

**U74LVC240****CMOS IC****OCTAL BUFFER/DRIVER WITH
3-STATE OUTPUTS****■ DESCRIPTION**

The **U74LVC240** contains two 4-bit line drivers with separate output-enable($\overline{OE}$) inputs. When $\overline{OE}$ is low, the device passes data from the A to the Y. When $\overline{OE}$ is high, the outputs are in the high-impedance state.

The **U74LVC240** can be used in a mixed 3.3V/5V system environment. This device has power-down protective circuit, preventing device destruction when it is powered down.

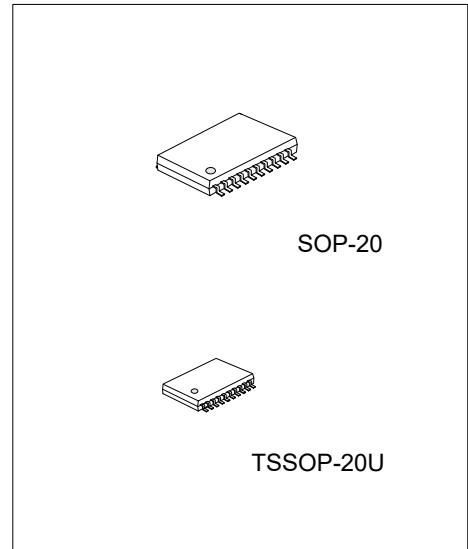
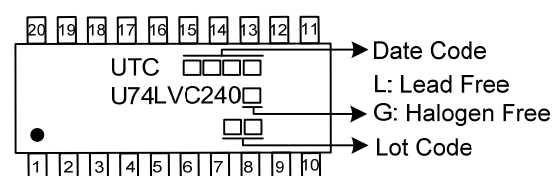
■ FEATURES

- * Operate From 1.65V to 3.6V
- * Input Accept Voltages to 5.5V
- * Partial-Power-Down Mode Operation
- * Max tpd is 5.9ns at 3.3V

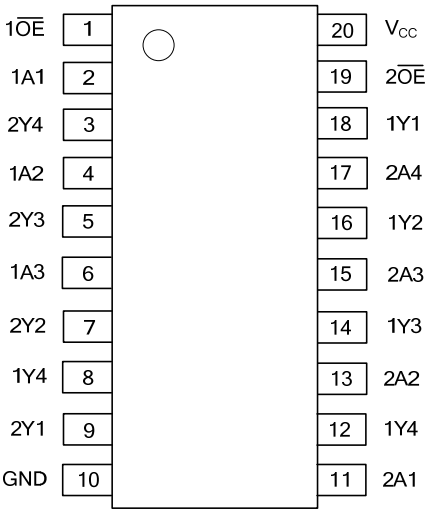
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC240L-S20-R	U74LVC240G-S20-R	SOP-20	Tape Reel
U74LVC240L-ULA-R	U74LVC240G-ULA-R	TSSOP-20U	Tape Reel

U74LVC240G-S20-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) S20: SOP-20, ULA: TSSOP-20U (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING

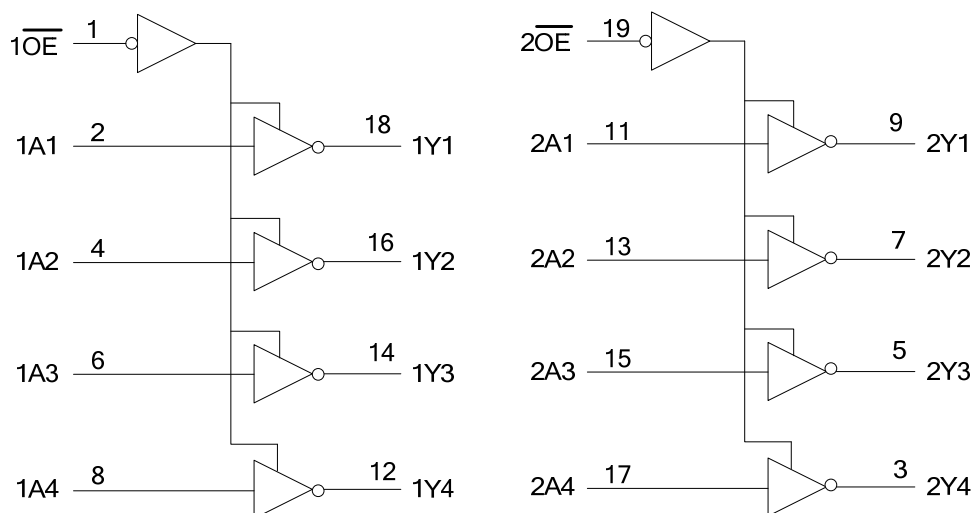
PIN CONFIGURATION



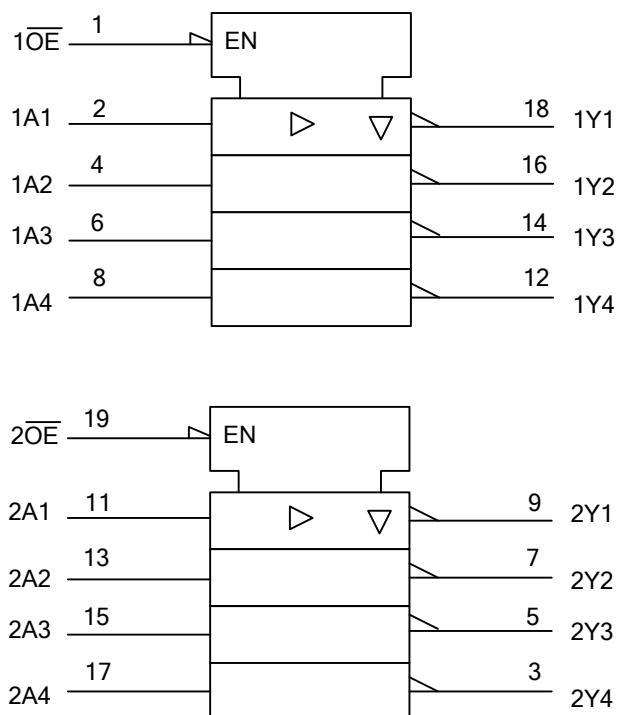
FUNCTION TABLE

INPUT		OUTPUT
OE	A	Y
H	x	Z
L	H	L
L	L	H

■ LOGIC DIAGRAM (POSITIVE LOGIC)



■ LOGIC SYMBOL



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

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

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 (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}	Operating	1.65		3.6	V
		Data retention only	1.50			V
High-level input voltage	V _{IH}	V _{CC} =1.65V~1.95V	0.65× V _{CC}			V
		V _{CC} =2.3V~2.7V	1.7			V
		V _{CC} =2.7V~3.6V	2			V
Low-level input voltage	V _{IL}	V _{CC} =1.65V~1.95V			0.35× V _{CC}	V
		V _{CC} =2.3V~2.7V			0.7	V
		V _{CC} =2.7V~3.6V			0.8	V
Input voltage	V _{IN}		0		5.5	V
Output Voltage	V _{OUT}	High or low state	0		V _{CC}	V
		3state	0		5.5	V
High level output current	I _{OH}	V _{CC} =1.65V			-4	mA
		V _{CC} =2.3V			-8	mA
		V _{CC} =2.7V			-12	mA
		V _{CC} =3V			-24	mA
Low level output current	I _{OL}	V _{CC} =1.65V			4	mA
		V _{CC} =2.3V			8	mA
		V _{CC} =2.7V			12	mA
		V _{CC} =3V			24	mA
Input transition rise or fall rate	Δt / Δv		0		6	ns/V
Operating free-air temperature	T _A		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT
Output Voltage High-Level	V _{OH}	V _{CC} =1.65~3.6V, I _{OH} =-100uA	V _{CC} -0.2			V
		V _{CC} =1.65V, I _{OH} =-4mA	1.2			V
		V _{CC} =2.3V, I _{OH} =-8mA	1.7			V
		V _{CC} =2.7V, I _{OH} =-12mA	2.2			V
		V _{CC} =3.0V, I _{OH} =-12mA	2.4			V
		V _{CC} =3.0V, I _{OH} =-24mA	2.2			V
Output Voltage Low-Level	V _{OL}	V _{CC} =1.65~3.6V, I _{OL} =100uA			0.2	V
		V _{CC} =1.65V, I _{OL} =4mA			0.45	V
		V _{CC} =2.3V, I _{OL} =8mA			0.7	V
		V _{CC} =2.7V, I _{OL} =12mA			0.4	V
		V _{CC} =3.0V, I _{OL} =24mA			0.55	V
Input Leakage Current	I _{I(LEAK)}	V _I =5.5 V or GND, V _{CC} =3.6V			±5	μA
Power off Leakage Current	I _{off}	V _I or V _O =5.5V, V _{CC} =0V			±10	mA
Output OFF-State Current	I _{OZ}	V _O =0 ~ 5.5 V, V _{CC} =3.6V			±10	μA
Quiescent Supply Current (I _O =0)	I _{CC}	V _I =V _{CC} or GND, V _{CC} =3.6V			10	μA
		3.6V ≤ V _I ≤ 5.5V, V _{CC} =3.6V (Note 2)			10	μA
Additional quiescent supply current	ΔI _{CC}	One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND, V _{CC} =2.7~3.6V			500	μA
Input Capacitance	C _{IN}	V _I =V _{CC} or GND, V _{CC} =3.3V		4		pF
Output Capacitance	C _{OUT}	V _O =V _{CC} or GND, V _{CC} =3.3V		5.5		pF

Notes: 1. All typical values are at V_{CC}=3.3V, T_A=25°C.

