

Features

- 26.3 dB Gain at 150 MHz
- 20.5 dBm P1dB at 150 MHz
- 41 dBm Output IP3 at 150 MHz
- 3.0 dB NF at 150 MHz
- MTTF > 100 Years
- Single Supply

Description

The ASF240, 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. The amplifier is available in an SOT-89 package and passes through the stringent DC, RF, and reliability tests.



ASF240

Package Style: SOT-89

Typical Performance

Parameters	Units	Typical			
Frequency	MHz	70	150	300	450
Gain	dB	26.4	26.3	26	25.6
S11	dB	-14	-15	-15	-15
S22	dB	-10	-11	-10	-9
Output IP3 ¹⁾	dBm	40.5	41	38	34.5
Noise Figure	dB	3.0	3.0	3.1	3.1
Output P1dB	dBm	20	20.5	20.5	20
Current	mA	114	114	114	114
Device Voltage	V	4.9	4.9	4.9	4.9

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

Product Specifications

Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		150	
Gain	dB	25	26.3	
S11	dB	-12	-15	
S22	dB	-9	-11	
Output IP3	dBm	38	41	
Noise Figure	dB		3.0	3.3
Output P1dB	dBm	19.5	20.5	
Current	mA	102	114	125
Device Voltage	V		4.9	

Absolute Maximum Ratings

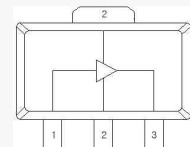
Parameters	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-40 to +150°C
Device Voltage	+5.5 V
Operating Junction Temperature	+150°C
Input RF Power (Continuous)	22 dBm

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

Application Circuit

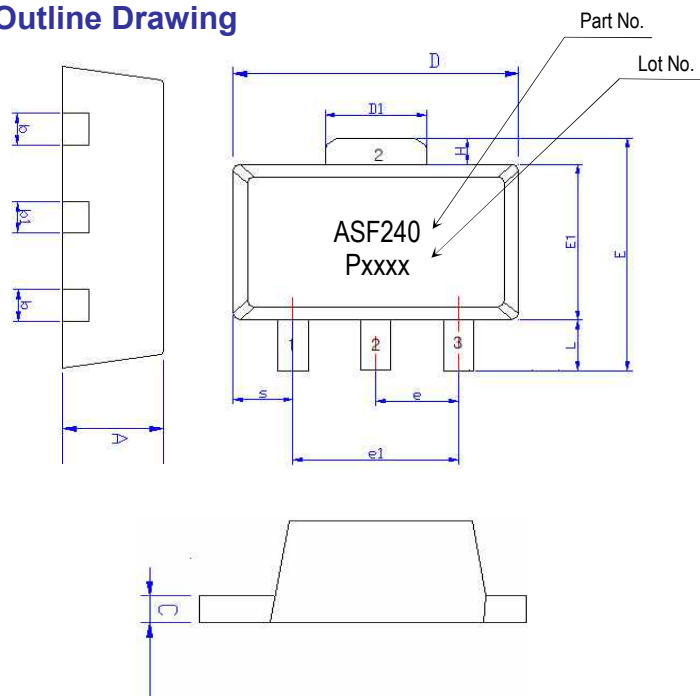
- IF (50 ~ 500MHz)
- IF (5 ~ 30MHz)
- 50 ~ 1000 MHz (75 ohm)
- 5 ~ 200 MHz (75 ohm)

Pin Configuration



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

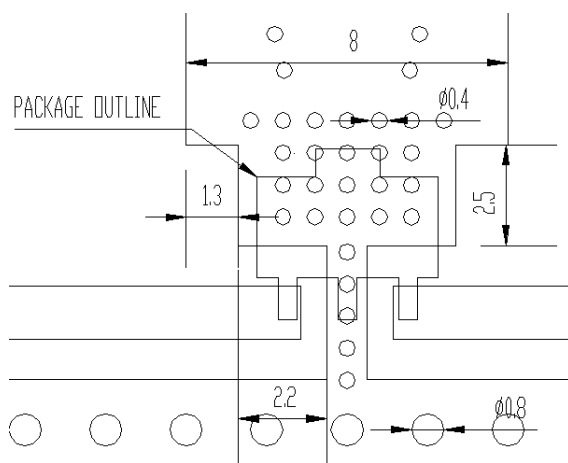
Outline Drawing



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: 500 V~1000 V
MM	Class A
	Voltage Level: <200 V

CAUTION: ESD-sensitive device!

