

### Features

- High Linearity 44 dBm OIP3
- Low Noise Figure 1.9 dB
- 23 dBm P1dB
- 75 Ohm Input / Output Match
- Bandwidth 50~1000 MHz
- Single Supply 8 V

### Description

The ASL522, a wideband linear two-stage amplifier MMIC, has a high linearity and low noise over a wide range of frequency up to 1 GHz, being suitable for use in the fiber receiver, distribution amplifiers and drop amplifiers of CATV systems, and in the mobile wireless repeaters and BTS. The amplifier is available in an SOIC-8 package and passes through the stringent DC, RF, and reliability tests.



Package Style: SOIC-8

### Typical Performance

Parameters	Units	Typical		
		50	500	860
Frequency	MHz	50	500	860
Noise Figure	dB	2.0	1.9	2.0
Gain	dB	33.9	33.6	30.8
S11	dB	-18	-14	-8
S22	dB	-11	-20	-9
Output P1dB	dBm	22.5	23	23
Output IP3 <sup>1)</sup>	dBm	42.5	44	41
Output IP2 <sup>1),2)</sup> (dBm)	dBm	56	55	63
CSO <sup>3)</sup> (@ 355.25 MHz)	dBc	74		
CTB <sup>3)</sup> (@ 355.25 MHz)	dBc	75		
Current	mA	240		
Device Voltage	V	8		

1) OIP3 and OIP2 are measured with two tones at an output power of +10 dBm/tone separated by 6 MHz.

2) OIP2 is measured at F1+F2 Frequency.

3) CSO & CTB was measured at 335.25 MHz.

For 116 flat channels at the input, measured at the output were 77 analog channels (55 MHz to 550 MHz) @ +20 dBmV per channel and 39 digital channels (550 MHz to 750 MHz) @ 6 dB lower than that of the analog channel.

### Product Specifications

Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		500	
Gain	dB		33.6	
S11	dB		-14	
S22	dB		-20	
Output IP3	dBm		44	
Noise Figure	dB		1.9	
Output P1dB	dBm		23	
Current	mA		240	
Device Voltage	V		8	

### Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-40 to +150°C
Device Voltage	+9 V
Operating Junction Temperature	+160°C
Input RF Power (CW, 75 ohm matched)	-10 dBm
Maximum Current	500 mA
Thermal Resistance	18 °C/W

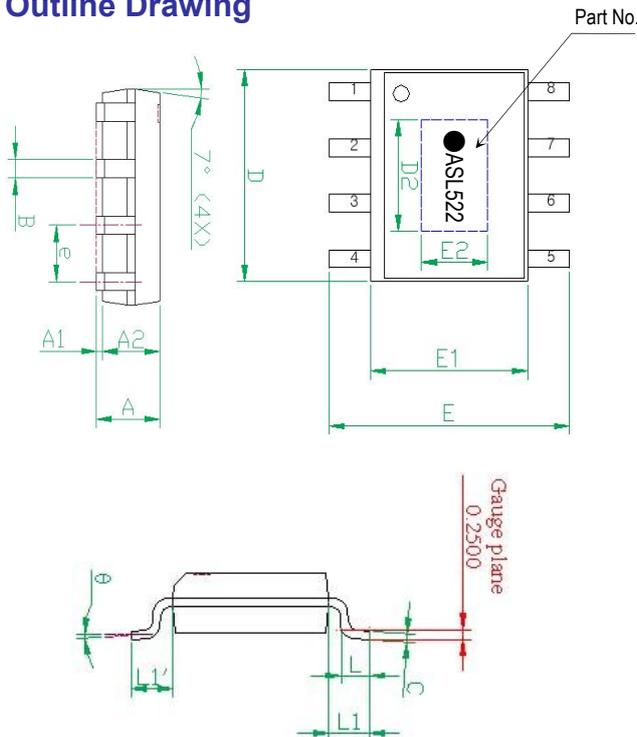
### Application Circuit

- 50 ~ 1000 MHz
- 50 ~ 1000 MHz (High Linearity)
- 50 ~ 1000 MHz ( 6V )

### Pin Configuration

Pin No.	Function
1	1 <sup>st</sup> stage RF OUT
2,3,6,7	NC
4	1 <sup>st</sup> stage RF IN
5	2 <sup>nd</sup> stage RF OUT
8	2 <sup>nd</sup> stage RF IN