2. This applies in the disabled state only.

■ SWITCHING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

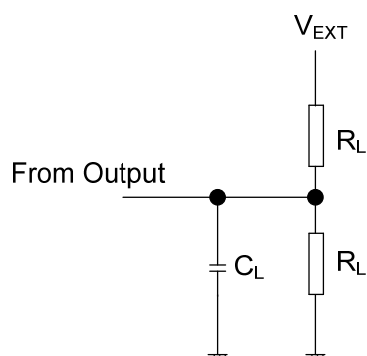
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time Signal From input A to output Y	t _{PD}	V _{CC} =2.7V			7.5	ns
		V _{CC} =3.3 V ± 0.3 V	1.3		6.5	ns
Propagation Delay Time Signal From input $\overline{OE}$ to output Y	t _{en}	V _{CC} =2.7V			9	ns
		V _{CC} =3.3 V ± 0.3 V	1.1		8	ns
Propagation Delay Time Signal From input $\overline{OE}$ to output Y	t _{dis}	V _{CC} =2.7V			8	ns
		V _{CC} =3.3 V ± 0.3 V	1.4		7	ns
High-impedance state Current (Note)	t _{sk}	V _{CC} =3.3 V ± 0.3 V			1	ns

Note: Skew between any two outputs of the same package switching in the same direction

■ OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	$\overline{OE}$ = 0, f=10MHZ, V _{CC} =3.3V		32		pF
		$\overline{OE}$ = 1, f=10MHZ, V _{CC} =3.3V		3		pF

■ TEST CIRCUIT AND WAVEFORMS



V_{CC}	V_I	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}
2.7 V	2.7 V	$\leq 2.5\text{ns}$	6V	0.3V	50 pF	500 Ω	OPEN	GND	6 V
3.3V $\pm 0.3\text{V}$	2.7 V	$\leq 2.5\text{ns}$	6V	0.3V	50 pF	500 Ω	OPEN	GND	6 V

Figure 1. Load Circuitry

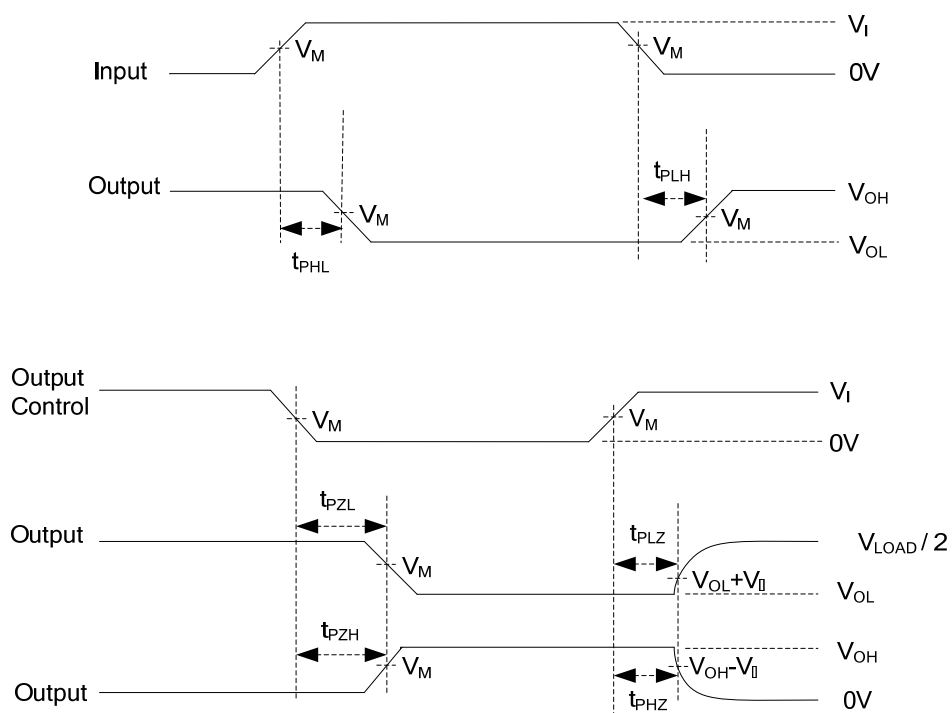


Figure 2. Propagation Delay Waves

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