



## AWS5504-S14

GaAs IC High Power Positive Control  
SPDT Reflective Switch DC-2.0 GHz

Advanced Product Information  
Rev. 1

### FEATURES

- High Linearity (IP3 55 dBm @ 0.9 GHz)
- Low Insertion Loss (0.35 dB @ 0.9 GHz)
- +3 V to +5 V Operation
- Low DC Power Consumption
- Ultra Miniature SOT-6 Package

### DESCRIPTION

The AWS5504 is a Single Pole Double Throw (SPDT) GaAs MMIC switch assembled in a SOT-6 plastic package. The AWS5504 is designed for analog and digital applications that require low insertion loss, high linearity, and small size. The switch can be controlled with positive, negative, or a combination of both voltages.

**Typical applications include:** transmit/receive switch, diversity switching, and antenna selection.



S14  
SOT-6  
6 Pin Plastic Package

### ELECTRICAL SPECIFICATIONS AT 25 °C (0, +5V)

Parameter <sup>1</sup>	Frequency <sup>2</sup>	Min	Typ	Max	Unit
Insertion Loss <sup>3</sup>	DC - 0.5 GHz		0.3	0.4	dB
	DC - 1.0 GHz	-	0.4	0.6	
	DC - 2.0 GHz		1.0	1.2	
Isolation	DC - 0.5 GHz	20	23		dB
	DC - 1.0 GHz	15	17	-	
	DC - 2.0 GHz	8	10		
VSWR <sup>4</sup>	DC - 1.0 GHz	-	1.3:1	1.4:1	dB
	DC - 2.0 GHz		1.3:1	1.8:1	

### OPERATING CHARACTERISTICS AT 25 °C (0, +5V)

Parameter	Condition	Frequency	Min	Typ	Max	Unit
Switching Characteristics <sup>5</sup>	Rise, Fall (10/90% or 90/10% RF)			60		ns
	On, Off (50% CTL to 90%/10% RF)	-	-	100	-	ns
	Video Feedthru			50		mV
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	0.9 GHz	-	+55	-	dBm
Input Power for 1dB Compression		0.9 GHz	-	+38	-	dBm
Control Voltage	$V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \text{ uA Max}$ $V_{HIGH} = +3 \text{ V @ } 100 \text{ uA Max to } +5 \text{ V @ } 200 \text{ uA Max}$ $V_S = V_{HIGH} \pm 0.2V$					

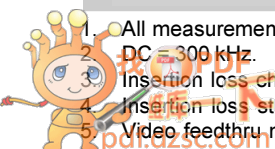
1. All measurements made in a 50 ohm system, unless other specified.

2. DC = 300 kHz.

3. Insertion loss changes by 0.003 dB/°C.

4. Insertion loss state.

5. Video feedthru measured with 1 ns rise time pulse and 500 MHz bandwidth.



## ABSOLUTE MAXIMUM RATINGS

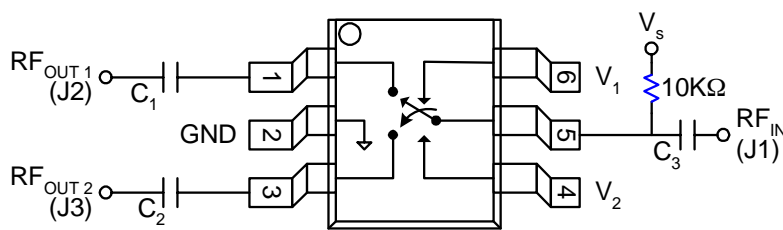
Characteristics	Value
RF Input Power	6 W Max > 900 MHz, 0/-5 V Control
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40° C to +85°C
Storage Temperature	-65°C to +150°C
$\theta_{jc}$	25° C/W

## TRUTH TABLE

$V_1$	$V_2$	$J_1 - J_2$	$J_1 - J_3$
0	$V_{High}$	Isolation	Insertion Loss
$V_{High}$	0	Insertion Loss	Isolation

$V_{High} = +3$  to  $+5$  V ( $V_S = V_{High} \pm 0.2$  V)

