

Features

- 19.3 dB Gain at 900 MHz
- 17.5 dBm P1dB at 900 MHz
- 31.5 dBm Output IP3 at 900 MHz
- 1.7 dB NF at 900 MHz
- MTTF > 100 Years
- Single Supply

Description

The ASW105, a power 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. The amplifier is available in an SOT-89 package and passes through the stringent DC, RF, and reliability tests.



Package Style: SOT-89

Typical Performance

Parameters	Units	Typical		
Frequency	MHz	150	900	2000
Gain	dB	21	19.3	17.5
S11	dB	-12	-16	-16
S22	dB	-12	-11	-11
Output IP3 ¹⁾	dBm	32	31.5	31.5
Noise Figure	dB	1.7	1.7	1.8
Output P1dB	dBm	18.5	17.5	18.5
Current	mA	65	65	65
Device Voltage	V	3.3	3.3	3.3

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

Application Circuit

- 500 ~ 3500 MHz
- IF (50 ~ 450 MHz)
- DMB

Product Specifications

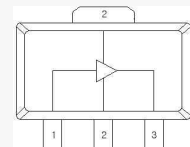
Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		900	
Gain	dB		19.3	
S11	dB		-16	
S22	dB		-11	
Output IP3	dBm		31.5	
Noise Figure	dB		1.7	
Output P1dB	dBm		17.5	
Current	mA		65	
Device Voltage	V		3.3	

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-40 to +150°C
Device Voltage	+4.3 V
Operating Junction Temperature	+150°C
Input RF Power (Continuous)	22 dBm

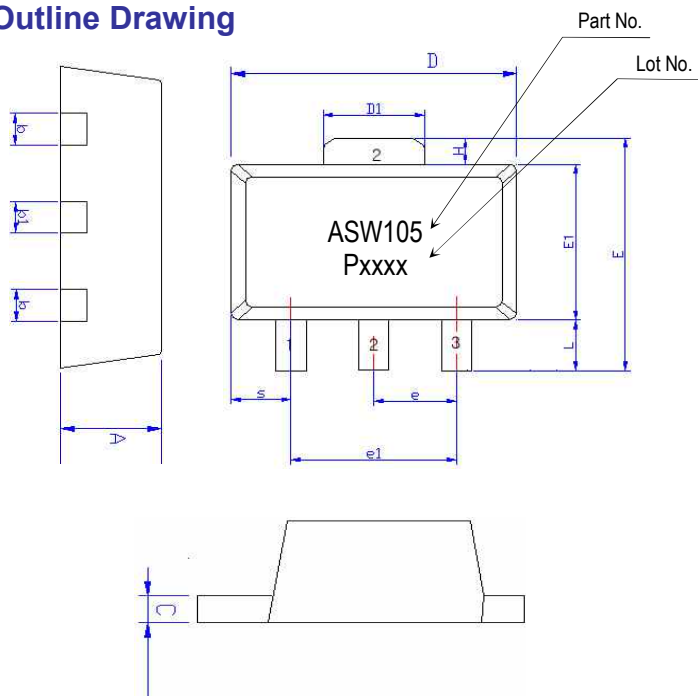
* Please find the max. input power data from http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf

Pin Configuration



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

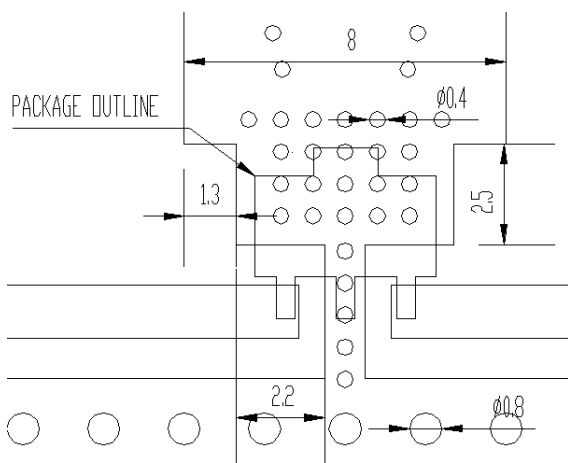
Outline Drawing



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 1A
	Voltage Level: 400 V
MM	Class A
	Voltage Level: 50 V

CAUTION: ESD-sensitive device!

Moisture Sensitivity Level (MSL)

Level 3 at 260°C reflow

APPLICATION CIRCUIT

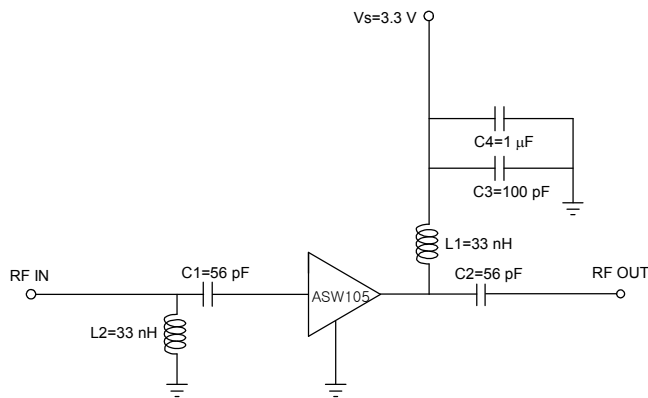
500 ~ 3500 MHz

+3.3 V

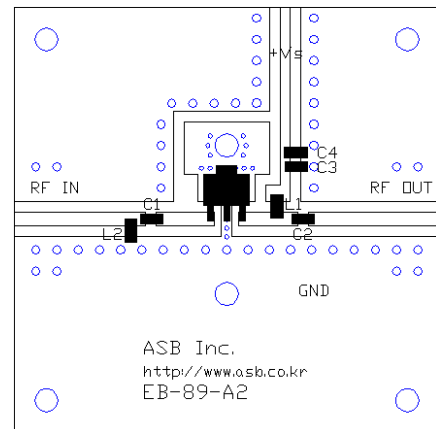
Frequency (MHz)	900	2000	2400	2700
Magnitude S21 (dB)	19.3	17.5	16.9	16.3
Magnitude S11 (dB)	-16	-16	-18	-18
Magnitude S22 (dB)	-11	-11	-10	-10
Output P1dB (dBm)	17.5	18.5	17.5	17.5
Output IP3 ¹⁾ (dBm)	31.5	31.5	32	33.5
Noise Figure (dB)	1.7	1.8	1.8	2.0
Device Voltage (V)	3.3	3.3	3.3	3.3
Current (mA)	65	65	65	65

