

IH5009-5012, 5014, 5016-5020, 5022, 5024

May 1999

Virtual Ground Analog Switch

NO RECOMMENDED REPLACEMENT Description

Features

Call Central Applications 1-800-442-7747 or email: centapp@harris.com Switches A te - Interfaces with Most Each Channe Integrated Logic

OBSOLETE PRODUCT

- Switching Speeds Less Than 0.5µs
- I_{D(OFF)} Less Than 500pA Typical at 70^oC
- Effective r_{DS(ON)} 5Ω to 50Ω
- **Commercial and Military Temperature Range** Operation

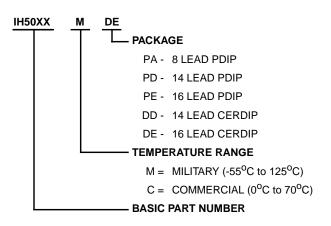
The IH5009 series of analog switches were designed to fill the need for an easy-to-use, inexpensive switch for both industrial and military applications. Although low cost is a primary design objective, performance and versatility have not been sacrificed.

Each package contains up to four channels of analog gating and is designed to eliminate the need for an external driver. The odd numbered devices are designed to be driven directly from TTL open collector logic (15 volts) while the even numbered devices are driven directly from low level TTL logic (5 volts). Each channel simulates a SPDT switch. SPST switch action is obtained by leaving the diode cathode unconnected; for SPDT action, the cathode should be grounded (0V). The parts are intended for high performance multiplexing and commutating usage. A logic "0" turns the channel ON and a logic "1" turns the channel OFF.

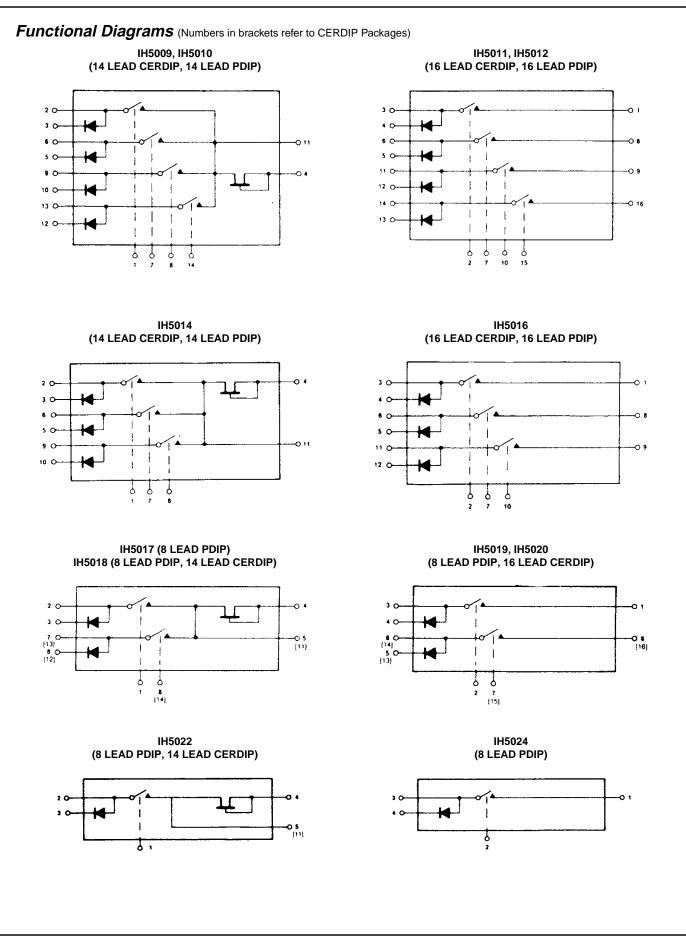
Part Number Information

PART NUMBER	CHANNELS	LOGIC LEVEL	PACKAGE	PKG NO.
IH5009	4	+15	DD, PD	
IH5010	4	+5	DD, PD	
IH5011	4	+15	DE, PE	
IH5012	4	+5	DE, PE	
IH5014	3	+5	DD, PD	
IH5016	3	+5	DE, PE	
IH5017	2	+15	PA	
IH5018	2	+5	DD, PA	
IH5019	2	+15	DE, PA	
IH5020	2	+5	DE, PA	
IH5022	1	+5	DD, PA	
IH5024	1	+5	PA	

NOTE: Mil-Temperature range (-55°C to 125°C) available in ceramic packages only.



