

GaAs MMIC SMT HIGH-ISOLATION SPDT SWITCH DC - 8 GHz

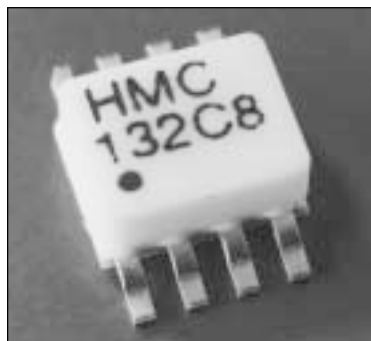
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Features

BANDWIDTH: DC-8 GHz

HIGH ISOLATION : > 50 dB

NON-REFLECTIVE DESIGN



General Description

The HMC132C8 is a surface mount, low cost, non-hermetic packaged version of the HMC132G7 MMIC SPDT switch. The device is a fast, broadband SPDT switch featuring high (> 42 dB) isolation over the entire band. The switch is non-reflective at both RF1 and RF2 ports. Applications for this device include T/R switching for 5.2 GHz UNII, 5.8 GHz ISM circuits, WLAN, and S,C and X-Band Telecom radios.

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SMT SPDT SWITCHES



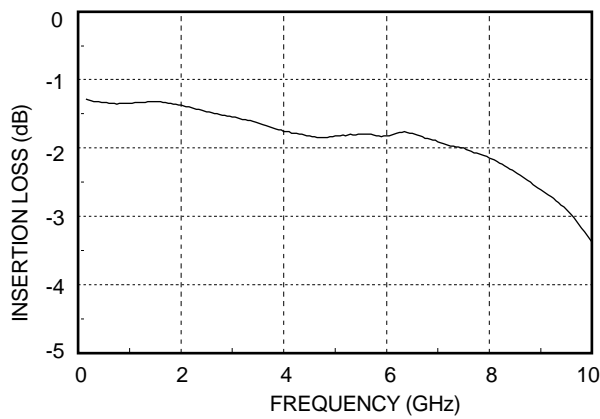
Guaranteed Performance, With 0/-5V control, 50 Ohm System, -55 to +85 deg C

| Parameter | Frequency | Min. | Typ. | Max. | Units |
|---|-------------|----------------------------------|------|------|-------|
| Insertion Loss | DC - 2 GHz | | 1.4 | 1.7 | dB |
| | DC - 6 GHz | | 1.8 | 2.2 | dB |
| | DC - 8 GHz | | 2.6 | 3.0 | dB |
| Isolation | DC - 2 GHz | 50 | 54 | | dB |
| | DC - 6 GHz | 38 | 45 | | dB |
| | DC - 8 GHz | 36 | 40 | | dB |
| Return Loss (on state) | DC - 2 GHz | 14 | 19 | | dB |
| | DC - 6 GHz | 10 | 14 | | dB |
| | DC - 8 GHz | 8 | 13 | | dB |
| Input Power for 0.1 dB Compression | 0.5 - 8 GHz | +20 | +25 | | dBm |
| Input Power for 1dB Compression (0/-5V Ctl) | 0.5 - 8 GHz | +22 | +27 | | dBm |
| Input Third Order Intercept | 0.5 - 8 GHz | +38 | +42 | | dBm |
| Switching Characteristics | DC - 8 GHz | | | | |
| | | tRISE, tFALL (10/90% RF) | | 3 | ns |
| | | tON, tOFF (50% CTL to 10/90% RF) | | 6 | ns |

