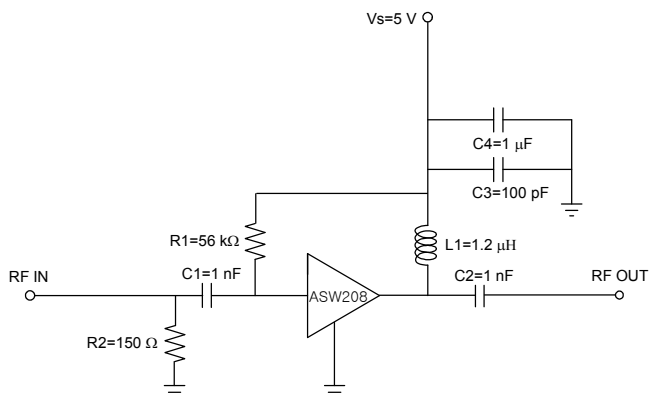
APPLICATION CIRCUIT

IF
 50 ~ 450 MHz
 +5 V

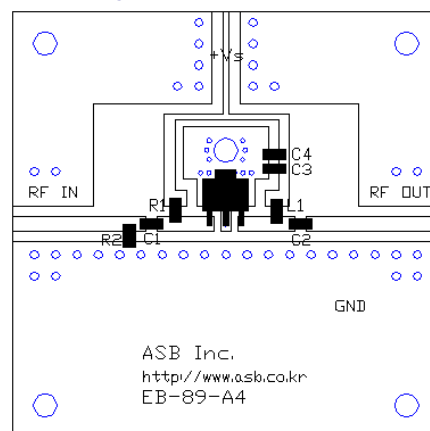
Frequency (MHz)	50	150	300	450
Magnitude S21 (dB)	21	20	19.5	19.5
Magnitude S11 (dB)	-10	-14	-15	-15
Magnitude S22 (dB)	-18	-18	-15	-15
Output P1dB (dBm)	22	22	22	22
Output IP3 ¹⁾ (dBm)	31	32	33	33
Noise Figure (dB)	4.0	3.2	3.2	3.2
Device Voltage (V)	5	5	5	5
Current (mA)	80	80	80	80

1) OIP3 is measured with two tones at an output power of +10 dBm/tone separated by 1MHz.

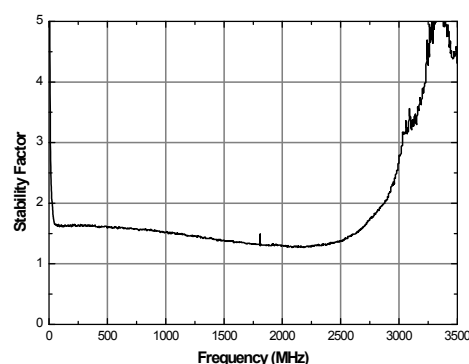
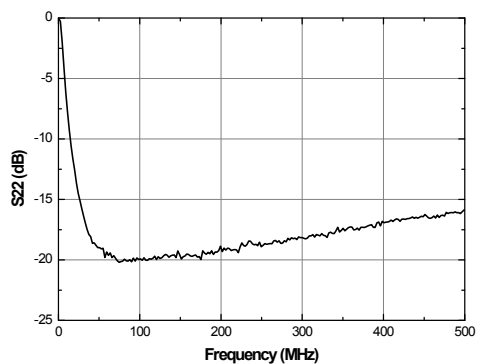
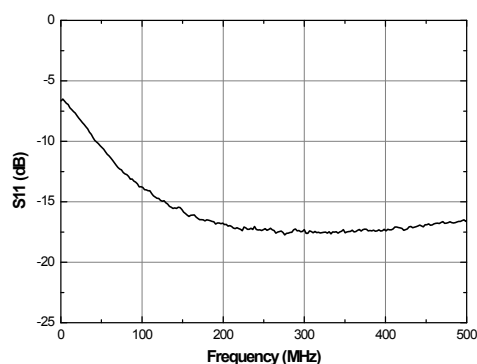
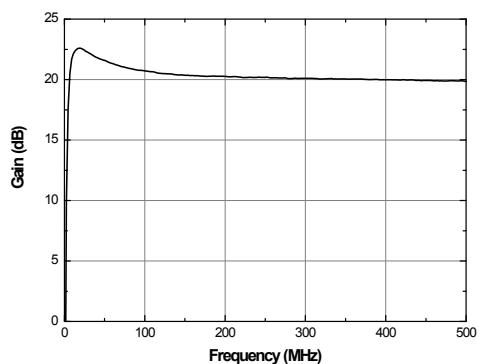
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

