

**FEATURES**

- **Low Insertion Loss (0.4 dB @ 0.9 GHz)**
- **Complementary Positive Control Voltages (0/+3V to 0/+5V)**
- **Positive Voltage Supply (+3 to +5 V)**
- **Low DC Power Consumption**
- **Ultra Miniature 6 Lead SOT-6 Package**

**DESCRIPTION**

The AWS5502 is a Single Pole Double Throw GaAs MMIC Switch assembled in a SOT-6 plastic package. The AWS5502 is designed for analog and digital application that require low insertion loss, small size, and low cost. State selection is achieved with a complimentary positive voltage (requires positive bias  $V_s$ , and blocking caps) or negative voltage (no  $V_s$  or blocking caps required).

**Typical applications include:** selection of synthesizers, filters, amplifiers in dual mode and dual band handsets.



**S14**  
**SOT-6**  
**6 Pin Plastic Package**

**ELECTRICAL SPECIFICATIONS AT 25 °C (0, +3V)**

Parameter <sup>1</sup>	Frequency <sup>2</sup>	Min	Typ	Max	Unit
Insertion Loss <sup>3</sup>	DC - 0.5 GHz	-	0.4	0.5	dB
	DC - 1.0 GHz		0.45	0.6	
	DC - 2.0 GHz		0.6	0.8	
	DC - 2.5 GHz		0.9	1.1	
Isolation	DC - 0.5 GHz	22	25	-	dB
	DC - 1.0 GHz	17	20		
	DC - 2.0 GHz	11	14		
	DC - 2.5 GHz	10	13		
VSWR <sup>4</sup>	DC - 1.0 GHz	-	1.2:1	1.3:1	-
	DC - 2.5 GHz		1.5:1	1.7:1	

**OPERATING CHARACTERISTICS AT 25 °C (0, +3V)**

Parameter	Condition	Frequency	Min	Typ	Max	Unit
Switching Characteristics <sup>5</sup>	Rise, Fall (10/90% or 90/10% RF)	-	-	10	-	ns
	ON, Off (50% CTL to 90%/10% RF)			20		ns
	Video Feedthru			25		mV
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	0.5 - 2.0 GHz	-	+45	-	dBm
Input Power for 1dB Compression	@ +3V	0.5 - 2.0 GHz	-	+21	-	dBm
	@ +5V	0.5 - 2.0 GHz		+28		
Control Voltage	$V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \text{ uA Max}$ $V_{HIGH} = +3 \text{ V @ } 100 \text{ uA Max to } +5 \text{ V @ } 200 \text{ uA Max}$ $V_s = V_{HIGH} \pm 0.2\text{V}$					

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

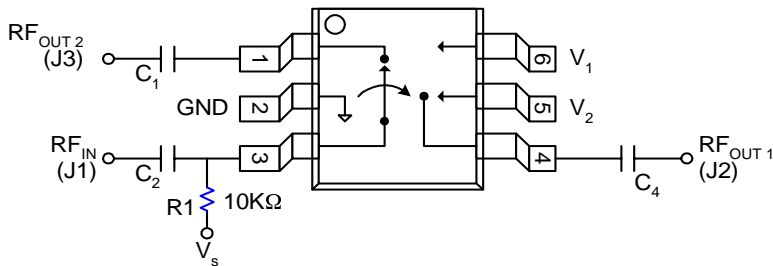
Characteristics	Value
RF Input Power	2 W > 500 MHz, 0/+7 V Control
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40° C to +125° C
Storage Temperature	-50° C to +150° C
$\theta_{JC}$	25° C/W

