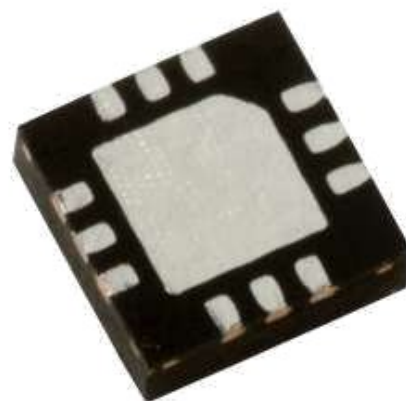


HRF-SW1001

SPDT Absorptive RF Switch DC to 2.5 GHz Operation

The Honeywell HRF-SW1001 is a high performance single pole double throw (SPDT) absorptive RF switch that is ideal for use in wireless basestation and handset applications that require minimum power and minimum insertion loss.

The HRF-SW1001 is manufactured with Honeywell's patented Silicon On Insulator (SOI) CMOS technology, which provides the performance of GaAs with the economy and integration capabilities of conventional CMOS technology. These switches are DC coupled to improve lower operating frequency, frequency response and reduce the number of DC bias points required.



HRF-SW1001 in VQFN Package

FEATURES

- Typical High Isolation Of > 44 dB @ 2 GHz
- Typical Low Insertion Loss Of 0.9dB @ 2 GHz
- Integrated CMOS Control Logic
- DC-coupled, bi-directional RF Path
- Single Positive Supply Voltage
- Ultra Small VQFN Packaging
- Impedance matched for 75 Ohm systems

RF ELECTRICAL SPECIFICATIONS @ + 25°C

Results @ $V_{DD} = 5.0 \pm 10\%$, $V_{SS} = 0$ unless otherwise stated, $Z_0 = 75$ Ohms
Contact Honeywell for relative performance at other supply configurations

Parameter	Test Condition	Frequency	Minimum	Typical	Maximum	Units
Insertion Loss		0.5 GHz		0.8	1.1	dB
		2.0 GHz		0.9	1.4	dB
		2.5 GHz		1.1	1.5	dB
Isolation		0.5 GHz	52	55		dB
		2.0 GHz	42	44		dB
		2.5 GHz	39	43		dB
Return Loss			-15	-20		dB
Input P1dB	$V_{SS} = \text{Gnd}$ $V_{SS} = -5V$	1.0 GHz		15		dBm
		1.0 GHz		25		dBm
Input IP3	Two-Tone Inputs, up to + 5 dBm $V_{SS} = \text{Gnd}$ $V_{SS} = -5V$	2.0 GHz		33		dBm
		2.0 GHz		35		dBm
Trise, Tfall	10% To 90%			10		ns
Ton, Toff	50% Cntl To 90% / 10%RF			20		ns

HRF-SW1001

DC ELECTRICAL SPECIFICATIONS @ + 25°C

Parameter	Minimum	Typical	Maximum	Units
V _{DD}	3.3 ¹	5.0	5.5	V
V _{SS}	-5.0			V
I _{DD}		<5	35	uA
CMOS Logic Level (0)	0		0.8	V
CMOS Logic Level (1)	V _{DD} - 0.8		V _{DD}	V
Input Leakage Current			10	uA

Note 1 - Performance curves are for VDD = +5.0 +/- 10%

ABSOLUTE MAXIMUM RATINGS¹

Parameter	Absolute Maximum	Units
V _{DD}	+6.0	V
V _{SS}	-5.5	V
Vin Digital Logic 0	- 0.6	V
Vin Digital Logic 1	Vdd + 0.6	V
Input Power	> 35	dBm
ESD Voltage	400	V
Moisture Sensitivity Level	MSL 1	
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-65 to +125	°C

Note 1 - Operation of this device beyond any of these parameters may cause permanent damage.

Note 2 - Although the HRF-SW1001 contains ESD protection circuitry on all digital inputs, precautions should be taken to ensure that the Absolute Maximum Ratings are not exceeded.

Latch-Up: Unlike conventional CMOS digital attenuators, Honeywell's HRF-SW1001 is immune to latch-up.

