

HD14566B

Industrial Time Base Generator

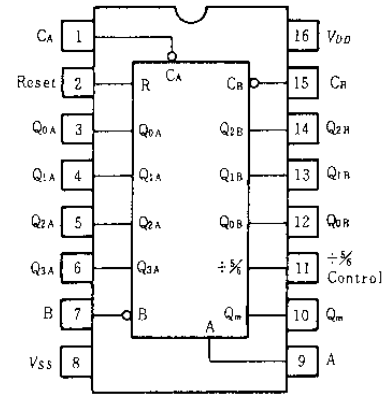
The HD14566B industrial time base generator consists of a divide-by-10 ripple counter and a divide-by-5 or divide-by-6 ripple counter to permit stable time generation from a 50 or 60Hz line. By cascading this device as divide-by-60 counter to permit stable time generation from a 50 or 60Hz line. By cascading this device as divide-by-60 counters, seconds and minutes can be counted and are available in BCD format at the circuit outputs.

An internal monostable multivibrator is included whose output can be used as a reset or clock pulse providing additional frequency flexibility. Also a pin has been included to allow divide-by-5 counting for generating 1.0Hz from European 50Hz line.

FEATURES

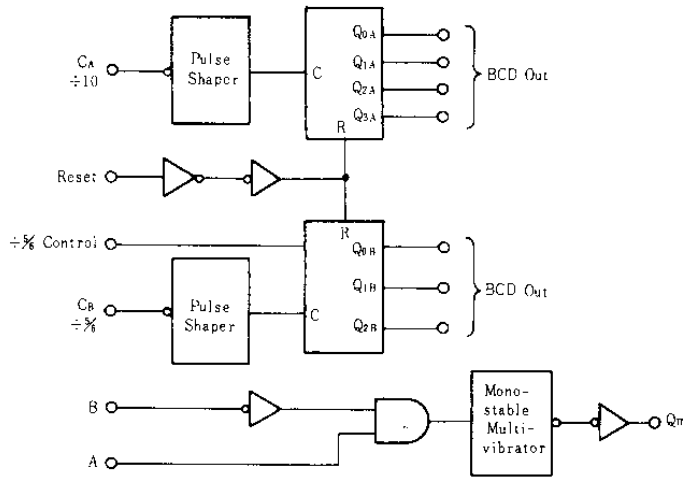
- Negative Edge Triggered Counters for Ease of Cascading
- Pulse Shapers on Counter Inputs Accept Slow Input Rise Times
- Monostable Multivibrator Positive or Negative Edge Triggered
- Noise Immunity = 45% of V_{DD} typ.
- Quiescent Current = 5nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

PIN ARRANGEMENT

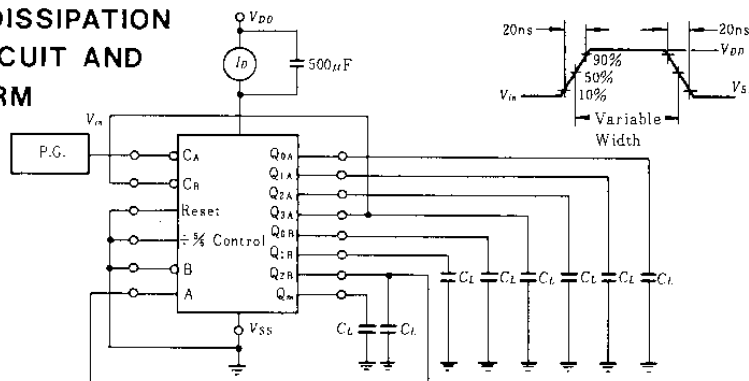


(Top View)

