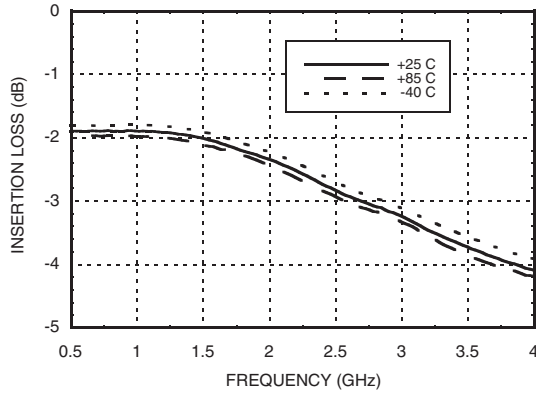
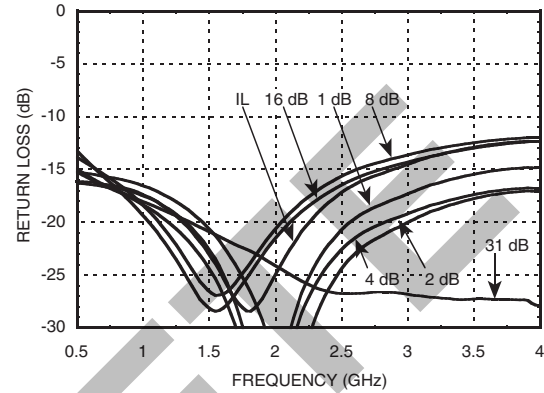




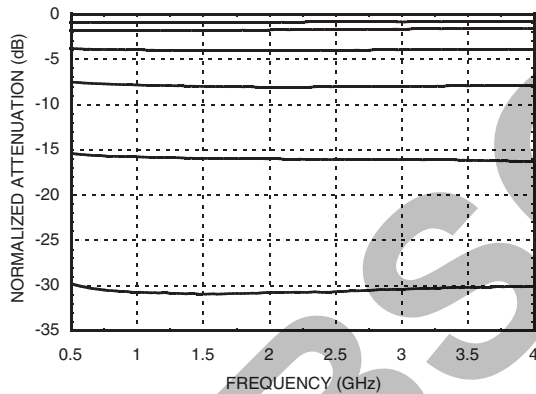
**Insertion Loss vs. Temperature**



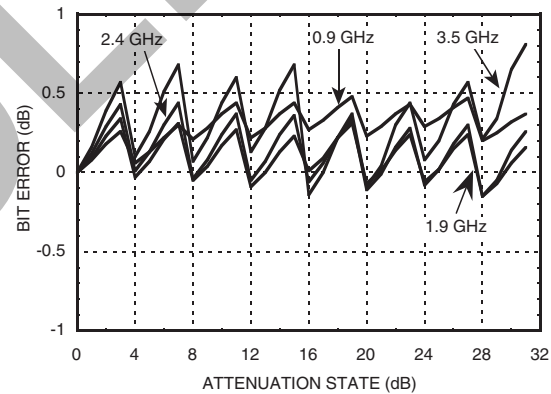
**Return Loss RF1, RF2**  
(Only Major States are Shown)



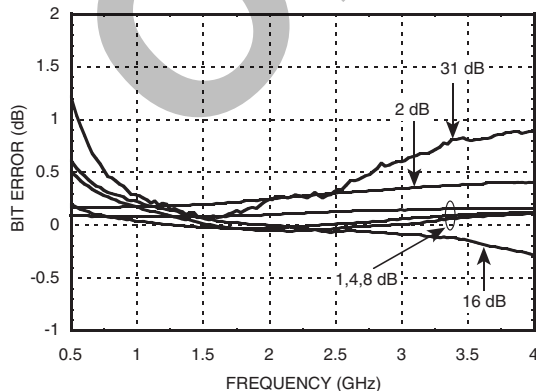
**Normalized Attenuation**  
(Only Major States are Shown)