TRUTH TABLE

Switch Control	RF Output 1	RF Output 2
0	RF INPUT	
1		RF INPUT

"0" = CMOS Low, "1" = CMOS High

PIN CONFIGURATIONS

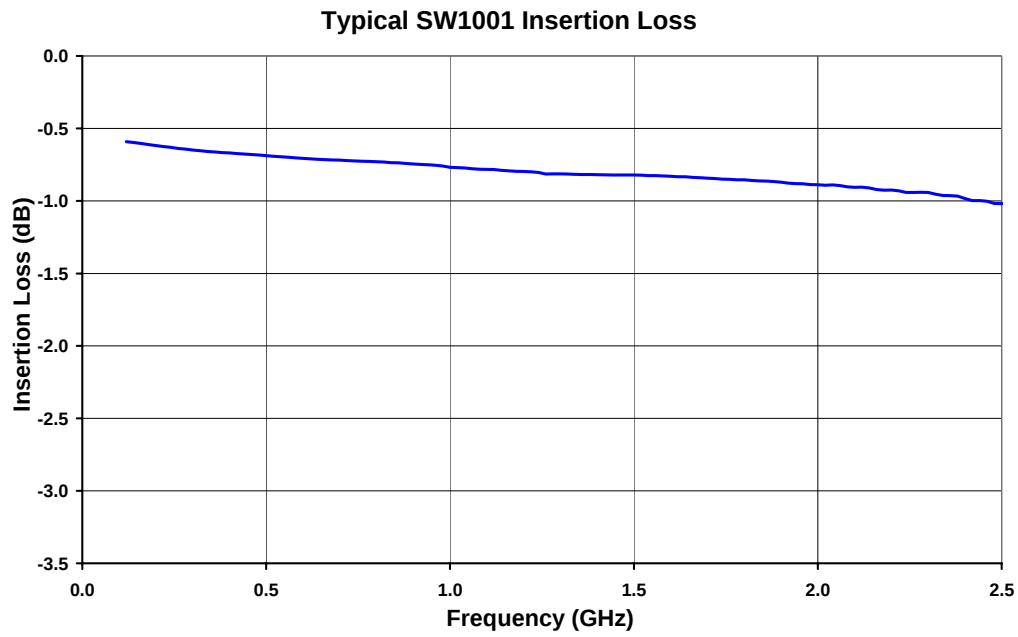
Pin	Function	Pin	Function
1	GROUND	7	GROUND
2	RF OUT 2	8	RF OUT 1
3	GROUND	9	GROUND
4	VDD	10	GROUND
5	SWITCH CONTROL	11	RF IN
6	VSS	12	GROUND

Note: Bottom ground plate must be grounded for proper RF performance.

