

GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 20 GHz

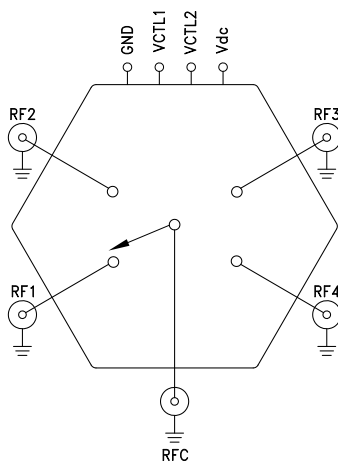


Typical Applications

The HMC-C071 is ideal for:

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

Functional Diagram



Features

- High Isolation: >42 dB up to 12 GHz
>32 dB up to 20 GHz
- Low Insertion Loss: 2 dB @ 2 GHz
2.8 dB @ 12 GHz
- Fast Switching: 17 ns Rise/Fall Times
- Non-Reflective Design
- Hermetically Sealed Module
- Field Replaceable SMA connectors
- 55 °C to +85 °C Operating Temperature

General Description

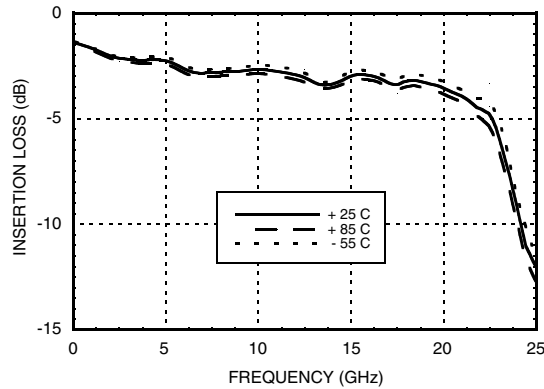
The HMC-C071 is a general purpose broadband high isolation non-reflective GaAs pHEMT SP4T switch housed in a miniature hermetic module with field replaceable SMA connectors. Covering DC to 20 GHz, the switch offers high isolation and low insertion loss. The switch features >42 dB isolation up to 12 GHz and >32 dB isolation up to 20 GHz. The HMC-C071 also provides 2.8 dB insertion loss up to 12 GHz with very fast rise and fall times of 17ns. A CMOS interface allows a single +5V bias voltage at very low DC currents.

Electrical Specifications, $T_A = +25^\circ \text{C}$, With $V_{dc} = +5\text{V}$ & 0/+5V Control, 50 Ohm System

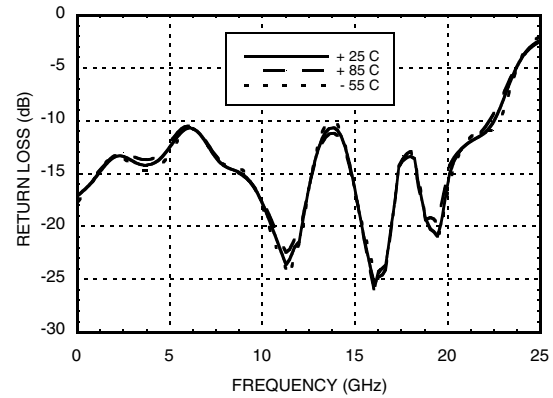
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 6 GHz		-2.7	-3.2	dB
	DC - 12 GHz		-2.8	-3.2	dB
	DC - 20 GHz		-3.8	-4.5	dB
Isolation	DC - 6 GHz	44	48		dB
	DC - 12 GHz	36	42		dB
	DC - 20 GHz	35	38		dB
Return Loss	"On State"	DC - 12 GHz	12		dB
		DC - 20 GHz	10		dB
Return Loss RF1, RF2	"Off State"	DC - 12 GHz	15		dB
		DC - 20 GHz	10		dB
Input Power for 1 dB Compression	0.5 - 20 GHz	20.5	24		dBm
Input Third Order Intercept (Two-Tone Input Power= +7 dBm Each Tone)	0.5 - 20 GHz	36.5	40		dBm
Switching Characteristics	DC - 20 GHz		17		ns
			130		ns

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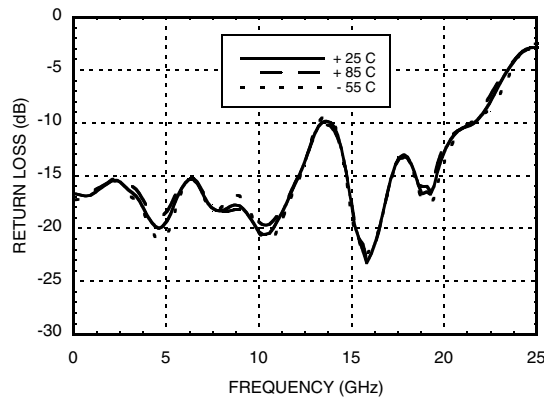
Insertion Loss



