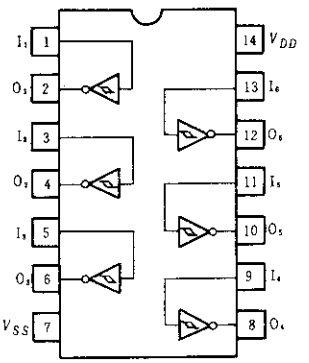
HD14584B

Hex Schmitt Trigger

■ FEATURES

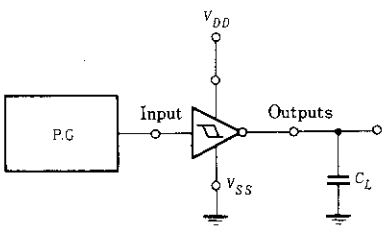
- Quiescent Current = 0.5nA typ/pkg @5V
- Noise Immunity = 45% of V_{DD} typ
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range
- Pin-for Pin Replacements for MC14584B Series

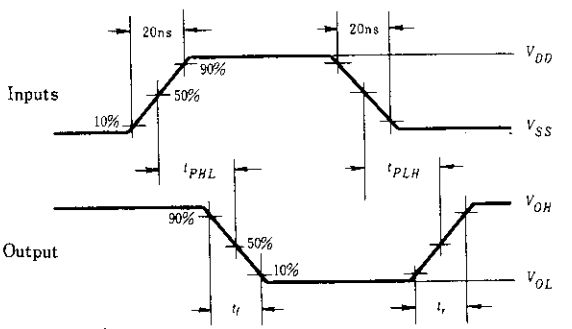
■ PIN ARRANGEMENT



(Top View)

■ SWITCHING TIME TEST CIRCUIT





HITACHI

■ ELECTRICAL CHARACTERISTICS

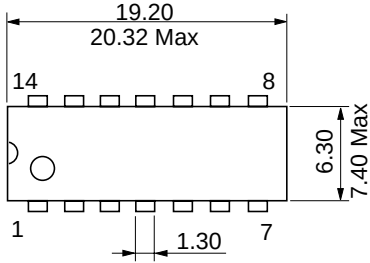
Characteristic	Symbol	V_{DD}(V)	Test Conditions	−40°C min	−40°C max	25°C min	25°C typ	25°C max	85°C min	85°C max	Unit
Output Voltage	V_{OL}	5.0	$V_{in}=V_{DD}$	—	0.05	—	0	0.05	—	0.05	V
		10		—	0.05	—	0	0.05	—	0.05	
		15		—	0.05	—	0	0.05	—	0.05	
	V_{OH}	5.0	$V_{in}=0$	4.95	—	4.95	5.0	—	4.95	—	V
		10		9.95	—	9.95	10	—	9.95	—	
		15		14.95	—	14.95	15	—	14.95	—	
Input Voltage	V_{IL}	5.0	$V_{out}=4.5V$	—	1.5	—	2.25	1.5	—	1.5	V
		10	$V_{out}=9.0V$	—	3.0	—	4.50	3.0	—	3.0	
		15	$V_{out}=13.5V$	—	4.0	—	6.75	4.0	—	4.0	
	V_{IH}	5.0	$V_{out}=0.5V$	3.5	—	3.5	2.75	—	3.5	—	V
		10	$V_{out}=1.0V$	7.0	—	7.0	5.50	—	7.0	—	
		15	$V_{out}=1.5V$	11.0	—	11.0	8.25	—	11.0	—	
Output Drive Current	I_{OH}	5.0	$V_{OH}=2.5V$	−2.5	—	−2.1	−4.2	—	−1.7	—	mA
		5.0	$V_{OH}=4.6V$	−0.52	—	−0.44	−0.88	—	−0.36	—	
		10	$V_{OH}=9.5V$	−1.3	—	−1.1	−2.25	—	−0.9	—	
		15	$V_{OH}=13.5V$	−3.6	—	−3.0	−8.8	—	−2.4	—	
	I_{OL}	5.0	$V_{OL}=0.4V$	0.52	—	0.44	0.88	—	0.36	—	mA
		10	$V_{OL}=0.5V$	1.3	—	1.1	2.25	—	0.9	—	
		15	$V_{OL}=1.5V$	3.6	—	3.0	8.8	—	2.4	—	
Input Current	I_{in}	15		—	±0.3	—	±0.00001	±0.3	—	±1.0	μA
Input Capacitance	C_{in}		$V_{in}=0$	—	—	—	5.0	7.5	—	—	pA
Quiescent Current	I_{DD}	5.0	Zero Signal, per Package	—	1.0	—	0.0005	1.0	—	7.5	μA
		10		—	2.0	—	0.0010	2.0	—	15	
		15		—	4.0	—	0.0015	4.0	—	34	
Total Supply Current*	I_T	5.0	Dynamic+I_{DD}, per Gate C_L=50pF, f=1 kHz	—	—	—	1.8	—	—	—	μA
		10		—	—	—	3.6	—	—	—	
		15		—	—	—	5.4	—	—	—	
Hysteresis Voltage	V_H	5.0		0.12	1.0	0.10	0.55	1.0	0.08	1.0	V
		10		0.26	1.3	0.20	0.7	1.2	0.15	1.2	
		15		0.47	1.4	0.30	1.1	1.5	0.2	1.4	
Threshold Voltage	V_T^+	5.0		1.9	3.5	1.8	2.7	3.4	1.7	3.4	V
		10		3.4	7.0	3.3	5.3	6.9	3.2	6.9	
		15		5.2	10.6	5.2	8.0	10.5	5.2	10.5	
	V_T^-	5.0		1.6	3.3	1.6	2.1	3.2	1.5	3.2	
		10		3.0	6.7	3.0	4.6	6.7	3.0	6.7	
		15		4.5	9.7	4.6	6.9	9.8	4.7	9.9	

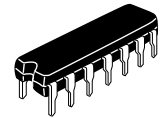
* To calculate total supply current at frequency other than 1kHz.
@V_{DD}=5.0V $I_T=(1.8\mu A/kHz)f+I_{DD}$ @V_{DD}=10V $I_T=(3.6\mu A/kHz)f+I_{DD}$ @V_{DD}=15V $I_T=(5.4\mu A/kHz)f+I_{DD}$

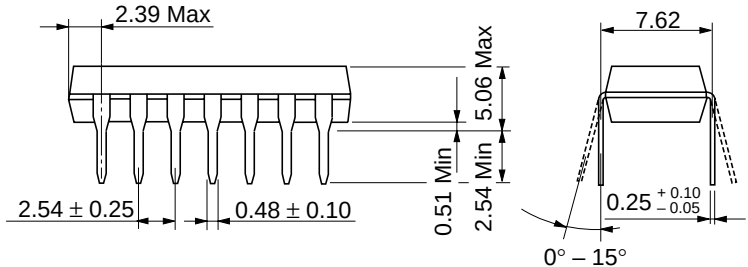
■ SWITCHING CHARACTERISTICS (C_L=50pF, Ta=25°C)

Characteristic	Symbol	V_{DD}(V)	min	typ	max	Unit
Output Rise Time	t_r	5.0	—	100	200	ns
		10	—	50	100	
		15	—	40	80	
Output Fall Time	t_f	5.0	—	100	200	ns
		10	—	50	100	
		15	—	40	80	
Propagation Delay Time	t_{PLH}	5.0	—	125	250	ns
		10	—	50	100	
		15	—	40	80	
	t_{PHL}	5.0	—	125	250	ns
		10	—	50	100	
		15	—	40	80	

Unit: mm

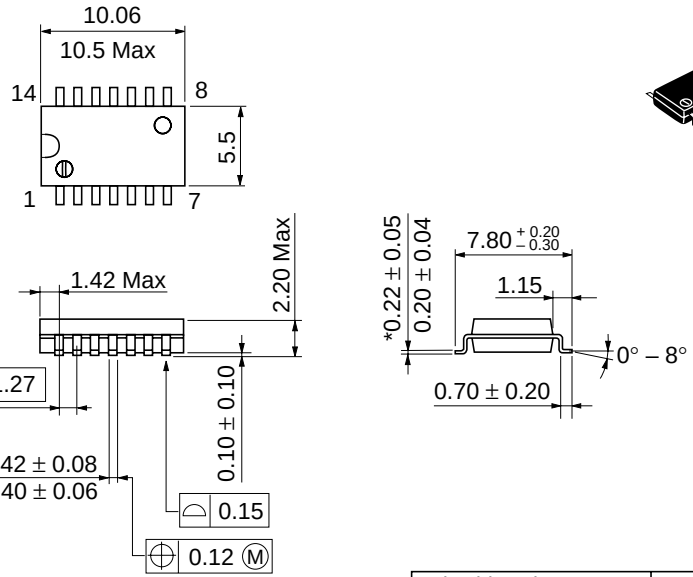


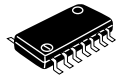




Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.97 g

Unit: mm

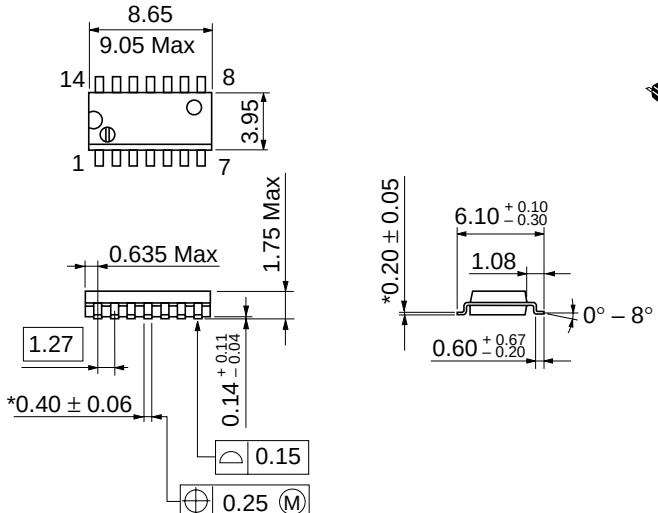




Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.23 g

*Dimension including the plating thickness
Base material dimension

Unit: mm



Hitachi Code	FP-14DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.13 g

*Pd plating

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HITACHI

Hitachi, Ltd.
Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL
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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose,CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX