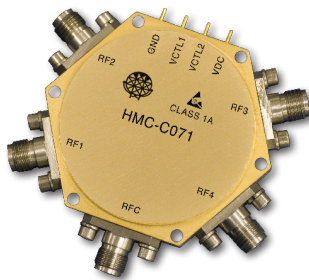## GaAs MMIC SP4T NON-REFLECTIVE SWITCH, DC - 20 GHz
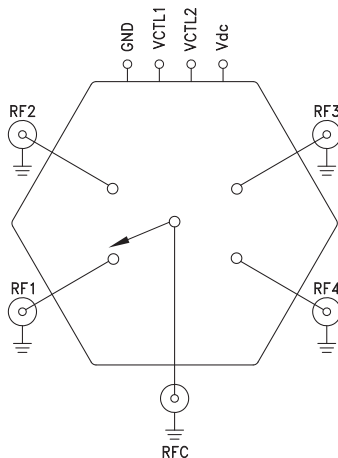

Typical Applications

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° C, With Vdc = +5V & 0/+5V Control, 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 6 GHz DC - 12 GHz DC - 20 GHz		-2.7 -2.8 -3.8	-3.2 -3.8 -5	dB dB dB
Isolation	DC - 6 GHz DC - 12 GHz DC - 20 GHz	44 36 35	48 42 38		dB dB dB
Return Loss "On State"	DC - 12 GHz DC - 20 GHz		12 10		dB dB
Return Loss RF1, RF2 "Off State"	DC - 12 GHz DC - 20 GHz		15 10		dB 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 tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 20 GHz		17 130		ns ns

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HMC-C071* PRODUCT PAGE QUICK LINKS

Last Content Update: 05/11/2017

COMPARABLE PARTS

View a parametric search of comparable parts.

DOCUMENTATION

Data Sheet

- HMC-C071: GaAs MMIC SP4T Non-Reflective Switch, DC - 20 GHz Data Sheet

REFERENCE MATERIALS

Technical Articles

- Hittite Launches HMC-T2100 10 MHz to 20 GHz Synthesized Signal Generator

DESIGN RESOURCES

- HMC-C071 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

DISCUSSIONS

View all HMC-C071 EngineerZone Discussions.

SAMPLE AND BUY

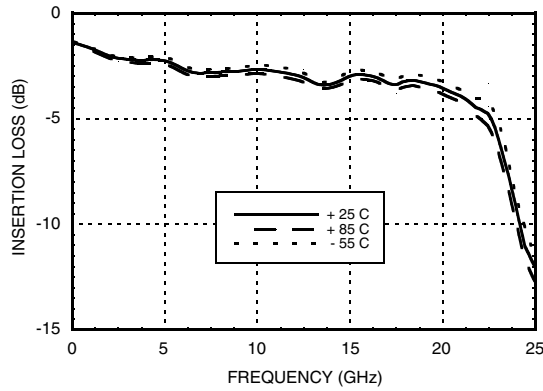Visit the product page to see pricing options.

TECHNICAL SUPPORT

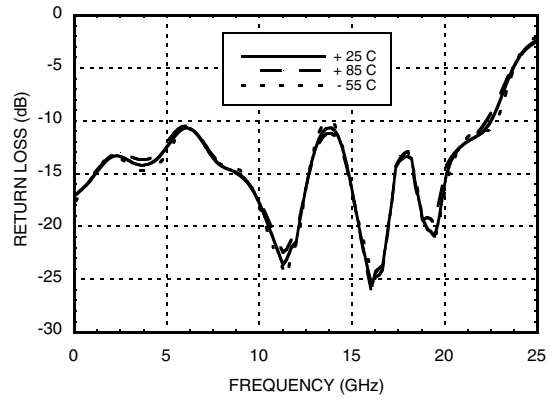Submit a technical question or find your regional support number.

DOCUMENT FEEDBACK
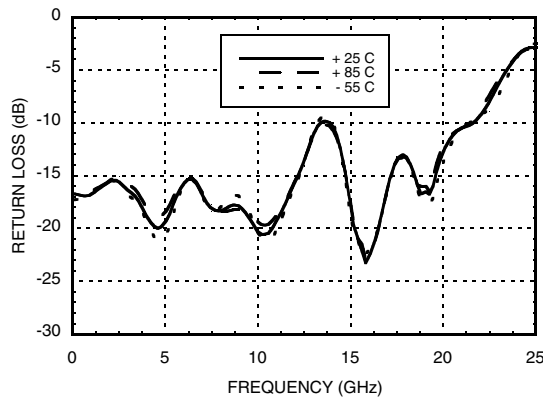
Submit feedback for this data sheet.

