HIGH ISOLATION SPST SWITCH MODULE, DC - 20 GHz



Features

High Isolation: 100 dB up to 4 GHz
65 dB up to 20 GHz

Low Insertion Loss: 3.5 dB @ 10 GHz
4.0 dB @ 16 GHz

Fast Switching RF Pulse Modulator

Non-Reflective Topology

Hermetically Sealed Module

Field Replaceable SMA connectors

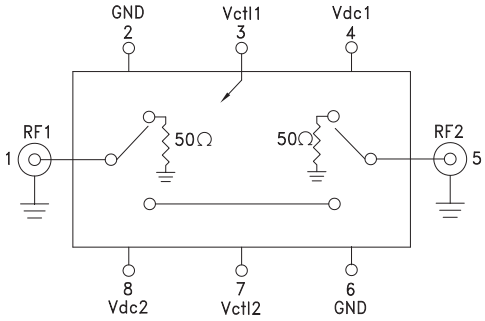
-55 °C to +85 °C Operating Temperature

Typical Applications

The HMC-C019 is ideal for:

- Basestation Infrastructure
- Fiber Optics & Broadband Telecom
- Microwave Radio & VSAT
- Military Radios, Radar, & ECM
- Test Instrumentation

Functional Diagram



General Description

The HMC-C019 is a high speed, high isolation GaAs MESFET SPST switch housed in a miniature hermetic module with field replaceable SMA connectors. Covering DC to 20 GHz, the switch features 100 dB isolation up to 4 GHz and 65 dB isolation up to 20 GHz. CMOS interface allows a positive +5V bias voltage at very low DC currents. This non-reflective switch exhibits very fast switching speeds, with very low switching transients making it ideal for high speed RF pulse modulation applications.

Electrical Specifications

T_A = +25° C, With Vdc1, Vdc2 = +5V & 0/+5V Control, 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 4 GHz DC - 16 GHz DC - 20 GHz		3.0 4.0 6.0	3.5 5.5 9.0	dB dB dB
Isolation	DC - 4 GHz DC - 10 GHz DC - 16 GHz DC - 20 GHz	90 75 70 60	100 80 75 65		dB dB dB dB
Return Loss RF1 & RF2 "On State & Off State"	DC - 12 GHz DC - 20 GHz		12 8		dB dB
Input Power for 1 dB Compression	0.5 - 20 GHz	20	23		dBm
Input Third Order Intercept (Two-Tone Input Power= +7 dBm Each Tone)	0.5 - 10 GHz 0.5 - 20 GHz		45 43		dBm dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 20 GHz		 2.5 8.5		 ns ns
Switching Transients	DC - 20 GHz		20		mVpp

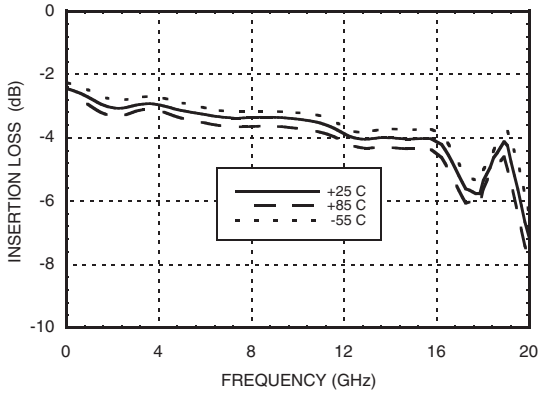
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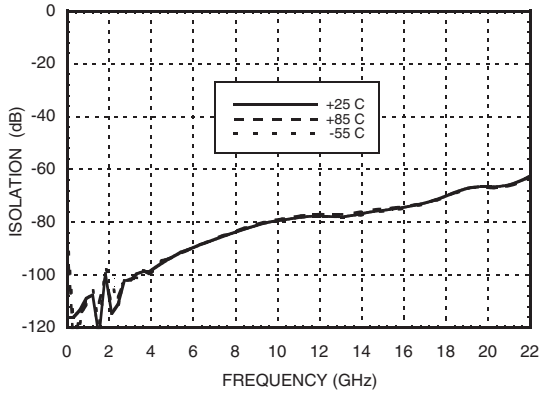
RoHS✓ EARTH FRIENDLY

