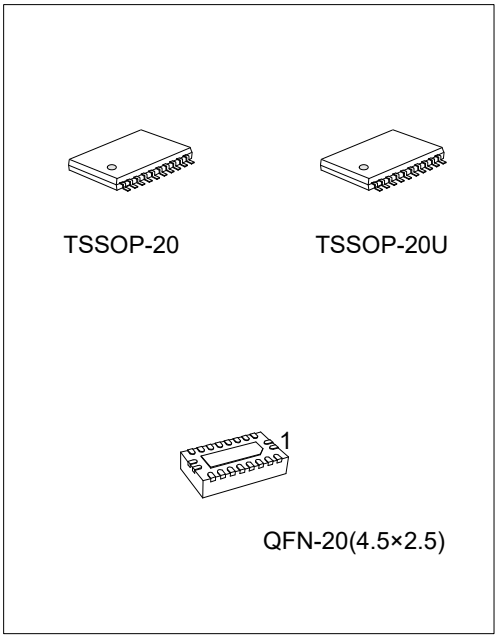
U74HC244B

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 n$\overline{OE}$ is High, the outputs nYn will be in the high impedance.

■ FEATURES

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

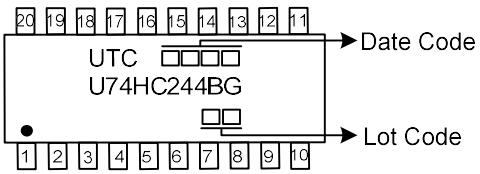
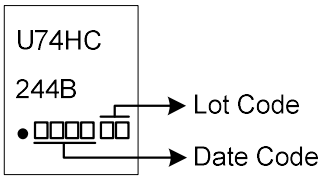
■ ORDERING INFORMATION

Ordering Number	Package	Packing
U74HC244BG-P20-R	TSSOP-20	Tape Reel
U74HC244BG-ULA-R	TSSOP-20U	Tape Reel
U74HC244BG-QAL-R	QFN-20(4.5×2.5)	Tape Reel

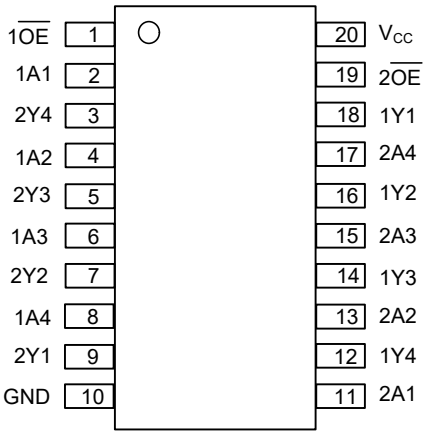
U74HC244BG-P20-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) P20: TSSOP-20, ULA: TSSOP-20U
QAL: QFN-20(4.5×2.5)
(3) G: Halogen Free and Lead Free

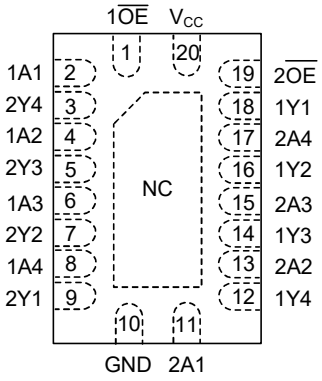
■ MARKING

TSSOP-20 / TSSOP-20U	QFN-20(4.5×2.5)
	

■ PIN CONFIGURATION



TSSOP-20
TSSOP-20U

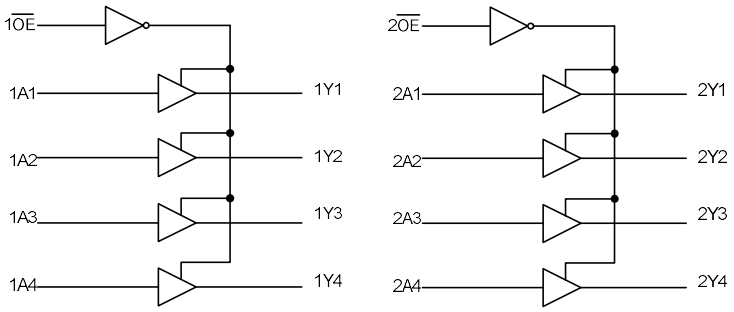


QFN-20(4.5×2.5)
(TOP VIEW)

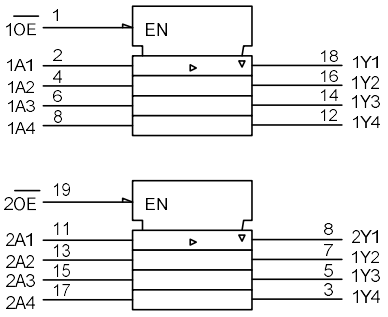
■ FUNCTION TABLE

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

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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	°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}=2V			1000	ns
		V_{CC}=4.5V			500	ns
		V_{CC}=6V			400	ns
Operating Temperature	T_A		-40		+125	°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°C			T_A=-40~+125°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}=-20μA	1.9			1.9			V
		V_{CC}=4.5V, I_{OH}=-20μA	4.4			4.4			V
		V_{CC}=6V, I_{OH}=-20μA	5.9			5.9			V
		V_{CC}=4.5V, I_{OH}=-6mA	3.98			3.7			V
		V_{CC}=6V, I_{OH}=-7.8mA	5.48			5.2			V
Low-Level Output Voltage	V_{OL}	V_{CC}=2V, I_{OL}=20μA			0.1			0.1	V
		V_{CC}=4.5V, I_{OL}=20μA			0.1			0.1	V
		V_{CC}=6V, I_{OL}=20μA			0.1			0.1	V
		V_{CC}=4.5V, I_{OL}=6mA			0.26			0.4	V
		V_{CC}=6V, I_{OL}=7.8mA			0.26			0.4	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=6V, V_{IN}=V_{CC} or 0			±100			±1000	nA
Output OFF-State Current	I_{OZ}	V_{CC}=6V,V_{OUT}=V_{CC} or 0,V_{IN}=V_{IH} or V_{IL}			±0.5			±10	μA
Quiescent Supply Current	I_Q	V_{CC}=6V, 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)

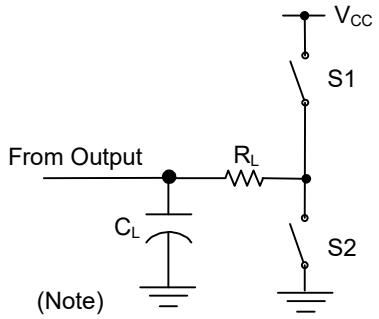
PARAMETER	SYMBOL	TEST CONDITIONS	T_A=25°C			T_A=-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (nAn) to Output (nYn)	t_{PLH} /t_{PHL}	V_{CC}=2V, C_L=50pF		17	115			145	ns
		V_{CC}=2V, C_L=150pF		27	165			245	ns
		V_{CC}=4.5V, C_L=50pF		7	23			34	ns
		V_{CC}=4.5V, C_L=150pF		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 nYn	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 nYn	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

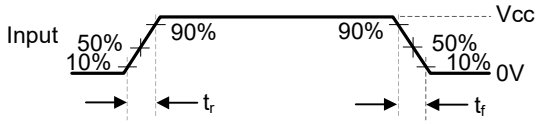
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	V_{CC}=2V~6V			10	pF
Power Dissipation Capacitance	C_{PD}	No load		35		pF

■ TEST CIRCUIT AND WAVEFORMS

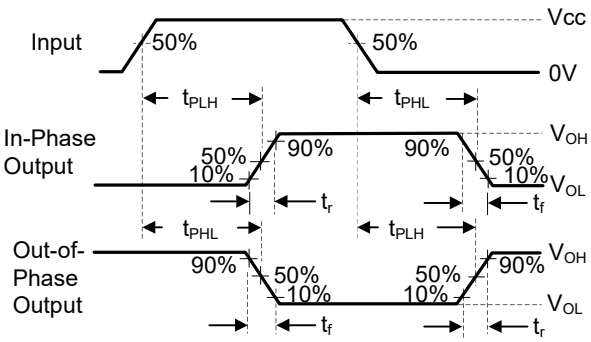


TEST		RL	CL	S1	S2
t_{en}	t_{PZH}	1kΩ	50pF or 150pF	Open	Close
	t_{PZL}			Close	Open
t_{dis}	t_{PHZ}	1kΩ	50pF	Open	Close
	t_{PLZ}			Close	Open
t_{PD} or t_t		-	50pF or 150pF	Open	Open

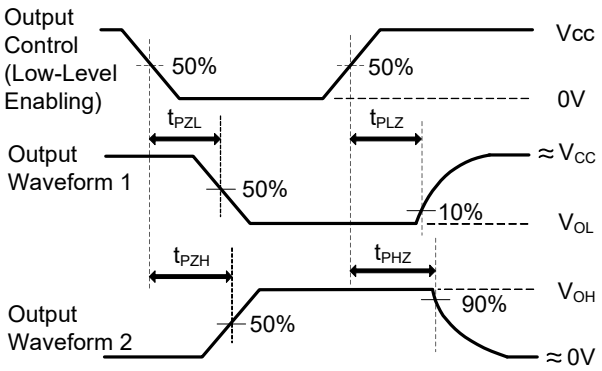
Notes: 1. C_L includes probe and jig capacitance.
2. $P_{RR} \leq 1MHz$, $Z_O = 50\Omega$, $t_R \leq 6ns$, $t_F \leq 6ns$.



Voltag Waveform



Propagation Delay Times



Enable and Disable Times

■ TYPICAL CHARACTERISTICS