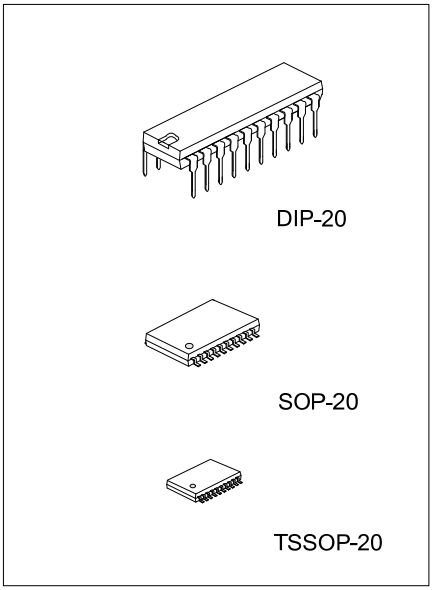
U74LVC245

CMOS IC

OCTAL BUS TRANSCEIVER WITH 3-STATE OUTPUTS



■ DESCRIPTION

The **U74LVC245** is designed for the communication between data buses asynchronously. 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 1.65V to 3.6V
* Input Accept Voltages to 5.5V
* Partial-Power-Down Mode Operation

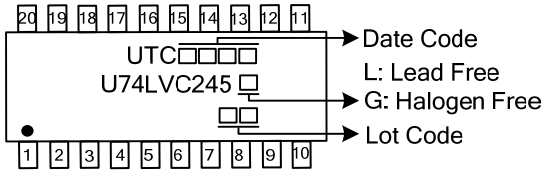
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC245L-D20-T	U74LVC245G-D20-T	DIP-20	Tube
U74LVC245L-S20-T	U74LVC245G-S20-T	SOP-20	Tube
U74LVC245L-S20-R	U74LVC245G-S20-R	SOP-20	Tape Reel
U74LVC245L-P20-T	U74LVC245G-P20-T	TSSOP-20	Tube
U74LVC245L-P20-R	U74LVC245G-P20-R	TSSOP-20	Tape Reel

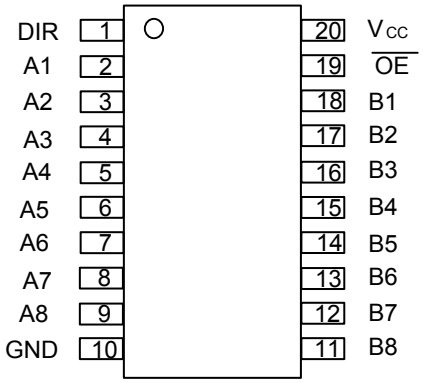
U74LVC245L-D20-T
(1)Packing Type
(2)Package Type
(3)Lead Free

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

■ MARKING INFORMATION

PACKAGE	MARKING
DIP-20/SOP-20/TSSOP-20	

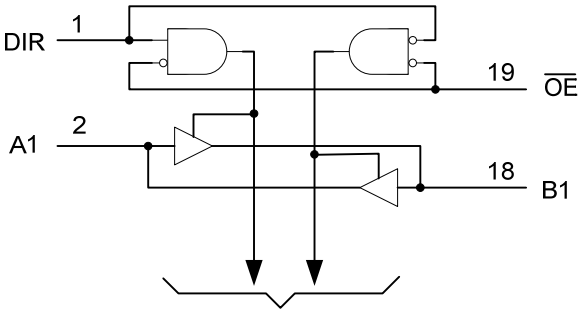
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)



Seven Other Channels

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~6.5	V
Input Voltage	V_{IN}	-0.5~ 6.5	V
Voltage Applied To Output In High-Impedance or Power-off State	V_{OUT}	-0.5~6.5	V
Voltage Applied to Output In High or Low State		-0.5~V_{CC}+0.5	
Input Clamp Current	I_{IK}	-50	mA
Output Clamp Current	I_{OK}	-50	mA
Output Current	I_{OUT}	±50	mA
V_{CC} or GND Current	I_{CC}	±100	mA
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. 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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	1.65		3.6	V
		Data retention only	1.5			
Input Voltage High-Level	V_{IH}	V_{CC} = 1.65 V to 1.95 V	0.65×V_{CC}			V
		V_{CC} = 2.3 V to 2.7 V	1.7			
		V_{CC} = 2.7 V to 3.6 V	2			
Input Voltage Low-Level	V_{IL}	V_{CC} = 1.65 V to 1.95 V			0.35×V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V			0.7	
		V_{CC} = 2.7 V to 3.6 V			0.8	
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-20	θ_{JA}	69	°C /W
	SOP-20		58	
	TSSOP-20		83	

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	V_{CC}=1.65V to 3.6V, I_{OH} = -100uA	V_{CC}-0.2			V
		V_{CC}=1.65V, I_{OH}= –4mA	1.29			
		V_{CC}=2.3V, I_{OH} = –8mA	1.9			
		V_{CC}=2.7V, I_{OH} = –12mA	2.2			
		V_{CC}=3V, I_{OH}= –12mA	2.4			
		V_{CC}=3V, I_{OH}= –24mA	2.3			
Output Voltage Low-Level	V_{OL}	V_{CC}=1.65V to 3.6V, I_{OL}= 100uA			0.1	V
		V_{CC}=1.65V, I_{OL}= 4mA			0.24	
		V_{CC}=2.3V, I_{OL}= 8mA			0.3	
		V_{CC}=2.7V, I_{OL}= 12mA			0.4	
		V_{CC}=3V, I_{OL}= 24mA			0.55	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=3.6V, V_{IN}= 5.5 V or GND			±1	uA
Power OFF Leakage Current	I_{OFF}	V_{CC} =0V, V_{IN} or V_{OUT}=5.5V			±1	uA
Input Leakage Current (For I/O Ports)	I_{OZ}	V_{CC}=3.6V, V_{OUT}= 0~5.5V			±1	uA
Quiescent Supply Current	I_Q	V_{CC}=3.6V,V_{IN} =V_{CC} or GND I_{OUT}= 0			1	uA
		V_{CC}=3.6V, 3.6V≦ V_{IN}≦5.5V, I_{OUT}=0			1	
Additional Quiescent Supply Current	ΔI_Q	V_{CC}=2.7V to 3.6V, One input at V_{CC} -0.6V, Other inputs at V_{CC} or GND			500	uA
Input Capacitance	C_{IN}	V_{CC}=3.3V, V_{IN} = V_{CC} or GND		4		pF

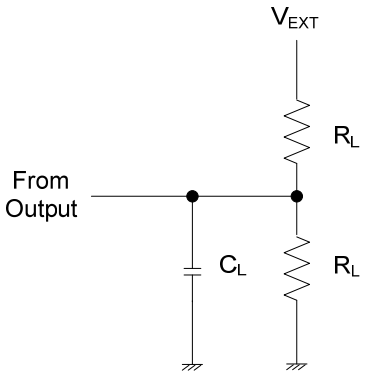
■ SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
From A to Y or From B to A	t_{PLH}/t_{PHL}	V_{CC}=1.8V ± 0.15V	1	6	12.2	ns
		V_{CC}=2.5V ± 0.2V	1	3.9	7.8	ns
		V_{CC}=2.7V	1	4.2	7.1	ns
		V_{CC}=3.3V ± 0.3V	1.5	3.8	6.1	ns
From $\overline{OE}$ to A or B	t_{PZL}/t_{PZH}	V_{CC}=1.8V ± 0.15V	1	7	14.8	ns
		V_{CC}=2.5V ± 0.2V	1	4.5	10	ns
		V_{CC}=2.7V	1	5.4	9.3	ns
		V_{CC}=3.3V ± 0.3V	1.5	4.4	8.3	ns
From $\overline{OE}$ A to A or B	t_{PLZ}/t_{PHZ}	V_{CC}=1.8V ± 0.15V	1	7.8	16.5	ns
		V_{CC}=2.5V ± 0.2V	1	4	9	ns
		V_{CC}=2.7V	1	4.4	8.3	ns
		V_{CC}=3.3V ± 0.3V	1.7	4.1	7.3	ns