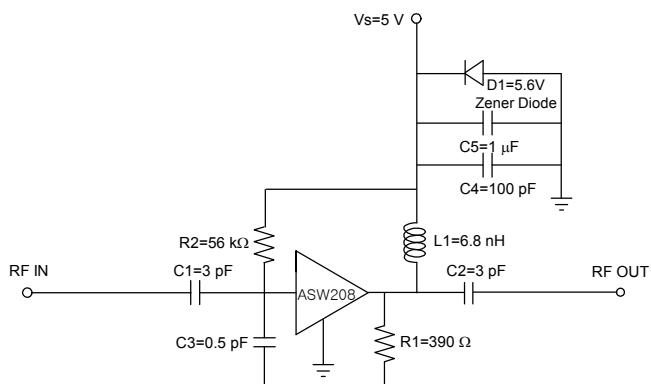
3000 ~ 4500 MHz

+5 V

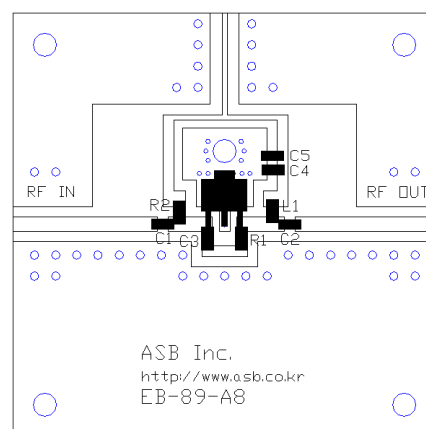
Frequency (MHz)	3000	4500
Magnitude S21 (dB)	16.2	16.4
Magnitude S11 (dB)	-13	-12
Magnitude S22 (dB)	-11	-13
Output P1dB (dBm)	20	16.5
Output IP3 ¹⁾ (dBm)	29	27.5
Noise Figure (dB)	2.4	2.7
Device Voltage (V)	5	5
Current (mA)	80	80

1) OIP3 is measured with two tones at an output power of +5 dBm/tone separated by 1MHz.

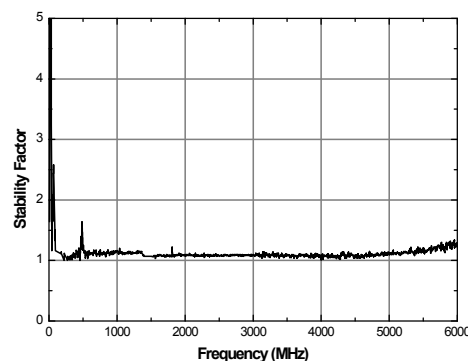
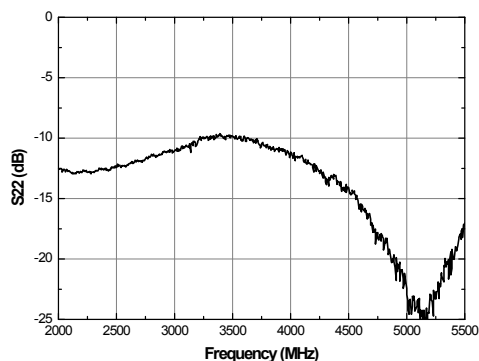
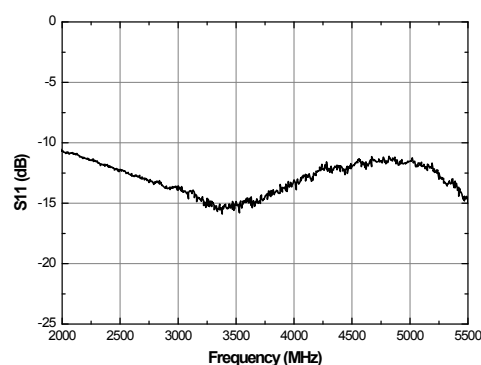
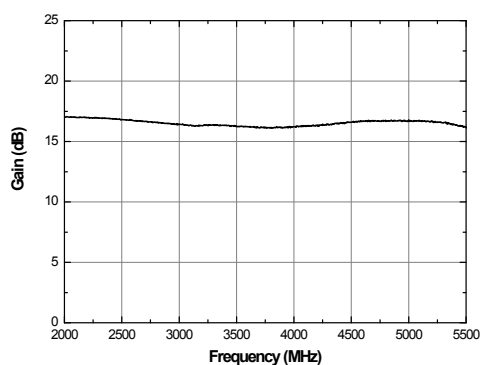
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

