

GaAs SPDT IC 4 W T/R Switch DC–4 GHz



AH004R2-93

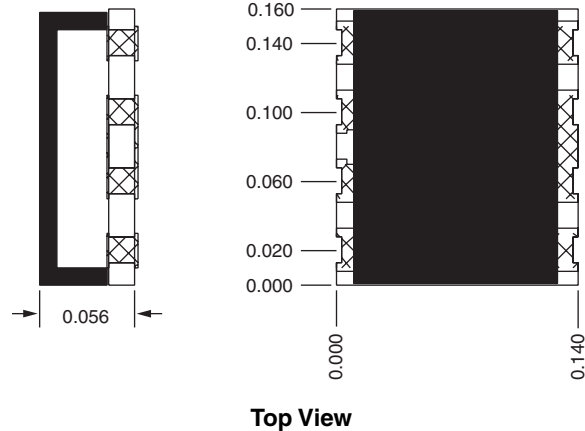
Features

- Low DC Power Consumption
- Low Insertion Loss
- High Linearity (56 dBm IP3)
- T/R Switch
- Small Low Cost “Chip on Board” Package

Description

The AH004R2-93 is an IC FET SPDT switch in a low cost “chip on board” package. It features extremely high linearity, low insertion loss, with very low DC power consumption. Some standard implementations include antenna changeover, T/R and diversity switching over 2 W. This switch can be used in many analog and digital wireless communication systems.

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Electrical Specifications at 25°C

Parameter ¹	Frequency ⁵	Min.	Typ.	Max.	Unit
Insertion Loss ²	DC–0.5 GHz		0.4	.5	dB
	DC–1.0 GHz		0.5	.6	dB
	DC–2.0 GHz		0.6	.8	dB
	DC–4.0 GHz		1.0	1.2	dB
Isolation	DC–0.5 GHz	35	38		dB
	DC–1.0 GHz	30	33		dB
	DC–2.0 GHz	20	25		dB
	DC–4.0 GHz	15	18		dB
VSWR ³	DC–0.5 GHz		1.3:1	1.4:1	
	DC–1.0 GHz		1.5:1	1.6:1	
	DC–2.0 GHz		1.6:1	1.8:1	
	DC–4.0 GHz		1.8:1	2.0:1	

Operating Characteristics at 25°C

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF)			6		ns
	On, Off (50% CTL to 90/10% RF)			12		ns
	Video Feedthru ⁴			30		mV
Input Power for 1 dB Compression	@ -5 V	0.9 GHz		27		dBm
	@ -10 V	0.9 GHz		35		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm, V _{High} = -10 V	0.9 GHz		56		dBm
Control Voltages	V _{Low} = 0 to -0.2 V @ 20 μA Max. V _{High} = -5 V @ 100 μA to -10 V @ 400 μA Max.					

1. All measurements made in a 50 Ω system, unless otherwise specified.

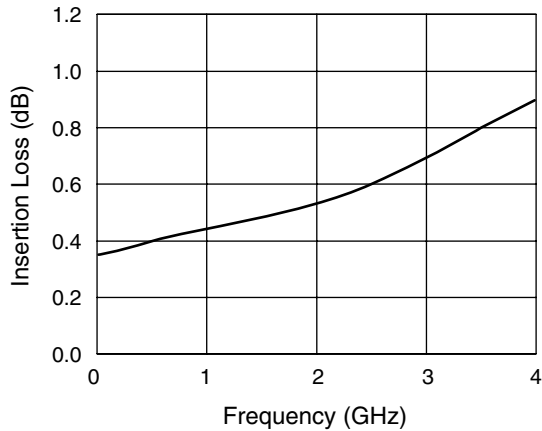
2. Insertion loss changes by 0.003 dB/°C.

3. Insertion loss state.

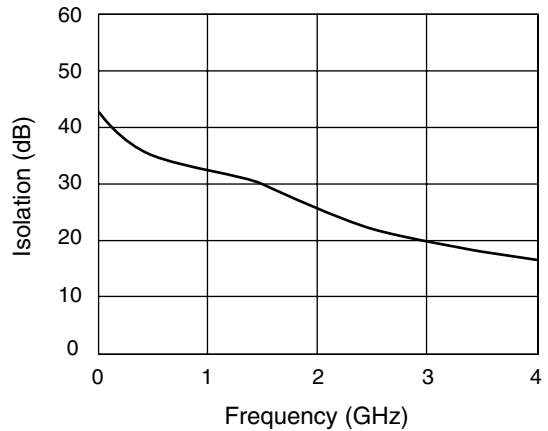
4. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

5. DC = 300 kHz.

Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency

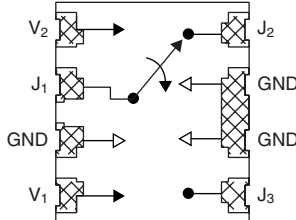
Truth Table

V ₁	V ₂	J ₁ -J ₂	J ₁ -J ₃
0	-5	Insertion Loss	Isolation
-5	0	Isolation	Insertion Loss

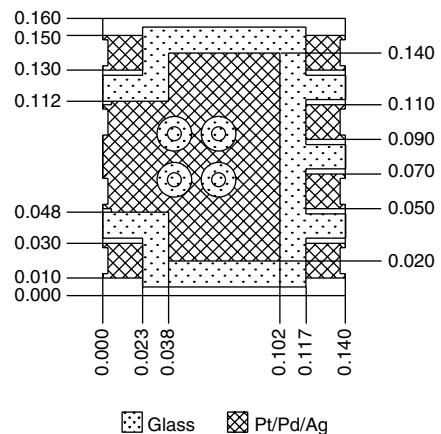
Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	6 W Max. > 900 MHz 0/-10 V Control
Control Voltage (V _C)	-0.2 V, -12 V
Operating Temperature (T _{OP})	-40°C to +90°C
Storage Temperature (T _{ST})	-65°C to +150°C
Thermal Resistance (Θ _{JC})	35°C/W

Pin Out



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Bottom View

The "chip on board" package is a ceramic leadless chip carrier with a ceramic lid, which allows for automatic pick and place. The external terminals and backside ground plane are Pt/Pd/Ag, which is highly leach resistant and very tolerant to variations in solder conditions. The glass fingers between contacts prevent the possibility of shorted terminals. The recommended solder attachment is a SN6337 (Pb/SN).