TC74HCT240AP/AF/AFW
TC74HCT241AP/AF
TC74HCT244AP/AF/AFW

Octal Bus Buffer with TTL Input Level
TC74HCT240 Inverted, 3-State Outputs
TC74HCT241 Non-Inverted, 3-State Outputs
TC74HCT244 Non-Inverted, 3-State Outputs

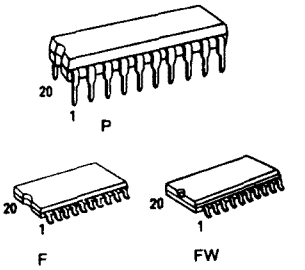
The TC74HCT240A, HCT241A and HCT244A are high speed CMOS OCTAL BUS BUFFERs fabricated with silicon gate C^2MOS technology.

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

The 74HCT240A is an inverting 3-state buffer having two active-low output enables. The TC74HCT241A and TC74HCT244A are non-inverting 3-state buffers that differ only in that the HCT241A has one active-high and one active-low output enable, and the HCT244A has two active-low output enables.

These devices are designed to be used with 3-state memory address drivers, etc.

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



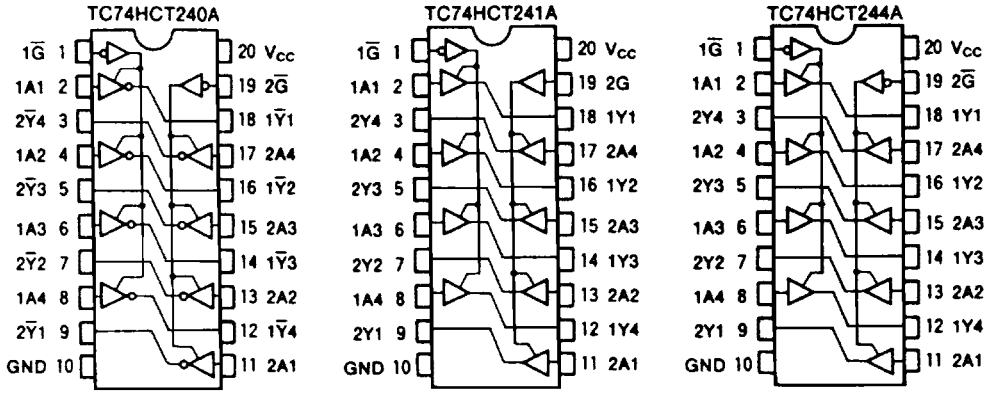
Truth Table

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

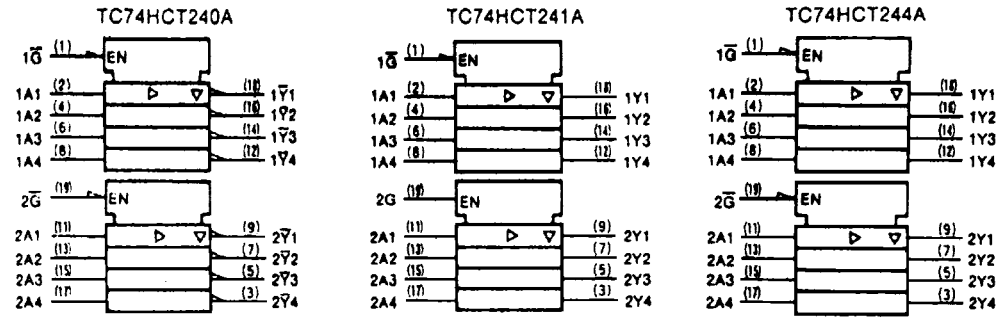
Δ: for TC74HC241A, 244A
ΔΔ: for TC74HC240A only
X: Don't Care
Z: High Impedance

Features

- High Speed: t_{pd} = 13ns(Typ.) at V_{CC} = 5V
- Low Power Dissipation: I_{CC} = 4μA(Max.) at Ta = 25°C
- Compatible with TTL outputs: V_{IL} = 0.8V(Max.), V_{IH} = 2.0V(Min.)
- Wide Interface Ability: LSTTL, NMOS, CMOS
- Output Drive Capability: 15 LSTTL Loads
- Symmetrical Output Impedance: $|I_{OH}| = I_{OL}$ = 4mA(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



Pin Assignment



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}	±35	mA
DC V_{CC}/Ground Current	I_{CC}	±75	mA
Power Dissipation	P_D	500(DIP)*/180(MFP)	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}	4 ~ 5.5	V
Input Voltage	V_{IN}	0 ~ V_{CC}	V
Output Voltage	V_{OUT}	0 ~ V_{CC}	V
Operating Temperature	T_{opr}	-40 ~ 85	°C
Input Rise and Fall Time	t_r, t_f	0 ~ 500	ns

DC Electrical Characteristics

Parameter	Symbol	Test Condition		V_{CC}	Ta = 25°C Min.	Ta = 25°C Typ.	Ta = 25°C Max.	Ta = -40 ~ 85°C Min.	Ta = -40 ~ 85°C Max.	Unit
High-Level Input Voltage	V_{IH}	–		4.5 ∫ 5.5	2.0	–	–	2.0	–	V
Low-Level Input Voltage	V_{IL}	–		4.5 ∫ 5.5	–	–	0.8	–	0.8	V
High-Level Output Voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -20μA	4.5	4.4	4.5	–	4.4	-	V
			I_{OH} = -6 mA	4.5	4.18	4.31	–	4.13	0.1	
Low-Level Output Voltage	V_{OL}	V_{IN} = V_{IH} or V_{IL}	I_{OL} = 20μA	4.5	–	0.0	0.1	–	0.1	V
			I_{OL} = 6 mA	4.5	–	0.17	0.26	–	0.33	
3-State Output Off-State Current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = V_{CC} or GND		5.5	–	–	±0.5	–	±5.0	V
Input Leakage Current	I_{IN}	V_{IN} = V_{CC} or GND		5.5	–	–	±0.1	–	±1.0	μA
Quiescent Supply Current	I_{CC}	V_{IN} = V_{CC} or GND		5.5	–	–	4.0	–	40.0	μA
	ΔI_{CC}	Per Input: V_{IN} = 0.5V or 2.4V Other Input: V_{CC} or GND		5.5	–	–	2.0	–	2.9	mA

AC Electrical Characteristics (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	4.5 5.5	– –	7 6	12 11	– –	15 14	ns
Propagation Delay Time*	t_{pLH} t_{pHL}	–	50	4.5 5.5	– –	15 13	22 20	– –	28 25	
			150	4.5 5.5	– –	21 16	30 27	– –	38 34	
Propagation Delay Time **	t_{pLH} t_{pHL}	–	50	4.5 5.5	– –	15 13	25 22	– –	31 28	
			150	4.5 5.5	– –	21 18	33 29	– –	41 37	
3-State Output Enable Time	t_{pLZ} t_{pZH}	R_L = 1k Ω	50	4.5 5.5	– –	17 14	30 27	– –	38 34	
			150	4.5 5.5	– –	23 20	38 34	– –	48 43	
3-State Output Disable Time	t_{pLZ} t_{pHZ}	R_L = 1k Ω	50	4.5 5.5	– –	16 13	30 27	– –	38 34	
Input Capacitance	C_{IN}	DIR, $\overline{G}$			– –	5	10	–	10	pF
Bus Input Capacitance	$C_{I/O}$	An			–	13	–	–	–	
Power Dissipation Capacitance Note (1)	C_{PD}	*			–	33	–	–	–	
		**			–	31	–	–	–	

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)

*TC74HCT240A

**TC74HCT241A/HCT244A