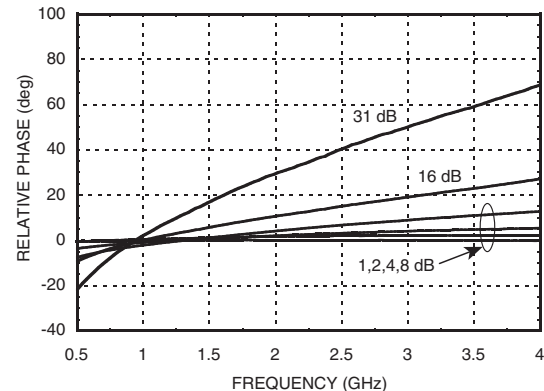
**Bit Error vs. Attenuation State**



**Bit Error vs. Frequency**  
(Only Major States are Shown)



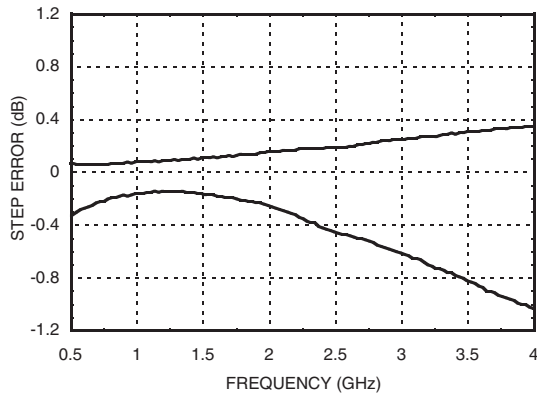
**Relative Phase vs. Frequency**  
(Only Major States are Shown)



Note: All Data Typical Over Voltage (+3V to +5V)

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**1 dB LSB GaAs MMIC 5-BIT DIGITAL  
ATTENUATOR, 0.7 - 3.8 GHz**
**Worst Case Step Error  
Between Successive Attenuation States**

**Truth Table**

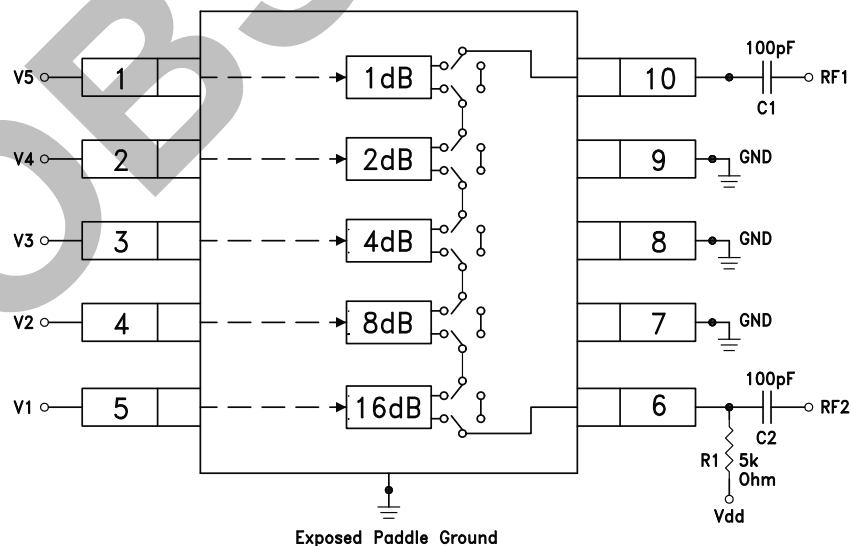
Control Voltage Input					Attenuation Setting RF1 - RF2
V1 16 dB	V2 8 dB	V3 4 dB	V4 2 dB	V5 1 dB	
High	High	High	High	High	Reference I.L.
High	High	High	High	Low	1 dB
High	High	High	Low	High	2 dB
High	High	Low	High	High	4 dB
High	Low	High	High	High	8 dB
Low	High	High	High	High	16 dB
Low	Low	Low	Low	Low	31 dB Max. Atten.

Any combination of the above states will provide an attenuation approximately equal to the sum of the bits selected.

**Control Voltages**

State	Bias Condition
Low	0 to +0.2 V @ 20 uA Max
High	Vdd ± 0.2V @ 100 uA Max

Note: Vdd = +3V to 5V ± 0.2V

**Application Circuit**


DC blocking capacitors C1 & C2 are required on RF1 & RF2. Choose C1 = C2 = 100 ~ 300 pF to allow lowest customer specific frequency to pass with minimal loss. R1 = 5K Ohm is required to supply voltage to the circuit through either PIN 6 or PIN 10.

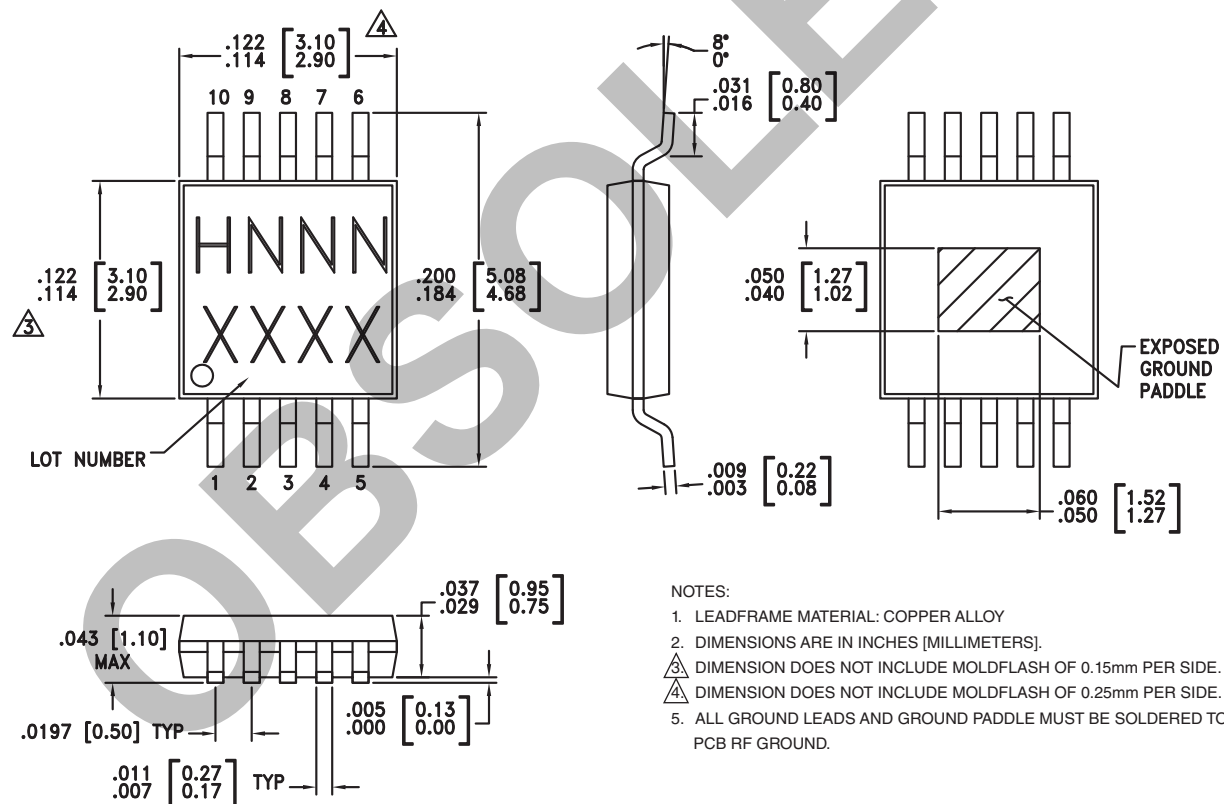
### Absolute Maximum Ratings

Control Voltage (V1 - V5)	Vdd + 0.5 Vdc
Bias Voltage (Vdd)	+8.0 Vdc
Channel Temperature	150 °C
Continuous P <sub>diss</sub> (T=85°C) (derate 6mW/°C above 85°C)	0.4 W
Thermal Resistance	163 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
RF Input Power (0.7 - 3.7 GHz)	+30 dBm
ESD Sensitivity (HBM)	Class 1A



