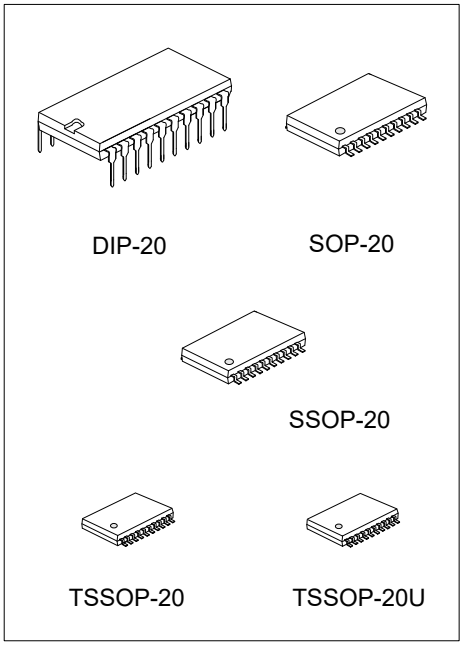
U74HC245

CMOS IC

OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS



■ DESCRIPTION

The **U74HC245** 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 2V to 6V
* Max t_{PD} is 18ns at 6V

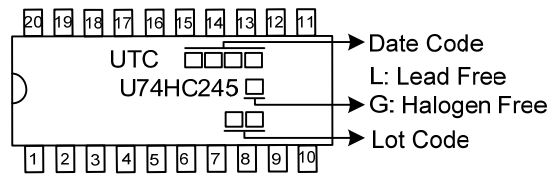
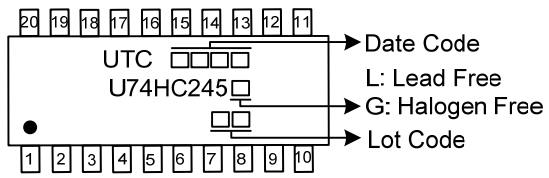
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC245L-D20-T	U74HC245G-D20-T	DIP-20	Tube
U74HC245L-S20-R	U74HC245G-S20-R	SOP-20	Tape Reel
U74HC245L-R20-R	U74HC245G-R20-R	SSOP-20	Tape Reel
U74HC245L-P20-R	U74HC245G-P20-R	TSSOP-20	Tape Reel
U74HC245L-ULA-R	U74HC245G-ULA-R	TSSOP-20U	Tape Reel

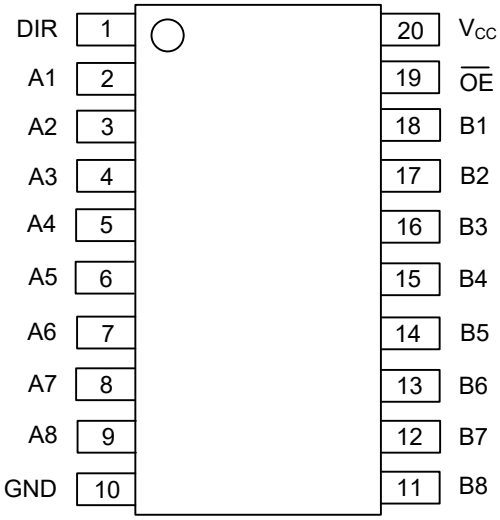
U74HC245G-D20-T
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) D20: DIP-20, S20: SOP-20, R20: SSOP-20, P20: TSSOP-20, ULA: TSSOP-20U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

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

■ PIN CONFIGURATION

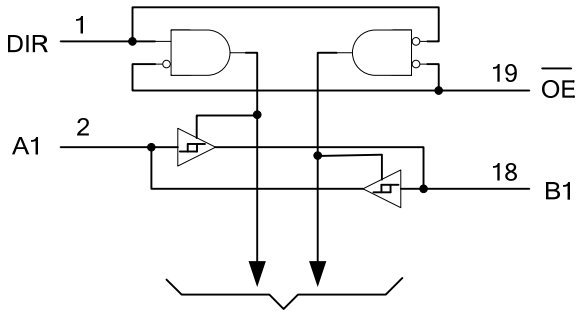


■ FUNCTION TABLE

INPUT		FUNCTION
$\overline{OE}$	DIR	
H	X	Isolation
L	H	Transmit data from A bus to B bus
L	L	Transmit data from B bus to A bus

