- **Flow-Through Architecture Optimizes PCB Layout**
- **Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise**
- *EPIC*™ **(Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package Options Include Plastic Small-Outline Packages, and Standard Plastic 300-mil DIPs**

DW OR NT PACKAGE
(TOP VIEW)

|			
A1	1	24	OEAB
A2	2	23	B1
A3	3	22	B2
A4	4	21	B3
GND	5	20	B4
GND	6	19	V_{CC}
GND	7	18	V_{CC}
GND	8	17	B5
A5	9	16	B6
A6	10	15	B7
A7	11	14	B8
A8	12	13	$\overline{\text{OEBA}}$

description

This octal bus transceiver is designed for asynchronous communication between data buses. The control function implementation allows for maximum flexibility in timing.

These devices transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the output-enable (OEAB or $\overline{\text{OEBA}}$) inputs. The output-enable inputs can be used to disable the device so that the buses are effectively isolated.

The dual-enable configuration gives these devices the capability to store data by simultaneous enabling of OEAB and $\overline{\text{OEBA}}$. Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled and all other data sources to the two sets of bus lines are at high impedance, both sets of bus lines (16 in all) will remain at their last states. The 8-bit codes appearing on the two sets of buses will be complementary for the 74AC11620.

The 74AC11620 is characterized for operation from –40°C to 85°C.
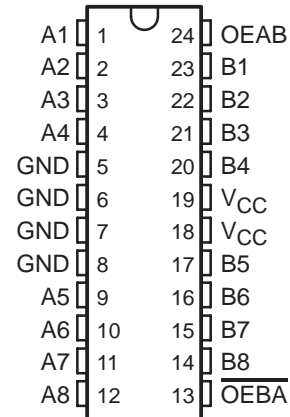
FUNCTION TABLE

INPUTS		OPERATION
$\overline{\text{OEBA}}$	OEAB	
L	L	$\overline{\text{B}}$ data to A bus
H	H	$\overline{\text{A}}$ data to B bus
H	L	Isolation
L	H	$\overline{\text{B}}$ data to A bus, $\overline{\text{A}}$ data to B bus

EPIC is a trademark of Texas Instruments Incorporated.

TEXAS INSTRUMENTS

74AC11620
OCTAL BUS TRANSCEIVER
WITH 3–STATE OUTPUTS
SCAS062A – JULY 1987 – REVISED APRIL 1993

logic symbol†

logic diagram (positive logic)

To 7 Other Channels

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

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)‡

Supply voltage range, V_{CC} .... −0.5 V to 7 V
Input voltage range, V_I (see Note 1) .... −0.5 V to V_{CC} + 0.5 V
Output voltage range, V_O (see Note 1) .... −0.5 V to V_{CC} + 0.5 V
Input clamp current, I_{IK} (V_I < 0 or V_I > V_{CC}) .... ±20 mA
Output clamp current, I_{OK} (V_O < 0 or V_O > V_{CC}) .... ±50 mA
Continuous output current, I_O (V_O = 0 to V_{CC}) .... ±50 mA
Continuous current through V_{CC} or GND pins .... ±200 mA
Storage temperature range .... −65°C to 150°C

‡ Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and
  functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not
  implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
NOTE 1: The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions

			MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage		3	5	5.5	V
V_{IH}	High-level input voltage	V_{CC} = 3 V	2.1			V
		V_{CC} = 4.5 V	3.15			
		V_{CC} = 5.5 V	3.85			
V_{IL}	Low-level input voltage	V_{CC} = 3 V			0.9	V
		V_{CC} = 4.5 V			1.35	
		V_{CC} = 5.5 V			1.65	
V_I	Input voltage		0		V_{CC}	V
V_O	Output voltage		0		V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 3 V			−4	mA
		V_{CC} = 4.5 V			−24	
		V_{CC} = 5.5 V			−24	
I_{OL}	Low-level output current	V_{CC} = 3 V			12	mA
		V_{CC} = 4.5 V			24	
		V_{CC} = 5.5 V			24	
$\Delta t/\Delta v$	Input transition rise or fall rate	$\overline{OEBA}$ or OEAB	0		5	ns/V
		A or B	0		10	
T_A	Operating free-air temperature		−40		85	°C

