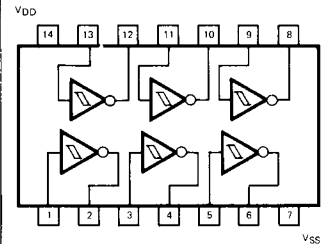


40014B/74C14/54C14

HEX SCHMITT TRIGGER

DESCRIPTION — The 40014B is a general purpose Hex Schmitt Trigger offering positive and negative threshold voltages, V_{T+} and V_{T-} , which show very low variation with temperature (typically $0.0005V/^{\circ}C$ at $V_{DD} = 10V$) and guaranteed hysteresis, V_{T+} to $V_{T-} \geq 0.2 V_{DD}$. Outputs are fully buffered for highest noise immunity. The 40014B is a direct replacement for the 74C14/54C14.

**LOGIC AND CONNECTION DIAGRAM
DIP (TOP VIEW)**



NOTE:
The flatpak version has the same pinouts (Connection Diagram) as the dual in-line package.

DC CHARACTERISTICS: V_{DD} as shown, $V_{SS} = 0 V$ (See Note 1)

SYMBOL	PARAMETER	LIMITS									UNITS	TEMP	TEST CONDITIONS	
		$V_{DD} = 5 V$			$V_{DD} = 10 V$			$V_{DD} = 15 V$						
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX				
V_{T+}	Positive-Going Threshold Voltage	2.9	3.6	4.3	6	6.8	8.6	9	10	12.9	V	All	$V_{IN} = V_{SS}$ to V_{DD}	
V_{T-}	Negative-Going Threshold Voltage	0.7	1.4	1.9	1.4	3.2	4	2.1	5	6	V	All	$V_{IN} = V_{DD}$ to V_{SS}	
V_{T+} to V_{T-}	Hysteresis	1	2.2	3.6	2	3.6	7.2	3	5	10.8	V	All	Guaranteed Hysteresis = V_{T+} Minus V_{T-}	
I_{DD}	Quiescent Power	XC	1			2			4			μA	MIN, 25°C	All Inputs at 0 V or V_{DD}
			7.5			15			30				MAX	
	Supply Current	XM	0.25			0.5			1			μA	MIN, 25°C	
			7.5			15			30				MAX	

AC CHARACTERISTICS: V_{DD} as shown, $V_{SS} = 0 V$, $T_A = 25^{\circ}C$.

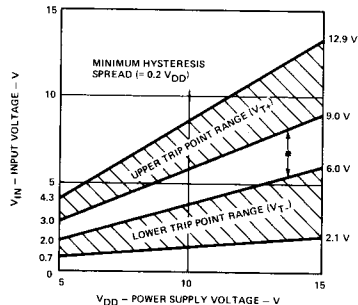
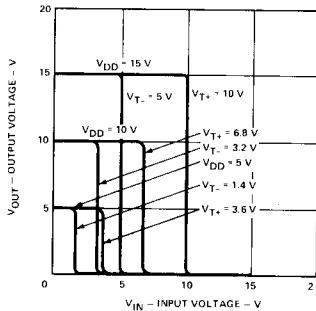
SYMBOL	PARAMETER	LIMITS									UNITS	TEST CONDITIONS (See Note 2)	
		$V_{DD} = 5 V$			$V_{DD} = 10 V$			$V_{DD} = 15 V$					
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX			
t_{PLH}	Propagation Delay	90			200			42			100	ns	$C_L = 50 pF$, $R_L = 200 k\Omega$
t_{PHL}		90			200			42			100		
t_{TLH}	Output Transition Time	70			135			30			75	ns	Input Transition Times $\leq 20 ns$
t_{THL}		70			135			30			75		

NOTES:

- Additional DC Characteristics are listed in this section under 4000B Series CMOS Family Characteristics.
- Propagation Delays and Output Transition Times are graphically described in this section under 4000B Series CMOS Family Characteristics.

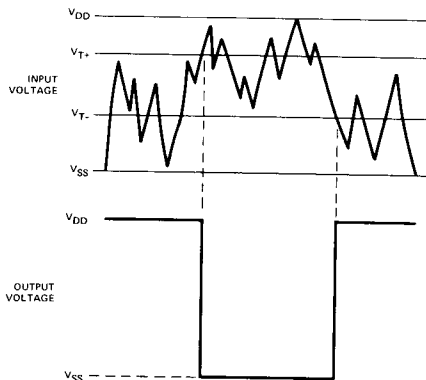
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TYPICAL PERFORMANCE CHARACTERISTICS



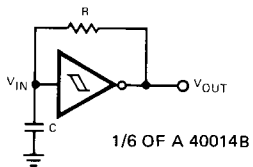
TYPICAL TRANSFER CHARACTERISTICS

GUARANTEED TRIP POINT RANGE



LOW POWER OSCILLATOR

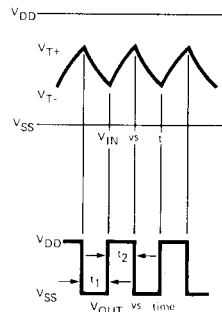
TYPICAL APPLICATION



$$t_1 = RCL_n \left(\frac{V_{T+}}{V_{T-}} \right)$$

$$t_2 = RCL_n \left(\frac{V_{DD} - V_{T-}}{V_{DD} - V_{T+}} \right)$$

$$f \approx \frac{1}{RC L_n \left[\frac{V_{T+} (V_{DD} - V_{T-})}{V_{T-} (V_{DD} - V_{T+})} \right]}$$



NOTE:
The equations assume that \$t_1 + t_2 \gg t_{PLH} + t_{PHL}\$.