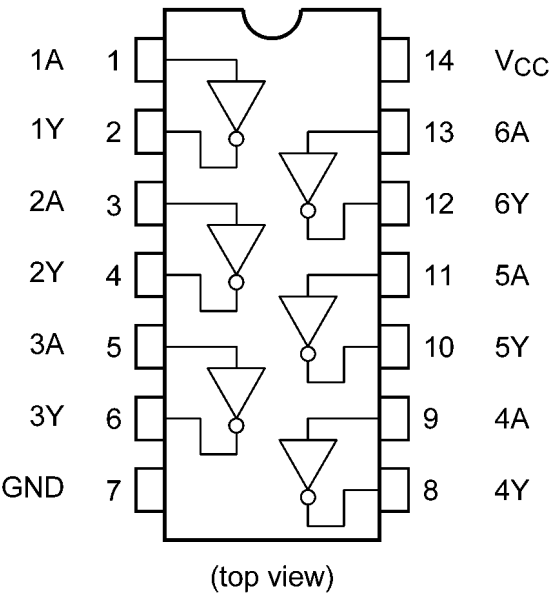
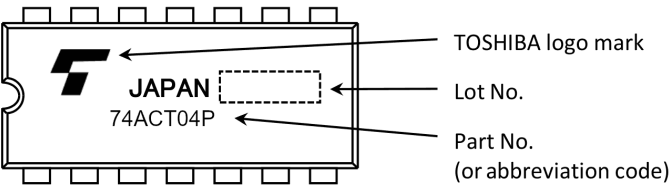


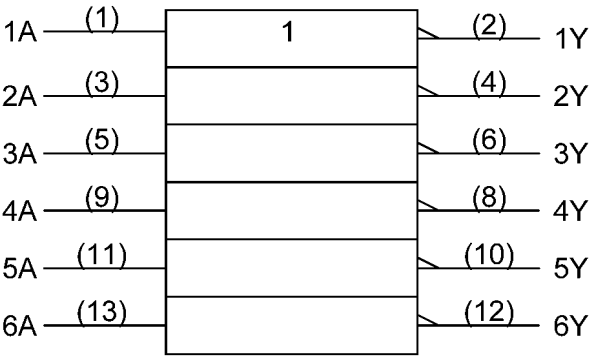
5. Pin Assignment



6. Marking



7. IEC Logic Symbol



### 8. Truth Table

A	Y
L	H
H	L

### 9. Absolute Maximum Ratings (Note)

Characteristics	Symbol	Note	Rating	Unit
Supply voltage	$V_{CC}$		-0.5 to 7.0	V
Input voltage	$V_{IN}$		-0.5 to $V_{CC} + 0.5$	V
Output voltage	$V_{OUT}$		-0.5 to $V_{CC} + 0.5$	V
Input diode current	$I_{IK}$		$\pm 20$	mA
Output diode current	$I_{OK}$		$\pm 50$	mA
Output current	$I_{OUT}$		$\pm 50$	mA
$V_{CC}$ /ground current	$I_{CC}$		$\pm 150$	mA
Power dissipation	$P_D$	(Note 1)	500	mW
Storage temperature	$T_{stg}$		-65 to 150	°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).

Note 1: 500 mW in the range of  $T_a = -40$  to  $65^\circ\text{C}$ . From  $T_a = 65$  to  $85^\circ\text{C}$  a derating factor of  $-10 \text{ mW}/^\circ\text{C}$  shall be applied until 300 mW.

### 10. Operating Ranges (Note)

Characteristics	Symbol	Rating	Unit
Supply voltage	$V_{CC}$	4.5 to 5.5	V
Input voltage	$V_{IN}$	0 to $V_{CC}$	V
Output voltage	$V_{OUT}$	0 to $V_{CC}$	V
Operating temperature	$T_{opr}$	-40 to 85	°C
Input rise and fall times	$dt/dv$	0 to 10	ns/V

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.

### 11. Electrical Characteristics

#### 11.1. DC Characteristics (Unless otherwise specified, $T_a = 25\text{ }^{\circ}\text{C}$ )

Characteristics	Symbol	Test Condition	$V_{CC}$ (V)	Min	Typ.	Max	Unit
High-level input voltage	$V_{IH}$	—	4.5 to 5.5	2.0	—	—	V
Low-level input voltage	$V_{IL}$	—	4.5 to 5.5	—	—	0.8	V
High-level output voltage	$V_{OH}$	$V_{IN} = V_{IL}$	$I_{OH} = -50\text{ }\mu\text{A}$	4.5	4.40	4.50	V
			$I_{OH} = -24\text{ mA}$	4.5	3.94	—	
Low-level output voltage	$V_{OL}$	$V_{IN} = V_{IH}$	$I_{OL} = 50\text{ }\mu\text{A}$	4.5	—	0.0	V
			$I_{OL} = 24\text{ mA}$	4.5	—	0.36	
Input leakage current	$I_{IN}$	$V_{IN} = V_{CC}$ or GND	5.5	—	—	$\pm 0.1$	$\mu\text{A}$
Quiescent supply current	$I_{CC}$	$V_{IN} = V_{CC}$ or GND	5.5	—	—	4.0	$\mu\text{A}$
	$I_{CCT}$	Per input: $V_{IN} = 3.4\text{ V}$ Other input: $V_{CC}$ or GND	5.5	—	—	1.35	mA

#### 11.2. DC Characteristics (Unless otherwise specified, $T_a = -40\text{ to }85\text{ }^{\circ}\text{C}$ )

Characteristics	Symbol	Test Condition	Note	$V_{CC}$ (V)	Min	Max	Unit
High-level input voltage	$V_{IH}$	—		4.5 to 5.5	2.0	—	V
Low-level input voltage	$V_{IL}$	—		4.5 to 5.5	—	0.8	V
High-level output voltage	$V_{OH}$	$V_{IN} = V_{IL}$	$I_{OH} = -50\text{ }\mu\text{A}$	4.5	4.40	—	V
			$I_{OH} = -24\text{ mA}$	4.5	3.80	—	
			$I_{OH} = -75\text{ mA}$ (Note 1)	5.5	3.85	—	
Low-level output voltage	$V_{OL}$	$V_{IN} = V_{IH}$	$I_{OL} = 50\text{ }\mu\text{A}$	4.5	—	0.1	V
			$I_{OL} = 24\text{ mA}$	4.5	—	0.44	
			$I_{OL} = 75\text{ mA}$ (Note 1)	5.5	—	1.65	
Input leakage current	$I_{IN}$	$V_{IN} = V_{CC}$ or GND		5.5	—	$\pm 1.0$	$\mu\text{A}$
Quiescent supply current	$I_{CC}$	$V_{IN} = V_{CC}$ or GND		5.5	—	40.0	$\mu\text{A}$
	$I_{CCT}$	Per input: $V_{IN} = 3.4\text{ V}$ Other input: $V_{CC}$ or GND		5.5	—	1.50	mA

Note 1: This spec indicates the capability of driving 50  $\Omega$  transmission lines.

One output should be tested within a 10 ms maximum duration.

#### 11.3. AC Characteristics (Unless otherwise specified, $T_a = 25\text{ }^{\circ}\text{C}$ , Input: $t_r = t_f = 3\text{ ns}$ )

Characteristics	Symbol	Note	Test Condition	$V_{CC}$ (V)	Min	Typ.	Max	Unit
Propagation delay time	$t_{PLH}, t_{PHL}$		$C_L = 50\text{ pF}$ $R_L = 500\text{ }\Omega$	$5.0 \pm 0.5$	—	5.5	7.9	ns
Input capacitance	$C_{IN}$		—	—	—	5	10	pF
Power dissipation capacitance	$C_{PD}$	(Note 1)	—	—	—	19	—	pF

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.