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

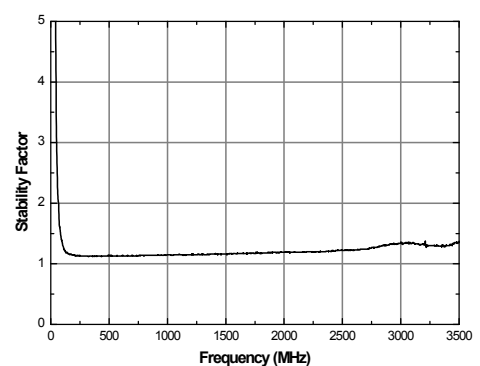
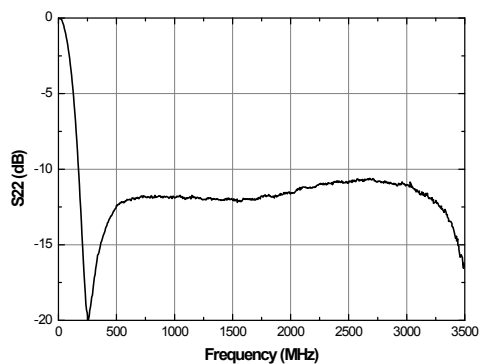
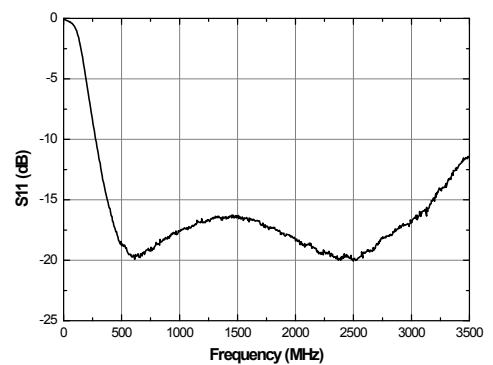
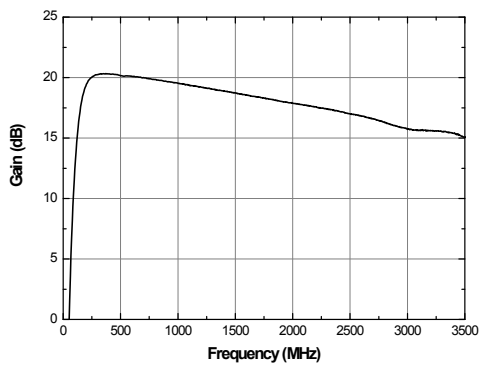
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

IF

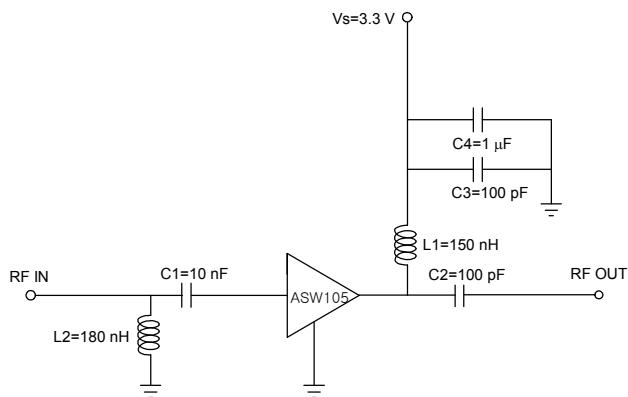
50 ~ 450 MHz

+3.3 V

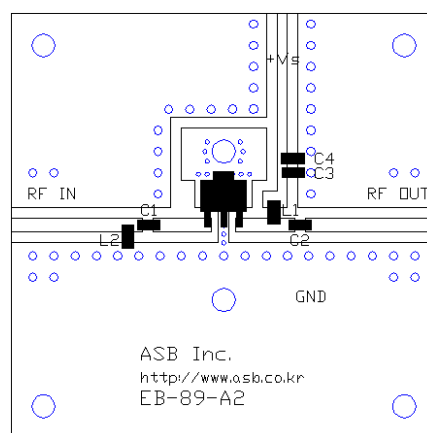
Frequency (MHz)	70	150	300	450
Magnitude S21 (dB)	22	21	20	20
Magnitude S11 (dB)	-6	-12	-14	-15
Magnitude S22 (dB)	-18	-12	-12	-12
Output P1dB (dBm)	18	18.5	18.5	18
Output IP3 ¹⁾ (dBm)	31	32	33	33.5
Noise Figure (dB)	2.1	1.7	1.7	1.7
Device Voltage (V)	3.3	3.3	3.3	3.3
Current (mA)	65	65	65	65

