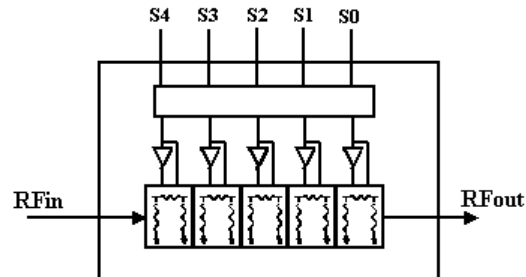


## 31 dB, DC – 1.5 GHz, 5 Bit Parallel Digital Attenuator - 75 Ohm Match

### Features

- Very Low DC Power Consumption
- Attenuation In Steps From 1 dB To 31 dB
- Single Or Dual Power Supply Voltages
- Parallel Data Interface
- 75 Ohm Compatible Impedance
- Space Saving LPCC™ Surface Mount Packaging



### Product Description

The Honeywell HRF-AT4522 is a 5-bit digital attenuator that is ideal for use in cable communication system applications that require accuracy, speed and low power consumption. The HRF-AT4522 is manufactured with Honeywell's patented Silicon On Insulator (SOI) CMOS manufacturing technology, which provides the performance of GaAs with the economy and integration capabilities of conventional CMOS.

### Electrical Specifications @ + 25°C

Results @ V<sub>dd</sub> = 5.0 +/- 10%, V<sub>ss</sub> = 0 unless otherwise stated, Z<sub>0</sub> = 75 Ohms

Parameter	Test Condition	Frequency	Minimum	Typical	Maximum	Units
Insertion Loss		DC – 0.5 GHz 0.5 – 2.0 GHz		2.5 3.0	3.0 4.0	dB dB
1dB Compression	V <sub>SS</sub> = 0V, Input Power	0.5 – 2.0 GHz		20		dBm
1dB Compression	V <sub>SS</sub> = - 3, Input Power	0.5 – 2.0 GHz		30		dBm
Input IP3	V <sub>SS</sub> = 0V Two-tone inputs Up To +5 dBm @ 0 dBm Attenuation	0.5 – 2.0 GHz		30		dBm
Input IP3	V <sub>ss</sub> = - 3 Two-tone inputs Up To + 5 dBm @ 0 dBm Attenuation	0.5 – 2.0 GHz		40		dBm
Return Loss	Any Bit or Combination	DC - 2.0 GHz	-12	-15		dB
Attenuation Accuracy	Any Bit Or Combination Of Bits	DC – 2.0 GHz			.3 + 3% attn.	dB
Trise, Tfall	10% To 90%			10		nS
Ton, Toff (Tpd)	50% Cntl To 90%/10%RF			15		nS
Transients	In-Band			30		mV

0.01uF Decoupling Capacitors Required On Power Supply Rails.

### DC Electrical Specifications @ + 25°C

Parameter	Minimum	Typical	Maximum	Units
V <sub>DD</sub>	4.5	5.0	5.5	V
V <sub>SS</sub>		-3.0	-5.0	V
I <sub>DD</sub> Power Supply Current		.01	2	mA
CMOS Logic level (0)	0		0.8	V
CMOS Logic level (1)	V <sub>DD</sub> – 0.8		V <sub>DD</sub>	V
Input Leakage Current			10	uA

Note 1, the performance curves are for V<sub>dd</sub> = +5.0 +/- 10%

## Absolute Maximum Ratings<sup>2</sup>

Parameter	Absolute Maximum	Units
Input Power	+ 35	dBm
V <sub>DD</sub>	+6.0	V
V <sub>SS</sub>	-5.5	V
ESD Voltage (Human Body Model)	TBD	V
Operating Temperature	-40 To +85	Degrees C
Storage Temperature	-65 To +125	Degrees C

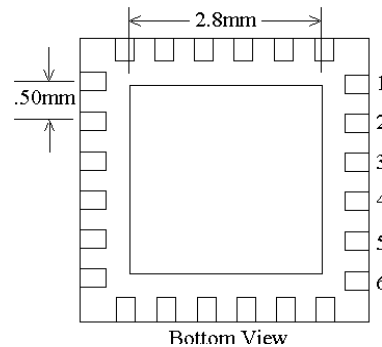
(Note 2) Operation of this Device beyond any of these parameters may cause permanent damage.

**Latch-Up:** Unlike conventional CMOS digital attenuators, Honeywell's HRF-AT4522 is immune to latch-up.

**ESD Protection:** Although the HRF-AT4522 contains ESD protection circuitry on all digital inputs, conventional precautions should be taken to ensure that the Absolute Maximum Ratings are not exceeded.

## Package Outline Drawing

This package conforms to the LPCC™ 4 X 4 mm 24 lead body dimensions.  
See ASAT LPCC Marketing Outline Dwg. # DGMJ00004 Latest Rev.



## Pin Configuration

Pin	Function	Pin	Function
1	VDD	13	GROUND
2	GROUND	14	GROUND
3	GROUND	15	RF OUTPUT
4	RF INPUT	16	GROUND
5	GROUND	17	VSS
6	GROUND	18	GROUND
7	GROUND	19	S0
8	GROUND	20	S1
9	GROUND	21	S2
10	GROUND	22	S3
11	GROUND	23	S4
12	GROUND	24	Open

## Truth Table

S4	S3	S2	S1	S0	Output
0	0	0	0	0	Reference Input
0	0	0	0	1	1 dB
0	0	0	1	0	2 dB
0	0	1	0	0	4 dB
0	1	0	0	0	8 dB
1	0	0	0	0	16 dB
1	1	1	1	1	31 dB

**Operation:** Data on parallel input "S" pins are independently buffered and presented to the RF attenuator circuits.  
"0" = CMOS Low, "1" = CMOS High.

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2002 4522W Published June 2002 Page 2

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