



AWS5506S14

GaAs IC SPDT Reflective Switch
Positive Control DC - 2.5 GHz

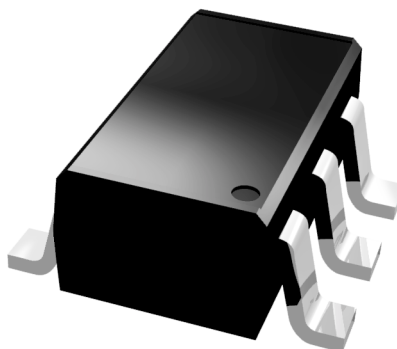
Data Sheet - Rev 0

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

- **Typical applications include:** selection of synthesizers, filters, amplifiers in dual mode, and dual band handsets.



S14
SOT-6
6 Pin Plastic Package

Description

The AWS5506 is a Single Pole Double Throw GaAs MMIC switch assembled in a SOT-6 plastic package. The AWS5506 is designed for analog and digital application that require for insertion loss, small size, and low cost. State selection is achieved with a complimentary positive voltage (requires positive bias V_s , and blocking caps) or negative voltage (no V_s or blocking caps required).

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	
	DC - 2.0 GHz		0.6	0.8	
	DC - 2.5 GHz		0.9	1.1	
Isolation	DC - 0.5 GHz	22	25	-	dB
	DC - 1.0 GHz	17	20		
	DC - 2.0 GHz	11	14		
	DC - 2.5 GHz	10	13		
VSWR ⁴	DC - 1.0 GHz	-	1.2:1	1.3:1	-
	DC - 2.5 GHz		1.5:1	1.7:1	

Operating Characteristics at 25° C (0, +3V)

Parameter	Condition	Frequency	Min	Typ	Max	Unit
Switching Characteristics 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	$V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \text{ uA Max}$ $V_{HIGH} = +3 \text{ V @ } 100 \text{ uA Max to } +5 \text{ V @ } 200 \text{ uA Max}$ $V_S = V_{HIGH} + 0.2 \text{ V}$					

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 Ranges

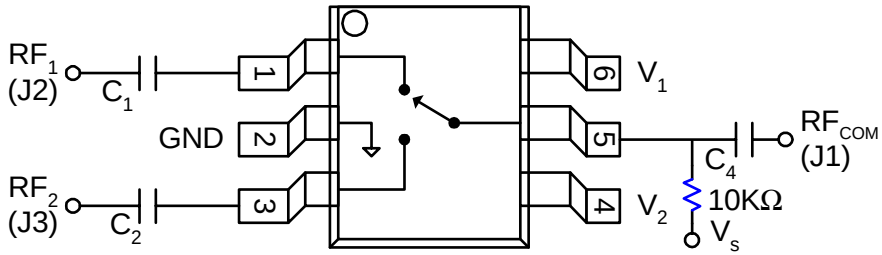
Characteristics	Value
RF Input Power	2 W > 500 MHz, 0/+7 V Control
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40° C to +125°C
Storage Temperature	-50°C to +150°C
Θ _{JC}	25° C/W

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

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

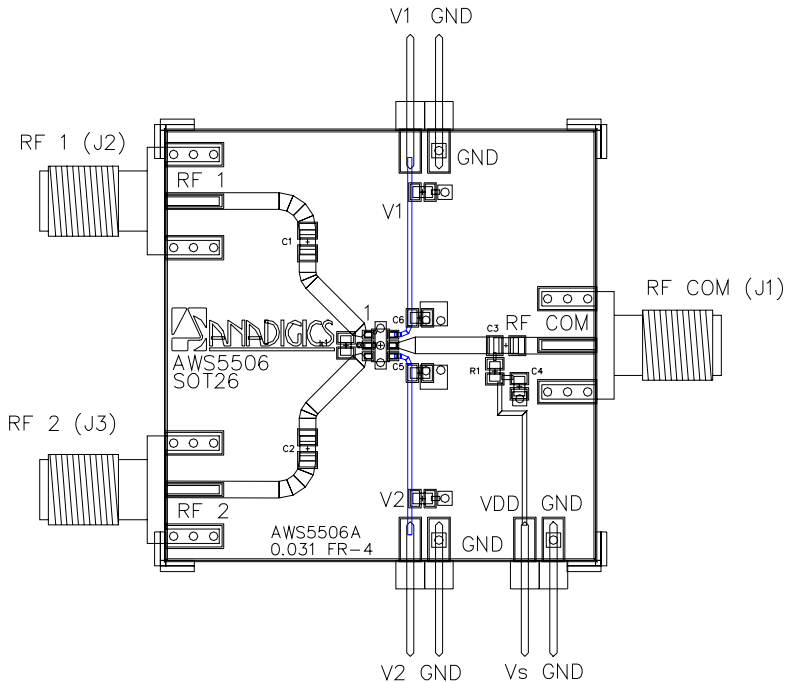
Pin Out



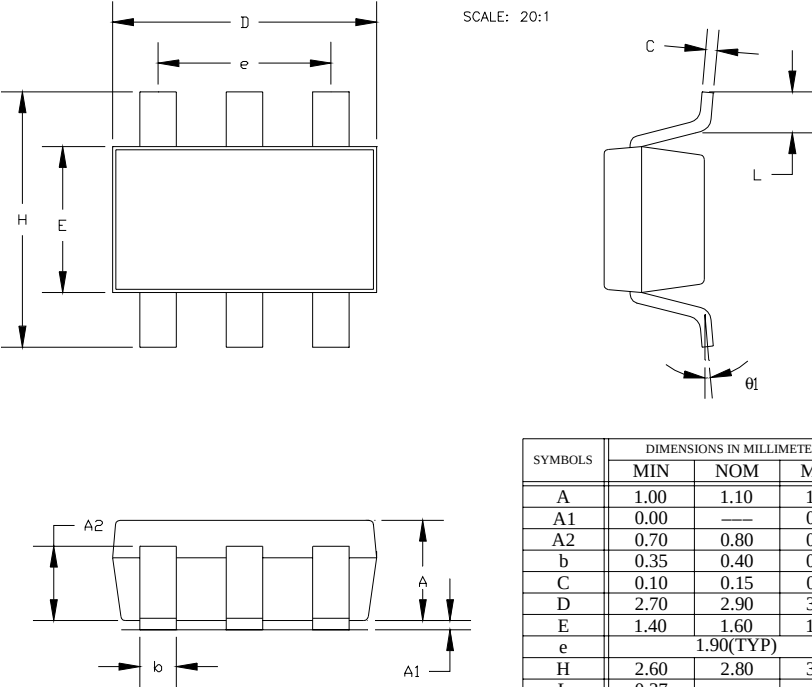
Pin	Function	Description
1	RF ₁ (J2)	RF port (can be used as an input and as an output)
2	GND	Ground connection (keep as short as possible)
3	RF ₂ (J3)	RF port (can be used as an input or as an output)
4	V2	Control voltage 2 (low 0V, High 3V to 5V)
5	RF _{COM} (J1)/V _S	RF common port and bias voltage for positive control (3V to 5V)
6	V1	Control voltage 1 (low 0V, High 3V to 5V)

DC blocking capacitors ($C_{1,2,4}$) and biasing resistor ($R1$) must be supplied externally for positive voltage operation. $C_{1,2,4} = 100 \text{ pF}$ for operation $>500 \text{ MHz}$.

Test Circuit Layout



Package Outline Drawing



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.



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