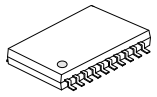
U74LVC540

CMOS IC

OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS



SSOP-20

■ DESCRIPTION

The **U74LVC540** octal buffer/driver is designed for 1.65V to 3.6V V_{CC} operation.

These devices are ideal for driving bus lines or buffer memory address registers. These devices feature inputs and outputs on opposite sides of the package that facilitate printed circuit board layout.

■ FEATURES

* Wide Operating Voltage Range of 1.65V to 3.6V
* Inputs Accept Voltages to 5.5V
* Max tpd of 5.3ns at 3.3V
* Typical VOLP (Output Ground Bounce) < 0.8 V at V_{CC}=3.3 V, T_A=25°C
* Typical VOHV (Output V_{OH} Undershoot) > 2 V at V_{CC}=3.3 V, T_A=25°C
* Support Mixed-Mode Signal Operation on All Ports (5V Input/Output Voltage With 3.3V V_{CC})
* I_{OFF} Supports Partial-Power-Down Mode Operation

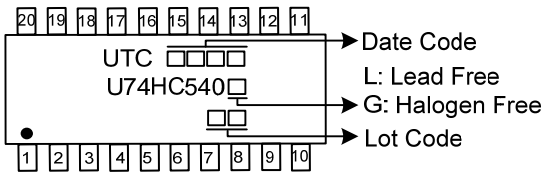
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74LVC540L-R20-R	U74LVC540G-R20-R	SSOP-20	Tape Reel

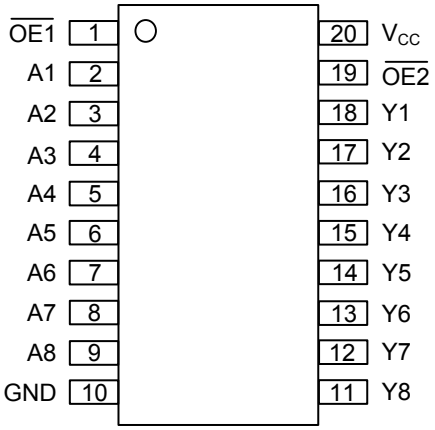
U74LVC540G-R20-R
- (1)Packing Type
- (2)Package Type
- (3)Green Package

(1) R: Tape Reel
(2) R20: SSOP-20
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



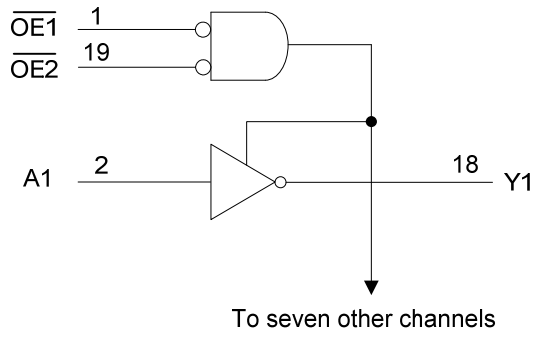
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUTS			OUTPUT
$\overline{OE1}$	$\overline{OE2}$	A	Y
L	L	L	H
L	L	H	L
H	X	X	Z
X	H	X	Z

■ 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 (Note 2)	V_{OUT}	Output in the High or Low State	-0.5 ~ +6.5	V
		High-Impedance or Power-Off State	-0.5 ~ +V_{CC}+0.5	V
Continuous Output Current	I_{OUT}		±50	mA
		V_{CC} or GND	±100	mA
Input Clamp Current	I_{IK}	V_{IN}<0V	-50	mA
Output Clamp Current	I_{OK}	V_{OUT}<0V	-50	mA
Storage Temperature Range	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 negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ 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}	3-State	0		5.5	V
		High or Low State	0		V_{CC}	V
Operating Temperature	T_A		-40		+85	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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
High-Level Output Voltage	V_{OH}	V_{CC}=1.65V~3.6V, I_{OH}=-100μA	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}=3V, I_{OH}=-12mA	2.4			
		V_{CC}=3V, I_{OH}=-24mA	2.2			V
Low-Level Output Voltage	V_{OL}	V_{CC}=1.65V~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}=3V, I_{OL}=24mA			0.55	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=3.6V, V_{IN}= 0~5.5V				±5	μA
Power OFF Leakage Current	I_{off}	V_{CC}=0V, V_{IN} or V_{OUT}=5.5V				±10	μA
OFF-state output current	I_{OZ}	V_{CC}=3.6V, V_{OUT}=0 to 5.5V				±10	μA
Quiescent Supply Current	I_{CC}	V_{CC}=3.6V, I_{OUT}=0	V_{IN}=V_{CC} or GND			10	μA
			3.6V≤V_I≤5.5V			10	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	μA
Input Capacitance	C_I	V_{CC}=3.3V, V_{IN}=GND or V_{CC}			4		pF
Output Capacitance	C_O	V_{CC}=3.3V, V_{OUT}= GND or V_{CC}			5.5		pF

