ASW135

5-4000 MHz MMIC Amplifier

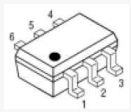
Features

- 16.5 dB Gain at 2000 MHz
- 18.5 dBm P1dB at 2000 MHz
- 29 dBm Output IP3 at 2000 MHz
- 1.8 dB NF at 2000 MHz
- MTTF > 100 Years
- Single Supply

Description

The ASW135, a power 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 4 GHz. The amplifier is available in an SOT-363 package and passes through the stringent DC, RF, and reliability tests.

RoHS-compliant GREEN Package



Package Style: SOT-363

Typical Performance

Parameters	Units	Typical				
Frequency	MHz	150	900	2000	2400	2700
Gain	dB	19.6	18.5	16.5	15.7	15
S11	dB	-10	-14	-14	-15	-16
S22	dB	-15	-15	-15	-14	-13
Output IP3[1)]	dBm	27.5	28.5	29	31	32.5
Noise Figure	dB	1.9	1.8	1.8	1.8	1.9
Output P1dB	dBm	17.5	17.5	18.5	17	17
Current	mA	60	60	60	60	60
Device Voltage (V)	V	3.3	3.3	3.3	3.3	3.3

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

Product Specifications

Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		2000	
Gain	dB		16.5	
S11	dB		-14	
S22	dB		-15	
Output IP3	dBm		29	
Noise Figure	dB		1.8	
Output P1dB	dBm		18.5	
Current	mA		60	
Device Voltage (V)	V		3.3	

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85°C
Storage Temperature	-40 to +150°C
Device Voltage (V)	+4.3 V
Operating Junction Temperature	+150°C
Input RF Power (CW, 50 ohm matched)*	20 dBm

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

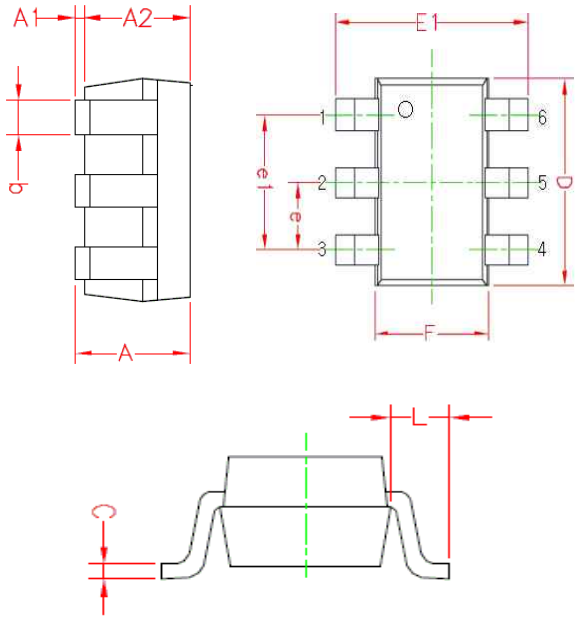
Application Circuit

- 500 ~ 3500 MHz
- IF (50 ~ 450 MHz)

Pin Configuration

Pin No.	Function
1	RF OUT / Bias
4	RF IN
2,3,5,6	GND

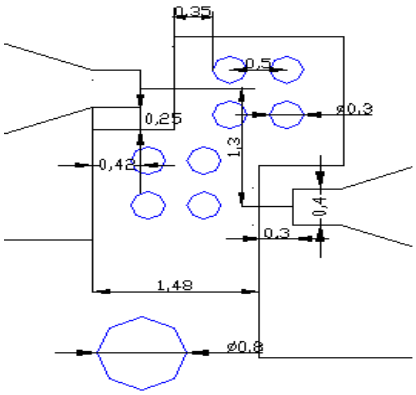
Outline Drawing



Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.025	0.062	0.10
A2	0.875	0.937	1.00
b	0.20	0.30	0.40
C	0.10	0.125	0.15
D	1.90	2.00	2.10
F	1.15	1.25	1.35
E1	2.00	2.10	2.20
e	--	0.65BSC	--
e1	--	1.30BSC	--
L	--	0.425REF	--

Pin NO.	Function	Pin NO.	Function.
1	RF OUT / Bias	4	RF IN
2	GND	5	GND
3	GND	6	GND

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 lead pin 2 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

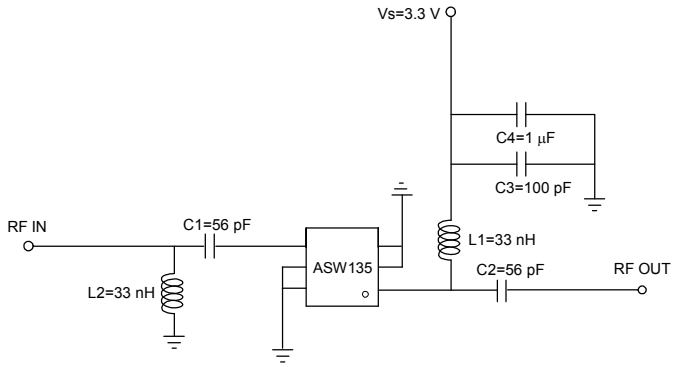
500 ~ 3500 MHz

+3.3 V

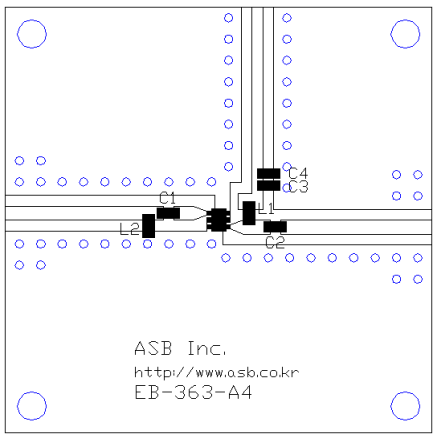
Frequency (MHz)	900	2000	2400	2700
Magnitude S21 (dB)	18.5	16.5	15.7	15
Magnitude S11 (dB)	-14	-14	-15	-16
Magnitude S22 (dB)	-15	-15	-14	-13
Output P1dB (dBm)	17.5	18.5	17	17
Output IP3[1)] (dBm)	28.5	29	31	32.5
Noise Figure (dB)	1.8	1.8	1.8	1.9
Device Voltage (V)	3.3	3.3	3.3	3.3
Current (mA)	60	60	60	60

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

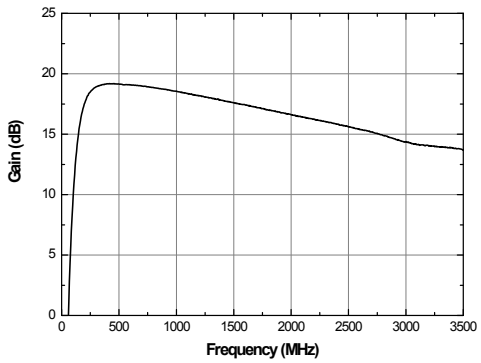
Schematic

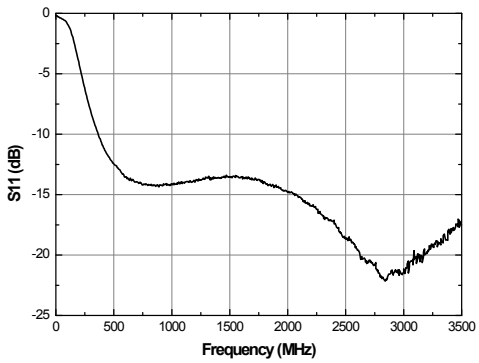


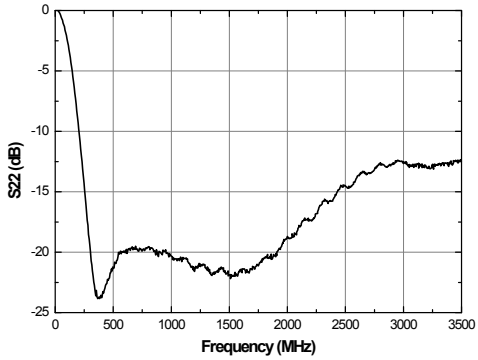
Board Layout (FR4, 40x40 mm^2, 0.8T)

