

# HD14566B

## Industrial Time Base Generator

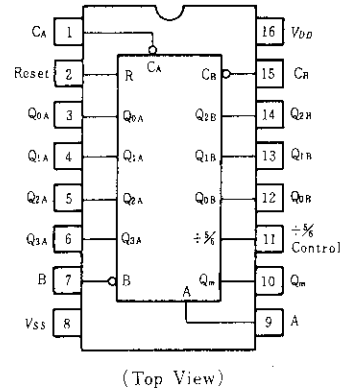
The HD14566B industrial time base generator consists of a divide-by-10 ripple counter and a divide-by-5 or divide-by-6 ripple counter to permit stable time generation from a 50 or 60Hz line. By cascading this device as divide-by-60 counter to permit stable time generation from a 50 or 60Hz line. By cascading 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.

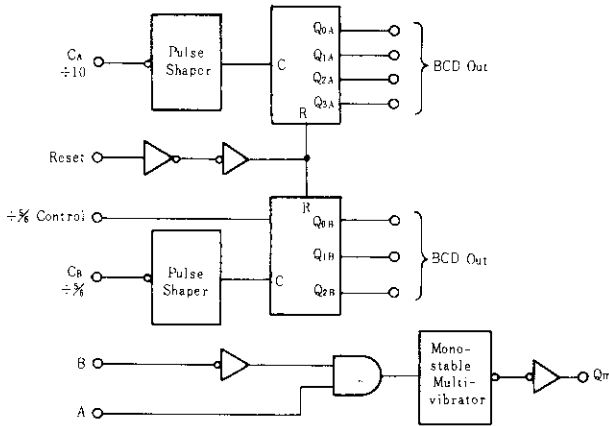
### FEATURES

- 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

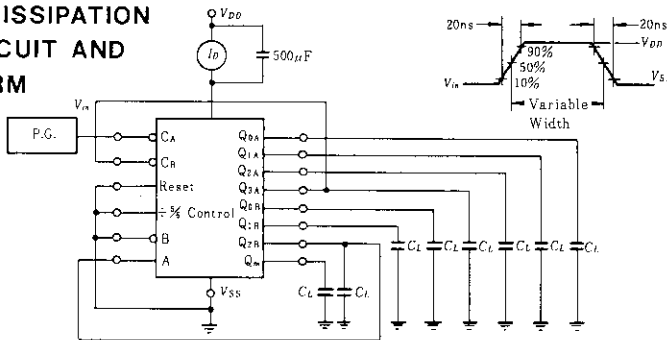
### PIN ARRANGEMENT



### BLOCK DIAGRAM



### POWER DISSIPATION TEST CIRCUIT AND WAVEFORM

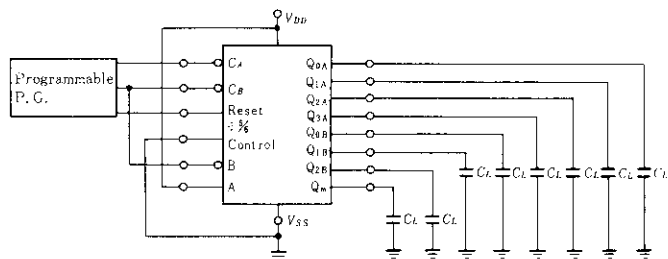


**ELECTRICAL CHARACTERISTICS**

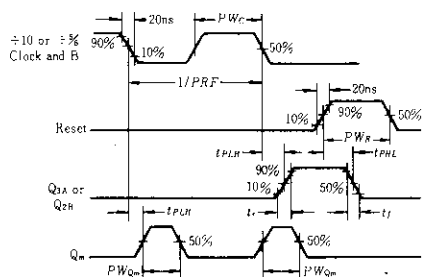
Characteristic	Symbol	Test Conditions	-40°C		25°C			85°C		Unit
			min	max	min	typ	max	min	max	
Output Voltage	V <sub>OL</sub>	5.0	—	0.05	—	0	0.05	—	0.05	V
		10	—	0.05	—	0	0.05	—	0.05	
		15	—	0.05	—	0	0.05	—	0.05	
	V <sub>OH</sub>	5.0	4.95	—	4.95	5.0	—	4.95	—	V
		10	9.95	—	9.95	10	—	9.95	—	
		15	14.95	—	14.95	15	—	14.95	—	
Input Voltage	V <sub>IL</sub>	5.0	—	1.5	—	2.25	1.5	—	1.5	V
		10	—	3.0	—	4.50	3.0	—	3.0	
		15	—	4.0	—	6.75	4.0	—	4.0	
	V <sub>IH</sub>	5.0	3.5	—	3.5	2.75	—	3.5	—	V
		10	7.0	—	7.0	5.50	—	7.0	—	
		15	11.0	—	11.0	8.25	—	11.0	—	
Output Drive Current	I <sub>OH</sub>	5.0	-1.0	—	0.8	-1.7	—	-0.6	—	mA
		5.0	-0.2	—	-0.16	-0.36	—	-0.12	—	
		10	-0.5	—	-0.4	-0.9	—	-0.3	—	
	I <sub>OL</sub>	5.0	0.52	—	0.44	0.88	—	0.36	—	mA
		10	1.3	—	1.1	2.25	—	0.9	—	
		15	3.6	—	3.0	8.8	—	2.4	—	
Input Current	I <sub>in</sub>	15	—	±0.3	—	±0.0001	±0.3	—	±1.0	μA
Input Capacitance	C <sub>in</sub>		—	—	—	5.0	7.5	—	—	pF
Quiescent Current	I <sub>DD</sub>	5.0	—	20	—	0.005	20	—	150	μA
		10	—	40	—	0.010	40	—	300	
		15	—	80	—	0.015	80	—	600	
Total Supply Current*	I <sub>T</sub>	5.0	—	—	—	1.0	—	—	—	μA
		10	—	—	—	2.0	—	—	—	
		15	—	—	—	3.0	—	—	—	

