

SN54HC365, SN74HC365 HEX BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

SCLS308B – JANUARY 1996 – REVISED MAY 1997

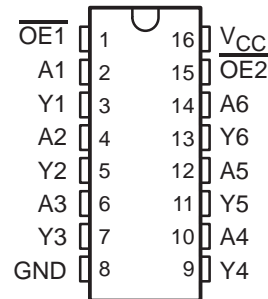
- High-Current 3-State Outputs Drive Bus Lines, Buffer Memory Address Registers, or Drive up to 15 LSTTL Loads
- True Outputs
- Package Options Include Plastic Small-Outline (D) and Ceramic Flat (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

description

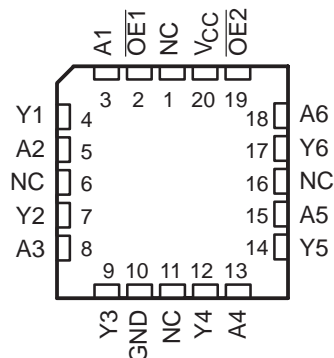
These hex buffers and line drivers are designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. The 'HC365 contain six independent buffers/drivers with dual-gated output-enable ($\overline{OE1}$ and $\overline{OE2}$) inputs. When $\overline{OE1}$ and $\overline{OE2}$ are both low, the device passes noninverted data from the A inputs to the Y outputs. If either (or both) output-enable terminal(s) is high, the outputs are in the high-impedance state.

The SN54HC365 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74HC365 is characterized for operation from -40°C to 85°C .

SN54HC365 . . . J OR W PACKAGE
SN74HC365 . . . D OR N PACKAGE
(TOP VIEW)



SN54HC365 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

FUNCTION TABLE
(each buffer/driver)

INPUTS			OUTPUT
$\overline{OE1}$	$\overline{OE2}$	A	Y
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS
INSTRUMENTS**

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recommended operating conditions

		SN54HC365			SN74HC365			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 V		1.5	1.5		V	
		V _{CC} = 4.5 V		3.15	3.15			
		V _{CC} = 6 V		4.2	4.2			
V _{IL}	Low-level input voltage	V _{CC} = 2 V		0	0.5	0	0.5	V
		V _{CC} = 4.5 V		0	1.35	0	1.35	
		V _{CC} = 6 V		0	1.8	0	1.8	
V _I	Input voltage	0		V _{CC}	0		V _{CC}	V
V _O	Output voltage	0		V _{CC}	0		V _{CC}	V
t _t	Input transition (rise and fall) time	V _{CC} = 2 V		0	1000	0	1000	ns
		V _{CC} = 4.5 V		0	500	0	500	
		V _{CC} = 6 V		0	400	0	400	
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°C			SN54HC365		SN74HC365		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	V _I = V _{IH} or V _{IL}	I _{OH} = -20 μA	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} = -6 mA	4.5 V	3.98	4.3		3.7		3.84		
		I _{OH} = -7.8 mA	6 V	5.48	5.8		5.2		5.34		
V _{OL}	V _I = V _{IH} or V _{IL}	I _{OL} = 20 μA	2 V		0.002	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} = 6 mA	4.5 V		0.17	0.26		0.4			0.33
		I _{OL} = 7.8 mA	6 V		0.15	0.26		0.4			0.33
I _I	V _I = V _{CC} or 0		6 V		±0.1	±100		±1000		±1000	nA
I _{OZ}	V _O = V _{CC} or 0		6 V		±0.01	±0.5		±10		±5	μA
I _{CC}	V _I = V _{CC} or 0, I _O = 0		6 V			8		160		80	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}	$T_A = 25^\circ\text{C}$			SN54HC365		SN74HC365		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	2 V		50	95	145		120		ns
			4.5 V		12	19	29		24		
			6 V		10	16	25		20		
t_{en}	\overline{OE}	Y	2 V		100	190	285		238		ns
			4.5 V		26	38	57		48		
			6 V		21	32	48		41		
t_{dis}	\overline{OE}	Y	2 V		50	175	265		240		ns
			4.5 V		21	35	53		48		
			6 V		19	30	45		41		
t_t		Any	2 V		28	60	90		75		ns
			4.5 V		8	12	18		15		
			6 V		6	10	15		13		

switching characteristics over recommended operating free-air temperature range, $C_L = 150$ pF (unless otherwise noted) (see Figure 1)

