FEBRUARY 1995

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.

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 1.0 diameter pure gold wire. 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. RF bonds should be as short as possible.

Absolute Maximum Ratings

Control Voltage Range	+0.5 to -7.5 Vdc
Storage Temperature	-65 to +150 deg C
Operating Temperature	-55 to +125 deg C

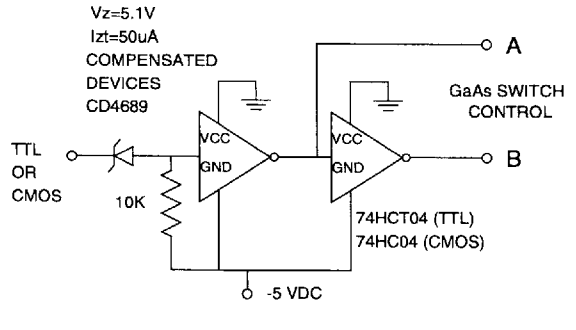
Control Voltages

State	Bias Condition
Low	0 to -0.2V@20uA Max
High	-5V@50uA Typ to -8V@300uA Max

Truth Table

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

Suggested Driver Circuit



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

Dimensions

Die Size	0.034 x 0.037 x 0.005 in. 0.875 x 0.950 x 0.125 mm
Signal Bondpads	0.004 x 0.004 in. 0.100 x 0.100 mm
Gnd Bondpads	0.004 x 0.008 in. 0.100 x 0.200 mm

21 Cabot Road, Woburn, Massachusetts 01801 Phone: 617-933-7267 FAX: 617-932-8903

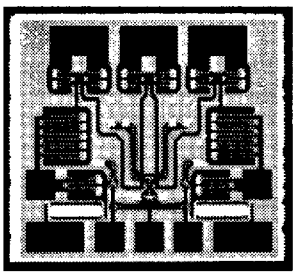
FEBRUARY 1995

Features

BANDWIDTH: DC-6 GHZ

LOW INSERTION LOSS : <1 dB

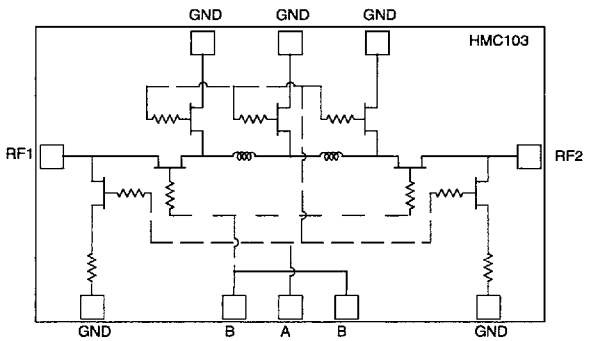
HIGH ISOLATION: > 40 dB



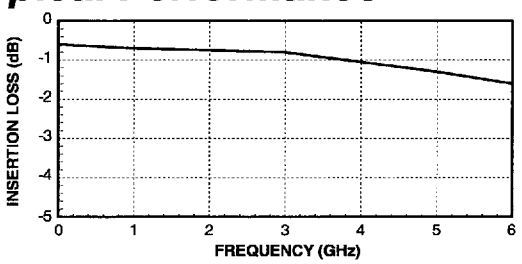
General Description

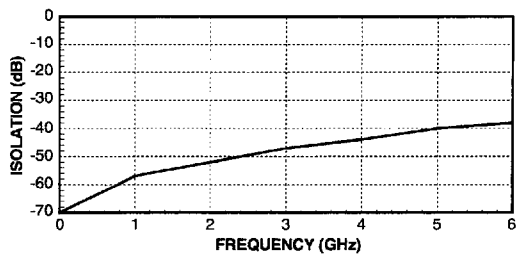
The HMC103 chip is a fast, broadband SPST switch. It features RF and control port bondpads conveniently located for easy interface.

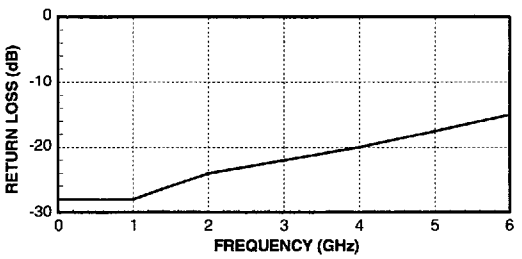
Schematic



Typical Performance







Electrical Performance

with 0V/-5V Control

PARAMETER	Freq.	Min.	Typ.	Max.	Units
Insertion Loss	DC - 3 GHz DC - 6 GHz		0.8 1.6	1.0 2.0	dB dB
Isolation	DC - 3 GHz DC - 6 GHz	40 35	47 38		dB dB
Return Loss	DC - 3 GHz DC - 6 GHz	18 22	22 15		dB dB
Input Power for 1 dB Compression	0.5 - 6 GHz		+27		dBm
Input Third Order Intercept	0.5 - 6 GHz		+40		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)	DC - 6 GHz		 3 6		 ns ns

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