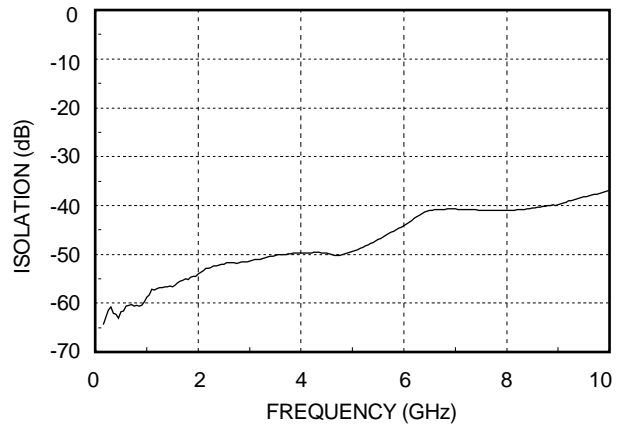
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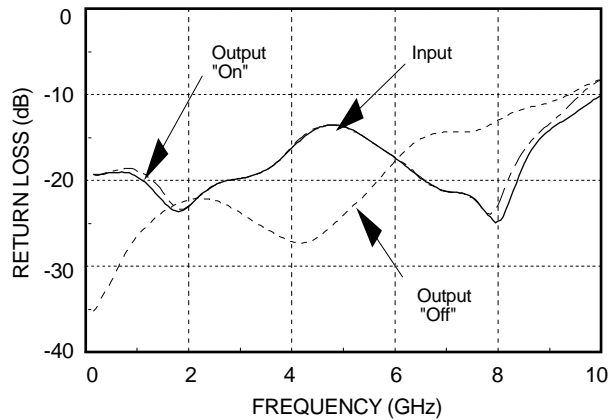
Insertion Loss



Isolation



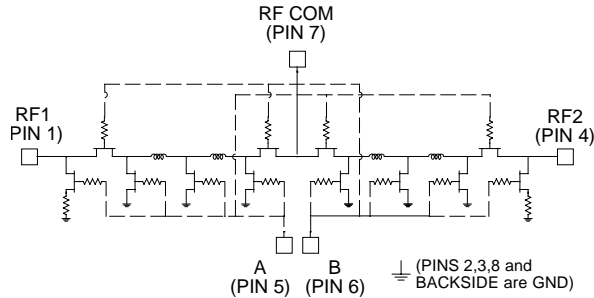
Return Loss



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Schematic



Absolute Maximum Ratings

| | |
|-----------------------|-------------------|
| Control Voltage Range | +0.5 to -7.5 Vdc |
| Storage Temperature | -65 to +175 deg C |
| Operating Temperature | -55 to +85 deg C |

Truth Table

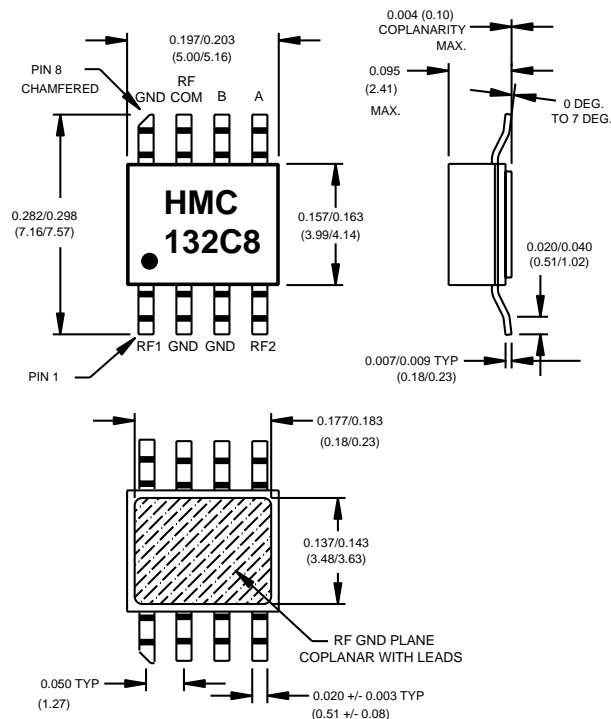
| Control Input | | Signal Path State | |
|---------------|------|-------------------|-----------|
| A | B | RF to RF1 | RF to RF2 |
| High | Low | ON | OFF |
| Low | High | OFF | ON |

Do not "HOT" switch power levels > +15 dBm ($V_{ctrl} = 0/-5Vdc$)

Control Voltages

| State | Bias Condition |
|-------|------------------------------------|
| Low | 0 to -0.2V @ 20uA Max. |
| High | -5V @ 200uA Typ to -7V @ 600uA Max |

