TC74HC125AP/AF/AFN
TC74HC126AP/AF

Quad Bus Buffer

The TC74HC125A/126A are high speed CMOS QUAD BUS BUFFERs fabricated with silicon gate C^2MOS technology.

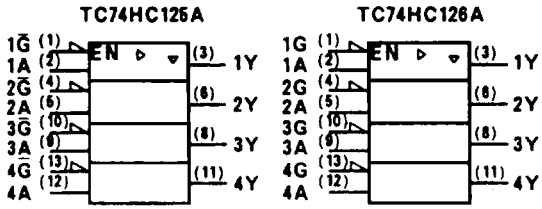
They achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.

The TC74HC125A requires a 3-state control input $\overline{G}$ to be set high to place the output into the high impedance state, where as the TC74HC126A requires the control input to be set low to place the output into high impedance.

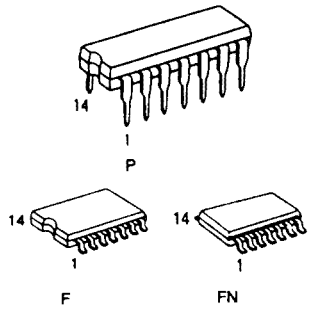
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

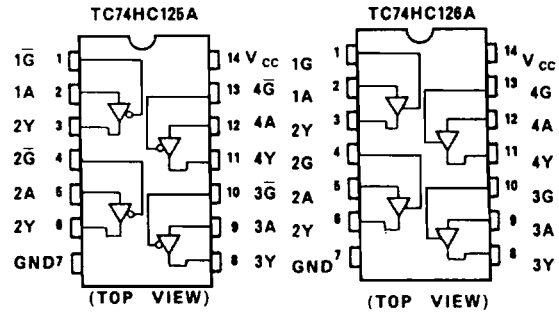
Features

- High Speed: t_{pd} = 10ns(Typ.) at V_{CC} = 5V
- Low Power Dissipation: I_{CC} = 4μA(Max.) at Ta = 25°C
- High Noise Immunity: $V_{NIH} = V_{NIL}$ = 28%V_{CC}(Min.)
- 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 74LS125/126



IEC Logic Symbol





Pin Assignment

Truth Table
TC74HC125A

Inputs		Outputs
$\overline{G}$	A	Y
H	X	Z
L	L	L
L	H	H

TC74HC126A

Inputs		Outputs
G	A	Y
L	X	Z
H	L	L
H	H	H

X: Don't Care
Z: High Impedance

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(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}	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
Input Rise and Fall Time	t_r, t_f	0 ~ 1000(V_{CC} = 2.0V) 0 ~ 500(V_{CC} = 4.5V) 0 ~ 400(V_{CC} = 6.0V)	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}	–		2.0 4.5 6.0	1.5 3.15 4.2	– – –	– – –	1.5 3.15 4.2	– – –	V
Low-Level Input Voltage	V_{IL}	–		2.0 4.5 6.0	– – –	– – –	0.5 1.35 1.8	- - -	0.5 1.35 1.8	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} = -4 mA I_{OH} = -5.2mA	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} = 4 mA I_{OL} = 5.2mA	4.5 6.0	– –	0.17 0.18	0.26 0.26	– –	0.33 0.33	
Input Leakage Current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = V_{CC} or GND		6.0	–	–	±0.5	–	±5.0	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 4.5 6.0	– – –	20 6 5	60 12 10	– – –	75 15 13	ns
Propagation Delay Time	t_{pLH} t_{pHL}	–	50	2.0 4.5 6.0	– – –	30 11 10	90 18 15	– – –	115 23 20	
			150	2.0 4.5 6.0	– – –	42 14 12	130 26 22	– – –	165 33 28	
Output Enable Time	t_{pZL} t_{pZH}	R_L = 1kΩ	50	2.0 4.5 6.0	– – –	30 11 10	90 18 15	– – –	115 23 20	
			150	2.0 4.5 6.0	– – –	42 14 12	130 26 22	– – –	165 33 28	
Output Enable Time	t_{pZL} t_{pZH}	R_L = 1kΩ	50	2.0 4.5 6.0	– – –	24 12 10	100 20 17	– – –	125 25 21	
Input Capacitance	C_{IN}	–			–	5	10	–	10	pF
Output Capacitance	C_{OUT}	–			–	10	–	–	–	
Power Dissipation Capacitance	C_{PD}(1)	–			–	41	–	–	–	

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:

$I_{CC(opr)} = C_{PD} \bullet V_{CC} \bullet f_{IN} + I_{CC}/4$(per Gate)

Notes