

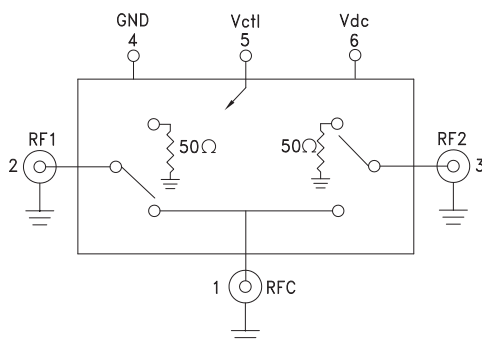


## Typical Applications

The HMC-C011 is ideal for:

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

## Functional Diagram



## Features

High Isolation: >45 dB up to 5 GHz

>35 dB up to 20 GHz

Low Insertion Loss: 2 dB @ 12 GHz

2.5 dB @ 16 GHz

Fast Switching

Non-Reflective Design

Hermetically Sealed Module

Field Replaceable SMA connectors

-55 °C to +85 °C Operating Temperature

## General Description

The HMC-C011 is a general purpose broadband high isolation non-reflective GaAs MESFET SPDT 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 >45 dB isolation up to 5 GHz and >35 dB isolation up to 20 GHz. CMOS interface allows a single positive +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 - 4.0 GHz   |               | 1.8  | 2.3  | dB    |
|   | DC - 12.0 GHz  |               | 2.0  | 2.5  | dB    |
|   | DC - 16.0 GHz  |               | 2.5  | 3.5  | dB    |
|   | DC - 20.0 GHz  |               | 4.0  | 4.9  | dB    |
| Isolation   | DC - 4.0 GHz   | 41            | 46   |      | dB    |
|   | DC - 8.0 GHz   | 35            | 40   |      | dB    |
|   | DC - 20.0 GHz  | 25            | 35   |      | dB    |
| Return Loss   | "On State"     | DC - 12.0 GHz | 15   |      | dB    |
|   |                | DC - 20.0 GHz | 10   |      | dB    |
| Return Loss RF1, RF2  | "Off State"    | DC - 10.0 GHz | 20   |      | dB    |
|   |                | DC - 15.0 GHz | 15   |      | dB    |
|   |                | DC - 20.0 GHz | 10   |      | dB    |
| Input Power for 1 dB Compression  | 0.5 - 20.0 GHz | 20            | 23   |      | dBm   |
| Input Third Order Intercept<br>(Two-Tone Input Power= +7 dBm Each Tone)                   | 0.5 - 10.0 GHz |               | 48   |      | dBm   |
|   | 0.5 - 20.0 GHz |               | 45   |      | dBm   |
| Switching Characteristics<br>tRISE, tFALL (10/90% RF)<br>tON, tOFF (50% CTL to 10/90% RF) | DC - 20 GHz    |               | 1.3  |      | ns    |
|   |                |               | 5.0  |      | ns    |
| Switching Transients  | DC - 20 GHz    |               | 20   |      | mVpp  |

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# HMC-C011\* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

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## COMPARABLE PARTS

View a parametric search of comparable parts.

## DOCUMENTATION

### Data Sheet

- HMC-C011 Data Sheet

## TOOLS AND SIMULATIONS

- HMC-C011 S-Parameter

## REFERENCE MATERIALS

### Technical Articles

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

## DESIGN RESOURCES

- HMC-C011 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

## DISCUSSIONS

View all HMC-C011 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

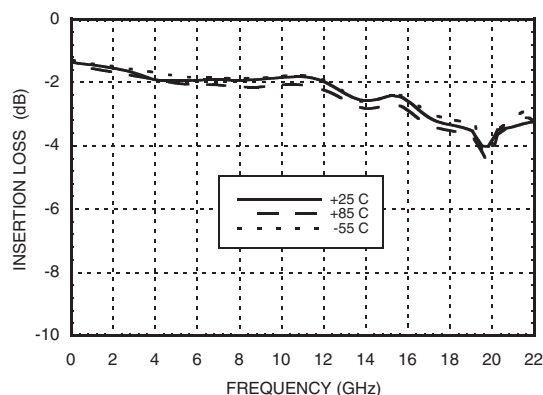
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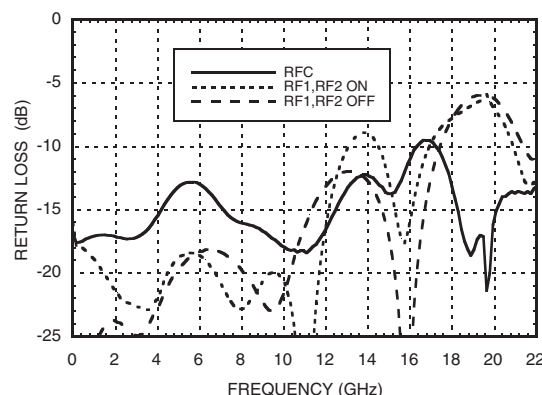


