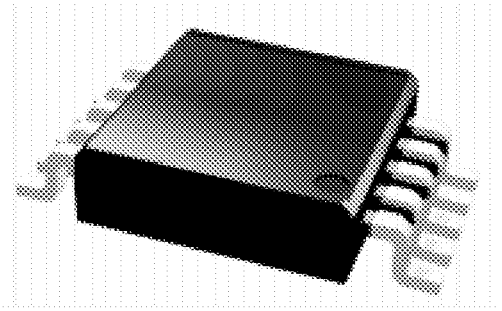
AWS5505-S16

GaAs IC Transmit/Dual Receive Switch with Diversity Antennas 0.5 - 2.0 GHz

Advanced Product Information
Rev. 0

FEATURES

- **Five RF Ports**
- **Transmit to Either of Two Antennas**
- **Receive From Either Of Two Antenna**
- **Differential Biasing for High Linearity**



S16
MSOP-10
10 Pin Plastic Package

DESCRIPTION

The AWS5505 GaAs MMIC IC is a transfer switch with an SPDT. This switch is ideal for dual band applications where TX/RX diversity is required. The switch has 4 control lines that may be positive, negative or a combination of both (differential biasing). This switch is designed for commercial wireless applications such as GSM, DCS and PCS systems.

ELECTRICAL SPECIFICATIONS AT 25 °C (+2.75, -4.5 V)

Parameter [1]	Condition	Frequency [2]	Min	Typ	Max	Unit
Insertion Loss	T_X-Ant. 1, Ant. 2	0.5 - 1.0 GHz 1.0 - 2.0 GHz	-	0.5 0.7	-	dB
	R_{X1}, R_{X2}-Ant. 1, Ant. 2	0.5 - 1.0 GHz 1.0 - 2.0 GHz	-	1.0 1.3	-	dB
Isolation	R_{X1}, R_{X2}- Ant. 1, Ant 2 (T_X- Ant. 1, 2 Insertion Loss)	0.5 - 1.0 GHz 1.0 - 2.0 GHz	-	35 25	-	dB
VSWR	Insertion Loss	0.5 - 2.0 GHz	-	1.5:1	-	dB

OPERATING CHARACTERISTICS AT 25° C (+2.74, -4.5 V)

Parameter	Condition	Frequency	Min	Typ	Max	Unit
Switching Characteritics	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90%/10% RF) Video Feedthru	-	-	50 100 50	-	ns ns mV
2nd and 3rd Harmonics	34.5 dBm @ (V_{High} - V_{LOW}) > 7.25	0.9 GHz	-	65	-	dBc
Control Voltage	V_{LOW} = -5 < V_{LOW} < -2.75 V @ 200 uA Max. V_{HIGH} = -.2 < V_{High} < +5 V @ 200 uA Max. Differential = 2.75 < (V_{High} - V_{LOW}) < 10 V @ 200 uA Max					

1. All measurements made in a 50 ohm system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C
3. Insertion loss state.

ABSOLUTE MAXIMUM RATINGS

Characteristics	Value
RF Input Power	3 W Max > 500 MHz, +5 V/-5 V
Control Voltage	+5 V/-5 V
Operating Temperature	-40° C to +125°C
Storage Temperature	-65°C to +150°C
θ_{JC}	25° C/W

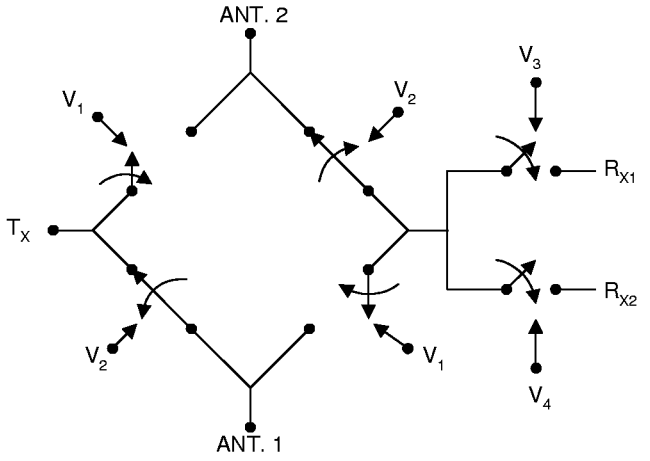
Note: Exceeding these ratings may cause irreversable damage.

