



GaAs IC High Power SPDT Reflective  
Switch Positive Control DC-3 GHz

**PRELIMINARY DATA SHEET - Rev 1.0**

## FEATURES

- High Linearity (IP3 55 dBm @ 1.9 GHz)
- High Isolation (20 dB @ 1.9 GHz)
- Low Insertion Loss (0.55 dB @ 1.9 GHz)
- Low DC Power Consumption
- Positive 3V or 5V Control Voltage

## APPLICATION

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



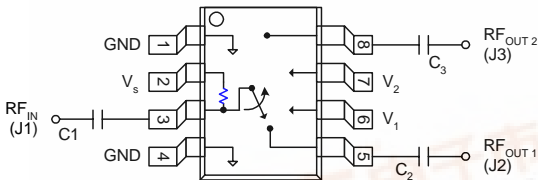
## PRODUCT DESCRIPTION

The AWS5503 is a Single Pole Double Throw (SPDT) GaAs MMIC assembled in a MSOP-8 plastic package. The AWS5503 is designed for analog and digital

applications that require low insertion loss, high linearity, and small size. State selection is achieved with positive voltage.

**Table 1: Pin Description**

PIN	NAME	DESCRIPTION
1	GND	Ground connection. (Keep as short as possible)
2	Vs	Bias voltage for positive control (3V to 5V).
3	RF <sub>IN</sub> (J1)	RF common port.
4	GND	Ground connection. (Keep short as possible)
5	RF <sub>OUT</sub> (J2)	RF port (can be used as an input or as an output)
6	V1	Control Voltage1 (Low 0V, High 3V to 5V)
7	V2	Control Voltage 2 (Low 0V, High 3V to 5V)
8	RF <sub>OUT</sub> (J3)	RF port (can be used as an input or as an output)



External DC Blocking capacitors are required on all RF ports.  
 $C_{1,2,3} = 100 \text{ pF}$  for operation >500 MHz.

**Figure 1: Pin Layout**

AWS5503

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

Table 2: Absolute Minimum and Maximum Ratings

PARAMETER	MIN	MAX	UNIT
RF Input Power > 900 MHz, 0/+5 V Control	-	6	W
Supply Voltage	-	+8	V
Control Voltage	-0.2	+8	V
Operating Temperature	-40	+85	°C
Storage Temperature	-65	+150	°C
$\Theta_{JC}$	-	+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

PARAMETER	CONDITION	FREQUENCY	MIN	TYP	MAX	UNIT
Switching Characteristics <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	1.9 GHz	-	+55	-	dBm
Input Power for 1dB Compression	@ +3V @ +5V	1.9 GHz 1.9 GHz	-	+28.5 +35	-	dBm
Control Voltage	$V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \text{ uA Max}$ $V_{HIGH} = +3 \text{ V @ } 100 \text{ uA Max to } +5 \text{ V @ } 200 \text{ uA Max}$ $V_S = V_{HIGH} + 0.2V$					

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 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.

**Table 4: Electrical Specifications**

PARAMETER <sup>1</sup>	FREQUENCY <sup>2</sup>	MIN	TYP	MAX	UNIT
Insertion Loss <sup>3</sup>	DC - 1.0 GHz	-	0.45	0.55	dB
	1.0 - 2.0 GHz		0.6	0.75	
	2.0 - 3.0 GHz		0.9	1.2	
Isolation	DC - 1.0 GHz	19	22	-	dB
	1.0 - 2.0 GHz	18	20		
	2.0 - 3.0 GHz	20	23		
VSWR <sup>4</sup>	DC - 1.0 GHz	-	1.2:1	1.3:1	-
	1.0 - 2.0 GHz		1.3:1	1.4:1	
	2.0 - 3.0 GHz		1.7:1	1.8:1	

Notes:

