ASL09C

5 ~ 4000 MHz High Linearity LNA MMIC

Features

- Same circuit over 800~2700 MHz
- 12.8 dB Gain at 1950 MHz
- 19.5 dBm P1dB at 1950 MHz
- 35 dBm Output IP3 at 1950 MHz
- 0.85 dB NF at 1950 MHz
- MTTF > 100 Years
- Single Supply

Description

The ASL09C, a wideband linear low noise amplifier MMIC, has a low noise and high linearity at low bias current, being suitable for use in both receiver and transmitter of telecommunication systems up to 3.5 GHz. S11 down to –18 dB is easily achieved for low noise application to provide a good productivity. The amplifier is available in a SOT89 package and passes through the stringent DC, RF, and reliability tests.

RoHS-compliant

Package Style: SOT89

Typical Performance

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

Parameters	Units	Typical			
Frequency	MHz	800	1950	2400	2700
Gain	dB	19.7	12.8	11.2	10.2
S11	dB	-19	-18	-18	-18
S22	dB	-10.5	-9.5	-11	-11
Output IP3[1)]	dBm	33	35	36	36
Noise Figure	dB	0.8	0.85	1.05	1.1
Output P1dB	dBm	19.5	19.5	19.5	19.5
Current	mA	51			
Device Voltage	V	+4.5			

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

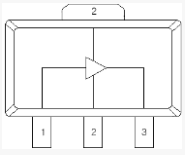
Application Circuit

- 800 ~ 2700 MHz

Product Specifications

Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		1950	
Gain	dB		12.8	
S11	dB		-18	
S22	dB		-9.5	
Output IP3	dBm		35	
Noise Figure	dB		0.85	
Output P1dB	dBm		19.5	
Current	mA		51	
Device Voltage	V		+4.5	

Pin Configuration



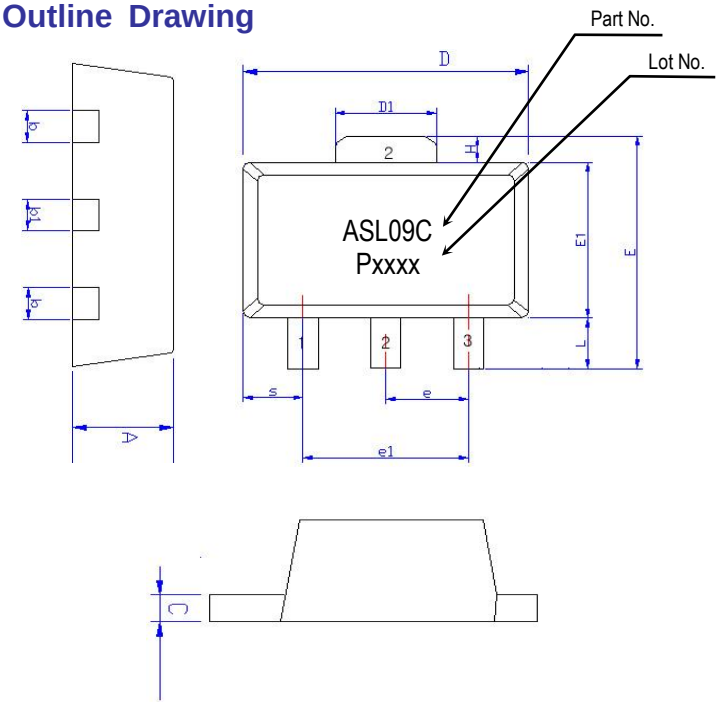
Pin No.	Function
1	RF IN
2	GND
3	RF OUT & Bias

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-40 to +150 °C
Device Voltage	+5.5 V
Operating Junction Temperature	+150 °C
Input RF Power (CW, 50ohm matched as in 1950 MHz application circuit)*	+20 dBm
Thermal Resistance	80 °C/W

* Please find the max. input power data from http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf
The max. input power, in principle, depends upon the application frequency and the matching circuit.