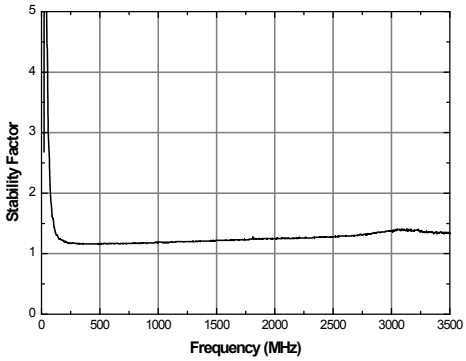


S-parameters & K-factor









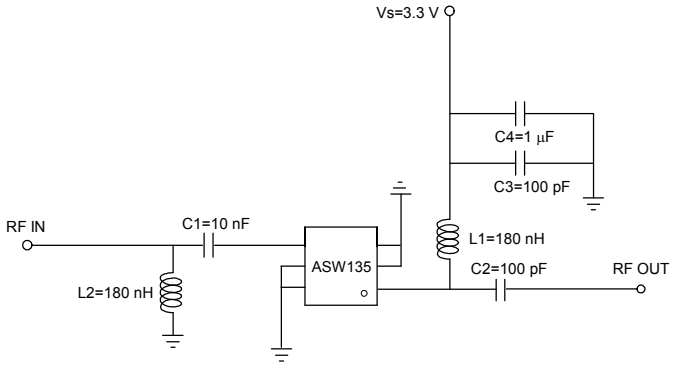
APPLICATION CIRCUIT

IF
50 ~ 450 MHz
+3.3 V

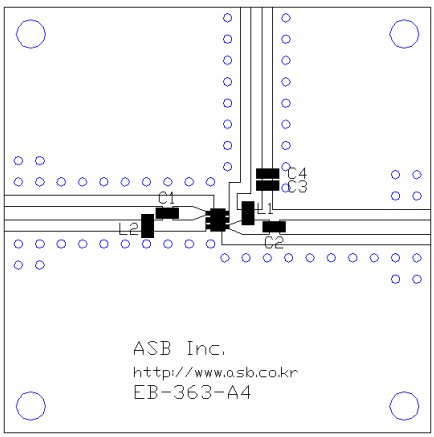
Frequency (MHz)	70	150	300	450
Magnitude S21 (dB)	20.5	19.6	19.2	19
Magnitude S11 (dB)	-6	-10	-12	-12
Magnitude S22 (dB)	-15	-15	-17	-18
Output P1dB (dBm)	17	17.5	17.5	17.5
Output IP3[1)] (dBm)	27.5	27.5	28.5	28.5
Noise Figure (dB)	2.1	1.9	1.8	1.7
Device Voltage (V)	3.3	3.3	3.3	3.3
Current (mA)	60	60	60	60