\* To calculate total supply current at frequency other than 1kHz.  
 @V<sub>DD</sub> = 5.0V I<sub>T</sub> = (1.0 μA/kHz)f + I<sub>DD</sub>. @V<sub>DD</sub> = 10V I<sub>T</sub> = (2.0 μA/kHz)f + I<sub>DD</sub>. @V<sub>DD</sub> = 15V I<sub>T</sub> = (3.0 μA/kHz)f + I<sub>DD</sub>

**SWITCHING TIME TEST CIRCUIT**



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

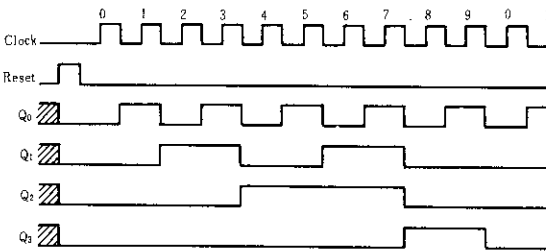


■ SWITCHING CHARACTERISTICS ( $C_L=50\text{pF}$ ,  $T_a=25^\circ\text{C}$ )

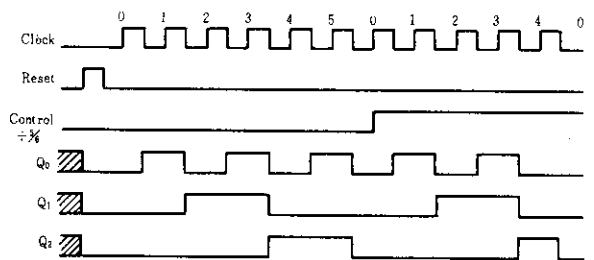
Characteristic		Symbol	$V_{DD}(\text{V})$	min	typ	max	Unit
Output Rise Time		$t_r$	5.0	—	180	400	ns
			10	—	90	200	
			15	—	65	160	
Output Fall Time		$t_f$	5.0	—	120	250	ns
			10	—	60	125	
			15	—	40	100	
Propagation Delay Time	Clock to $Q_{3A}$	$t_{PLH}$ $t_{PHL}$	5.0	—	1450	4500	ns
			10	—	530	1500	
			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		$PW_{Q_0}$	5.0	1200	2800	—	ns
			10	400	900	—	
			15	300	600	—	

■ TIMING DIAGRAM

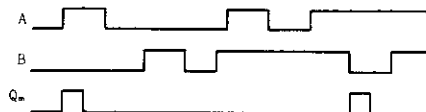
● Divide-by-10 Counter



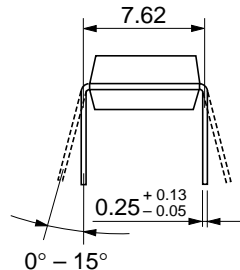
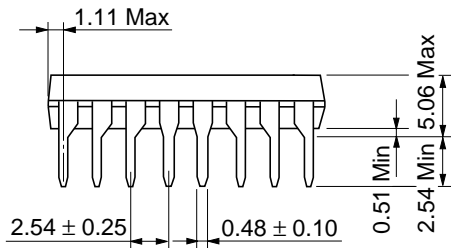
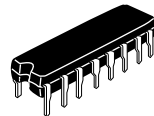
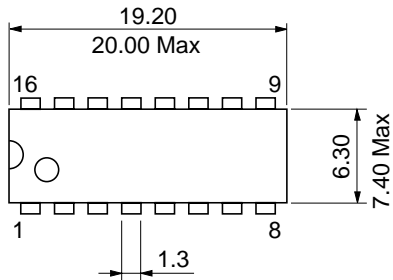
● Divide-by-5/6 Counter



● Monostable Multivibrator



▨ = Don't Care



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

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