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

Alpha

AK006M2-93

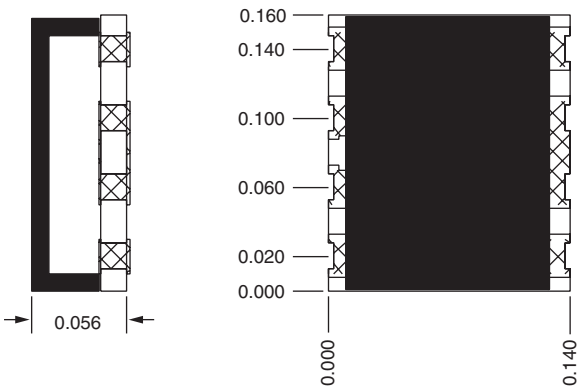
Features

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

Description

The AK006M2-93 is an IC FET SPDT switch in a low cost “chip on board” package. It features non-reflective matching at each output, broadband performance, with integral driver. This switch can be used in many analog and digital wireless communication systems.

-93



Top View

Electrical Specifications at 25°C

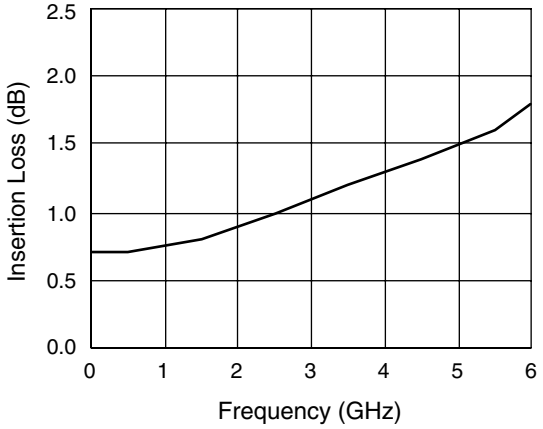
Parameter[1]	Frequency[6]	Min.	Typ.	Max.	Unit
Insertion Loss[2]	DC–1.0 GHz		0.7	0.8	dB
	DC–2.0 GHz		1.0	1.2	dB
	DC–4.0 GHz		1.4	1.6	dB
	DC–6.0 GHz		1.8	2.0	dB
Isolation	DC–1.0 GHz	48	52		dB
	DC–2.0 GHz	42	48		dB
	DC–4.0 GHz	36	37		dB
	DC–6.0 GHz	26	30		dB
VSWR (I/O)	DC–1.0 GHz		1.3:1	1.4:1	
	DC–2.0 GHz		1.4:1	1.6:1	
	DC–4.0 GHz		1.6:1	1.8:1	
	DC–6.0 GHz		1.8:1	2.0:1	

Operating Characteristics at 25°C

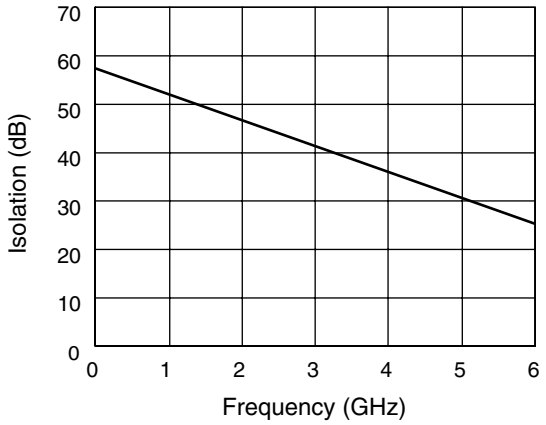
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF)			10	20	ns
	On, Off (50% CTL to 90/10% RF)			20	40	ns
	Video Feedthru[3]			30	40	mV
Input Power for 1 dB Compression		0.5–6 GHz	20	23		dBm
		0.001 GHz	12	15		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–6 GHz	34	37		dBm
		0.001 GHz	22	26		dBm
Control Voltages	V_{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. The supply 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 4 mA to 5 mA @ 85°C.
6. DC = 300 kHz.

Typical Performance Data



Insertion Loss vs. Frequency

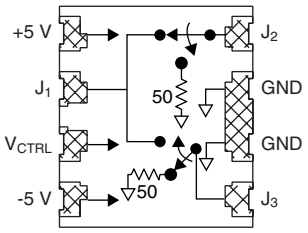


Isolation vs. Frequency

Truth Table

V_{CTRL}	J_1–J_2	J_1–J_3
1	Insertion Loss	Isolation
0	Isolation	Insertion Loss

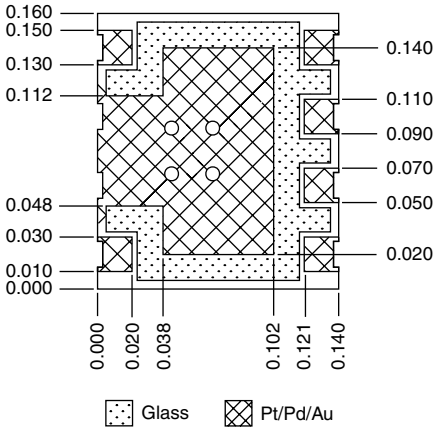
Pin Out



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

-93



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).