

GaAS MMIC SP4T SWITCH NON-REFLECTIVE DC TO 2.0 GHz

FEBRUARY 2001

v01.0101

Features

LOW INSERTION LOSS: 0.8dB

INTEGRATED 2:4 DECODER

14 LEAD SOIC PACKAGE



General Description

The HMC182S14 is a low-cost terminated SP4T switch in a 14-lead SOIC package for use in antenna diversity, switched filter banks, gain/attenuation selection, and general channel multiplexing applications. The switch can control signals up to 2 GHz and is especially suited for 800-1000 MHz basestation applications. A 2:4 decoder is integrated on the switch, requiring only 2 control lines and a negative bias to select each RF path. The 2:4 decoder replaces 4 to 8 control lines normally required by GaAS SP4T switches. The HMC182S14 is a drop-in replacement for the HMC165S14 in applications requiring low "off state" VSWR. See positive bias/TTL SP4T HMC241QS16.

Guaranteed Performance

For 0/-5V Control and Vee = -5V in a 50 Ohm system, -40 to +85 deg C

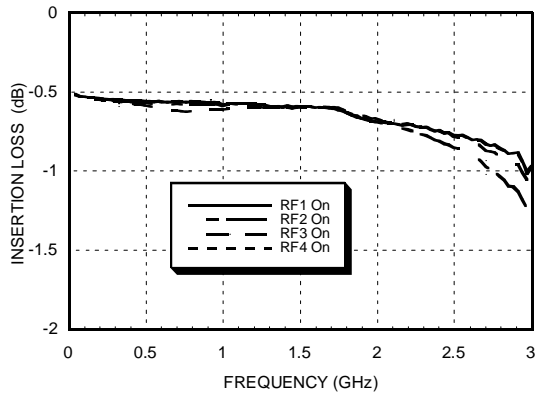
Parameter	Frequency	Min.	Typ.	Max.	Units
Insertion Loss	DC - 1.0 GHz		0.7	1.1	dB
	DC - 2.0 GHz		0.8	1.2	dB
Isolation	DC - 0.5 GHz	41	45		dB
	DC - 1.0 GHz	36	40		dB
	DC - 2.0 GHz	28	32		dB
Return Loss	DC - 1.0 GHz	21	25		dB
	DC - 2.0 GHz	16	20		dB
	DC - 1.0 GHz	17	21		dB
	DC - 2.0 GHz	13	17		dB
Input Power for 1dB Compression	50 MHz		22		dBm
	0.5 - 2.0 GHz		24		dBm
Input Third Order Intercept (+7 dBm EACH Tone)	50 MHz	25	30		dBm
	0.5 - 1.0 GHz	41	45		dBm
	0.5 - 2.0 GHz	37	41		dBm
Switching Characteristics	DC - 2.0 GHz	tRISE, tFALL (10/90% RF)	25		nS
		tON, tOFF (50% CTL to 10/90% RF)	50		nS

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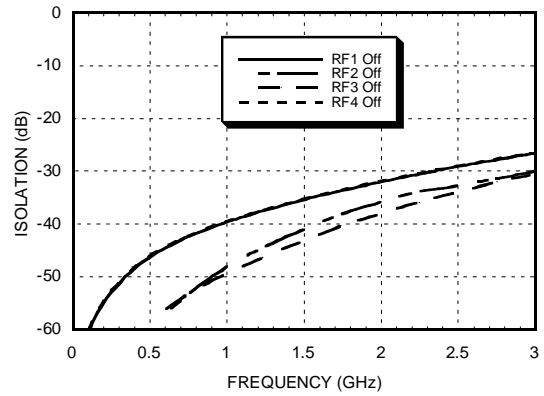
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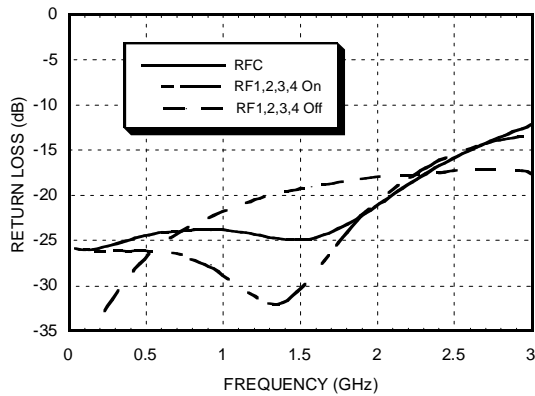
Insertion Loss