Insertion Loss

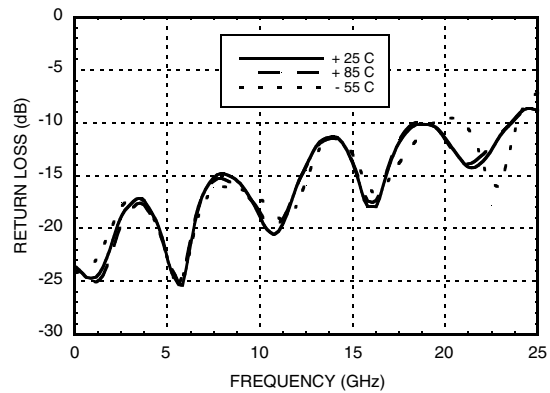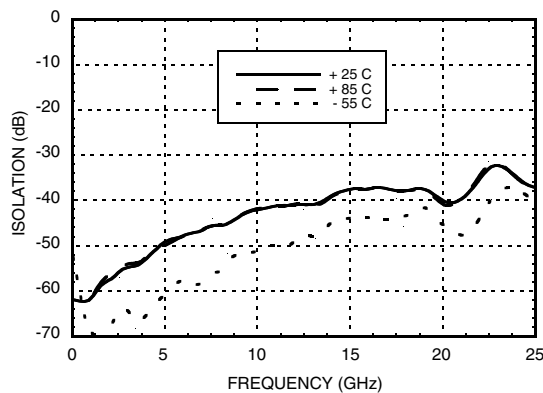**Return Loss RFC**

Return Loss RF1, RF2, RF3, RF4 On

Return Loss RF1, RF2, RF3, RF4 Off

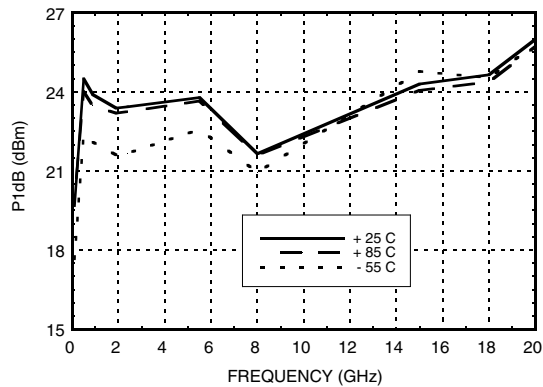

Isolations

Isolation Between Ports RF1 and RF2

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SWITCHES

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![ANALOG DEVICES]
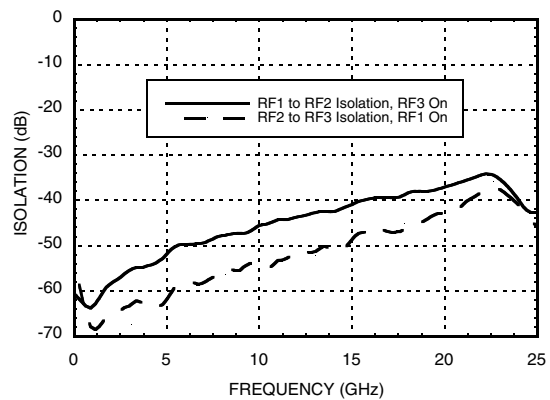
Input P1dB Compression Point

Input Third Order Intercept Point
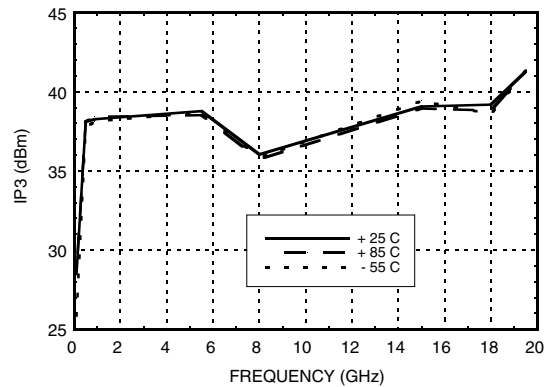
Absolute Maximum Ratings

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

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Control Voltages

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

Truth Table

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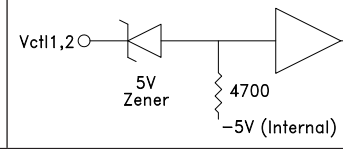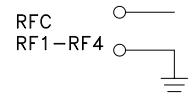
Bias Voltage & Current

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

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

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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![Analog Devices logo]

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SWITCHES

Outline Drawing

3X .180 [4.57mm]
.090 [2.29mm]
.220 [5.59mm]
.360 [9.14mm]

.840 [21.34mm]
.420 [10.67mm]
.325 [8.26mm]

4X 30°
3X .800 [20.32mm]
3X 1.600 [40.64mm]

1 2 3 4
GND VCTL1 VCTL2 VDC
RF2   CLASS 1A   RF3
HMC-C071
RF1   XXXX   RF4
RFC

1.460 [37.08mm]
ø1.50 [38.20mm]
.070 [1.78mm]

LOT NO. SEE NOTE 5
6X ø.098 THRU [ø2.49mm]
.840 [21.34mm]
1.680 [42.67mm]

5X .200 [5.08mm]

5X FIELD REPLACEABLE SMA (F) CONNECTOR
BOTTOM TO BE HELD AT 85°C MAX

MOUNTING SPACER SEE DETAIL A SEE NOTE 6

Package Information

Package Type	C-15

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 = ±.02 [.51]
   4.2 .XXX = ±.010 [.25]
5. MARK LOT NUMBER ON .080 X .250 LABEL WHERE SHOWN, WITH .030 MIN TEXT HEIGHT.
6. MOUNTING SPACER PART NUMBER: 123811.

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Notes:

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SWITCHES

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