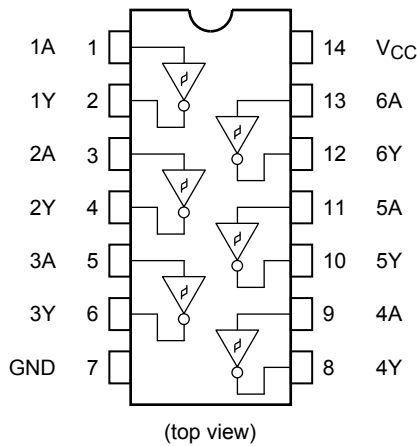
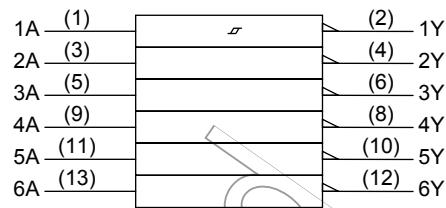


Pin Assignment



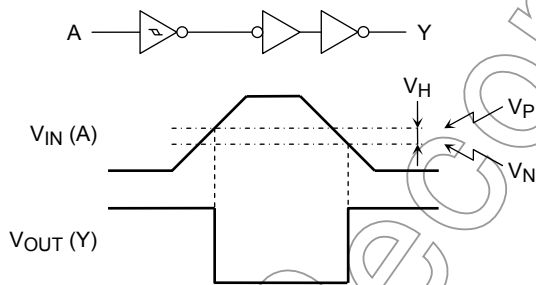
IEC Logic Symbol



Truth Table

A	Y
L	H
H	L

System Diagram, Waveform



Absolute Maximum Ratings (Note)

Characteristics	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to 7.0	V
DC input voltage	V_{IN}	-0.5 to 7.0	V
DC output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	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	180	mW
Storage temperature	T_{stg}	-65 to 150	$^{\circ}C$

Note: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.

Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Operating Ranges (Note)

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	2.0 to 5.5	V
Input voltage	V_{IN}	0 to 5.5	V
Output voltage	V_{OUT}	0 to V_{CC}	V
Operating temperature	T_{opr}	-40 to 85	°C

Note: The operating ranges must be maintained to ensure the normal operation of the device.
Unused inputs must be tied to either V_{CC} or GND.

Electrical Characteristics

DC Characteristics

Characteristics	Symbol	Test Condition		$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } 85^\circ\text{C}$		Unit
				V_{CC} (V)	Min	Typ.	Max	Min	Max
Positive threshold voltage	V_P	—	—	3.0	—	—	2.20	—	2.20
			—	4.5	—	—	3.15	—	3.15
			—	5.5	—	—	3.85	—	3.85
Negative threshold voltage	V_N	—	—	3.0	0.90	—	—	0.90	—
			—	4.5	1.35	—	—	1.35	—
			—	5.5	1.65	—	—	1.65	—
Hysteresis voltage	V_H	—	—	3.0	0.30	—	1.20	0.30	1.20
			—	4.5	0.40	—	1.40	0.40	1.40
			—	5.5	0.50	—	1.60	0.50	1.60
High-level output voltage	V_{OH}	$V_{IN} = V_{IL}$	$I_{OH} = -50 \mu\text{A}$	2.0	1.9	2.0	—	1.9	—
			—	3.0	2.9	3.0	—	2.9	—
			—	4.5	4.4	4.5	—	4.4	—
			$I_{OH} = -4 \text{ mA}$	3.0	2.58	—	—	2.48	—
Low-level output voltage	V_{OL}	$V_{IN} = V_{IH}$	$I_{OH} = -8 \text{ mA}$	4.5	3.94	—	—	3.80	—
			—	2.0	—	0.0	0.1	—	0.1
			$I_{OL} = 50 \mu\text{A}$	3.0	—	0.0	0.1	—	0.1
			—	4.5	—	0.0	0.1	—	0.1
Input leakage current	I_{IN}	$V_{IN} = 5.5 \text{ V or GND}$	$I_{OL} = 4 \text{ mA}$	3.0	—	—	0.36	—	0.44
			$I_{OL} = 8 \text{ mA}$	4.5	—	—	0.36	—	0.44
			—	2.0	—	0.0	0.1	—	0.1
Input leakage current	I_{IN}	$V_{IN} = 5.5 \text{ V or GND}$	—	0 to 5.5	—	—	± 0.1	—	± 1.0
Quiescent supply current	I_{CC}	$V_{IN} = V_{CC} \text{ or GND}$	—	5.5	—	—	2.0	—	20.0

AC Characteristics (input: $t_r = t_f = 3\text{ ns}$)

Characteristics	Symbol	Test Condition			Ta = 25°C			Ta = -40 to 85°C		Unit
			VCC (V)	CL (pF)	Min	Typ.	Max	Min	Max	
Propagation delay time	t _{pLH} t _{pHL}	—	3.3 ± 0.3	15	—	8.3	12.8	1.0	15.0	ns
				50	—	10.8	16.3	1.0	18.5	
			5.0 ± 0.5	15	—	5.5	8.6	1.0	10.0	
				50	—	7.0	10.6	1.0	12.0	
Input capacitance	C _{IN}	—			—	4	10	—	10	pF
Power dissipation capacitance	C _{PD}	(Note)			—	21	—	—	—	pF

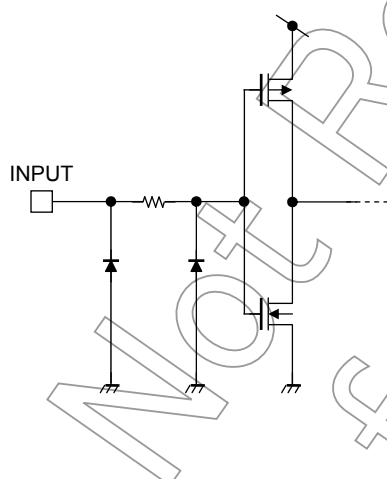
Note: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation:

$$I_{CC(\text{opr})} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/6 \text{ (per gate)}$$

Noise Characteristics (input: $t_r = t_f = 3\text{ ns}$)

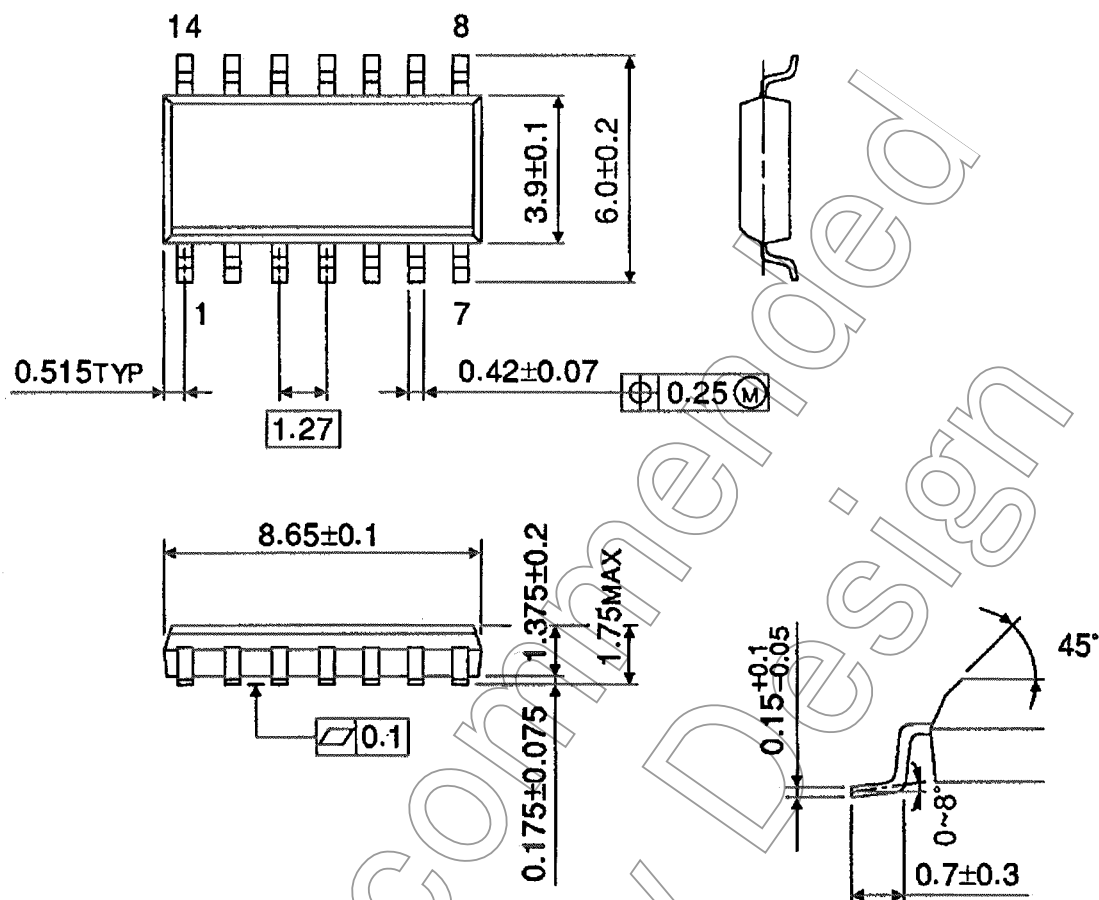
Characteristics	Symbol	Test Condition		Ta = 25°C		Unit
			V _{CC} (V)	Typ.	Limit	
Quiet output maximum dynamic V _{OL}	V _{OLP}	C _L = 50 pF	5.0	0.4	0.8	V
Quiet output minimum dynamic V _{OL}	V _{OLV}	C _L = 50 pF	5.0	-0.4	-0.8	V
Minimum high level dynamic input voltage	V _{IHD}	C _L = 50 pF	5.0	—	3.5	V
Maximum low level dynamic input voltage	V _{ILD}	C _L = 50 pF	5.0	—	1.5	V

Input Equivalent Circuit

Package Dimensions (Note)

SOL14-P-150-1.27

Unit : mm



Note: This package is not available in Japan.

Weight: 0.12 g (typ.)

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