

GaAs IC SPDT Low Loss Switch Reflective DC–2.5 GHz



AS002R2-12

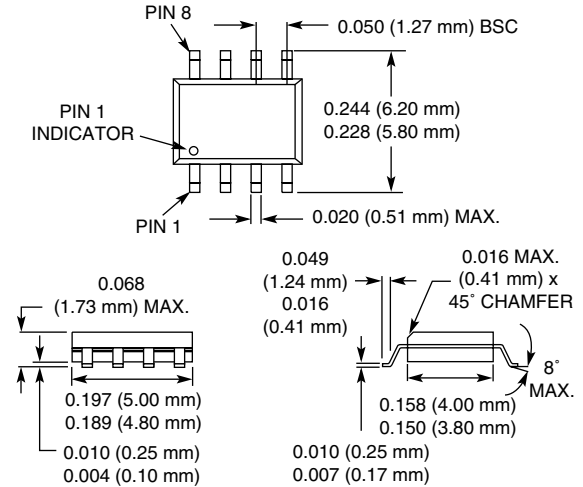
Features

- Low Insertion Loss (0.5 dB @ 0.9 GHz)
- High Isolation (35 dB @ 0.9 GHz)
- Low Power T/R Switch
- Low Cost SOIC-8 Plastic Package

Description

The AS002R2-12 is a low loss IC FET SPDT reflective general purpose switch in a plastic SOIC-8 package for commercial low cost, low power applications. The switch operates with -5, 0 V or 0, +5 V when “floated” as shown on the following page.

SOIC-8



Electrical Specifications at 25°C (0, -5 V)

Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.5 GHz		0.4	0.5	dB
	DC–1.0 GHz		0.5	0.6	dB
	DC–2.0 GHz		0.7	0.8	dB
	DC–2.5 GHz		0.8	0.9	dB
Isolation	DC–0.5 GHz	40	42		dB
	DC–1.0 GHz	30	32		dB
	DC–2.0 GHz	22	24		dB
	DC–2.5 GHz	18	20		dB
VSWR ⁴	DC–0.5 GHz		1.2:1	1.3:1	
	DC–1.0 GHz		1.3:1	1.5:1	
	DC–2.0 GHz		1.5:1		
	DC–2.5 GHz			1.7:1	

Operating Characteristics at 25°C (0, -5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			3		ns
	On, Off (50% CTL to 90/10% RF)			6		ns
	Video Feedthru			15		mV
Input Power for 1 dB Compression		0.50–2.0 GHz		+24		dBm
		0.05 GHz		+16		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.50–2.0 GHz		+46		dBm
Control Voltages	$V_{Low} = 0 \text{ to } -0.2 \text{ V @ } 20 \mu\text{A Max.}$ $V_{High} = -5 \text{ V @ } 50 \mu\text{A to } -8 \text{ V @ } 200 \mu\text{A Max.}$					

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

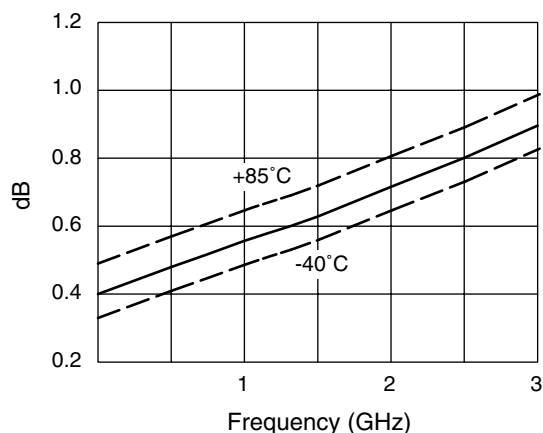
2. DC = 300 kHz.

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

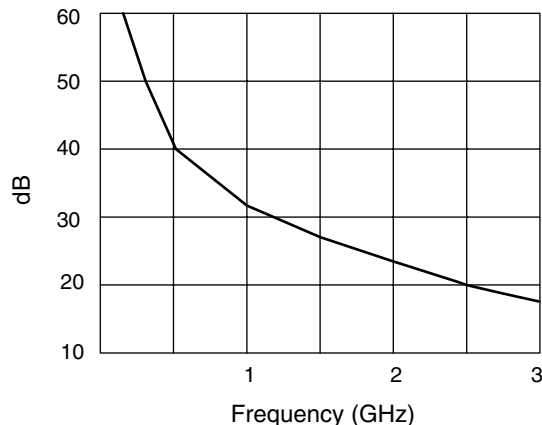
4. Insertion loss state.

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

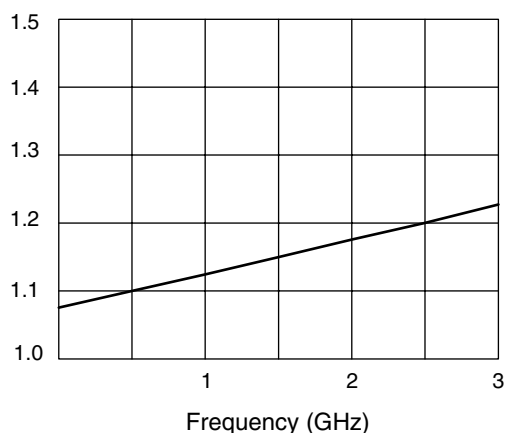
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

Negative Operation

V_1	V_2	J_1-J_2	J_1-J_3
0	-5	Isolation	Insertion Loss
-5	0	Insertion Loss	Isolation

Positive Operation

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

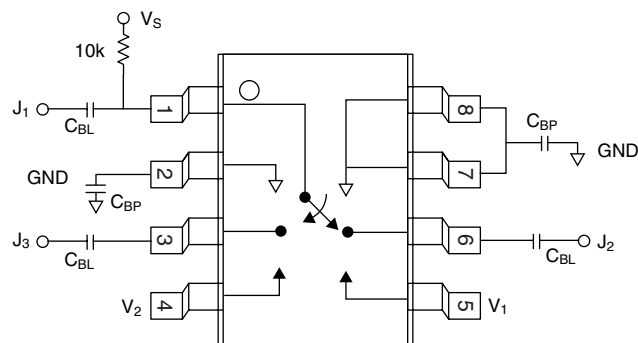
$$V_{\text{High}} = +5 \text{ to } +8 \text{ V } (V_{\text{S}} = V_{\text{High}} \pm 0.2 \text{ V}).$$

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	2 W > 500 MHz 0/-8 V 0.5 W @ 50 MHz 0/-8 V
Control Voltage	+0.2 V, -8 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	25°C/W

Note: Exceeding these parameters may cause irreversible damage.

Pin Out



External components shown are for positive voltage operation only.
 $C_{BI} = 100 \text{ pF}$, $C_{BP} = 1000 \text{ pF}$ for operation $> 500 \text{ MHz}$.