

Features

- 16.9 dB Gain at 150 MHz
- 22 dBm P1dB at 150 MHz
- 43.5 dBm Output IP3 at 150 MHz
- 2.5 dB NF at 150 MHz
- MTTF > 100 Years
- Single Supply
- Minimal External Components

Description

The ASF250, a IF 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 1 GHz. It has an active bias network for stable current over temperature and process variation. 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						
		70	150	300	450	900	150	
Frequency	MHz	70	150	300	450	900	150	
Gain	dB	17.0	16.9	16.7	16.6	16.1	16.8	
S11	dB	-15	-20	-20	-20	-14.5	-20	
S22	dB	-18	-20	-20	-19	-16	-20	
Output IP3	dBm	40.0 ¹⁾	43.5 ¹⁾	43.5 ¹⁾	40.5 ¹⁾	38.5 ¹⁾	41.5 ²⁾	
Noise Figure	dB	2.5	2.5	2.7	2.7	2.7	2.4	
Output P1dB	dBm	22	22	22	22	22	21	
Current	mA	103	103	103	103	103	90	
Device Voltage	V	5	5	5	5	5	4.5	

1) OIP3 is measured with two tones at an output power of +10dBm/tone separated by 1 MHz
 2) OIP3 is measured with two tones at an output power of +9dBm/tone separated by 1 MHz.

Application Circuit

- 50 ~ 1000 MHz (5 V)
- 50 ~ 1000 MHz (4.5 V, 90 mA)
- 50 ~ 1000 MHz (6 V)

Product Specifications

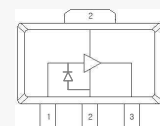
Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		150	
Gain	dB		16.9	
S11	dB		-20	
S22	dB		-20	
Output IP3	dBm		43.5	
Noise Figure	dB		2.5	
Output P1dB	dBm		22	
Current	mA		103	
Device Voltage	V		5	

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)	20 dBm

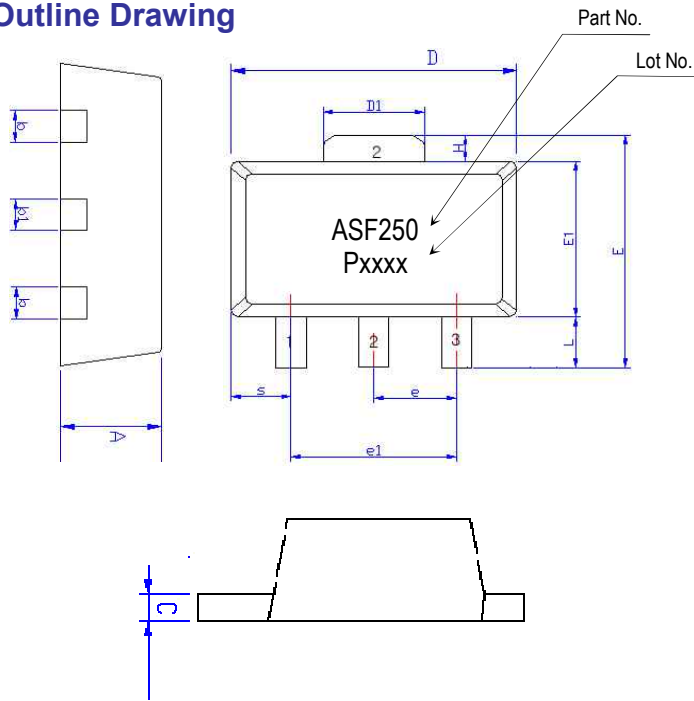
* Please find the max. input power data from http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf

Pin Configuration



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

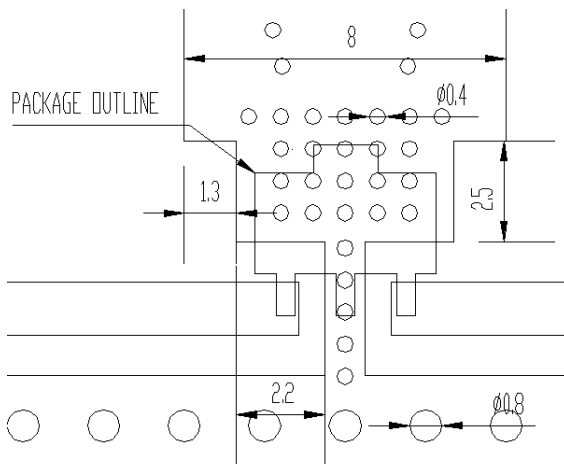
Outline Drawing



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 1C Voltage Level: 1900 V
MM	Class B Voltage Level: 225V

CAUTION: ESD-sensitive device!

Moisture Sensitivity Level (MSL)

Level 3 at 260°C reflow

APPLICATION CIRCUIT

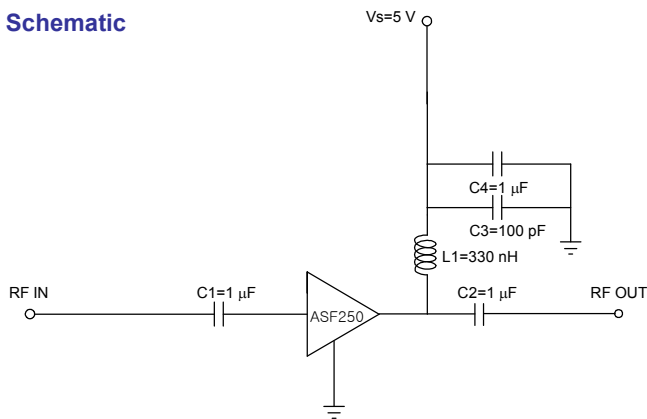
50 ~ 1000

+5 V

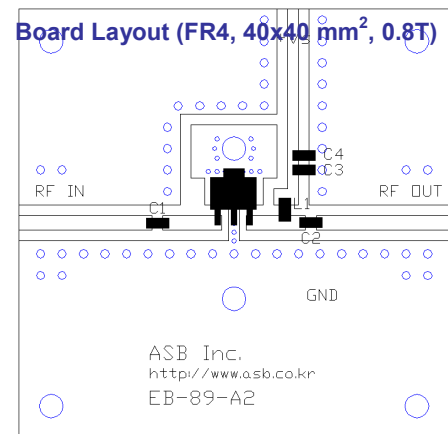
Frequency (MHz)	70	150	300	450	900
Magnitude S21 (dB)	17.0	16.9	16.7	16.6	16.1
Magnitude S11 (dB)	-15	-20	-20	-20	-14.5
Magnitude S22 (dB)	-18	-20	-20	-19	-16
Output P1dB (dBm)	22	22	22	22	22
Output IP3 ¹⁾ (dBm)	40.0	43.5	43.5	40.5	38.5
Noise Figure (dB)	2.5	2.5	2.7	2.7	2.7
Device Voltage (V)	5	5	5	5	5
Device Current (mA)	103	103	103	103	103