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

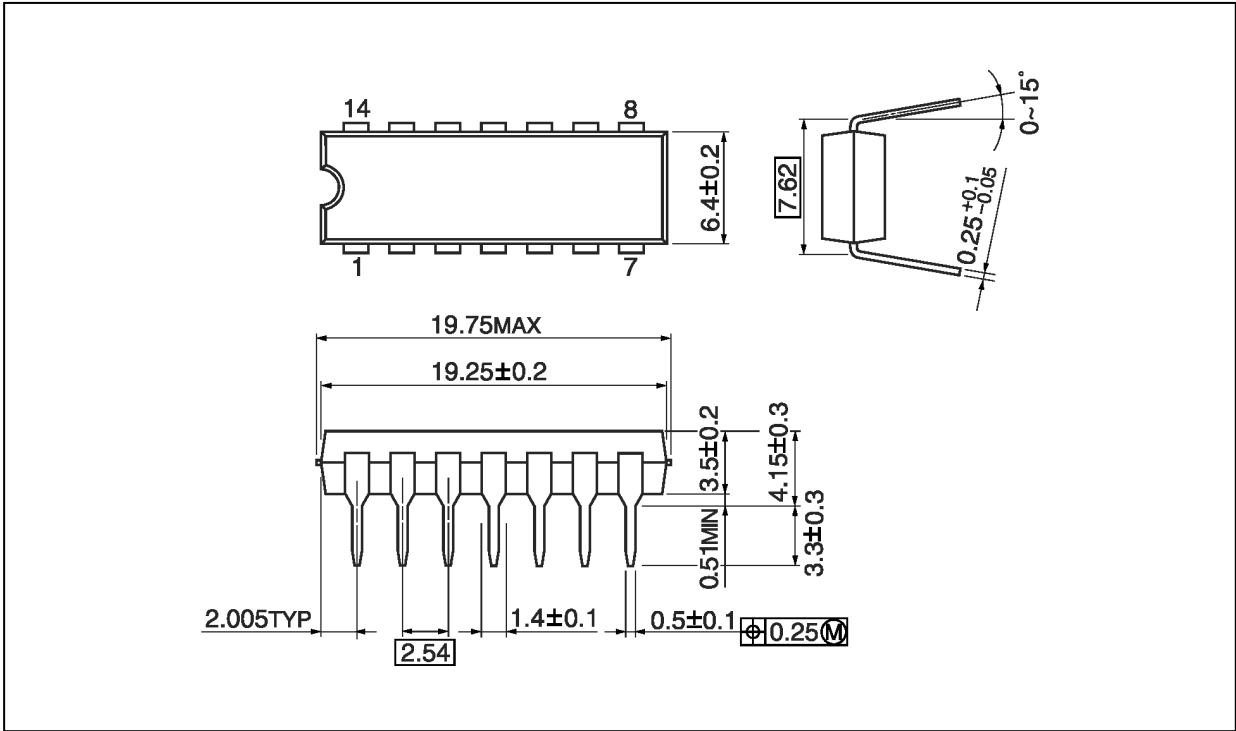
#### 11.4. AC Characteristics

(Unless otherwise specified,  $T_a = -40\text{ to }85\text{ }^{\circ}\text{C}$ , Input:  $t_r = t_f = 3\text{ ns}$ )

Characteristics	Symbol	Test Condition	$V_{CC}$ (V)	Min	Max	Unit
Propagation delay time	$t_{PLH}, t_{PHL}$	$C_L = 50\text{ pF}$ $R_L = 500\text{ }\Omega$	$5.0 \pm 0.5$	1.0	9.0	ns
Input capacitance	$C_{IN}$	—	—	—	10	pF

Package Dimensions

Unit: mm



Weight: 0.96 g (typ.)

Package Name(s)
Nickname: DIP14

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