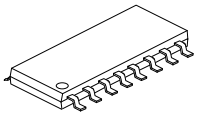
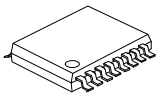
U74LVC257

CMOS IC

QUADRUPLE 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS 3-STATE OUTPUTS



SOP-16



TSSOP-16

■ DESCRIPTION

The **U74LVC257** is designed for 1.65V to 3.6V V_{CC} operation.

The **U74LVC257** devices are designed to multiplex signals from 4-bit data sources to 4-output data lines in bus-organized systems. The 3-state outputs do not load the data lines when the output-enable ($\overline{OE}$) input is at a high logic level.

■ FEATURES

* Operate From 1.65V to 3.6V
* Input Accept Voltages to 5.5V
* Partial-Power-Down Mode Operation
* Max tpd is 4.6ns at 3.3V

■ ORDERING INFORMATION

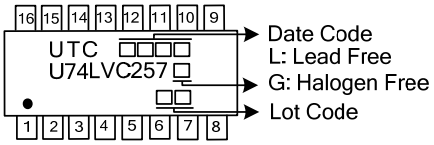
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC257L-S16-R	U74LVC257G-S16-R	SOP-16	Tape Reel
U74LVC257L-P16-R	U74LVC257G-P16-R	TSSOP-16	Tape Reel

U74LVC257G-S16-R

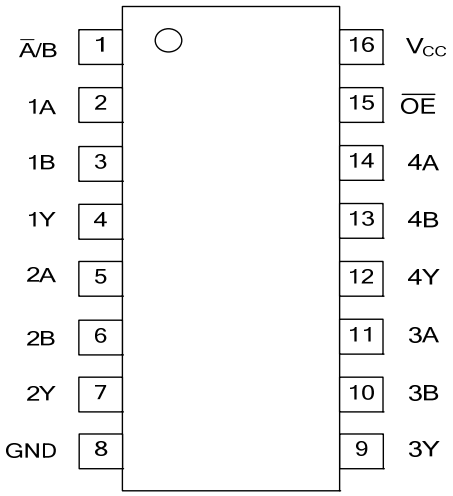
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S16: SOP-16, P16: TSSOP-16
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

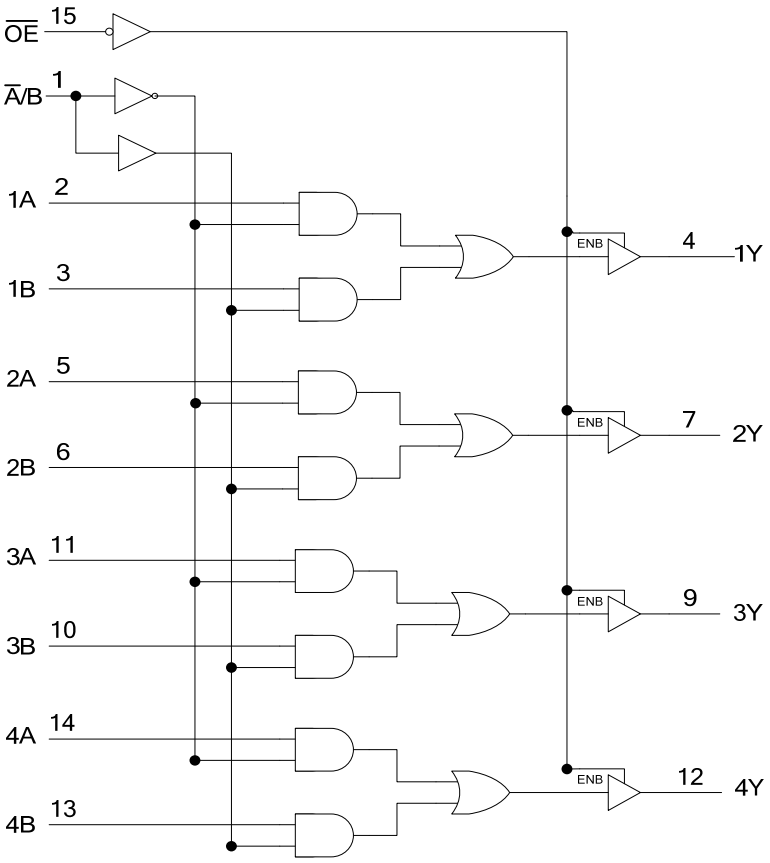


■ FUNCTION TABLE **(each gate)**

INPUTS				OUTPUT(Y)
INPUT($\overline{OE}$)	INPUT($\overline{A}$/B)	A	B	
H	X	X	X	Z
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

H = High voltage level；L = Low voltage level；X = Don't care；Z = High-impedance OFF-state

■ LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +6.5	V
Input Voltage	V_{IN}		-0.5 ~ +6.5	V
Output Voltage	V_{OUT}	Output in the high or low state	-0.5 ~ V_{CC} +0.5	V
		Output in the power-off state	-0.5 ~ +6.5	V
Continuous V_{CC} or GND Current	I_{CC}		±100	mA
Continuous Output Current	I_{OUT}	V_{OUT}=0V ~ V_{CC}	±50	mA
Input Clamp Current	I_{IK}	V_{IN}<0V	-50	mA
Output Clamp Current	I_{OK}	V_{OUT}>V_{CC} or V_{OUT}<0V	-50	mA
Storage Temperature Range	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.

■ 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			V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	Δt/Δv	V_{CC}=1.65V ~ 2.7V	0		20	ns/V
		V_{CC}=2.7V ~ 3.6V	0		10	ns/V
Operating Temperature	T_A		-40		+125	°C

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

■ 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}=1.8V±0.15V	0.65×V_{CC}			0.65×V_{CC}			V
		V_{CC}=2.5V±0.2V	1.7			1.7			V
		V_{CC}=3.3V±0.3V	2			2.0			V
Low-level Input Voltage	V_{IL}	V_{CC}=1.8V±0.15V			0.35×V_{CC}			0.35×V_{CC}	V
		V_{CC}=2.5V±0.2V			0.7			0.7	V
		V_{CC}=3.3V±0.3V			0.8			0.8	V
High-Level Output Voltage	V_{OH}	V_{CC}=1.65V ~ 3.6V, I_{OH}=-100μA	V_{CC} -0.2			V_{CC} -0.3			V
		V_{CC}=1.65V, I_{OH}=-4mA	1.2			1.05			V
		V_{CC}=2.3V, I_{OH}=-8mA	1.7			1.65			V
		V_{CC}=2.7V, I_{OH}=-12mA	2.2			2.05			V
		V_{CC}=3.0V, I_{OH}=-12mA	2.4			2.25			V
		V_{CC}=3.0V, I_{OH}=-24mA	2.2			2.0			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65V ~ 3.6V, I_{OL}=100μA			0.2			0.3	V
		V_{CC}=1.65V, I_{OL}=4mA			0.45			0.65	V
		V_{CC}=2.3V, I_{OL}=8mA			0.7			0.8	V
		V_{CC}=2.7V, I_{OL}=12mA			0.4			0.6	V
		V_{CC}=3.0V, I_{OL}=24mA			0.55			0.8	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=3.6V, V_{IN}=5.5V or GND			±5			±20	μA

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	MAX
Power OFF Leakage Current	I_{OFF}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V			±10			±20	μA
OFF-state output current	I_{OZ}	V_{IN} = V_{IH} or V_{IL}, V_{CC}=3.6V V_{OUT}=V_{CC} or GND			±10			±20	μA
Quiescent Supply Current	I_{CC}	V_{CC}=3.6V, V_{IN}=V_{CC} or GND, I_{OUT}=0A			10			40	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	V_{CC}=2.7V~3.6V, One input at V_{CC}-0.6V, Other inputs at V_{CC} or GND			500			5000	μA

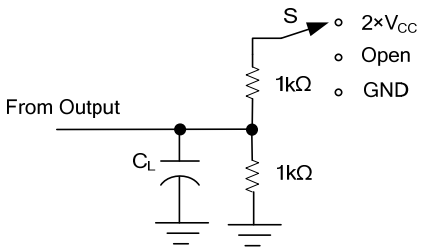
■ SWITCHING CHARACTERISTICS (Unless otherwise specified)

