

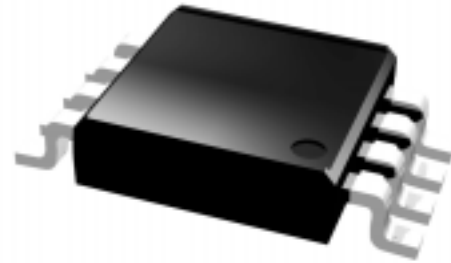
**FEATURES**

- **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**

**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.

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



**S15**  
**MSOP-8**  
**8 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 - 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	

**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	1.9 GHz	-	+55	-	dBm
Input Power for 1dB Compression	@ +3V	1.9 GHz		+28.5		dBm
	@ +5V	1.9 GHz	-	+35	-	
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

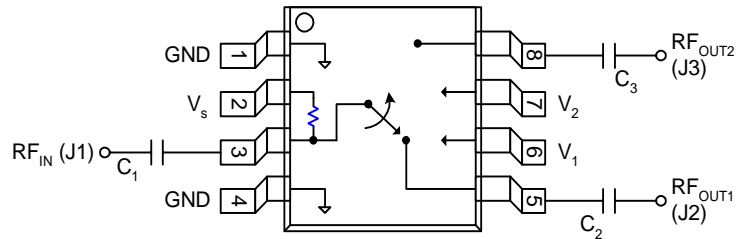
Characteristics	Value
RF Input Power	6 W Max > 900 MHz, 0/+5 V Control
Supply Voltage	+8 V
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40° C to +85° C
Storage Temperature	-65° C to +150° C
$\theta_{JC}$	25° C/W

