

SN54ACT1284, SN74ACT1284 7-BIT BUS INTERFACES WITH 3-STATE OUTPUTS

SCAS459B – NOVEMBER 1994 – REVISED APRIL 1996

- 3-State Outputs Directly Drive Bus Lines
- Flow-Through Architecture Optimizes PCB Layout
- Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise
- ESD Protection Exceeds 2000 V Per MIL-STD-883, Method 3015; Exceeds 200 V Using Machine Model ($C = 200$ pF, $R = 0$)
- Designed for the IEEE 1284-I (Level 1 Type) and IEEE 1284-II (Level 2 Type) Electrical Specifications
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), Thin Shrink Small-Outline (PW), and DIP (N) Packages, Ceramic Chip Carriers (FK), Flat (W), and DIP (J) Packages

description

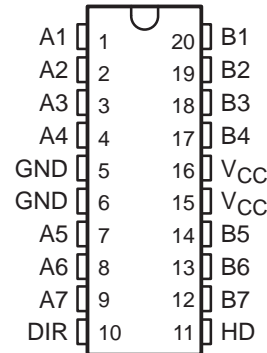
The 'ACT1284 are designed for asynchronous two-way communication between data buses. The control function minimizes external timing requirements.

The devices allow data transmission in either the A-to-B or the B-to-A direction for bits 1, 2, 3, and 4, depending on the logic level at the direction-control (DIR) input. Bits 5, 6, and 7, however, always transmit in the A-to-B direction.

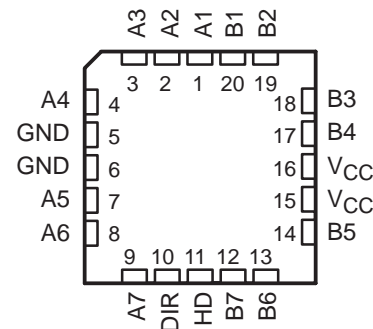
The output drive for each mode is determined by the high drive (HD) control pin. When HD is high, the high drive is delivered by the totem-pole configuration, and when HD is low, the outputs are open drain. This meets the drive requirements as specified in the IEEE 1284-I (level 1 type) and the IEEE 1284-II (level 2 type) parallel peripheral-interface specification.

The SN54ACT1284 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ACT1284 is characterized for operation from 0°C to 70°C .

SN54ACT1284 . . . J OR W PACKAGE
SN74ACT1284 . . . DB, DW, N, OR PW PACKAGE
(TOP VIEW)



FK PACKAGE
(TOP VIEW)



FUNCTION TABLE

INPUTS		OUTPUT	MODE
DIR	HD		
L	L	Open drain	A to B: Bits 5, 6, 7
		Totem pole	B to A: Bits 1, 2, 3, 4
L	H	Totem pole	B to A: Bits 1, 2, 3, 4 and A to B: Bits 5, 6, 7
H	L	Open drain	A to B: Bits 1, 2, 3, 4, 5, 6, 7
H		Totem pole	A to B: Bits 1, 2, 3, 4, 5, 6, 7



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**TEXAS
INSTRUMENTS**

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recommended operating conditions

		SN54ACT1284		SN74ACT1284		UNIT
		MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage	4.7	5.5	4.7	5.5	V
V _{IH}	High-level input voltage	2		2		V
V _{IL}	Low-level input voltage		0.8		0.8	V
V _I	Input voltage	0	V _{CC}	0	V _{CC}	V
V _O	Open drain output voltage	HD low		0	5.5	V
I _{OH}	High-level output current	B port, HD high		-14		mA
		A port		-4		
I _{OL}	Low-level output current	B port		14		mA
		A port		4		
T _A	Operating free-air temperature	-55	125	0	70	°C

electrical characteristics over recommended ranges of operating free-air temperature and supply voltage (unless otherwise noted)

PARAMETER		TEST CONDITIONS	V _{CC} [†]	SN54ACT1284			SN74ACT1284			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V _{hys}	Input hysteresis	V _{IT+} - V _{IT-} for all inputs	5 V	0.4			0.4			V
			4.7 V	0.2			0.2			
V _{OH}	B port	I _{OH} = -14 mA	4.7 V	2.4			2.4			V
	A port	I _{OH} = -50 μA	MIN to MAX	V _{CC} -0.2			V _{CC} -0.2			
			I _{OH} = -4 mA	4.7 V	3.7			3.7		
V _{OL}	A port	I _{OL} = 14 mA	4.7 V				0.4			V
							0.2			
							0.4			
I _I		V _I = V _{CC} or GND	5.5 V	±1			±1			μA
I _{OZ}	A or B ports [‡]	V _O = V _{CC} or GND	5.5 V	±20			±20			μA
I _{OFF}	B port	V _I or V _O ≤ 7 V	0 V	±100			±100			μA
I _{CC}		V _I = V _{CC} or GND, I _O = 0	5.5 V	1.5			1.5			mA
C _i	Control inputs	V _I = V _{CC} or GND	5 V	4			4			pF
C _{io}	A or B ports	V _O = V _{CC} or GND	5 V	12			12			pF
Z _O	B port	I _{OH} = -20 mA, I _{OH} = -50 mA	5 V	8	30	8	30	Ω		

[†] For I/O ports, the parameter I_{OZ} includes the input leakage current I_I.

[‡] For conditions shown as MIN or MAX, use the appropriate values under recommended operating conditions.

switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

PARAMETER		FROM (INPUT)	TO (OUTPUT)	SN54ACT1284		SN74ACT1284		UNIT
				MIN	MAX	MIN	MAX	
t _{PLH}	Totem pole	A or B	B or A	1	20	1	20	ns
t _{PHL}				1	20	1	20	
SR	Totem pole	B output		0.05	0.4	0.05	0.4	V/ns
t _{pd(EN)}	Totem pole	HD	B	1	20	1	20	ns
t _{pd(DIS)}				1	20	1	20	
t _r , t _f	Open drain	A	B	120		120		ns

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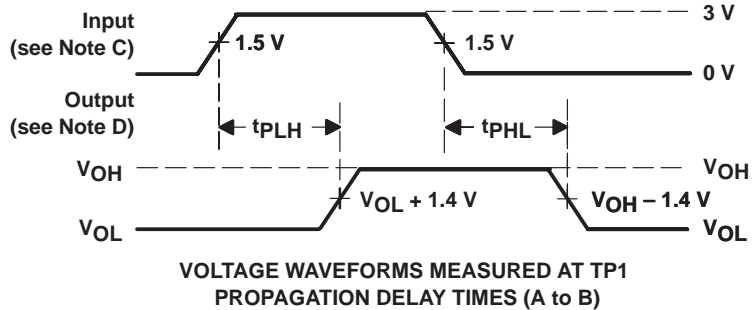
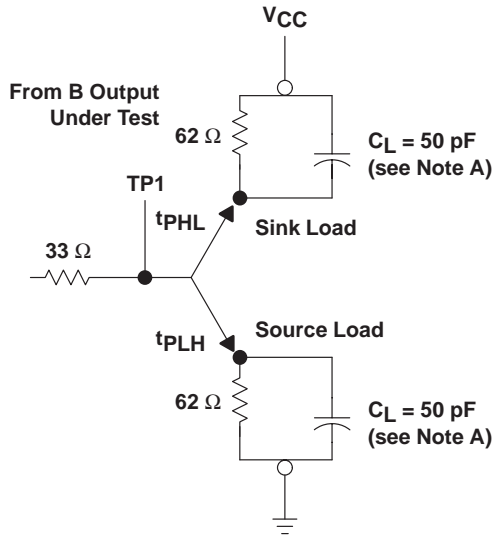


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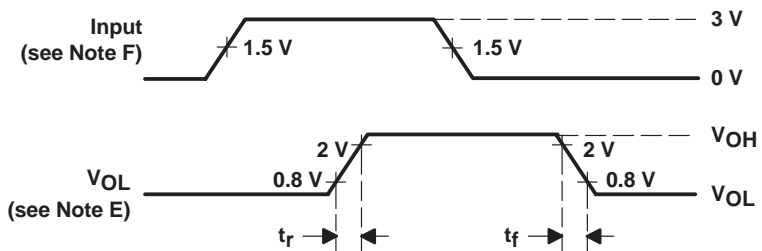
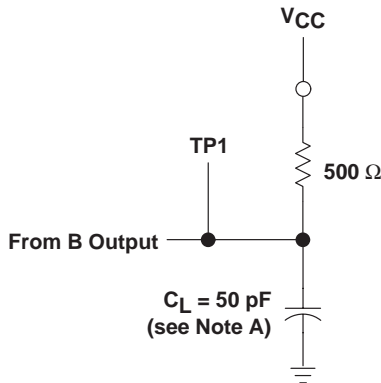
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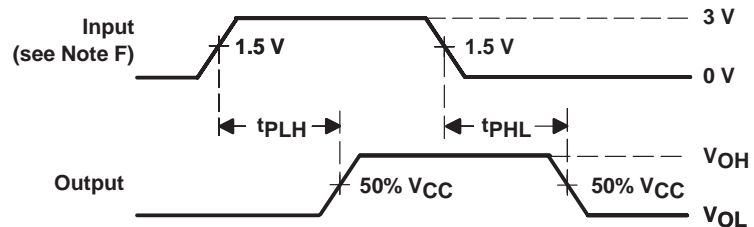
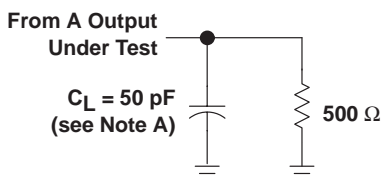
PARAMETER MEASUREMENT INFORMATION



A-TO-B LOAD (totem pole)



A-TO-B LOAD (open drain)



B-TO-A LOAD (totem pole)

- NOTES: A. C_L includes probe and jig capacitance.
 B. The outputs are measured one at a time with one transition per measurement.
 C. Input rise and fall times are 3 ns, $150 \text{ ns} < \text{pulsewidth} < 10 \text{ } \mu\text{s}$ for both low-to-high and high-to-low transitions.
 D. Slew rate is defined as 10% and 90% of the transition times.
 E. Rise and fall times, open drain, are $< 120 \text{ ns}$.
 F. Input rise and fall times are 3 ns.

Figure 1. Load Circuits and Voltage Waveforms



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