**GaAs MMIC SPDT NON-REFLECTIVE  
SWITCH, DC - 20 GHz**

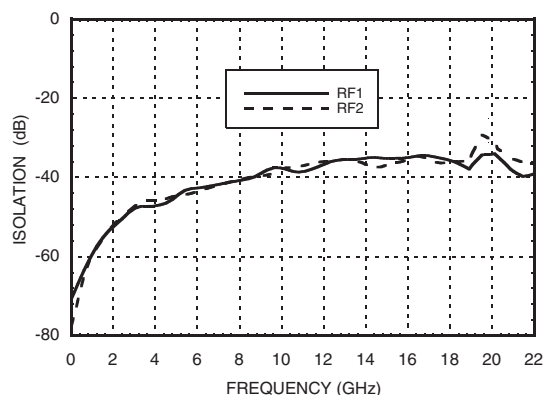
**Insertion Loss**



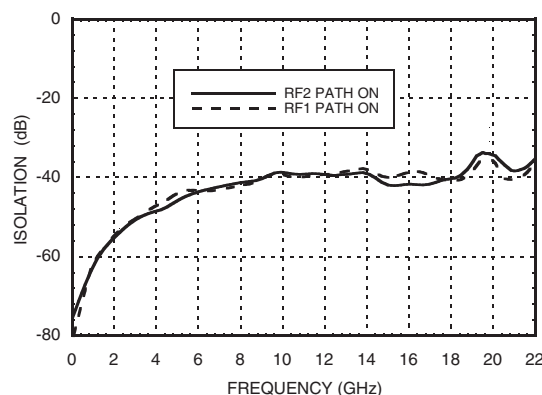
**Return Loss**



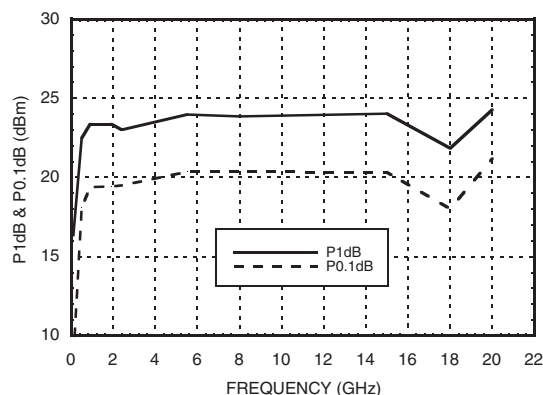
**Isolations**



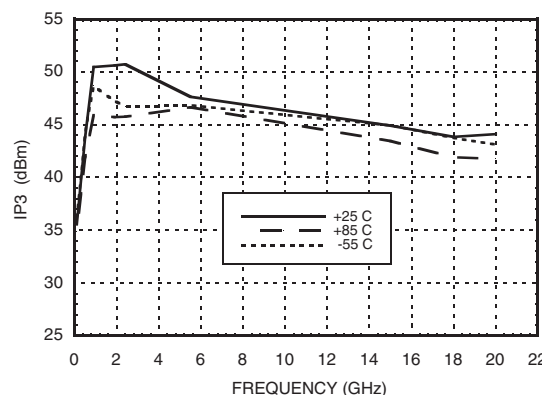
**Isolation Between Ports RF1 and RF2**



**Input P1dB & P0.1dB Compression Point**



**Input Third Order Intercept Point**





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

### Absolute Maximum Ratings

|                              |                    |
|------------------------------|--------------------|
| RF Input Power               | +27 dBm            |
| Supply Voltage (Vdc)         | +7 Vdc             |
| Control Voltage Range (Vctl) | -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

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

### Truth Table

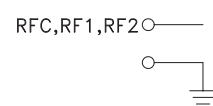

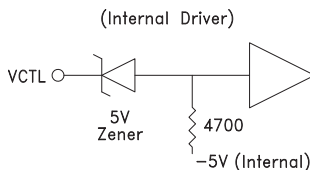
| Control Input | Signal Path State |            |
|---------------|-------------------|------------|
| Vctl          | RFC to RF1        | RFC to RF2 |
| High          | On                | Off        |
| Low           | Off               | On         |

### Bias Voltage & Current

| Vdc Range = +5 Vdc ± 10% |                    |
|--------------------------|--------------------|
| Vdc<br>(Vdc)             | Idc (Typ.)<br>(mA) |
| +5.0                     | 1.4                |

