GaAs IC SP4T Non-Reflective Switch With Integral Driver DC–2 GHz

AN002M4-31

Features

- Integral Driver ±5 V Supply Voltages
- Non-Reflective All Ports
- Two Line Control
- Capable of Meeting MIL-STD Requirements[7]

Description

The AN002M4-31 ia a SP4T non-reflective FET MMIC switch. The switch consists of a GaAs SP4T chip and an integral translator and decoder for two line control. This unit is used in military switch filter banks, instruments and telecommunication applications.

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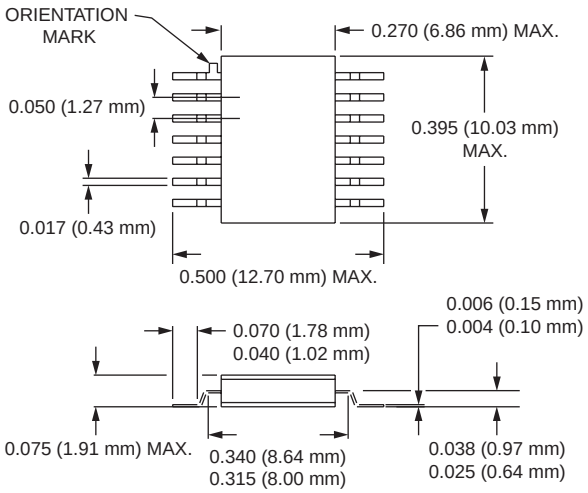


Electrical Specifications at 25°C

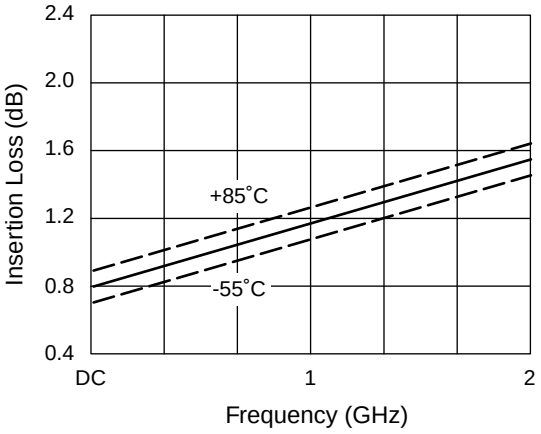
Parameter[1]	Frequency[6]	Min.	Typ.	Max.	Unit
Insertion Loss[2]	DC–0.5 GHz 0.5–1.0 GHz 1.0–2.0 GHz		1.0 1.2 1.5	1.1 1.4 1.7	dB dB dB
Isolation	DC–0.5 GHz 0.5–1.0 GHz 1.0–2.0 GHz	43 36 30	45 38 34		dB dB dB
VSWR (I/O)	DC–0.5 GHz 0.5–1.0 GHz 1.0–2.0 GHz		1.2:1 1.4:1 1.5:1	1.3:1 1.5:1 1.7:1	

Operating Characteristics at 25°C

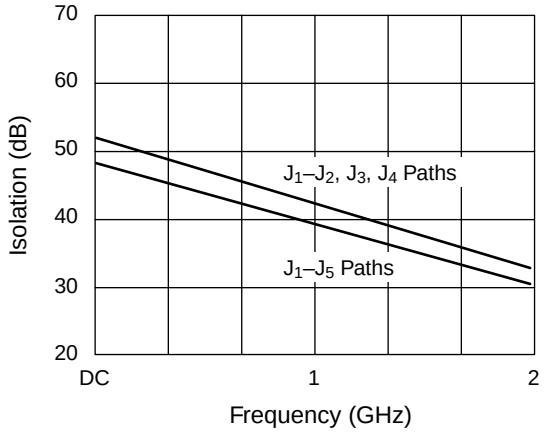
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru[3]			15 35 30		ns ns mV
Input Power for 1 dB Compression		0.5–2 GHz 0.001 GHz		24 16		dBm dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–2 GHz 0.02 GHz		40 29		dBm dBm
Control Voltages	V_{Low} V_{High}		0 2.0		0.8 5.5	V V
Supply Voltages[4,5]	+5 V @ 4 mA Typ. -5 V @ 16 mA Typ.		+4.75 -4.75		+5.25 -5.25	V 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. Bias voltage and ground 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 12 mA to 16 mA @ 85°C.
6. DC = 300 kHz.
7. See Quality/Reliability section.

Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency

Truth Table

Control Logic		Condition J_1 to			
C_0	C_1	J_2	J_3	J_4	J_5
0	1	Ins. Loss	Isolation	Isolation	Isolation
0	0	Isolation	Ins. Loss	Isolation	Isolation
1	1	Isolation	Isolation	Ins. Loss	Isolation
1	0	Isolation	Isolation	Isolation	Ins. Loss

Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	0.8 W > 500 MHz 0.2 W @ 50 MHz
Bias Voltage (V_B)	+7.0 V, -7.0 V
Control Voltage (V_C)	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

Do not allow control voltage to exceed bias voltage.

Pin Out