



GaAs MMIC SPDT NON-REFLECTIVE SWITCH, DC - 18 GHz



Typical Applications

The HMC-C058 is ideal for:

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

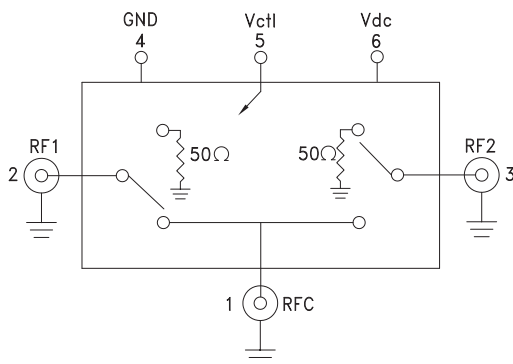
Features

- High Isolation: >65 dB up to 6 GHz
>50 dB up to 18 GHz
- Low Insertion Loss: 2 dB @ 8 GHz
2.8 dB @ 12 GHz
- Fast Switching: 3 ns Rise/Fall Times
- Non-Reflective Design
- Hermetically Sealed Module
- Field Replaceable SMA connectors
- 55 to +85 °C Operating Temperature

General Description

The HMC-C058 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 18 GHz, the switch offers high isolation and low insertion loss. The switch features >65 dB isolation up to 6 GHz and >50 dB isolation up to 18 GHz. A CMOS interface allows a single +5V bias voltage at very low DC currents.

Functional Diagram



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

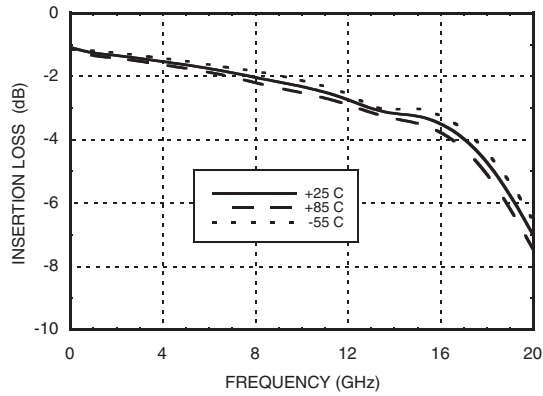
| Parameter | Frequency | Min. | Typ. | Max. | Units |
|--|--------------|----------------------------------|------|------|-------|
| Insertion Loss | DC - 6 GHz | | 1.6 | 2.4 | dB |
| | DC - 10 GHz | | 2.0 | 2.8 | dB |
| | DC - 18 GHz | | 3.0 | 5.5 | dB |
| Isolation | DC - 6 GHz | 55 | 65 | | dB |
| | DC - 10 GHz | 50 | 60 | | dB |
| | DC - 18 GHz | 42 | 55 | | dB |
| Return Loss | "On State" | DC - 6 GHz | 17 | | dB |
| | | DC - 18 GHz | 12 | | dB |
| Return Loss RF1, RF2 | "Off State" | DC - 6 GHz | 14 | | dB |
| | | DC - 18 GHz | 17 | | dB |
| Input Power for 1 dB Compression | 0.5 - 18 GHz | 24 | 27 | | dBm |
| Input Third Order Intercept (Two-Tone Input Power = +7 dBm Each Tone) | 0.5 - 18 GHz | | 46 | | dBm |
| Switching Characteristics | DC - 18 GHz | tRISE, tFALL (10/90% RF) | 3 | | ns |
| | | tON, tOFF (50% CTL to 10/90% RF) | 12 | | ns |
| | | Switching Transients | 12 | | 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 Online at www.hittite.com

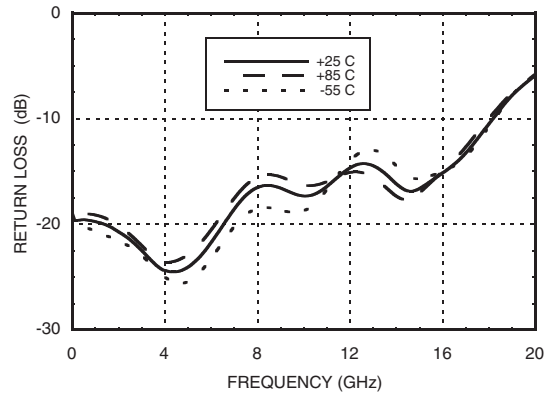


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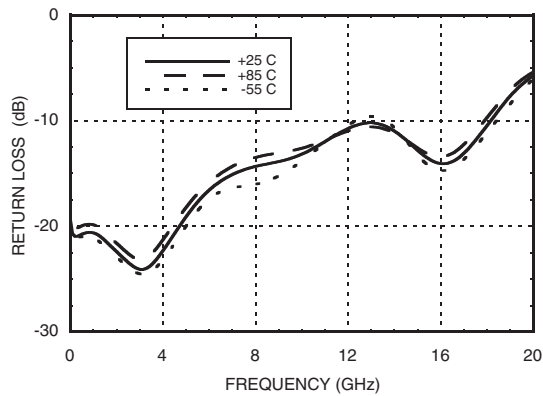
Insertion Loss



