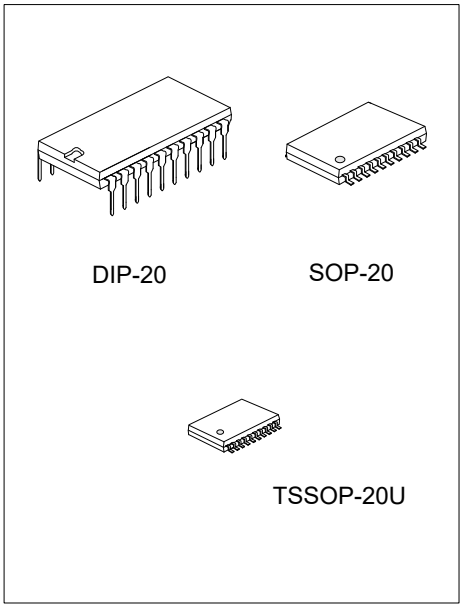
U74HC541

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°C
* Typical V_{IL}> 1.35V at V_{CC}=4.5V, T_A=25°C

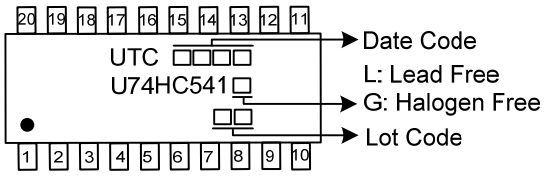
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC541L-D20-T	U74HC541G-D20-T	DIP-20	Tube
U74HC541L-S20-R	U74HC541G-S20-R	SOP-20	Tape Reel
U74HC541L-ULA-R	U74HC541G-ULA-R	TSSOP-20U	Tape Reel

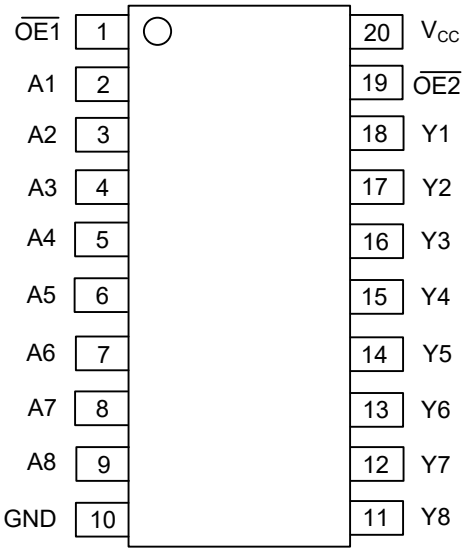
U74HC541G-D20-T
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) D20: DIP-20, S20: SOP-20, ULA: TSSOP-20U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

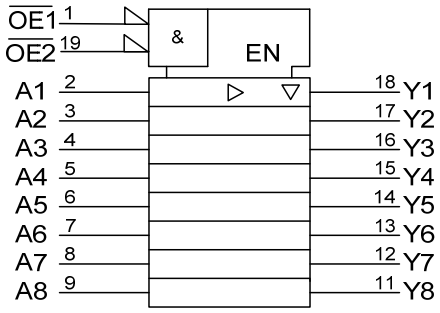


■ FUNCTION TABLE

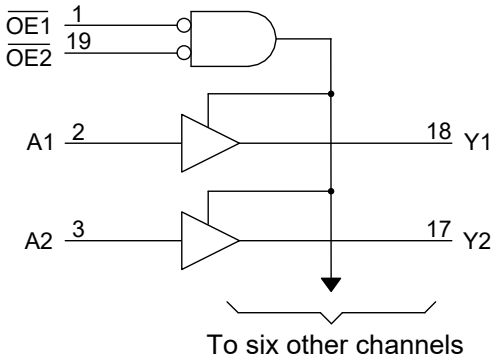
INPUTS $\overline{OE1}$	INPUTS $\overline{OE2}$	INPUTS(A)	OUTPUT(Y)
L	L	L	L
L	L	H	H
H	X	X	Z
X	H	X	Z

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
Storage Temperature	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}		2		6	V
High-Level Input Voltage	V_{IH}	V_{CC}=2V	1.5			V
		V_{CC}=4.5V	3.15			V
		V_{CC}=6V	4.2			V
Low-Level Input Voltage	V_{IL}	V_{CC}=2V			0.5	V
		V_{CC}=4.5V			1.35	V
		V_{CC}=6V			1.8	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			1000	ns
		V_{CC}=4.5V			500	ns
		V_{CC}=6V			400	ns
Operating Temperature	T_A		-40		+125	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	V_{CC}=2V, I_{OH}=-20μA	1.9	1.998		V
		V_{CC}=4.5V, I_{OH}=-20μA	4.4	4.499		V
		V_{CC}=6V, I_{OH}=-20μA	5.9	5.999		V
		V_{CC}=4.5V, I_{OH}=-6mA	3.98	4.3		V
		V_{CC}=6V, I_{OH}=-7.8mA	5.48	5.8		V
Output Voltage Low-Level	V_{OL}	V_{CC}=2V, I_{OL}=20μA		0.002	0.1	V
		V_{CC}=4.5V, I_{OL}=20μA		0.001	0.1	V
		V_{CC}=6V, I_{OL}=20μA		0.001	0.1	V
		V_{CC}=4.5V, I_{OL}=6mA		0.17	0.26	V
		V_{CC}=6V, I_{OL}=7.8mA		0.15	0.26	V
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 (C_L=50pF, T_A=25°C, unless otherwise specified)

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

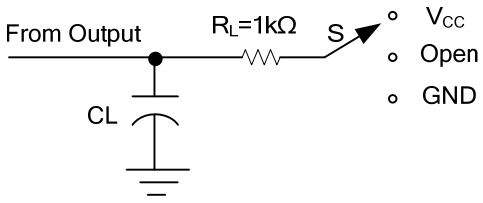
■ SWITCHING CHARACTERISTICS (C_L=150pF, T_A=25°C, unless otherwise specified)

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

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

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

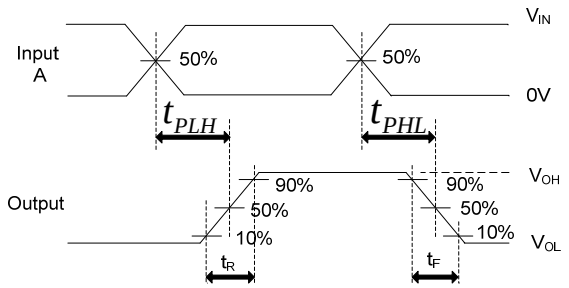
■ TEST CIRCUIT AND WAVEFORMS



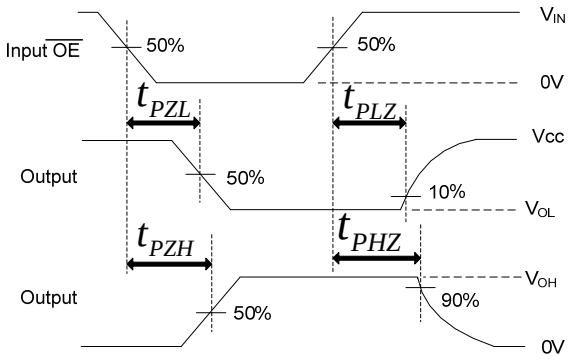
TEST CIRCUIT

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

Parameter		RL	CL
t_{en}	t_{PZH}	1KΩ	50 pF or 150 pF
	t_{PZL}		
t_{dis}	t_{PZH}	1KΩ	50 pF
	t_{PZL}		
t_{PD} or t_t		—	50 pF or 150 pF



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 ≤1MHz, Z_O = 50Ω, t_r = 6ns, t_f = 6ns.