Moisture Sensitivity Level (MSL)

Level 3 at 260°C reflow

APPLICATION CIRCUIT

IF

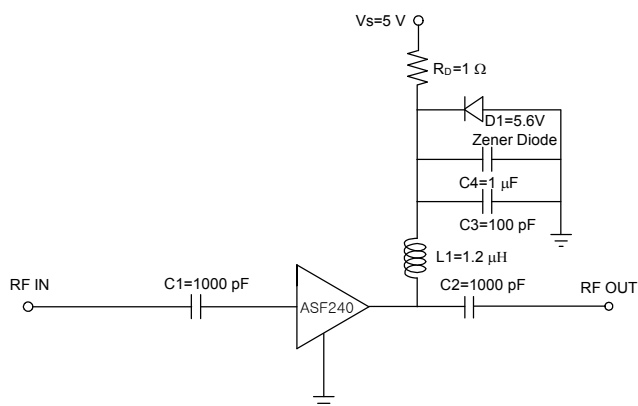
50 ~ 500 MHz

+5 V

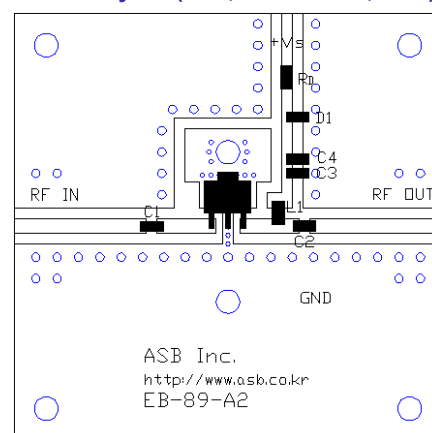
Frequency (MHz)	70	150	300	450
Magnitude S21 (dB)	26.4	26.3	26	25.6
Magnitude S11 (dB)	-14	-15	-15	-15
Magnitude S22 (dB)	-10	-11	-10	-9
Output P1dB (dBm)	20	20.5	20.5	20
Output IP3 ¹⁾ (dBm)	40.5	41	38	34.5
Noise Figure (dB)	3.0	3.0	3.1	3.1
Device Voltage (V)	4.9	4.9	4.9	4.9
Current (mA)	114	114	114	114

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

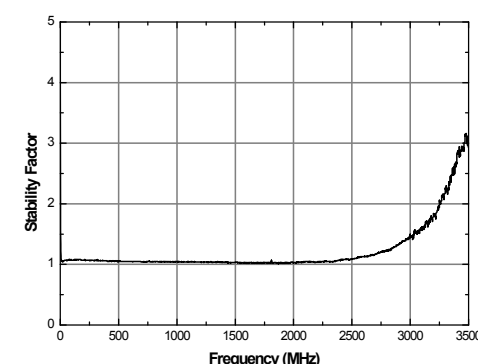
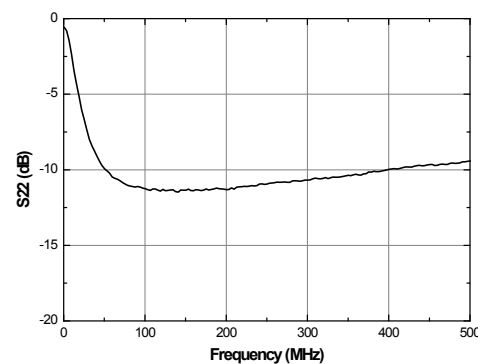
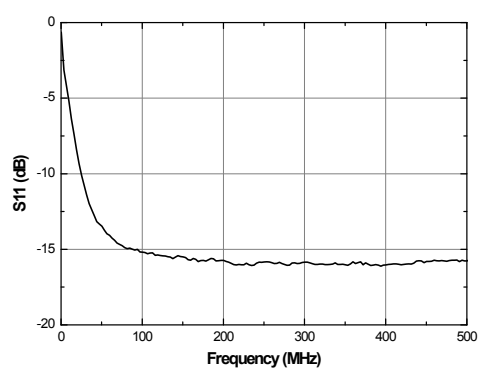
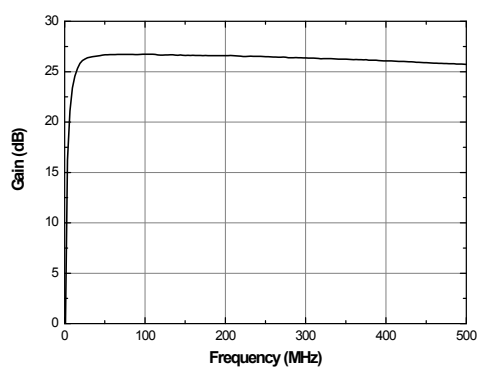
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

