

ASL16C Data Sheet

70 ~ 860 MHz Low Noise Amplifier MMIC

1. Product Overview

1.1 General Description

ASL16C has high linearity and low noise to be suitable for use automotive FM/DAB/DVB/CMMB antenna. The amplifier is available in a SOT89 package and passes through the stringent 100% DC & RF test via an automated test handler.



1.2 Features

- 16.4 dB gain at 470 MHz
- 20.0 dBm P1dB at 470 MHz
- 36.5 dBm OIP3 at 470 MHz
- 1.5 dBm NF at 470 MHz
- MTTF > 100 Years
- Single supply: +5 V

1.3 Applications

- FM antenna
- DAB, DVB antenna
- CMMB antenna

1.4 Package Profile & RoHS Compliance

 <p>SOT89, 4.5x4.0 mm², surface mount</p>	 <p>RoHS-compliant</p>
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2. Summary on Product Performances

2.1 Typical Performance

Supply voltage = +5 V, $T_A = +25\text{ }^\circ\text{C}$, $Z_0 = 50\ \Omega$.

Parameter	Typical			Unit
Frequency	170	470	860	MHz
Gain	16.7	16.4	16.1	dB
S11	-15	-15	-15	dB
S22	-17	-15	-14	dB
Noise Figure	1.5	1.5	1.5	dB
Output IP3 ¹⁾	36.5	36.5	36.5	dBm
Output P1dB	20	20	20	dBm
Current	68			mA
Device Voltage	5			V

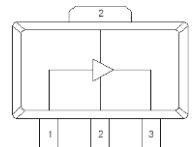
1) OIP3 is measured with two tones at an output power of +4 dBm/tone separated by 1MHz.

2.2 Product Specification

Supply voltage = +5 V, $T_A = +25\text{ }^\circ\text{C}$, $Z_0 = 50\ \Omega$.

Parameter	Min	Typ	Max	Unit
Frequency		470		MHz
Gain		16.4		dB
S11		-15		dB
S22		-15		dB
Noise Figure		1.5		dB
OIP3		36.5		dBm
P1dB		20		dBm
Current		68		mA
Device Voltage		+5		V

2.3 Pin Configuration

Pin	Description	Simplified Outline
1	RF_IN	
2	Ground	
3	RF_OUT & Bias	

2.4 Absolute Maximum Ratings

Parameters	Max. Ratings
Operation Case Temperature	-40 to +105 °C
Storage Temperature	-40 to +150 °C
Device Voltage	+6.5 V
Device Current	90 mA
Power Dissipation	450 mW
Operation Junction Temperature	+150 °C
Input RF Power (At 470 MHz, CW, 50 Ω matched)	TBD

The operation of this device in excess of any of these limits may cause permanent damage.

2.5 Thermal Resistance

Symbol	Description	Typ	Unit
R _{th}	Thermal resistance from junction to lead	55	°C/W

2.6 ESD Classification & Moisture Sensitivity Level

ESD Classification

HBM	TBD
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CAUTION: Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

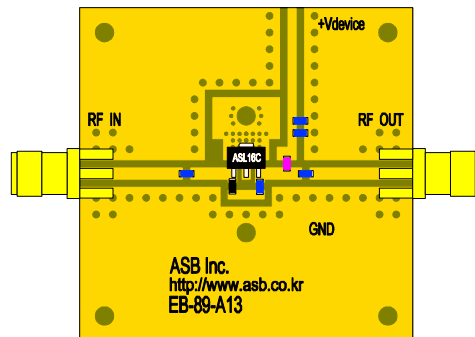
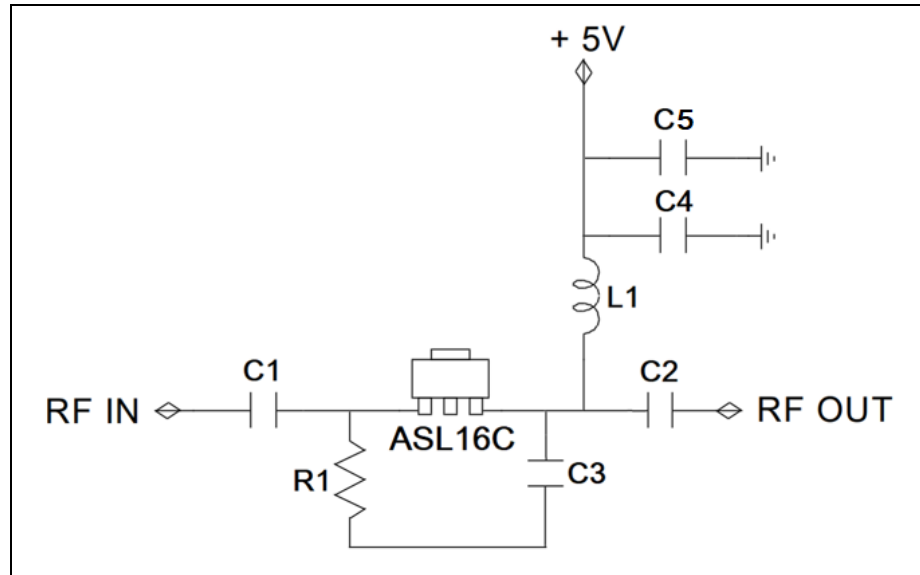
Moisture Sensitivity Level