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

PARAMETER		TEST CONDITIONS		V_{CC}	$T_A = 25°C$			MIN	MAX	UNIT
					MIN	TYP	MAX			
V_{OH}		$I_{OH} = -50\ \mu A$		3 V	2.9			2.9		V
				4.5 V	4.4			4.4		
				5.5 V	5.4			5.4		
		$I_{OH} = -4\ mA$		3 V	2.58			2.48		
		$I_{OH} = -24\ mA$		4.5 V	3.94			3.8		
				5.5 V	4.94			4.8		
		$I_{OH} = -75\ mA†$		5.5 V				3.85		
V_{OL}		$I_{OL} = 50\ \mu A$		3 V			0.1		0.1	V
				4.5 V			0.1		0.1	
				5.5 V			0.1		0.1	
		$I_{OL} = 12\ mA$		3 V			0.36		0.44	
		$I_{OL} = 24\ mA$		4.5 V			0.36		0.44	
				5.5 V			0.36		0.44	
		$I_{OL} = 75\ mA†$		5.5 V					1.65	
I_I	$\overline{OEBA}$ or OEAB	$V_I = V_{CC}$ or GND		5.5 V		±0.1			±1	µA
$I_{OZ}‡$	A or B ports	$V_O = V_{CC}$ or GND		5.5 V		±0.5			±5	µA
I_{CC}		$V_I = V_{CC}$ or GND,	$I_O = 0$	5.5 V		8			80	µA
C_i	$\overline{OEBA}$ or OEAB	$V_I = V_{CC}$ or GND		5 V		4				pF
C_{io}	A or B ports	$V_O = V_{CC}$ or GND		5 V		12				pF

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.
‡ For I/O ports, the parameter I_{OZ} includes the input leakage current.

switching characteristics over recommended operating free-air temperature range, $V_{CC} = 3.3\ V \pm 0.3\ V$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$T_A = 25°C$			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A or B	B or A	1.5	6.8	9	1.5	10.2	ns
t_{PHL}			1.5	6.5	8.2	1.5	9.1	
t_{PZH}	$\overline{OEBA}$	A	1.5	8	10.3	1.5	11.7	ns
t_{PZL}			1.5	7.3	9.8	1.5	10.9	
t_{PHZ}	$\overline{OEBA}$	A	1.5	6.7	8.4	1.5	9	ns
t_{PLZ}			1.5	7.8	9.6	1.5	10.4	
t_{PZH}	OEAB	B	1.5	8.4	10	1.5	11.5	ns
t_{PZL}			1.5	8.1	10.1	1.5	11.3	
t_{PHZ}	OEAB	B	1.5	7	8.7	1.5	9.4	ns
t_{PLZ}			1.5	7.7	9.6	1.5	10.4	

TEXAS INSTRUMENTS

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A or B	B or A	1.5	5.2	6.6	1.5	7.4	ns
t_{PHL}			1.5	4.8	6.3	1.5	7.1	
t_{PZH}	$\overline{OEBA}$	A	1.5	6	7.8	1.5	8.9	ns
t_{PZL}			1.5	5.5	7.6	1.5	8.5	
t_{PHZ}	$\overline{OEBA}$	A	1.5	5.9	7.5	1.5	8.1	ns
t_{PLZ}			1.5	6.3	8.1	1.5	8.7	
t_{PZH}	OEAB	B	1.5	6.2	7.7	1.5	8.8	ns
t_{PZL}			1.5	6	7.8	1.5	8.8	
t_{PHZ}	OEAB	B	1.5	6.1	7.7	1.5	8.2	ns
t_{PLZ}			1.5	6.2	7.9	1.5	8.6	

operating characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS		TYP	UNIT
C_{pd}	Power dissipation capacitance per transceiver	Outputs enabled	C_L = 50 pF, f = 1 MHz	54	pF
		Outputs disabled		11	

TEXAS
INSTRUMENTS

PARAMETER MEASUREMENT INFORMATION

LOAD CIRCUIT FOR OUTPUTS

TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	$2 \times V_{CC}$
t_{PHZ}/t_{PZH}	GND

VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
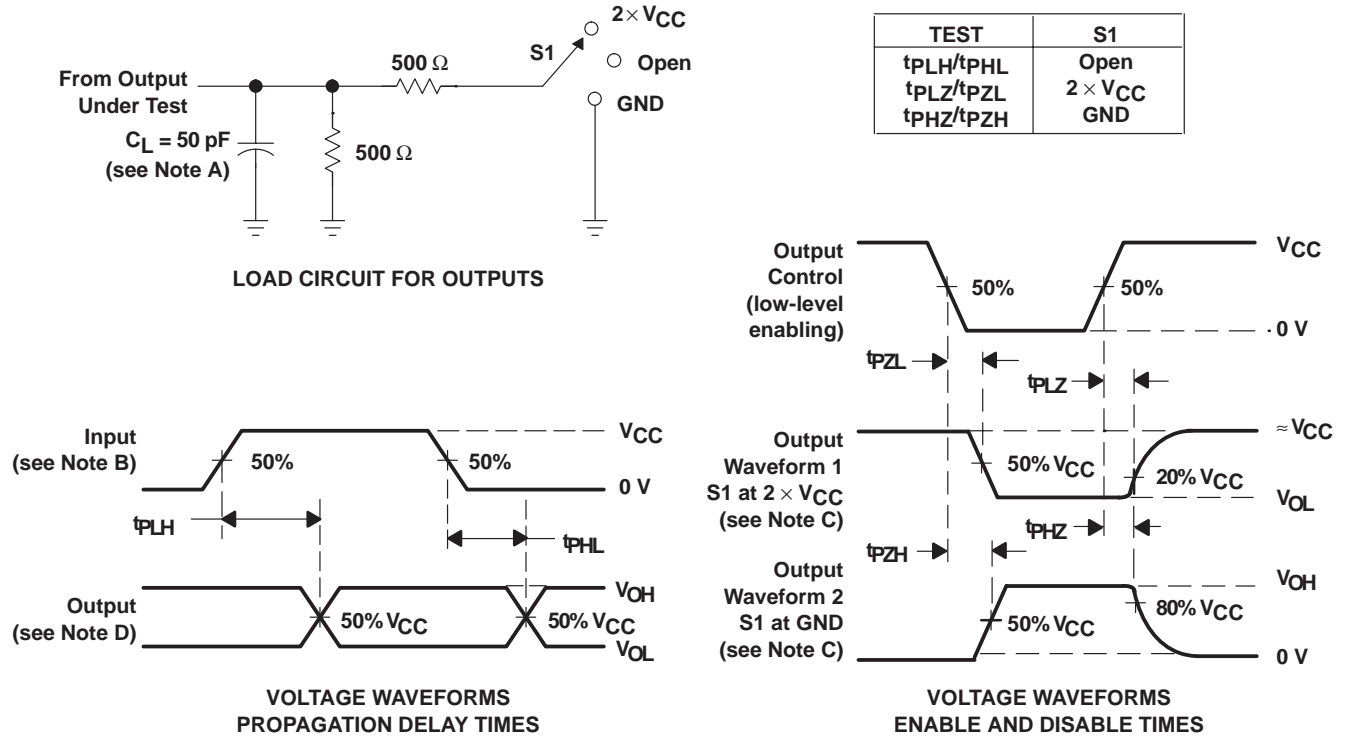
NOTES: A. C_L includes probe and jig capacitance.
      B. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r ≤ 3 ns, t_f ≤ 3 ns.
          For testing pulse duration: t_r = t_f = 1 to 3 ns. Pulse polarity can be either high-to-low-to-high or low-to-high-to-low.
      C. 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.
      D. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

IMPORTANT NOTICE