

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



AN002M4-05, AN002M4-78

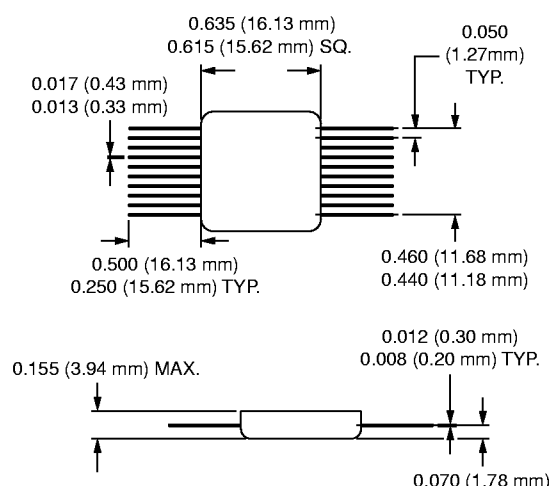
Features

- Integral Driver ± 5 V Supply Voltages
- Non-Reflective All Ports
- Two Line Control
- Capable of Meeting MIL-STD Requirements⁷

Description

The AN002M4-05 is a SP4T non-reflective FET MMIC switch. This switch consists of a GaAs SP4T chip with integral driver and silicon decoder chip. It is ideal for cellular base stations when channel switching is required. This unit is used in military switched filter banks, instruments and telecommunication applications. It requires two lines of logic control. The AN002M4-78 is the gullwing version for surface mount 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		1.3	1.5	dB
	0.50–1.0 GHz		1.4	1.6	dB
	1.00–2.0 GHz		1.7	1.9	dB
Isolation	DC–0.5 GHz	55	58		dB
	0.50–1.0 GHz	50	52		dB
	1.00–2.0 GHz	40	44		dB
VSWR (I/O)	DC–0.5 GHz		1.2:1	1.3:1	
	0.50–1.0 GHz		1.4:1	1.5:1	
	1.00–2.0 GHz		1.6:1	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)			15		ns
	On, Off (50% CTL to 90/10% RF)			50		ns
	Video Feedthru ³			30		mV
Input Power for 1 dB Compression	5 V (7 V)	0.5–2 GHz		24 (28)		dBm
		0.001 GHz		16 (20)		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–2 GHz		46		dBm
		0.02 GHz		35		dBm
Control Voltages	V _{Low}		0		0.8	V
	V _{High}		2.0		5.5	V
Supply Voltages ^{4,5}	5 V @ 50 μ A Typ. 7 V @ 100 μ A Typ.					

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.

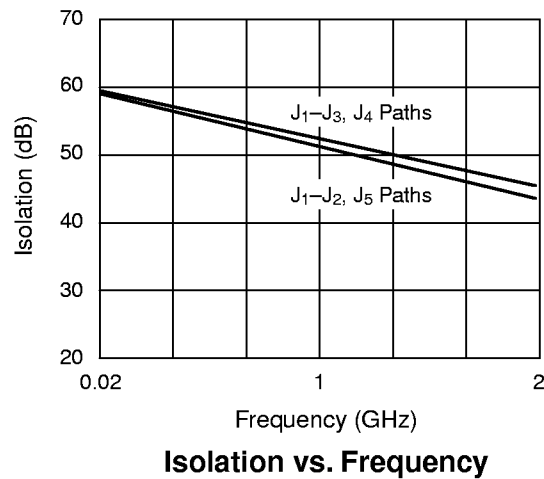
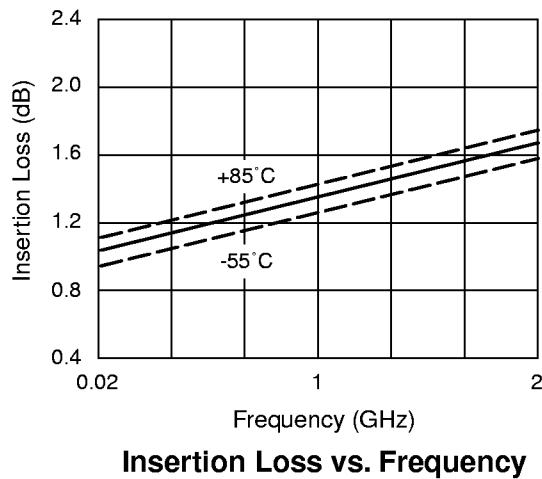
To avoid voltage sequencing refer to the Application Note section, "Driver Protection Circuit."

5. Current increases from 3 mA to 4 mA @ 85 °C.

6. DC = 300 kHz.

7. See Quality/Reliability section.

Typical Performance Data



Truth Table

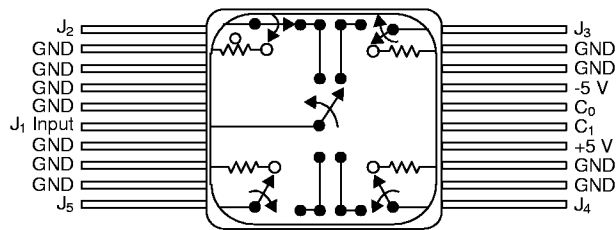
Control Logic		Condition J ₁ to			
C ₀	C ₁	J ₂	J ₃	J ₄	J ₅
0	0	Isolation	Isolation	Isolation	Ins. Loss
0	1	Isolation	Ins. Loss	Isolation	Isolation
1	0	Isolation	Isolation	Ins. Loss	Isolation
1	1	Ins. Loss	Isolation	Isolation	Isolation

Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	2 W > 500 MHz 0/7 V 0.5 W @ 50 MHz 0/7 V
Bias Voltage (V _B)	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})	25 °C/W

Do not allow control voltage to exceed bias voltage.

Pin Out



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