8 Bits Octal 3-state Non-inverting Bus Transceiver

Description

The ET74HC245 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 sates. The pin DIR control determines whether data flows from A to B or from B to A.

Features

- Designed for 2.0 to 6V VCC 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 Performance:

  -- Human Body Model >2000V

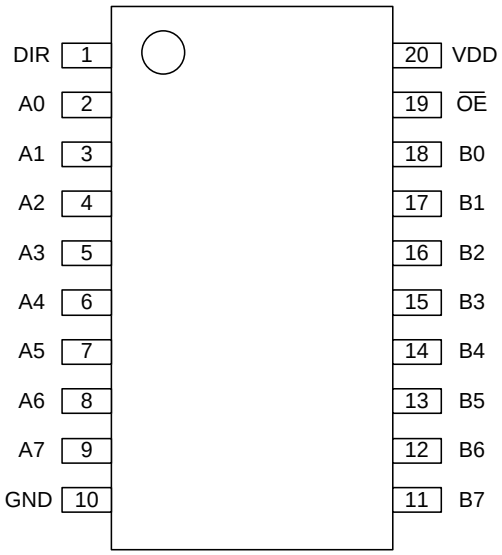
  -- Machine Model >200V
- These Devices are Pb. Free, Halogen Free/BFR Free and are RoHS Compliant
- Part No. and Package

