

GaAs IC SPDT Reflective Switch DC–2.5 GHz

AS239-12

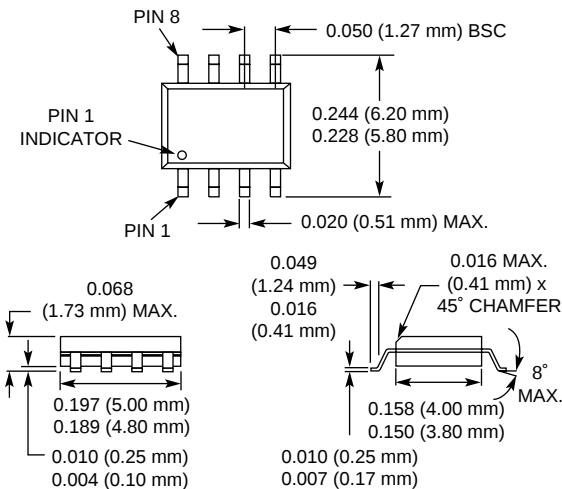
Features

- Low Insertion Loss (0.4 dB @ 1 GHz)
- High Isolation (35 dB @ 1 GHz)
- General Purpose Switching

Description

The AS239-12 is a low cost IC FET SPDT reflective switch in a plastic SOIC-8 package for commercial low cost, low power applications. The switch operates with -5 V, 0 V or operates with +5 V, 0 V when device is “floated” as shown on following page. This general purpose SPDT switch is used in many commercial telecommunication applications.

SOIC-8



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

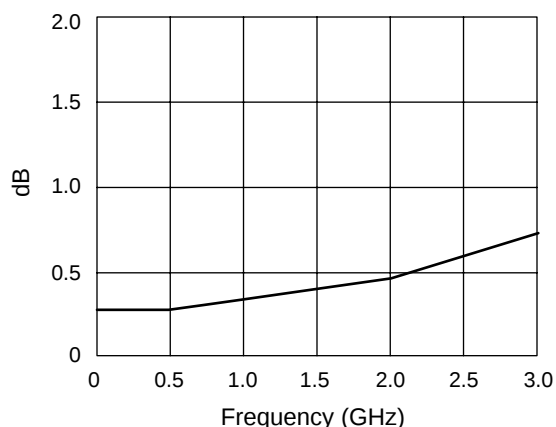
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.1 GHz		0.3	0.6	dB
	DC–0.5 GHz		0.3	0.6	dB
	DC–1.0 GHz		0.4	0.7	dB
	DC–2.0 GHz		0.5	0.8	dB
	DC–2.5 GHz		0.7	0.9	dB
Isolation	DC–0.1 GHz	52	56		dB
	DC–0.5 GHz	40	45		dB
	DC–1.0 GHz	30	35		dB
	DC–2.0 GHz	22	24		dB
	DC–2.5 GHz	17	20		dB
VSWR ⁴	DC–2.0 GHz			1.2:1	
	DC–2.5 GHz			1.5:1	

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

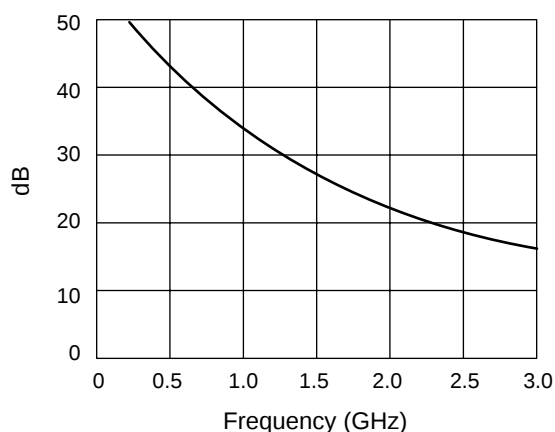
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			8		ns
	On, Off (50% CTL to 90/10% RF)			30		ns
	Video Feedthru			25		mV
Input Power for 1 dB Compression		0.5–2.0 GHz		+27		dBm
		0.05 GHz		+21		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +5 dBm	0.5–2.0 GHz		+46		dBm
		0.05 GHz		+40		dBm
Control Voltages	V _{Low} = 0 to -0.2 V @ 20 μA Max.					
	V _{High} = -5 V @ 20 μA to -7 V @ 200 μA 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.

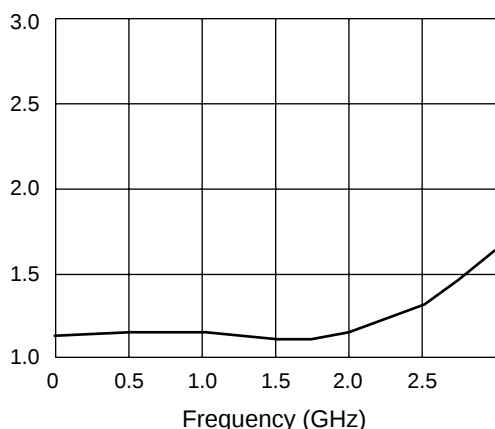
Typical Performance Data (0, -5 V)



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 Operation¹

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

$V_{High} = +5$ to $+7$ V ($V_S = V_{High} \pm 0.2$ V).

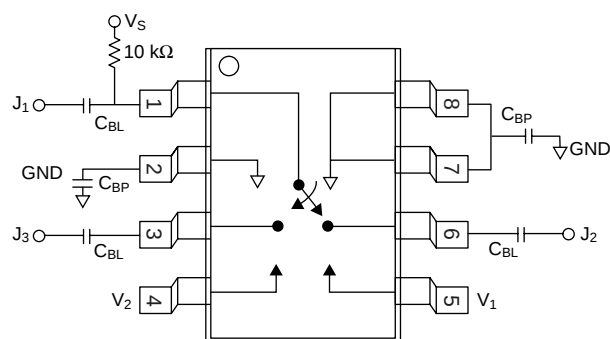
1. Refer to Application Notes for further information.

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



DC blocking (C_{BL}), bypass (C_{BP}) capacitors and biasing resistor supplied externally. $C_{BL} = 100$ pF, $C_{BP} = 1000$ pF for operation >500 MHz.