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

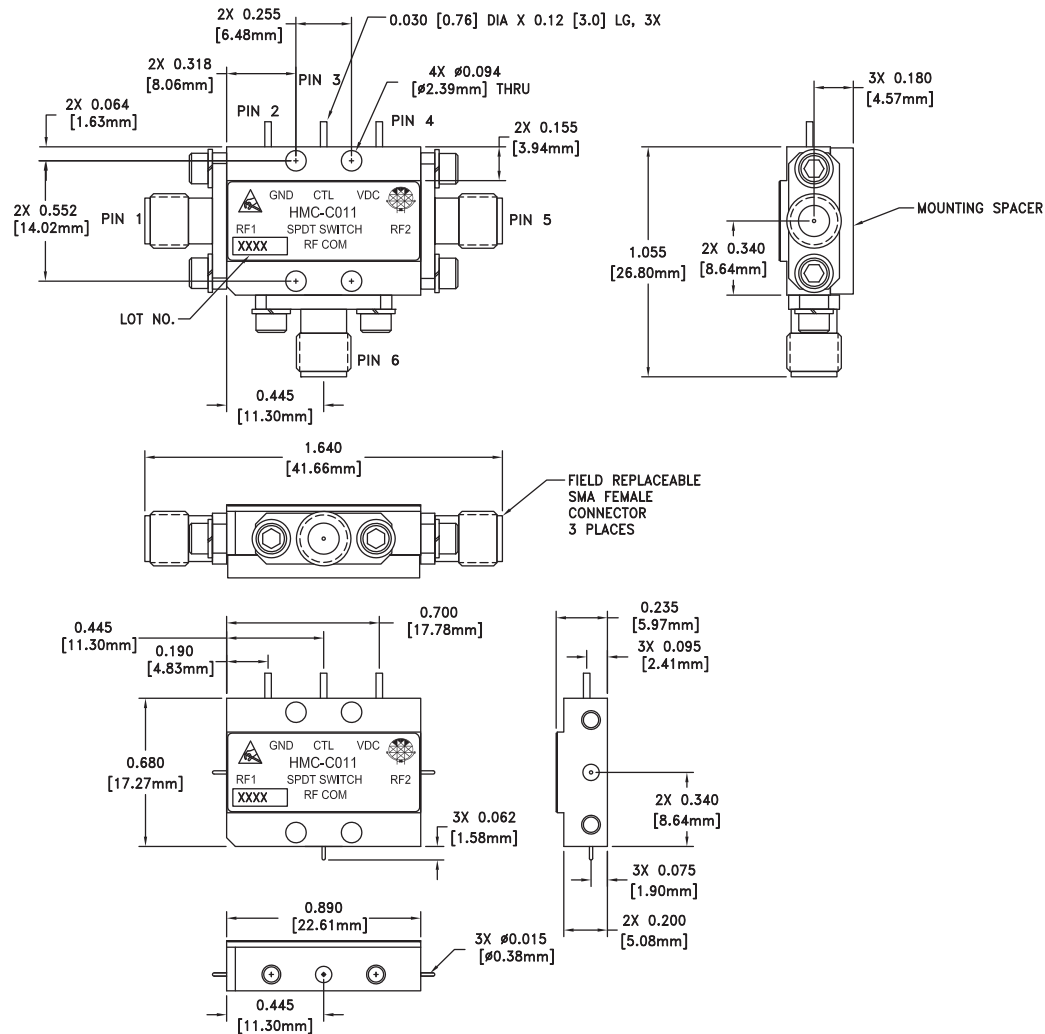
### Pin Descriptions

| Pin Number | Function      | Description  | Interface Schematic   |
|------------|---------------|--|---|
| 1, 2, 3    | RFC, 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. |  |
| 4          | GND           | Power supply ground.   |  |
| 5          | Vctl          | CMOS interface, control voltages per table. Requires active pullup to +5V (Vdc).   |  |
| 6          | Vdc           | Supply voltage   |   |

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



### Outline Drawing



VIEW SHOWN WITH CONNECTORS REMOVED

### Package Information

|                    |              |
|--------------------|--------------|
| Package Type       | C-5          |
| Package Weight [1] | 17.7 gms [2] |
| Spacer Weight      | 2.6 gms [2]  |

[1] Includes the connectors

[2]  $\pm 1$  gms Tolerance

### NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. FINISH: GOLD PLATE OVER NICKEL PLATE
3. MOUNTING SPACER: NICKEL PLATED ALUMINUM
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]
5. TOLERANCES:
  - 5.1 .XX =  $\pm 0.02$
  - 5.2 .XXX =  $\pm 0.010$
6. FIELD REPLACEABLE SMA CONNECTORS  
TENSOLITE 5602 - 5CCSF OR EQUIVALENT
7. TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0 -80  
HARDWARE WITH DESIRED MOUNTING SCREWS