

SN54HC7032, SN74HC7032 QUADRUPLE POSITIVE-OR GATES WITH SCHMITT-TRIGGER INPUTS

SCLS036B – MARCH 1984 – REVISED MAY 1997

- This is text in a key features bullet. This is text in a key features bullet.
- Operation From Very Slow Input Transitions
- Temperature-Compensated Threshold Levels
- High Noise Immunity
- Same Pinouts as 'HC32
- Package Options Include Plastic Small-Outline (D) and Ceramic Flat (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

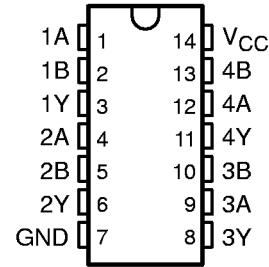
description

In these devices, each circuit functions as a quadruple OR gate. They perform the Boolean function $Y = \overline{A} \cdot \overline{B}$ or $Y = A + B$ in positive logic. However, because of the Schmitt action, the inputs have different input threshold levels for positive- and negative-going signals.

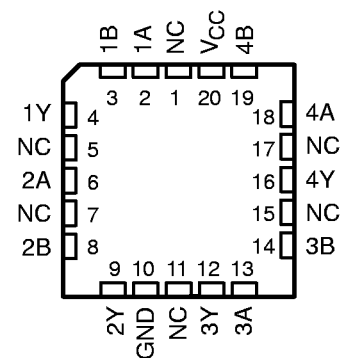
These circuits are temperature compensated and can be triggered from the slowest of input ramps and still give clean jitter-free output signals.

The SN54HC7032 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74HC7032 is characterized for operation from -40°C to 85°C .

SN54HC7032 . . . J OR W PACKAGE
SN74HC7032 . . . D OR N PACKAGE
(TOP VIEW)



SN54HC7032 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

FUNCTION TABLE
(each gate)

INPUTS		OUTPUT
A	B	Y
H	X	H
X	H	H
L	L	L



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 **TEXAS
INSTRUMENTS**

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recommended operating conditions

		SN54HC7032			SN74HC7032			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	2	5	6	2	5	6	V
V_{IH}	High-level input voltage	$V_{CC} = 2\text{ V}$	1.5		1.5			V
		$V_{CC} = 4.5\text{ V}$	3.15		3.15			
		$V_{CC} = 6\text{ V}$	4.2		4.2			
V_{IL}	Low-level input voltage	$V_{CC} = 2\text{ V}$	0	0.5	0	0.5		V
		$V_{CC} = 4.5\text{ V}$	0	1.35	0	1.35		
		$V_{CC} = 6\text{ V}$	0	1.8	0	1.8		
V_I	Input voltage	V_{CC}			0	V_{CC}		V
V_O	Output voltage	0	V_{CC}		0	V_{CC}		V
T_A	Operating free-air temperature	-55		125	-40		85	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS		V_{CC}	$T_A = 25^\circ\text{C}$			SN54HC7032		SN74HC7032		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	$V_I = V_{IH}$ or V_{IL}	$I_{OH} = -20\ \mu\text{A}$	2 V	1.9	1.998		1.9		1.9	V	
			4.5 V	4.4	4.499		4.4		4.4		
			6 V	5.9	5.999		5.9		5.9		
		$I_{OH} = -4\ \text{mA}$	4.5 V	3.98	4.3		3.7		3.84		
		$I_{OH} = -5.2\ \text{mA}$	6 V	5.48	5.8		5.2		5.34		
V_{OL}	$V_I = V_{IH}$ or V_{IL}	$I_{OL} = 20\ \mu\text{A}$	2 V		0.002	0.1		0.1		0.1	V
			4.5 V		0.001	0.1		0.1		0.1	
			6 V		0.001	0.1		0.1		0.1	
		$I_{OL} = 4\ \text{mA}$	4.5 V		0.17	0.26		0.4		0.33	
		$I_{OL} = 5.2\ \text{mA}$	6 V		0.15	0.26		0.4		0.33	
V_{T+}			2 V	0.7	1.2	1.5	0.7	1.5	0.7	1.5	V
			4.5 V	1.55	2.5	3.15	1.55	3.15	1.55	3.15	
			6 V	2.1	3.3	4.2	2.1	4.2	2.1	4.2	
V_{T-}			2 V	0.3	0.6	1	0.3	1	0.3	1	V
			4.5 V	0.9	1.6	2.45	0.9	2.45	0.9	2.45	
			6 V	1.2	2	3.2	1.2	3.2	1.2	3.2	
$V_{T+} - V_{T-}$			2 V	0.2	0.6	1.2	0.2	1.2	0.2	1.2	V
			4.5 V	0.4	0.9	2.1	0.4	2.1	0.4	2.1	
			6 V	0.5	1.3	2.5	0.5	2.5	0.5	2.5	
I_I	$V_I = V_{CC}$ or 0		6 V		± 0.1	± 100		± 1000		± 1000	nA
I_{CC}	$V_I = V_{CC}$ or 0, $I_O = 0$		6 V			2		40		20	μA
C_i			2 V to 6 V		3	10		10		10	pF