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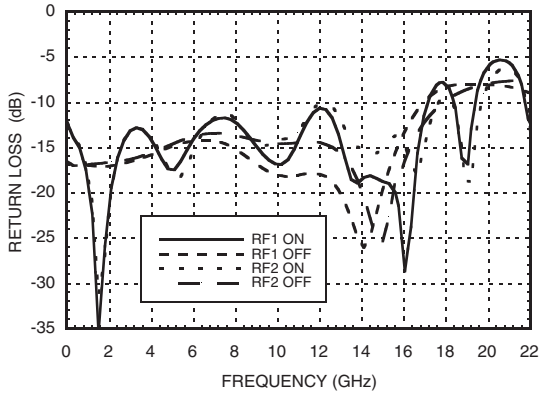
Insertion Loss



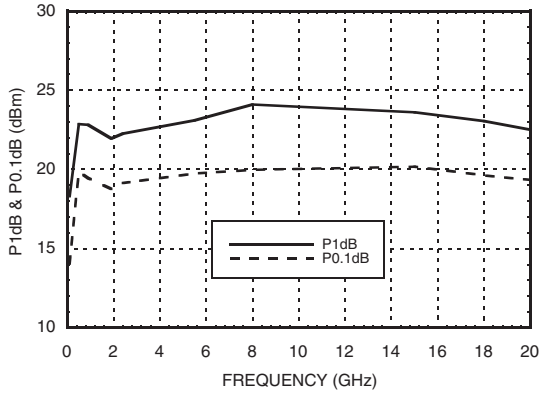
Isolation



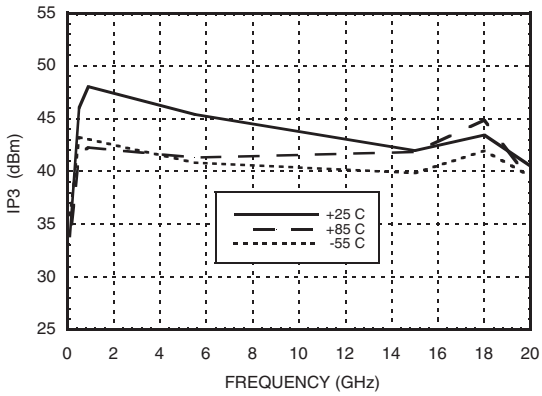
Return Loss



Input P0.1dB & P1dB Compression Point



Input Third Order Intercept Point



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Absolute Maximum Ratings

RF Input Power	+27 dBm
Supply Voltage (Vdc1, Vdc2)	+7V
Control Voltage Range (Vctl1, Vctl2)	-0.5V to Vdd +0.5V
Hot Switch Power Level	+23 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Control Voltages Vctl1 & Vctl2

State	Bias Condition
High	+3.5 to Vdc @ 1 mA Typ.
Low	0 to +1.5V @ 20 µA Typ.

Truth Table

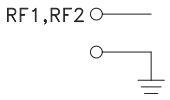
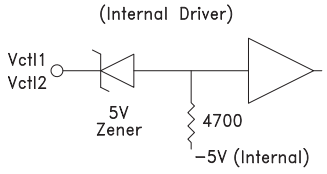
Control Input (Vctl1 & Vctl2)	RF1 to RF2 Path
High	On
Low	Off

Bias Voltage & Current

Vdc Range = +5 Vdc ± 10%	
Vdc1 & Vdc2 (V)	Idc (Typ.) (mA)
+5	2.8

(Bias current increases with switching rate to 15 - 20 mA.)

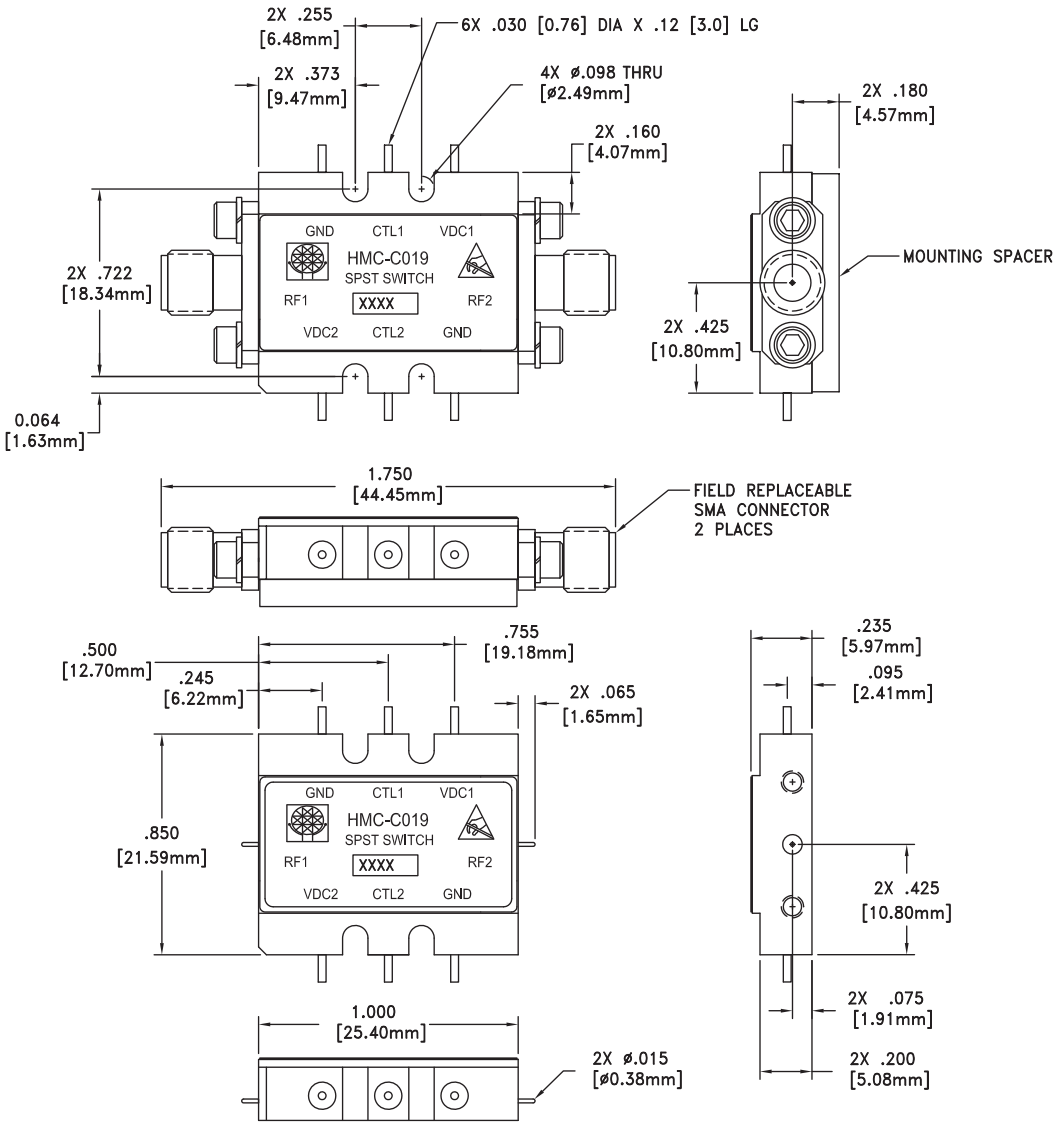
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 5	RF1, RF2	RF connector, SMA female, field replaceable. These pins are DC coupled and matched to 50 Ohms. DC blocking capacitors are required if external RF line potential is not equal to 0V.	
2, 6	GND	Power supply ground.	
3, 7	Vctl1, Vctl2	CMOS interface, control voltages per table. Requires active pullup to +5V.	
4, 8	Vdc1, Vdc2	Supply voltage (+5V ±10%)	

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Outline Drawing



VIEW SHOWN WITH CONNECTORS REMOVED

Package Information

Package Type	C-9
Package Weight [1]	18.7 gms [2]
Spacer Weight	3.3 gms [2]

[1] Includes the connectors

[2] ±1 gms Tolerance

NOTES:

1.O PACKAGE, LEADS, COVER MATERIAL: KOVAR™

2.0 FINISH: GOLD PLATE OVER NICKEL PLATE

3.0 ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].

4.0 TOLERANCES:

4.1 .XX = %%P.02

4.2 .XXX = %%P.010

5.0 MARK LOT NUMBER ON .080 X .250 LABEL WHERE SHOWN, WITH .030 MIN TEXT HEIGHT.

6.0 MOUNTING SPACER PART NUMBER 111532.

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