AWS5503

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

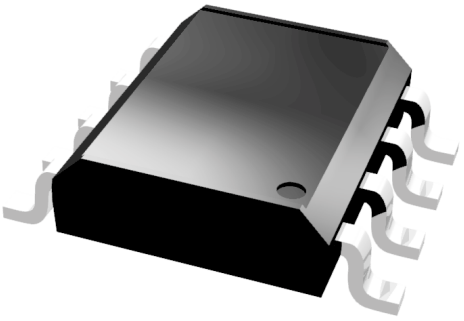
PRELIMINARY DATA SHEET - Rev 1.0

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

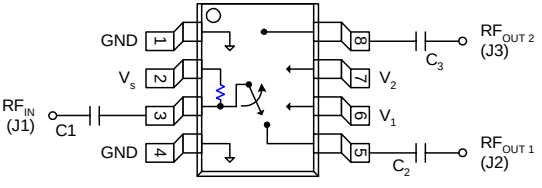
- Typical applications include: transmit/ receive switch, diversity switching, and antenna selection.



S15
MSOP-8
8 Pin Plastic Package

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.



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

Figure 1: Pin Layout

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_{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)

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
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

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	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					

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 [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	-

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

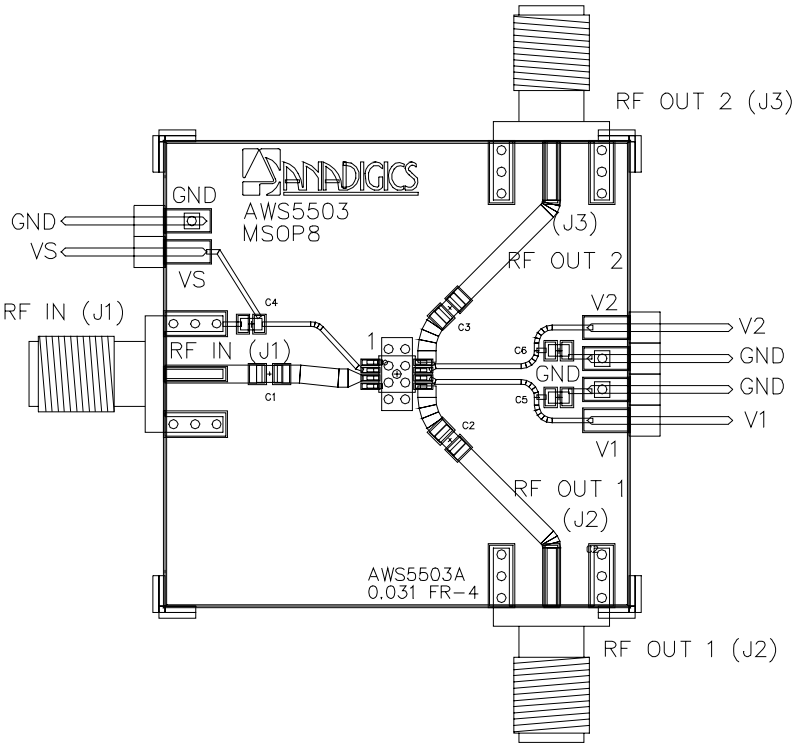
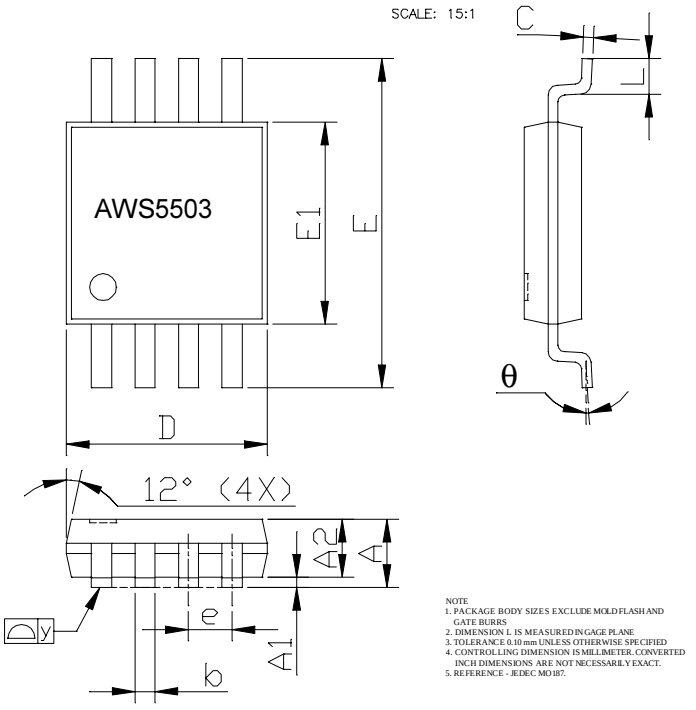


Figure 2: Test Circuit Schematic

PACKAGE OUTLINE



NOTE
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 DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
5. REFERENCE - JEDEC MO187.

SYMBOLS	DIMENSIONS IN MILLIMETERS		DIMENSIONS IN INCHES	
	MIN	MAX	MIN	MAX
A	-	1.10	-	0.044
A1	0.05	0.15	0.002	0.006
A2	0.75	0.95	0.030	0.037
b	0.28	0.38	0.011	0.015
C	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
E	4.80	5.00	0.189	0.197
E1	2.90	3.10	0.114	0.122
e	0.65 (NOM.)		0.025 (NOM.)	
L	0.40	0.70	0.016	0.028
y	—	0.10	—	0.004
θ	0°	6°	0°	6°

Figure 3: Package Outline

NOTES

NOTES

ORDERING INFORMATION

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

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