AWS5502

GaAs IC SPDT Reflective Switch
Positive Control DC - 2.5 GHz

PRELIMINARY DATA SHEET - Rev 1.0

FEATURES

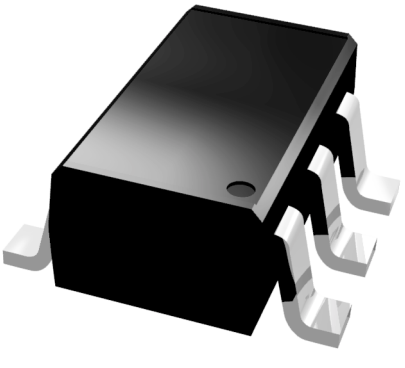
- Low Insertion Loss (0.4 dB @ 0.9 GHz)
- Complementary Positive Control Voltages (0/ +3V to 0/+5V)
- Positive Voltage Supply (+3 to +5 V)
- Low DC Power Consumption
- Ultra Miniature 6 Lead SOT-6 Package

APPLICATIONS

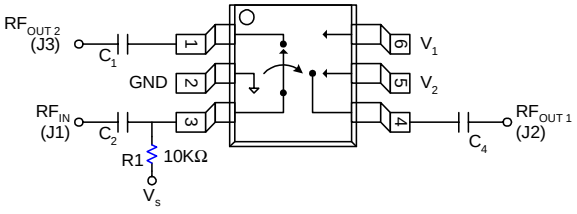
- Selection of Synthesizers
- Filters
- Amplifiers in Dual Mode & Dual Band Handsets

PRODUCT DESCRIPTION

The AWS5502 is a Single Pole Double Throw GaAs MMIC Switch assembled in a SOT-6 plastic package. The AWS5502 is designed for analog and digital application that require low insertion loss, small size, and low cost. State selection is achieved with a complimentary positive voltage (requires positive bias Vs, and blocking caps) or negative voltage (no Vs or blocking caps required).



S14
SOT-6
6 Pin Plastic Package



DC blocking capacitors ($C_{1, 2, 4}$) & biasing resistor must be supplied externally for positive voltage operation. $C_{1, 2, 4}$ = 100 pF for operation >500 MHz.

Figure 1: Pin Layout

Table 1: Pin Description

PIN	FUNCTION	DESCRIPTION
1	RFOUT (J2)	RF port (can be used as an input or as an output)
2	GND	Ground connection (keep as short as possible)
3	RFIN (J1)/Vs	RF common port and bias voltage for positive control (3V to 5V)
4	RFOUT 1 (J2)	RF port (can be used as an input or as an output)
5	V2	Control voltage 2 (low 0V , high 3V to 5V)
6	V1	Control voltage 1 (low 0V , high 3V to 5V)

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Minimum and Maximum Ratings

PARAMETER	MIN	MAX	UNIT
RF Input Power > 500 MHz, 0/+7 V Control	-	2	W
Control Voltage	-0.2	+8	V
Operating Temperature	-40	+125	°C
Storage Temperature	-50	+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 at 25° C (0, +3V)

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	-	-	10 20 25	-	ns ns mV
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	0.5 - 2.0 GHz	-	+45	-	dBm
Input Power for 1dB Compression	@ +3V @ +5V	0.5 - 2.0 GHz 0.5 - 2.0 GHz	-	+21 +28	-	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 wirh 1 ns rise time pulse and 500 MHz bandwidth.*

Table 4: Electrical Specifications at 25 °C (0, +3V)

PARAMETER [1]	FREQUENCY [2]	MIN	TYP	MAX	UNIT
Insertion Loss [3]	DC - 0.5 GHz	-	0.4	0.5	dB
	DC - 1.0 GHz	-	0.45	0.6	dB
	DC - 2.0 GHz	-	0.6	0.8	dB
	DC - 2.5 GHz	-	0.9	1.1	dB
Isolation	DC - 0.5 GHz	22	25	-	dB
	DC - 1.0 GHz	17	20	-	dB
	DC - 2.0 GHz	11	14	-	dB
	DC - 2.5 GHz	10	13	-	dB
VSWR [4]	DC - 1.0 GHz	-	1.2:1	1.3:1	-
	DC - 2.5 GHz	-	1.5:1	1.7:1	-

Table 5: Truth Table: Positive Operation

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

V_{High} = +3 to +5 V (V_S = V_{High} ± 0.2 V)

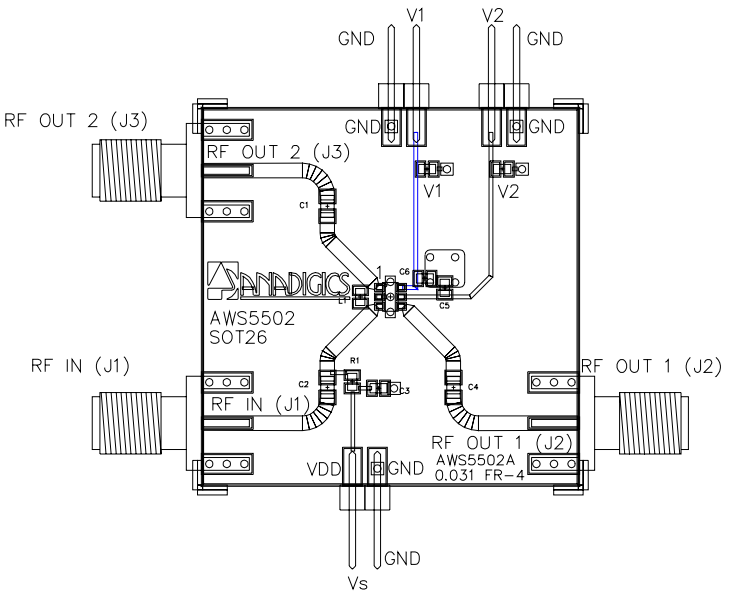
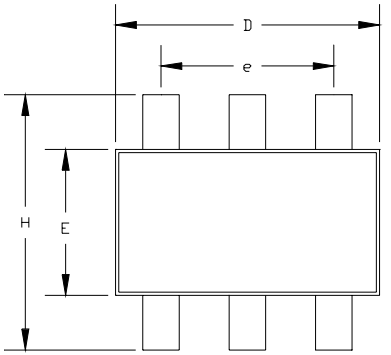
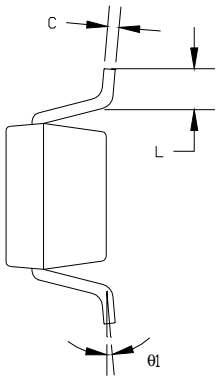


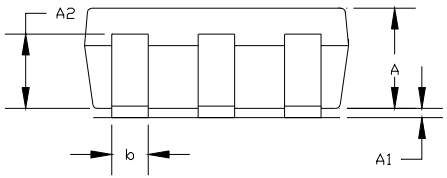
Figure 2: Text Circuit Schematic

PACKAGE OUTLINE



SCALE: 20:1





SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.00	1.10	1.30	0.039	0.043	0.051
A1	0.00	——	0.10	0.00	——	0.004
A2	0.70	0.80	0.90	0.027	0.031	0.035
b	0.35	0.40	0.50	0.014	0.016	0.020
C	0.10	0.15	0.25	0.004	0.006	0.010
D	2.70	2.90	3.10	0.106	0.114	0.122
E	1.40	1.60	1.80	0.055	0.063	0.071
e	1.90(TYP)			0.075(TYP)		
H	2.60	2.80	3.00	0.102	0.110	0.118
L	0.37	——	——	0.015	——	——
θ1	1°	5°	9°	1°	5°	9°

NOTES:
1. *Package body sizes exclude mold flash and gate burrs.*
2. *Dimension L is measured in gage plane*
3. *Coplanarity: 0.1000 mm*
4. *Tolerance + 0.1000 mm (4 mil) unless otherwise specified.*

Figure 3: S14 Package Outline

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ORDERING INFORMATION

ORDER NUMBER	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AWS5502S14	S14	6 Pin Plastic Package

ANADIGICS, Inc.
35 Technology Drive
Warren, New Jersey 07059
Tel: (908) 668-5000
Fax: (908) 668-5132

http://www.anadigics.com
Mktg@anadigics.com