BLOCK DIAGRAM



POWER DISSIPATION TEST CIRCUIT AND WAVEFORM

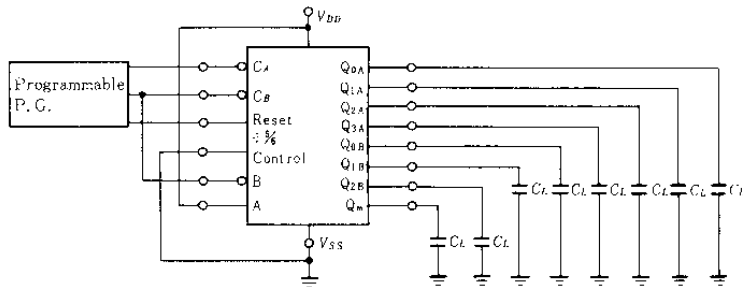


ELECTRICAL CHARACTERISTICS

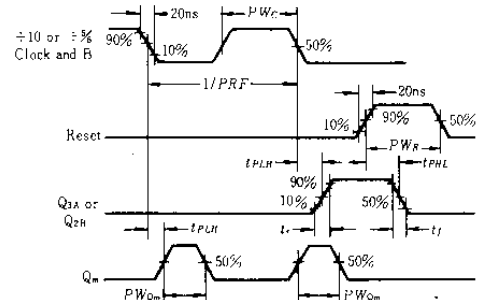
Characteristic	Symbol	V _{DD} (V)	Test Conditions	-40°C		25°C			85°C		Unit	
				min	max	min	typ	max	min	max		
Output Voltage	V _{OL}	5.0	V _{in} = V _{DD} or 0	—	0.05	—	0	0.05	—	0.05	V	
		10		—	0.05	—	0	0.05	—	0.05		
		15		—	0.05	—	0	0.05	—	0.05		
	V _{OH}	5.0		V _{in} = 0 or V _{DD}	4.95	—	4.95	5.0	—	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 _{ext} = 4.5 or 0.5V		—	1.5	—	2.25	1.5	—	1.5	V
		10	V _{ext} = 9.0 or 1.0V		—	3.0	—	4.50	3.0	—	3.0	
		15	V _{ext} = 13.5 or 1.5V		—	4.0	—	6.75	4.0	—	4.0	
	V _{IH}	5.0	V _{ext} = 0.5 or 4.5V	3.5	—	3.5	2.75	—	3.5	—	V	
		10	V _{ext} = 1.0 or 9.0V	7.0	—	7.0	5.50	—	7.0	—		
		15	V _{ext} = 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	—	±0.00001	±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	—	—	—	1.0	—	—	—	μA	
		10		—	—	—	2.0	—	—	—		
		15		—	—	—	3.0	—	—	—		

* To calculate total supply current at frequency other than 1kHz.
 @V_{DD} = 5.0V I_T = (1.0 μA/kHz)f + I_{DD}. @V_{DD} = 10V I_T = (2.0 μA/kHz)f + I_{DD}. @V_{DD} = 15V I_T = (3.0 μA/kHz)f + I_{DD}

SWITCHING TIME TEST CIRCUIT



Note: Assume ÷10 Counter at "6" and ÷5/6 Counter at "2" at beginning of sequence.

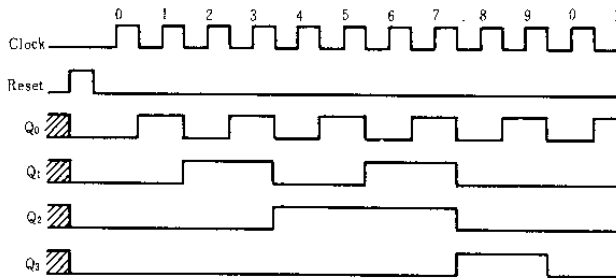


■ SWITCHING CHARACTERISTICS ($C_L=50\text{pF}$, $T_a=25^\circ\text{C}$)

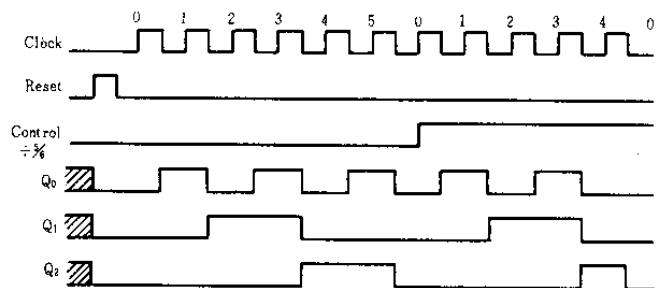
Characteristic		Symbol	V_{DD} (V)	min	typ	max	Unit
Output Rise Time		t_r	5.0	—	180	400	ns
			10	—	90	200	
			15	—	65	160	
Output Fall Time		t_f	5.0	—	120	250	ns
			10	—	60	125	
			15	—	40	100	
Propagation Delay Time	Clock to Q_{3A}	t_{PLH} t_{PHL}	5.0	—	1450	4500	ns
			10	—	530	1500	
			15	—	320	1000	
	Reset to Q_{3A}	t_{PHL}	5.0	—	930	3000	ns
			10	—	315	1000	
			15	—	210	750	
Clock Pulse Width		PW_C	5.0	1200	400	—	ns
			10	400	125	—	
			15	270	90	—	
Reset Pulse Width		PW_R	5.0	1200	400	—	ns
			10	400	125	—	
			15	270	90	—	
Clock Frequency		PRF	5.0	—	1.0	0.3	MHz
			10	—	2.5	1.0	
			15	—	4.2	1.5	
Clock Pulse Rise and Fall Time		t_r, t_f	5.0	No Limit			
			10				
			15				
Monostable Multivibrator Pulse Width		PW_{Q_m}	5.0	1200	2800	—	ns
			10	400	900	—	
			15	300	600	—	

