



# U74HC540

**CMOS IC**

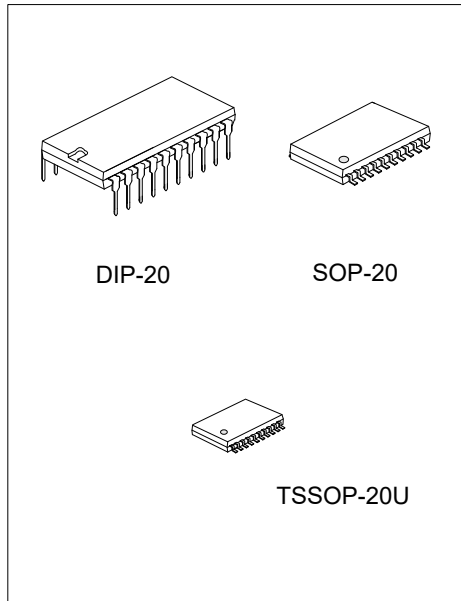
## OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS

### DESCRIPTION

The **U74HC540** combines with octal buffers and line drivers with inverting 3-state outputs. The 3-state output is controlled by output enable inputs  $\overline{OE1}$  and  $\overline{OE2}$ , all eight outputs will be in high-impedance when either of the 2 inputs is applied with high voltage.

### FEATURES

- \* Operation voltage range: 2V ~ 6V
- \* High-current 3-state outputs for bus driver
- \* Inverting outputs



### ORDERING INFORMATION

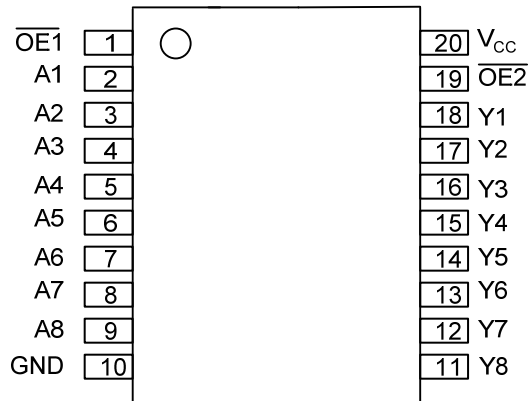
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC540L-D20-T	U74HC540G-D20-T	DIP-20	Tube
U74HC540L-S20-R	U74HC540G-S20-R	SOP-20	Tape Reel
U74HC540L-ULA-R	U74HC540G-ULA-R	TSSOP-20U	Tape Reel

<p>U74HC540G-D20-T</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube, R: Tape Reel</li> <li>(2) D20: DIP-20, S20: SOP-20, ULA: TSSOP-20U</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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### MARKING

DIP-20	SOP-20 / TSSOP-20U
<p>UTC □□□□ → Date Code            L: Lead Free            U74HC540 □ →            G: Halogen Free            □□ → Lot Code</p>	<p>UTC □□□□ → Date Code            L: Lead Free            U74HC540 □ →            G: Halogen Free            □□ → Lot Code</p>

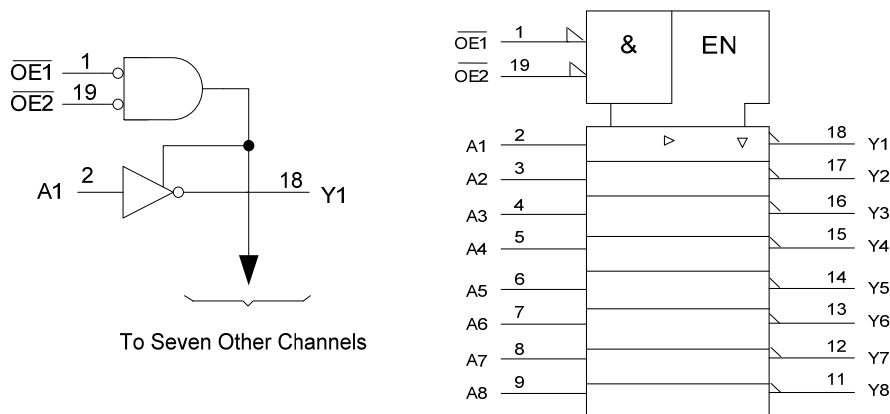
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT			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 RATINGS (unless otherwise specified)(Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5~7	V
Input Clamp Current	$I_{IK}$	$\pm 20$	mA
Output Clamp Current	$I_{OK}$	$\pm 20$	mA
Output Current	$I_{OUT}$	$\pm 35$	mA
$V_{CC}$ or GND Current	$I_{CC}$	$\pm 70$	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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2	5	6	V
Input Voltage	$V_{IN}$		0		$V_{CC}$	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
Input Transition Rise or Fall Rate	$t_R, t_F$	$V_{CC}=2V$	0		1000	ns
		$V_{CC}=4.5V$	0		500	ns
		$V_{CC}=6V$	0		400	ns
Operating Temperature	$T_A$		-40		+125	°C

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^\circ C$			$T_A=-40\sim+125^\circ C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	$V_{IH}$	$V_{CC}=2V$	1.5			1.5			V
		$V_{CC}=4.5V$	3.15			3.15			V
		$V_{CC}=6V$	4.2			4.2			V
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=2V$			0.5			0.5	V
		$V_{CC}=4.5V$			1.35			1.35	V
		$V_{CC}=6V$			1.8			1.8	V
High-Level Output Voltage	$V_{OH}$	$V_{CC}=2V, I_{OH}=-20\mu A$	1.9	1.998		1.9			V
		$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.499		4.4			V
		$V_{CC}=6V, I_{OH}=-20\mu A$	5.9	5.999		5.9			V
		$V_{CC}=4.5V, I_{OH}=-6mA$	3.98	4.3		3.7			V
		$V_{CC}=6V, I_{OH}=-7.8mA$	5.48	5.8		5.2			V
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=2V, I_{OL}=20\mu A$		0.002	0.1			0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1			0.1	V
		$V_{CC}=6V, I_{OL}=20\mu A$		0.001	0.1			0.1	V
		$V_{CC}=4.5V, I_{OL}=6mA$		0.17	0.26			0.4	V
		$V_{CC}=6V, I_{OL}=7.8mA$		0.15	0.26			0.4	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND	$\pm 0.1$	$\pm 100$				$\pm 1000$	nA
Output Leakage Current	$I_{O(LEAK)}$	$V_{CC}=6V, V_{OUT}=V_{CC}$ or GND	$\pm 0.01$	$\pm 0.5$				$\pm 10$	uA
Quiescent Supply Current	$I_Q$	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			8			80	$\mu A$
Propagation delay from input (A) to output(Y)	$t_{PLH}/t_{PHL}$	$V_{CC}=2V, C_L=50 pF$		35	100			150	ns
		$V_{CC}=2V, C_L=150 pF$		60	150			188	ns
		$V_{CC}=4.5V, C_L=50 pF$		10	20			30	ns
		$V_{CC}=4.5V, C_L=150 pF$		15	30			38	ns
		$V_{CC}=6V, C_L=50 pF$		8	17			26	ns
		$V_{CC}=6V, C_L=150 pF$		13	26			32	ns

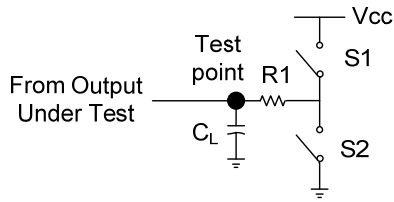
■ SWITCHING CHARACTERISTICS ( $t_R, t_F \leq 3ns$ )

PARAMETER	SYMBOL	TEST CONDITIONS	T <sub>A</sub> =25°C			T <sub>A</sub> =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
3-state output enable time from $\overline{OE}$ to Y <sub>n</sub>	t <sub>PZH</sub> / t <sub>PZL</sub>	V <sub>CC</sub> =2V, C <sub>L</sub> =50 pF		75	150			240	ns
		V <sub>CC</sub> =2V, C <sub>L</sub> =150 pF		100	200			250	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =50 pF		15	30			48	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =150 pF		20	40			50	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =50 pF		13	26			41	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =150 pF		17	34			43	ns
3-state output disable time from $\overline{OE}$ to Y <sub>n</sub>	t <sub>PHZ</sub> / t <sub>PLZ</sub>	V <sub>CC</sub> =2V, C <sub>L</sub> =50 pF		40	150			240	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =50 pF		18	30			48	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =50 pF		17	26			41	ns

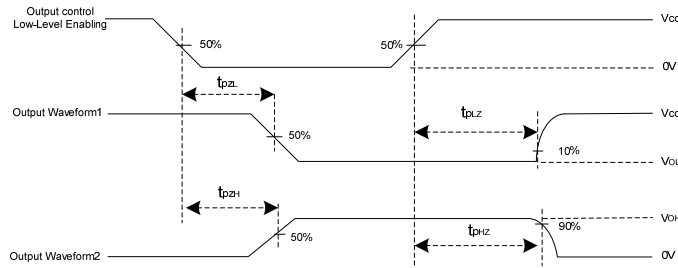
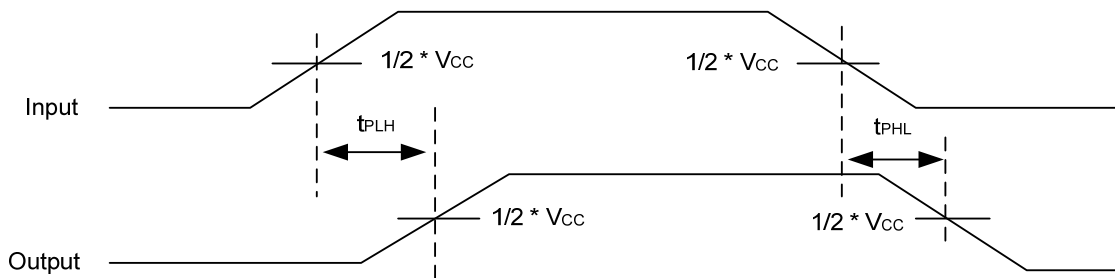
■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C <sub>IN</sub>	V <sub>CC</sub> =2V~6V		3	10	pF
Power Dissipation Capacitance	C <sub>PD</sub>	No load, f=1MHz		35		pF

■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.



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