MSL 3 at 260 °C reflow

(Intentionally Blanked)

3. Application: 170 ~ 860 MHz

3.1 Application Circuit & Evaluation Board



PCB Information	
Material	FR4
Thickness (mm)	0.8
Size (mm)	40x40
EB No.	EB-89-A13

Bill of Material

Symbol	Value	Size	Description	Manufacturer
ASL16C	-	-	MMIC Amplifier	ASB
C1, C2	1 μ F	0603	DC blocking capacitor	Murata
C3	1 μ F	0603	Feedback capacitor	Murata
C4	1 μ F	0603	Decoupling capacitor	Murata
C5	100 pF	0603	Decoupling capacitor	Murata
L1	470 nH	0603	RF choke inductor	Murata
R1	510 Ω	0603	Feedback Resister	Samsung

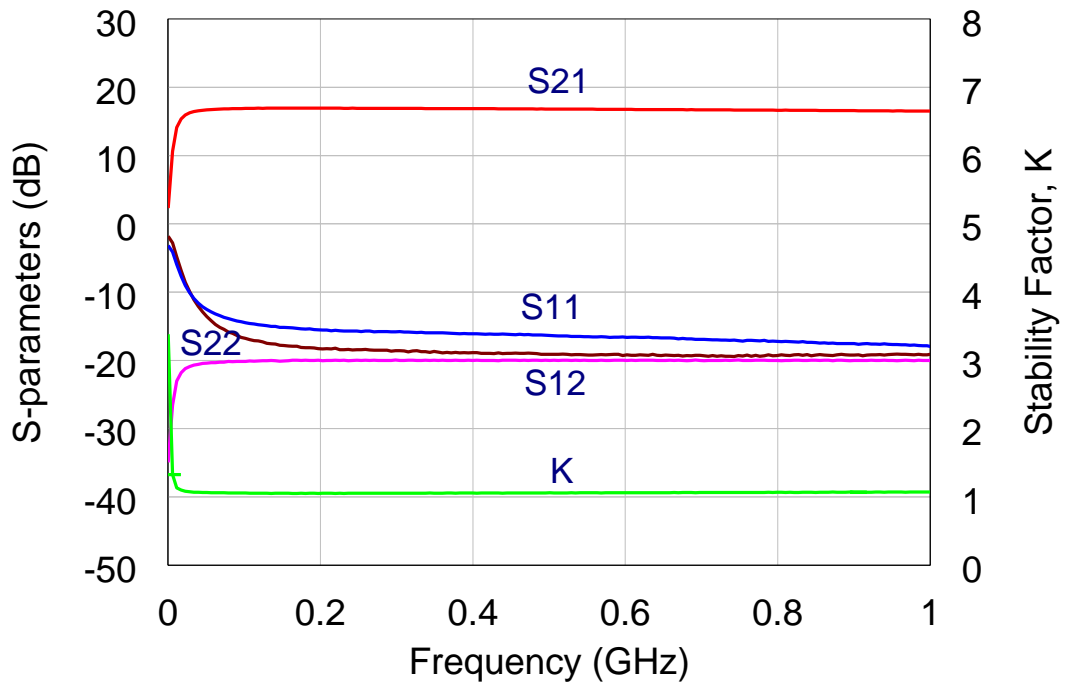
3.2 Performance Table

Supply voltage = +5 V, $T_A = +25\text{ }^\circ\text{C}$, $Z_0 = 50\ \Omega$.

