



## U74HC244

CMOS IC

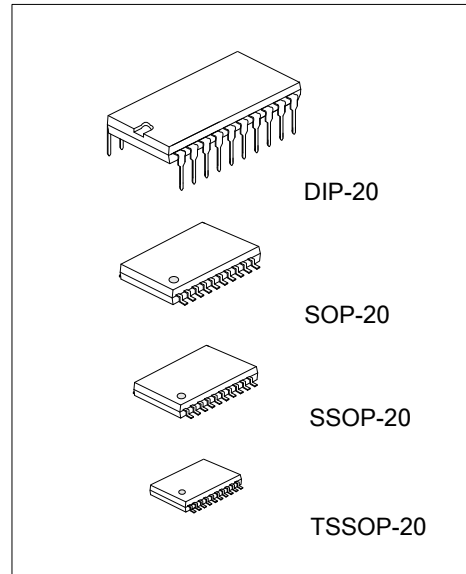
### OCTAL BUFFER AND LINE DRIVER WITH 3-STATE OUTPUT

#### DESCRIPTION

The **U74HC244** are octal buffer and line drivers with non-inverting 3-state outputs. When  $\overline{nOE}$  is High, the outputs nQ will be in the high impedance.

#### FEATURES

- \* Operation voltage range: 2~6V
- \* 3-state output
- \* Output Drive Capability: 15 LSTTL Loads

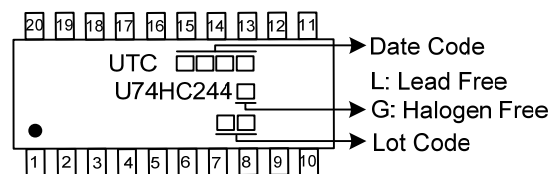


#### ORDERING INFORMATION

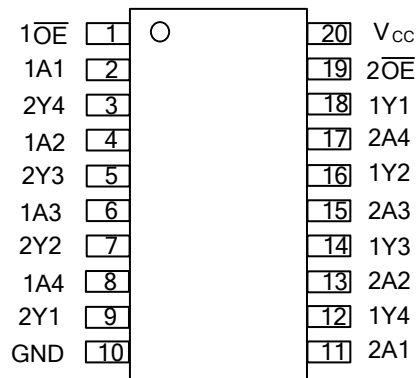
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC244L-D20-T	U74HC244G-D20-T	DIP-20	Tube
U74HC244L-S20-R	U74HC244G-S20-R	SOP-20	Tape Reel
U74HC244L-R20-R	U74HC244G-R20-R	SSOP-20	Tape Reel
U74HC244L-P20-R	U74HC244G-P20-R	TSSOP-20	Tape Reel

<p>U74HC244G-D20-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) D20: DIP-20, P20: TSSOP-20, R20: SSOP-20, S20: SOP-20 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



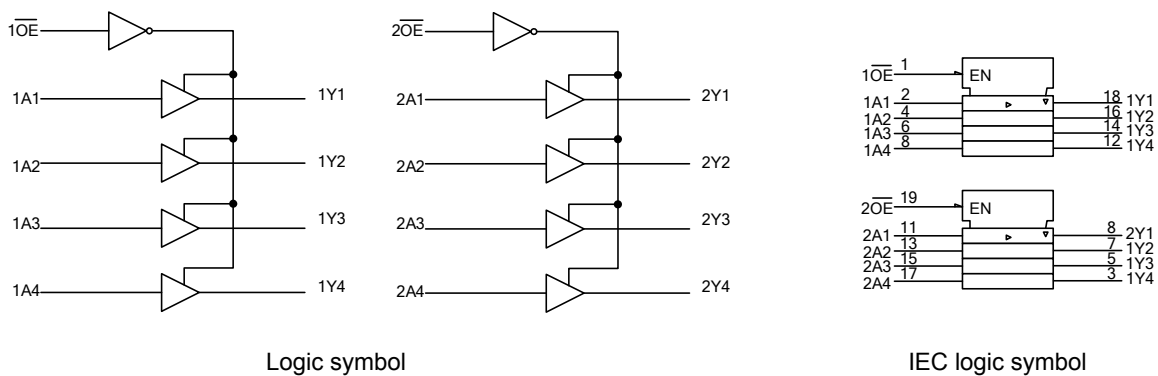
## ■ PIN CONFIGURATION



## ■ FUNCTION TABLE (each gate)

INPUT(nOE)	INPUT(nAn)	OUTPUT(nYn)
H	X	Z
L	H	H
L	L	L

## ■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)

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	$^{\circ}C$

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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		2		6	V
Input Voltage	$V_{IN}$		0		$V_{CC}$	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
Input Rise or Fall Times	$t_R, t_F$	$V_{CC}=2V$			1000	ns
		$V_{CC}=4.5V$			500	ns
		$V_{CC}=6V$			400	ns
Operating Temperature	$T_A$		-40		85	$^{\circ}C$

■ STATIC CHARACTERISTICS ( $T_A=25^{\circ}C$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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
High-Level Output Voltage	$V_{OH}$	$V_{CC}=2V, I_{OH}=-20\mu A$	1.9	1.998		V
		$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.499		V
		$V_{CC}=6V, I_{OH}=-20\mu A$	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
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=2V, I_{OL}=20\mu A$		0.002	0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1	V
		$V_{CC}=6V, I_{OL}=20\mu A$		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 0			$\pm 100$	nA
Output OFF-State Current	$I_{OZ}$	$V_{CC}=6V, V_{OUT}=V_{CC}$ or 0, $V_{IN}=V_{IH}$ or $V_{IL}$			$\pm 0.5$	$\mu A$
Quiescent Supply Current	$I_Q$	$V_{CC}=6V, V_{IN}=V_{CC}$ or 0, $I_{OUT}=0$			8	$\mu A$
Input Capacitance	$C_{IN}$	$V_{CC}=2V\sim 6V$		3	10	pF

■ DYNAMIC CHARACTERISTICS (T<sub>A</sub>=25°C, Input: t<sub>R</sub>, t<sub>F</sub>=6ns)

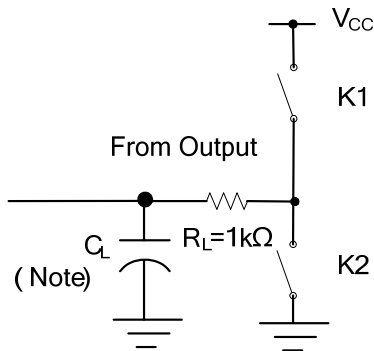
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A) to output(Y)	t <sub>PLH</sub> /t <sub>PHL</sub>	V <sub>CC</sub> =2V, C <sub>L</sub> =50pF		40	115	ns
		V <sub>CC</sub> =2V, C <sub>L</sub> =150pF		56	165	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF		13	23	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =150pF		18	33	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =50pF		11	20	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =150pF		15	28	ns
3-state output enable time n $\overline{OE}$ to nYn	t <sub>PZH</sub> /t <sub>PZL</sub>	V <sub>CC</sub> =2V, C <sub>L</sub> =50pF		75	150	ns
		V <sub>CC</sub> =2V, C <sub>L</sub> =150pF		100	200	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF		15	30	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =150pF		20	40	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =50pF		13	26	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =150pF		17	34	ns
3-state output disable time n $\overline{OE}$ to nYn	t <sub>PHZ</sub> /t <sub>PLZ</sub>	V <sub>CC</sub> =2V, C <sub>L</sub> =50pF		75	150	ns
		V <sub>CC</sub> =4.5V, C <sub>L</sub> =50pF		15	30	ns
		V <sub>CC</sub> =6V, C <sub>L</sub> =50pF		13	26	ns

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	No load		35		pF

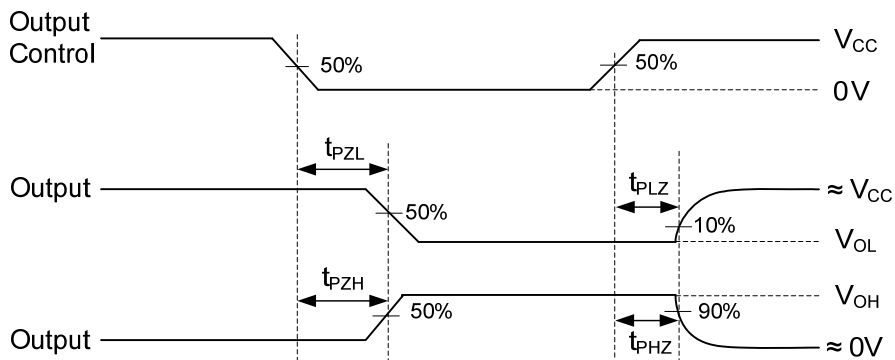
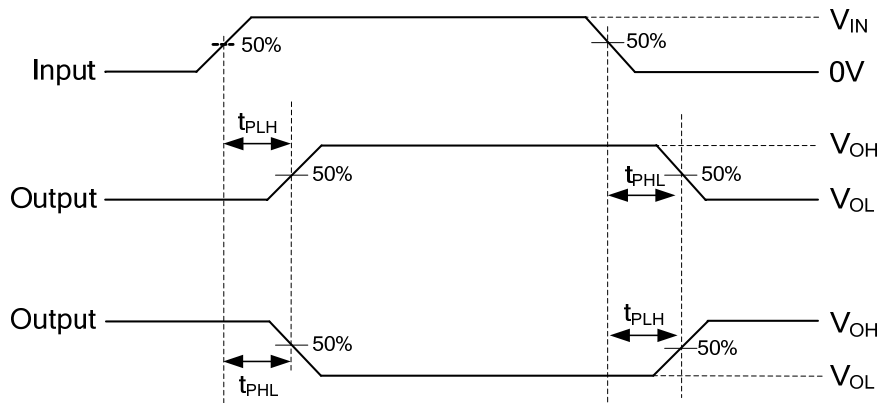
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## TEST CIRCUIT AND WAVEFORMS



TEST	K1	K2
$t_{PLH}/t_{PHL}$	Open	Open
$t_{PHZ}/t_{PZH}$	Open	Close
$t_{PLZ}/t_{PZL}$	Close	Open

Note:  $C_L$  includes probe and jig capacitance.



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