■ TIMING DIAGRAM

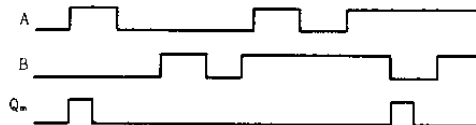
● Divide-by-10 Counter



● Divide-by-5/6 Counter

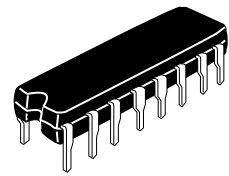
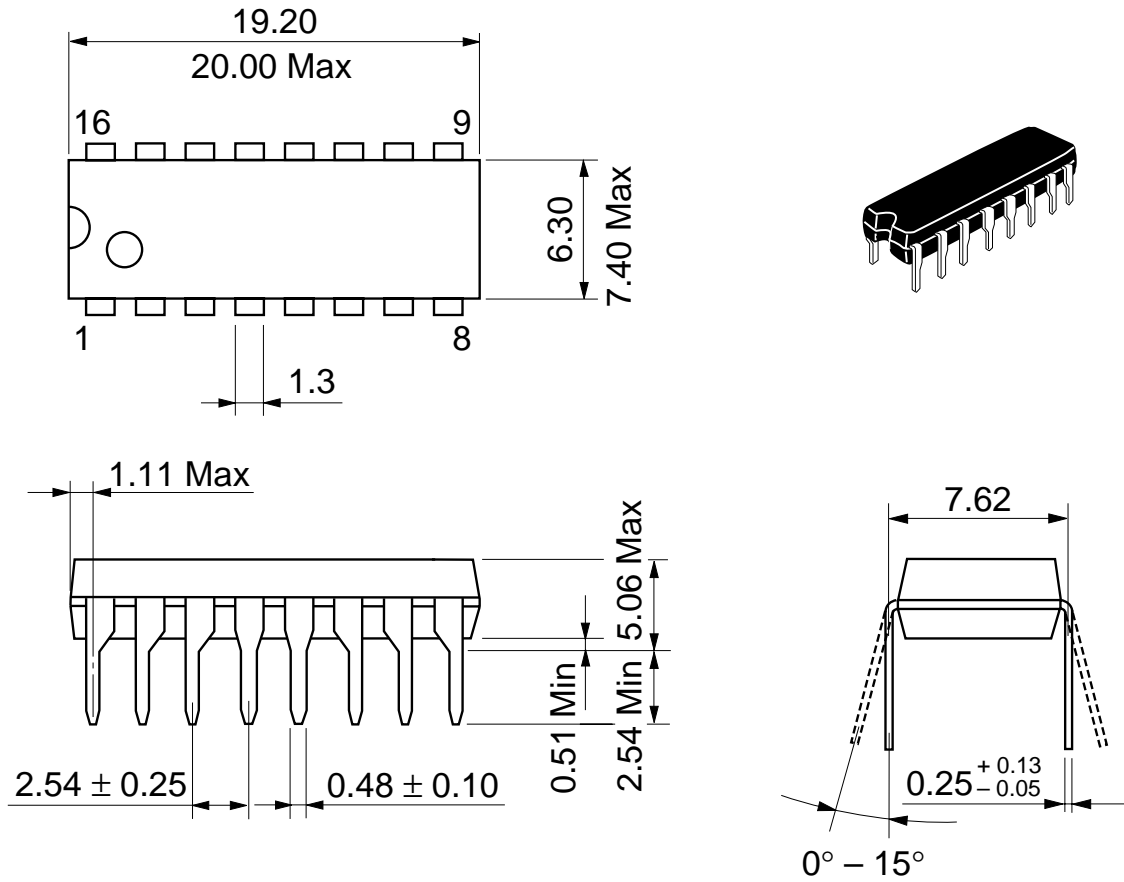


● Monostable Multivibrator



▨ = Don't Care

Unit: mm



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

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