### Outline Drawing

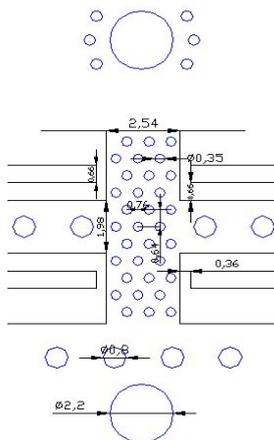


Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	1.40	1.50	1.60
A1	0.00	---	0.10
A2	---	1.45	---
B	0.33	---	0.51
C	0.19	---	0.25
D	4.80	---	5.00
D2	3.20	3.30	3.40
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
E2	2.30	2.40	2.50
e	---	1.27	---
L	0.40	---	1.27
y	---	---	0.10
θ	0°	---	8°
L1-L1'	---	---	0.12
L1	1.04REF		

Pin No.	Function	Pin No.	Function.
1	1 <sup>st</sup> stage RF OUT	5	2 <sup>nd</sup> stage RF OUT
2	NC	6	NC
3	NC	7	NC
4	1 <sup>st</sup> stage RF IN	8	2 <sup>nd</sup> stage RF IN

Note: 1. Backside metal paddle is RF and DC ground.

### Mounting Recommendation (in mm)



- Note:**
1. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
  2. To ensure reliable operation, device ground paddle-to-ground pad soldering is critical.
  3. Add mounting screws near the part to fasten the board to a heat sinker. Ensure that the ground / thermal via region contacts the heat sinker.
  4. A proper heat dissipation path underneath the area of the PCB for the mounted device is strictly required for proper thermal operation. Damage to the device can result from inappropriate heat dissipation.

### ESD Classification

HBM	Class 1B
	Voltage Level: 550 V
MM	Class A
	Voltage Level: 50 V

CAUTION: ESD-sensitive device!

### Moisture Sensitivity Level (MSL)

Level 3 at 260°C reflow

## Wideband Linear Amplifier MMIC

### APPLICATION CIRCUIT

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**CATV**

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**50 ~ 1000 MHz**

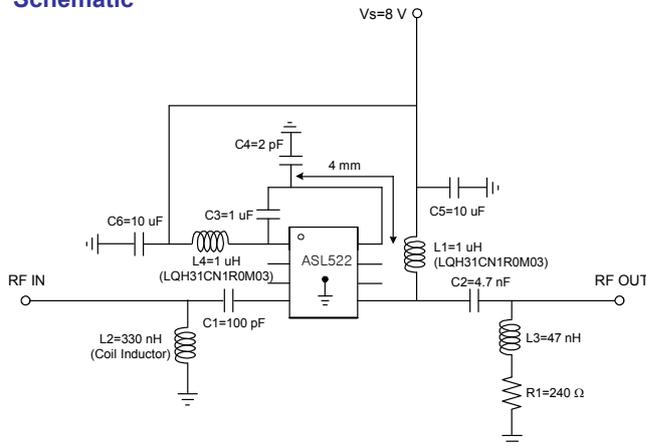
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**+8 V**

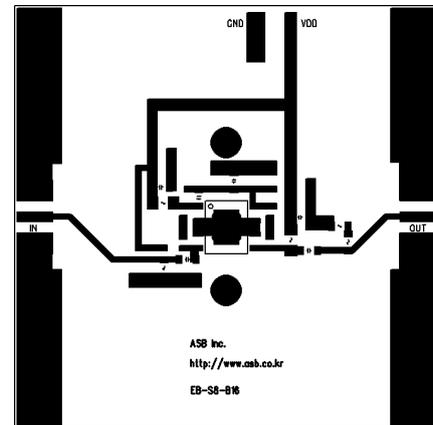
Frequency (MHz)	50	500	860
Noise Figure (dB)	2.0	1.9	2.0
Magnitude S21 (dB)	33.9	33.6	30.8
Magnitude S11 (dB)	-18	-14	-8
Magnitude S22 (dB)	-11	-20	-9
Output P1dB (dBm)	22.5	23	23
Output IP3 <sup>1)</sup> (dBm)	42.5	44	41
Output IP2 <sup>1),2)</sup> (dBm)	56	55	63
CSO <sup>3)</sup> (dBc)	74		
CTB <sup>3)</sup> (dBc)	75		
Device Voltage (V)	8		
Current (mA)	240		

- 1) OIP3 and OIP2 are measured with two tones at an output power of +10 dBm/tone separated by 6 MHz.
- 2) OIP2 is measured at F1+F2 Frequency.
- 3) CSO & CTB was measured at 335.25 MHz. For 116 flat channels at the input, measured at the output were 77 analog channels (55 MHz to 550 MHz) @ +20 dBmV per channel and 39 digital channels (550 MHz to 750 MHz) @ 6 dB lower than that of the analog channel.

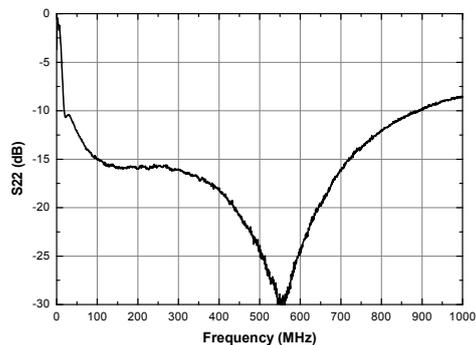
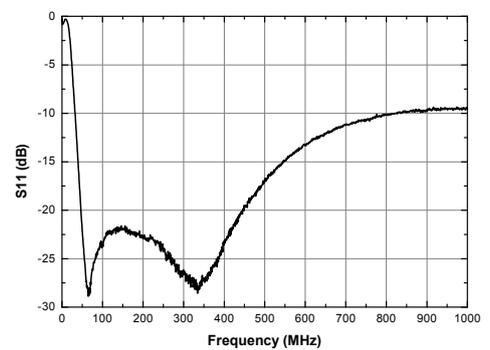
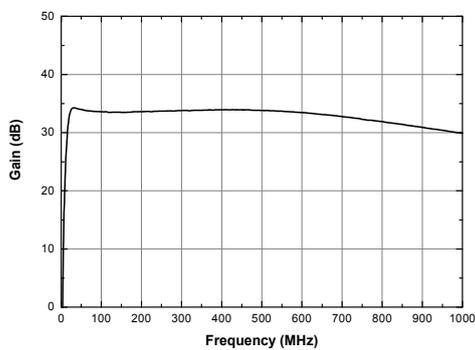
### Schematic



### Board Layout (FR4, 40x40 mm<sup>2</sup>, 0.8T)



### S-parameters



### APPLICATION CIRCUIT

CATV

High Linearity

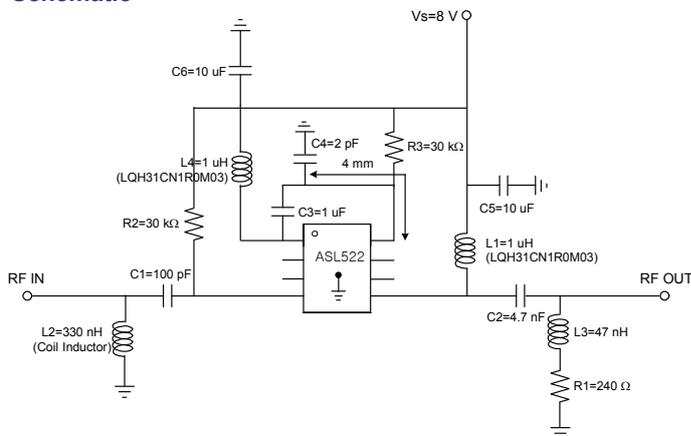
50 ~ 1000 MHz

+8 V

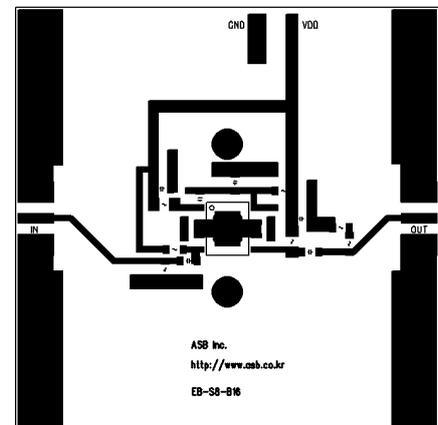
Frequency (MHz)	50	500	860
Noise Figure (dB)	2.0	1.9	2.0
Magnitude S21 (dB)	34.3	34	31.1
Magnitude S11 (dB)	-20	-13	-8
Magnitude S22 (dB)	-11	-20	-9
Output P1dB (dBm)	23.5	23	22.5
Output IP3 <sup>1)</sup> (dBm)	43	45.5	42.5
Output IP2 <sup>1),2)</sup> (dBm)	65	63	64
Device Voltage (V)	8		
Current (mA)	360		

- OIP3 and OIP2 are measured with two tones at an output power of +10 dBm/tone separated by 6 MHz.
- OIP2 is measured at F1+F2 Frequency.
- CSO & CTB was measured at 335.25 MHz. For 116 flat channels at the input, measured at the output were 77 analog channels (55 MHz to 550 MHz) @ +20 dBmV per channel and 39 digital channels (550 MHz to 750 MHz) @ 6 dB lower than that of the analog channel.

