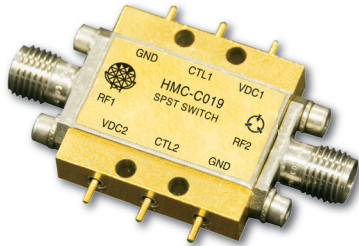


HIGH ISOLATION SPST SWITCH MODULE, DC - 20.0 GHz

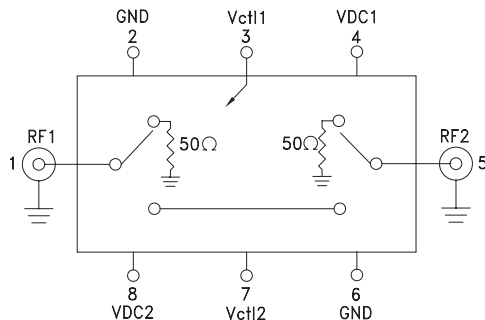


Typical Applications

The HMC-C019 is ideal for:

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

Functional Diagram



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 to +85 °C Operating Temperature

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

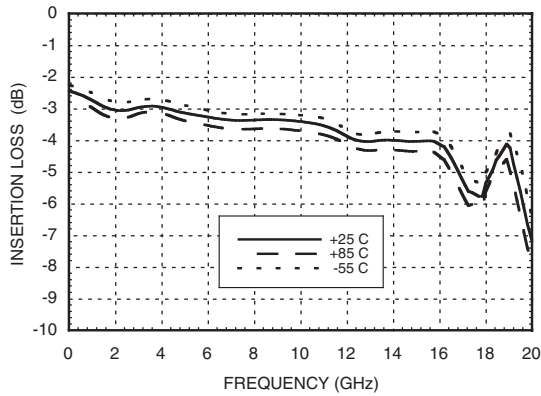
$T_A = +25^\circ \text{C}$, With VDC1, VDC2 = +5V & 0/+5V Control, 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 4.0 GHz		3.0	3.3	dB
	DC - 16.0 GHz		4.0	4.5	dB
	DC - 20.0 GHz		6.0	8.0	dB
Isolation	DC - 4.0 GHz	90	100		dB
	DC - 10.0 GHz	75	80		dB
	DC - 16.0 GHz	70	75		dB
	DC - 20.0 GHz	60	65		dB
Return Loss RF1 & RF2 "On State & Off State"	DC - 12.0 GHz		12		dB
	DC - 20.0 GHz		8		dB
Input Power for 1 dB Compression	0.5 - 20.0 GHz	20	23		dBm
Input Third Order Intercept (Two-Tone Input Power= +7 dBm Each Tone)	0.5 - 10.0 GHz		45		dBm
	0.5 - 20.0 GHz		43		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 20 GHz		2.5		ns
			8.5		ns
Switching Transients	DC - 20 GHz		20		mVpp

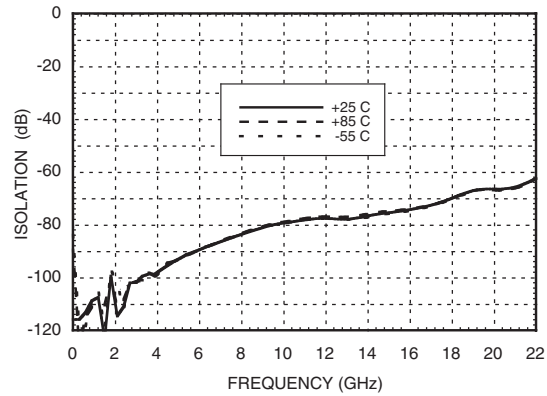
For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
 20 Alpha Road, Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373
 Order On-line at www.hittite.com

