# ANADIGICS

# FEATURE

- High Linearity (IP3 48 dBm @ 0.9 GHz)
- Low Insertion Loss (0.4 dB @ 0.9 GHz)
- 2.75 V to -3.5 to +2.75 operation
- Low DC Power Consumption
- Ultra Miniature SOT-26 Package
- High Isolation

# AWS5504

GaAs IC Negative Control SPDT Reflective Switch DC-2.0 GHz Data Sheet - Rev 2.1



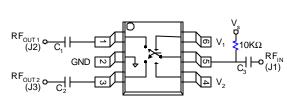
# APPLICATION

- Transmit/receive switch
- Diversity switching
- Antenna selection

# 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.

### **Table 1: Pin Description**



DC block capacitors  $C_{1, 2, 3}$  must be supplied externally.

 $C_{1,2,3} = 100 \text{ pF}$  for operation >500 MHz Figure 1: Pin Out Diagram

PIN	NAME	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 ouput.	
4	V2	Control Voltage 2, Low 0V, High 3V to 5V	
5	RF <sub>ℕ</sub> (J1)/Vs	RF common port and bias voltage for positive control (3V to 5V).	
6	V1	Control Voltage 1, Low 0V , High 3V to 5V	

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# AWS5504 **ELECTRICAL CHARACTERISTICS**

PARAMETER	MIN	MAX	UNIT
RF Input Power > 900 MHz, 0/-5 V Control	-	6	W
Control Voltage	-0.2	+8	V
Operating Temperature	-40	+85	°C
Storage Temperature	-65	+150	°C
ο <sub>JC</sub>	-	25	°C/W

### **Table 2: Absolute Maximum Ratings**

Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability.

PARAMETER	CONDITION	FREQUENCY	MIN	ТҮР	МАХ	UNIT
Switching Characteritics <sup>5</sup>	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90%/10% RF) Video Feedthru	-	-	60 100 50	-	ns ns 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	$V_{LOW} = 0 \text{ to } 0.2 \text{ V} @ 20 \text{ uA Max}$ $V_{HIGH} = +3 \text{ V} @ 100 \text{ uA Max to +5 V} (V_{S} = V_{HIGH} \pm 0.2 \text{ V}$	@ 200 uA Max				

# Table 3: Operating Ranges at 25° C (0, +5V)

The device may be operated safely over these conditions; however, parametric performance is guaranteed only over the conditions defined in the electrical specifications.

Notes:

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.

Insertion loss state.
Video feedthru measured with 1 ns rise time pulse and 500 MHz bandwidth.

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PARAMETER <sup>1</sup>	FREQUENCY <sup>2</sup>	MIN	TYP	MAX	UNIT
Insertion Loss <sup>3</sup>	DC - 0.5 GHz DC - 1.0 GHz DC - 2.0 GHz	- - -	0.3 0.4 1.0	0.4 0.6 1.2	dB
Isolation	DC - 0.5 GHz DC - 1.0 GHz DC - 2.0 GHz	20 15 8	23 17 10	- - -	dB
VSWR <sup>4</sup>	DC - 1.0 GHz DC - 2.0 GHz	-	1.3:1 1.3:1	1.4:1 1.8:1	dB

### Table 4: Electrical Specifications at 25 °C (0, +5V)

Notes:

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

2. DC= 300 kHz

3. Insertion loss changes by 0.003 dB/ $^{\circ}$ C.

Insertion loss state.
Video feedthru measured with 1 nx rise time pulse and 500 MHz bandwidth.

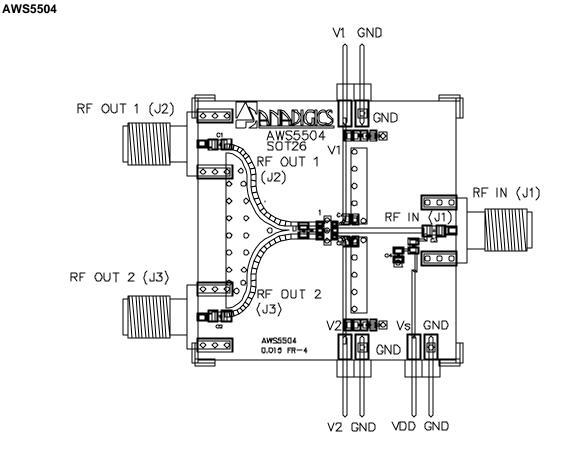
# Table 5: Truth Table

V <sub>1</sub>	V <sub>2</sub>	J <sub>1</sub> - J <sub>2</sub>	J <sub>1</sub> - J <sub>3</sub>	
0	$V_{High}$	Isolation	Insertion Loss	
V <sub>High</sub>	0	Insertion Loss	Isolation	

 $V_{High}$  = +3 to +5 V (V<sub>s</sub> = Vhigh <u>+</u> 0.2 V)

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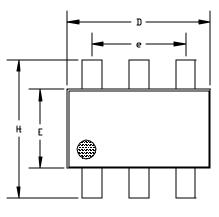


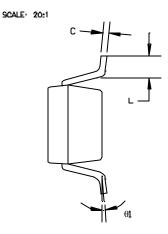
# Figure 2: Test Circuit Schematic

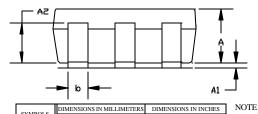
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# PACKAGE OUTLINE







MAX

1.30

0.10

0.90

0.50

0.25

3.10

3.00

9°

MIN MAX

0.055 0.071 0.075(TYP)

0.051

0.004

0.035

0.020

0.010

0.122

0.118

9°

0.039

0.00

0.027

0.014

0.004

0.106

0.102

0.015

1°

NOIL
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 ±0.1000 mm(4 mil) UNLESS

- OTHERWISE SPECIFIED

### NOTES:

1. Package body sizes exclude mold flash and gate burrs.

MIN

1.00

0.00

0.70

0.35

0.10

2.70

2.60 0.37

1°

1.40 1.80 1.90(TYP)

2. Dimension L is measured in gage plane

SYMBOLS

A

A1

A2 b

C D

Е e H

L θ1

- 3. Coplanarity: 0.1000 mm
- 4. Tolerance + 0.1000 mm (4 mil) unless otherwise specified.

### Figure 3: Package Outline

	A DIR	DIZ	300
100	AN	ALAC	

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AWS5504 NOTES

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NOTES

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### AWS5504

### **ORDERING INFORMATION**

ORDER NUMBER PACKAGE DESCRIPTION		COMPONENT PACKAGING	
AWS5504S14	S14	6 Pin Plastic Package	



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