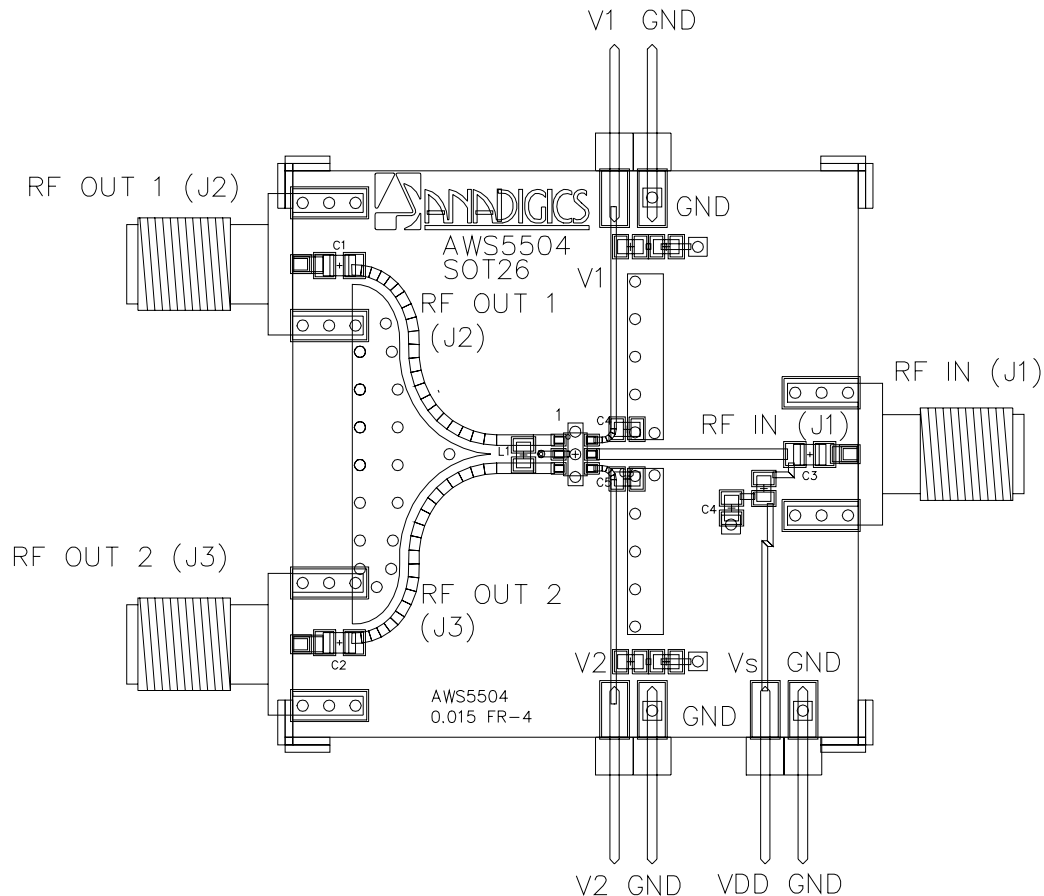
## PIN OUT



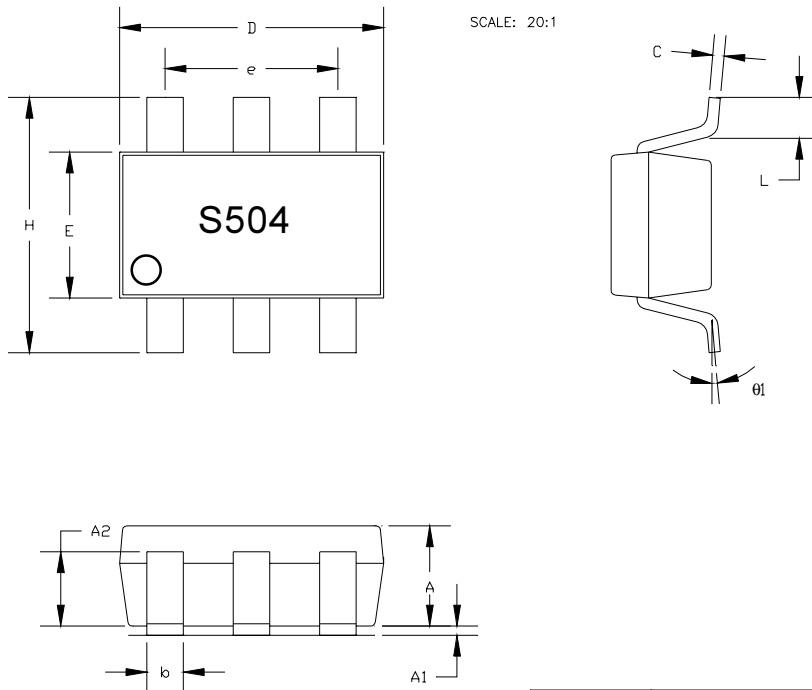
DC block capacitors  $C_{1,2,3}$  must be supplied externally.  
 $C_{1,2,3} = 100$  pF for operation >500 MHz

Pin	Function	Description
1	RF <sub>OUT1</sub> (J2)	RF port can be used as an input or as an output.
2	GND	Ground connection. Keep as short as possible.
3	RF <sub>OUT2</sub> (J3)	RF port can be used as an input or an output.
4	V2	Control Voltage 2, Low 0V, High 3V to 5V
5	RF <sub>N</sub> (J1)/V <sub>S</sub>	RF common port and bias voltage for positive control (3V to 5V).
6	V1	Control Voltage 1, Low 0V, High 3V to 5V

## TEST CIRCUIT LAYOUT



## PACKAGE OUTLINE DRAWING



### NOTES:

1. Package body sizes exclude mold flash and gate burrs.
2. Dimension L is measured in gage plane
3. Coplanarity: 0.1000 mm
4. Tolerance  $\pm 0.1000$  mm (4 mil) unless otherwise specified.

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.00	1.10	1.30	0.039	0.043	0.051
A1	0.00	—	0.10	0.00	—	0.004
A2	0.70	0.80	0.90	0.027	0.031	0.035
b	0.35	0.40	0.50	0.014	0.016	0.020
C	0.10	0.15	0.25	0.004	0.006	0.010
D	2.70	2.90	3.10	0.106	0.114	0.122
E	1.40	1.60	1.80	0.055	0.063	0.071
e	1.90(TYP)			0.075(TYP)		
H	2.60	2.80	3.00	0.102	0.110	0.118
L	0.37	—	—	0.015	—	—
$\theta 1$	1°	5°	9°	1°	5°	9°

## ANADIGICS, Inc.

35 Technology Drive

Warren, New Jersey 07059

Tel: (908) 668-5000 / Fax: (908) 668-5132

Email: [Mktg@anadigics.com](mailto:Mktg@anadigics.com)

[www.anadigics.com](http://www.anadigics.com)

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