Product Name	Package
ET74HC245M	SOP20
ET74HC245Y	QFN20(4×4)
ET74HC245V	TSSOP20

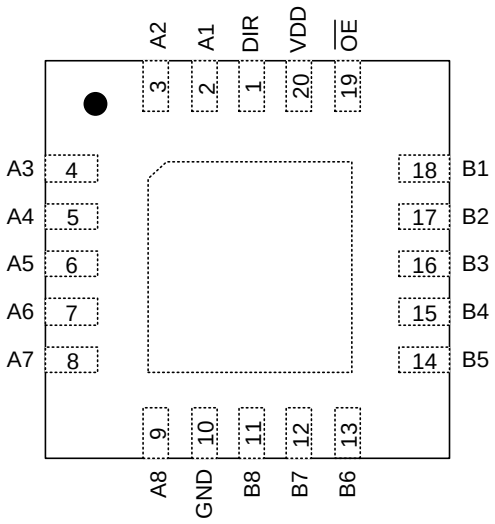
Applications

- Memory chip select decoding
- Data transmission system

Pin Configuration



SOP20/TSSOP20



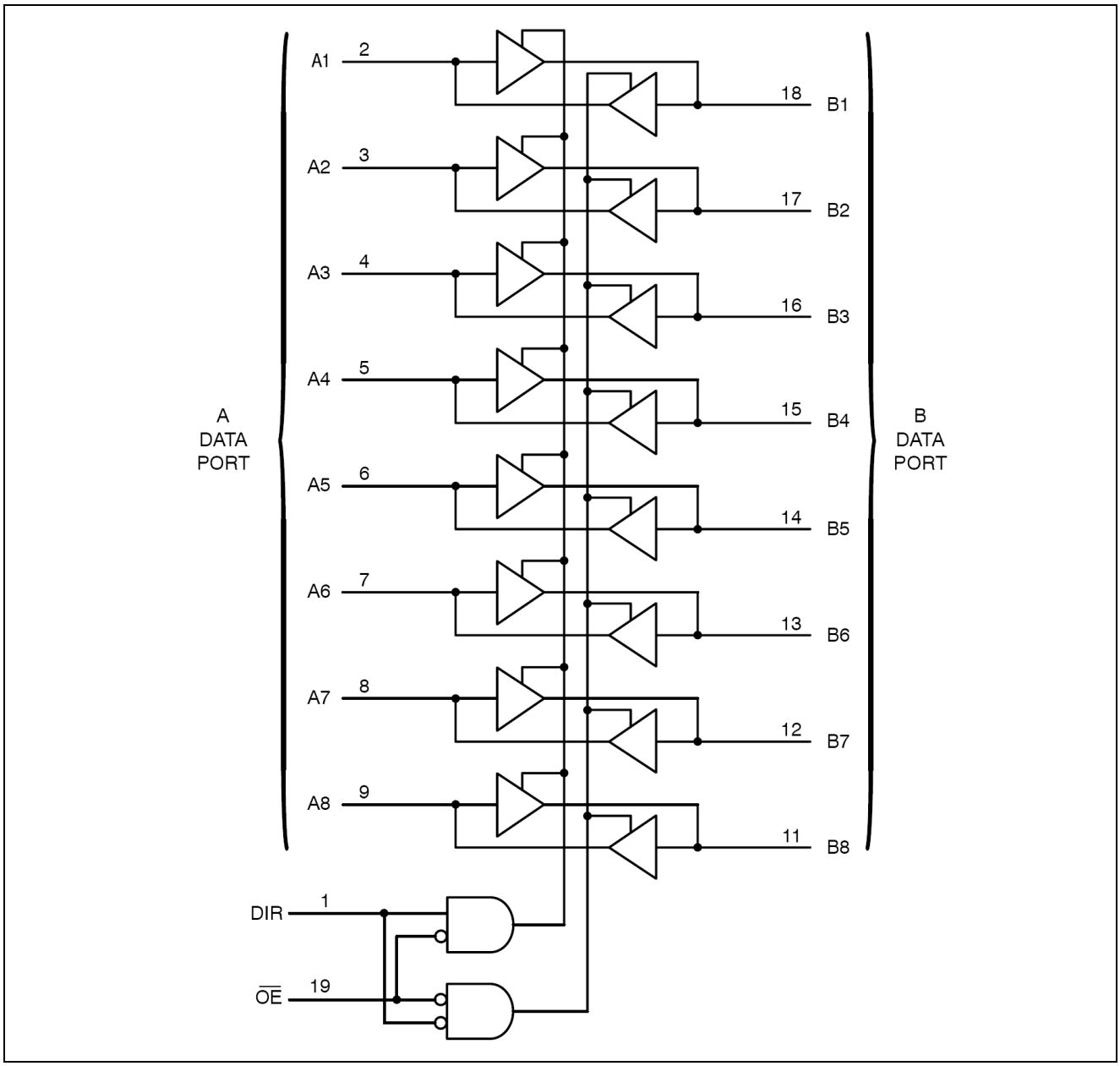
QFN20

TOP VIEW

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	VDD	Supply Voltage

Block Diagram



Functional Description

$\overline{OE}$	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.

Absolute Maximum Ratings

Symbol	Parameter	Min/Max	Unit
V_{CC}	Supply Voltage	-0.5~7.0	V
V_I	Input Voltage	-0.5~V_{DD}+0.5	V
V_O	Output Voltage	-0.5~V_{DD}+0.5	V
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°C		T_A = -40°C to +85°C		T_A = -55°C to +125°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} – 0.1V $\|I_{OUT}\|$ ≤ 20μA	2.0 3.0 4.5 6.0	1.5 2.1 3.15 4.0		1.5 2.1 3.15 4.0		1.5 2.1 3.15 4.0		V
V_{IL}	Maximum Low-Level Input Voltage	V_{OUT} = 0.1V $\|I_{OUT}\|$ ≤ 20μA	2.0 3.0 4.5 6.0		0.5 0.9 1.35 1.6		0.5 0.9 1.35 1.6		0.5 0.9 1.35 1.6	V
V_{OH}	Minimum High-Level Output Voltage	V_{IN} = V_{IH} $\|I_{OUT}\|$ ≤ 20μA	2.0 4.5 6.0	1.9 4.4 5.9		1.9 4.4 5.9		1.9 4.4 5.9		V
		V_{IN} = V_{IH} $\|I_{OUT}\|$ ≤ 2.4mA $\|I_{OUT}\|$ ≤ 6.0mA $\|I_{OUT}\|$ ≤ 7.8mA	 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} $\|I_{OUT}\|$ ≤ 20μA	2.0 4.5 6.0		0.1 0.1 0.1		0.1 0.1 0.1		0.1 0.1 0.1	V
		V_{IN} = V_{IH} $\|I_{OUT}\|$ ≤ 2.4mA $\|I_{OUT}\|$ ≤ 6.0mA $\|I_{OUT}\|$ ≤ 7.8mA	 3.0 4.5 6.0		 0.26 0.26 0.26		 0.33 0.33 0.33		 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} = 0μA	6.0		4.0		40		40	μA

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
			Min	Max	Min	Max	Min	Max	
t_{PLH}, t_{PHL}	Maximum Propagation Delay, A to B, B to A (Figure 1)	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 2)	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 2)	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 1)	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

AC Characteristics Test Waveform

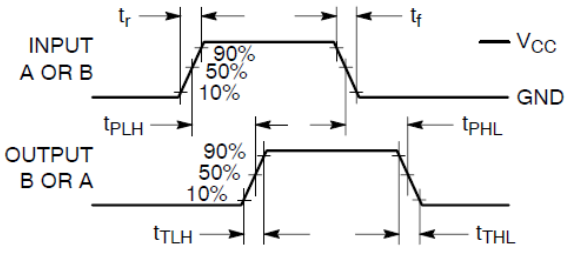


Figure 1

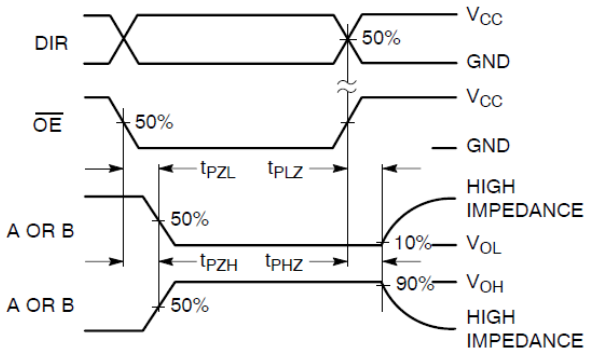
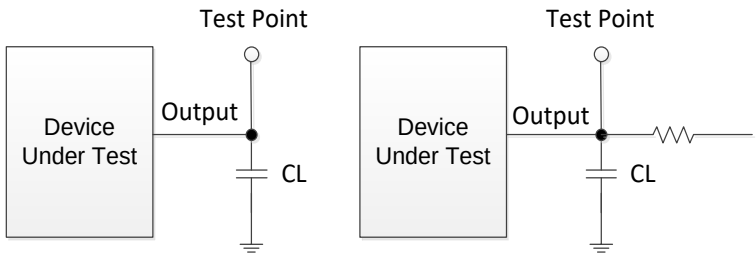


Figure 2

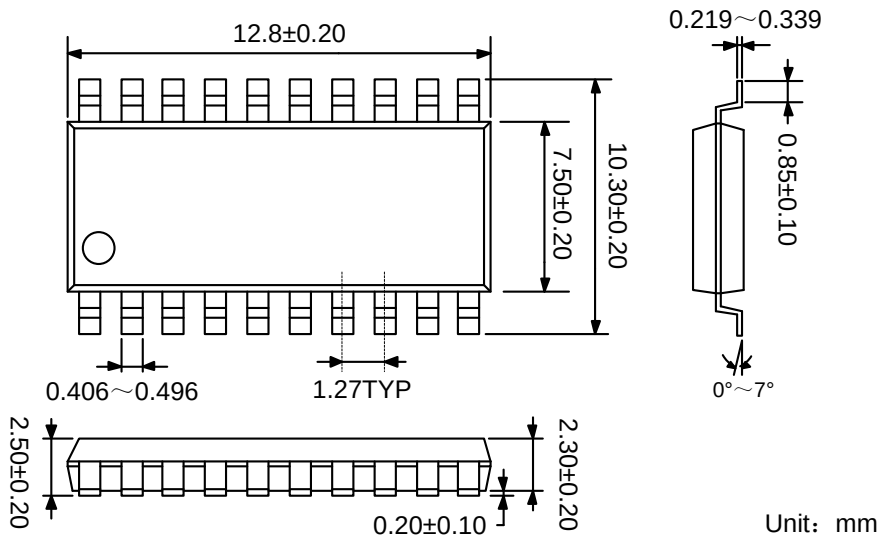
Test Circuit



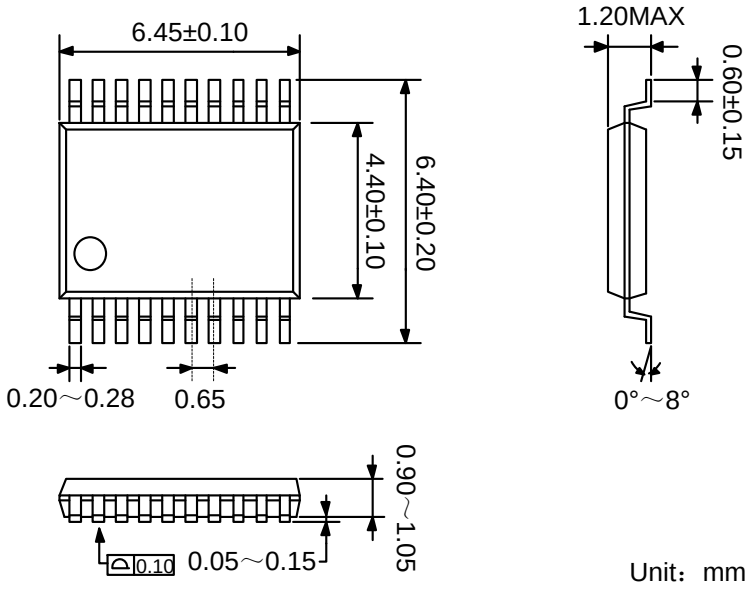
While test tPLZ and tPZL, connect this port to VDD , While test tPHZ and tPZH, connect this port to GND ,

Package Dimension

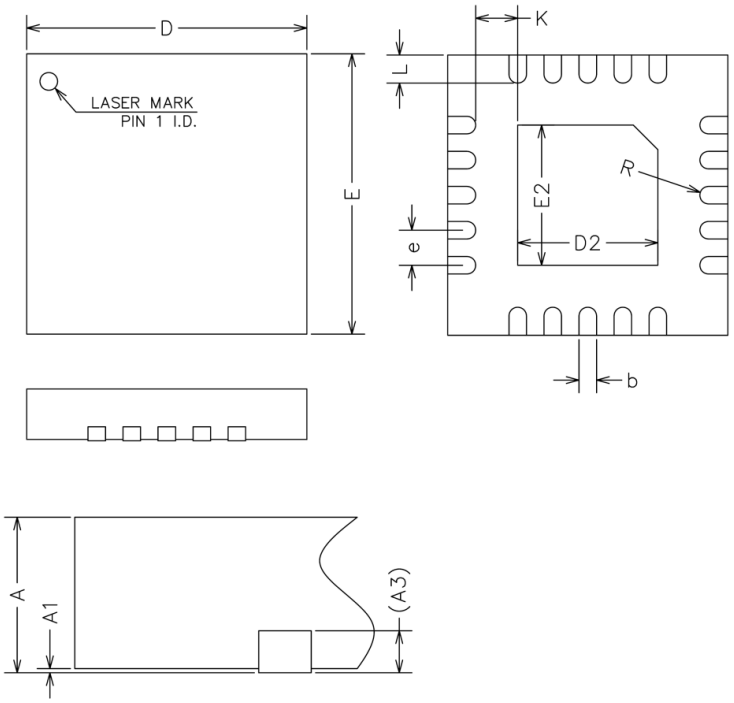
SOP20 (ET74HC245M)



TSSOP20(ET74HC245V)



QFN20 (ET74HC245Y)



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
A3		0.20REF	
b	0.18	0.25	0.30
D	3.90	4.00	4.10
E	3.90	4.00	4.10
D2	1.90	2.00	2.10
E2	1.90	2.00	2.10
e	0.40	0.50	0.60
K	0.20	–	–
L	0.35	0.40	0.45
R	0.09	–	–

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	2020-6-23	Update the Electrical Characteristics	Shibo	Shi Liang Jun	Zhu Jun Li
1.2	2022-9-2	Update Typeset	Shibo	Shibo	Shibo