Outline



- MATERIAL:
 - PACKAGE BODY & COVER: WHITE ALUMINA (92%)
 - LEADS & PACKAGE BOTTOM: COPPER
- PLATING: ELECTROLYTIC GOLD 100 - 200 MICROINCHES OVER ELECTROLYTIC NICKEL 100 TO 200 MICROINCHES.
- DIMENSIONS ARE IN INCHES (MILLIMETERS). UNLESS OTHERWISE SPECIFIED TOL. ARE $\pm 0.005 (\pm 0.13)$.
- ALL UNLABELED LEADS ARE GROUND. THESE LEADS ARE CONNECTED INTERNALLY TO THE PACKAGED BOTTOM GROUND. THE PACKAGE BOTTOM RF GROUND **MUST** BE SOLDERED TO THE PCB RF GROUND.
- PACKAGE LENGTH AND WIDTH DIMENSIONS SHOWN DO NOT INCLUDE LID SEAL PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.005 (0.127MM) PER SIDE.

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SPDT SWITCHES

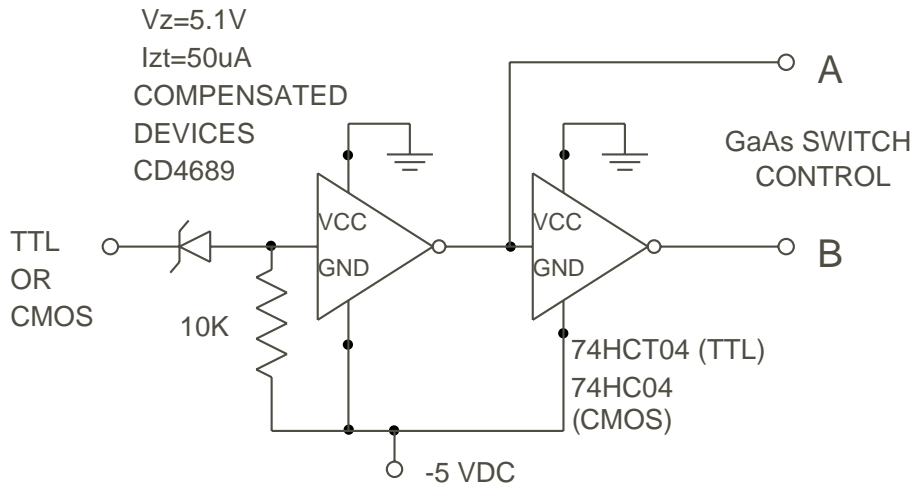
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Suggested Driver Circuit for HMC132C8

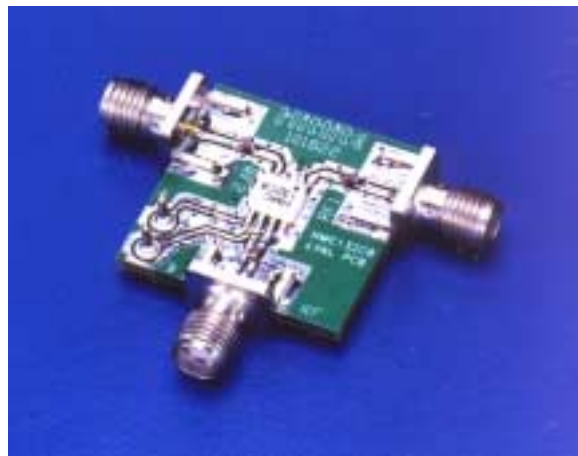


Simple driver using inexpensive standard logic ICs provides fast switching using minimum DC current.

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Evaluation Circuit Board



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The circuit board used in the final application should use RF circuit design techniques. Signal lines should have 50 ohm impedance while the package ground leads should be connected directly to the ground plane similar to that shown above. A sufficient number of VIA holes should be used to connect the top and bottom ground planes. The evaluation circuit board as shown is available from Hittite upon request.

Evaluation Circuit Board Layout Design Details

| | |
|--------------------------|--|
| Layout Technique | Grounded Co-Planar Waveguide (GCPW) |
| Material | Rogers 4350 |
| Dielectric Thickness | 0.020" (0.51 mm) |
| 50 Ohm Line Width | 0.034" (0.86 mm) |
| Gap to Ground Edge | 0.010" (0.25 mm) |
| Ground VIA Hole Diameter | 0.014" (0.36 mm) |
| Connectors | SMA-F (EF - Johnson P/N 142-0701-806) |

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NOTES: