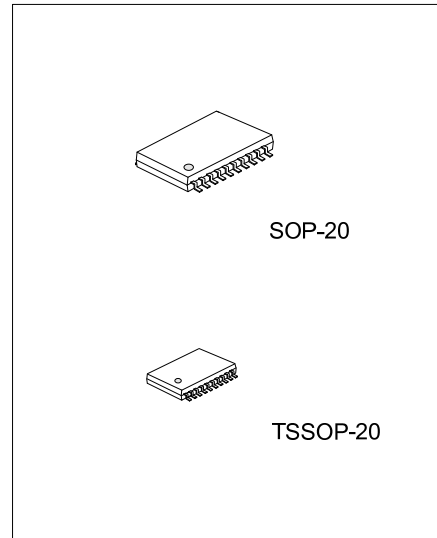




U74HC541

CMOS IC

OCTAL BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS



DESCRIPTION

The **U74HC541** is a octal buffers and line drivers with 3-state outputs and 8 channels.

FEATURES

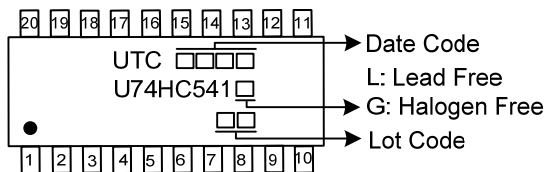
- * Operate from 2V to 6V
- * Max t_{PD} of 23ns at 4.5 V($C_L=50pF$)
- * Typical $V_{IH} < 3.15V$ at $V_{CC}=4.5V, T_a=25^\circ C$
- * Typical $V_{IL} > 1.35V$ at $V_{CC}=4.5V, T_a=25^\circ C$

ORDERING INFORMATION

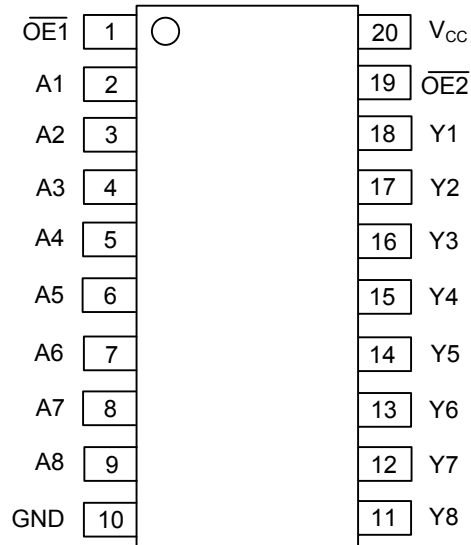
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC541L-S20-R	U74HC541G-S20-R	SOP-20	Tape Reel
U74HC541L-P20-R	U74HC541G-P20-R	TSSOP-20	Tape Reel

<p>U74HC541G-S20-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) R20: SSOP-20, P20: TSSOP-20</p> <p>(3) G: Halogen Free and Lead Free</p>
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MARKING



■ PIN CONFIGURATION

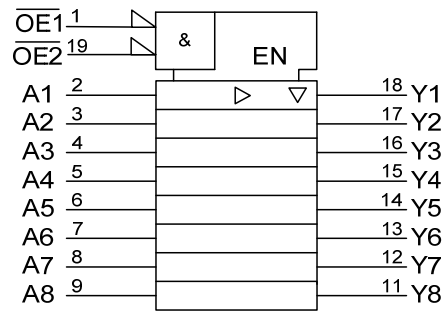


■ FUNCTION TABLE

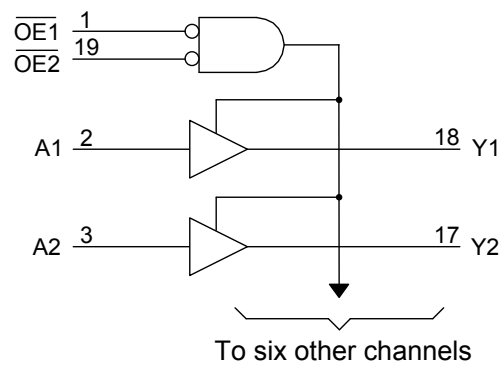
INPUTS $\overline{OE1}$	INPUTS $\overline{OE2}$	INPUTS(A)	OUTPUT(Y)
L	L	L	L
L	L	H	H
H	X	X	Z
X	H	X	Z

Note: H: HIGH voltage level L: LOW voltage level Z: High impedance X: Don't care

■ LOGIC SYMBOL



■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7	V
V_{CC} or GND Current	I_{CC}	± 70	mA
Output Current	I_{OUT}	± 35	mA
Input Clamp Current	I_{IK}	± 20	mA
Output Clamp Current	I_{OK}	± 20	mA
Operating Temperature	T_{OPR}	-40 ~ + 85	$^{\circ}C$
Storage Temperature	T_{STG}	-65 ~ + 150	$^{\circ}C$

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}		2		6	V
High-Level Input Voltage	V_{IH}	$V_{CC}=2V$	1.5			V
		$V_{CC}=4.5V$	3.15			
		$V_{CC}=6V$	4.2			
Low-Level Input Voltage	V_{IL}	$V_{CC}=2V$			0.5	V
		$V_{CC}=4.5V$			1.35	
		$V_{CC}=6V$			1.8	
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	$V_{CC}=2V$			1000	ns
		$V_{CC}=4.5V$			500	
		$V_{CC}=6V$			400	

■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	$V_{CC}=2V, I_{OH}=-20\mu A$	1.9	1.998		V
		$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.499		
		$V_{CC}=6V, I_{OH}=-20\mu A$	5.9	5.999		
		$V_{CC}=4.5V, I_{OH}=-6mA$	3.98	4.3		
		$V_{CC}=6V, I_{OH}=-7.8mA$	5.48	5.8		
Output Voltage Low-Level	V_{OL}	$V_{CC}=2V, I_{OL}=20\mu A$		0.002	0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1	
		$V_{CC}=6V, I_{OL}=20\mu A$		0.001	0.1	
		$V_{CC}=4.5V, I_{OL}=6mA$		0.17	0.26	
		$V_{CC}=6V, I_{OL}=7.8mA$		0.15	0.26	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND		± 0.1	± 100	nA
Output Off-state Current	I_{OZ}	$V_{CC}=6V, V_{OUT}=V_{CC}$ or GND		± 0.01	± 0.5	μA
Quiescent Supply Current	I_Q	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			8	μA
Input Capacitance	C_{IN}	$V_{CC}=2V$ to 6V		3	10	pF

■ SWITCHING CHARACTERISTICS ($T_A=25^\circ\text{C}$, $C_L=50\text{pF}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From Input (A) to Output (Y)	t_{PLH}/t_{PHL}	$V_{CC}=2\text{V}$		40	115	ns
		$V_{CC}=4.5\text{V}$		12	23	
		$V_{CC}=6\text{V}$		10	20	
Output Enable Time From \overline{OE} to Y	t_{PZL}/t_{PZH}	$V_{CC}=2\text{V}$		80	150	ns
		$V_{CC}=4.5\text{V}$		17	30	
		$V_{CC}=6\text{V}$		15	26	
Output Disable Time From \overline{OE} to Y	t_{PLZ}/t_{PHZ}	$V_{CC}=2\text{V}$		40	150	ns
		$V_{CC}=4.5\text{V}$		18	30	
		$V_{CC}=6\text{V}$		17	26	
Output Y	t_t	$V_{CC}=2\text{V}$		28	60	ns
		$V_{CC}=4.5\text{V}$		8	12	
		$V_{CC}=6\text{V}$		6	10	

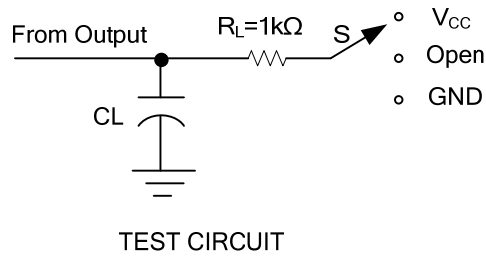
■ SWITCHING CHARACTERISTICS ($T_A=25^\circ\text{C}$, $C_L=150\text{pF}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From Input (A) to Output (Y)	t_{PLH}/t_{PHL}	$V_{CC}=2\text{V}$		65	165	ns
		$V_{CC}=4.5\text{V}$		16	33	
		$V_{CC}=6\text{V}$		14	28	
Output Enable Time From \overline{OE} to Y	t_{PZL}/t_{PZH}	$V_{CC}=2\text{V}$		100	200	ns
		$V_{CC}=4.5\text{V}$		20	40	
		$V_{CC}=6\text{V}$		17	34	
Output Y	t_t	$V_{CC}=2\text{V}$		45	210	ns
		$V_{CC}=4.5\text{V}$		17	42	
		$V_{CC}=6\text{V}$		13	36	

■ OPERATING CHARACTERISTICS ($T_A=25^\circ\text{C}$)

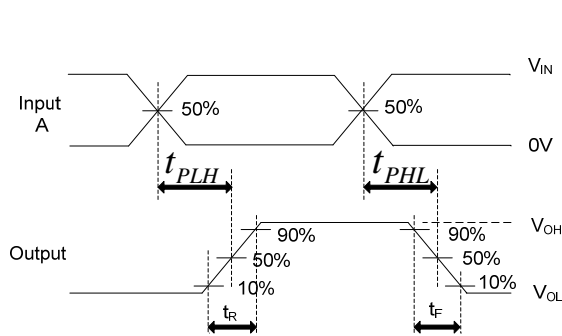
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No Load		35		pF

■ TEST CIRCUIT AND WAVEFORMS

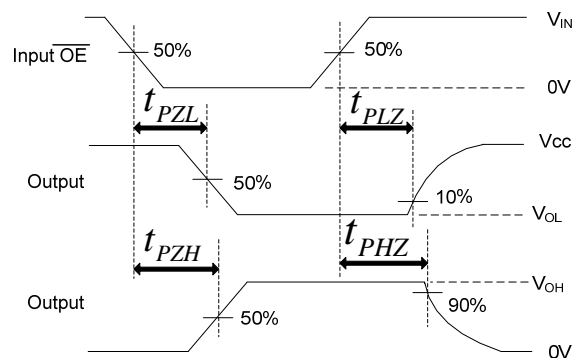


TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{CC}

Parameter	R_L	C_L
t_{en}	1K Ω	50 pF or 150 pF
		50 pF or 150 pF
t_{dis}	1K Ω	50 pF
		50 pF
t_{PD} or t_t	—	50 pF or 150 pF



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR $\leq 1MHz$, $Z_o = 50\Omega$, $t_r=6ns$, $t_f=6ns$.

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