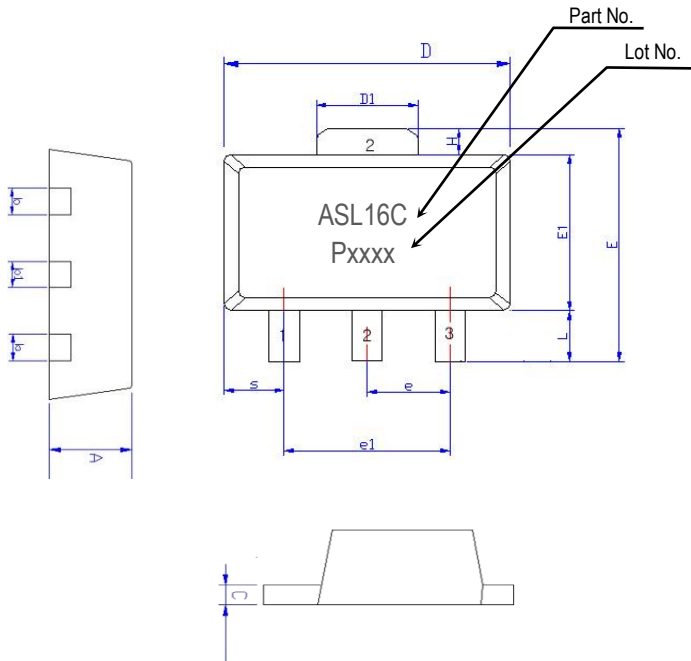
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Current	68			mA
Device Voltage	5			V

1) OIP3 is measured with two tones at an output power of +4 dBm/tone separated by 1MHz.

3.3 Plot of S-parameter & Stability Factor

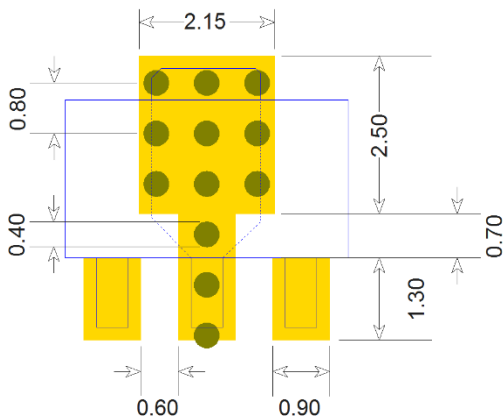


4. Package Outline (SOT89, 4.5x4.0x1.5 mm)



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

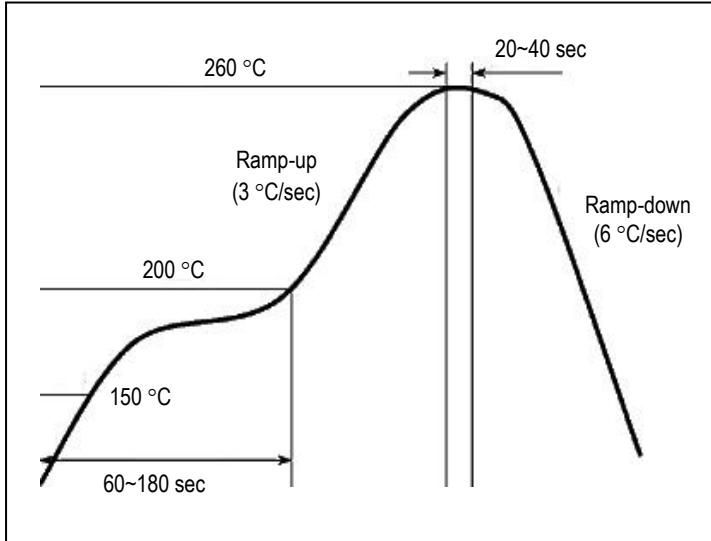
5. Surface Mount Recommendation (In mm)



NOTE

1. The number and size of ground via holes in a circuit board are 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.

6. Recommended Soldering Reflow Profile



(End of Datasheet)

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