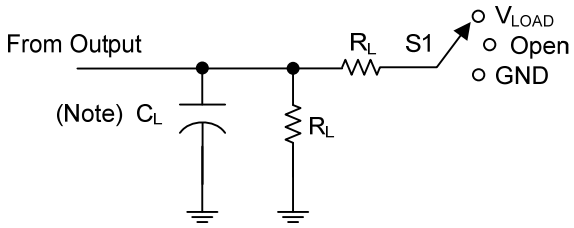
■ SWITCHING CHARACTERISTICS (T_A =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A) to output(Y)	t_{PD}	V_{CC}=1.8V±0.15V	1		16.4	ns
		V_{CC}=2.5V±0.2V	1		7.8	ns
		V_{CC}=2.7V	1		7.1	ns
		V_{CC}=3.3V±0.3V	1.4		5.3	ns
Propagation delay from input ($\overline{OE}$) to output(Y)	t_{en}	V_{CC}=1.8V±0.15V	1		16.5	ns
		V_{CC}=2.5V±0.2V	1		10.5	ns
		V_{CC}=2.7V	1		8	ns
		V_{CC}=3.3V±0.3V	1.1		6.6	ns
Propagation delay from input ($\overline{OE}$) to output(Y)	t_{dis}	V_{CC}=1.8V±0.15V	1		15.9	ns
		V_{CC}=2.5V±0.2V	1		9	ns
		V_{CC}=2.7V	1		8.2	ns
		V_{CC}=3.3V±0.3V	1.8		7.4	ns
Propagation delay	$t_{SK(O)}$	V_{CC}=3.3V±0.3V			1	ns

■ OPERATING CHARACTERISTICS (f=10MHz, T_A =25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Output Enabled	C_{PD}	V_{CC}=1.8V		63		pF
			V_{CC}=2.5V		56		pF
			V_{CC}=3.3V		31		pF
	Output Disabled		V_{CC}=1.8V		3		pF
			V_{CC}=2.5V		3		pF
			V_{CC}=3.3V		3		pF

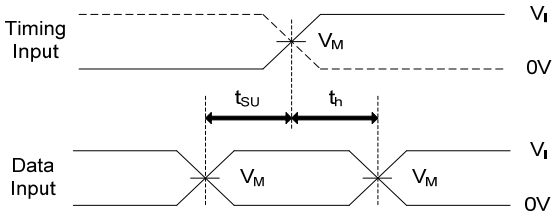
■ TEST CIRCUIT AND WAVEFORMS



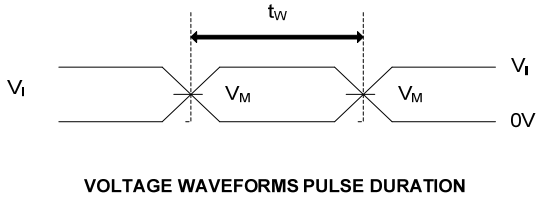
TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

Note: C_L includes probe and jig capacitance.

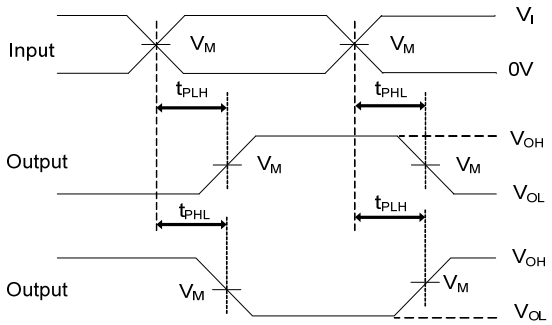
V_{CC}	INPUTS		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	t_R/t_F					
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	30pF	1kΩ	0.15V
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	$2\times V_{CC}$	30pF	500Ω	0.15V
2.7V	2.7V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
3.3V±0.3V	2.7V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V



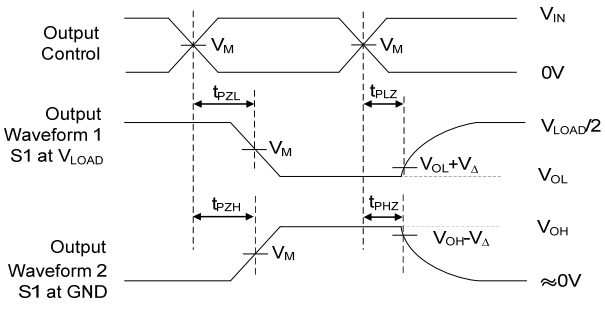
VOLTAGE WAVEFORMS SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS PULSE DURATION



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING

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.