HD14532B

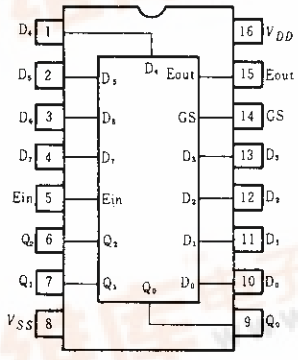
8-bit Priority Encoder

The HD14532B priority encoder is to provide a binary address for the active input with the highest priority. Eight data inputs (D0 thru D7) and an enable input (Ein) are provided. Five outputs are available, three are address outputs (Q0 thru Q2), one group select (GS) and one enable output (Eout).

■ FEATURES

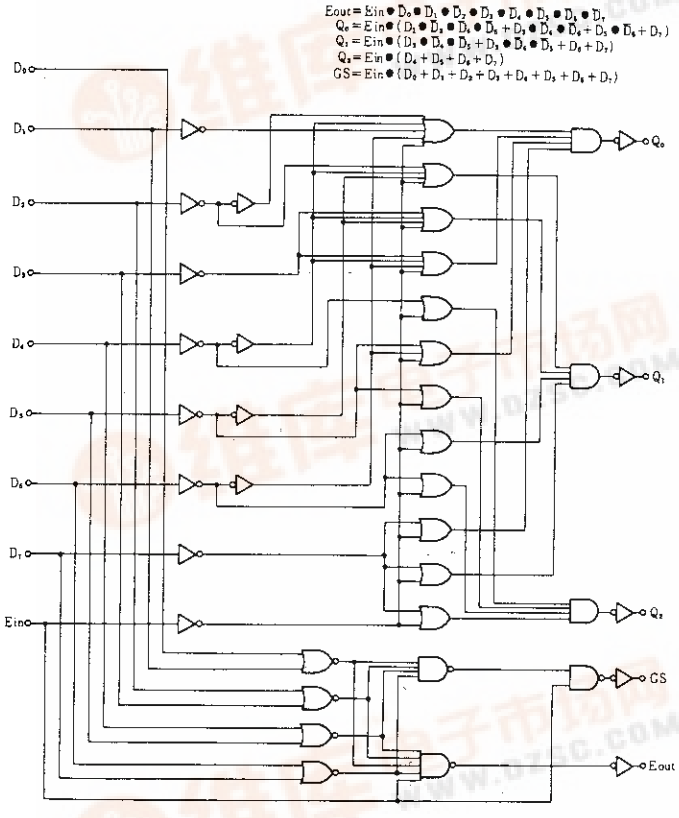
- Quiescent Current = 5nA/pkg typ. @5V
- Noise Immunity = 45% of V_{DD} typ.
- Low Input Capacitance = 5pF typ.
- Supply Voltage Range = 3 to 18V
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

■ PIN ARRANGEMENT



(Top View)

■ LOGIC DIAGRAM



■ TRUTH TABLE

Inputs									Outputs				
E_{in}	D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0	GS	Q_2	Q_1	Q_0	E_{out}
0	×	×	×	×	×	×	×	×	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	1
1	1	×	×	×	×	×	×	×	1	1	1	1	0
1	0	1	×	×	×	×	×	×	1	1	1	0	0
1	0	0	1	×	×	×	×	×	1	1	0	1	0
1	0	0	0	1	×	×	×	×	1	1	0	0	0
1	0	0	0	0	1	×	×	×	1	0	1	1	0
1	0	0	0	0	0	1	×	×	1	0	1	0	0
1	0	0	0	0	0	0	1	×	1	0	0	1	0
1	0	0	0	0	0	0	0	1	1	0	0	0	0

× = Don't Care

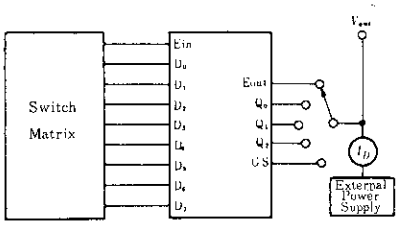
■ ELECTRICAL CHARACTERISTICS

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 $\div I_{DD}$, per Gate $C_L=50$pF, $f=1$kHz	—	—	—	1.74	—	—	—	μA
		10		—	—	—	3.65	—	—	—	
		15		—	—	—	5.73	—	—	—	

* To calculate total supply current at frequency other than 1kHz.
@V_{DD}=5.0V $I_T=(1.74\mu A/kHz)f+I_{DD}$, @$V_{DD}$=10V $I_T=(3.65\mu A/kHz)f+I_{DD}$, @$V_{DD}$=15V $I_T=(5.73\mu A/kHz)f+I_{DD}$

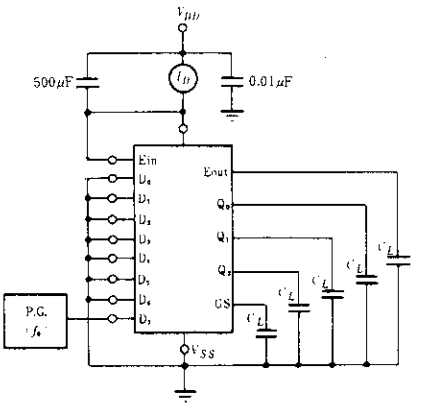
■ DC CHARACTERISTIC TEST CIRCUIT

● I_{OH}, I_{OL}



Output Under Test	I_{OL} $V_{GS}=V_{DD}$, $V_{DS}=V_{out}$		I_{OH} $V_{GS}=-V_{DD}$, $V_{DS}=V_{out}-V_{DD}$		
	D_0~D_7	E_{in}	D_0~D_6	D_7	E_{in}
E_{out}	×	0	0	0	1
Q_0	×	0	0	1	1
Q_1	×	0	0	1	1
Q_2	×	0	0	1	1
GS	×	0	0	1	1

