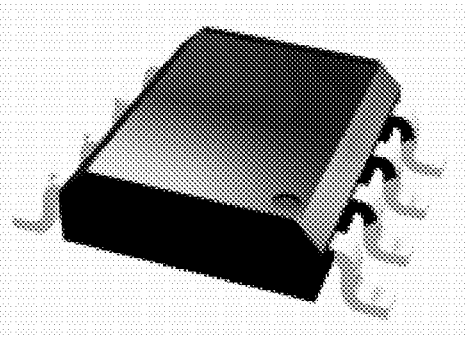
AWS5501-S13

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

Advanced Product Information
Rev. 0

FEATURES

- **High Linearity (IP3 55 dBm @ 1.9 GHz)**
- **High Isolation (30 dB @ 1.9 GHz)**
- **Low Insertion Loss (0.55 dB @ 1.9 GHz)**
- **Positive 3V to 5V Control Voltage**
- **Low DC Power Consumption**



S13
SOIC-8
8 Pin Plastic Package

DESCRIPTION

The AWS5501 is a Single Pole Double Throw (SPDT) GaAs MMIC switch assembled in a SOIC-8 plastic package. The AWS5501 is designed for analog and digital applications that require low insertion loss and high linearity. State selection is achieved with positive voltage.

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

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 - 1.8 GHz 1.8 - 2.1 GHz 2.1 - 3.0 GHz	20 22 27 10	23 25 31 12	-	dB
VSWR [4]	DC - 1.0 GHz DC - 2.0 GHz DC - 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 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 @ 20 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

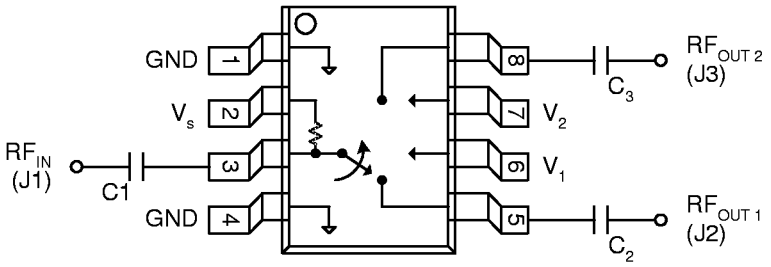
Characteristics	Value
RF Input Power	6W Max. > 900 MHz, 0/+5 Control
Supply Voltage	+8V
Control Voltage	-0.2V, +8V
Operating Temperature	-40° C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	25° C/W

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} ± 0.2 V)

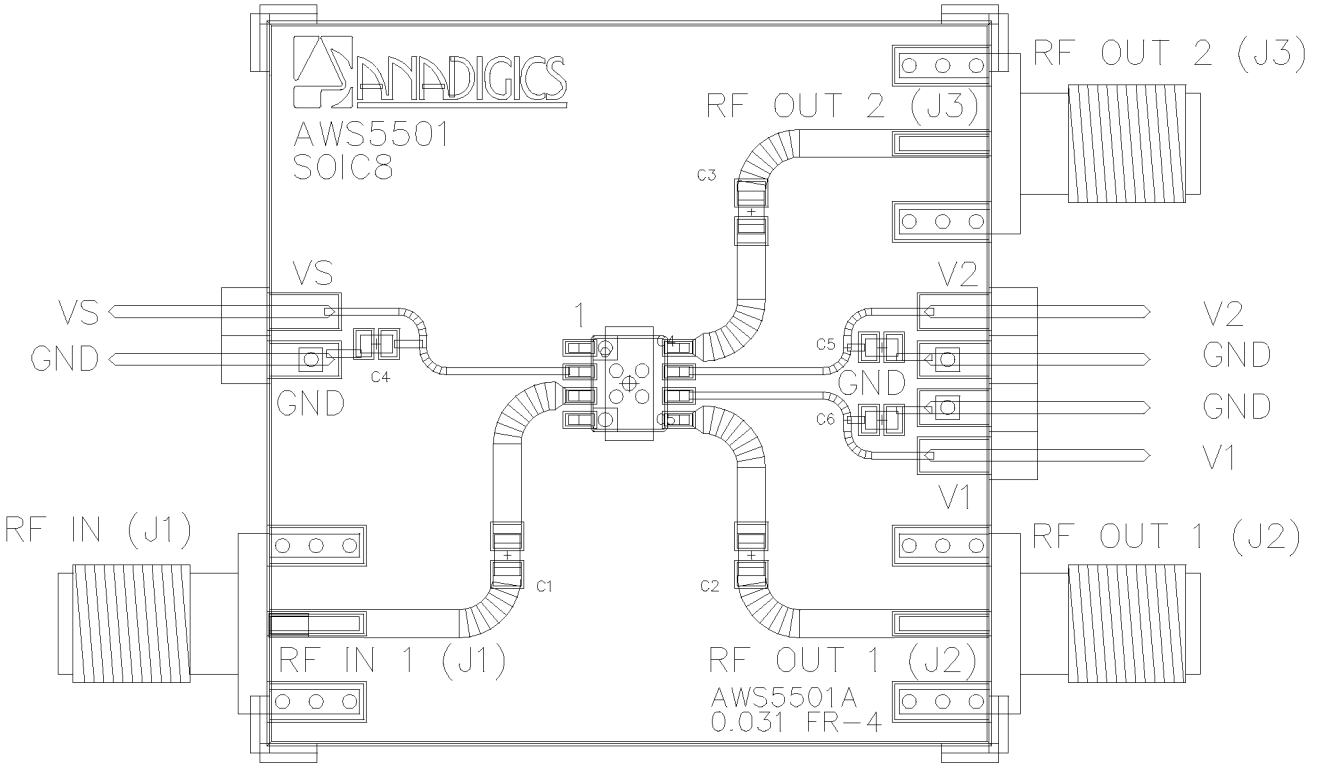
PIN OUT



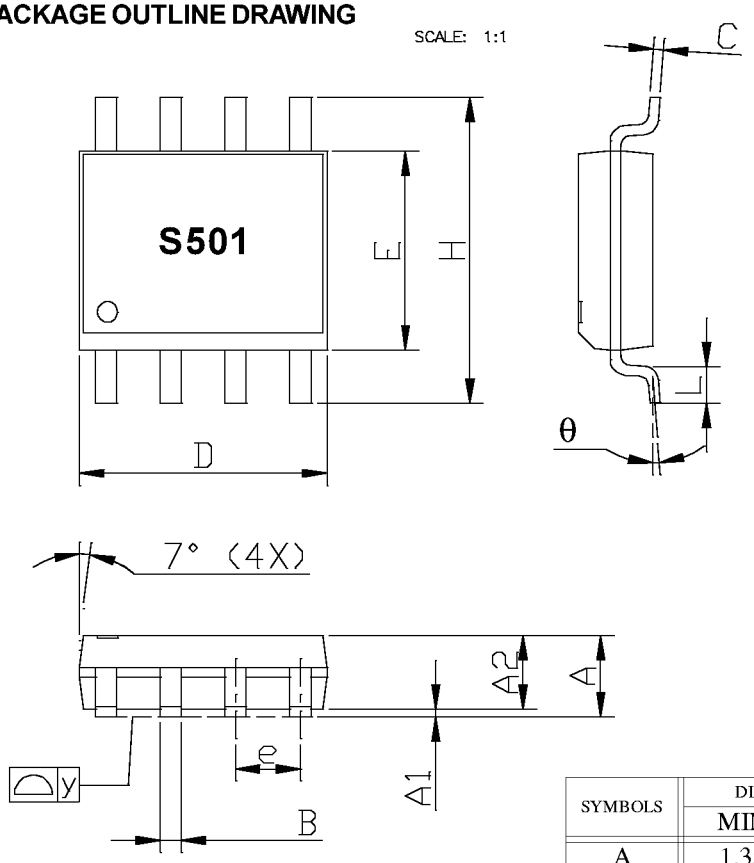
DC block capacitors $C_{1, 2, 3}$ must be supplied externally.
$C_{1, 2, 3}$ = 100 pF for operation >500 MHz

Pin	Function	Description
1	GND	Ground connection (keepas 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 as short as possible)
5	RF_{OUT} (J2)	RF port (can be used as an input or as an output)
6	V1	Control voltage (low 0V, High 3V to 5V)
7	V2	Control voltage (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



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 dimension are metric. Converted inch dimensions are not necessarily exact.
5. Followed from JEDEC MS-012.

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.60	1.75	0.053	0.063	0.069
A1	0.10	—	0.25	0.004	—	0.010
A2	—	1.45	—	—	0.057	—
B	0.33	—	0.51	0.013	—	0.020
C	0.19	—	0.25	0.007	—	0.010
D	4.80	—	5.00	0.189	—	0.197
E	3.80	—	4.00	0.150	—	0.157
e	—	1.27	—	—	0.050	—
H	5.80	—	6.20	0.228	—	0.244
L	0.40	—	1.27	0.016	—	0.050
y	—	—	0.10	—	—	0.004
θ	0°	—	8°	0°	—	8°

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