



U74HC244B

CMOS IC

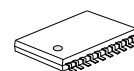
OCTAL BUFFER AND LINE DRIVER WITH 3-STATE OUTPUT

DESCRIPTION

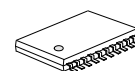
The **U74HC244B** are octal buffer and line drivers with non-inverting 3-state outputs. When $\overline{nOE}$ is High, the outputs nY_n will be in the high impedance.

FEATURES

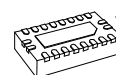
- * Operation voltage range: 2V ~ 6V
- * 3-state output
- * Output Drive Capability: 15 LSTTL Loads
- * Green & Pb Free



TSSOP-20



TSSOP-20U

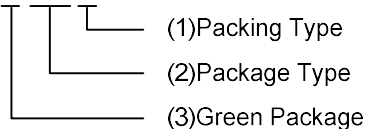


QFN-20(4.5x2.5)

ORDERING INFORMATION

Ordering Number	Package	Packing
U74HC244BG-P20-R	TSSOP-20	Tape Reel
U74HC244BG-ULA-R	TSSOP-20U	Tape Reel
U74HC244BG-QAL-R	QFN-20(4.5x2.5)	Tape Reel

U74HC244BG-P20-R

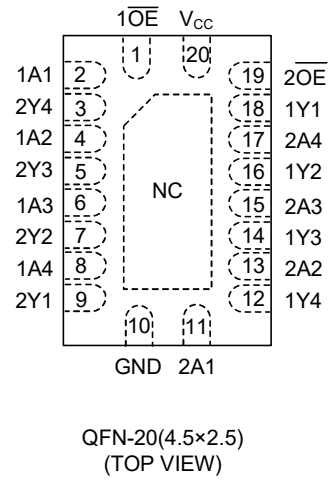
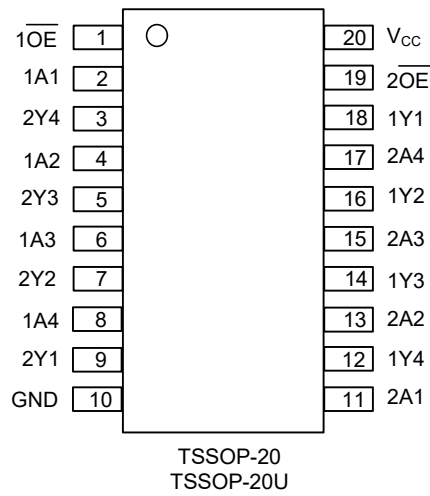


- (1) R: Tape Reel
(2) P20: TSSOP-20, ULA: TSSOP-20U
QAL: QFN-20(4.5x2.5)
(3) G: Halogen Free and Lead Free

MARKING

TSSOP-20 / TSSOP-20U	QFN-20(4.5x2.5)
20 19 18 17 16 15 14 13 12 11 UTC □□□□ → Date Code U74HC244BG □□ → Lot Code 1 2 3 4 5 6 7 8 9 10	U74HC 244B • □□□□ □□ → Lot Code □□ → Date Code

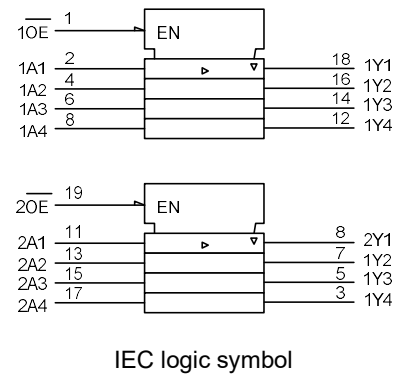
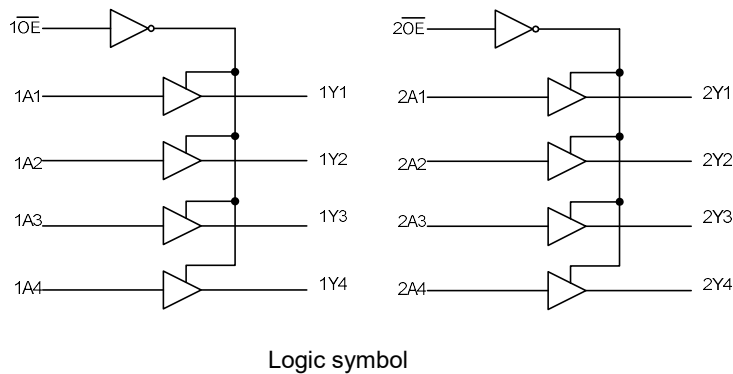
PIN CONFIGURATION



FUNCTION TABLE

INPUT $\overline{nOE}$	INPUT(nAn)	OUTPUT(nYn)
H	X	Z
L	H	H
L	L	L

LOGIC DIAGRAM (positive logic)



■ **ABSOLUTE MAXIMUM RATINGS** ($T_A=25^{\circ}\text{C}$, unless otherwise specified) (Note 1, 2)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ 7	V
V_{CC} or GND Current	I_{CC}		± 70	mA
Output Current	I_{OUT}	$V_{OUT}=0$ to V_{CC}	± 35	mA
Input Clamp Current	I_{IK}	$V_{IN} < 0$ or $V_{IN} > V_{CC}$	± 20	mA
Output Clamp Current	I_{OK}	$V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	± 20	mA
Storage Temperature	T_{STG}		-65 ~ +150	$^{\circ}\text{C}$

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. It's guarantee by design, this parameter is not production tested.

■ **RECOMMENDED OPERATING CONDITIONS (NOTE)**

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	$V_{CC}=2\text{V}$			1000	ns
		$V_{CC}=4.5\text{V}$			500	ns
		$V_{CC}=6\text{V}$			400	ns
Operating Temperature	T_A		-40		+125	$^{\circ}\text{C}$

Note: It's guarantee by design, this parameter is not production tested.

■ **STATIC CHARACTERISTICS** (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}\text{C}$			$T_A=-40\sim+125^{\circ}\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V_{IH}	$V_{CC}=2\text{V}$	1.5			1.5			V
		$V_{CC}=4.5\text{V}$	3.15			3.15			V
		$V_{CC}=6\text{V}$	4.2			4.2			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=2\text{V}$			0.5			0.5	V
		$V_{CC}=4.5\text{V}$			1.35			1.35	V
		$V_{CC}=6\text{V}$			1.8			1.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=2\text{V}, I_{OH}=-20\mu\text{A}$	1.9			1.9			V
		$V_{CC}=4.5\text{V}, I_{OH}=-20\mu\text{A}$	4.4			4.4			V
		$V_{CC}=6\text{V}, I_{OH}=-20\mu\text{A}$	5.9			5.9			V
		$V_{CC}=4.5\text{V}, I_{OH}=-6\text{mA}$	3.98			3.7			V
		$V_{CC}=6\text{V}, I_{OH}=-7.8\text{mA}$	5.48			5.2			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=2\text{V}, I_{OL}=20\mu\text{A}$			0.1			0.1	V
		$V_{CC}=4.5\text{V}, I_{OL}=20\mu\text{A}$			0.1			0.1	V
		$V_{CC}=6\text{V}, I_{OL}=20\mu\text{A}$			0.1			0.1	V
		$V_{CC}=4.5\text{V}, I_{OL}=6\text{mA}$			0.26			0.4	V
		$V_{CC}=6\text{V}, I_{OL}=7.8\text{mA}$			0.26			0.4	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6\text{V}, V_{IN}=V_{CC}$ or 0			± 100			± 1000	nA
Output OFF-State Current	I_{OZ}	$V_{CC}=6\text{V}, V_{OUT}=V_{CC}$ or 0, $V_{IN}=V_{IH}$ or V_{IL}			± 0.5			± 10	μA
Quiescent Supply Current	I_Q	$V_{CC}=6\text{V}, V_{IN}=V_{CC}$ or 0, $I_{OUT}=0$			8			160	μA

Note: It's guarantee by design, this parameter is not production tested.

■ DYNAMIC CHARACTERISTICS (Input: t_R , $t_F=6ns$, unless otherwise specified)

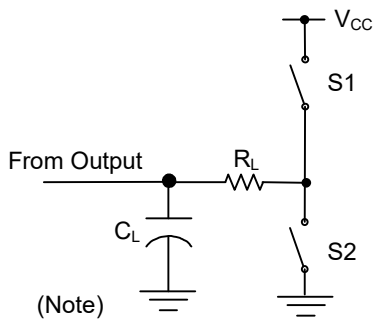
PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}C$			$T_A=-40\sim+125^{\circ}C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (nA_n) to Output (nY_n)	t_{PLH} / t_{PHL}	$V_{CC}=2V, C_L=50pF$		17	115			145	ns
		$V_{CC}=2V, C_L=150pF$		27	165			245	ns
		$V_{CC}=4.5V, C_L=50pF$		7	23			34	ns
		$V_{CC}=4.5V, C_L=150pF$		11	33			49	ns
		$V_{CC}=6V, C_L=50pF$		6	20			25	ns
		$V_{CC}=6V, C_L=150pF$		10	28			42	ns
3-State Output Enable Time $n\overline{OE}$ to nY_n	t_{PZH} / t_{PZL}	$V_{CC}=2V, C_L=50pF$		19	150			190	ns
		$V_{CC}=2V, C_L=150pF$		32	200			300	ns
		$V_{CC}=4.5V, C_L=50pF$		8	30			45	ns
		$V_{CC}=4.5V, C_L=150pF$		12	40			60	ns
		$V_{CC}=6V, C_L=50pF$		5	26			32	ns
		$V_{CC}=6V, C_L=150pF$		9	34			51	ns
3-State Output Disable Time $n\overline{OE}$ to nY_n	t_{PHZ} / t_{PLZ}	$V_{CC}=2V, C_L=50pF$		12	150			190	ns
		$V_{CC}=4.5V, C_L=50pF$		8	30			45	ns
		$V_{CC}=6V, C_L=50pF$		7	26			32	ns
Propagation Delay From Input (Y)	t_t	$V_{CC}=2V, C_L=50pF$		19	60			90	ns
		$V_{CC}=2V, C_L=150pF$		35	210			315	ns
		$V_{CC}=4.5V, C_L=50pF$		7	12			18	ns
		$V_{CC}=4.5V, C_L=150pF$		17	42			63	ns
		$V_{CC}=6V, C_L=50pF$		6	10			15	ns
		$V_{CC}=6V, C_L=150pF$		16	36			53	ns

Note: It's guarantee by design, this parameter is not production tested.

■ OPERATING CHARACTERISTICS

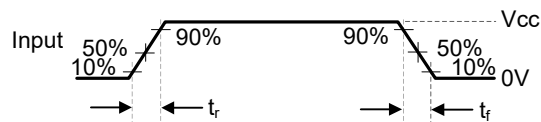
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC}=2V\sim 6V$			10	pF
Power Dissipation Capacitance	C_{PD}	No load		35		pF

■ TEST CIRCUIT AND WAVEFORMS

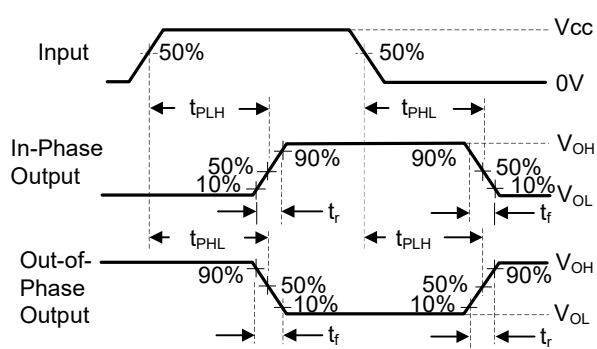


TEST		R_L	C_L	S1	S2
t_{en}	t_{PZH}	$1k\Omega$	50pF or 150pF	Open	Close
	t_{PZL}			Close	Open
t_{dis}	t_{PHZ}	$1k\Omega$	50pF	Open	Close
	t_{PLZ}			Close	Open
t_{PD} or t_t		-	50pF or 150pF	Open	Open

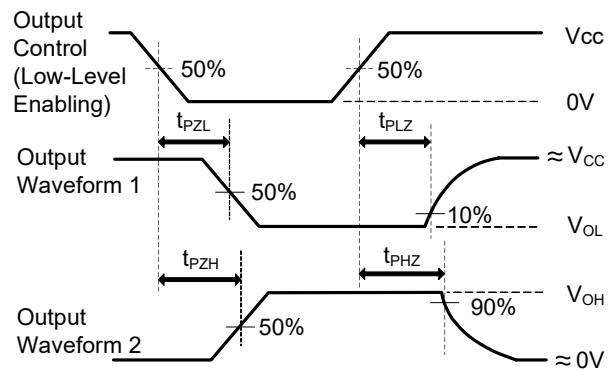
- Notes: 1. C_L includes probe and jig capacitance.
 2. $P_{RR} \leq 1MHz$, $Z_O = 50\Omega$, $t_R \leq 6ns$, $t_F \leq 6ns$.



Voltage Waveform

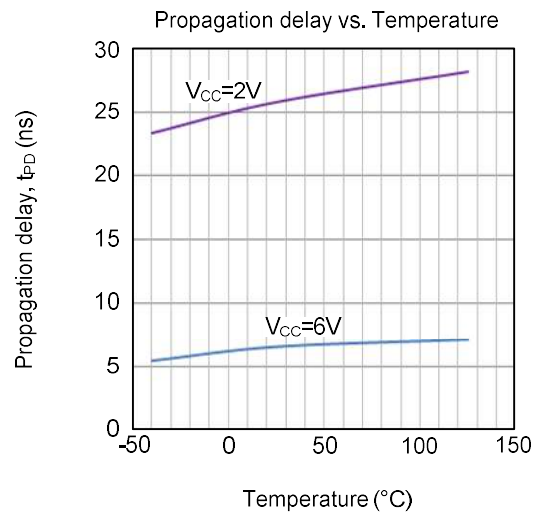
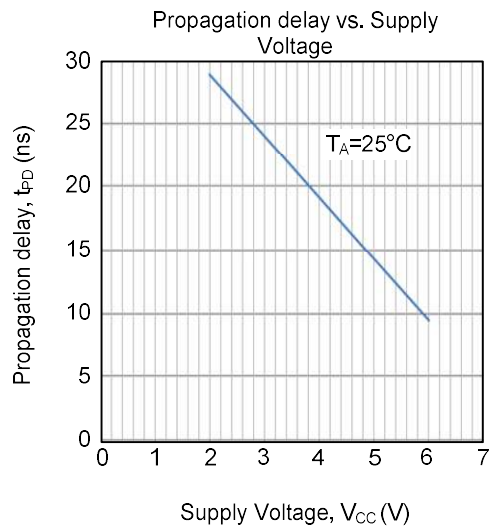


Propagation Delay Times



Enable and Disable Times

■ TYPICAL CHARACTERISTICS



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