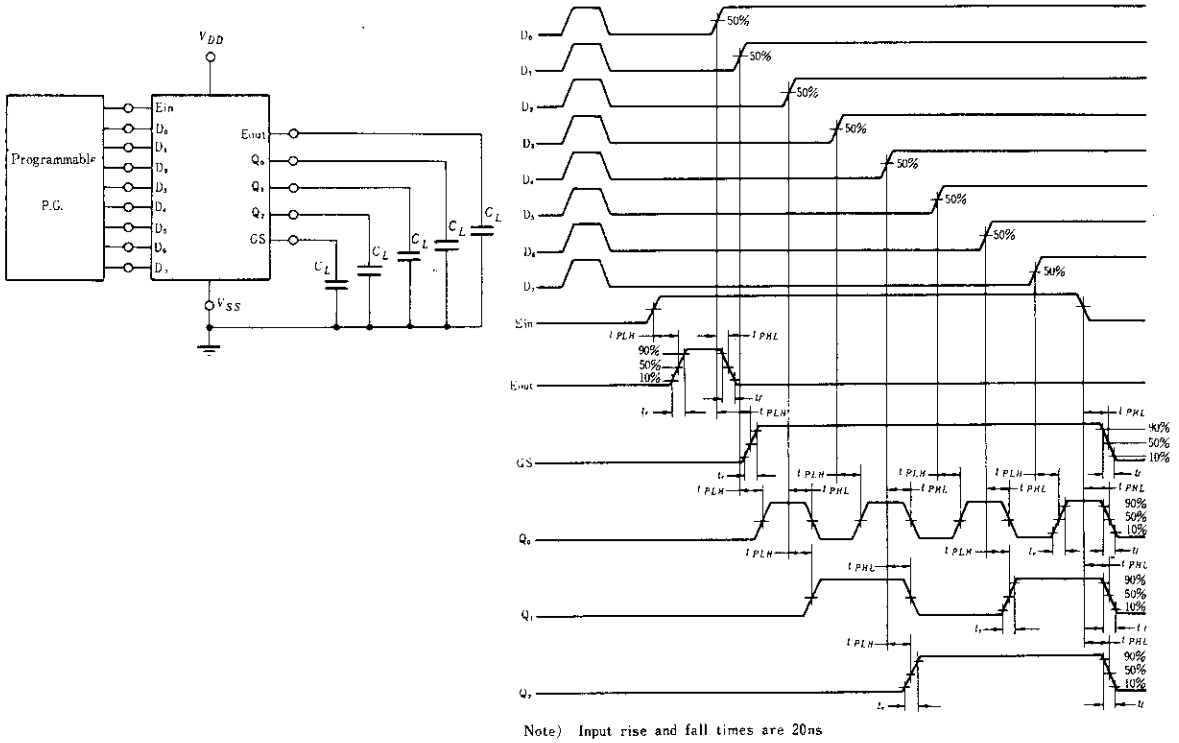
● Typical Power Dissipation



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

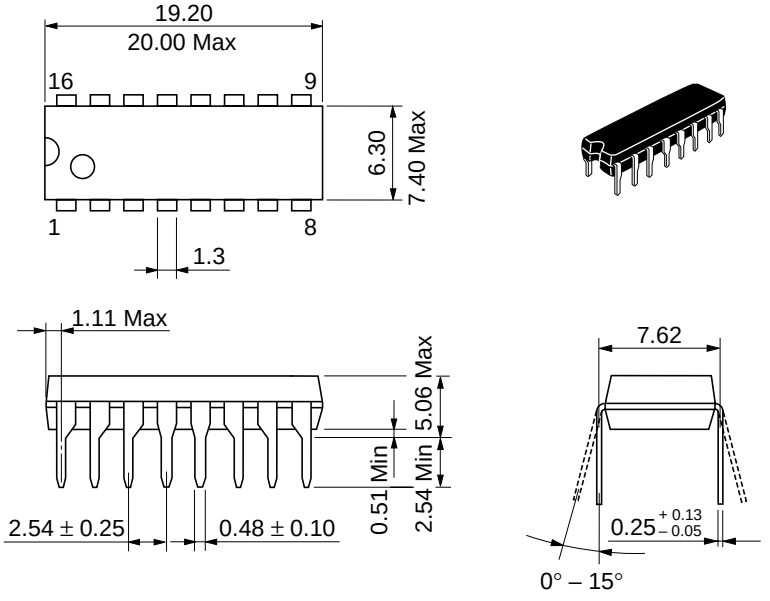
Characteristic		Symbol	V_{DD} (V)	min	typ	max	Unit
Output Rise Time		t_r	5.0	—	180	400	ns
			10	—	90	200	
			15	—	65	160	
Output Fall Time		t_f	5.0	—	100	200	ns
			10	—	50	100	
			15	—	37	80	
Propagation Delay Time	Ein to Eout	t_{PLH}, t_{PHL}	5.0	—	205	475	ns
			10	—	110	250	
			15	—	80	190	
	Ein to GS		5.0	—	175	400	
			10	—	90	200	
			15	—	65	155	
	Ein to Qn		5.0	—	280	650	
			10	—	140	325	
			15	—	100	250	
	Dn to Qn		5.0	—	300	720	
			10	—	170	350	
			15	—	110	265	
	Dn to GS		5.0	—	280	650	
			10	—	140	325	
			15	—	100	250	

■ SWITCHING TIME TEST CIRCUIT



Note) Input rise and fall times are 20ns

Unit: mm


19.20
20.00 Max
16
9
6.30
7.40 Max
1
8
1.3
1.11 Max
5.06 Max
0.51 Min
2.54 Min
2.54 ± 0.25
0.48 ± 0.10
7.62
0.25 + 0.13 − 0.05
0° – 15°

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