IF

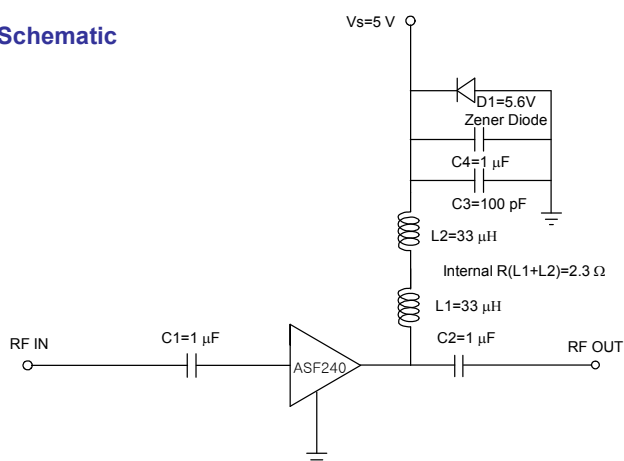
5 ~ 30 MHz

+5 V

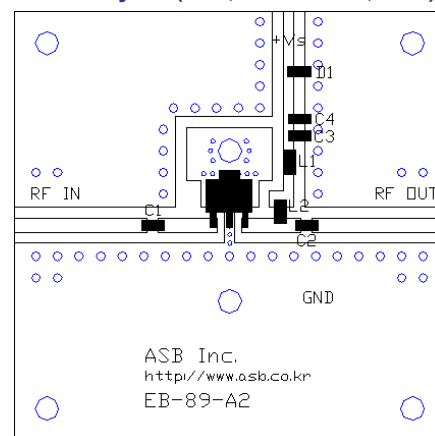
Frequency (MHz)	5	30
Magnitude S21 (dB)	26.5	26.5
Magnitude S11 (dB)	-14	-15
Magnitude S22 (dB)	-8	-9
Output P1dB (dBm)	20	20
Output IP3 ¹⁾ (dBm)	40	40
Noise Figure (dB)	-	3.0
Device Voltage (V)	4.75	4.75
Current (mA)	108	108

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

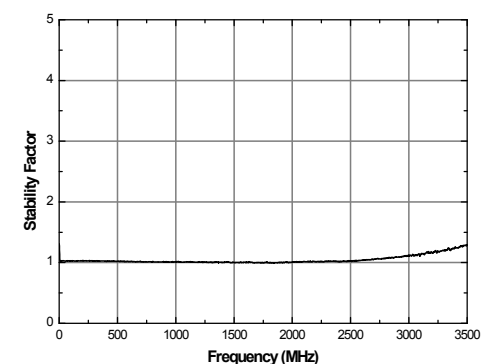
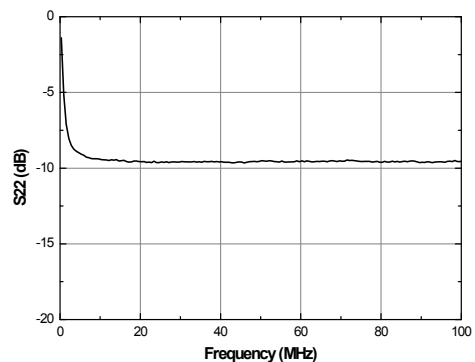
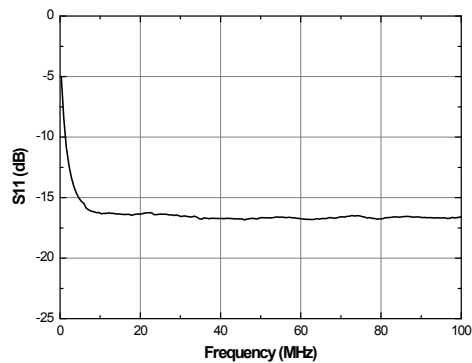
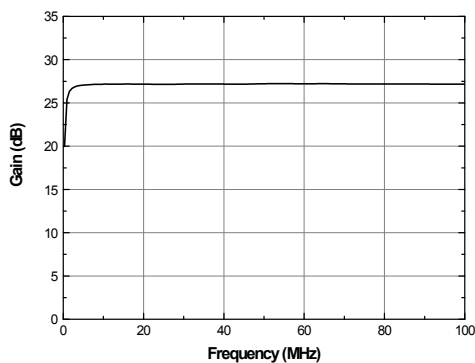
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

CATV (75 Ohm)

50 ~ 1000 MHz

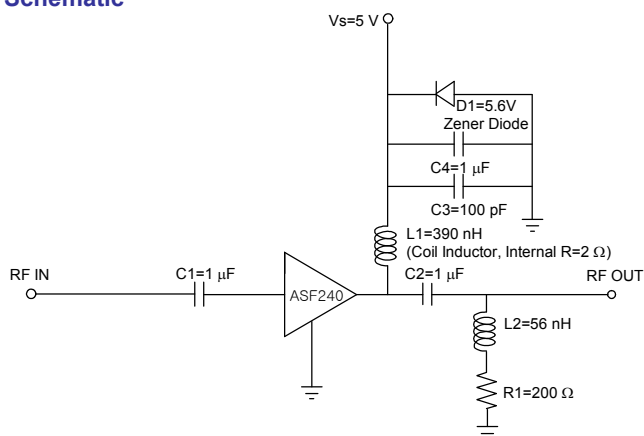
+5 V

Frequency (MHz)	50	500	860
Magnitude S21 (dB)	25.4	25.3	24.2
Magnitude S11 (dB)	-14	-14	-14
Magnitude S22 (dB)	-10	-11	-9
Output P1dB (dBm)	20	19	16.5
Output IP3 ¹⁾ (dBm)	37	32	27.5
Output IP2 ^{1),2)} (dBm)	44	46	36
Noise Figure (dB)	2.8	2.9	3.1
Device Voltage (V)	4.8	4.8	4.8
Current (mA)	107	107	107

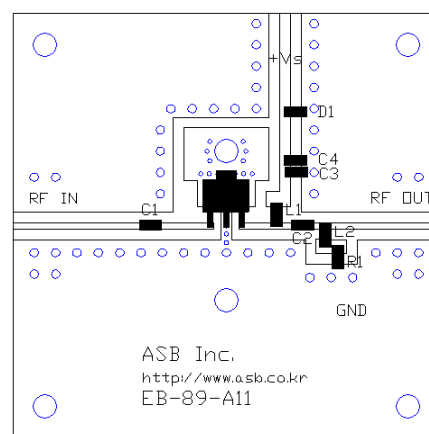
1) OIP3 and OIP2 are measured with two tones at an output power of +5 dBm/tone separated by 6 MHz.

2) OIP2 is measured at F1+F2 Frequency.