**HIGH ISOLATION SPST SWITCH
MODULE, DC - 20.0 GHz**

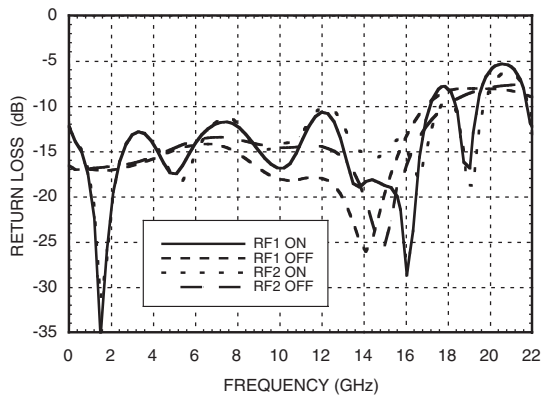
Insertion Loss



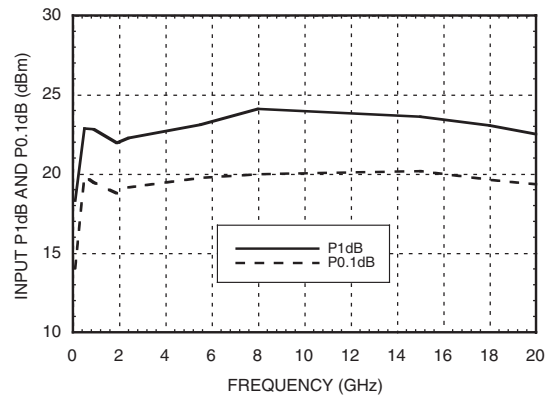
Isolation



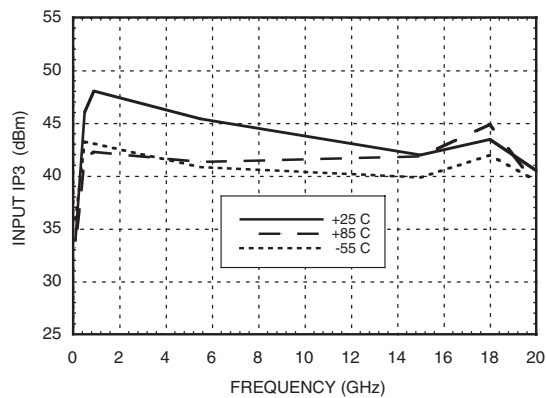
Return Loss



0.1 and 1dB Input Compression Point



Input Third Order Intercept Point



**HIGH ISOLATION SPST SWITCH
 MODULE, DC - 20.0 GHz**
Absolute Maximum Ratings

RF Input Power	+27 dBm
Supply Voltage (VDC1, VDC2)	+7 Vdc
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 μ A Typ.

