GaAs IC SPST Switch With Integral Driver Non-Reflective DC–4 GHz

AK004M1-11

Features

- Integral Driver ±5 V Supply Voltages
- High Isolation, Non-Reflective
- 8 Lead Hermetic Surface Mount Package
- Capable of Meeting MIL-STD Requirements[7]

Description

The AK004M1-11 is a GaAs IC FET SPST non-reflective switch with integral driver. This device is useful as a modulator and a switch in high reliability and commercial applications. It is ideal as building blocks for high isolation multithrow switches. The integral driver simplifies the external driver circuit, thus saving PC board space and reducing component count.

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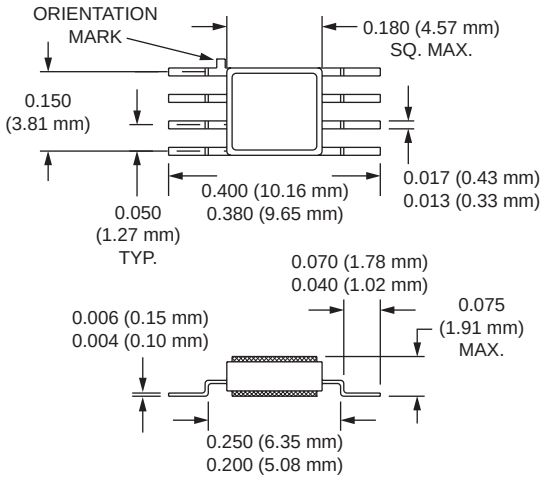


Electrical Specifications at 25°C

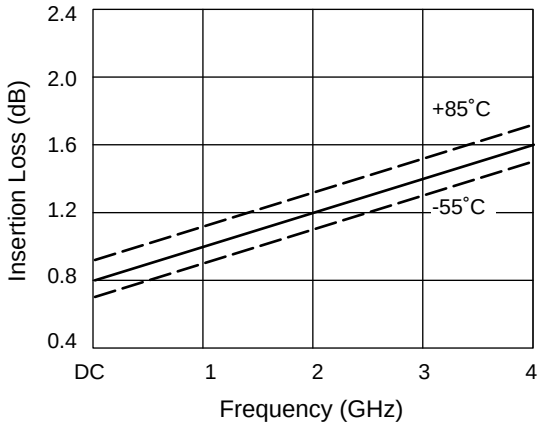
Parameter[1]	Frequency[6]	Min.	Typ.	Max.	Unit
Insertion Loss[2]	DC–1.0 GHz		0.9	1.1	dB
	DC–2.0 GHz		1.0	1.2	dB
	DC–4.0 GHz		1.4	1.6	dB
Isolation	DC–1.0 GHz	48	55		dB
	DC–2.0 GHz	42	48		dB
	DC–4.0 GHz	36	40		dB
VSWR (I/O)	DC–1.0 GHz		1.2:1	1.3:1	
	DC–2.0 GHz		1.3:1	1.5:1	
	DC–4.0 GHz		1.6:1	1.8:1	

Operating Characteristics at 25°C

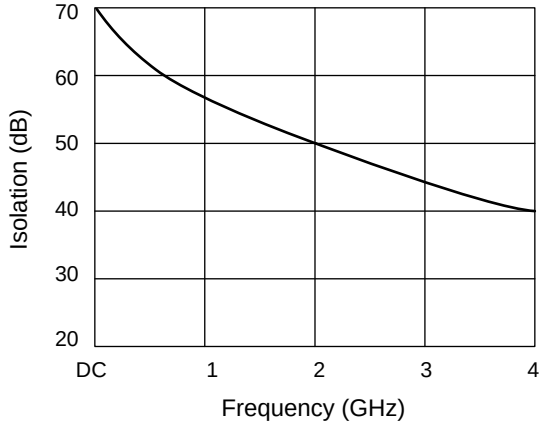
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF)			10	20	ns
	On, Off (50% CTL to 90/10% RF)			20	40	ns
	Video Feedthru[3]			30	40	mV
Input Power for 1 dB Compression		0.5–4 GHz	20	23		dBm
		0.001 GHz	12	15		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–4 GHz	34	37		dBm
		0.001 GHz	20	26		dBm
Control Voltages	V_{Low}		0		0.5	V
	V_{High}		4		5.5	V
Supply Voltages[4,5]	+5 V @ 1 mA Typ.		+4.75		+5.25	V
	-5 V @ 4 mA Typ.		-4.75		-5.25	V

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C.
3. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.
4. Supply voltage must be connected before TTL voltage is applied. To avoid voltage sequencing refer to the Application Note section, "Driver Protection Circuit."
5. Current increases from 4 mA to 5 mA @ 85°C.
6. DC = 300 kHz.
7. See Quality/Reliability section.

Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency

Truth Table

TTL	J_1–J_2
0	Isolation
1	Insertion Loss

Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	0.5 W > 500 MHz 0.1 W @ 50 MHz
Bias Voltage (V_B)	+7.0 V, -7.0 V
Control Voltage (V_C)	-0.2 V, +7.0 V
Operating Temperature (T_{OP})	-40°C to +90°C
Storage Temperature (T_{ST})	-65°C to +150°C
Thermal Resistance (Θ_{JC})	30°C/W

Pin Out