ANADIGICS®

AWS5503-S15
GaAs IC High Power SPDT Reflective Switch
Positive Control DC - 3 GHz
Advanced Product Information
Rev. 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**

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.
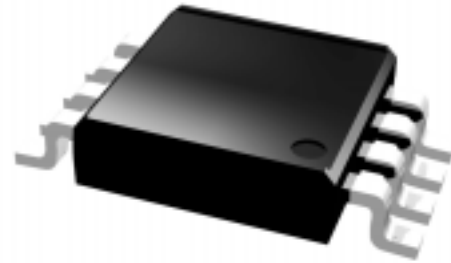
**S15
MSOP-8
8 Pin Plastic Package**

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

Parameter [1]	Frequency [2]	Min	Typ	Max	Unit
Insertion Loss [3]	DC - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	- 	0.45 0.6 0.9	0.55 0.75 1.2	dB
Isolation	DC - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	19 18 20	22 20 23	-	dB
VSWR [4]	DC - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	-	1.2:1 1.3:1 1.7:1	1.3:1 1.4:1 1.8:1	-

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

Parameter	Condition	Frequency	Min	Typ	Max	Unit
Switching Charecteritics [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	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 to 0.2 V @ 20 uA Max V_{HIGH} = +3 V @ 100 uA Max to +5 V @ 200 uA Max V_S = V_{HIGH} ± 0.2V					

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.
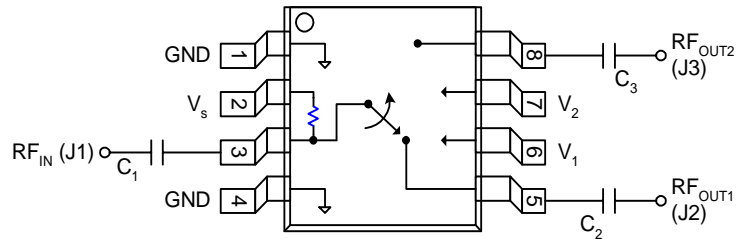
ABSOLUTE MAXIMUM RATINGS

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

PIN OUT

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

Pin	Function	Description
1	GND	Ground connection. (Keep as short as possible)
2	Vs	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	V1	Control Voltage1 (Low 0V, High 3V to 5V)
7	V2	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
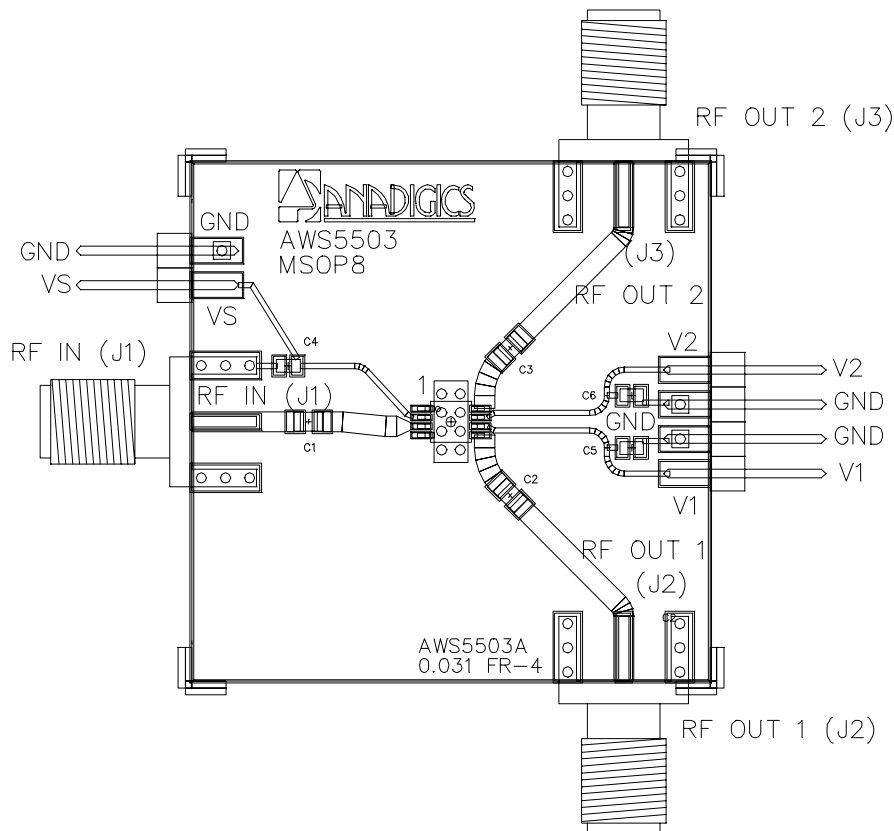
PACKAGE OUTLINE DRAWING

SCALE: 15:1

S503
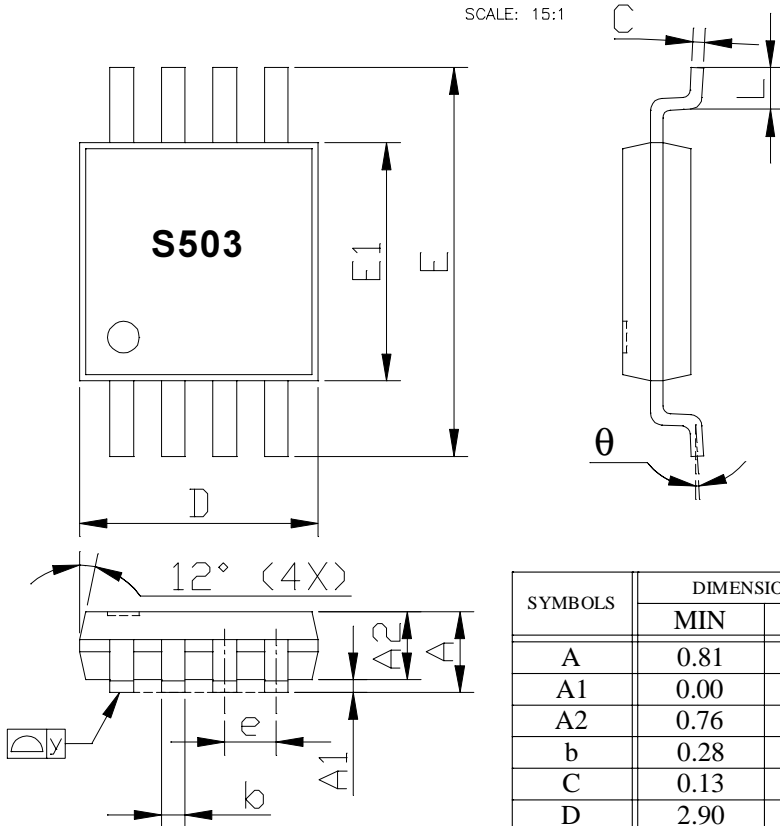
NOTES:
1. **Package body sizes exclude mold flash and gate burrs.**

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.**

12° (4X)

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°

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