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM



Seven Other channels

■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

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

Note: 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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-20	θ_{JA}	57	°C/W
	SOP-20		80	°C/W
	SSOP-20		96	°C/W
	TSSOP-20 TSSOP-20U		103	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2	5	6	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	V_{CC} =2V			1000	ns
		V_{CC} =4.5V			500	ns
		V_{CC} =6V			400	ns
Ambient Operating Temperature	T_A		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-level input voltage	V_{IH}	V_{CC}=2V	1.5			1.5			V
		V_{CC}=4.5V	3.15			3.15			V
		V_{CC}=6V	4.2			4.2			V
Low-lever output voltage	V_{IL}	V_{CC}=2V			0.5			0.5	V
		V_{CC}=4.5V			1.35			1.35	V
		V_{CC}=6V			1.8			1.8	V
High-Level Output Voltage	V_{OH}	V_{CC}=2V, I_{OH}=-20μA	1.9	1.998		1.9			V
		V_{CC}=4.5V, I_{OH}=-20μA	4.4	4.499		4.4			V
		V_{CC}=6V, I_{OH}=-20μA	5.9	5.999		5.9			V
		V_{CC}=4.5V, I_{OH}=-6mA	3.98	4.3		3.7			V
		V_{CC}=6V, I_{OH}=-7.8mA	5.48	5.8		5.2			V
Low-Level Output Voltage	V_{OL}	V_{CC}=2V, I_{OL}=20μA		0.002	0.1			0.1	V
		V_{CC}=4.5V, I_{OL}=20μA		0.001	0.1			0.1	V
		V_{CC}=6V, I_{OL}=20μA		0.001	0.1			0.1	V
		V_{CC}=4.5V, I_{OL}=6mA		0.17	0.26			0.4	V
		V_{CC}=6V, I_{OL}=7.8mA		0.15	0.26			0.4	V
Input Current of DIR or $\overline{OE}$	$I_{I(LEAK)}$	V_{CC}=6V, V_{IN}=V_{CC} or GND		±0.1	±100			±1000	nA
Output OFF-state current	I_{OZ}	V_{CC}=6V, V_{OUT}=V_{CC} or GND		±0.01	±0.5			±10	μA
Quiescent Supply Current	I_Q	V_{CC}=6V, V_{IN}=V_{CC} or GND, I_{OUT}=0			8			160	μA

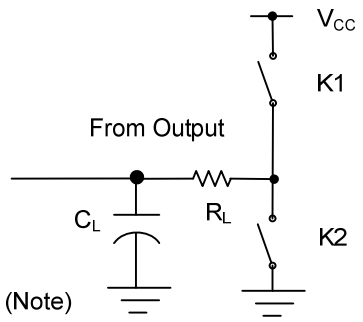
■ SWITCHING CHARACTERISTICS (C_L=50pF, R_L=1kΩ, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A or B) to output (B or A)	t_{PD} (t_{PLH}/t_{PHL})	V_{CC}=2V		40	105	1		135	ns
		V_{CC}=4.5V		15	21	1		27	ns
		V_{CC}=6V		12	18	1		23	ns
3-state output enable time from input ($\overline{OE}$) to output (A or B)	t_{EN} (t_{PZL}/t_{PZH})	V_{CC}=2V		125	230	1		290	ns
		V_{CC}=4.5V		23	46	1		58	ns
		V_{CC}=6V		20	39	1		49	ns
3-state output disable time from input ($\overline{OE}$) to output (A or B)	t_{DIS} (t_{PLZ}/t_{PHZ})	V_{CC}=2V		74	200	1		250	ns
		V_{CC}=4.5V		25	40	1		50	ns
		V_{CC}=6V		21	34	1		43	ns
Output transition time (A or B)	t_T (t_R/t_F)	V_{CC}=2V		20	60	1		90	ns
		V_{CC}=4.5V		8	12	1		18	ns
		V_{CC}=6V		6	10	1		15	ns

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance of DIR or $\overline{OE}$	C_{IN}	V_{CC}=6V, V_{IN}=V_{CC} or GND		3	10	pF
Power Dissipation Capacitance	C_{PD}	No load		40		pF

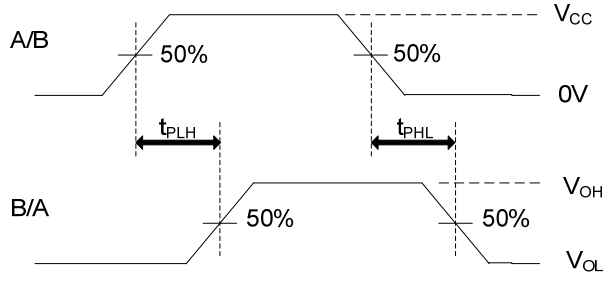
■ TEST CIRCUIT AND WAVEFORMS



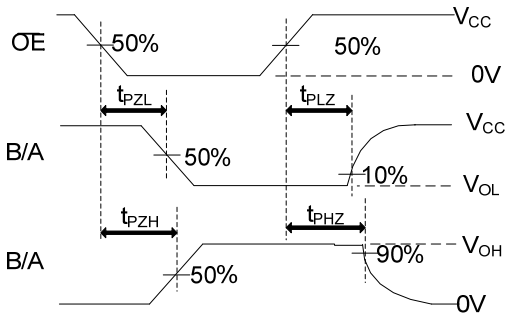
TEST	K1	K2
t_{PLH}/t_{PHL}	Open	Open
t_{PHZ}/t_{PZH}	Open	Close
t_{PLZ}/t_{PZL}	Close	Open

Note: C_L includes probe and jig capacitance.

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



Propagation Delay Times



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