

# GaAs IC SPST Switch With Integral Driver Non-Reflective DC–6 GHz



AK006M1-93

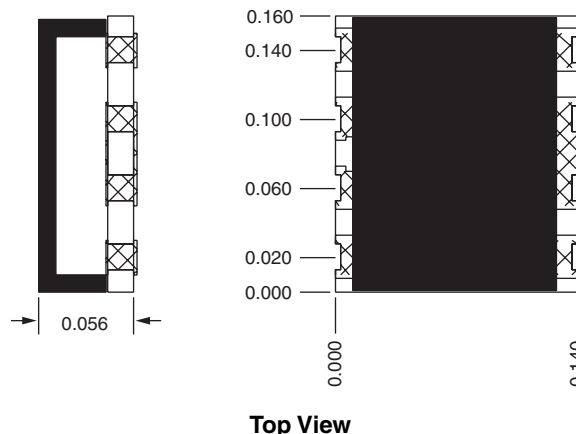
## Features

- Integral Driver  $\pm 5$  V Supply Voltages
- High Isolation, Non-Reflective
- Broadband DC–6 GHz
- Small Low Cost “Chip on Board” Package

## Description

The AK006M1-93 is an IC FET SPST switch in a low cost “chip on board” package. It features non-reflective matching at each RF broadband performance, with integral driver. This switch can be used in many analog and digital wireless communication systems.

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## Electrical Specifications at 25°C

Parameter <sup>1</sup>	Frequency <sup>6</sup>	Min.	Typ.	Max.	Unit
Insertion Loss <sup>2</sup>	DC–1.0 GHz		0.6	0.8	dB
	DC–2.0 GHz		1.0	1.2	dB
	DC–4.0 GHz		1.4	1.6	dB
	DC–6.0 GHz		1.8	2.0	dB
Isolation	DC–1.0 GHz	50	55		dB
	DC–2.0 GHz	45	50		dB
	DC–4.0 GHz	42	45		dB
	DC–6.0 GHz	40	42		dB
VSWR (I/O)	DC–1.0 GHz		1.3:1	1.4:1	
	DC–2.0 GHz		1.5:1	1.6:1	
	DC–4.0 GHz		1.7:1	1.8:1	
	DC–6.0 GHz		1.9:1	2.0:1	

## 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 <sup>3</sup>			30	40	mV
Input Power for 1 dB Compression		0.5–6 GHz	20	23		dBm
		0.001 GHz	12	15		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–6 GHz	34	37		dBm
		0.001 GHz	22	26		dBm
Control Voltages	V <sub>Low</sub>		0		0.5	V
	V <sub>High</sub>		4		5.5	V
Supply Voltages <sup>4,5</sup>	+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  $\Omega$  system, unless otherwise specified.

2. Insertion loss changes by 0.003 dB/°C.

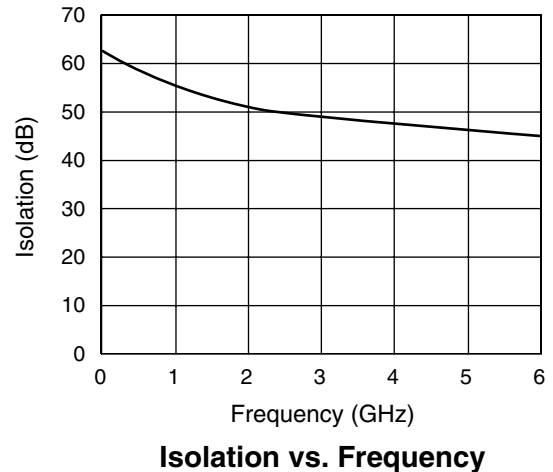
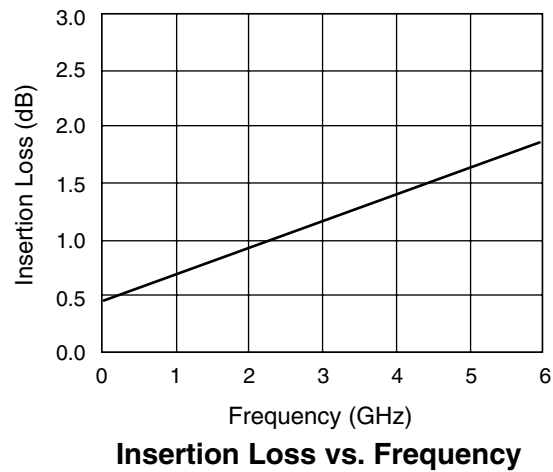
3. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

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.

Typical Performance Data



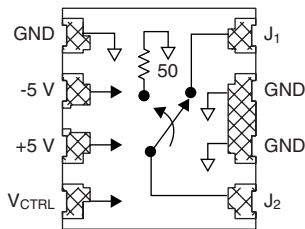
Truth Table

V <sub>CTRL</sub>	J <sub>1</sub> –J <sub>2</sub>
1	Insertion Loss
0	Isolation

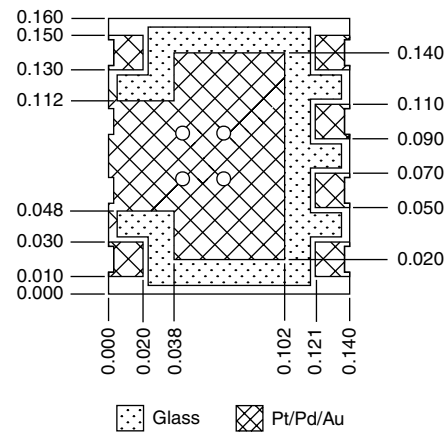
Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	0.5 W > 500 MHz 0.1 W @ 50 MHz
Bias Voltage (V <sub>B</sub> )	+7.0 V, -7.0 V
Control Voltage (V <sub>C</sub> )	-0.2 V, +7.0 V
Operating Temperature (T <sub>OP</sub> )	-40°C to +90°C
Storage Temperature (T <sub>ST</sub> )	-65°C to +150°C
Thermal Resistance (Θ <sub>JC</sub> )	30°C/W

Pin Out



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Bottom View

The “chip on board” package is a ceramic leadless chip carrier with a ceramic lid, which allows for automatic pick and place. The external terminals and backside ground plane are Pt/Pd/Au, which is highly leach resistant and very tolerant to variations in solder conditions. The glass fingers between contacts prevent the possibility of shorted terminals. The recommended solder attachment is a SN6337 (Pb/SN).