

GaAs IC SPDT Switch With Integral Driver Non-Reflective DC–2.5 GHz



AK002M2-12

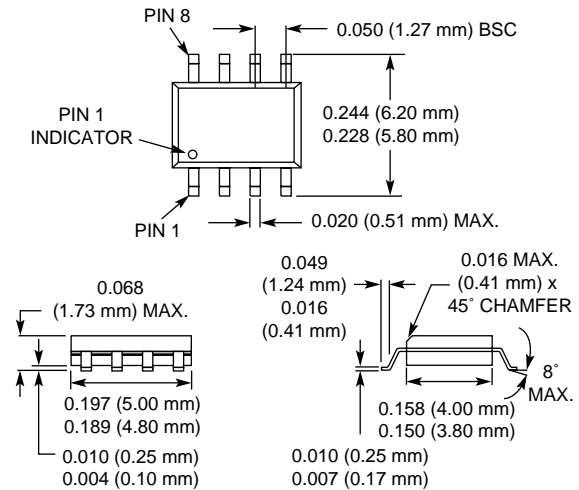
Features

- Low DC Current < 4 mA Total
- Non-Reflective
- Integral Driver ± 5 V Supply Voltages
- Low Cost SOIC-8 Plastic Package

Description

The GaAs FET IC SPDT non-reflective switch with integral driver is offered in the SOIC-8 package. These devices are useful as modulators as well as switches in instrumentation and telecommunications applications. The integral driver simplifies the external drive circuit, thus saving PC board space and reducing component count.

SOIC-8



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

Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.5 GHz		0.6	0.7	dB
	DC–1.0 GHz		0.7	0.8	dB
	DC–2.0 GHz		0.9	1.0	dB
	DC–2.5 GHz		1.0	1.1	dB
Isolation	DC–0.5 GHz	40	42		dB
	DC–1.0 GHz	30	32		dB
	DC–2.0 GHz	20	23		dB
	DC–2.5 GHz	15	17		dB
VSWR (I/O) ⁴	DC–0.5 GHz		1.3:1	1.5:1	
	DC–2.5 GHz		1.6:1	1.8:1	

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

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			10		ns
	On, Off (50% CTL to 90/10% RF)			20		ns
	Video Feedthru			30		mV
Input Power for 1 dB Compression		0.5–2.0 GHz		+23		dBm
		0.05 GHz		+15		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.5–2.0 GHz		+37		dBm
		0.05 GHz		+26		dBm
Logic Drives	V _{Low} (0)		0		0.2	V
	V _{High} (1)		4.5		5.0	V
Supply Voltages ^{6,7}	+5 V \pm 0.20 V @ 1 mA Typ.		4.8		5.2	V
	-5 V \pm 0.20 V @ 4 mA Typ.		-4.8		-5.2	V

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.

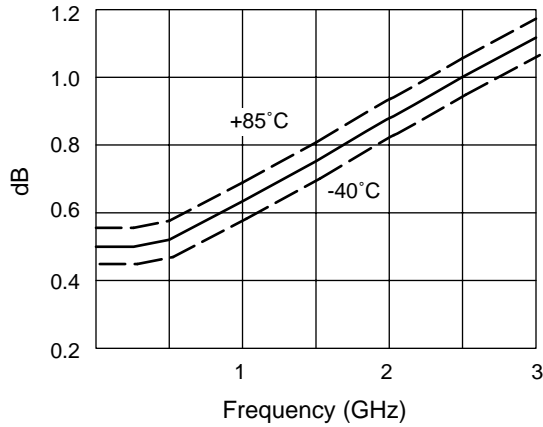
4. Insertion loss state.

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

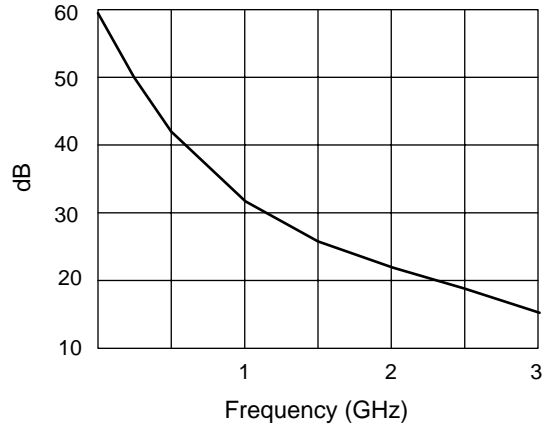
6. Supply voltage must be connected before control voltage is applied. Use of toggle switches or other similar components may produce voltage spikes which can cause irreversible damage to the device.

7. Current increases from 4 mA to 5 mA at +85°C.

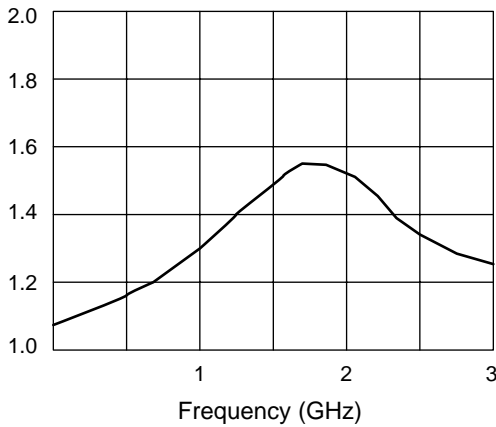
Typical Performance Data (+5 V, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

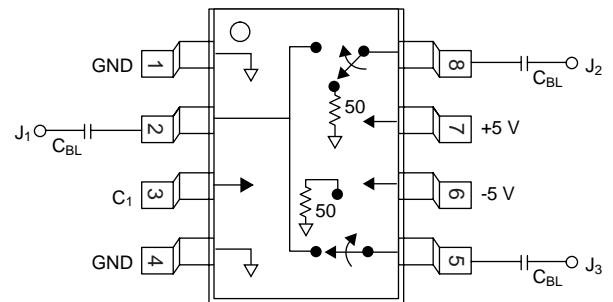
Characteristic	Value
RF Input Power	0.5 W > 500 MHz 0.1 W @ 50 MHz
Bias Voltage	+7 V, -7 V
Control Voltage	-0.2 V, +7 V
Operating Temperature	0°C to +70°C
Storage Temperature	-65°C to +150°C
θ_{JC}	30°C/W

Truth Table

C ₁	J ₁ -J ₂	J ₁ -J ₃
1	Insertion Loss	Isolation
0	Isolation	Insertion Loss

"0" = 0.0 to 0.2 V, "1" = 4.5 to 5.0 V.

Pin Out



DC blocking capacitors (C_{BL}) must be supplied externally.
C_{BL} = 100 pF for operation >500 MHz.