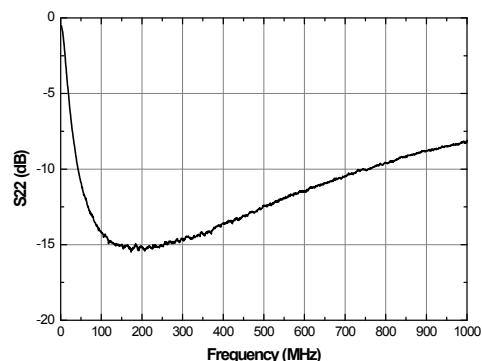
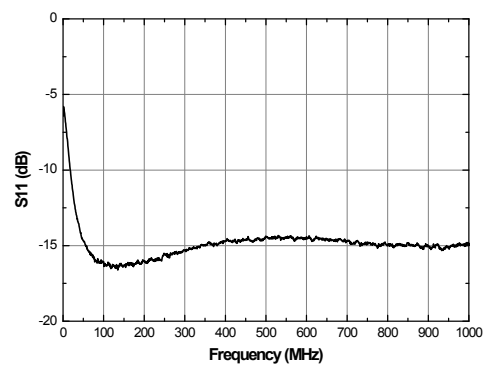
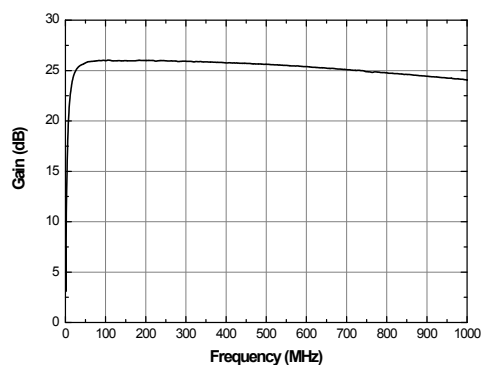
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters



APPLICATION CIRCUIT

CATV (75 Ohm)

5 ~ 200 MHz

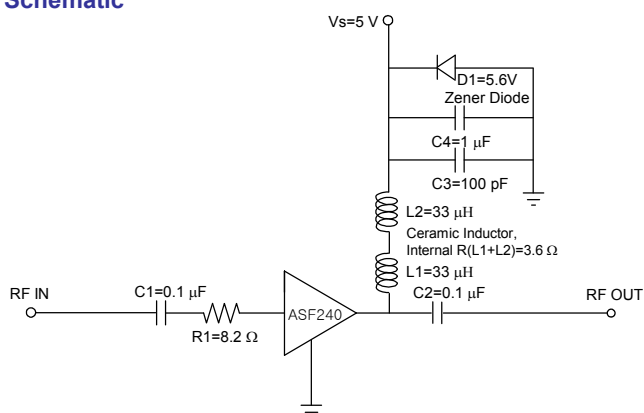
+5 V

Frequency (MHz)	5	50	200
Magnitude S21 (dB)	26.3	26.5	26.3
Magnitude S11 (dB)	-16	-17	-18
Magnitude S22 (dB)	-14	-20	-15
Output P1dB (dBm)	20	20	20
Output IP3 ¹⁾ (dBm)	37	39	39
Output IP2 ^{1),2)} (dBm)	44	47	53
Noise Figure (dB)	3.6	3.4	3.4
Device Voltage (V)	4.65	4.65	4.65
Current (mA)	95	95	95

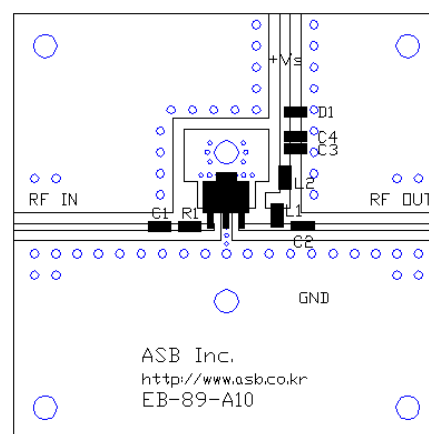
1) OIP3 and OIP2 are measured with two tones at an output power of +5 dBm/tone separated by 1 MHz.

2) OIP2 is measured at F1+F2 Frequency.

Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters