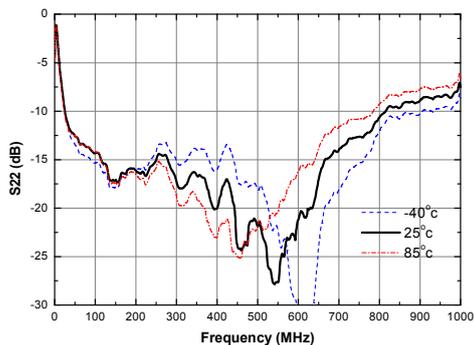
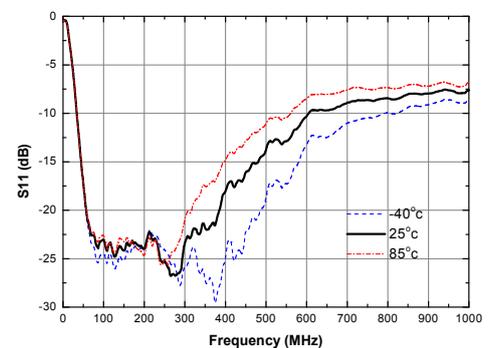
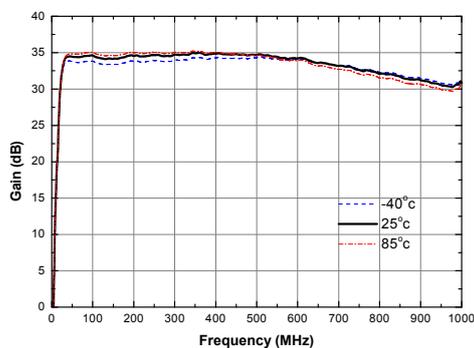
### Schematic



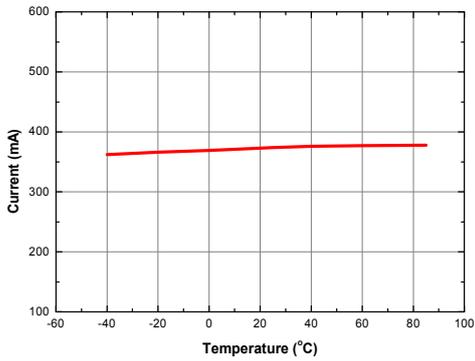
### Board Layout (FR4, 40x40 mm<sup>2</sup>, 0.8T)



