



U74LVC245

CMOS IC

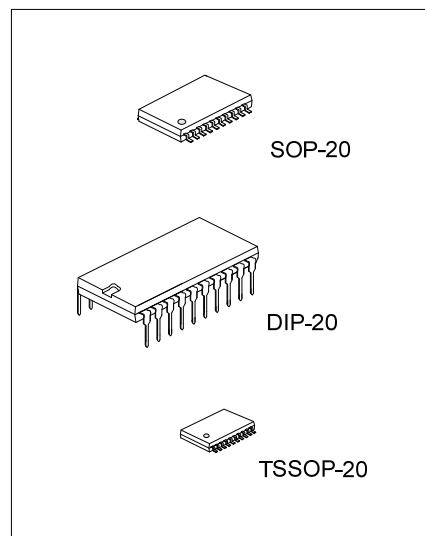
OCTAL BUS TRANSCEIVER WITH 3-STATE OUTPUTS

■ 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

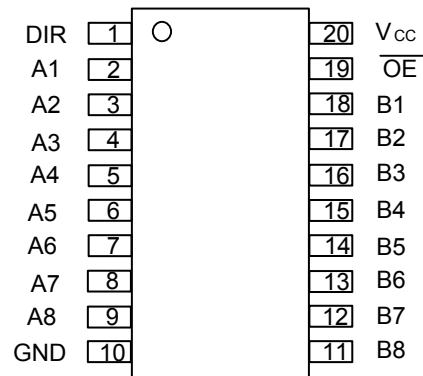


■ ORDERING INFORMATION

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

U74LVC245L-D20-T	(1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel, T: Tube (2) D20: DIP-20, S20: SOP-20, P20: TSSOP-20 (3) G: Halogen Free, L: Lead Free
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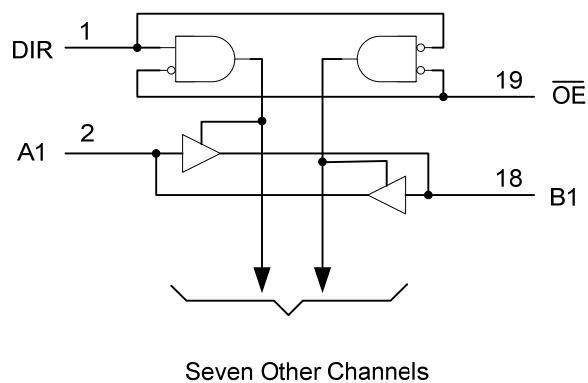
PIN CONFIGURATION



FUNCTION TABLE (each gate)

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

LOGIC DIAGRAM (positive logic)



■ 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
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}	$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	$0.65 \cdot V_{CC}$			V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.7			
		$V_{CC} = 2.7 \text{ V to } 3.6 \text{ V}$	2			
Input Voltage Low-Level	V_{IL}	$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$			$0.35 \cdot V_{CC}$	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$			0.7	
		$V_{CC} = 2.7 \text{ V to } 3.6 \text{ V}$			0.8	
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V

■ ELECTRICAL CHARACTERISTICS

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

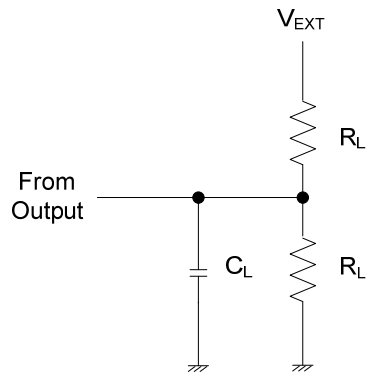
SWITCHING CHARACTERISTICS

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

OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	$\overline{OE}=0$, 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_{Δ}	C_L	R_L	V_{EXT}		
							t_{PLH}/t_{PHL}	t_{PZH}/t_{PHZ}	t_{PZL}/t_{PLZ}
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	0.15V	30 pF	1 k Ω	OPEN	GND	$2 \cdot V_{CC}$
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	0.15V	30 pF	500 Ω	OPEN	GND	$2 \cdot V_{CC}$
2.7 V	2.7 V	$\leq 2.5ns$	1.5V	0.3V	50 pF	500 Ω	OPEN	GND	6 V
$3.3V \pm 0.3V$	2.7 V	$\leq 2.5ns$	1.5V	0.3V	50 pF	500 Ω	OPEN	GND	6 V

Fig-1 Load circuitry

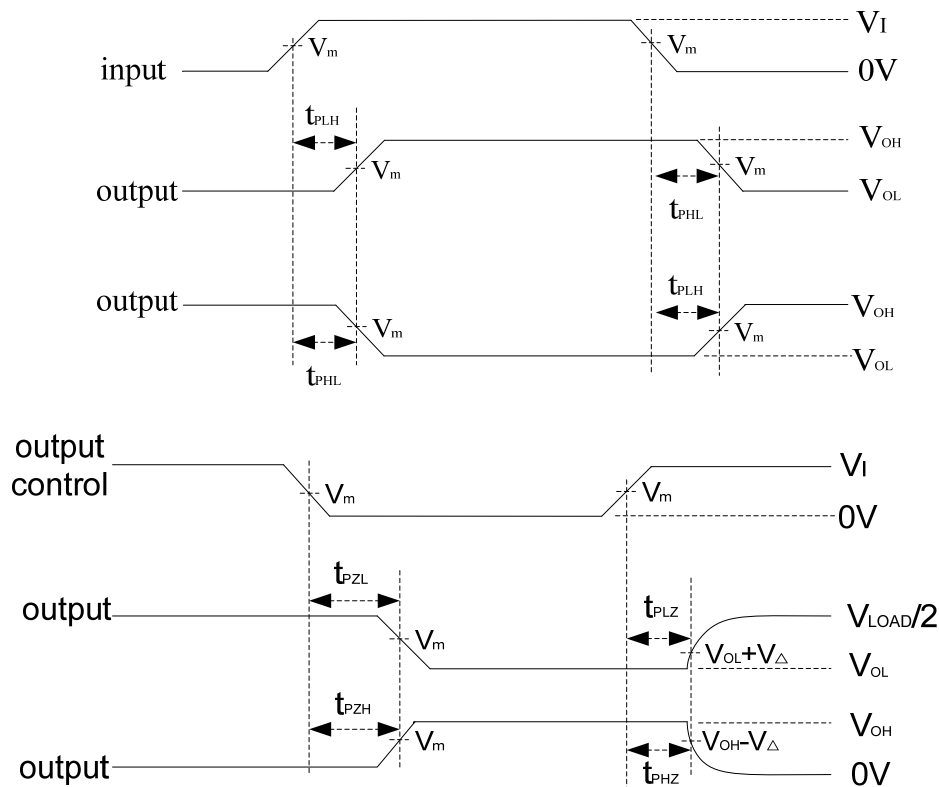


Fig-2 Propagation delay waves

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