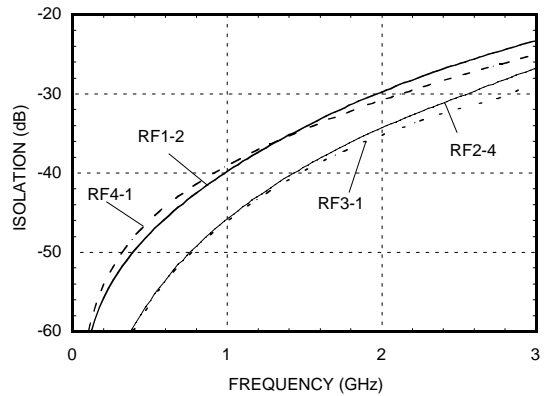
Isolation



Return Loss



Isolation Between Several RF I/Os

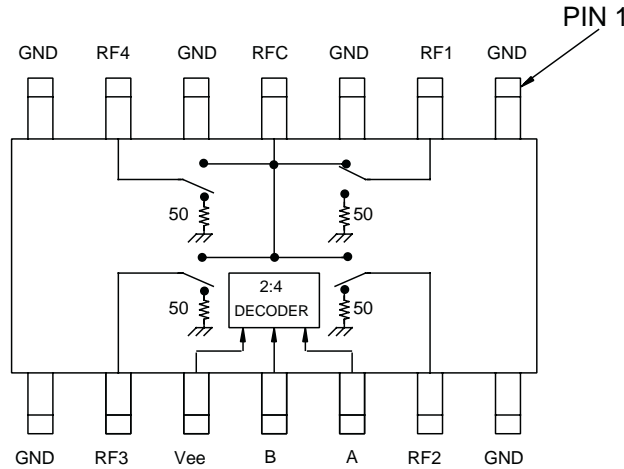


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Functional Diagram



Absolute Maximum Ratings

Bias Voltage Range (Port Vee)	-7.0 Vdc
Control Voltage Range (A & B)	Vee -0.5V to +1.0 Vdc
Storage Temperature	-65 to +150 deg C
Operating Temperature	-40 to +85 deg C
Maximum Input Power	+27dBm (<500MHz) +30dBm (>500MHz)

Truth Table

Control Input		Signal Path State
A	B	RFCOM to:
High	High	RF1
Low	High	RF2
High	Low	RF3
Low	Low	RF4

Bias Voltage & Current

Vee Range = -5.0 Vdc ± 10%		
Vee (Vdc)	I _{ee} (Typ.) (mA)	I _{ee} (Max.) (mA)
-5.0	4.0	7.0

Control Voltages

State	Bias Condition
Low	-3V to 0 VDC @ 70 uA Typ.
High	-5 to -4.2 VDC @ 5 uA Typ.

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SWITCHES

SP4T

SMT

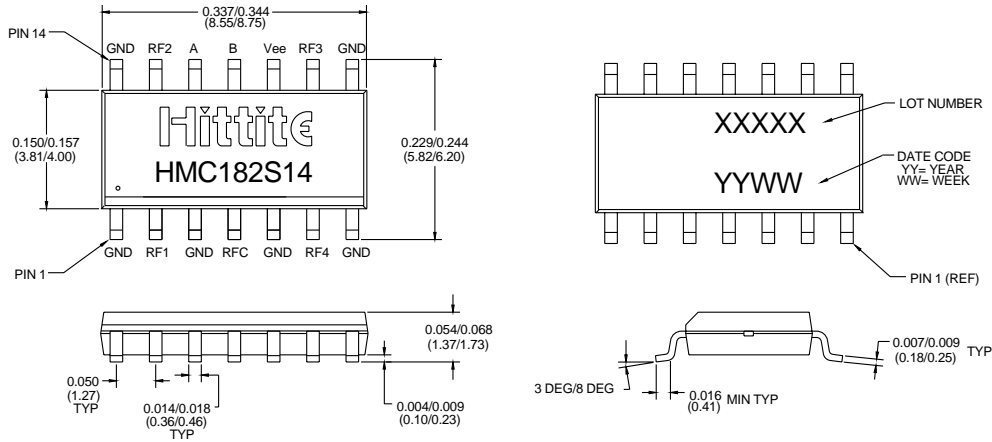


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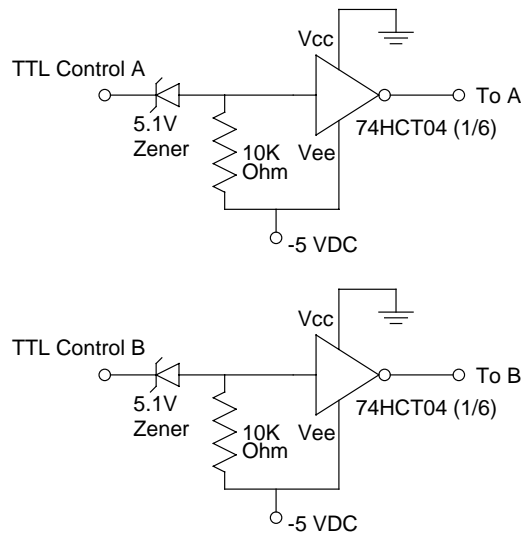
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Outline



- 1) MATERIAL:
 - A) PACKAGE BODY: LOW STRESS INJECTION MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED
 - B) LEADFRAME MATERIAL: COPPER ALLOY
2. PLATING: LEAD-TIN SOLDER PLATE
3. DIMENSIONS ARE IN INCHES (MILLIMETERS)

TTL Interface Circuit



Note:
Control inputs A and B can be driven directly with TTL logic with -5 Volts applied to the HCT logic gates Vee pin and to Vee (pin 10) of the RF switch.