AWS5504

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

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

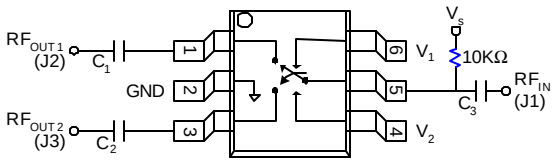
S14
SOT-26
6 Pin Plastic Package

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.



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

Figure 1: Pin Out Diagram

Table 1: Pin Description

PIN	NAME	DESCRIPTION
1	RF_{OUT1} (J2)	RF port can be used as an input or as an output.
2	GND	Ground connection. Keep as short as possible.
3	RF_{OUT2} (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_{IN} (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

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Maximum Ratings

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	℃
Storage Temperature	-65	+150	℃
Θ_{JC}	-	25	°C/W

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.

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

PARAMETER	CONDITION	FREQUENCY	MIN	TYP	MAX	UNIT
Switching Characteritics [5]	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 to 0.2 V @ 20 uA Max V_{HIGH} = +3 V @ 100 uA Max to +5 V @ 200 uA Max $V_S = V_{HIGH} \pm$ 0.2V					

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

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

PARAMETER [1]	FREQUENCY [2]	MIN	TYP	MAX	UNIT
Insertion Loss [3]	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 [4]	DC - 1.0 GHz DC - 2.0 GHz	- -	1.3:1 1.3:1	1.4:1 1.8:1	dB

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/°C.*
4. *Insertion loss state.*
5. *Video feedthru measured with 1 nx rise time pulse and 500 MHz bandwidth.*

Table 5: 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 = Vhigh $\pm$ 0.2 V)

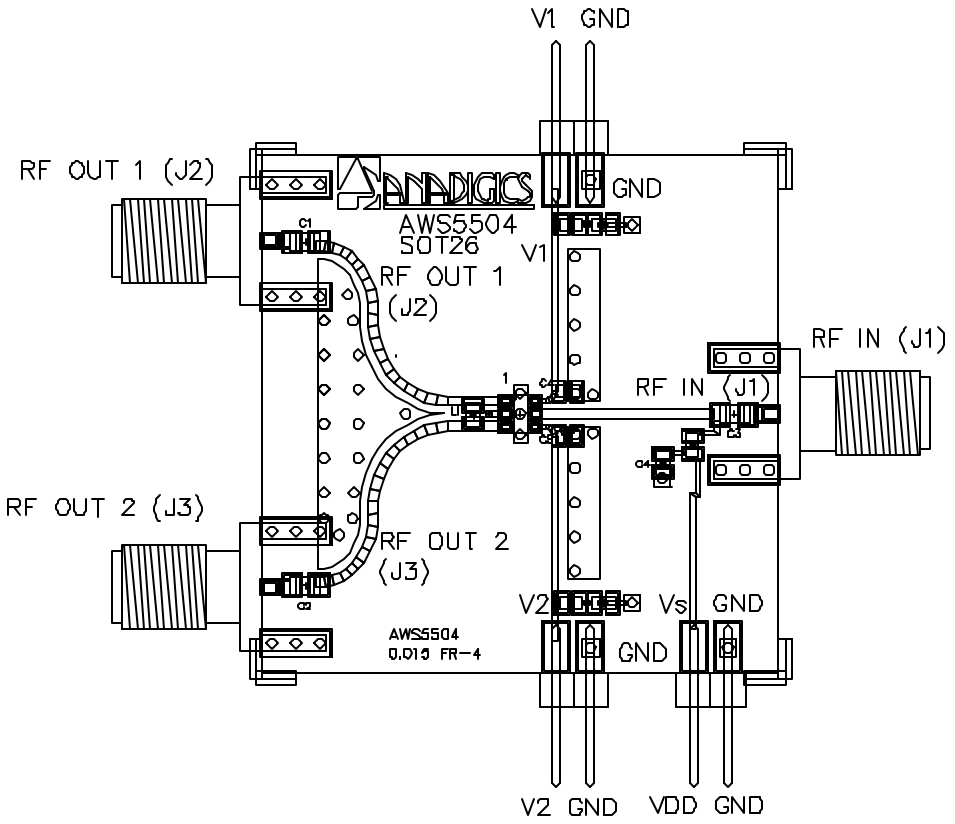
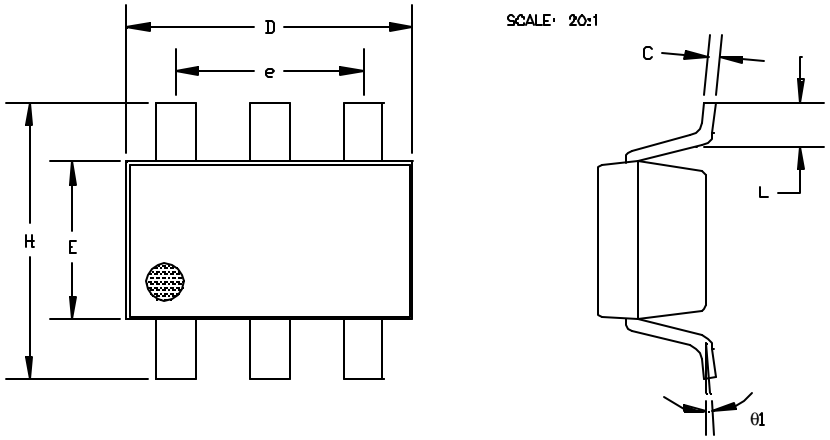
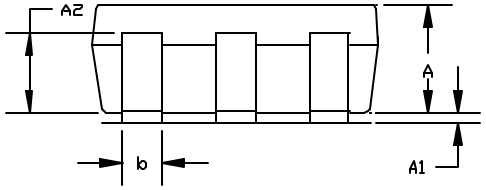


Figure 2: Test Circuit Schematic

PACKAGE OUTLINE





SYMBOLS	DIMENSIONS IN MILLIMETERS		DIMENSIONS IN INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.00	0.004
A2	0.70	0.90	0.027	0.035
b	0.35	0.50	0.014	0.020
C	0.10	0.25	0.004	0.010
D	2.70	3.10	0.106	0.122
E	1.40	1.80	0.055	0.071
e	1.90(TYP)		0.075(TYP)	
H	2.60	3.00	0.102	0.118
L	0.37	——	0.015	——
θ1	1°	9°	1°	9°

NOTE
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.*
2. *Dimension L is measured in gage plane*
3. *Coplanarity: 0.1000 mm*
4. *Tolerance + 0.1000 mm (4 mil) unless otherwise specified.*

Figure 3: Package Outline

NOTES

NOTES

ORDERING INFORMATION

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

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