## TRUTH TABLE Positive Operation

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

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

## PIN OUT

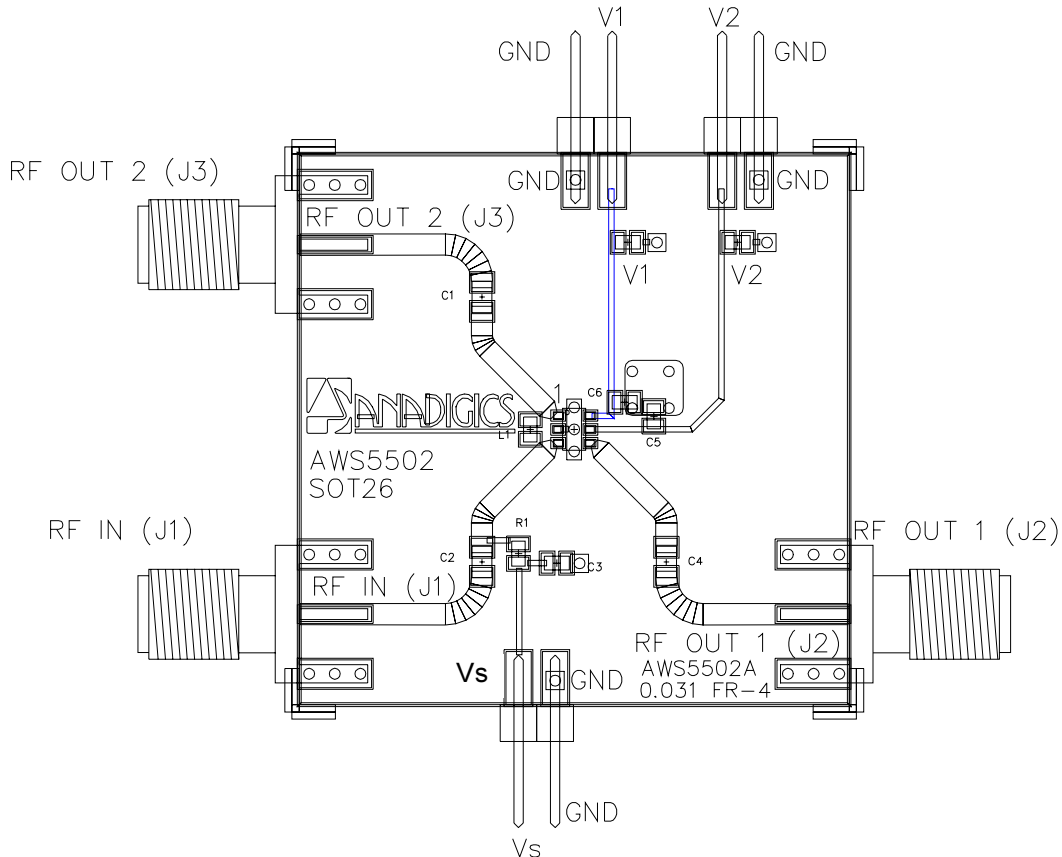


DC blocking capacitors ( $C_{1,2,4}$ ) and biasing resistor must be supplied externally for positive voltage operation.

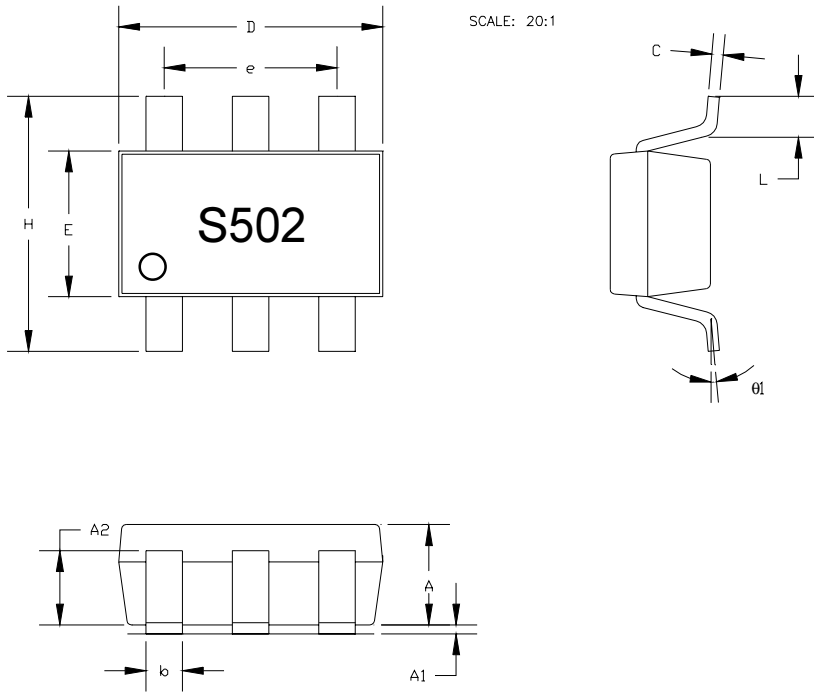
$C_{1,2,4} = 100 \text{ pF}$  for operation >500 MHz.

Pin	Function	Description
1	RFOUT (J2)	RF port (can be used as an input or as an output)
2	GND	Ground connection (keep as short as possible)
3	RFIN (J1)/ $V_S$	RF common port and bias voltage for positive control (3V to 5V)
4	RFOUT 1 (J2)	RF port (can be used as an input or as an output)
5	V2	Control voltage 2 (low 0V, high 3V to 5V)
6	V1	Control voltage 1 (low 0V, high 3V to 5V)

## TEST CIRCUIT LAYOUT



**PACKAGE OUTLINE DRAWING**



SCALE: 20:1

**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°

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