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$\overline{OE}$ =0, f=10MHZ, V_{CC}=1.8V		42		pF
		$\overline{OE}$ =0, f=10MHZ, V_{CC}=2.5V		43		pF
		$\overline{OE}$ =0, f=10MHZ, V_{CC}=3.3V		45		pF
		$\overline{OE}$ =1, f=10MHZ, V_{CC}=1.8V		1		pF
		$\overline{OE}$ =1, f=10MHZ, V_{CC}=2.5V		1		pF
		$\overline{OE}$ =1, f=10MHZ, V_{CC}=3.3V		2		pF

■ TEST CIRCUIT AND WAVEFORMS



V_{CC}	V_{IN}	t_R/t_F	V_M	$V\triangle$	C_L	R_L	V_{EXT}		
							t_{PLH}/t_{PHL}	t_{PZH}/t_{PHZ}	t_{PZL}/t_{PLZ}
1.8V ±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	0.15V	30 pF	1 kΩ	OPEN	GND	$2*V_{CC}$
2.5V ±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	0.15V	30 pF	500Ω	OPEN	GND	$2*V_{CC}$
2.7 V	2.7 V	≤2.5ns	1.5V	0.3V	50 pF	500Ω	OPEN	GND	6 V
3.3V ±0.3V	2.7 V	≤2.5ns	1.5V	0.3V	50 pF	500Ω	OPEN	GND	6 V

Fig-1 Load circuitry

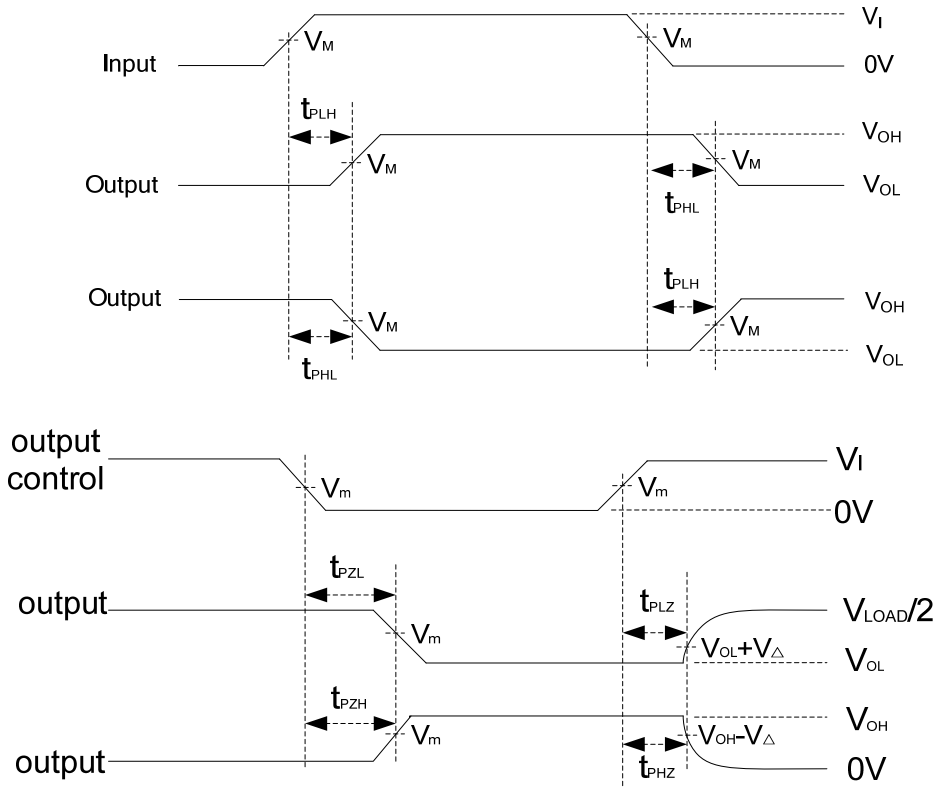


Fig-2 Propagation delay waves