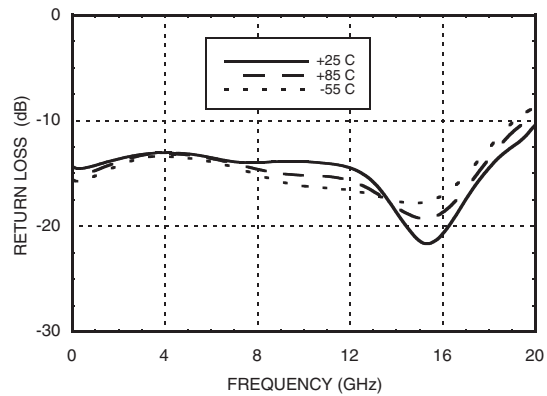
Return Loss RFC



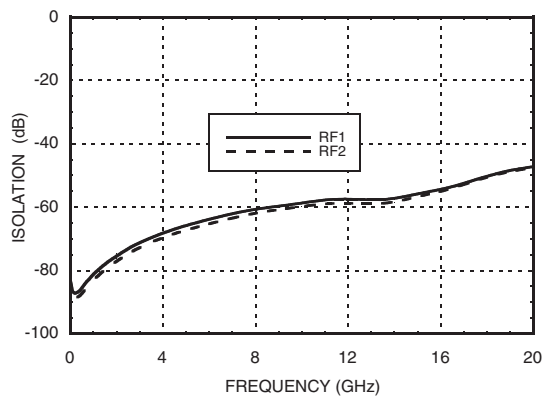
Return Loss RF1, RF2 On



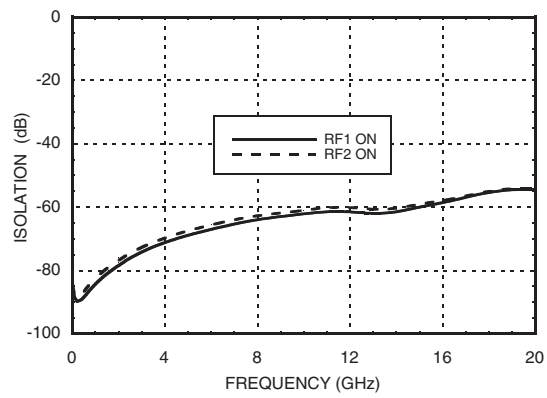
Return Loss RF1, RF2 Off

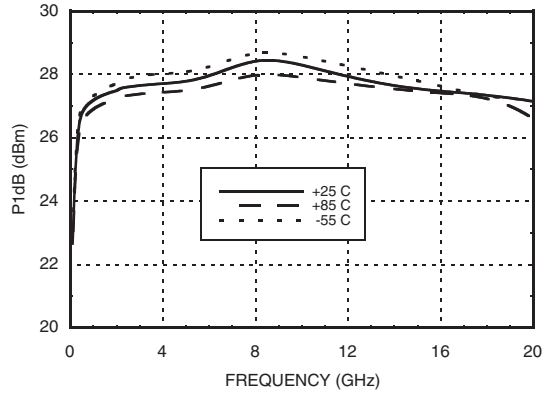
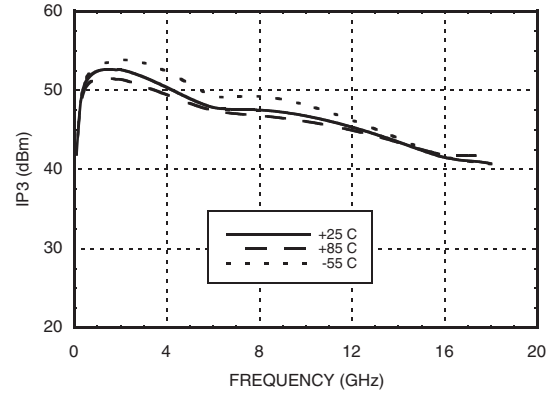


