

HD14028B

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

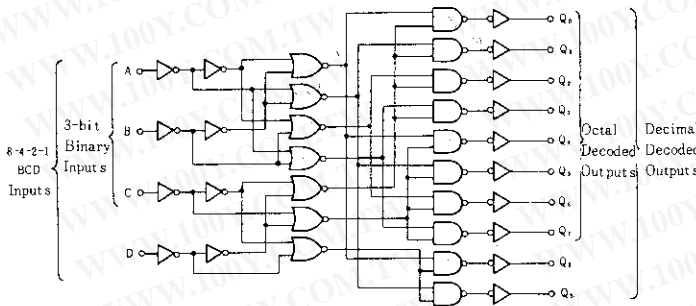
BCD-to-Decimal Decoder/ Binary-to-Octal Decoder

The HD14028B decoder is constructed so that an 8421 BCD code on the four inputs provides a decimal (one-of-ten) decoded output, while a 3-bit binary input provides a decoded octal (one-of-eight) code output with D forced to a logic "0". Expanded decoding such as binary-to-hexadecimal (one-of-16), etc., can be achieved by using other HD14028B devices. The part is useful for code conversion, address decoding, memory selection control, demultiplexing, or readout decoding.

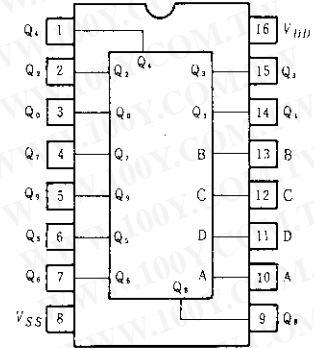
FEATURES

- Supply Voltage Range = 3 to 18V
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range
- Positive Logic Design
- Quiescent Current 5nA/pkg typ. @5V
- Low Outputs on All Illegal Input Combinations
- Pin-for-pin Replacement for MC14028B

LOGIC DIAGRAM



PIN ARRANGEMENT

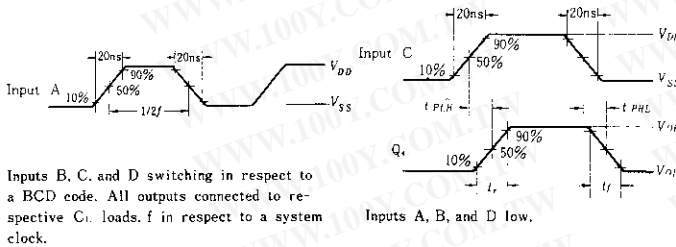


(Top View)

TRUTH TABLE

Inputs				Outputs									
D	C	B	A	Q ₉	Q ₈	Q ₇	Q ₆	Q ₅	Q ₄	Q ₃	Q ₂	Q ₁	Q ₀
0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	1	0	0	0	0	0	0	0	0	1	0
0	0	1	0	0	0	0	0	0	0	0	1	0	0
0	0	1	1	0	0	0	0	0	0	1	0	0	0
0	1	0	0	0	0	0	0	0	1	0	0	0	0
0	1	0	1	0	0	0	0	1	0	0	0	0	0
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1	0	1	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	1	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	0

DYNAMIC SIGNAL WAVEFORMS



Inputs B, C, and D switching in respect to a BCD code. All outputs connected to respective C_L loads. f in respect to a system clock.

Inputs A, B, and D low.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	$V_{DD}(V)$	Test Conditions	-40°C		25°C			85°C		Unit
				min	max	min	typ	max	min	max	
Output Voltage	V_{OL}	5.0	$V_{in} = V_{DD}$ or 0	-	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	$V_{in} = 0$ or V_{DD}	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	$V_{out} = 4.5$ or $0.5V$	-	1.5	-	2.25	1.5	-	1.5	V
		10	$V_{out} = 9.0$ or $1.0V$	-	3.0	-	4.50	3.0	-	3.0	
		15	$V_{out} = 13.5$ or $1.5V$	-	4.0	-	6.75	4.0	-	4.0	
	V_{IH}	5.0	$V_{out} = 0.5$ or $4.5V$	3.5	-	3.5	2.75	-	3.5	-	V
		10	$V_{out} = 1.0$ or $9.0V$	7.0	-	7.0	5.50	-	7.0	-	
		15	$V_{out} = 1.5$ or $13.5V$	11.0	-	11.0	8.25	-	11.0	-	
Output Drive Current	I_{OH}	5.0	$V_{OH} = 2.5V$	-1.0	-	-0.8	-1.7	-	-0.6	-	mA
		5.0	$V_{OH} = 4.6V$	-0.2	-	-0.16	-0.36	-	-0.12	-	
		10	$V_{OH} = 9.5V$	-0.5	-	-0.4	-0.9	-	-0.3	-	
	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	-	-	pF
Quiescent Current	I_{DD}	5.0	Zero Signal, per Package	-	20	-	0.005	20	-	150	μA
		10		-	40	-	0.010	40	-	300	
		15		-	80	-	0.015	80	-	600	
Total Supply Current*	I_T	5.0	Dynamic + I_{DD} ,	-	-	-	0.3	-	-	-	μA
		10	per Gate	-	-	-	0.6	-	-	-	
		15	$C_L = 50pF$, $f = 1$ kHz	-	-	-	0.9	-	-	-	

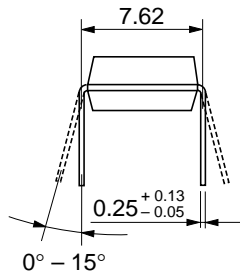
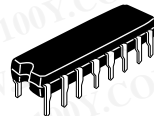
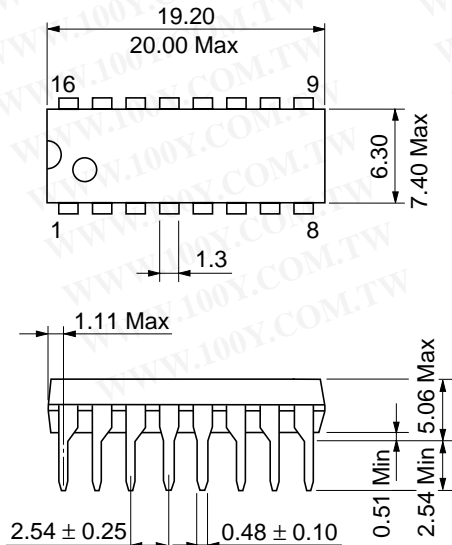
* To calculate total supply current at frequency other than 1kHz.

① $V_{DD} = 5.0V$ $I_T = (0.3\mu A/kHz) \cdot f + I_{DD}$ ② $V_{DD} = 10V$ $I_T = (0.6\mu A/kHz) \cdot f + I_{DD}$ ③ $V_{DD} = 15V$ $I_T = (0.9\mu A/kHz) \cdot f + I_{DD}$

SWITCHING CHARACTERISTICS ($C_L = 50pF$, $T_a = 25^\circ C$)

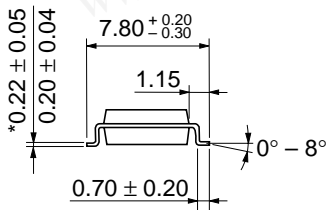
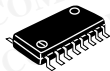
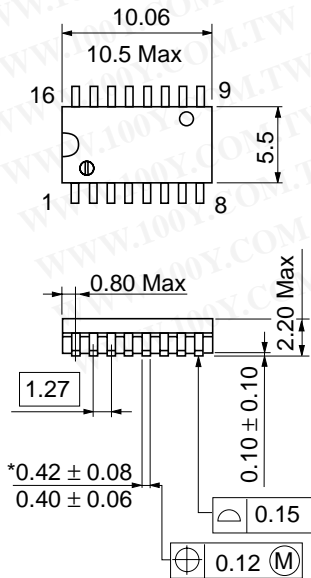
Characteristic	Symbol	$V_{DD}(V)$	min	typ	max	Unit
Output Rise Time	t_r	5.0	-	180	400	ns
		10	-	90	200	
		15	-	65	160	
Output Fall Time	t_f	5.0	-	150	300	ns
		10	-	70	150	
		15	-	50	100	
Propagation Delay Time	t_{PLH}	5.0	-	300	700	ns
		10	-	130	300	
		15	-	90	200	
	t_{PHL}	5.0	-	300	700	ns
		10	-	130	300	
		15	-	90	200	

Unit: mm



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Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



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*Dimension including the plating thickness
 Base material dimension

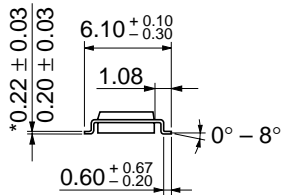
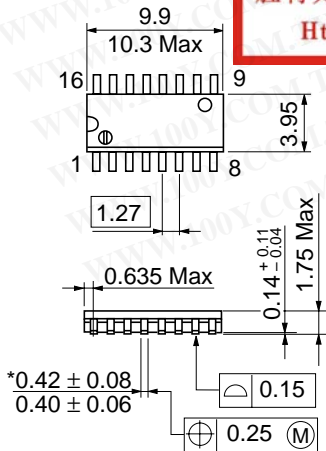
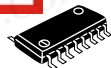
Hitachi Code	FP-16DA
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EIAJ	Conforms
Weight (reference value)	0.24 g

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*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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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

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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
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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
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