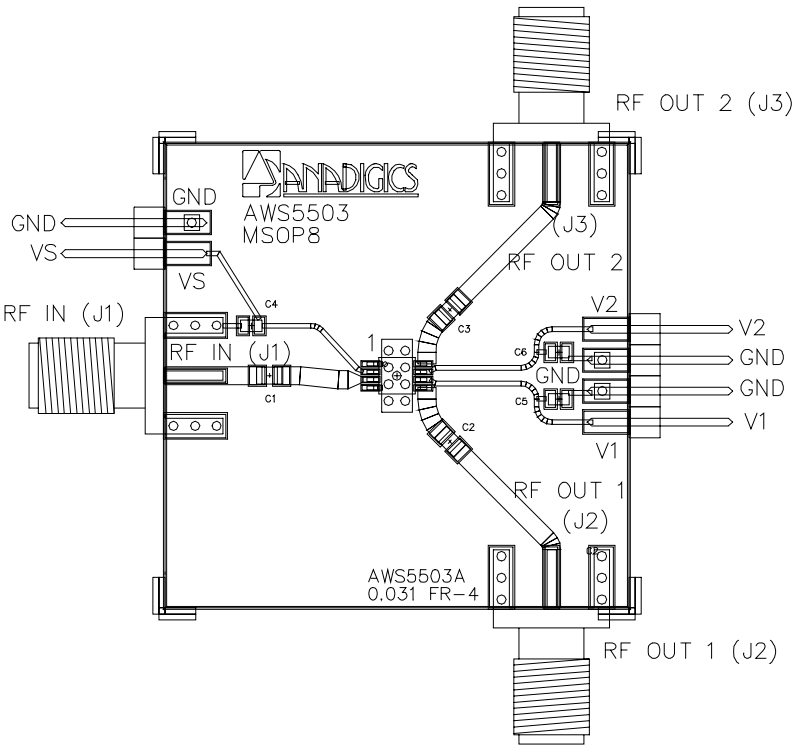
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**Table 5: Truth Table**

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

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

**AWS5503**



**Figure 2: Test Circuit Schematic**

PACKAGE OUTLINE

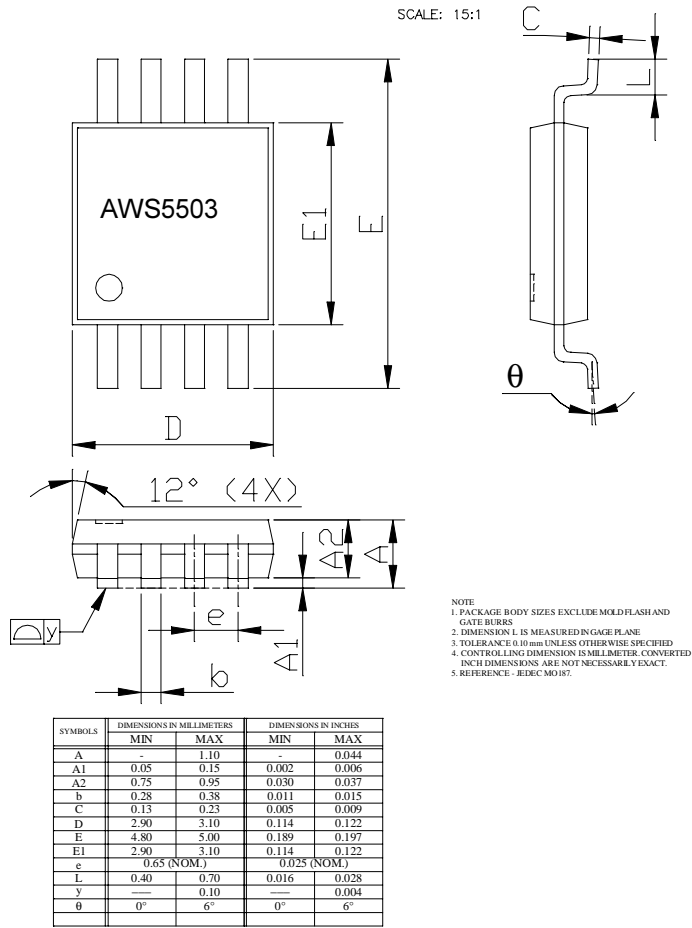


Figure 3: Package Outline

**AWS5503**

**NOTES**

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## **AWS5503**

### **ORDERING INFORMATION**

ORDER NUMBER	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AWS5503S15	S15	8 Pin Plastic Package



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