Isolations



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 | +30 dBm |
| Supply Voltage (Vdc) | +7 V |
| Control Voltage Range (Vctl) | -0.5V to Vdc +0.5V |
| Hot Switch Power Level | +27 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 | |
|---------------|-------------------|------------|
| | RFC to RF1 | RFC to RF2 |
| High | On | Off |
| Low | Off | On |

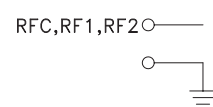

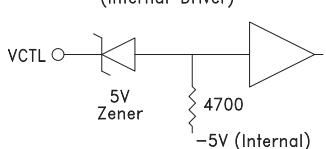
Bias Voltage & Current

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

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

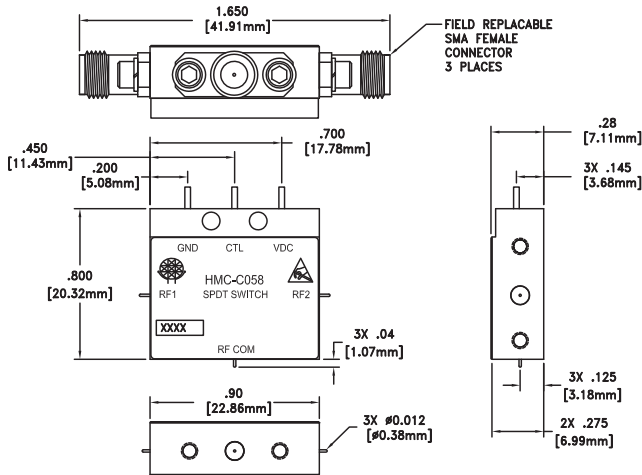
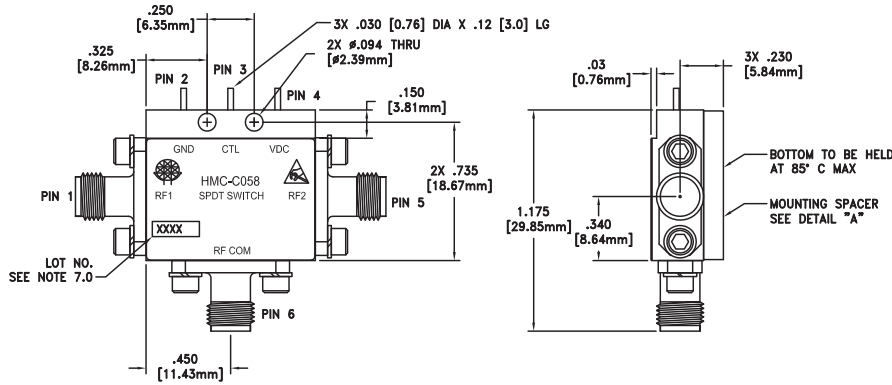


Pin Descriptions

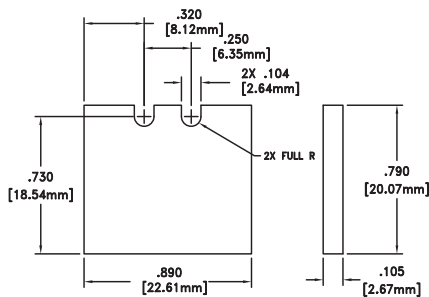
| Pin Number | Function | Description | Interface Schematic |
|------------|---------------|--|--|
| 1, 2, 3 | RFC, RF1, RF2 | RF connector, SMA female, field replaceable. These pins are DC coupled and matched to 50 Ohms. DC blocking capacitors are required if external RF line potential is not equal to 0V. |  |
| 4 | GND | Power supply ground. |  |
| 5 | Vctl | CMOS interface, control voltages per table. Requires active pullup to +5V (V _{dc}). | <p>(Internal Driver)</p>  |
| 6 | Vdc | Supply voltage | |

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Outline Drawing



VIEW SHOWN WITH CONNECTORS AND MOUNTING SPACER REMOVED.



Package Information

| | |
|--------------|------|
| Package Type | C-14 |
|--------------|------|

NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
3. SPACER MATERIAL: NICKEL PLATED ALUMINUM
4. DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES ±0.010 [0.25] UNLESS OTHERWISE SPECIFIED
6. FIELD REPLACEABLE SMA CONNECTORS. TENSOLITE 5602-5CCSF OR EQUIVALENT.



MICROWAVE CORPORATION v00.0109



HMC-C058

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Notes:

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SWITCHES