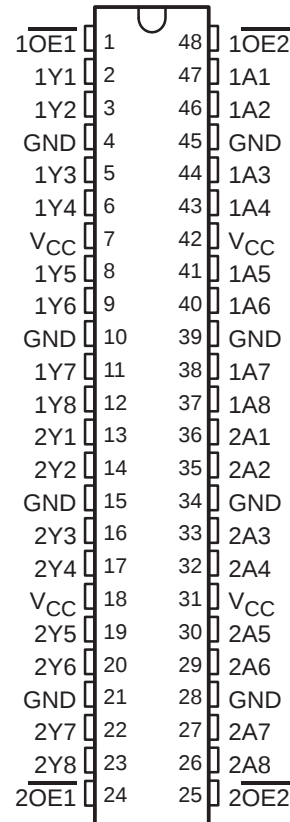


SN54AHCT16540, SN74AHCT16540 16-BIT BUFFERS/DRIVERS WITH 3-STATE OUTPUTS

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- **Members of the Texas Instruments Widebus™ Family**
- **EPIC™ (Enhanced-Performance Implanted CMOS) Process**
- **Inputs Are TTL-Voltage Compatible**
- **Distributed V_{CC} and GND Pins Minimize High-Speed Switching Noise**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Latch-Up Performance Exceeds 250 mA Per JESD 17**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **Package Options Include Plastic Shrink Small-Outline (DL), Thin Shrink Small-Outline (DGG), and Thin Very Small-Outline (DGV) Packages and 380-mil Fine-Pitch Ceramic Flat (WD) Package Using 25-mil Center-to-Center Spacings**

SN54AHCT16540 . . . WD PACKAGE
SN74AHCT16540 . . . DGG, DGV, OR DL PACKAGE
(TOP VIEW)



description

These 16-bit buffers and bus drivers provide a high-performance bus interface for wide data paths.

The 3-state control gate is a 2-input AND gate with active-low inputs so that if either output-enable ($\overline{OE1}$ or $\overline{OE2}$) input is high, all corresponding outputs are in the high-impedance state.

To ensure the high-impedance state during power up or power down, $\overline{OE}$ should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

The SN54AHCT16540 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74AHCT16540 is characterized for operation from –40°C to 85°C.

FUNCTION TABLE
(each 8-bit buffer/driver)

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



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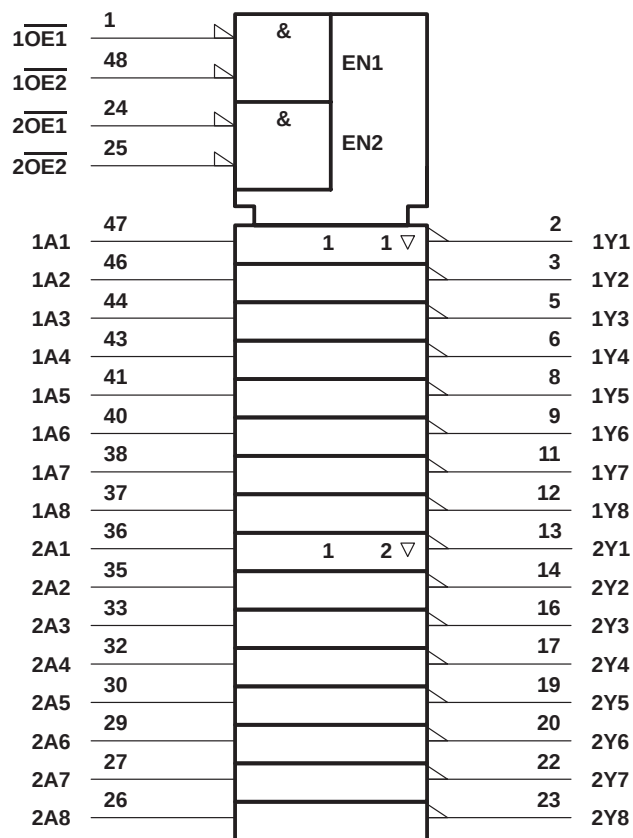
SN54AHCT16540, SN74AHCT16540

