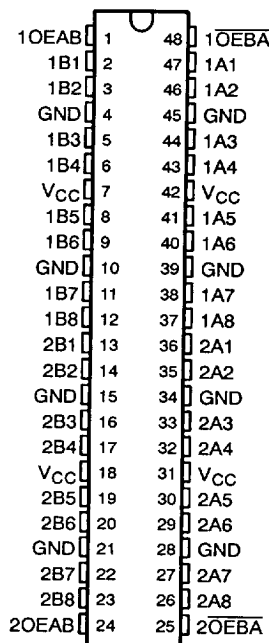


- DL PACKAGE
-
- (TOP VIEW)



The 74AC16620 is an inverting 16-bit transceiver designed for asynchronous communication between data buses. The control function implementation allows for maximum flexibility in timing.

This device can be used as two 8-bit transceivers or one 16-bit transceiver. It allows data transmission from the A bus to the B bus or from the B bus to the A bus, depending upon the logic level at the complementary output-enable (OEAB or 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 the transceiver the capability to store data by simultaneous enabling of OEAB and 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, the bus lines remain at their last states.

The 74AC16620 is packaged in TI's shrink small-outline package (DL), which provides twice the I/O pin count and functionality of standard small-outline packages in the same printed-circuit-board area.

The 74AC16620 is characterized for operation from -40°C to 85°C .

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

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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.

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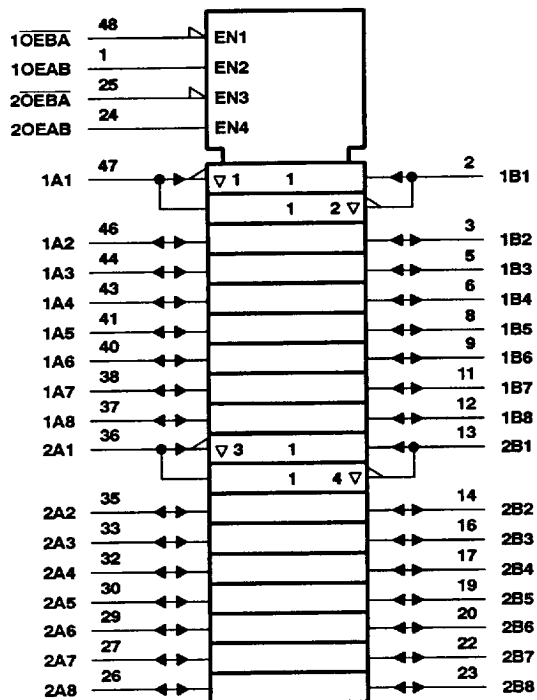
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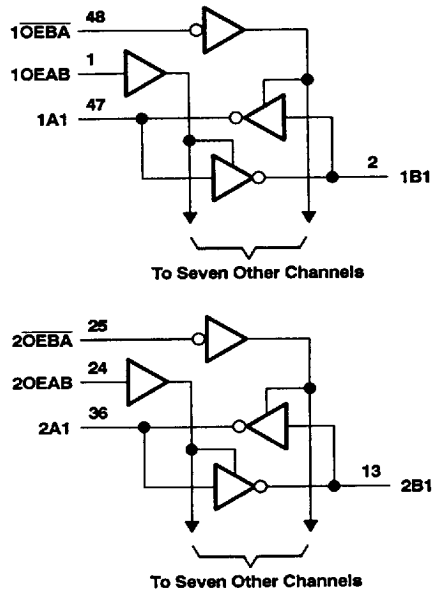
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74AC16620
16-BIT BUS TRANSCEIVER
WITH 3-STATE OUTPUTS
D3600, JULY 1990 – REVISED APRIL 1993

logic symbol†



logic diagram (positive logic)



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

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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	±400 mA
Maximum power dissipation at $T_A = 55^\circ\text{C}$ (in still air)	0.85 W
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 (see Note 2)

		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	0		10	ns/V
T_A	Operating free-air temperature	–40		85	°C

NOTE 2: Unused or floating pins (input or I/O) must be held high or low.



