

Octal transceiver with dual enable, inverting
(3-State)

74ABT620

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FEATURES

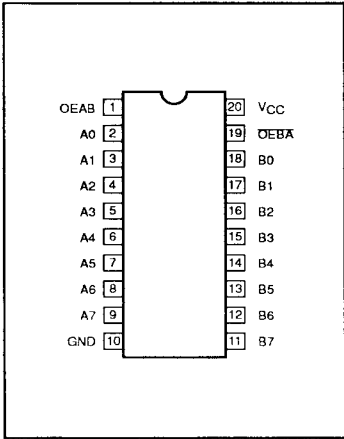
- Octal bidirectional bus interface
- 3-State buffers
- Power-up 3-State
- Live insertion/extraction permitted
- Output capability: +64mA/-32mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000 V per MIL STD 883 Method 3015 and 200 V per Machine Model

DESCRIPTION

The 74ABT620 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The 74ABT620 device is an octal transceiver featuring inverting 3-State bus compatible outputs in both send and receive directions. The 74ABT620 is designed for asynchronous two-way communication between data buses. The control function implementation allows for maximum flexibility in timing. This device allows data transmission from the A bus to the B bus or from the B bus to the A bus, depending upon the logic levels at the Enable inputs (OEBA and OEAB). The Enable inputs can be used to disable the device so that the buses are effectively isolated.

PIN CONFIGURATION



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS T _{amb} = 25°C; GND = 0V	TYPICAL	UNIT
t _{PLH} t _{PHL}	Propagation delay An to Bn or Bn to An	C _L = 50pF; V _{CC} = 5V	3.1	ns
C _{IN}	Input capacitance OEAB, OEBA	V _I = 0V or V _{CC}	4	pF
C _{VO}	I/O capacitance	Outputs disabled; V _O = 0V or V _{CC}	7	pF
I _{CCZ}	Total supply current	Outputs disabled; V _{CC} = 5.5V	50	µA

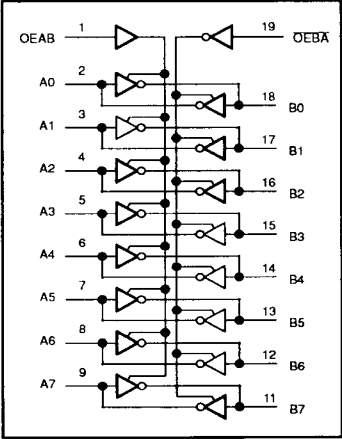
ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	ORDER CODE	DRAWING NUMBER
20-pin plastic DIP	-40°C to +85°C	74ABT620N	0408B
20-pin plastic SOL	-40°C to +85°C	74ABT620D	0172D
20-pin plastic SSOP type II	-40°C to +85°C	74ABT620DB	1640A

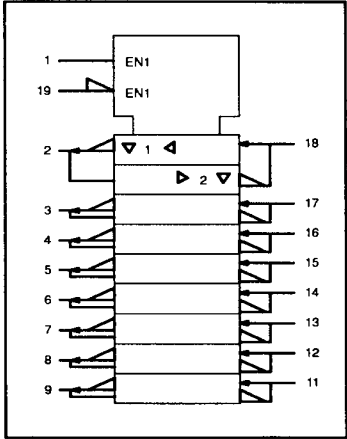
PIN DESCRIPTION

PIN NUMBER	SYMBOL	NAME AND FUNCTION
1	OEAB	Output enable input, A side to B side (active-High)
2, 3, 4, 5, 6, 7, 8, 9	A0 – A7	Data inputs/outputs (A side)
18, 17, 16, 15, 14, 13, 12, 11	B0 – B7	Data inputs/outputs (B side)
19	OEBA	Output enable input, B side to A side (active-Low)
10	GND	Ground (0V)
20	V _{CC}	Positive supply voltage

LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



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FUNCTION TABLE

INPUTS		INPUTS/OUTPUTS	
OEBA	OEAB	A _n	B _n
L	L	B _n	Inputs
H	H	Inputs	\bar{A}_n
H	L	Z	Z
L	H	B _n Inputs or Inputs \bar{A}_n	

H = High voltage level

L = Low voltage level

Z = High impedance "off" state

ABSOLUTE MAXIMUM RATINGS^{1, 2}

SYMBOL	PARAMETER	CONDITIONS	RATING	UNIT
V _{CC}	DC supply voltage		-0.5 to +7.0	V
I _{IK}	DC input diode current	V _I < 0	-18	mA
V _I	DC input voltage ³		-1.2 to +7.0	V
I _{OK}	DC output diode current	V _O < 0	-50	mA
V _{OUT}	DC output voltage ³	output in Off or High state	-0.5 to +5.5	V
I _{OUT}	DC output current	output in Low state	128	mA
T _{stg}	Storage temperature range		-65 to 150	°C

NOTES:

- Stresses beyond those listed 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.
- The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature of this integrated circuit should not exceed 150°C.
- The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS		UNIT
		Min	Max	
V _{CC}	DC supply voltage	4.5	5.5	V
V _I	Input voltage	0	V _{CC}	V
V _{IH}	High-level input voltage	2.0		V
V _{IL}	Low-level input voltage		0.8	V
I _{OH}	High-level output current		-32	mA
I _{OL}	Low-level output current		64	mA
Δt/Δv	Input transition rise or fall rate	0	5	ns/V
T _{amb}	Operating free-air temperature range	-40	+85	°C

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DC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER		TEST CONDITIONS	LIMITS					UNIT
				T _{amb} = +25°C			T _{amb} = -40°C to +85°C		
				Min	Typ	Max	Min	Max	
V _{IK}	Input clamp voltage		V _{CC} = 4.5V; I _{IK} = -18mA		-0.9	-1.2		-1.2	V
V _{OH}	High-level output voltage		V _{CC} = 4.5V; I _{OH} = -3mA; V _I = V _{IL} or V _{IH}	2.5	2.9		2.5		V
			V _{CC} = 5.0V; I _{OH} = -3mA; V _I = V _{IL} or V _{IH}	3.0	3.4		3.0		V
			V _{CC} = 4.5V; I _{OH} = -32mA; V _I = V _{IL} or V _{IH}	2.0	2.4		2.0		V
V _{OL}	Low-level output voltage		V _{CC} = 4.5V; I _{OL} = 64mA; V _I = V _{IL} or V _{IH}		0.42	0.55		0.55	V
I _I	Input leakage current	Control pins	V _{CC} = 5.5V; V _I = GND or 5.5V		±0.01	±1.0		±1.0	µA
		Data pins	V _{CC} = 5.5V; V _I = GND or 5.5V		±5	±100		±100	µA
I _{OFF}	Power-off leakage current		V _{CC} = 0.0V; V _O or V _I ≤ 4.5V		±5.0	±100		±100	µA
I _{PU/PD}	Power-up/down 3-State output current ³		V _{CC} = 2.1V; V _O = 0.5V; V _I = GND or V _{CC} ; V _{OE} and V _{OE} = Don't care		±5.0	±50		±50	µA
I _{IH} + I _{OZH}	3-State output High current		V _{CC} = 5.5V; V _O = 2.7V; V _I = V _{IL} or V _{IH}		5.0	50		50	µA
I _{IL} + I _{OZL}	3-State output Low current		V _{CC} = 5.5V; V _O = 0.5V; V _I = V _{IL} or V _{IH}		-5.0	-50		-50	µA
I _{CEX}	Output High leakage current		V _{CC} = 5.5V; V _O = 5.5V; V _I = GND or V _{CC}		5.0	50		50	µA
I _O	Output current ¹		V _{CC} = 5.5V; V _O = 2.5V	-50	-100	-180	-50	-180	mA
I _{CCH}	Quiescent supply current		V _{CC} = 5.5V; Outputs High, V _I = GND or V _{CC}		50	250		250	µA
I _{CCL}			V _{CC} = 5.5V; Outputs Low, V _I = GND or V _{CC}		24	30		30	mA
I _{CCZ}			V _{CC} = 5.5V; Outputs 3-State; V _I = GND or V _{CC}		50	250		250	µA
ΔI _{CC}	Additional supply current per input pin ²		V _{CC} = 5.5V; one input at 3.4V, other inputs at V _{CC} or GND		0.05	1.5		1.5	mA