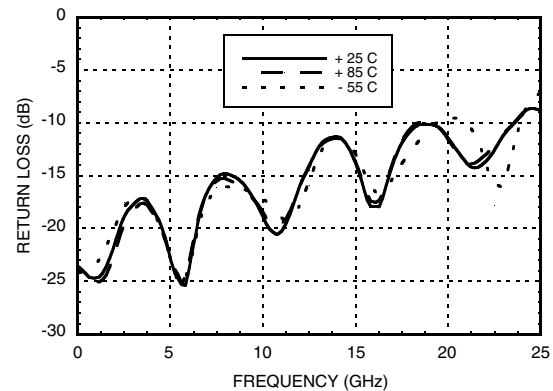
Return Loss RFC



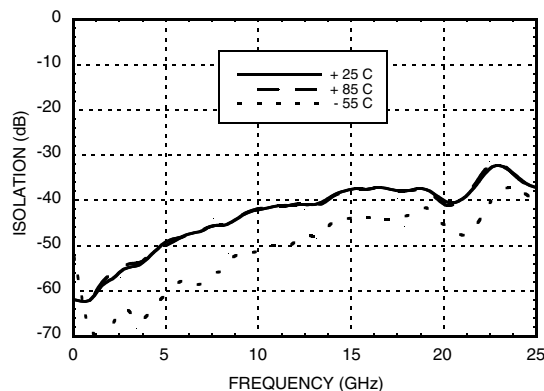
Return Loss RF1, RF2, RF3, RF4 On



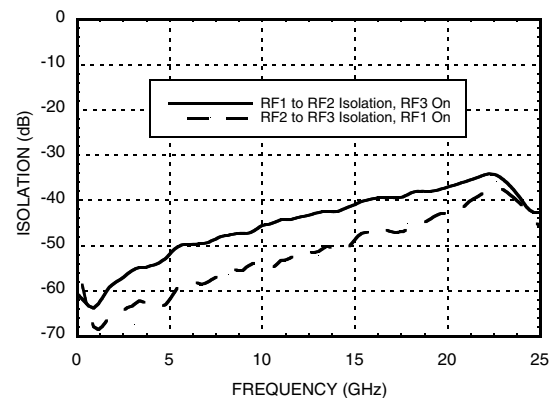
Return Loss RF1, RF2, RF3, RF4 Off



Isolations

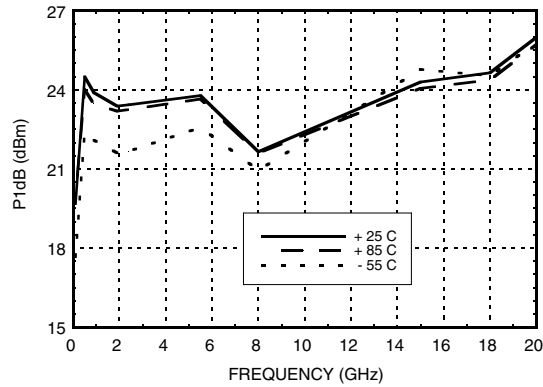


Isolation Between Ports RF1 and RF2

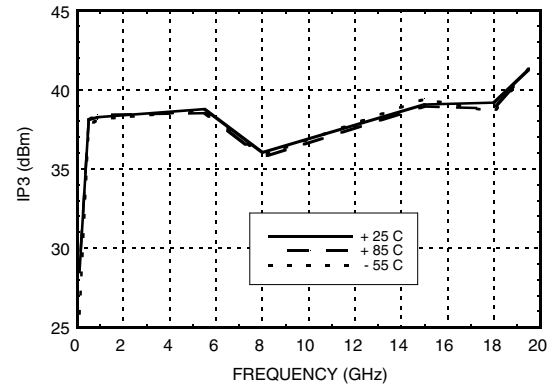


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Input P1dB Compression Point



Input Third Order Intercept Point



Absolute Maximum Ratings

RF Input Power	+24 dBm
Supply Voltage (Vdc)	+7V
Control Voltage Range (Vctl)	-0.5V to Vdc +1V
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

Control Voltages

State	Bias Condition
High	+3.0 to Vdc @ 1 mA Typ.
Low	0 to +1.5V @ 20 µA Typ.



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

Truth Table

Control Input	Signal Path State	
VCTL1	VCTL2	RFC to:
LOW	LOW	RF1
LOW	HIGH	RF2
HIGH	LOW	RF3
HIGH	HIGH	RF4

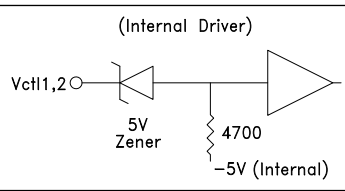
Bias Voltage & Current

Vdc Range = +5 Vdc ± 10%	
Vdc (V)	Idc (Typ.) (mA)
+5.0	1.4

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

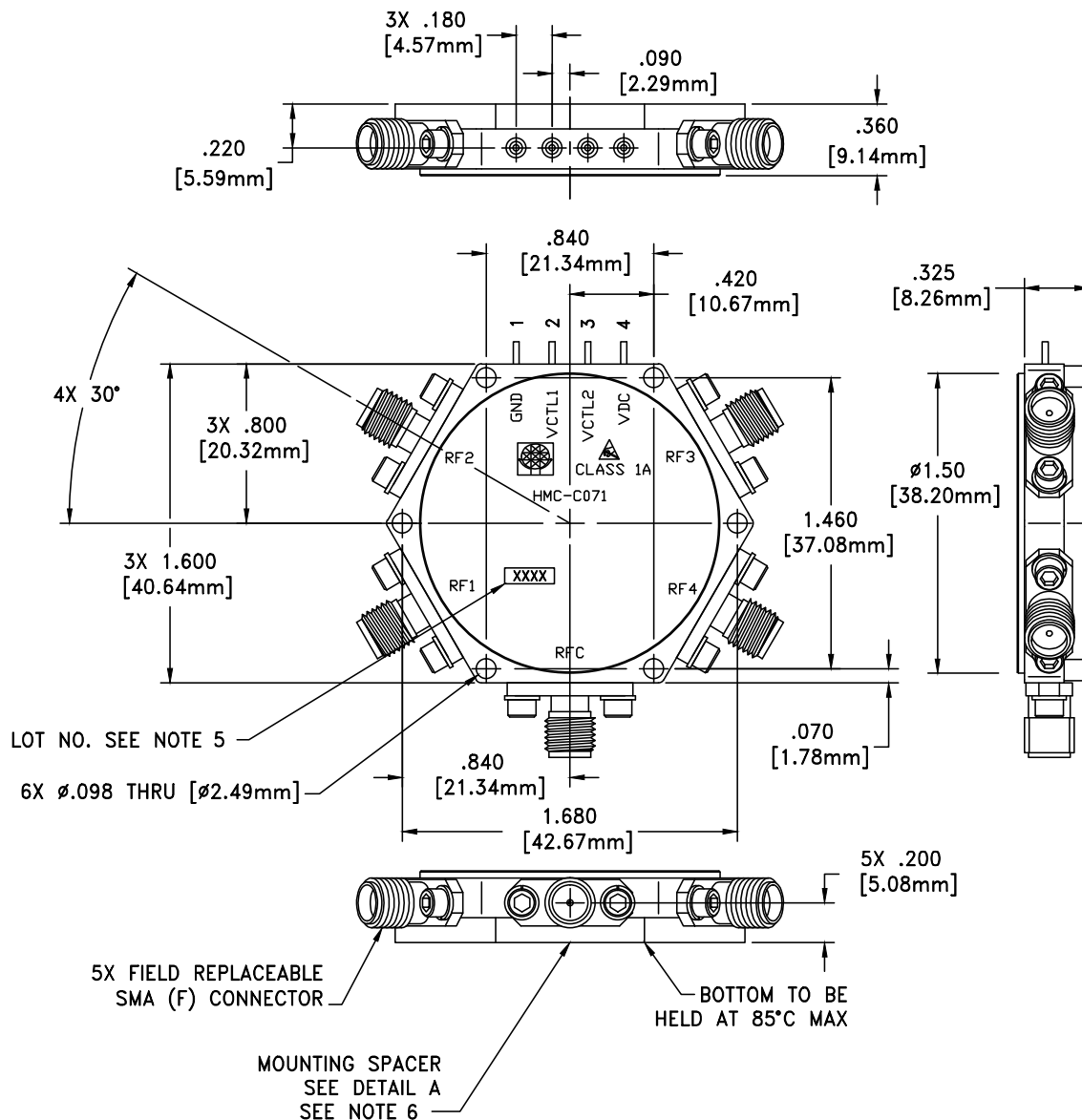
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Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	GND	Power supply ground.	
2, 3	Vctl1, 2	CMOS interface, control voltages per table. Requires active pull up to +5V (V_{dc}).	
4	Vdc	Supply voltage	
5 - 9	RFC, RF1, RF2, RF3, RF4	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.	

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Outline Drawing



Package Information

Package Type	C-15
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NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. FINISH: GOLD PLATE OVER NICKEL PLATE
3. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
4. TOLERANCES:
 - 4.1 .XX = $\pm$.02 [.51]
 - 4.2 .XXX = $\pm$.010 [.25]
5. MARK LOT NUMBER ON .080 X .250 LABEL WHERE SHOWN, WITH .030 MIN TEXT HEIGHT.
6. MOUNTING SPACER PART NUMBER: 123811.



MICROWAVE CORPORATION

v03.0711



HMC-C071

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Notes:

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SWITCHES