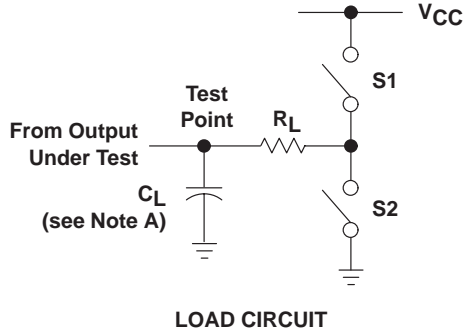
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			SN54HC365		SN74HC365		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	2 V		70	120	180		150		ns
			4.5 V		17	24	36		30		
			6 V		14	20	31		25		
t_{en}	\overline{OE}	Y	2 V		140	230	345		285		ns
			4.5 V		30	46	69		57		
			6 V		28	39	59		48		
t_t		Any	2 V		45	210	315		265		ns
			4.5 V		17	42	63		53		
			6 V		13	36	53		45		

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

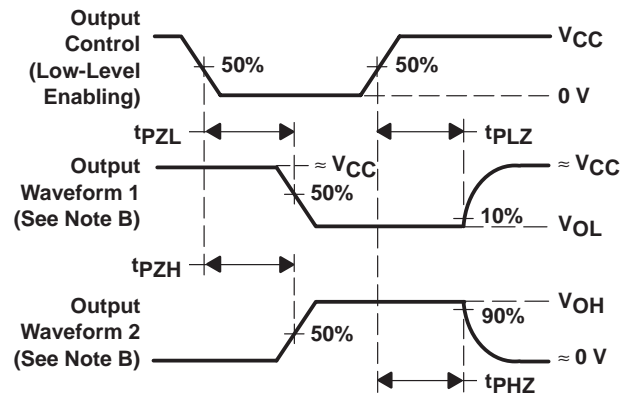
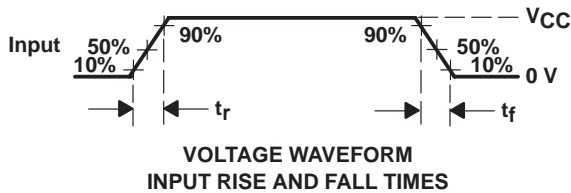
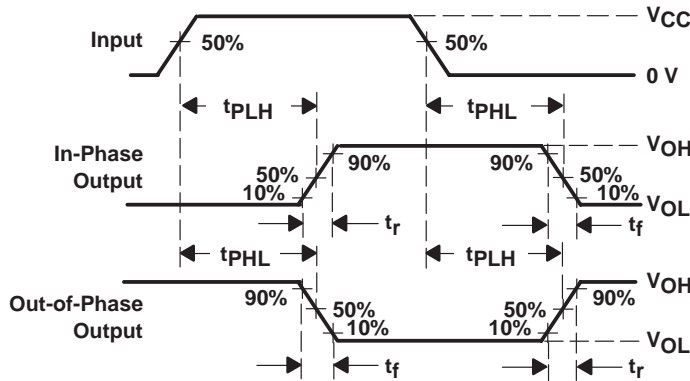
PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance per buffer/driver	No load	35	pF



PARAMETER MEASUREMENT INFORMATION



PARAMETER	R_L	C_L	S1	S2
t_{en}	1 k Ω	50 pF or 150 pF	Open	Closed
			Closed	Open
t_{dis}	1 k Ω	50 pF	Open	Closed
			Closed	Open
t_{pd} or t_t	—	50 pF or 150 pF	Open	Open



- NOTES:
- A. C_L includes probe and test-fixture capacitance.
 - B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 - C. 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.
 - D. The outputs are measured one at a time with one input transition per measurement.
 - E. t_{PLH} and t_{PHL} are the same as t_{pd} .
 - F. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - G. t_{PZL} and t_{PZH} are the same as t_{en} .

Figure 1. Load Circuit and Voltage Waveforms

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