

8 Bits Octal 3-State Non-Inverting Bus Transceiver

Description

The 74HC245 is a 3-state non-inverting transceiver that is used for 2-way asynchronous communication between data buses. The device has an active-low pin $\overline{OE}$, which is used to place the I/O ports into high-impedance states. The pin DIR control determines whether data flows from A to B or from B to A.

Features

- Designed for 2.0 to 6V V_{CC} Operation
- Outputs Directly Interface to COMS, NMOS, and TTL
- Low Input Current is Typical 0.1uA
- High Noise Immunity Characteristic of CMOS Devices
- 2-way 3 States Output
- ESD Protection Exceeds JESD22
 - HBM: $\pm 2000V$ Pass (JEDEC JS-001)
 - CDM: $\pm 200V$ Pass (JEDEC JS-002)
- These Devices are Pb. Free, Halogen Free/BFR Free and are RoHS Compliant
- Part No. and Package Information

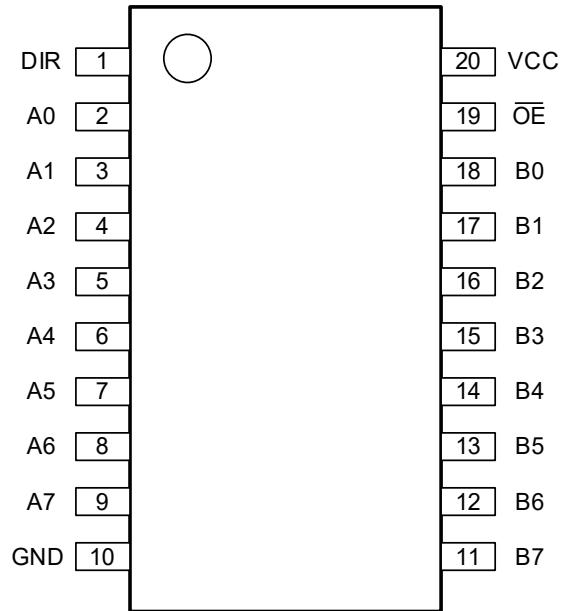
Product Name	Package	MSL
74HC245V	TSSOP20	Level 3