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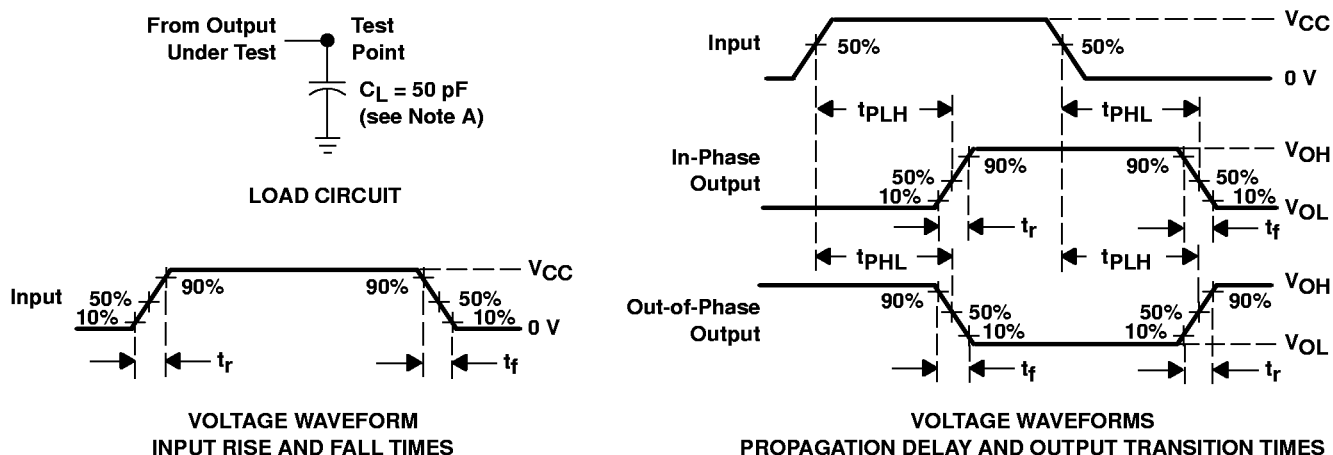
switching characteristics over recommended operating free-air temperature range, $C_L = 50$ pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			SN54HC7032		SN74HC7032		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A or B	Y	2 V	60	130	195	163	ns			
			4.5 V	18	26	39	33				
			6 V	14	22	33	28				
t_t	Any	Any	2 V	28	75	110	95	ns			
			4.5 V	8	15	22	19				
			6 V	6	13	19	16				

operating characteristics, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance per gate	No load	20	pF

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and test-fixture capacitance.
 B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, $t_r = 6$ ns, $t_f = 6$ ns.
 C. The outputs are measured one at a time with one input transition per measurement.
 D. t_{PLH} and t_{PHL} are the same as t_{pd} .

Figure 1. Load Circuit and Voltage Waveforms