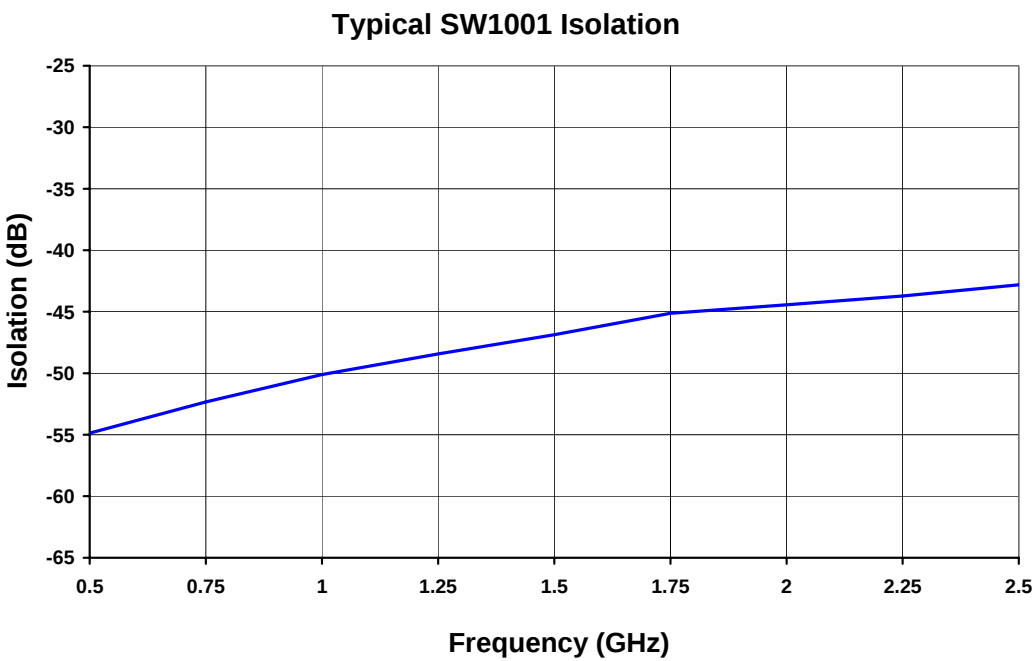
HRF-SW1001

PERFORMANCE CURVES

Insertion Loss

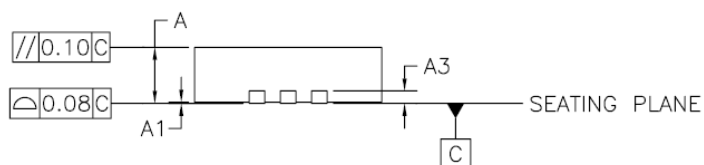
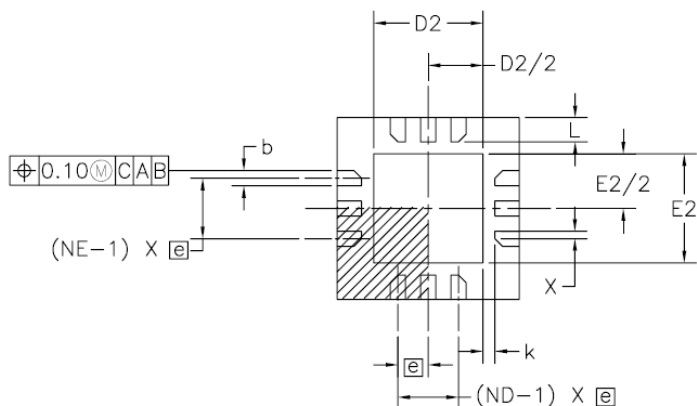
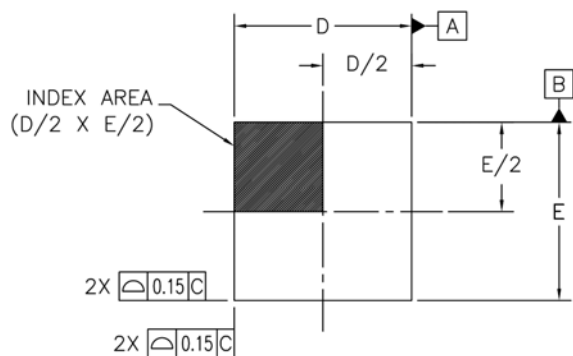


Isolation



HRF-SW1001

PACKAGE OUTLINE DRAWING



Notes

1. Pin 1 identifier can be a combination or a dot and/or chamfer.
2. Dimensions are in millimeters.

SYMBOL	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0	0.02	0.05
A3	---	0.20 REF	---
[e]	0.50	BSC	
b	0.23	0.25	0.28
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D2	1.70	1.80	1.90
E2	1.70	1.80	1.90
k	0.20	---	---
L	0.35	0.40	0.45
N	12		
ND	3		
NE	3		
X	b/2	---	---

LEAD FINISH

The package leads are Tin Lead (SnPb).

CIRCUIT APPLICATION INFORMATION

These attenuators require a DC reference to ground. They may not operate properly when AC coupled on both the RF input and output without a DC ground reference provided as part of the circuit. See Application Note AN311 at www.honeywell.com/microwave.

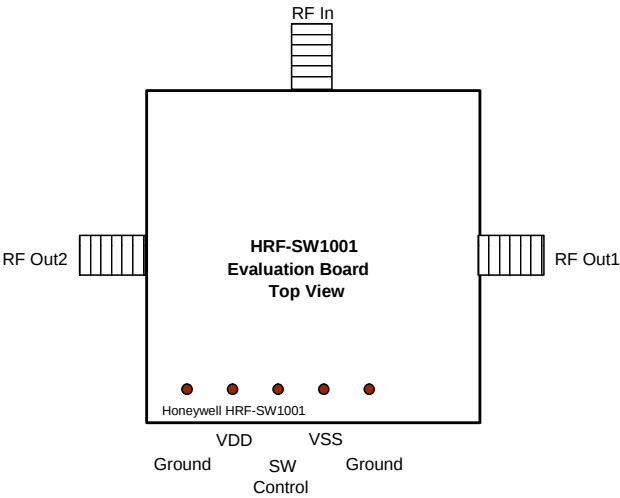
HRF-SW1001

EVALUATION CIRCUIT BOARD

Honeywell's evaluation board provides an easy to use method of evaluating the RF performance of our switch. Simply connect power; DC and RF signals to be measuring switch performance in less than 10 minutes.



HRF-SW1001 Evaluation Board



EVALUATION CIRCUIT BOARD LAYOUT DESIGN DETAILS

Item	Description
PCB	Impedance Matched Multi-Layer FR4
Switch	HRF-SW1001 RF Switch
Chip Capacitor	Panasonic Model ECU-E1C103KBQ Capacitor, .01uf 0402 10% 16V
RF Connector	Johnson Connectors Model 142-0701-801 SMA RF Coaxial Connector
DC Pin	Mil-Max Model 800-10-064-10-001 Header Pins

ORDERING INFORMATION

Ordering Number	Delivery Method	Units Per Shipment
HRF-SW1001-TR HRF-SW1001-T HRF-SW1001-E	Delivered On Tape And Reel Delivered On Tape Engineering Evaluation Board	3000 Units per Reel <3000 One Board Per Box

FIND OUT MORE

For more information on Honeywell's Microwave Products visit us online at www.honeywell.com/microwave or contact us at 800-323-8295 (763-954-2474 internationally).

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