Applications

- Memory Chip Select Decoding
- Data Transmission System

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Pin Configuration



TOP VIEW

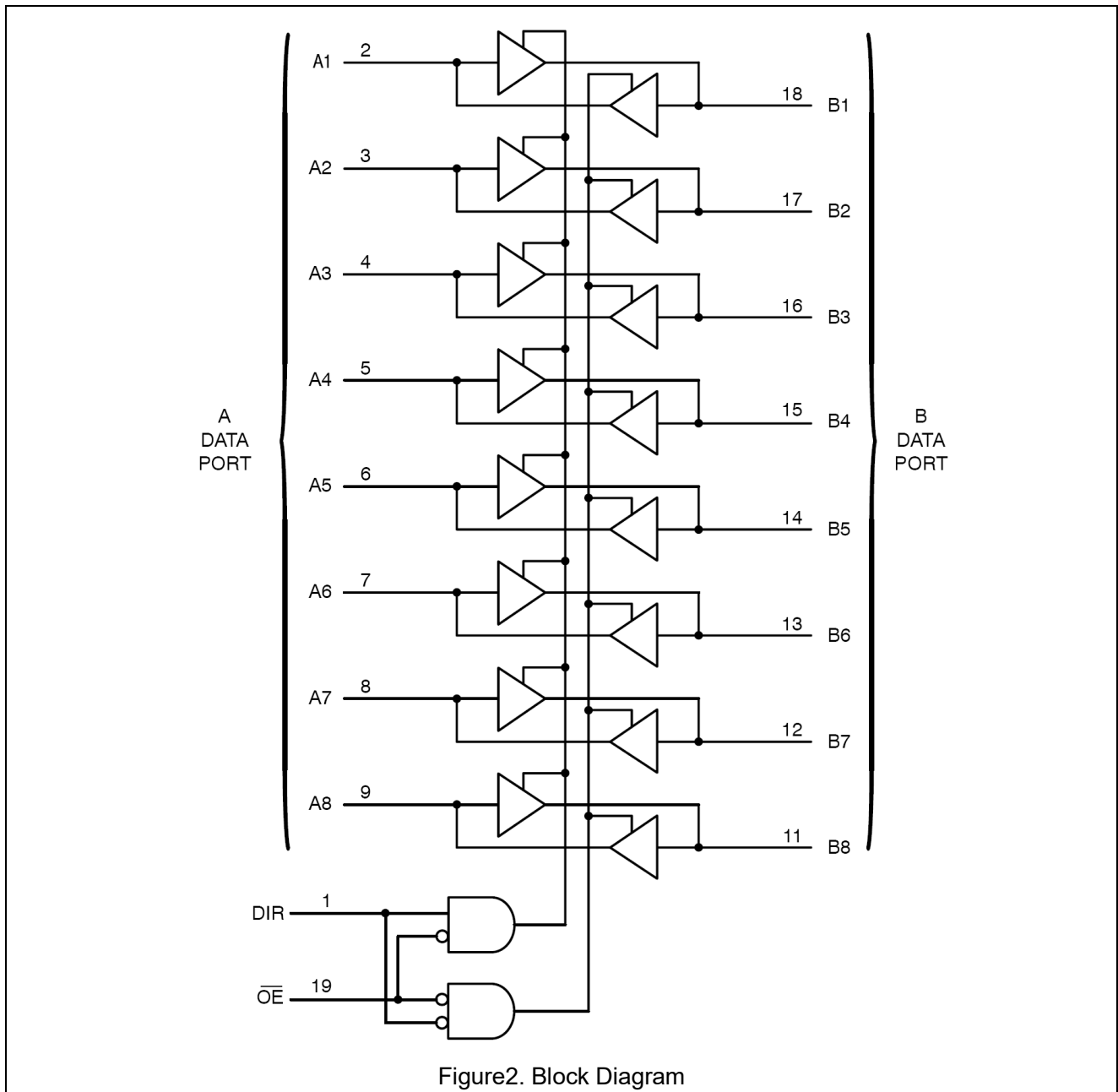
Figure1. Pin Configuration

Pin Function

Pin Number	Symbol	Description
1	DIR	Direction Control: DIR = 1, A→B, DIR=0, B→A。
2-9	A0-A7	Data Input/Output
10	GND	GND
11-18	B7-B0	Data Input/Output
19	$\overline{OE}$	Output Enable
20	VCC	Supply Voltage

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Block Diagram



Functional Description

OE	DIR	Input/Output	
L	L	A = B	Input
L	H	Input	B = A
H	X	Z	Z

Note: H = High voltage level,
L = Low voltage level,
X = Don't care,
Z = High-impedance OFF-state.

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Absolute Maximum Ratings

Symbol	Parameter	Min/Max	Unit
V_{CC}	Supply Voltage	-0.5~7.0	V
V_I	Input Voltage	-0.5~ $V_{CC}+0.5$	V
V_O	Output Voltage	-0.5~ $V_{CC}+0.5$	V
I_O	DC Output Sink Current	±35	mA
P_D	Max Power Dissipation (TSSOP20)	400	mW
T_A	Operate Temperature Range	-40~85	°C
T_{STG}	Storage Temperature Range	-50~150	°C

Electrical Characteristics

DC Electrical Characteristics

Symbol	Parameter	Test condition	V_{CC} (V)	$T_A = +25^{\circ}\text{C}$		$T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$		$T_A = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$		Unit
				Min	Max	Min	Max	Min	Max	
V_{CC}	Supply Voltage			2.0	6.0	2.0	6.0	2.0	6.0	V
V_{IH}	Minimum High-Level Input Voltage	$V_{OUT} = V_{CC} - 0.1\text{V}$ $ I_{OUT} = 20\mu\text{A}$	2.0	1.5		1.5		1.5		V
			3.0	2.1		2.1		2.1		
			4.5	3.15		3.15		3.15		
			6.0	4.0		4.0		4.0		
V_{IL}	Maximum Low-Level Input Voltage	$V_{OUT} = 0.1\text{V}$ $ I_{OUT} = 20\mu\text{A}$	2.0		0.5		0.5		0.5	V
			3.0		0.9		0.9		0.9	
			4.5		1.35		1.35		1.35	
			6.0		1.6		1.6		1.6	
V_{OH}	Minimum High-Level Output Voltage	$V_{IN} = V_{IH}$ $ I_{OUT} = 20\mu\text{A}$	2.0	1.9		1.9		1.9		V
			4.5	4.4		4.4		4.4		
			6.0	5.9		5.9		5.9		
		$V_{IN} = V_{IH}$ $ I_{OUT} = 4\text{mA}$ $ I_{OUT} = 8\text{mA}$ $ I_{OUT} = 12\text{mA}$	3.0 4.5 6.0	2.48 3.98 5.48		2.34 3.84 5.34		2.2 3.7 5.2		
V_{OL}	Minimum Low-Level Output Voltage	$V_{IN} = V_{IL}$ $ I_{OUT} = 20\mu\text{A}$	2.0		0.1		0.1		0.1	V
			4.5		0.1		0.1		0.1	
			6.0		0.1		0.1		0.1	
		$V_{IN} = V_{IH}$ $ I_{OUT} = 4\text{mA}$ $ I_{OUT} = 8\text{mA}$ $ I_{OUT} = 12\text{mA}$	3.0 4.5 6.0		0.26 0.26 0.32		0.33 0.33 0.35		0.4 0.4 0.4	
I_{IN}	Maximum Input Leakage Current	$V_{IN} = V_{CC}$ or GND	6.0		±0.1		±1.0		±1.0	μA
I_{OZ}	Maximum Three-State Leakage Current	Output in High-Impedance State $V_{IN} = V_{IL}$ or V_{IH} $V_{OUT} = V_{CC}$ or GND	6.0		±0.5		±5.0		±10	μA
I_{CC}	Maximum Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND $I_{OUT} = 0\mu\text{A}$	6.0		4.0		40		40	μA