16-BIT BUFFERS/DRIVERS

WITH 3-STATE OUTPUTS

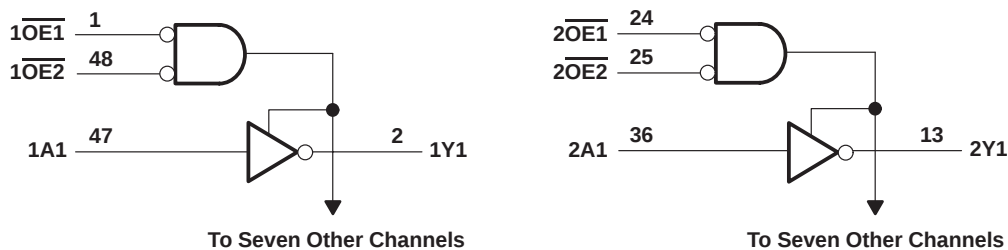
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logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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16-BIT BUFFERS/DRIVERS

WITH 3-STATE OUTPUTS

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

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			SN54AHCT16540		SN74AHCT16540		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	I _{OH} = –50 μA	4.5 V	4.4	4.5		4.4		4.4		V
	I _{OH} = –8 mA		3.94			3.8		3.8		
V _{OL}	I _{OL} = 50 μA	4.5 V			0.1		0.1		0.1	V
	I _{OL} = 8 mA				0.36		0.44		0.44	
I _I	V _I = V _{CC} or GND	0 V to 5.5 V			±0.1		±1*		±1	μA
I _{OZ}	V _O = V _{CC} or GND	5.5 V			±0.25		±2.5		±2.5	μA
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5 V			4		40		40	μA
ΔI _{CC} [†]	One input at 3.4 V, Other inputs at V _{CC} or GND	5.5 V			1.35		1.5		1.5	mA
C _i	V _I = V _{CC} or GND	5 V		2	10				10	pF
C _o	V _O = V _{CC} or GND	5 V		3						pF

* On products compliant to MIL-PRF-38535, this parameter is not production tested at V_{CC} = 0 V.

† This is the increase in supply current for each input at one of the specified TTL voltage levels rather than 0 V or V_{CC}.

**switching characteristics over recommended operating free-air temperature range,
V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T _A = 25°C			SN54AHCT16540		SN74AHCT16540		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	C _L = 15 pF	4**	8.5**		1**	10**	1	9.5	ns
t _{PHL}				4**	8.5**		1**	10**	1	9.5	
t _{PZH}	$\overline{\text{OE}}$	Y	C _L = 15 pF	5.5**	10.4**		1**	12**	1	12	ns
t _{PZL}				5.5**	10.4**		1**	12**	1	12	
t _{PHZ}	$\overline{\text{OE}}$	Y	C _L = 15 pF	5**	10.4**		1**	12**	1	12	ns
t _{PLZ}				5**	10.4**		1**	12**	1	12	
t _{PLH}	A	Y	C _L = 50 pF	6	9.5		1**	11**	1	10.5	ns
t _{PHL}				6	9.5		1	11	1	10.5	
t _{PZH}	$\overline{\text{OE}}$	Y	C _L = 50 pF	7.5	11.4		1	13	1	13	ns
t _{PZL}				7.5	11.4		1	13	1	13	
t _{PHZ}	$\overline{\text{OE}}$	Y	C _L = 50 pF	8	11.4		1	13	1	13	ns
t _{PLZ}				8	11.4		1	13	1	13	
t _{sk(0)}			C _L = 50 pF		1***				1		ns

** On products compliant to MIL-PRF-38535, this parameter is not production tested.

*** On products compliant to MIL-PRF-38535, this parameter does not apply.

noise characteristics, V_{CC} = 5 V, C_L = 50 pF, T_A = 25°C (see Note 4)

PARAMETER		SN74AHCT16540			UNIT
		MIN	TYP	MAX	
V _{OL(P)}	Quiet output, maximum dynamic V _{OL}		0.7		V
V _{OL(V)}	Quiet output, minimum dynamic V _{OL}		–0.3		V
V _{OH(V)}	Quiet output, minimum dynamic V _{OH}		4.5		V
V _{IH(D)}	High-level dynamic input voltage		2		V
V _{IL(D)}	Low-level dynamic input voltage			0.8	V

NOTE 4: Characteristics are for surface-mount packages only.