NOTES:

1. Not more than one output should be tested at a time, and the duration of the test should not exceed one second.
2. This is the increase in supply current for each input at 3.4V.
3. This parameter is valid for any V_{CC} between 0V and 2.1V, with a transition time of up to 10msec. From $V_{CC} = 2.1\text{V}$ to $V_{CC} = 5\text{V} \pm 10\%$ a transition time of up to 100 μsec is permitted.

AC CHARACTERISTICS

 $\text{GND} = 0\text{V}; t_R = t_F = 2.5\text{ns}; C_L = 50\text{pF}, R_L = 500\Omega$

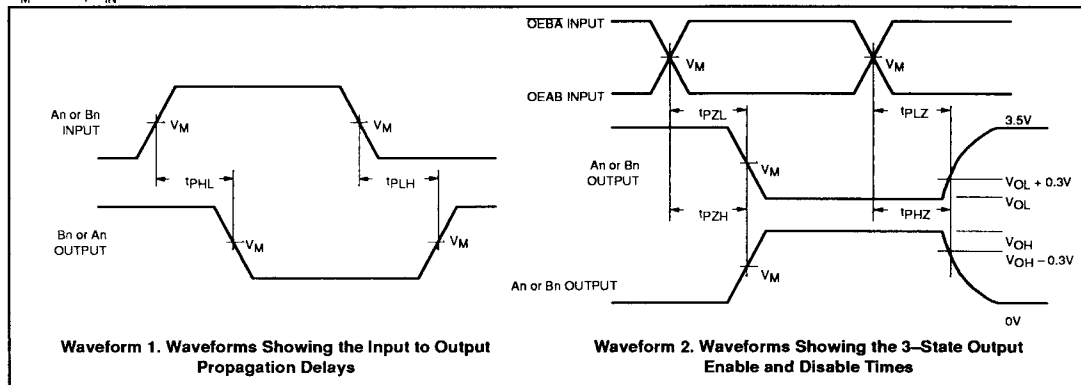
SYMBOL	PARAMETER	WAVEFORM	LIMITS					UNIT
			$T_{amb} = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{V}$			$T_{amb} = -40^{\circ}\text{C to } +85^{\circ}\text{C}$ $V_{CC} = +5.0\text{V} \pm 0.5\text{V}$		
			Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation delay An to Bn or Bn to An	1	1.0 1.0	2.9 3.1	4.1 4.3	1.0 1.0	4.8 4.8	ns
t_{PZH} t_{PZL}	Output enable time OEBA to An	2	1.3 1.0	3.2 2.7	4.6 6.1	1.3 1.0	5.5 7.1	ns
t_{PHZ} t_{PLZ}	Output disable time OEBA to An	2	2.0 1.4	5.0 4.0	6.3 5.4	2.0 1.4	7.0 5.8	ns
t_{PZH} t_{PZL}	Output enable time OEAB to Bn	2	1.6 2.0	4.6 4.2	6.2 5.9	1.6 2.0	6.8 6.4	ns
t_{PHZ} t_{PLZ}	Output disable time OEAB to Bn	2	1.2 1.1	3.9 2.9	5.6 4.7	1.2 1.1	6.5 5.6	ns

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AC WAVEFORMS

 $V_M = 1.5V$, $V_{IN} = GND$ to $3.0V$


TEST CIRCUIT AND WAVEFORMS