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AC Electrical Characteristics (C_L=50pF)

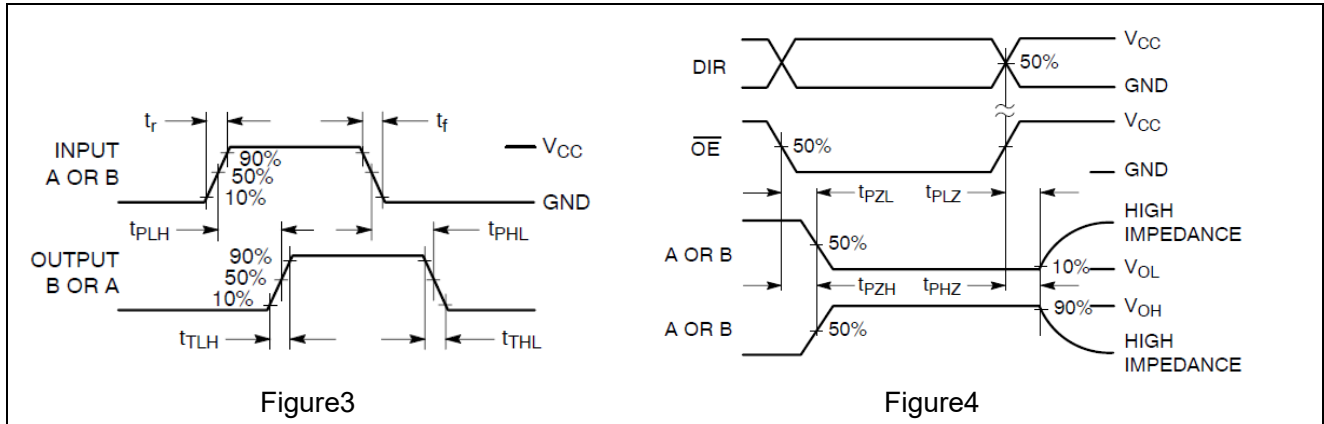
Symbol	Parameter	V _{CC} (V)	T _A = +25°C	T _A = -40°C to +85°C	T _A = -55°C to +125°C	Unit
			Typ	Typ	Typ	
t _{PLH} , t _{PHL}	Maximum Propagation Delay, A to B, B to A (Figure 3)	2.0 3.0 4.5 6.0	40 20 12 10	50 25 16 14	60 30 20 18	ns
t _{PLZ} , t _{PHZ}	Maximum Propagation Delay, Direction or Output Enable to A or B (Figure 4)	2.0 3.0 4.5 6.0	20 15 12 10	30 20 17 14	40 25 22 18	ns
t _{PZL} , t _{PZH}	Maximum Propagation Delay, Output Enable to A or B (Figure 4)	2.0 3.0 4.5 6.0	35 15 12 10	45 20 17 14	55 25 22 18	ns
T _{TLH} , T _{THL}	Maximum Output Transition Time, Any Output (Figure 3)	2.0 3.0 4.5 6.0	12 8 6 5	22 13 10 9	32 18 14 13	ns
C _{IN}	Maximum Input Capacitance (Pin 1 or Pin 19)	-	10	10	10	pF
C _{OUT}	Maximum Three-State I/O Capacitance (I/O in High-Impedance State)	-	15	15	15	pF

Maximum Data Rate

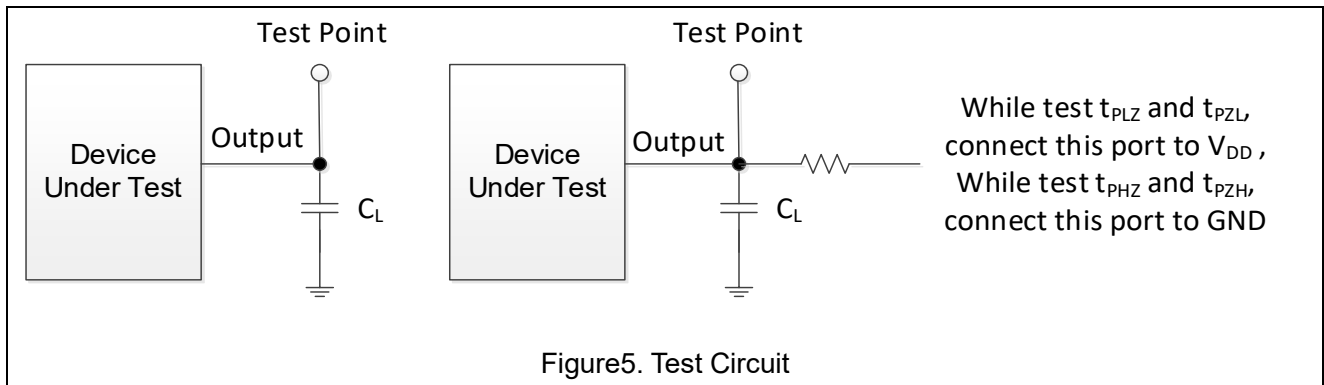
Symbol	Parameter	Test Conditions	V _{CC}	-40°C to +85°C			Unit
				Min	Typ	Max	
MDR	Maximum Data Rate	C _{IO} = 15pF	3.3~5.0			60	Mbps

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AC Characteristics Test Waveform

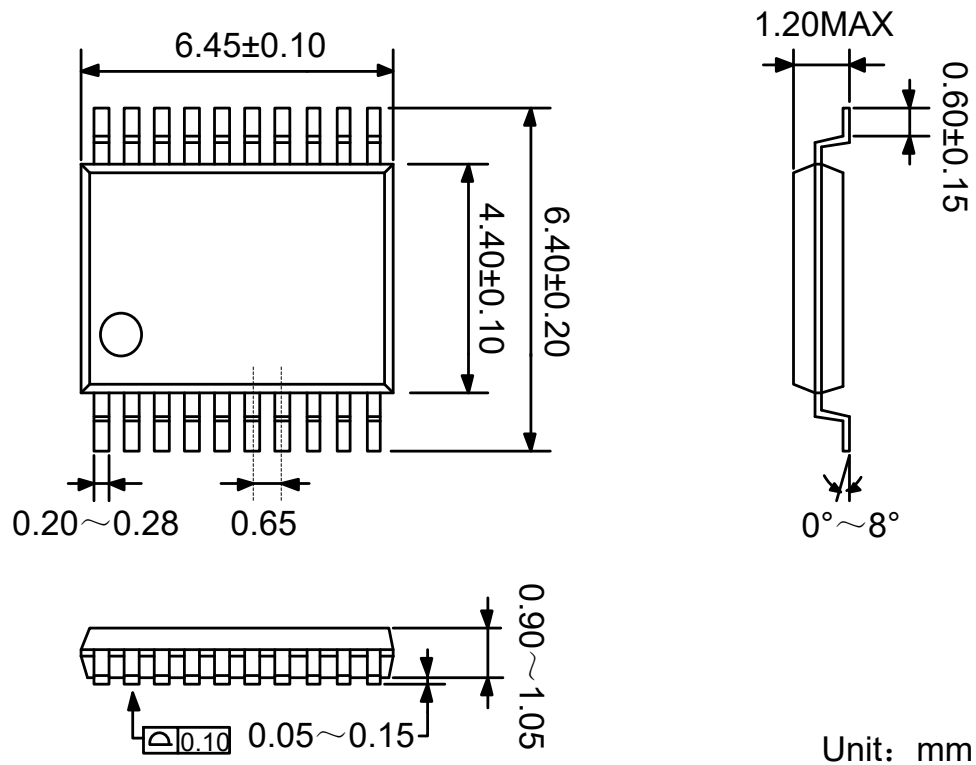


Test Circuit

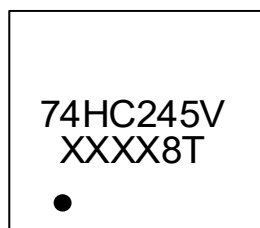


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Package Dimension



Marking



74HC245V = Part Number
XXXX8T = Tracking Number

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Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2016-06-23	Original version	Shi Liang Jun	Shi Liang Jun	Zhu Jun Li
1.1	2020-06-23	Update the Electrical Characteristics	Shi bo	Shi Liang Jun	Zhu Jun Li
1.2	2022-09-02	Update Typeset	Shi bo	Shi bo	Shi bo
1.3	2025-10-27	Update EC table	Yang xiaoxu	Yang xiaoxu	Liu jiaying
1.3.a	2025-11-19	Add Marking	Yang xiaoxu	Yang xiaoxu	Liu jiaying