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

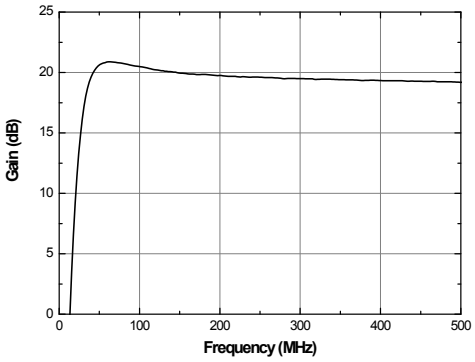
Schematic

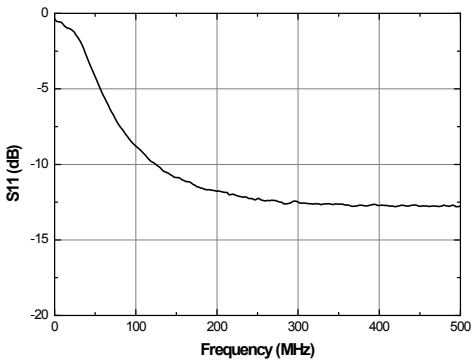


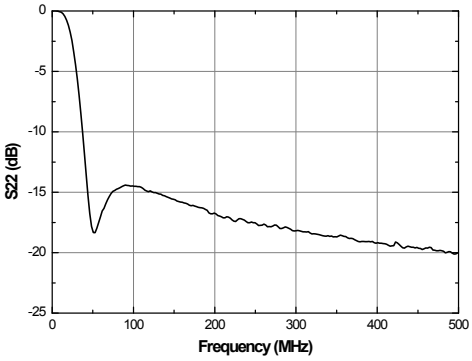
Board Layout (FR4, 40x40 mm^2, 0.8T)

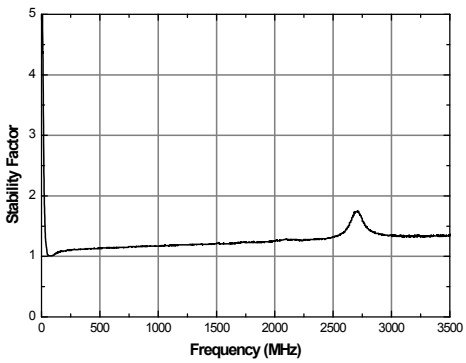


S-parameters & K-factor









APPLICATION CIRCUIT

SMATV

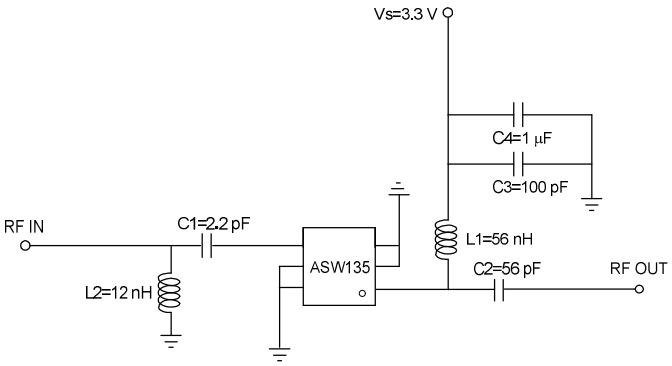
950 ~ 2150 MHz

+3.3 V

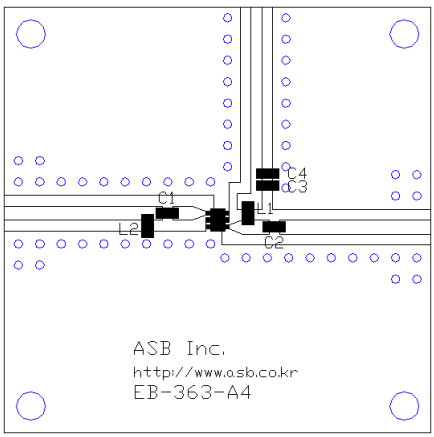
Frequency (MHz)	950	1600	2150
Magnitude S21 (dB)	18	17.3	16
Magnitude S11 (dB)	-8	-13	-17
Magnitude S22 (dB)	-9	-14	-12
Output P1dB (dBm)	16	18	18
Output IP3[1)] (dBm)	32	32	32
Noise Figure (dB)	2.7	2.2	2.4
Device Voltage (V)	3.3	3.3	3.3
Current (mA)	60	60	60

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

Schematic



Board Layout (FR4, 40x40 mm^2, 0.8T)



S-parameters & K-factor