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

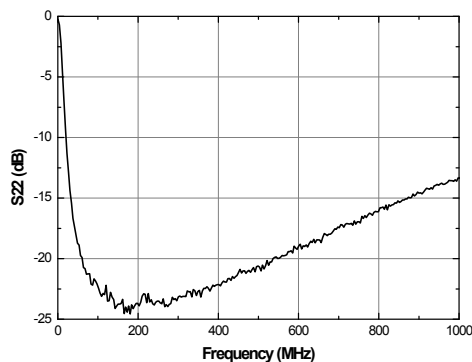
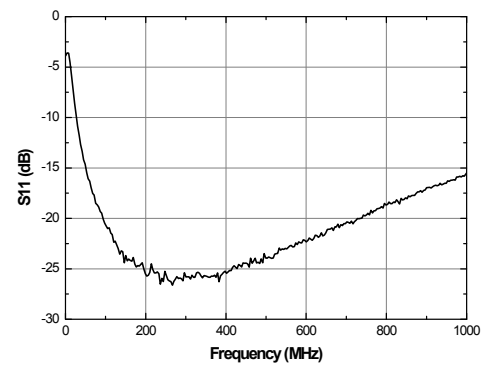
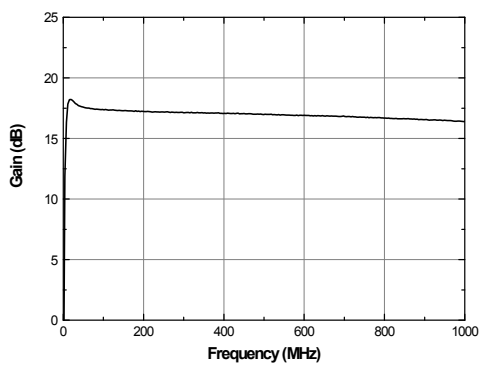
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

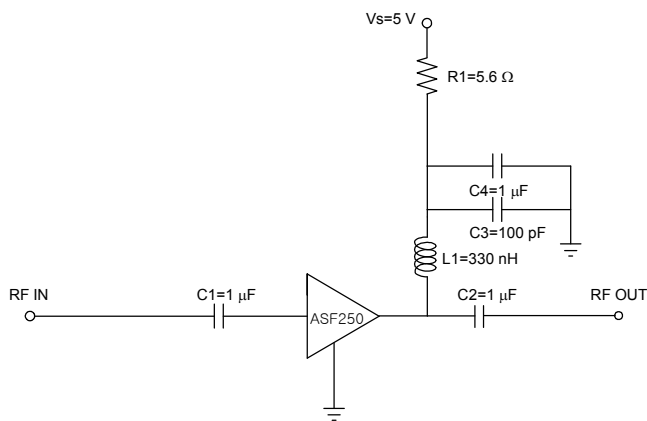
50 ~ 1000

+4.5 V, 90 mA

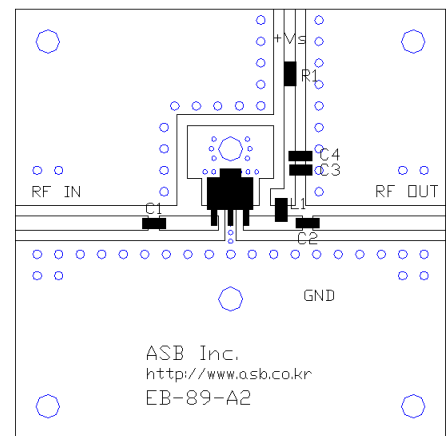
Frequency (MHz)	70	150	300	450	900
Magnitude S21 (dB)	17.0	16.8	16.7	16.5	16.0
Magnitude S11 (dB)	-15	-20	-20	-20	-14.5
Magnitude S22 (dB)	-17.5	-20	-20	-20	-15.5
Output P1dB (dBm)	21	21	21	21	21
Output IP3 ¹⁾ (dBm)	39.0	41.5	42.0	39.0	36.5
Noise Figure (dB)	2.4	2.4	2.6	2.6	2.6
Device Voltage (V)	4.5	4.5	4.5	4.5	4.5
Device Current (mA)	90	90	90	90	90

1) OIP3 is measured with two tones at an output power of +9 dBm/tone separated by 1 MHz.