TRUTH TABLE

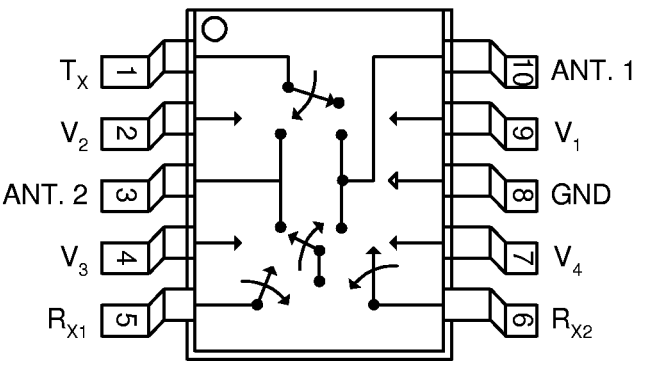
V_1	V_2	V_3	V_4	T_X-Ant. 1	T_X-Ant. 2	R_{X1}-Ant. 1	R_{X1}-Ant. 2	R_{X2}-Ant. 1	R_{X2}-Ant. 2
V_{LOW}	V_{HIGH}	V_{LOW}	V_{LOW}	Insertion Loss	Isolation	Isolation	Isolation	Isolation	Isolation
V_{HIGH}	V_{LOW}	V_{LOW}	V_{LOW}	Isolation	Insertion Loss	Isolation	Isolation	Isolation	Isolation
V_{HIGH}	V_{LOW}	V_{HIGH}	V_{LOW}	Isolation	Insertion Loss	Insertion Loss	Isolation	Isolation	Isolation
V_{LOW}	V_{HIGH}	V_{HIGH}	V_{LOW}	Insertion Loss	Isolation	Isolation	Insertion Loss	Isolation	Isolation
V_{HIGH}	V_{LOW}	V_{LOW}	V_{HIGH}	Isolation	Insertion Loss	Isolation	Isolation	Insertion Loss	Isolation
V_{LOW}	V_{HIGH}	V_{LOW}	V_{HIGH}	Insertion Loss	Isolation	Isolation	Isolation	Isolation	Insertion Loss

V_{LOW} = -5 < V_{LOW} < -2.75 V @ 200 uA Max.
V_{HIGH} = -.2 < V_{High} < +5 V @ 200 uA Max.
Differential = 2.75 < (V_{High} - V_{LOW}) < 10 V @ 200 uA Max

