

# GaAs IC SP4T Switch Chip Non-Reflective DC–2 GHz



AS002M4-00

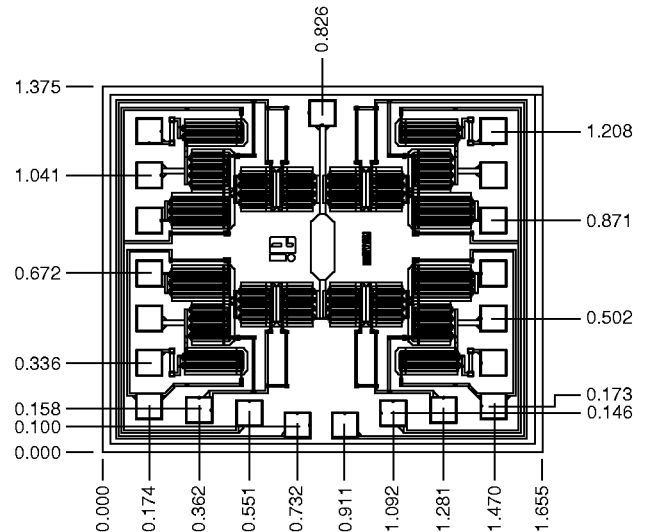
## Features

- Fully Passivated
- Non-Reflective All Ports
- Excellent Intermodulation and Temperature Stability
- Fast Switching, Low Transients

## Description

The AS002M4-00 switch is designed for applications up to 6 GHz where multi-through switching is required. The chip is a rugged .008" thick, and has a fully passivated surface allowing for ease of handling for MCM assemblies. Ti/W/Au gate metal makes this product ideal for commercial, SatCom and military applications. All devices are 100% tested on-wafer and inspected to MIL-STD-883 MT 2010. Element evaluation can be performed to MIL-PRF-38534 Class H or K on request.

## Chip Outline



## Electrical Specifications at 25°C

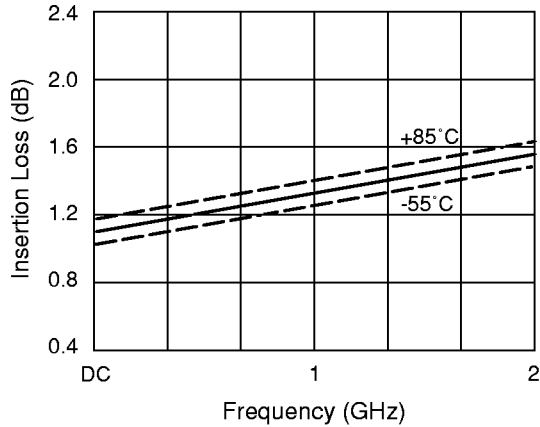
Parameter <sup>1</sup>	Frequency <sup>4</sup>	Min.	Typ.	Max.	Unit
Insertion Loss <sup>2</sup>	DC–0.5 GHz		1.0	1.2	dB
	DC–1.0 GHz		1.2	1.4	dB
	DC–2.0 GHz		1.4	1.6	dB
Isolation	DC–0.5 GHz	55	58		dB
	DC–1.0 GHz	50	52		dB
	DC–2.0 GHz	45	48		dB
VSWR (I/O)	DC–1.0 GHz		1.3:1	1.4:1	
	DC–2.0 GHz		1.5:1	1.6:1	

## Operating Characteristics at 25°C

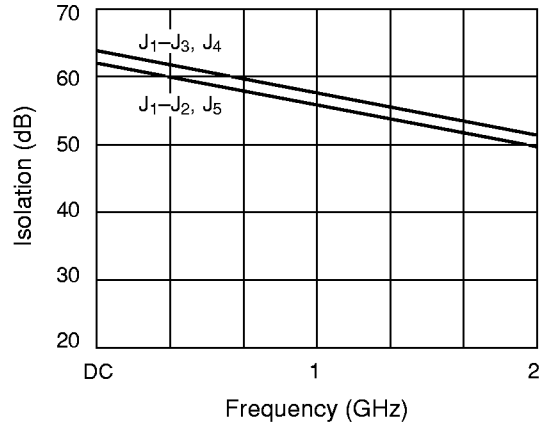
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF)			10		ns
	On, Off (50% CTL to 90/10% RF)			20		ns
	Video Feedthru <sup>3</sup>			30		mV
Input Power for 1 dB Compression Control Voltages (V <sub>C</sub> )	0/-5 V (0/-8 V)	0.5–2 GHz		24 (30)		dBm
		0.001 GHz		16 (20)		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–2 GHz		40		dBm
		0.001 GHz		29		dBm
Control Voltages	V <sub>Low</sub> = 0 to -0.2 V @ 20 μA Max. V <sub>High</sub> = -5 V @ 50 μA to -9 V @ 200 μA Max.					

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. DC = 300 kHz.

Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency

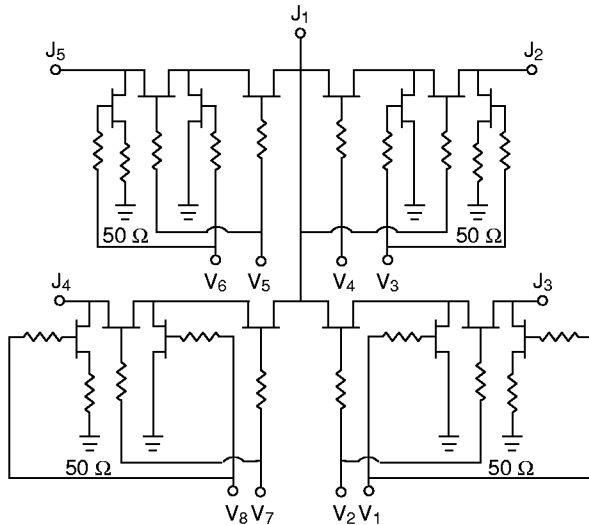
Truth Table

V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	V <sub>4</sub>	V <sub>5</sub>	V <sub>6</sub>	V <sub>7</sub>	V <sub>8</sub>	Insertion Loss Path J <sub>1</sub> to:
0	-5	-5	0	-5	0	-5	0	J <sub>2</sub>
-5	0	0	-5	-5	0	-5	0	J <sub>3</sub>
0	-5	0	-5	-5	0	0	-5	J <sub>4</sub>
0	-5	0	-5	0	-5	-5	0	J <sub>5</sub>

Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	2 W > 500 MHz 0/-8 V 0.5 W @ 50 MHz 0/-8 V
Control Voltage (V <sub>C</sub> )	+0.2 V, -10 V
Operating Temperature (T <sub>OP</sub> )	-55°C to +125°C
Storage Temperature (T <sub>ST</sub> )	-65°C to +150°C
Thermal Resistance (Θ <sub>JC</sub> )	25°C/W

Switch Schematic



Chip Layout