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74AC16620
16-BIT BUS TRANSCEIVER
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			MIN	MAX	UNIT
				MIN	TYP	MAX			
V _{OH}	I _{OH} = – 50 μA		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 μA		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	Control inputs	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	Control inputs	V _I = V _{CC} or GND	5 V		4.5			pF	
C _{io}	A or B ports	V _O = V _{CC} or GND	5 V		16			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 ± 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	2.7	6.1	8.7	2.7	9.7	ns
t _{PHL}			3.9	7.9	10.6	3.9	11.7	
t _{PZH}	OEBA	A	3.2	7.1	10	3.2	11.2	ns
t _{PZL}			4.5	11.1	13.5	4.5	15	
t _{PHZ}	OEBA	A	5.3	7.4	9.5	5.3	10.2	ns
t _{PLZ}			4.6	7	9.2	4.6	9.8	
t _{PZH}	OEAB	B	3.1	6.7	9.5	3.1	10.7	ns
t _{PZL}			4.4	9.6	13	4.4	14.5	
t _{PHZ}	OEAB	B	5	7.1	9.3	5	9.8	ns
t _{PLZ}			4.4	6.8	8.9	4.4	9.4	

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$T_A = 25^\circ\text{C}$			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A or B	B or A	2.1	3.9	6.1	2.1	6.8	ns
t_{PHL}			3.1	4.9	7.3	3.1	8.2	
t_{PZH}	$\overline{OEBA}$	A	2.2	4.3	6.8	2.2	7.6	ns
t_{PZL}			3.3	5.5	8.4	3.3	9.4	
t_{PHZ}	$\overline{OEBA}$	A	4.9	6.6	8.6	4.9	9.2	ns
t_{PLZ}			4.1	5.8	7.8	4.1	8.3	
t_{PZH}	OEAB	B	2.2	4.2	6.5	2.2	7.3	ns
t_{PZL}			3.4	5.4	8.1	3.4	9.1	
t_{PHZ}	OEAB	B	4.6	6.4	8.5	4.6	9	ns
t_{PLZ}			4.1	5.6	7.6	4.1	8	

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

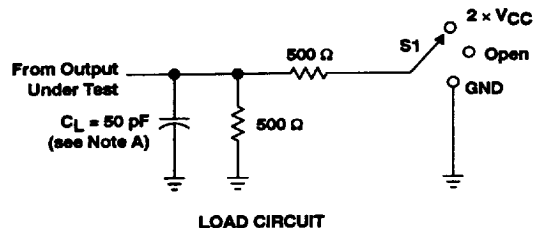
PARAMETER			TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance per transceiver	Outputs enabled	$C_L = 50\text{ pF}$, $f = 1\text{ MHz}$	49	pF
		Outputs disabled		6	



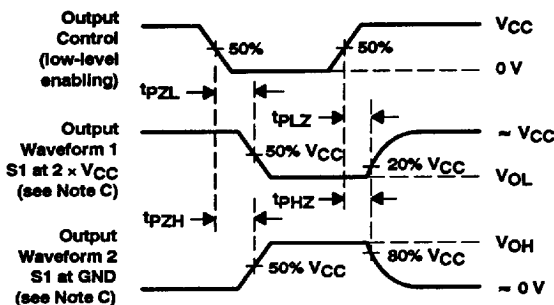
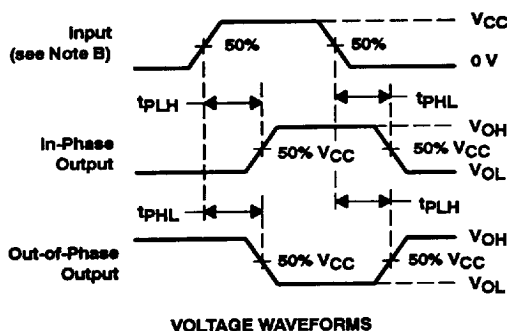
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PARAMETER MEASUREMENT INFORMATION



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



- NOTES: A. C_L includes probe and jig capacitance.
B. All input pulses are supplied by generators having the following characteristics: PRR $\leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r = 3 \text{ ns}$, $t_f = 3 \text{ ns}$.
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 input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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