GaAs IC SP4T Non-Reflective Switch With Integral Driver DC–3 GHz

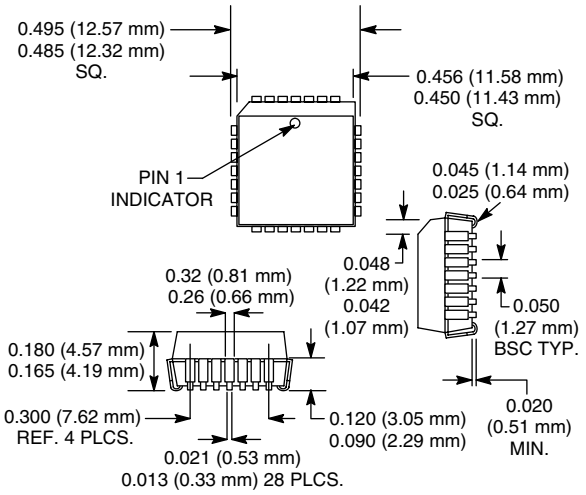
SKYWORKS

AK002M4-47

Features

- Integral Driver ±5 V Supply Voltages
- PLCC-28 Plastic Package
- Single Voltage Control for Each Port
- Non-Reflective on All Ports
- Base Station Switch Matrix Applications

PLCC-28



Description

The AK002M4-47 is a SP4T non-reflective FET IC switch. The switch consists of a GaAs SP4T chip and an integral driver. This unit is ideal for cellular base station switch matrices.

Electrical Specifications at 25°C (+5, -5 V)

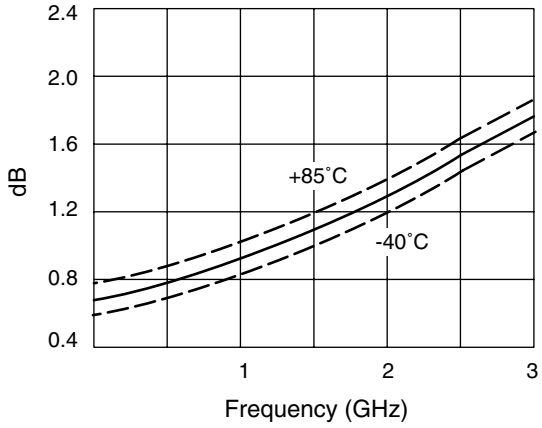
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz		0.8	1.1	dB
	DC–1.0 GHz		1.0	1.4	dB
	DC–2.0 GHz		1.3	1.6	dB
	DC–3.0 GHz		1.8	2.1	dB
Isolation	DC–0.5 GHz	48	51		dB
	DC–1.0 GHz	40	42		dB
	DC–2.0 GHz	29	33		dB
	DC–3.0 GHz	25	28		dB
VSWR[4]	DC–0.5 GHz		1.3:1	1.5:1	
	DC–1.0 GHz		1.5:1	1.7:1	
	DC–3.0 GHz		1.7:1	1.9:1	

Operating Characteristics at 25°C (+5, -5 V)

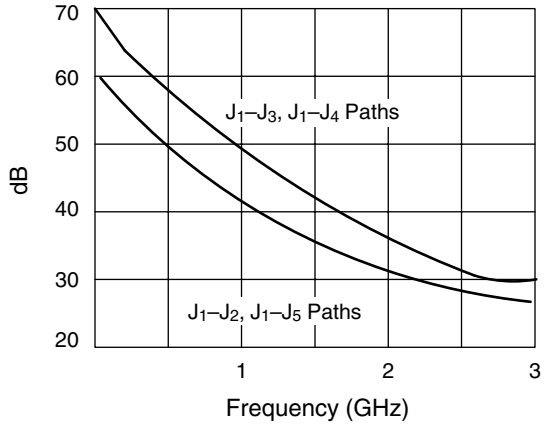
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF)			15		ns
	On, Off (50% CTL to 90/10% RF)			35		ns
	Video Feedthru			30		mV
Input Power for 1 dB Compression		0.50–3.0 GHz		+24		dBm
		0.05 GHz		+16		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.50–3.0 GHz		+40		dBm
		0.05 GHz		+29		dBm
Control Voltages	V_{Low}		0.0		0.2	V
	V_{High}		4.5		5.0	V
Supply Voltages	+5 V ± 0.2 V @ 3 mA Typ.					
	-5 V ± 0.20 V @ 16 mA Typ.[6,7]					

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. DC = 300 kHz.
3. Insertion loss changes by 0.003 dB/°C.
4. Input/Output.
5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.
6. Supply voltage and ground must be connected before control voltage is applied to avoid irreversible damage to the device.
7. Current increases from 16 mA to 20 mA @ +85°C.

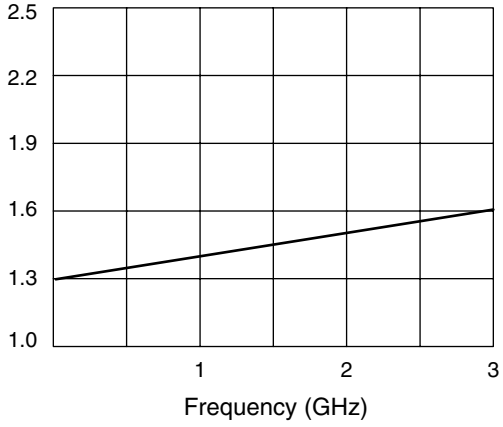
Typical Performance Data (+5, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	0.8 W > 500 MHz 0.2 W @ 50 MHz
Supply Voltage	+7.0 V, -7 V
Control Voltage	-0.2 V, +7.0 V
Operating Temperature	0°C to +70°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	30°C/W

Truth Table

Insertion Loss Path J_1 to:	J_2	J_3	J_4	J_5
	C_2	C_3	C_4	C_5
J_2	0	1	1	1
J_3	1	0	1	1
J_4	1	1	0	1
J_5	1	1	1	0

"0" = 0.0 to 0.2 V, "1" = 4.5 to 5.0 V.

Pin Out