CAUTION: These devices are sensitive to electrostatic discharge. Users should follow proper IC Handling Procedures. Copyright C Harris Corporation 1999



Absolute Maximum Ratings

Positive Analog Signal Voltage
Negative Analog Signal Voltage15V
Diode Current
Power Dissipation (Note) 500mW

Operating Conditions

Temperature Range

5009C Series	
5009M Series	55 ⁰ C to 125 ⁰ C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE: Dissipation rating assumes device is mounted with all leads welded or soldered to printed circuit board in ambient temperature below 75°C. For higher temperature, derate at rate of 5m/W°C.

PARAMETER	(NOTE 1) SYMBOL	(NOTE 4) TEST CONDITIONS	(NOTE 2) TYPE	-55 ^o C (M) 0 ^o C (C) MIN/MAX	25 ⁰ C		125°C(M)	
					ТҮР	MIN/MAX	70 ^o C (C) MIN/MAX	UNITS
Input Current-ON	I _{IN(ON)}	ALL	$V_{IN} = 0V, I_D = 2mA$	-	0.01	±0.5	100	μΑ
Input Current-OFF	lin(OFF)	5V Logic Ckts	V_{IN} = +4.5V, V_A = ±10V	-	0.04	±0.5	20	nA
Input Current-OFF	IN(OFF)	15V Logic Ckts	$V_{IN} = +11V,$ $V_A = \pm 10V$	-	0.04	±0.5	20	nA
Channel Control Voltage-ON	V _{IN(ON)}	5V Logic Ckts	Note 3	0.5	-	0.5	0.5	V
Channel Control Voltage-ON	V _{IN(ON)}	15V Logic Ckts	Note 3	1.5	-	1.5	1.5	V
Channel Control Voltage-OFF	V _{IN(OFF)}	5V Logic Ckts	Note 3	-	-	4.5	4.5	V
Channel Control Voltage-OFF	V _{IN(OFF)}	15V Logic Ckts	Note 3	-	-	11.0	11.0	V
Leakage Current-OFF	ID(OFF)	5V Logic Ckts	V_{IN} = +4.5V, V_A = ±10V	-	0.02	±0.5	20	nA
Leakage Current-OFF	ID(OFF)	15V Logic Ckts	$V_{IN} = +11V,$ $V_A = \pm 10V$	-	0.02	±0.5	20	nA
Leakage Current-ON	I _{D(ON)}	5V Logic Ckts	V _{IN} = 0V, I _S = 1mA	-	0.30	±1.0	1000 (M) 200 (C)	nA
Leakage Current-ON	I _{D(ON)}	15V Logic Ckts	V _{IN} = 0V, I _S = 1mA	-	0.10	±0.5	500 (M) 100 (C)	nA
Leakage Current-ON	I _{D(ON)}	5V Logic Ckts	$V_{IN} = 0V, I_S = 2mA$	-	-	1.0	10	μΑ
Leakage Current-ON	I _{D(ON)}	15V Logic Ckts	$V_{IN} = 0V, I_S = 2mA$	-	-	2.0	100	μΑ
Drain-Source ON-Resistance	^r DS(ON)	5V Logic Ckts	I _D = 2mA, V _{IN} = 0.5V	150	90	150	385 (M) 240 (C)	Ω
Drain-Source ON-Resistance	^r DS(ON)	15V Logic Ckts	I _D = 2mA, V _{IN} = 1.5V	100	80	100	250 (M) 160 (C)	Ω
Turn-ON Time	t _(ON)	All		-	150	500	-	ns
Turn-OFF Time	^t (OFF)	All		-	300	500	-	ns
Cross Talk	СТ	All	f = 100Hz	-	120	-	-	dB

Electrical Specifications (Per Channel)

NOTES:

1. (OFF) and (ON) subscript notation refers to the conduction state of the FET switch for the given test.

2. Refer to Figure 1 for definition of terms.

3. $V_{IN(ON)}$ and $V_{IN(OFF)}$ are test conditions guaranteed by the tests of $r_{DS(ON)}$ and $I_{D(OFF)}$ respectively.

4. "5V Logic CKTS" applies to even-numbered devices. "15V Logic CKTS" applies to odd-numbered devices.

Thermal Information