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(Y)	t_{PD}	C_L=30pF	V_{CC}=1.8V±0.15V	1		15.5	1		16.5	ns
			V_{CC}=2.5V±0.2V	1		7.4	1		9.0	ns
		C_L=50pF	V_{CC}=2.7V	1		5.4	1		7.0	ns
			V_{CC}=3.3V±0.3V	1		4.6	1		6.0	ns
Propagation delay from input ($\overline{A}$ / B) to output(Y)	t_{en}	C_L=30pF	V_{CC}=1.8V±0.15V	1		15.6	1		17.1	ns
			V_{CC}=2.5V±0.2V	1		9.5	1		11.0	ns
		C_L=50pF	V_{CC}=2.7V	1		7.5	1		9.0	ns
			V_{CC}=3.3V±0.3V	1		6.4	1		8.0	ns
Propagation delay from input ($\overline{OE}$) to output(Y)	t_{en}	C_L=30pF	V_{CC}=1.8V±0.15V	1		16.5	1		17.5	ns
			V_{CC}=2.5V±0.2V	1		8.7	1		10.0	ns
		C_L=50pF	V_{CC}=2.7V	1		6.7	1		8.0	ns
			V_{CC}=3.3V±0.3V	1		5.6	1		7.0	ns
Propagation delay from input ($\overline{OE}$) to output(Y)	t_{dis}	C_L=30pF	V_{CC}=1.8V±0.15V	1		15.4	1		16.4	ns
			V_{CC}=2.5V±0.2V	1		6.7	1		8.0	ns
		C_L=50pF	V_{CC}=2.7V	1		4.7	1		6.0	ns
			V_{CC}=3.3V±0.3V	1		4.3	1		5.5	ns

■ OPERATING CHARACTERISTICS (f=10MHz, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_I	V_{CC}= 3.3V, V_{IN}= V_{CC} or GND		5.0		pF
Output Capacitance	C_O	V_{CC}= 3.3V, V_{IN}= V_{CC} or GND		5.0		pF
Power Dissipation Capacitance	C_{PD}	V_{CC}=1.8V±0.15V		13.5		pF
		V_{CC}=2.5V±0.2V		14.5		pF
		V_{CC}=3.3V±0.3V		15.5		pF

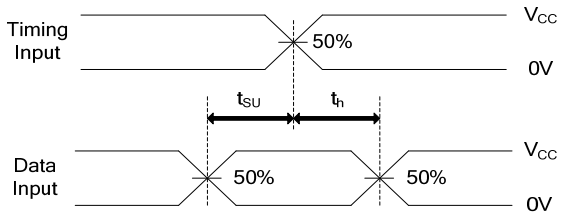
■ TEST CIRCUIT AND WAVEFORMS



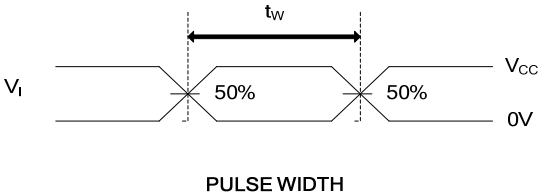
TEST CIRCUIT

TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	2×VCC

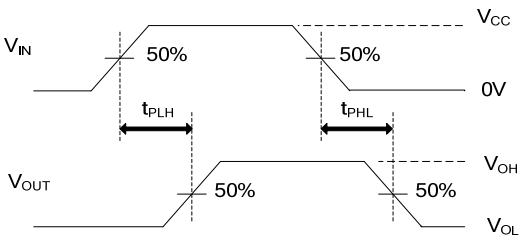
VCC	INPUTS		VM	VLOAD	CL	RL	VΔ
	VIN	tR/tF					
1.8V±0.15V	VCC	≤2ns	VCC/2	2×VCC	30pF	1KΩ	0.15V
2.5V±0.2V	VCC	≤2ns	VCC/2	2×VCC	30pF	500Ω	0.15V
2.7V	2.7V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
3.3V±0.3V	2.7V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V



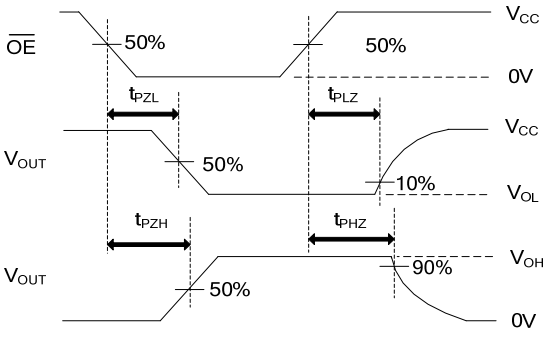
SETUP TIME AND HOLD TIME



PULSE WIDTH



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR ≤10MHz, Z_O = 50Ω.