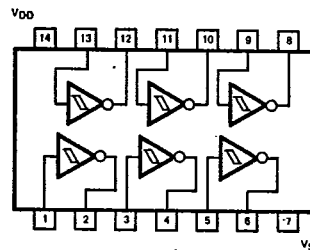


# GD40014B

## 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 SO Package 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	3	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	2	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			$\mu A$	MIN, 25°C	All Inputs at 0 V or $V_{DD}$
			7.5			15			30				MAX	
	Supply Current	XM	0.25			0.5			1			$\mu A$	MIN, 25°C	
			7.5			15			30				MAX	

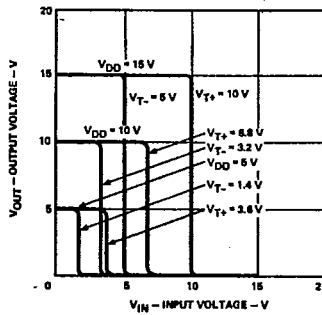
**AC CHARACTERISTICS:  $V_{DD}$  as shown,  $V_{SS} = 0 V$ ,  $T_A = 25^{\circ}C$ .**

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		35	80	ns	$C_L = 50 pF$ , $R_L = 200 k\Omega$
$t_{PHL}$			90	200		42	100		35	80		
$t_{TLH}$	Output Transition Time		70	135		30	75		22	45	ns	Input Transition Times < 20 ns
$t_{THL}$			70	135		30	75		22	45		

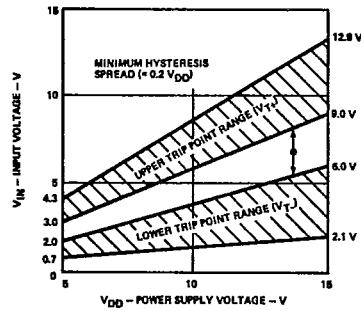
- NOTES:**  
 1. Additional DC Characteristics are listed in this section under 4000B Series CMOS Family Characteristics.  
 2. Propagation Delays and Output Transition Times are graphically described in this section under 4000B Series CMOS Family Characteristics.

GS CMOS · GD40014B

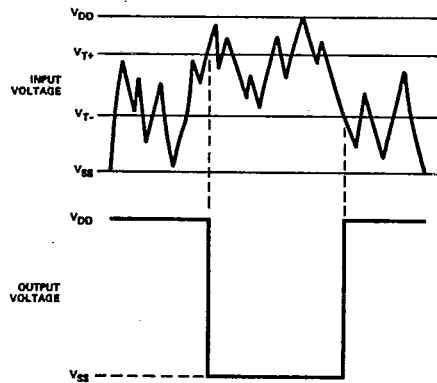
TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL TRANSFER CHARACTERISTICS

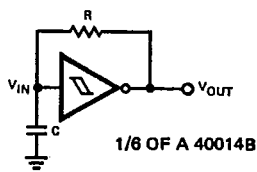


GUARANTEED TRIP POINT RANGE



LOW POWER OSCILLATOR

TYPICAL APPLICATION



1/8 OF A 40014B

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

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

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

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