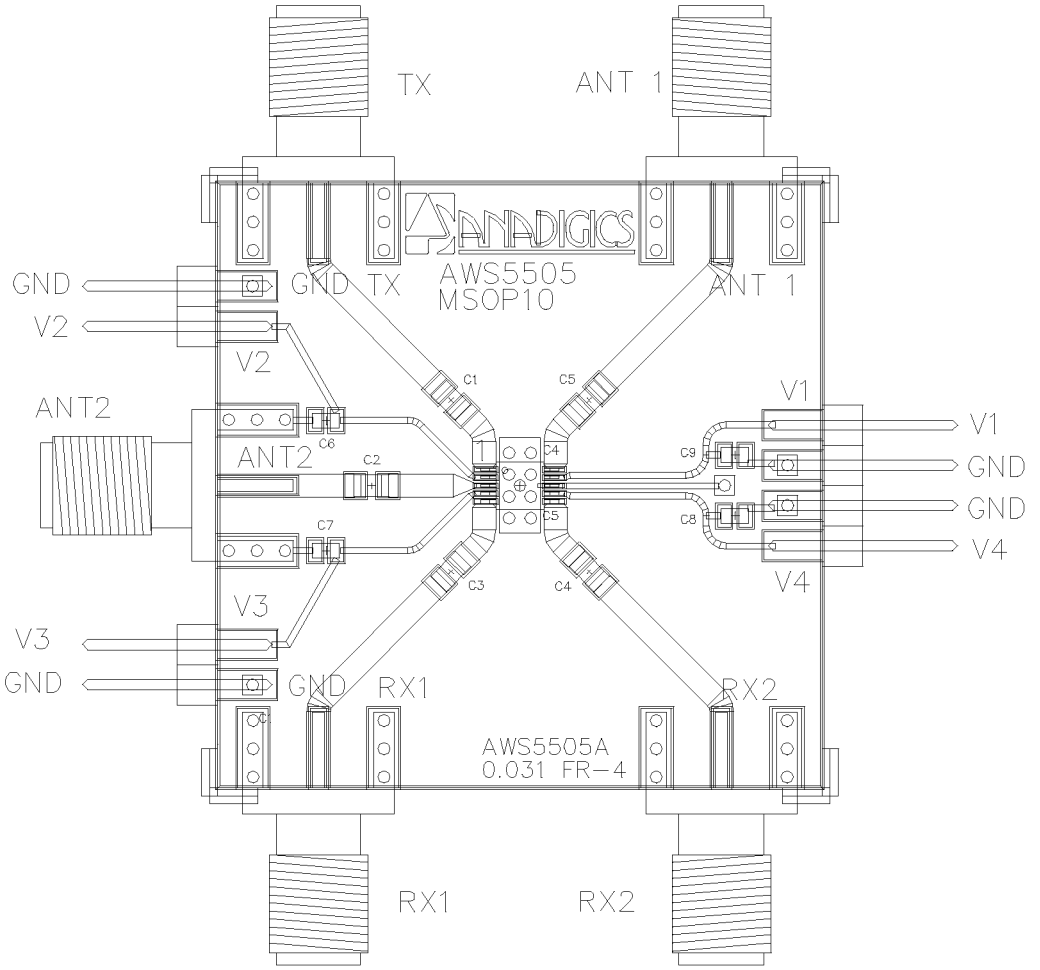
SWITCH SCHEMATIC



PIN OUT



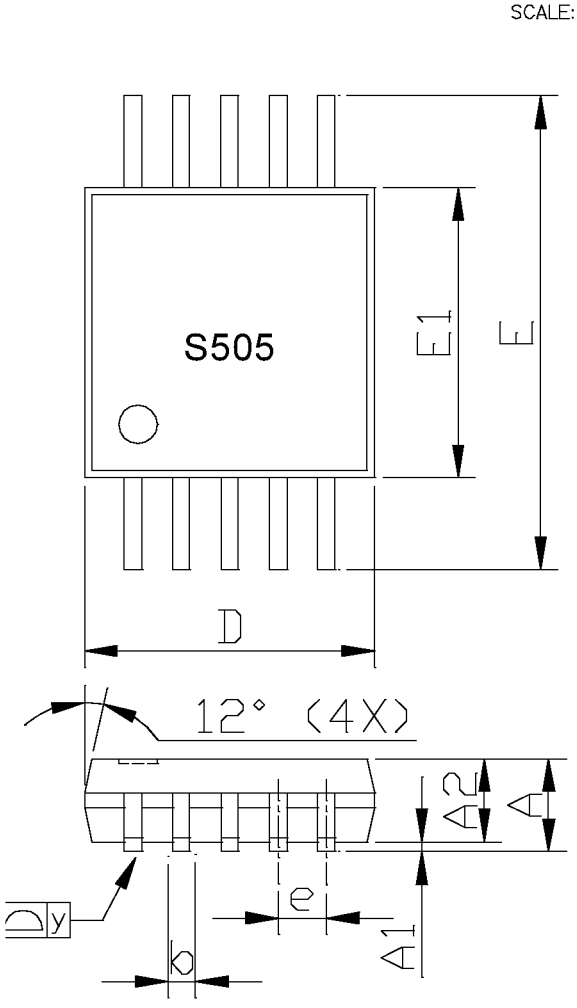
TEST CIRCUIT LAYOUT

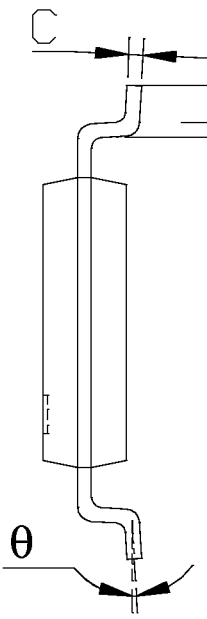


Pin	Function	Description
1	TX	Transmitter output can be connected to Antenna 1 or Antenna 2 in accordance to control voltage V1 and V2.
2	V2	Voltage control 2
3	ANT 2	Antenna 2 - This port is connected to antenna 2.
4	V3	Voltage control 3
5	RX1	Receier 1 - Connection of antenna 1 or 2 to RX1
126	RX2	Receiver 2 - Connection of antenna 1 or 2 to RX2
7	V4	Voltage control 4
8	GND	Ground
9	V1	Voltage control 1
10	ANT 1	Antenna 1 - This port is connected to antenna 1

PACKAGE OUTLINE DRAWING

SCALE: 15:1





NOTES:

1. **Package body sizes exclude mold flash and gate burrs.**
2. **Dimension L is measured in gage plane**
3. **Tolerance 0.10mm unless otherwise specified.**
4. **Controlling dimensions are metric. Converted inch dimensions are not necessarily exact.**

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	0.15	0.20	0.30	0.006	0.008	0.012
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	—	0.50	—	—	0.0197	—
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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