HMC132

GaAs MMIC HIGH-ISOLATION SPDT SWITCH, DC - 15 GHz

Typical Applications

The HMC132 is ideal for:

- Wireless Local Loop
- MMDS & Wireless LAN
- UNII & HiperLAN
- Fiber Optics

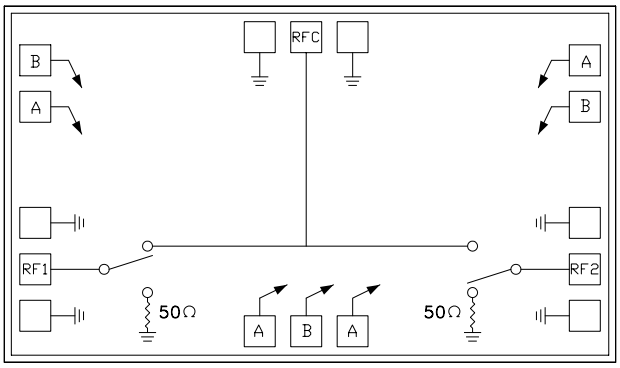
Features

Bandwidth: DC - 15 GHz

High Isolation: >40 dB

Non-Reflective Design

Functional Diagram



General Description

The HMC132 chip is a fast, broadband SPDT switch featuring high (40 dB) isolation over the entire band, provided by on-chip ground vias. The switch is non-reflective at both the RF1 and RF2 ports. A negative control voltage of 0 / -5 Vdc to 0 / -7 Vdc controls the channel selection. Redundant A/B control lines lend versatility to MIC layouts.

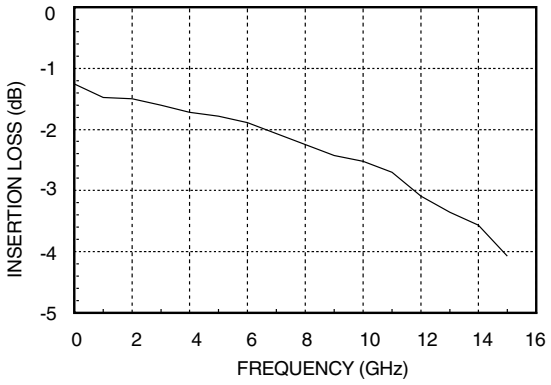
Electrical Specifications, T_A = +25° C, With 0/-5V control, 50 Ohm System

Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 6 GHz DC - 15 GHz		1.9 4.0	2.4 4.5	dB dB
Isolation	DC - 6 GHz DC - 15 GHz	45 37	55 40		dB dB
Return Loss	DC - 6 GHz DC - 15 GHz	14 9.5	17 11		dB dB
Input Power for 0.1 dB Compression	0.5 - 15 GHz	+20	+25		dBm
Input Power for 1dB Compression	0.5 - 15 GHz	+22	+28		dBm
Input Third Order Intercept	0.5 - 15 GHz	+38	+42		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 15 GHz		 3 6		 ns ns

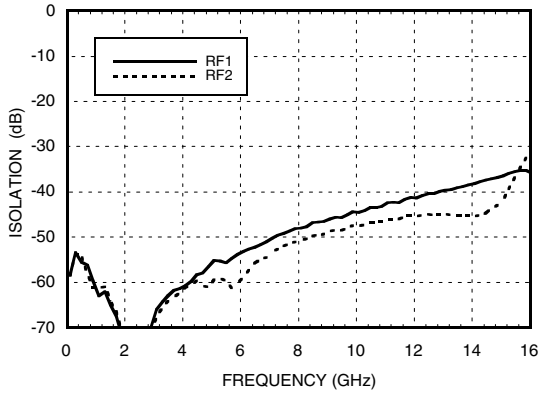
For price, delivery, and to place orders, please contact Hittite Microwave Corporation:
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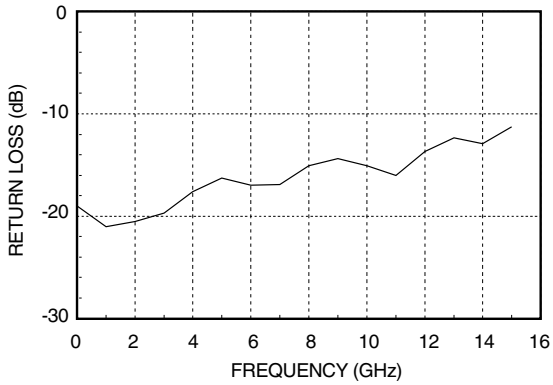
Insertion Loss



Isolation



Return Loss



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Truth Table

Control Input		Single Path State	
A	B	RF to RF1	RF to RF2
HIGH	LOW	ON	OFF
LOW	HIGH	OFF	ON