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

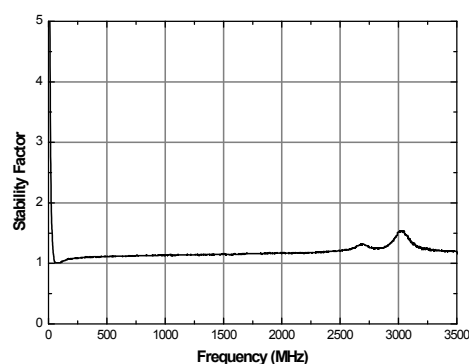
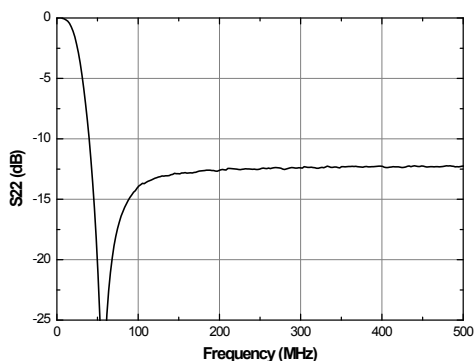
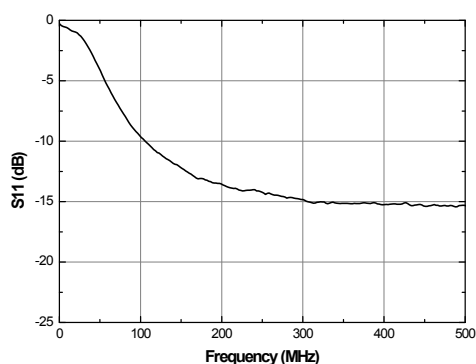
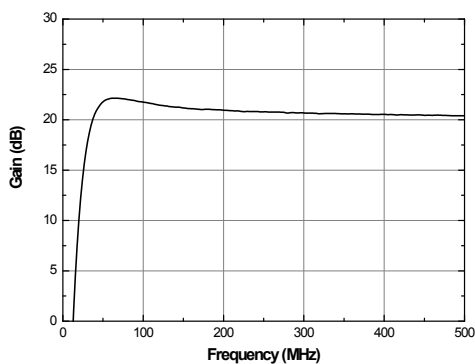
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

DMB

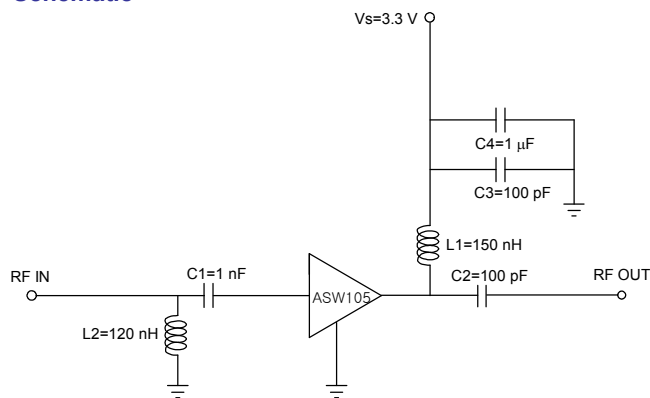
145 ~ 245 MHz

+3.3 V

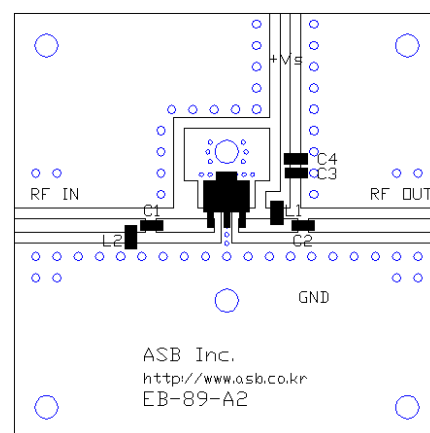
Frequency (MHz)	145	245
Magnitude S21 (dB)	21	20.5
Magnitude S11 (dB)	-12	-14
Magnitude S22 (dB)	-12	-12
Output P1dB (dBm)	18	18
Output IP3 ¹⁾ (dBm)	31.5	32
Noise Figure (dB)	1.9	1.8
Device Voltage (V)	3.3	3.3
Current (mA)	65	65

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

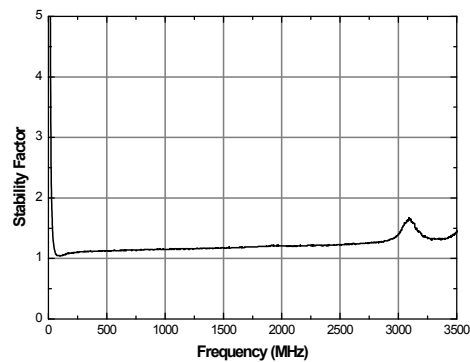
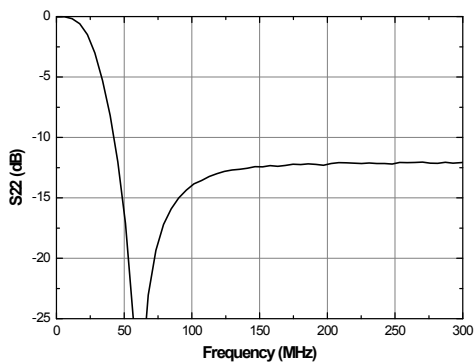
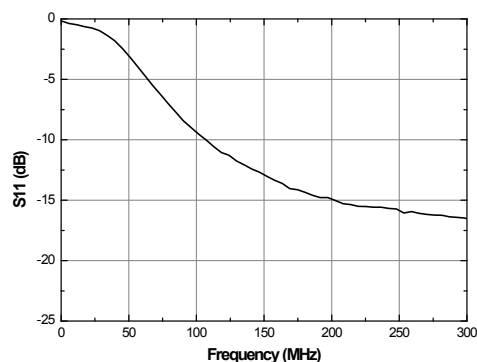
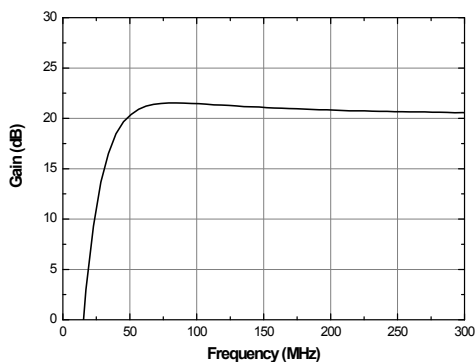
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



Performance with varying Current

V _{DEVICE} (V)	R _D (ohm)	Current (mA)	Freq. (MHz)	Gain (dB)	S11 (dB)	S22 (dB)	OIP3 (dBm)	P1dB (dBm)	NF (dB)
3.3	0	66	900	19.7	-19.6	-10.8	34.1	18.3	1.28
			2000	17.8	-17.1	-12.2	33.5	19.1	1.39
			2700	16.6	-21.2	-10.6	34.7	18.3	1.56
			3500	15.6	-23.2	-11.4	32.2	18.9	1.65
3.3	3.3	50	900	19.4	-17.5	-12.1	31.7	17.5	1.25
			2000	17.6	-15.5	-12.4	31.2	18.0	1.36
			2700	16.3	-18.3	-10.7	32.4	17.4	1.51
			3500	15.3	-20.6	-11.4	30.2	17.7	1.60
3.3	7.5	39	900	18.9	-15.2	-14.2	29.1	16.2	1.26
			2000	17.1	-13.8	-12.9	28.3	16.1	1.35
			2700	16.0	-16.5	-10.8	29.8	16.2	1.50
			3500	15.1	-18.0	-11.2	28.2	15.7	1.58
3.3	18	26	900	17.6	-11.5	-18.7	28.6	14.2	1.27
			2000	16.1	-10.8	-12.6	28.0	12.1	1.37
			2700	15.1	-12.7	-10.4	28.1	13.3	1.55
			3500	14.3	-13.7	-10.3	29.7	12.3	1.62