

HD14518B, HD14520B

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捷多邦 专业PCB打样工厂, 24小时加急

出货

Dual BCD Up Counter.....HD14518B

Dual Binary Up Counter.....HD14520B

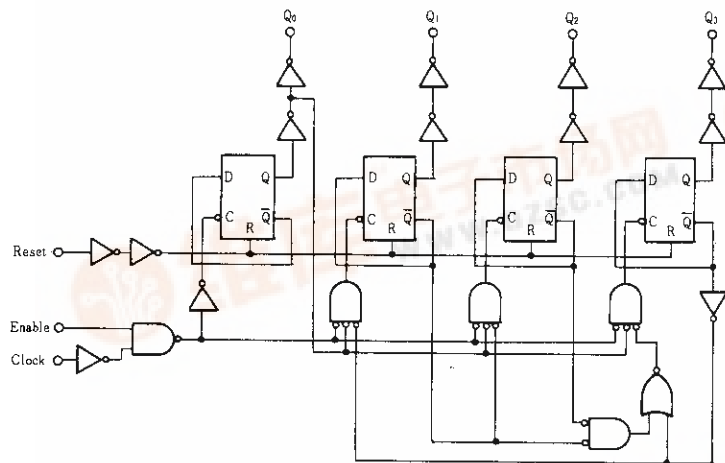
The HD14518B dual BCD counter and the HD14520B dual binary counter consist of two identical, independent, internally synchronous 4-stage counters. The counter stages are type D flip-flops, with interchangeable Clock and Enable lines for incrementing on either the positive-going or negative-going transition as required when cascading multiple stages. Each counter can be cleared by applying a high level on the Reset line. In addition, the HD14518B will count out of all undefined states within two clock periods. These complementary MOS up counters find primary use in multi-stage synchronous or ripple counting applications requiring low power dissipation and/or high noise immunity.

FEATURES

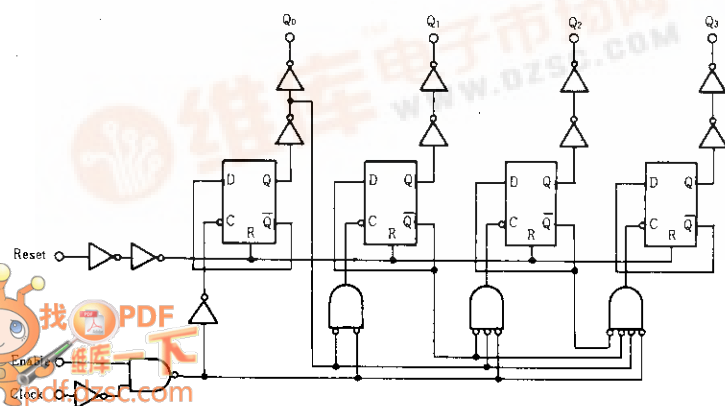
- Quiescent Current = 5nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- Internally Synchronous for High Internal and External Speeds
- Logic Edge-clocked Design ... Incremented on Positive Transition of Clock or Negative Transition of Enable
- 6MHz Counting Rate
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

LOGIC DIAGRAM

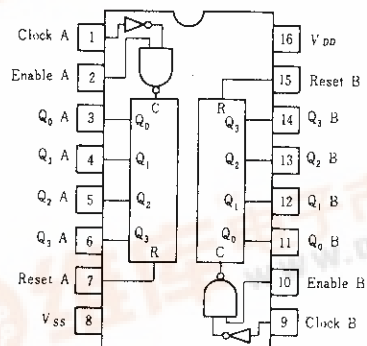
HD14518B (1/2)



HD14520B (1/2)



PIN ARRANGEMENT



(Top View)

