

HD14555B, HD14556B

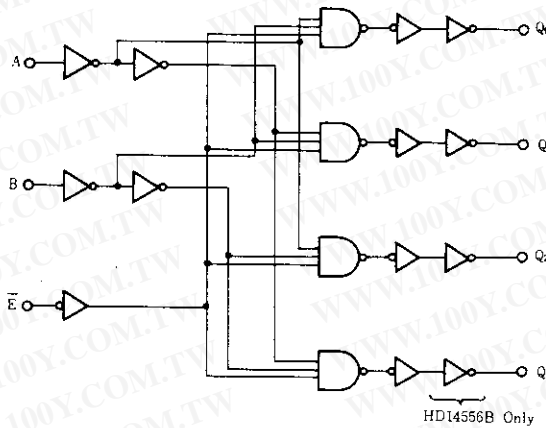
Dual Binary to 1-of-4 Decoder/Demultiplexer

The HD14555B and HD14556B decoder/demultiplexer have two select inputs (A and B), an active low Enable input (E), and four mutually exclusive outputs (Q0, Q1, Q2, Q3). The HD14555B has the selected output go to the "high" state, and the HD14556B has the selected output go to the "low" state. Expanded decoding such as binary-to-hexadecimal (1-of-16), etc., can be achieved by using other HD14555B or HD14556B devices. Applications include code conversion, address decoding, memory selection control, and demultiplexing (using the Enable input as a data input) in digital data transmission systems.

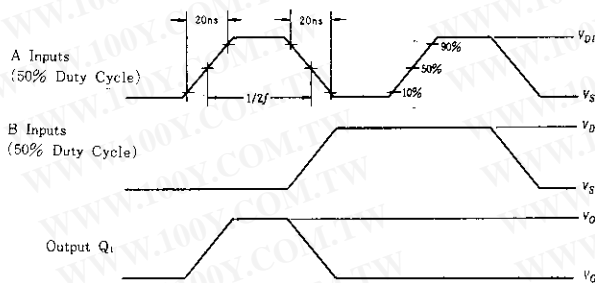
FEATURES

- Noise Immunity = 45% of V_{DD} typ.
- Low Quiescent Current = 5nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- All Output Buffered
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

LOGIC DIAGRAM (1/2)

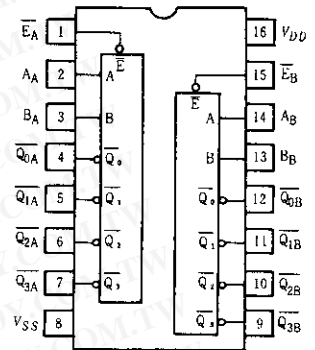


Dynamic Power Dissipation Signal Waveforms



Note) All 8 outputs connect to respective C_L loads.
f in respect to a system clock.

PIN ARRANGEMENT



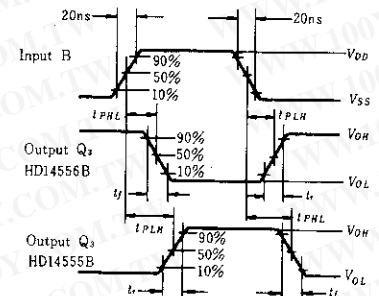
(Top View)

TRUTH TABLE

Inputs		Outputs								
Enable	Select	HD14555B				HD14556B				
\bar{E}	B	A	Q ₃	Q ₂	Q ₁	Q ₀	\bar{Q}_3	\bar{Q}_2	\bar{Q}_1	\bar{Q}_0
0	0	0	0	0	0	1	1	1	1	0
0	0	1	0	0	1	0	1	1	0	1
0	1	0	0	1	0	0	1	0	1	1
0	1	1	1	0	0	0	0	1	1	1
1	X	X	0	0	0	0	1	1	1	1

X : Don't Care

Dynamic Signal Waveforms



Note) Input A high, Input E low.

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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	—	± 0.0001	± 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} , per Gate $C_L = 50pF, f = 1kHz$	—	—	—	0.85	—	—	—	μA
		10		—	—	—	1.7	—	—	—	
		15		—	—	—	2.6	—	—	—	

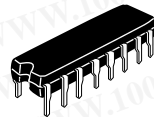
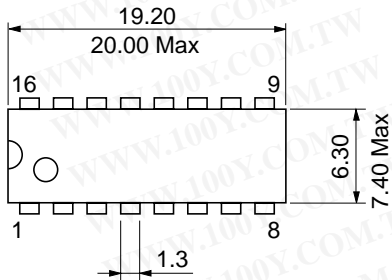
* To calculate total supply current at frequency other than 1kHz.
 @ $V_{DD} = 5.0V$ $I_T = (0.85\mu A/kHz) f - I_{DD}$. @ $V_{DD} = 10V$ $I_T = (1.7\mu A/kHz) f - I_{DD}$. @ $V_{DD} = 15V$ $I_T = (2.6\mu A/kHz) f - I_{DD}$

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

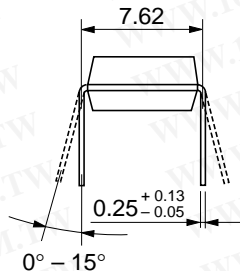
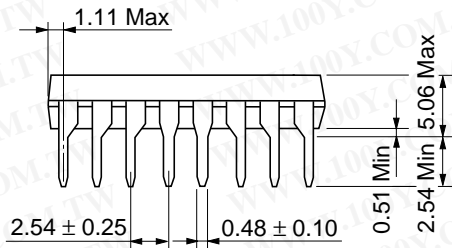
Characteristic	Symbol	V_{DD} (V)	min	typ	max	Unit	
Output Rise Time	t_r	5.0	—	180	360	ns	
		10	—	90	180		
		15	—	65	130		
Output Fall Time	t_f	5.0	—	100	200	ns	
		10	—	50	100		
		15	—	37	80		
Propagation Delay Time	A, B → Q	t_{PLH}	5.0	—	220	440	ns
			10	—	95	190	
	E → Q	t_{PHL}	5.0	—	200	400	
			10	—	85	170	
			15	—	65	130	

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Unit: mm



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

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