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

### Outline Drawing



### Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[3]</sup>
HMC273MS10G	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 <sup>[1]</sup>	H273 XXXX
HMC273MS10GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 <sup>[2]</sup>	H273 XXXX

[1] Max peak reflow temperature of 235 °C

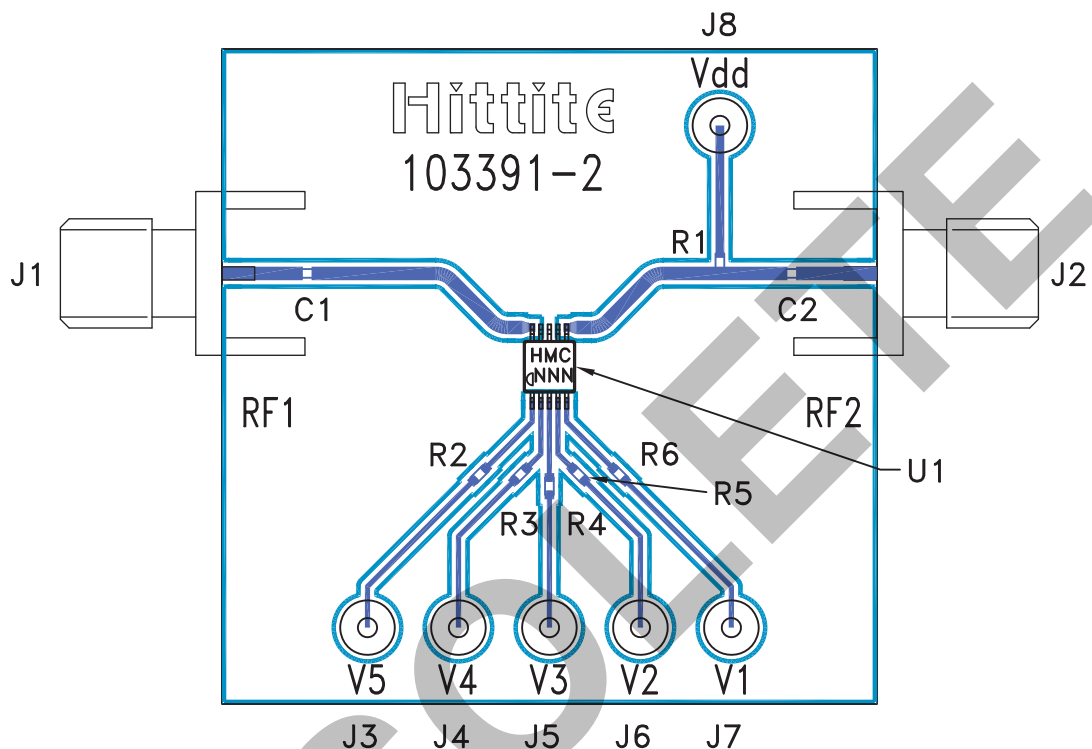
[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

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**Evaluation Circuit Board**



\* R2 - R6 = 100 Ohm.  
These resistors are optional  
and may be used to enhance  
decoupling of the RF path  
from the control inputs.

**List of Materials for Evaluation PCB 103393 <sup>[1]</sup>**

Item	Description
J1 - J2	PCB Mount SMA Connector
J3 - J6	DC Pin
R1	5k Ohm Resistor, 0402 Chip
R2, R3, R4	100 Ohm Resistor, 0402 Chip
C1, C2	0402 Chip Capacitor, Select for Lowest Frequency of Operation
U1	HMC273MS10G / HMC273MS10GE Digital Attenuator
PCB [2]	103391 Evaluation PCB 1.5" x 1.5"

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

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 and exposed ground paddle should be connected directly to the ground plane similar to that shown below. 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 Microwave Corporation upon request.



Notes:

## HMC273MS10G / 273MS10GE

v04.0907

**1 dB LSB GaAs MMIC 5-BIT DIGITAL  
ATTENUATOR, 0.7 - 3.8 GHz**

OBSOLETE

5

ATTENUATORS - SMT

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