SMATV

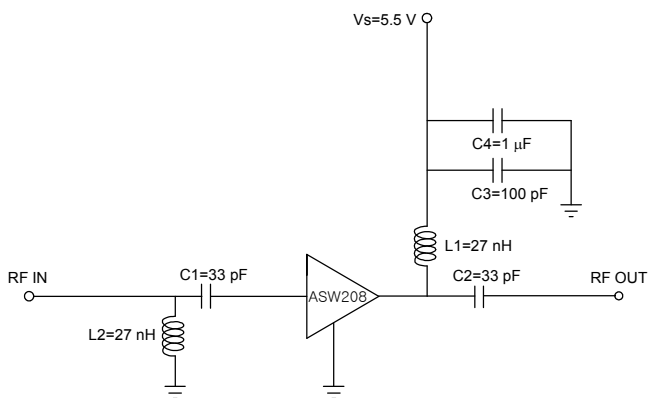
950 ~ 2150 MHz

+5.5 V

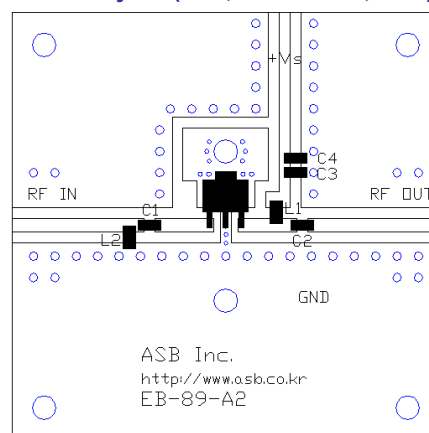
Frequency (MHz)	950	1500	2150
Magnitude S21 (dB)	21	20	17.5
Magnitude S11 (dB)	-14	-12	-11
Magnitude S22 (dB)	-12	-12	-12
Output P1dB (dBm)	22	22	21
Output IP3 ¹⁾ (dBm)	37	35	34
Noise Figure (dB)	1.6	1.7	1.8
Device Voltage (V)	5.5	5.5	5.5
Current (mA)	80	80	80

1) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1MHz.

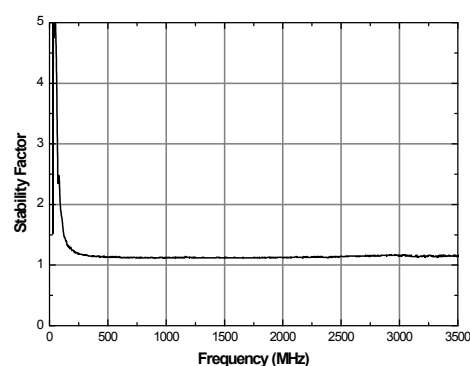
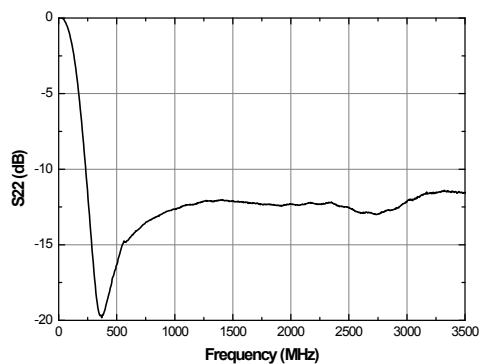
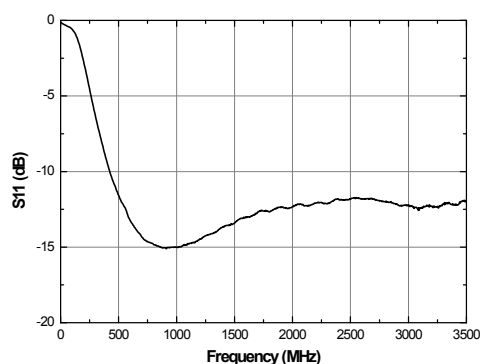
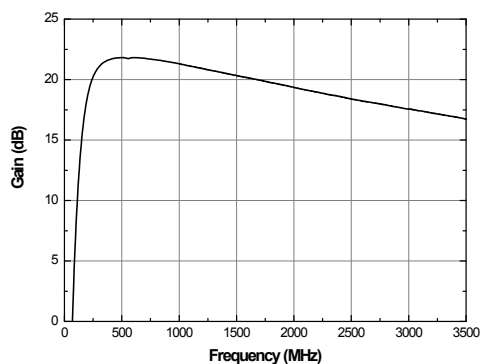
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

SMATV

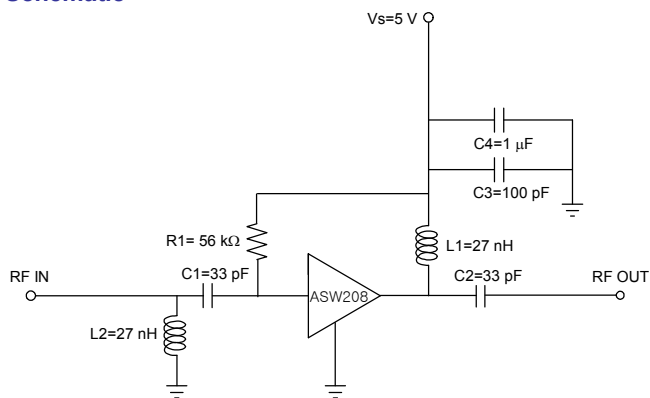
950 ~ 2150 MHz

+5 V

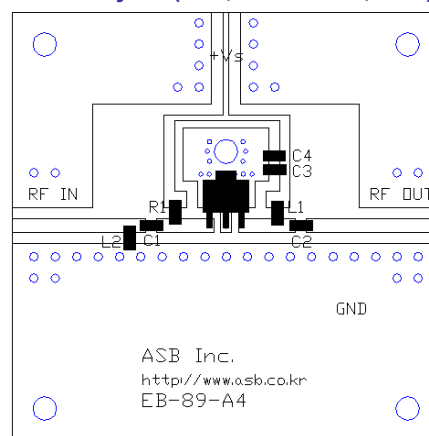
Frequency (MHz)	950	1500	2150
Magnitude S21 (dB)	21	20	18
Magnitude S11 (dB)	-14	-11	-11
Magnitude S22 (dB)	-12	-11	-10
Output P1dB (dBm)	22	22	21
Output IP3 ¹⁾ (dBm)	37	35	34
Noise Figure (dB)	1.6	1.7	1.8
Device Voltage (V)	5	5	5
Current (mA)	80	80	80

1) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1MHz.

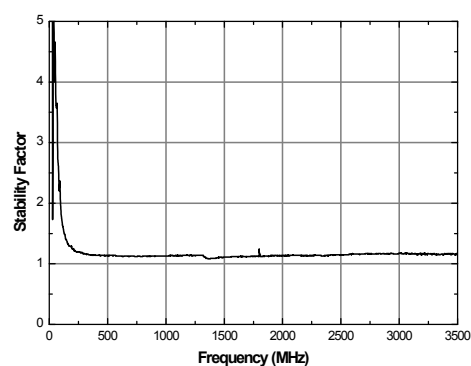
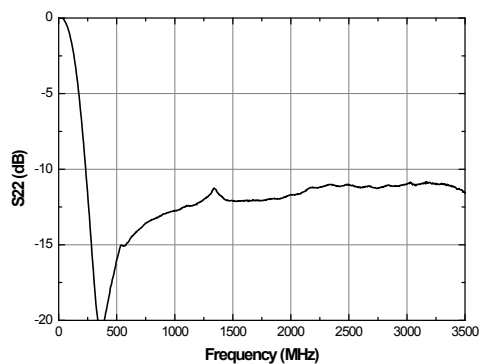
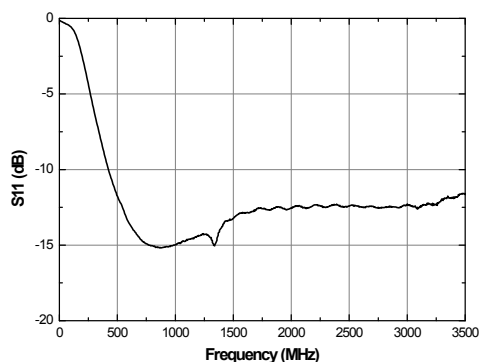
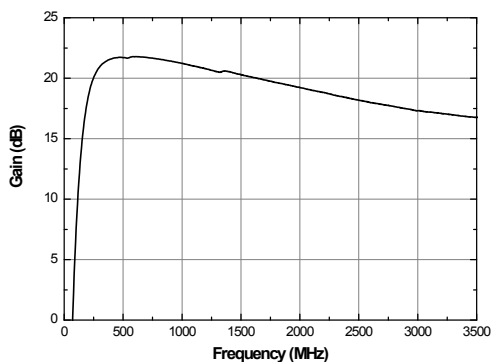
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

75 Ohm

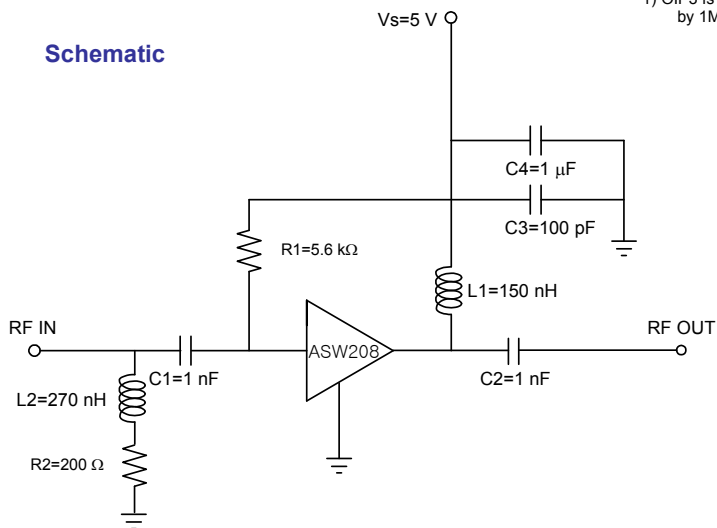
50 ~ 2600 MHz

+5 V

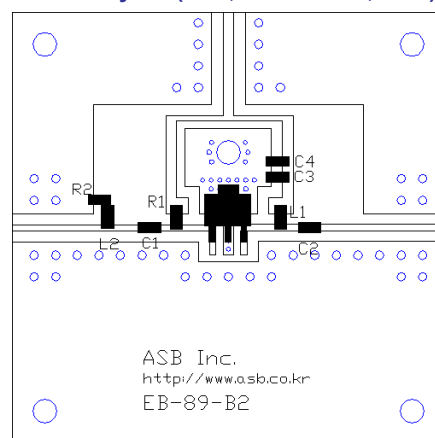
Frequency (MHz)	50	1300	2600
Magnitude S21 (dB)	21.8	20.0	17.0
Magnitude S11 (dB)	-7	-8	-10
Magnitude S22 (dB)	-7	-9	-15
Output P1dB (dBm)	21	21	20
Output IP3 ¹⁾ (dBm)	28.0	31.0	33.5
Output IP2 ¹⁾ (dBm)	29	46	49
Noise Figure (dB)	3.5	2.1	1.6
Device Voltage (V)	5	5	5
Current (mA)	80	80	80

1) OIP3 is measured with two tones at an output power of +5 dBm/tone separated by 1MHz.

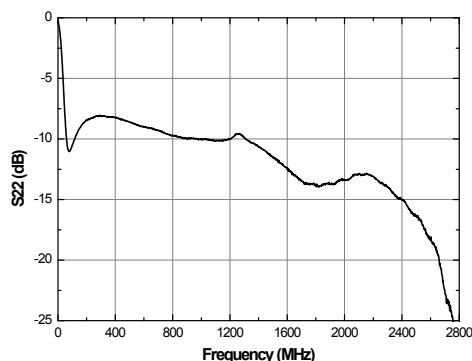
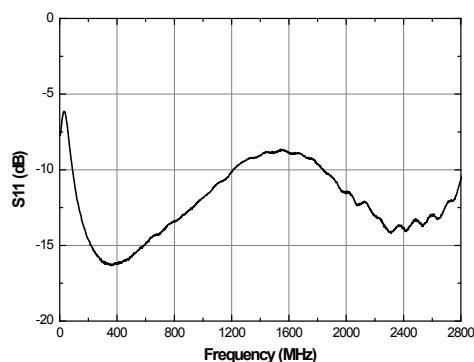
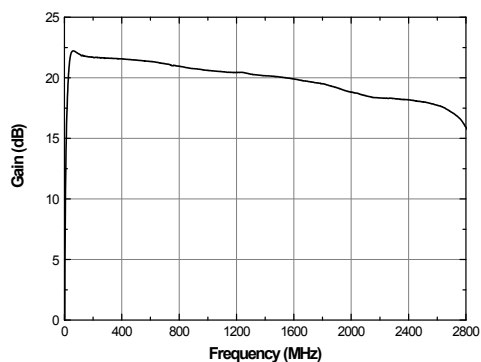
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

75 Ohm

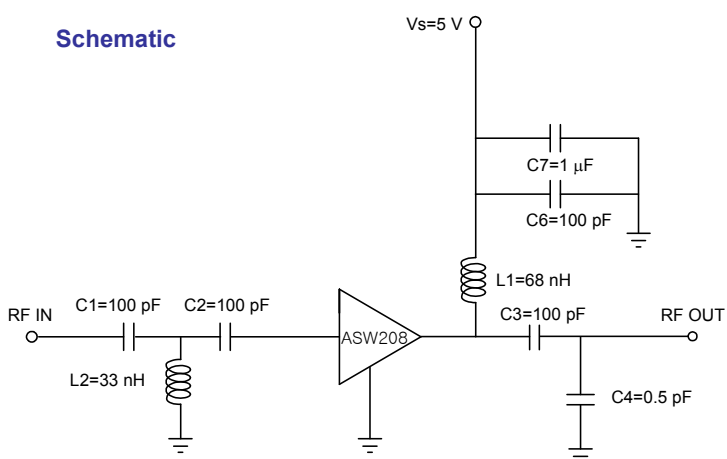
1000 ~ 2600 MHz

+5 V

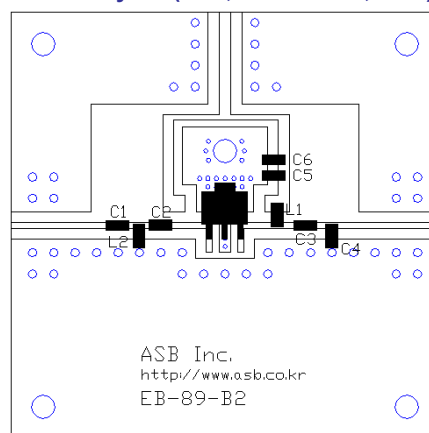
Frequency (MHz)	1000	1800	2600
Magnitude S21 (dB)	19.7	18.4	16.9
Magnitude S11 (dB)	-11	-8	-12
Magnitude S22 (dB)	-8	-15	-14
Output P1dB (dBm)	21	23	20
Output IP3 ¹⁾ (dBm)	30	24	31
Noise Figure (dB)	1.8	2.5	2.5
Device Voltage (V)	5	5	5
Current (mA)	45	45	45

1) OIP3 is measured with two tones at an output power of +7 dBm/tone separated by 1MHz.

Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor

