TC74HC7240AP/AF
TC74HC7241AP/AF
TC74HC7244AP/AF

Octal Bus Buffer
TC74HC7240 Inverted, 3-State Outputs
TC74HC7241 Non-Inverted, 3-State Outputs
TC74HC7244 Non-Inverted, 3-State Outputs

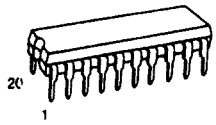
The TC74HC240A, 241A AND 244A are high speed CMOS OCTAL BUS BUFFERs fabricated with silicon gate C^2MOS technology.

They achieve the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.

The TC74HC7240A/7241A/7244A have same pin configuration and function as the TC74HC240A/241A/244A. And they have a hysteresis characteristics with each input, so TC74HC7240A/7241A/7244A can be used as a line receiver, etc.

The 74HC7240A is an inverting 3-state buffer having two active low output enables. The TC74HC7241A and HC7244A are non-inverting 3-state buffers that differ only in that the 7241A has one active-high and one active-low output enable, and the HC7244A has two active-low output enables.

All inputs are equipped with protection circuits against static discharge or transient excess voltage.



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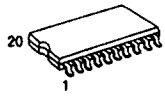


F

Truth Table

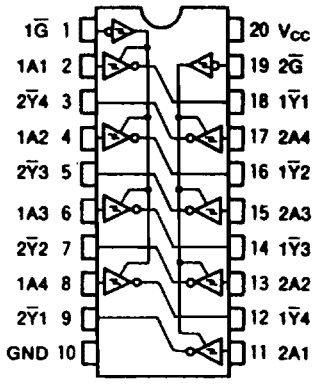
Inputs			Outputs	
$\overline{G}$	G^{Δ}	A_n	Y_n	$\overline{Y}_n^{\Delta\Delta}$
L	H	L	L	H
L	H	H	H	L
H	L	X	Z	Z

Δ: for TC74HC7241A, 244A
ΔΔ: for TC74HC7240A only
X: Don't Care
Z: High Impedance

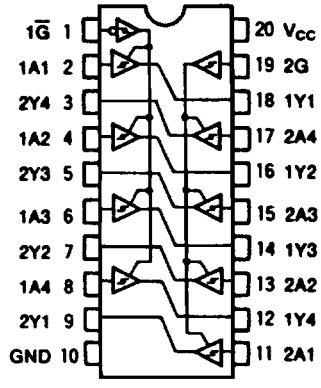
Features

- High Speed: t_{pd} = 15ns(Typ.) at V_{CC} = 5V
- Low Power Dissipation: I_{CC} = 4μA(Max.) at Ta = 25°C
- High Noise Immunity: V_{NIH} = 1.1V(Typ.) at V_{CC} = 5V
- Output Drive Capability: 15 LSTTL Loads
- Symmetrical Output Impedance: $|I_{OH}| = I_{OL}$ = 6mA(Min.)
- Balanced Propagation Delays: $t_{pLH} = t_{pHL}$
- Wide Operating Voltage Range: V_{CC}(opr) = 2V ~ 6V
- Pin and Function Compatible with 74LS240/241/244

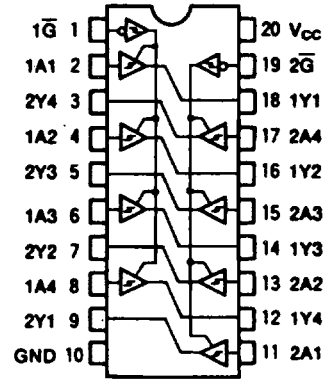
TC74HC7240A



TC74HC7241A



TC74HC7244A



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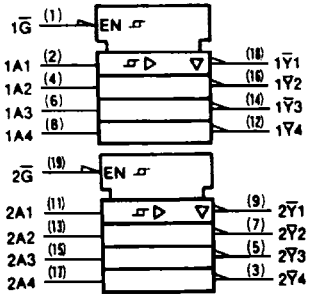
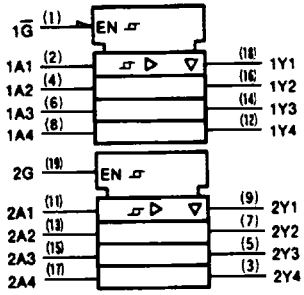
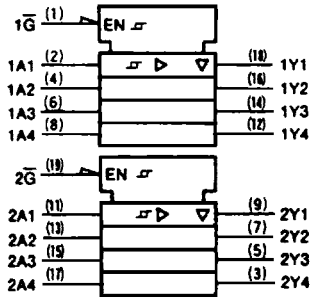


TC74HC7241A



TC74HC7244A



IEC Logic Symbol

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage Range	V_{CC}	-0.5 ~ 7	V
DC Input Voltage	V_{IN}	-0.5 ~ V_{CC} + 0.5	V
DC Output Voltage	V_{OUT}	-0.5 ~ V_{CC} + 0.5	V
Input Diode Current	I_{IK}	±20	mA
Output Diode Current	I_{OK}	±20	mA
DC Output Current	I_{OUT}	±25	mA
DC V_{CC}/Ground Current	I_{CC}	±50	mA
Power Dissipation	P_D	500(DIP)*/180(SOIC)	mW
Storage Temperature	T_{stg}	-65 ~ 150	°C
Lead Temperature 10sec	T_L	300	°C

*500mW in the range of Ta = -40°C ~ 65°C. From Ta = 65°C to 85°C a derating factor of -10mW/°C shall be applied until 300mW.

Recommended Operating Conditions

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	2 ~ 6	V
Input Voltage	V_{IN}	0 ~ V_{CC}	V
Output Voltage	V_{OUT}	0 ~ V_{CC}	V
Operating Temperature	T_{opr}	-40 ~ 85	°C

DC Electrical Characteristics

Parameter	Symbol	Test Condition		Ta = 25°C				Ta = -40 ~ 85°C		Unit
				V_{CC}	Min.	Typ.	Max.	Min.	Max.	
Positive Threshold Voltage	V_P	–		2.0 4.5 6.0	1.0 2.3 3.5	1.25 2.7 3.5	1.5 3.15 4.2	1.0 2.3 3.0	1.5 3.15 4.2	V
Negative Threshold Voltage	V_N	–		2.0 4.5 6.0	0.3 1.13 1.5	0.65 1.6 2.3	0.9 2.0 2.6	0.3 1.13 1.5	0.9 2.0 2.6	V
Hysteresis Voltage	V_H	–		2.0 4.5 6.0	0.3 0.6 0.8	0.6 1.1 1.2	1.0 1.4 1.7	0.3 0.6 0.8	1.0 1.4 1.7	V
High-Level Output Voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -20μA	2.0 4.5 6.0	1.9 4.4 5.9	2.0 4.5 6.0	– – –	1.9 4.4 5.9	– – –	V
			I_{OH} = -6 mA I_{OH} = 7.8 mA	4.5 6.0	4.18 5.68	4.31 5.80	– –	4.13 5.63	– –	
Low-Level Output Voltage	V_{OL}	V_{IN} = V_{IH} or V_{IL}	I_{OL} = 20μA	2.0 4.5 6.0	– – –	0.0 0.0 0.0	0.1 0.1 0.1	– – –	0.1 0.1 0.1	V
			I_{OL} = 6 mA I_{OL} = 7.8mA	4.5 6.0	– –	0.17 0.18	0.26 0.26	– –	0.33 0.33	
3-State Output Off-State Current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = V_{CC} or GND		6.0	–	–	±0.5	–	±0.5	μA
Input Leakage Current	I_{IN}	V_{IN} = V_{CC} or GND		6.0	–	–	±0.1	–	±1.0	
Quiescent Supply Current	I_{CC}	V_{IN} = V_{CC} or GND		6.0	–	–	4.0	–	40.0	

AC Electrical Characteristics (C_L = 50pF, Input $t_r = t_f$ = 6ns)

Parameter	Symbol	Test Condition			Ta = 25°C			Ta = -40 ~ 85°C		Unit
			CL	V_{CC}	Min.	Typ.	Max.	Min.	Max.	
Output Transition Time	t_{TLH} t_{THL}	–	50	2.0	–	25	60	–	75	ns
				4.5	–	7	12	–	15	
				6.0	–	6	10	–	13	
Propagation Delay Time	t_{pLH} t_{pHL}	–	50	2.0	–	50	125	–	155	
				4.5	–	15	25	–	31	
				6.0	–	13	21	–	26	
			150	2.0	–	67	165	–	205	
				4.5	–	20	33	–	41	
				6.0	–	17	28	–	35	
Output Enable Time	t_{pZL} t_{pZH}	R_L = 1k Ω	50	2.0	–	68	150	–	190	
				4.5	–	21	30	–	38	
				6.0	–	16	26	–	32	
			150	2.0	–	84	165	–	230	
				4.5	–	26	37	–	46	
				6.0	–	20	31	–	39	
Output Disable Time	t_{pLZ} t_{pHZ}	R_L = 1k Ω	50	2.0	–	48	150	–	190	
				4.5	–	21	30	–	38	
				6.0	–	19	26	–	32	
Input Capacitance	C_{IN}	–			–	5	10	–	10	pF
Output Capacitance	C_{OUT}	–			–	10	–	–	–	
Power Dissipation Capacitance	C_{PD}(1)	TC74HC7240A			–	33	–	–	–	
		TC74HC7241A/7244A			–	34	–	–	–	

Note (1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation:
$I_{CC(opr)} = C_{PD} \bullet V_{CC} \bullet f_{IN} + I_{CC}/8$(per bit)