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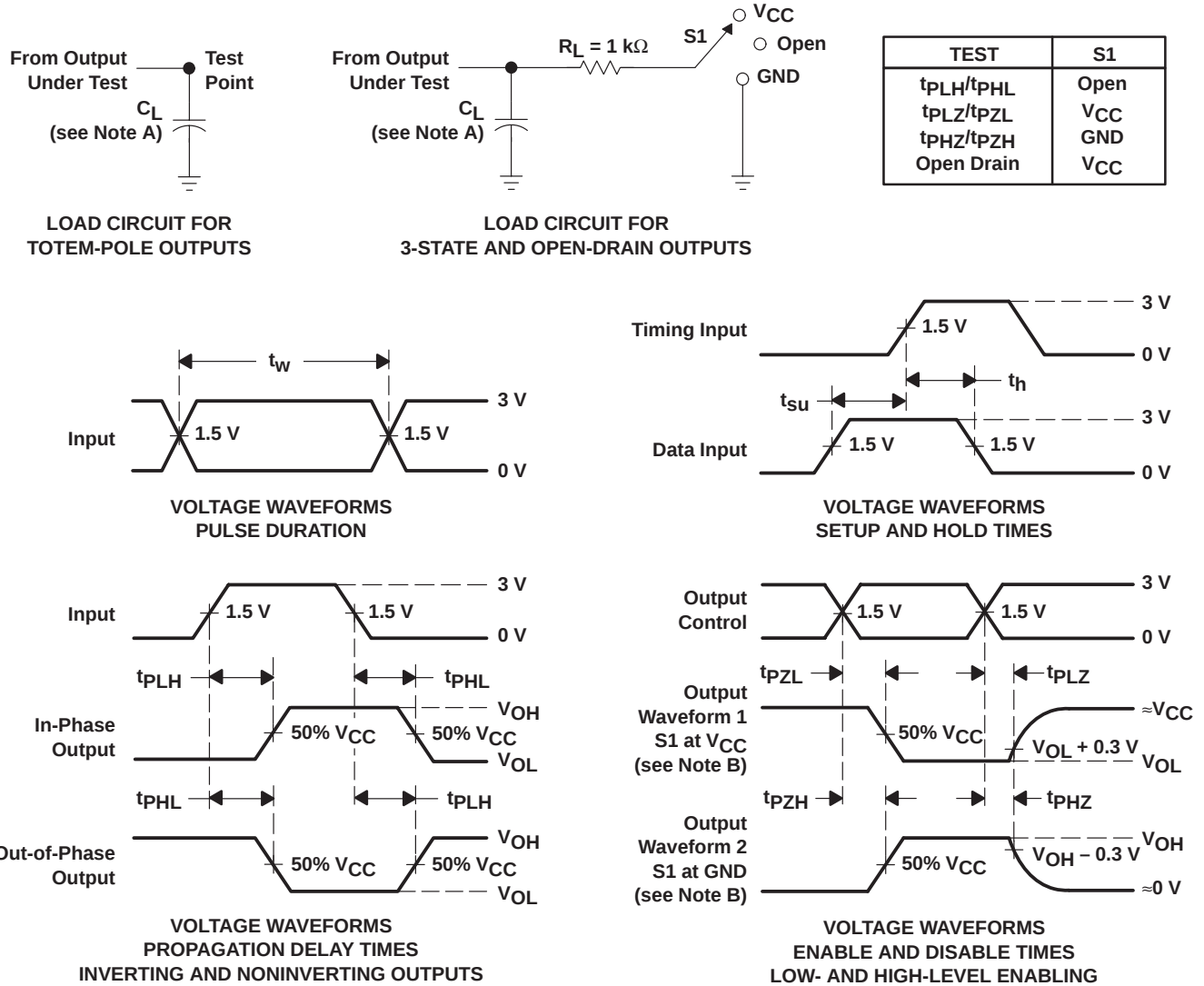


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operating characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance	No load, $f = 1\text{ MHz}$	14	pF

PARAMETER MEASUREMENT INFORMATION



- NOTES:
- A. C_L includes probe and jig 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. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r \leq 3\text{ ns}$, $t_f \leq 3\text{ ns}$.
 - D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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