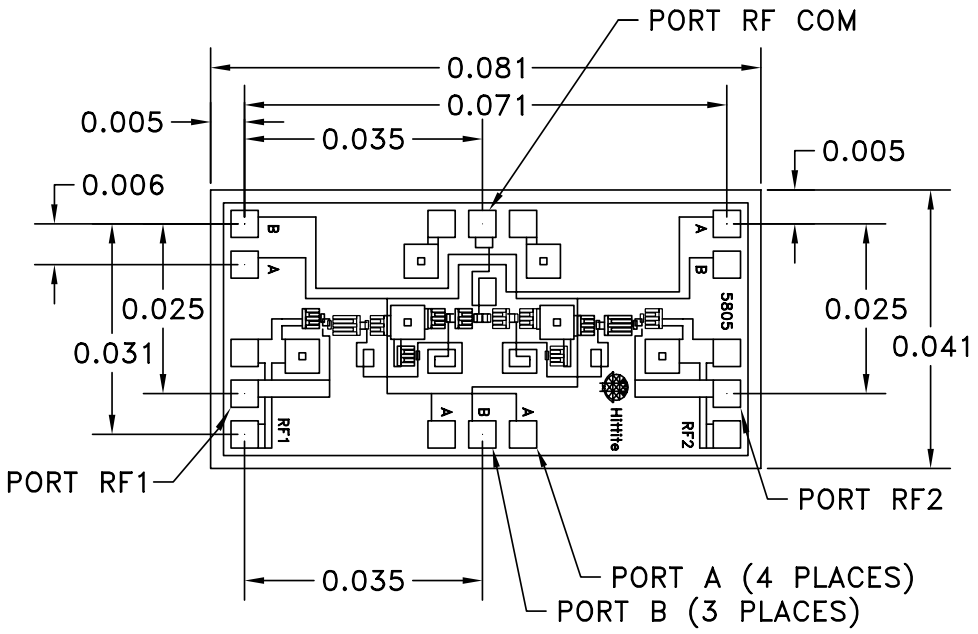
Control Voltages

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

Absolute Maximum Ratings

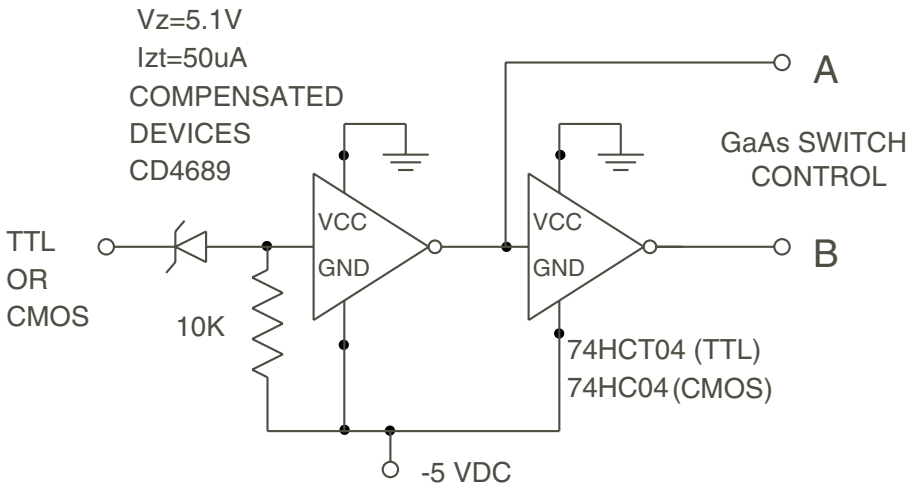
Control Voltage Range	+0.5 to -7.5 Vdc
Storage Temperature	-65 to +175 deg C
Operating Temperature	-55 to +125 deg C

Outline Drawing



DIE THICKNESS IS 0.004, BACKSIDE IS GROUND
BOND PADS ARE 0.004, SQUARE
ALL DIMENSION IN INCHES ±0.001
BOND PAD METALLIZATION: GOLD
BACKSIDE METALLIZATION: GOLD

Suggested Driver Circuit



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

Handling Precautions

Follow these precautions to avoid permanent damage.

Cleanliness: Handle the chips in a clean environment. DO NOT attempt to clean the chip using liquid cleaning systems.

Static Sensitivity: Follow ESD precautions to protect against > ± 250V ESD strikes.

Transients: Suppress instrument and bias supply transients while bias is applied. Use shielded signal and bias cables to minimize inductive pick-up.

General Handling: Handle the chip along the edges with a vacuum collet or with a sharp pair of bent tweezers. The surface of the chip has fragile air bridges and should not be touched with vacuum collet, tweezers, or fingers.

Mounting

The chip is back-metallized and can be die mounted with AuSn eutectic preforms or with electrically conductive epoxy. The mounting surface should be clean and flat.

Eutectic Die Attach:
A 80/20 gold tin preform is recommended with a work surface temperature of 255 deg. C and a tool temperature of 265 deg. C. When hot 90/10 nitrogen/hydrogen gas is applied, tool tip temperature should be 290 deg. C. DO NOT expose the chip to a temperature greater than 320 deg. C for more than 20 seconds. No more than 3 seconds of scrubbing should be required for attachment.

Epoxy Die Attach:
Apply a minimum amount of epoxy to the mounting surface so that a thin epoxy fillet is observed around the perimeter of the chip once it is placed into position.
Cure epoxy per the manufacturer's schedule.

Wire Bonding

Ball or wedge bond with 0.025 mm (1 mil) diameter pure gold wire (DC Bias) or ribbon bond (RF ports) 0.076 mm x 0.013 mm (3 mil x 0.5 mil) size is recommended. Thermosonic wirebonding with a nominal stage temperature of 150 deg. C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package or substrate. All bonds should be as short as possible <0.31 mm (12 mils).

Notes: