



## U74HCT245

CMOS IC

### OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

#### DESCRIPTION

The **U74HCT245** is designed for the asynchronous communication between data buses. While the direction-control(DIR) is high, data transmits from the A bus to the B bus. Data transmits from the B bus to the A bus if DIR is low.

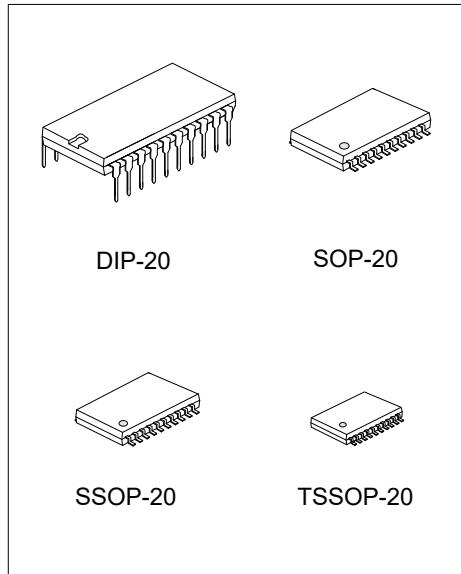
The output-enable  $\overline{OE}$  will isolate the device from the buses when high voltage is applied on it.

#### FEATURES

- \* Operate from 4.5V to 5.5V
- \* Typical  $t_{PD}$  is 14ns at 5.5V
- \* Inputs are TTL Voltage Compatible

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT245L-D20-T	U74HCT245G-D20-T	DIP-20	Tube
U74HCT245L-S20-R	U74HCT245G-S20-R	SOP-20	Tape Reel
U74HCT245L-R20-R	U74HCT245G-R20-R	SSOP-20	Tape Reel
U74HCT245L-P20-R	U74HCT245G-P20-R	TSSOP-20	Tape Reel



<p>U74HCT245G-D20-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) D20: DIP-20, S20: SOP-20, R20: SSOP-20, P20: TSSOP-20 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING

DIP-20	SOP-20 / SSOP-20 / TSSOP-20



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5 ~ 7.0	V
Input Clamp Current ( $V_{IN} < 0$ )	$I_{IK}$	$\pm 20$	mA
Output Clamp Current ( $V_{OUT} < 0$ )	$I_{OK}$	$\pm 20$	mA
Output Current	$I_{OUT}$	$\pm 35$	mA
$V_{CC}$ or GND Current	$I_{CC}$	$\pm 70$	mA
Storage Temperature	$T_{STG}$	-65 ~ +150	$^{\circ}C$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$	4.5	5	5.5	V
Input Voltage	$V_{IN}$	0		$V_{CC}$	V
Output Voltage	$V_{OUT}$	0		$V_{CC}$	V
Input Transition Rise and Fall Time	$t_R / t_F$			500	ns
Ambient Operating Temperature	$T_A$	-40		+125	$^{\circ}C$

### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}C$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}C$			$T_A=-40\sim+125^{\circ}C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	$V_{IH}$	$V_{CC}=4.5V\sim 5.5V$	2.0	1.6		2			V
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=4.5V\sim 5.5V$		1.2	0.8			0.8	V
High-Level Output Voltage	$V_{OH}$	$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.499		4.4			V
		$V_{CC}=4.5V, I_{OH}=-6mA$	3.98	4.3		3.7			V
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1			0.1	V
		$V_{CC}=4.5V, I_{OL}=6mA$		0.17	0.26			0.4	V
Input Current of DIR or $\overline{OE}$	$I_{I(LEAK)}$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND		$\pm 0.1$	$\pm 100$			$\pm 1000$	nA
Output OFF-State Current	$I_{OZ}$	$V_{CC}=5.5V, V_{OUT}=V_{CC}$ or GND		$\pm 0.01$	$\pm 0.5$			$\pm 10$	$\mu A$
Quiescent Supply Current	$I_{CC}$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			8			160	$\mu A$
Additional Quiescent Supply Current	$\Delta I_{CC}$	$V_{CC}=5.5V$ , One input at 0.5V or 2.4V, other inputs at 0 or $V_{CC}$		1.4	2.4			3	mA

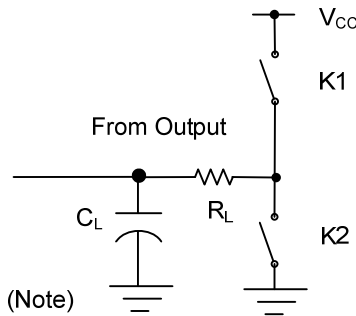
■ SWITCHING CHARACTERISTICS (R<sub>L</sub>=1kΩ, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (A or B) to Output (B or A)	t <sub>PD</sub> (t <sub>PLH</sub> /t <sub>PHL</sub> )	C <sub>L</sub> =50pF	V <sub>CC</sub> =4.5V	16	22			33	ns
			V <sub>CC</sub> =5.5V	14	20			30	ns
		C <sub>L</sub> =150pF	V <sub>CC</sub> =4.5V	20	30			45	ns
			V <sub>CC</sub> =5.5V	18	27			41	ns
3-state Output Enable Time From Input ( $\overline{OE}$ ) to Output (A or B)	t <sub>EN</sub> (t <sub>PZL</sub> /t <sub>PZH</sub> )	C <sub>L</sub> =50pF	V <sub>CC</sub> =4.5V	25	46			69	ns
			V <sub>CC</sub> =5.5V	22	41			62	ns
		C <sub>L</sub> =150pF	V <sub>CC</sub> =4.5V	36	59			89	ns
			V <sub>CC</sub> =5.5V	30	53			80	ns
3-state Output Enable Time From Input ( $\overline{OE}$ ) to Output (A or B)	t <sub>DIS</sub> (t <sub>PLZ</sub> /t <sub>PHZ</sub> )	C <sub>L</sub> =50pF	V <sub>CC</sub> =4.5V	26	40			60	ns
			V <sub>CC</sub> =5.5V	23	36			54	ns
Output Transition Time (A or B)	t <sub>r</sub> (t <sub>r</sub> /t <sub>f</sub> )	C <sub>L</sub> =50pF	V <sub>CC</sub> =4.5V	9	12			18	ns
			V <sub>CC</sub> =5.5V	8	11			16	ns
		C <sub>L</sub> =150pF	V <sub>CC</sub> =4.5V	17	42			63	ns
			V <sub>CC</sub> =5.5V	14	38			57	ns

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance of DIR or $\overline{OE}$	C <sub>IN</sub>	V <sub>CC</sub> =5.5V, V <sub>IN</sub> =V <sub>CC</sub> or GND		3	10	pF
Power Dissipation Capacitance	C <sub>PD</sub>	No load		40		pF

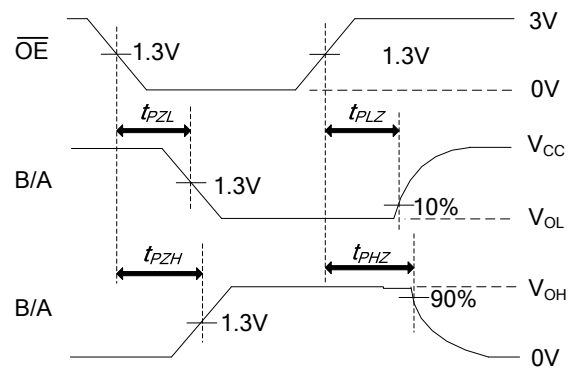
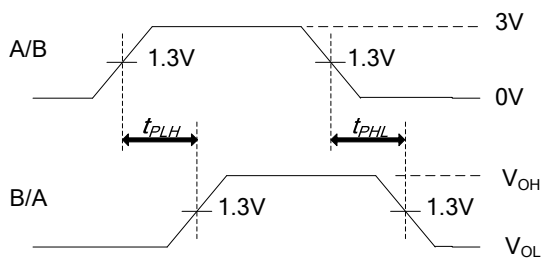
## ■ TEST CIRCUIT AND WAVEFORMS



TEST	K1	K2
$t_{PLH}/t_{PHL}$	Open	Open
$t_{PHZ}/t_{PZH}$	Open	Close
$t_{PLZ}/t_{PZL}$	Close	Open

Note:  $C_L$  includes probe and jig capacitance.

$$P_{RR} \leq 1\text{MHz}, Z_O = 50\Omega, t_R \leq 6\text{ns}, t_F \leq 6\text{ns}$$



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