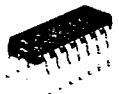
T-43-21

LC74HC125



3003A

CMOS High-Speed Standard Logic
LC74HC Series

Quad 3-State Bus Buffer

E *2029A

TENTATIVE

Features

- The LC74HC125 consists of 4 identical noninverting buffers with 3-state outputs.
- Has 4 separate output enables that are active-low.
- Uses CMOS structure to provide such features as wide operating voltage range (2 to 6V), low power dissipation, and high noise margin.
- The LC74HC125 is functionally as well as pin-out compatible with LS-TTL (74LS125) and uses silicon gate process technology to achieve operating speeds similar to LS-TTL (74LS125).
- All inputs are protected from damage.

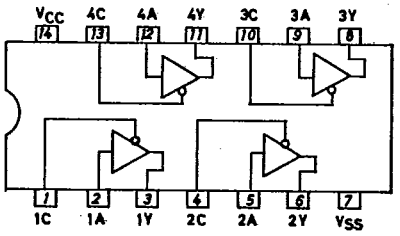
Absolute Maximum Ratings/Ta=25±2°C, V_{SS}=0V

				unit
Maximum Supply Voltage	V_{CC} max		V_{SS}-0.5 to V_{SS}+7.0	V
Maximum Input Voltage	V_{IN} max		V_{SS}-0.5 to V_{CC}+0.5	V
Maximum Output Voltage	V_{OUT} max		V_{SS}-0.5 to V_{CC}+0.5	V
Maximum Output Current	I_{OUT}	Per output	±35	mA
Current Dissipation	I_{CC}/I_{Gnd}		±70	mA
Clamp Diode Current	I_K	Per input pin (Input protector)	±20	mA
Allowable Power Dissipation	Pd max	Per Package, Ta≤85°C	300	mW
Storage Temperature	Tstg		−65 to +150	°C
Lead Temperature and Time	Tsol	t=10sec	300	°C

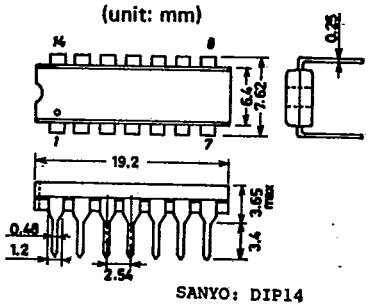
Allowable Operating Conditions/V_{SS}=0V

			unit
Supply Voltage	V_{CC}	2.0 to 6.0	V
Input Voltage	V_{IN}	0 to V_{CC}	V
Output Voltage	V_{OUT}	0 to V_{CC}	V
Operating Temperature	Topg	−40 to +85	°C
Input Rise/Fall Time	tr, tf	0 to 500	ns

Pin Assignment



Case Outline 3003A-D14IC
(unit: mm)



SANYO: DIP14

Truth Table

Input		Output
C	A	Y
0	0	0
0	1	1
1	*	z

0:'L' level
1:'H' level
z:High impedance

Electrical Characteristics/Ta=25±2°C, V_{SS}=0V

			Vcc	min	typ	max	unit
'H'-Level Input Voltage	V_{IH}		2.0	1.5			V
			4.5	3.15			V
			5.0	3.5			V
			5.5	3.85			V
			6.0	4.2			V
'L'-Level Input Voltage	V_{IL}		2.0			0.6	V
			4.5			1.35	V
			5.0			1.5	V
			5.5			1.65	V
			6.0			1.8	V
'H'-Level Output Voltage	V_{OH}	I_{OH}=-20uA	4.5	4.4	4.5		V
		〃	5.0	4.9	5.0		V
		〃	5.5	5.4	5.5		V
		I_{OH}=-6mA	4.5	4.1	4.3		V
		〃	5.0	4.6	4.8		V
		〃	5.5	5.1	5.3		V
'L'-Level Output Voltage	V_{OL}	I_{OL}=20uA	4.5		0.0	0.1	V
		〃	5.0		0.0	0.1	V
		〃	5.5		0.0	0.1	V
		I_{OH}=6mA	4.5		0.2	0.4	V
		〃	5.0		0.2	0.4	V
		〃	5.5		0.2	0.4	V
Input Current	I_{IN}		6.0			±0.3	μA
Quiescent Current	I_{CC}		6.0			1.0	μA

Electrical Characteristics/Ta=−40°C, V_{SS}=0V

			Vcc	min	typ	max	unit
'H'-Level Input Voltage	V_{IH}		2.0	1.5			V
			4.5	3.15			V
			5.0	3.5			V
			5.5	3.85			V
			6.0	4.2			V
'L'-Level Input Voltage	V_{IL}		2.0			0.6	V
			4.5			1.35	V
			5.0			1.5	V
			5.5			1.65	V
			6.0			1.8	V
'H'-Level Output Voltage	V_{OH}	I_{OH}=-20uA	4.5	4.4			V
		〃	5.0	4.9			V
		〃	5.5	5.4			V
		I_{OH}=-6mA	4.5	4.1			V
		〃	5.0	4.6			V
		〃	5.5	5.1			V
'L'-Level Output Voltage	V_{OL}	I_{OL}=20uA	4.5			0.1	V
		〃	5.0			0.1	V
		〃	5.5			0.1	V
		I_{OL}=6mA	4.5			0.4	V
		〃	5.0			0.4	V
		〃	5.5			0.4	V
Input Current	I_{IN}		6.0			±0.3	μA
Quiescent Current	I_{CC}		6.0			1.0	μA

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Electrical Characteristics/T_a=+85°C, V_{SS}=0V

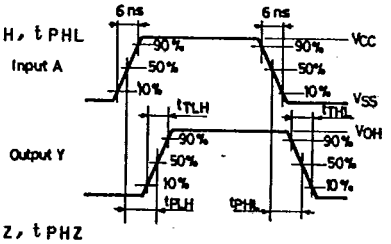
			Vcc	min	typ	max	unit
'H'-Level Input Voltage	VIH		2.0	1.5			V
			4.5	3.15			V
			5.0	3.5			V
			5.5	3.85			V
			6.0	4.2			V
'L'-Level Input Voltage	VIL		2.0			0.6	V
			4.5			1.35	V
			5.0			1.5	V
			5.5			1.65	V
			6.0			1.8	V
'H'-Level Output Voltage	VOH	IOH=-20uA	4.5	4.4			V
		〃	5.0	4.9			V
		〃	5.5	5.4			V
		IOH=-6mA	4.5	4.0			V
		〃	5.0	4.5			V
		〃	5.5	5.0			V
'L'-Level Output Voltage	VOL	IOL=20uA	4.5			0.1	V
		〃	5.0			0.1	V
		〃	5.5			0.1	V
		IOL=6mA	4.5			0.5	V
		〃	5.0			0.5	V
		〃	5.5			0.5	V
Input Current	IIN		6.0			±1.0	μA
Quiescent Current	ICC		6.0			10.0	μA

Switching Characteristics/T_a=25±2°C, V_{SS}=0V, Input, tr, tf=6ns

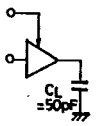
			Vcc	min	typ	max	unit
Output Rise Time	tTLH	CL=50pF	5.0		8	15	ns
Output Fall Time	tTHL	〃	5.0		8	15	ns
'H'-Level Propagation Delay Time	tPLH	〃	5.0		15	25	ns
'L'-Level Propagation Delay Time	tPHL	〃	5.0		15	25	ns
Propagation Delay Time	tPZH	〃 ,RL=1kΩ	5.0		20	30	ns
at 3-State Output Enable	tPZL	〃 ,RL=1kΩ	5.0		20	30	ns
Propagation Delay Time	tPHL	〃 ,RL=1kΩ	5.0		20	30	ns
at 3-State Output Disable	tPLZ	〃 ,RL=1kΩ	5.0		20	30	ns
Input Capacitance	cin				5		pF

Switching Waveforms

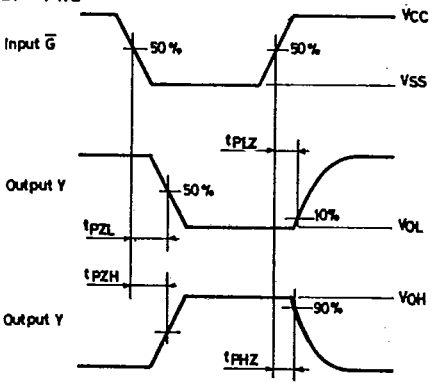
• tTLH, tTHL, tPLH, tPHL



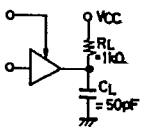
• Load



• tPZL, tPZH, tPLZ, tPHZ



• Load (tPZL, tPLZ)



• Load (tPZH, tPHZ)