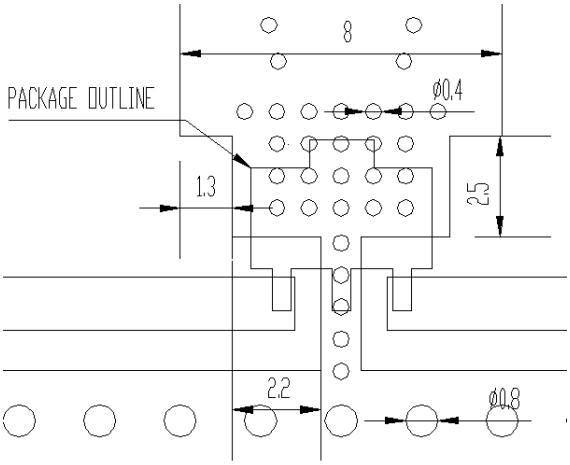
Outline Drawing



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

Wide Band

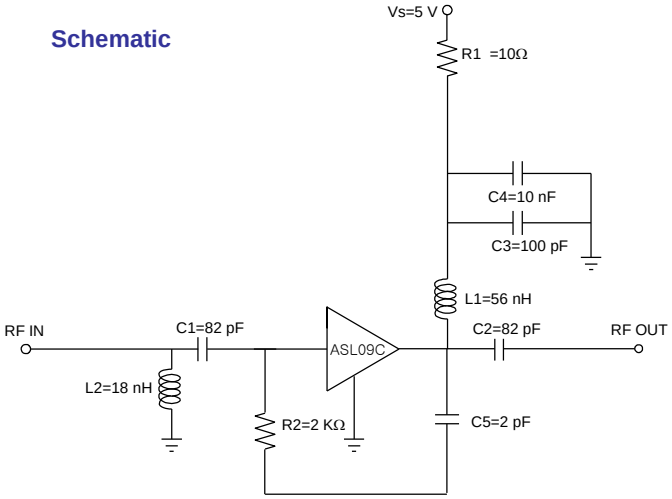
800 ~ 2700 MHz

+5 V

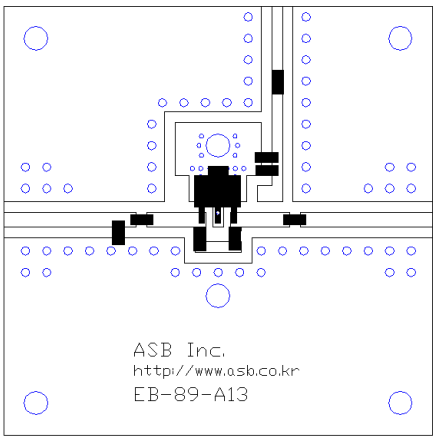
Frequency (MHz)	800	1950	2400	2700
Magnitude S21 (dB)	19.7	12.8	11.2	10.2
Magnitude S11 (dB)	-19	-18	-18	-18
Magnitude S22 (dB)	-10.5	-9.5	-11	-11
Output P1dB (dBm)	19.5	19.5	19.5	19.5
Output IP3[1)] (dBm)	33	35	36	36
Noise Figure (dB)	0.8	0.85	1.05	1.1
Device Voltage (V)	+4.5			
Current (mA)	51			

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

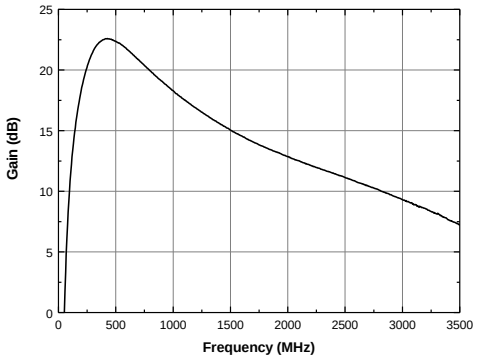
Schematic

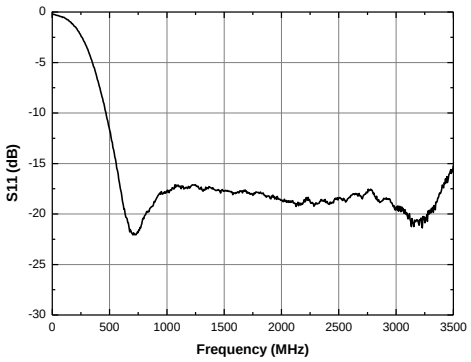


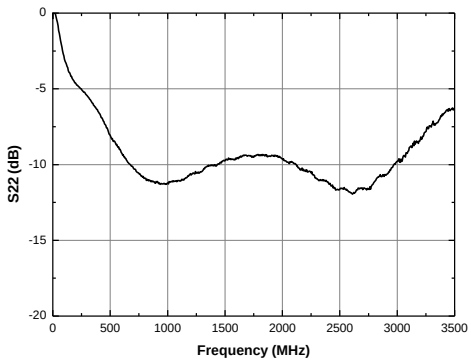
Board Layout (FR4, 40x40 mm², 0.8T)

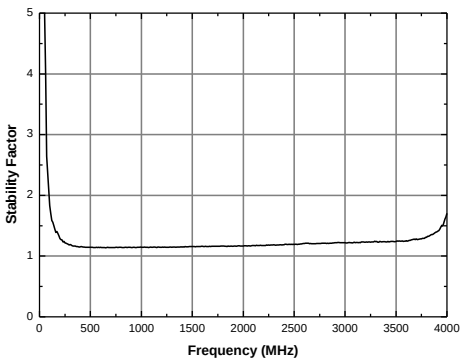


S-parameters & K-factor









Recommended Soldering Reflow Profile