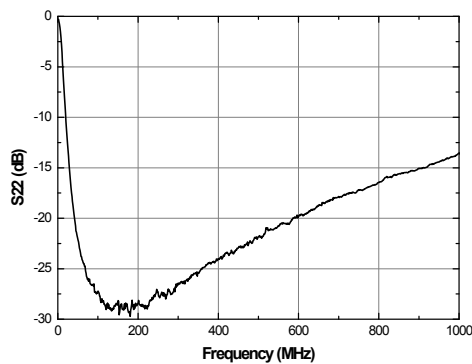
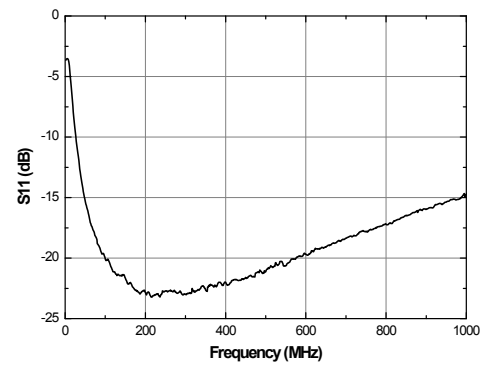
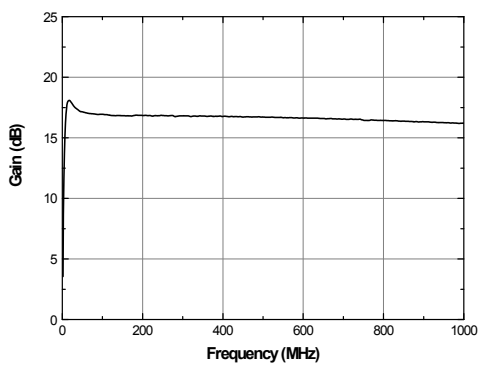
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

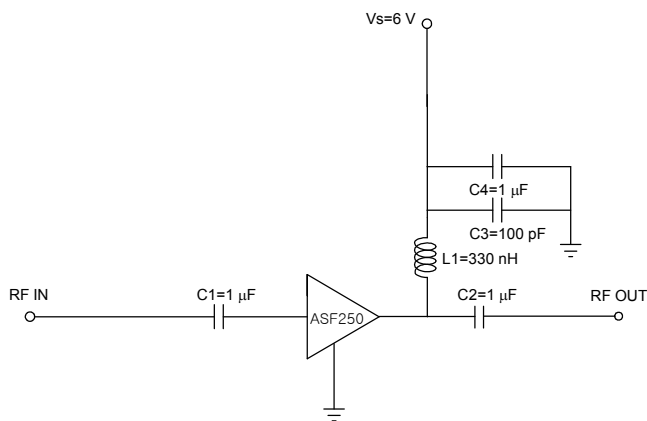
50 ~ 1000

+6 V

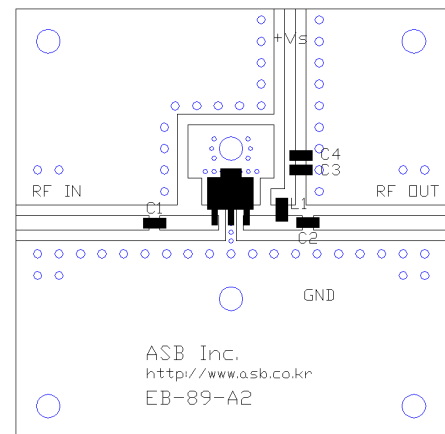
Frequency (MHz)	70	150	300	450	900
Magnitude S21 (dB)	17.5	17.2	17.1	17.0	16.4
Magnitude S11 (dB)	-15	-20	-20	-18	-10
Magnitude S22 (dB)	-17	-20	-18	-15	-10
Output P1dB (dBm)	23.5	24	24	24	24
Output IP3 ¹⁾ (dBm)	39.5	42.5	42.5	40.0	38.0
Noise Figure (dB)	2.6	2.6	2.8	2.8	2.8
Device Voltage (V)	6	6	6	6	6
Device Current (mA)	115	115	115	115	115

1) OIP3 is measured with two tones at an output power of +9dBm/tone separated by 1 MHz.

Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor

