HD14555B, HD14556B

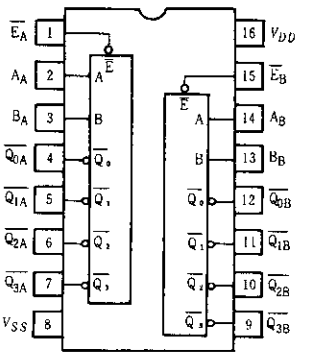
Dual Binary to 1-of-4 Decoder/Demultiplexer

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 HD145556B 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

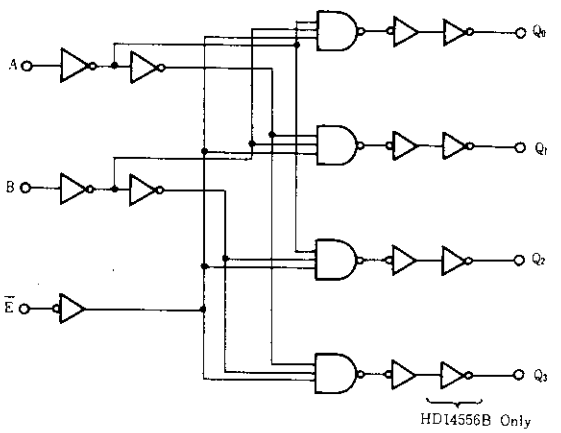
- Noise Immunity = 45% of V_{DD} typ.
- Low Quiescent Current = 5nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- All Output Buffered
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

■ PIN ARRANGEMENT



(Top View)

■ LOGIC DIAGRAM (1/2)

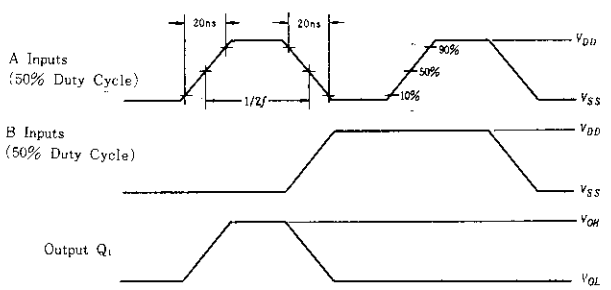


■ TRUTH TABLE

Inputs			Outputs							
Enable	Select		HD14555B				HD14556B			
$\overline{E}$	B	A	Q_3	Q_2	Q_1	Q_0	$\overline{Q}_3$	$\overline{Q}_2$	$\overline{Q}_1$	$\overline{Q}_0$
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	×	×	0	0	0	0	1	1	1	1

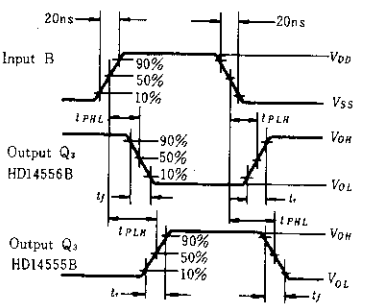
× : Don't Care

● Dynamic Power Dissipation Signal Waveforms



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

● Dynamic Signal Waveforms



Note) Input A high, Input $\overline{E}$ low.

■ ELECTRICAL CHARACTERISTICS

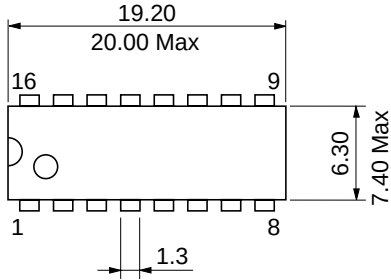
Characteristic	Symbol	V_{DD}(V)	Test Conditions	−40℃ min	−40℃ max	25℃ min	25℃ typ	25℃ max	85℃ min	85℃ max	Unit
Output Voltage	V_{OL}	5.0	$V_{in}=V_{DD}$ or 0	—	0.05	—	0	0.05	—	0.05	V
		10		—	0.05	—	0	0.05	—	0.05	
		15		—	0.05	—	0	0.05	—	0.05	
	V_{OH}	5.0	$V_{in}=0$ or V_{DD}	4.95	—	4.95	5.0	—	4.95	—	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	$V_{OH}=2.5$V	−1.0	—	−0.8	−1.7	—	−0.6	—	mA
		5.0	$V_{OH}=4.6$V	−0.2	—	−0.16	−0.36	—	−0.12	—	
		10	$V_{OH}=9.5$V	−0.5	—	−0.4	−0.9	—	−0.3	—	
		15	$V_{OH}=13.5$V	−1.4	—	−1.2	−3.5	—	−1.0	—	
	I_{OL}	5.0	$V_{OL}=0.4$V	0.52	—	0.44	0.88	—	0.36	—	mA
		10	$V_{OL}=0.5$V	1.3	—	1.1	2.25	—	0.9	—	
		15	$V_{OL}=1.5$V	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}, per Gate $C_L=50$pF, $f=1$ kHz	—	—	—	0.85	—	—	—	μA
		10		—	—	—	1.7	—	—	—	
		15		—	—	—	2.6	—	—	—	

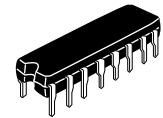
* To calculate total supply current at frequency other than 1kHz.
@V_{DD}=5.0V $I_T=(0.85\mu A/kHz)f-I_{DD}$, @$V_{DD}$=10V $I_T=(1.7\mu A/kHz)f-I_{DD}$, @$V_{DD}$=15V $I_T=(2.6\mu A/kHz)f-I_{DD}$

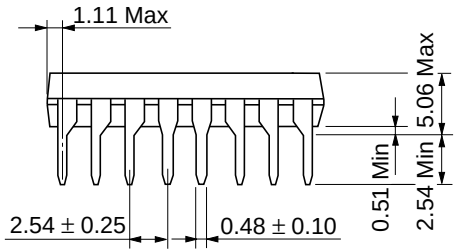
■ SWITCHING CHARACTERISTICS ($C_L=50$pF, $Ta=25$℃)

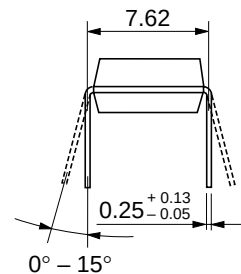
Characteristic		Symbol	V_{DD}(V)	min	typ	max	Unit
Output Rise Time		t_r	5.0	—	180	360	ns
			10	—	90	180	
			15	—	65	130	
Output Fall Time		t_f	5.0	—	100	200	ns
			10	—	50	100	
			15	—	37	80	
Propagation Delay Time	A, B →Q	t_{PLH}, t_{PHL}	5.0	—	220	440	ns
			10	—	95	190	
			15	—	70	140	
	$\overline{E}$ →Q		5.0	—	200	400	
			10	—	85	170	
			15	—	65	130	

Unit: mm









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