## TRUTH TABLE

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

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

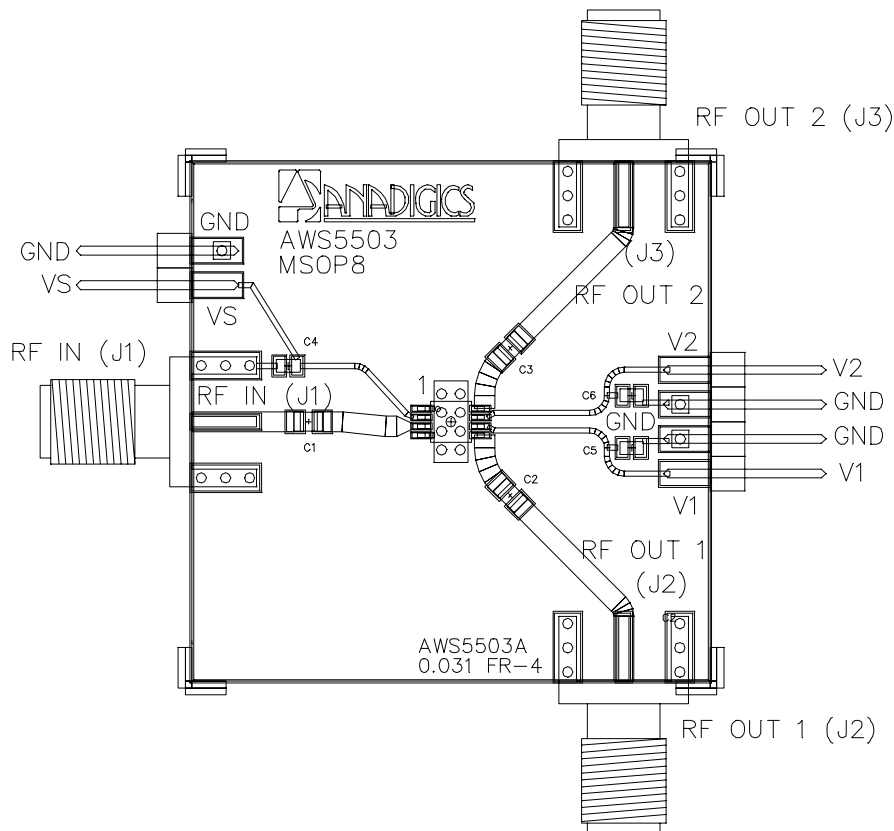
## PIN OUT



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

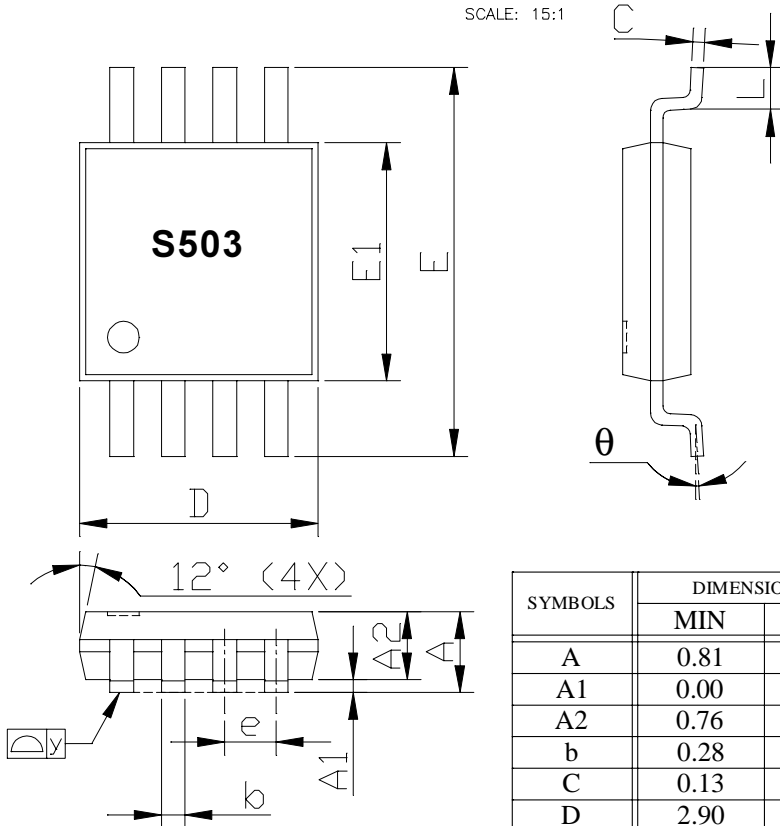
Pin	Function	Description
1	GND	Ground connection. (Keep as short as possible)
2	$V_S$	Bias voltage for positive control (3V to 5V).
3	$RF_{IN}$ (J1)	RF common port.
4	GND	Ground connection. (Keep short as possible)
5	$RF_{OUT}$ (J2)	RF port (can be used as an input or as an output)
6	$V_1$	Control Voltage1 (Low 0V, High 3V to 5V)
7	$V_2$	Control Voltage 2 (Low 0V, High 3V to 5V)
8	$RF_{OUT}$ (J3)	RF port (can be used as an input or as an output)

## TEST CIRCUIT LAYOUT



**PACKAGE OUTLINE DRAWING**

SCALE: 15:1



**NOTES:**

1. Package body sizes exclude mold flash and gate burrs.
2. Dimension L is measured in gage plane.
3. Tolerance 0.10 mm unless otherwise specified.
4. Controlling dimensions are metric. Converted inch dimensions are not necessarily exact.

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.81	1.02	1.22	0.032	0.040	0.048
A1	0.00	----	0.20	0.000	----	0.008
A2	0.76	0.86	0.97	0.030	0.034	0.038
b	0.28	0.30	0.38	0.011	0.012	0.015
C	0.13	0.15	0.23	0.005	0.006	0.009
D	2.90	3.00	3.10	0.114	0.118	0.122
E	4.80	4.90	5.00	0.189	0.193	0.197
E1	2.90	3.00	3.10	0.114	0.118	0.122
e	----	0.65	----	----	0.026	----
L	0.40	0.53	0.66	0.016	0.021	0.026
y	----	----	0.10	----	----	0.004
θ	0°	----	6°	0°	----	6°

**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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