TRUTH TABLE

Clock	Enable	Reset	Action
↑	1	0	Increment Counter
↓	0	0	Increment Counter
×	x	0	No Change
x	↑	0	No Change
↑	0	0	No Change
↓	↑	0	No Change
x	x	1	Q ₀ ~Q ₃ = 0

x = Don't Care



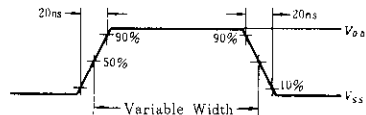
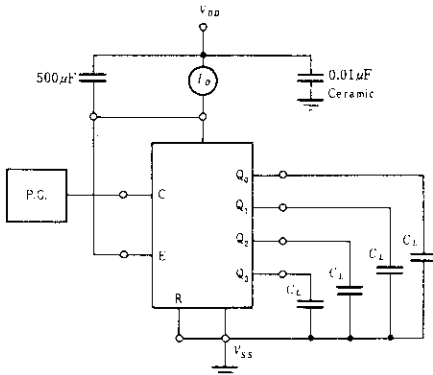
ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	-40°C		25°C		85°C		Unit	
			min	max	min	typ	max	min		max
Output Voltage	V _{OL}	V _{DD} (V)								
		5.0	V _{in} = V _{DD} or 0	—	0.05	—	0	0.05	—	0.05
		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	—
		10		9.95	—	9.95	10	—	9.95	—
15		14.95		—	14.95	15	—	14.95	—	
Input Voltage	V _{IL}	V _{out} = 4.5 or 0.5V	—	1.5	—	2.25	1.5	—	1.5	
		V _{out} = 9.0 or 1.0V	—	3.0	—	4.50	3.0	—	3.0	
		V _{out} = 13.5V or 1.5V	—	4.0	—	6.75	4.0	—	4.0	
	V _{IH}	V _{out} = 0.5 or 4.5V	3.5	—	3.5	2.75	—	3.5	—	
		V _{out} = 1.0 or 9.0V	7.0	—	7.0	5.50	—	7.0	—	
		V _{out} = 1.5 or 13.5V	11.0	—	11.0	8.25	—	11.0	—	
Output Drive Current	I _{OH}	V _{OH} = 2.5V	-1.0	—	-0.8	-1.7	—	-0.6	—	
		V _{OH} = 4.6V	-0.2	—	-0.16	-0.36	—	-0.12	—	
		V _{OH} = 9.5V	-0.5	—	-0.4	-0.9	—	-0.3	—	
		V _{OH} = 13.5V	-1.4	—	-1.2	-3.5	—	-1.0	—	
	I _{OL}	V _{OL} = 0.4V	0.52	—	0.44	0.88	—	0.36	—	
		V _{OL} = 0.5V	1.3	—	1.1	2.25	—	0.9	—	
V _{OL} = 1.5V		3.6	—	3.0	8.8	—	2.4	—		
Input Current	I _{in}	15	—	±0.3	—	±0.0001	±0.3	—	±1.0	
Input Capacitance	C _{in}					5.0	7.5	—	—	
Quiescent Current	I _{DD}	5.0	Zero Signal, per Package	—	20	—	0.005	20	—	150
		10		—	40	—	0.010	40	—	300
		15		—	80	—	0.015	80	—	600
Total Supply Current*	I _T	5.0	Dynamic + I _{DD} ,	—	—	—	0.6	—	—	—
		10	per Gate	—	—	—	1.2	—	—	—
		15	C _L = 50pF, f = 1 kHz	—	—	—	1.7	—	—	—

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

@ V_{DD} = 5.0V I_T = (0.6 μA/kHz) f + I_{DD}. @ V_{DD} = 10V I_T = (1.2 μA/kHz) f + I_{DD}. @ V_{DD} = 15V I_T = (1.7 μA/kHz) f + I_{DD}

POWER DISSIPATION TEST CIRCUIT AND WAVEFORM

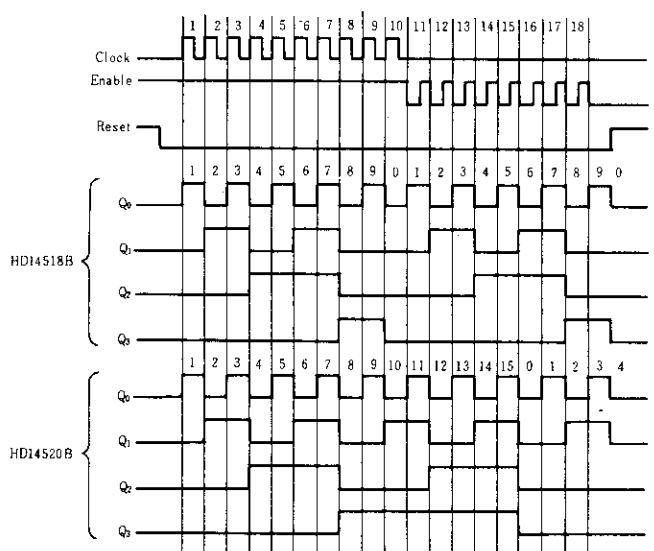
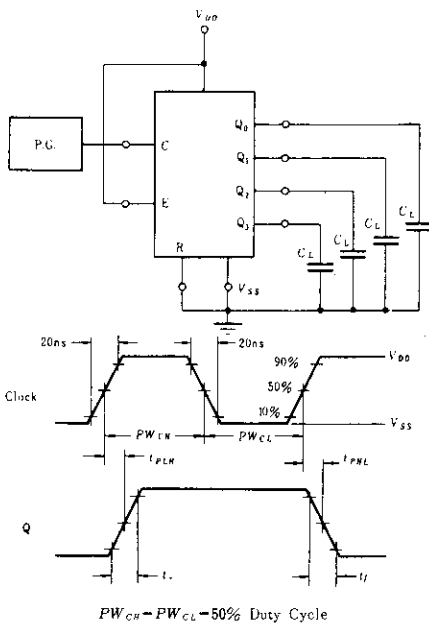


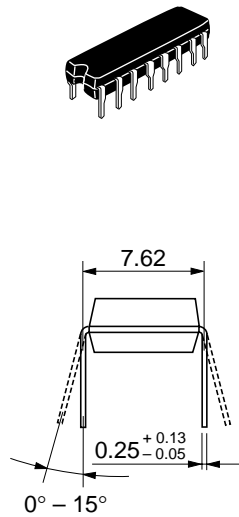
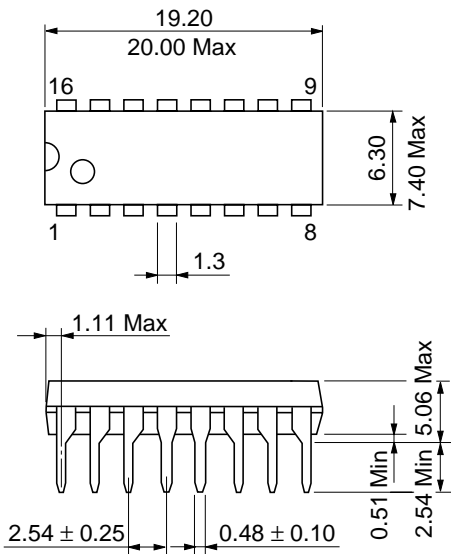
■ SWITCHING CHARACTERISTICS ($C_L=50\text{pF}$, $T_a=25^\circ\text{C}$)

Characteristic	Symbol	$V_{DD}(\text{V})$	min	typ	max	Unit	
Output Rise Time	t_r	5.0	—	180	360	ns	
		10	—	90	180		
		15	—	65	130		
Output Fall Time	t_f	5.0	—	130	250	ns	
		10	—	50	100		
		15	—	40	80		
Propagation Delay Time	Clock	t_{PLH}	5.0	—	280	ns	
			10	—	115		230
			15	—	80		160
	Reset	t_{PHL}	5.0	—	440	ns	
			10	—	160		300
			15	—	110		220
Clock Pulse Width	PW_{CH} PW_{CL}	5.0	200	100	—	ns	
		10	100	50	—		
		15	70	35	—		
Clock Frequency	PRF	5.0	—	5.0	2.5	MHz	
		10	—	10.0	5.0		
		15	—	15.0	7.5		
Clock Pulse or Enable Rise and Fall Time	t_r, t_f	5.0	—	—	15	μs	
		10	—	—	15		
		15	—	—	15		
Enable Pulse Width	PW_E	5.0	440	220	—	ns	
		10	200	100	—		
		15	140	70	—		
Reset Pulse Width	PW_R	5.0	250	125	—	ns	
		10	110	55	—		
		15	80	40	—		

■ SWITCHING TIME TEST CIRCUIT

■ TIMING DIAGRAM





Unit: mm

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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 NorthAmerica : <http://semiconductor.hitachi.com/>
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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 StraÙe 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