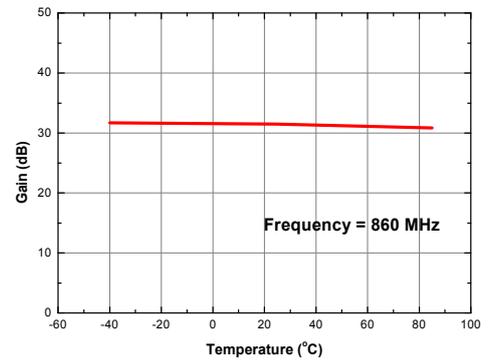
### S-parameters



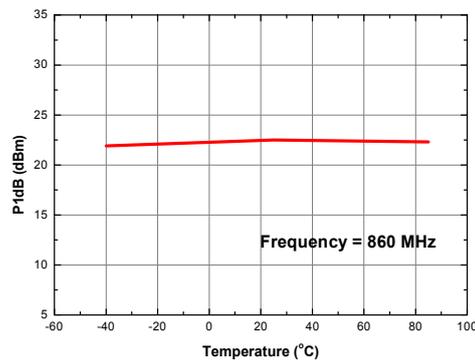
### Current vs. Temperature



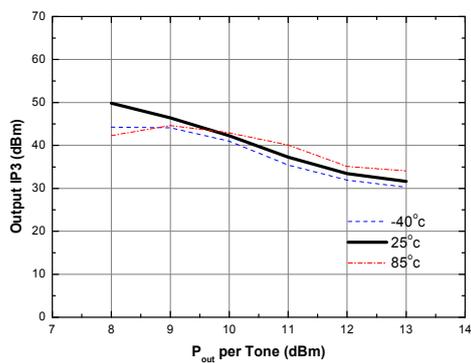
### Gain vs. Temperature



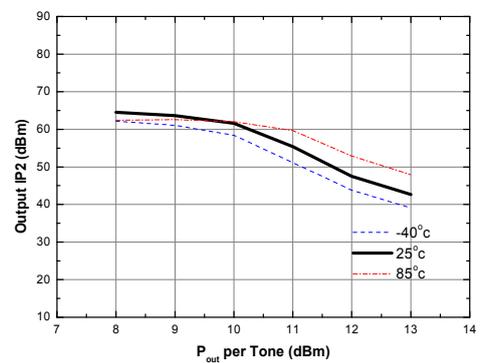
### P1dB vs. Temperature



### Output IP3 vs. Tone Power (Frequency = 860 MHz)



### Output IP2 vs. Tone Power (Frequency = 860 MHz)



## Wideband Linear Amplifier MMIC

### APPLICATION CIRCUIT

CATV

50 ~ 1000 MHz

+6 V

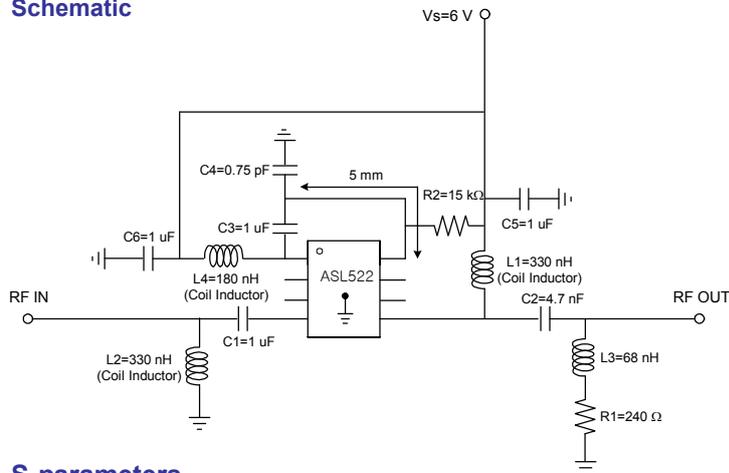
Frequency (MHz)	50	500	860
Noise Figure (dB)	1.9	1.8	1.8
Magnitude S21 (dB)	34.2	34.2	32.8
Magnitude S11 (dB)	-18	-18	-13
Magnitude S22 (dB)	-15	-14	-14
Output P1dB (dBm)	23	22	20
Output IP3 <sup>1)</sup> (dBm)	41	41.5	40.5
Output IP2 <sup>1),2)</sup> (dBm)	58	62	64
CSO <sup>3)</sup> (dBc)	74		
CTB <sup>3)</sup> (dBc)	75		
Device Voltage (V)	6		
Current (mA)	240		

1) OIP3 and OIP2 are measured with two tones at an output power of +7 dBm/tone separated by 6 MHz.

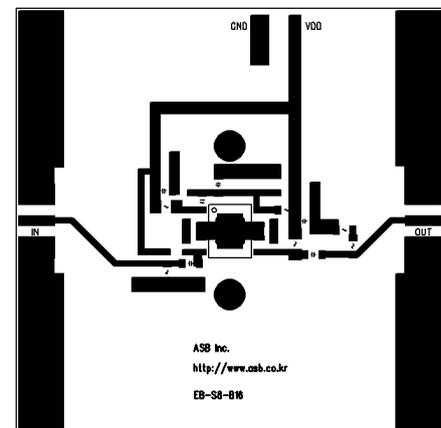
2) OIP2 is measured at F1+F2 Frequency.

3) CSO & CTB was measured at 335.25 MHz. For 116 flat channels at the input, measured at the output were 77 analog channels (55 MHz to 550 MHz) @ +20 dBmV per channel and 39 digital channels (550 MHz to 750 MHz) @ 6 dB lower than that of the analog channel.

### Schematic



### Board Layout (FR4, 40x40 mm<sup>2</sup>, 0.8T)



### S-parameters