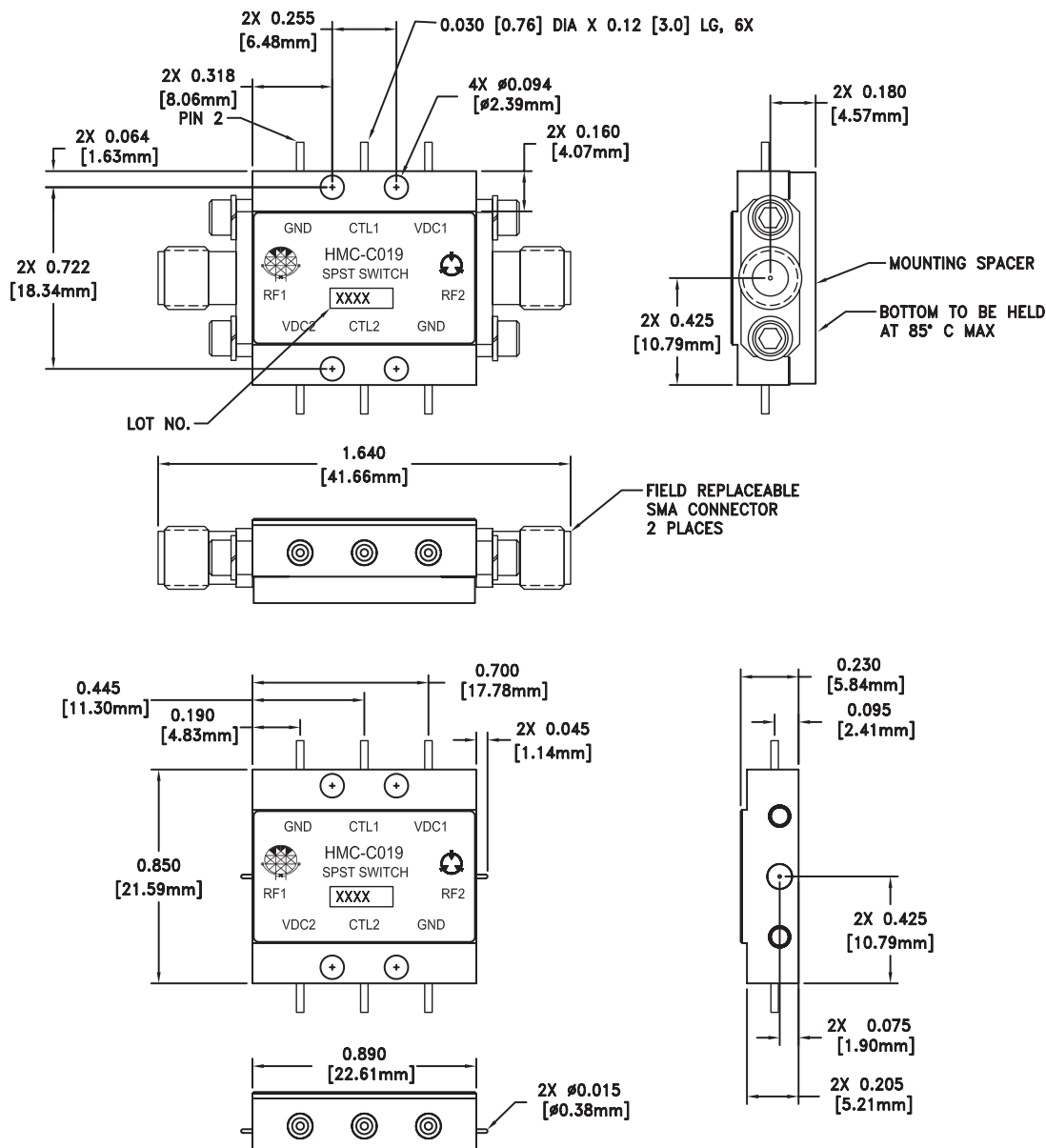
Truth Table

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

Bias Voltage & Current

V _{DC} Range = +5 Vdc \pm 10%	
VDC1 & VDC2 (Vdc)	I _{DC} (Typ.) (mA)
+5.0	2.8

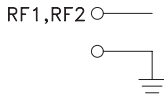

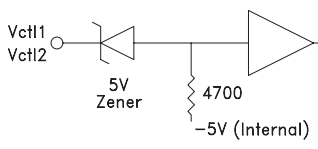
(Bias current increases with switching rate to 15 - 20 mA.)

**HIGH ISOLATION SPST SWITCH
 MODULE, DC - 20.0 GHz**
Outline Drawing**NOTES:**

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. BRACKET MATERIAL: ALUMINUM
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES .005 [0.13] UNLESS OTHERWISE SPECIFIED
6. FIELD REPLACEABLE SMA CONNECTORS. TENSOLITE 5602-5CCSF OR EQUIVALENT.

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**HIGH ISOLATION SPST SWITCH
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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.	<p>(Internal Driver)</p> 
4, 8	VDC1, VDC2	Supply voltage (+5V ±10%)	



HMC-C019

HIGH ISOLATION SPST SWITCH MODULE, DC - 20.0 GHz

Notes: