

HD14175B

查询HD14175B供应商

捷多邦, 专业PCB打样工厂, 24小时加急

出货

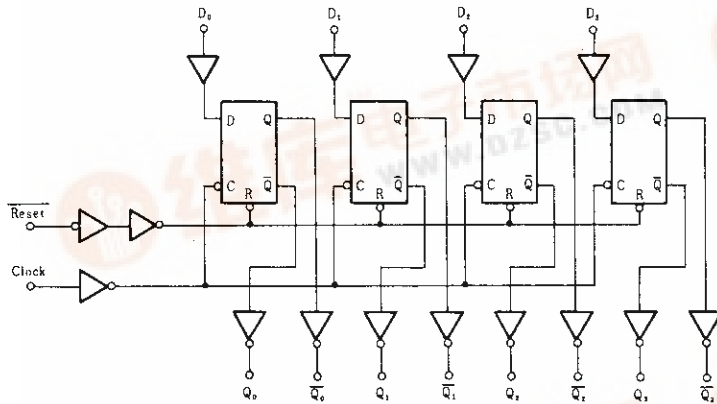
Quadruple D-type Flip Flop

The HD14175B is quad type D flip-flop. Each of the four flip-flops is positive-edge triggered by a common clock input (C). An active-low reset input (\bar{R}) asynchronously resets all flip-flops. Each flip-flop has independent Data (D) inputs and complementary outputs (Q and \bar{Q}). This device may be used as shift register elements or as type T flip-flops for counter and toggle applications.

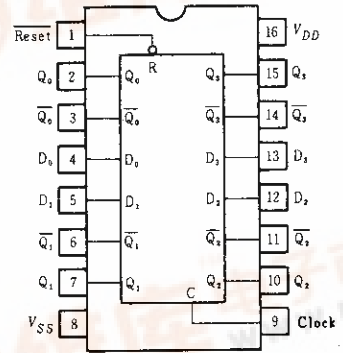
FEATURES

- Supply Voltage Range = 3 to 18V
- Output Compatible with One Low-power Schottky TTL Load
- Functional Equivalent to TTL74175

BLOCK DIAGRAM



PIN ARRANGEMENT



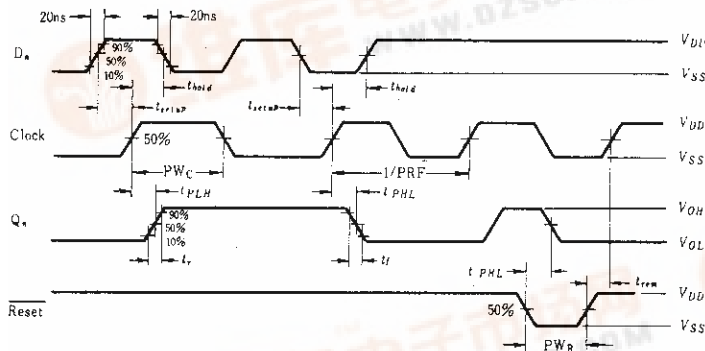
(Top View)

TRUTH TABLE

Inputs			Output	
Clock	Data	Reset	Q	\bar{Q}
0	0	1	0	1
0	1	1	1	0
1	x	1	Q	\bar{Q}
x	x	0	0	1

x = Don't Care

DYNAMIC SIGNAL WAVEFORMS



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	-2.5	-	-2.1	-4.2	-	-1.7	-	mA
		5.0	V _{OH} = 4.6V	-0.52	-	-0.44	-0.88	-	-0.36	-	
		10	V _{OH} = 9.5V	-1.3	-	-1.1	-2.25	-	-0.9	-	
		15	V _{OH} = 13.5V	-3.6	-	-3.0	-8.8	-	-2.4	-	
	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	-	0.0005	20	-	150	μA
		10		-	40	-	0.0010	40	-	300	
		15		-	80	-	0.0015	80	-	600	
Total Supply Current*	I _T	5.0	Dynamic + I _{DD} , C _L = 50pF	-	-	-	1.7	-	-	-	μA
		10	f = 1kHz	-	-	-	3.4	-	-	-	
		15	per Gate	-	-	-	5.0	-	-	-	

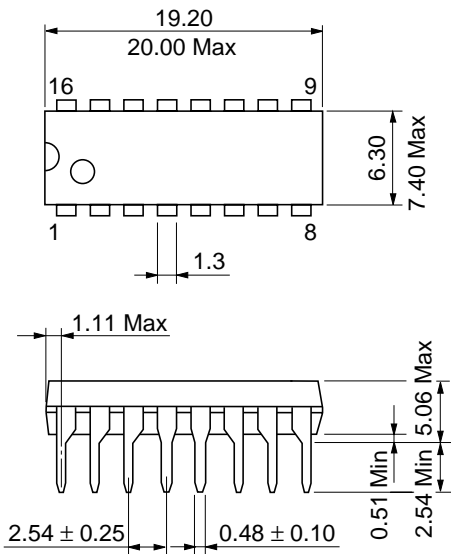
* To calculate total supply current at frequency other than 1kHz.

Ⓢ V_{DD} = 5.0V I_T = (1.7 μA/kHz) f + I_{DD} Ⓢ V_{DD} = 10V I_T = (3.4 μA/kHz) f + I_{DD} Ⓢ V_{DD} = 15V I_T = (5.0 μA/kHz) f + I_{DD}

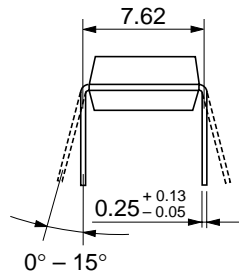
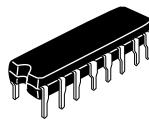
■ SWITCHING CHARACTERISTICS ($C_L=50\text{pF}$, $T_a=25^\circ\text{C}$)

Characteristic	Symbol	$V_{DD}(\text{V})$	min	typ	max	Unit	
Output Rise and Fall Time	t_r, t_f	5.0	—	100	200	ns	
		10	—	50	100		
		15	—	40	80		
Propagation Delay Time	Clock	t_{PLH}	5.0	—	220	420	ns
		t_{PHL}	10	—	90	170	
			15	—	70	130	
	Reset	t_{PHL}	5.0	—	325	650	ns
			10	—	130	260	
			15	—	100	200	
Clock Pulse Width	PW_C	5.0	250	110	—	ns	
		10	100	45	—		
		15	75	35	—		
Reset Pulse Width	PW_R	5.0	200	100	—	ns	
		10	80	40	—		
		15	60	30	—		
Clock Frequency	PRF	5.0	—	4.5	2.0	MHz	
		10	—	11	5.0		
		15	—	14	6.5		
Clock Pulse Rise and Fall Time	t_r, t_f	5.0	—	—	15	μs	
		10	—	—	15		
		15	—	—	15		
Setup Time	t_{setup}	5.0	120	60	—	ns	
		10	50	25	—		
		15	40	20	—		
Hold Time	t_{hold}	5.0	80	40	—	ns	
		10	40	20	—		
		15	30	15	—		
Reset Removal Time	t_{rem}	5.0	250	125	—	ns	
		10	100	50	—		
		15	80	40	—		

* The reset signal must be high prior to a positive-going transition of the clock.



Unit: mm



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