Absolute Maximum Ratings (Note)

Characteristics	Symbol	Rating	Unit
DC supply voltage	V_{DD}	V_{SS} − 0.5 to V_{SS} + 20	V
Input voltage	V_{IN}	V_{SS} − 0.5 to V_{DD} + 0.5	V
Output voltage	V_{OUT}	V_{SS} − 0.5 to V_{DD} + 0.5	V
DC input current	I_{IN}	±10	mA
Power dissipation	P_D	300 (DIP)/180 (SOIC)	mW
Operating temperature range	T_{opr}	−40 to 85	°C
Storage temperature range	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).

Operating Ranges (V_{SS} = 0 V) (Note)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
DC supply voltage	V_{DD}	—	3	—	18	V
Input voltage	V_{IN}	—	0	—	V_{DD}	V

Note 1: The operating ranges must be maintained to ensure the normal operation of the device.
Unused inputs must be tied to either V_{DD} or V_{SS}.

Static Electrical Characteristics (V_{SS} = 0 V)

Characteristics		Sym-bol	Test Condition		−40°C		25°C			85°C		Unit
				V_{DD} (V)	Min	Max	Min	Typ.	Max	Min	Max	
High-level output voltage		V_{OH}	$\|I_{OUT}\| < 1$ μA $V_{IN} = V_{SS}, V_{DD}$	5	4.95	—	4.95	5.00	—	4.95	—	V
				10	9.95	—	9.95	10.00	—	9.95	—	
				15	14.95	—	14.95	15.00	—	14.95	—	
Low-level output voltage		V_{OL}	$\|I_{OUT}\| < 1$ μA $V_{IN} = V_{SS}, V_{DD}$	5	—	0.05	—	0.00	0.05	—	0.05	V
				10	—	0.05	—	0.00	0.05	—	0.05	
				15	—	0.05	—	0.00	0.05	—	0.05	
Output high current		I_{OH}	V_{OH} = 4.6 V	5	−0.61	—	−0.51	−1.0	—	−0.42	—	mA
			V_{OH} = 2.5 V	5	−2.50	—	−2.10	−4.0	—	−1.70	—	
			V_{OH} = 9.5 V	10	−1.50	—	−1.30	−2.2	—	−1.10	—	
			V_{OH} = 13.5 V	15	−4.00	—	−3.40	−9.0	—	−2.80	—	
			$V_{IN} = V_{SS}$									
Output low current		I_{OL}	V_{OL} = 0.4 V	5	0.61	—	0.51	1.5	—	0.42	—	mA
			V_{OL} = 0.5 V	10	1.50	—	1.30	3.8	—	1.10	—	
			V_{OL} = 1.5 V	15	4.00	—	3.40	15.0	—	2.80	—	
			$V_{IN} = V_{DD}$									
Positive trigger threshold voltage		V_P	V_{OUT} = 0.5 V	5	2.05	3.75	2.15	3.0	3.75	2.15	3.85	V
			V_{OUT} = 1.0 V	10	4.80	7.60	4.90	6.4	7.60	4.90	7.70	
			V_{OUT} = 1.5 V	15	7.80	11.60	7.90	9.9	11.60	7.90	11.70	
Negative trigger threshold voltage		V_N	V_{OUT} = 4.5 V	5	1.25	2.95	1.25	2.3	2.85	1.15	2.85	V
			V_{OUT} = 9.0 V	10	2.40	5.20	2.40	3.8	5.10	2.30	5.10	
			V_{OUT} = 13.5 V	15	3.40	7.20	3.40	5.2	7.10	3.30	7.10	
Hysteresis voltage		V_H	—	5	0.10	1.25	0.25	0.65	1.25	0.25	1.40	V
				10	1.80	3.50	1.90	2.60	3.50	1.90	3.60	
				15	3.70	5.60	3.80	4.70	5.60	3.80	5.70	
Input current	"H" level	I_{IH}	V_{IH} = 18 V	18	—	0.1	—	10^{-5}	0.1	—	1.0	μA
	"L" level	I_{IL}	V_{IL} = 0 V	18	—	−0.1	—	-10^{-5}	−0.1	—	−1.0	
Quiescent supply current		I_{DD}	$V_{IN} = V_{SS}, V_{DD}$ (Note)	5	—	1	—	0.001	1	—	7.5	μA
				10	—	2	—	0.002	2	—	15.0	
				15	—	4	—	0.004	4	—	30.0	

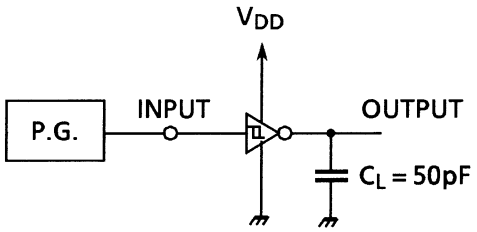
Note: All valid input combinations.

Dynamic Electrical Characteristics (Ta = 25°C, V_{SS} = 0 V, C_L = 50 pF)

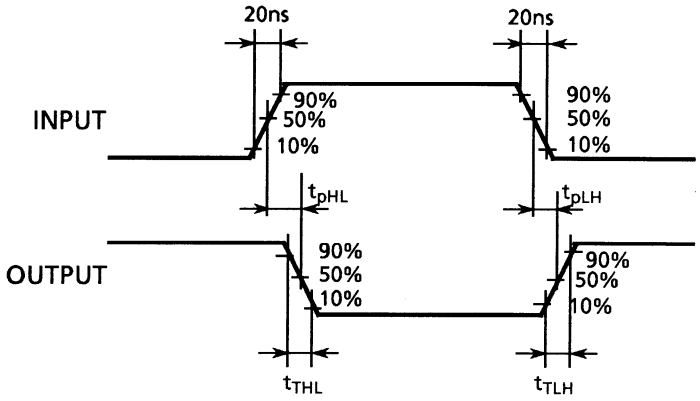
Characteristics	Symbol	Test Condition	V_{DD} (V)	Min	Typ.	Max	Unit
Output transition time (low to high)	t_{TLH}	—	5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Output transition time (high to low)	t_{THL}	—	5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Propagation delay time	t_{pLH} t_{pHL}	—	5	—	170	340	ns
			10	—	80	160	
			15	—	60	120	
Input capacitance	C_{IN}	—		—	5	7.5	pF

Circuit and Waveform for Measurement of Dynamic Characteristics

Circuit

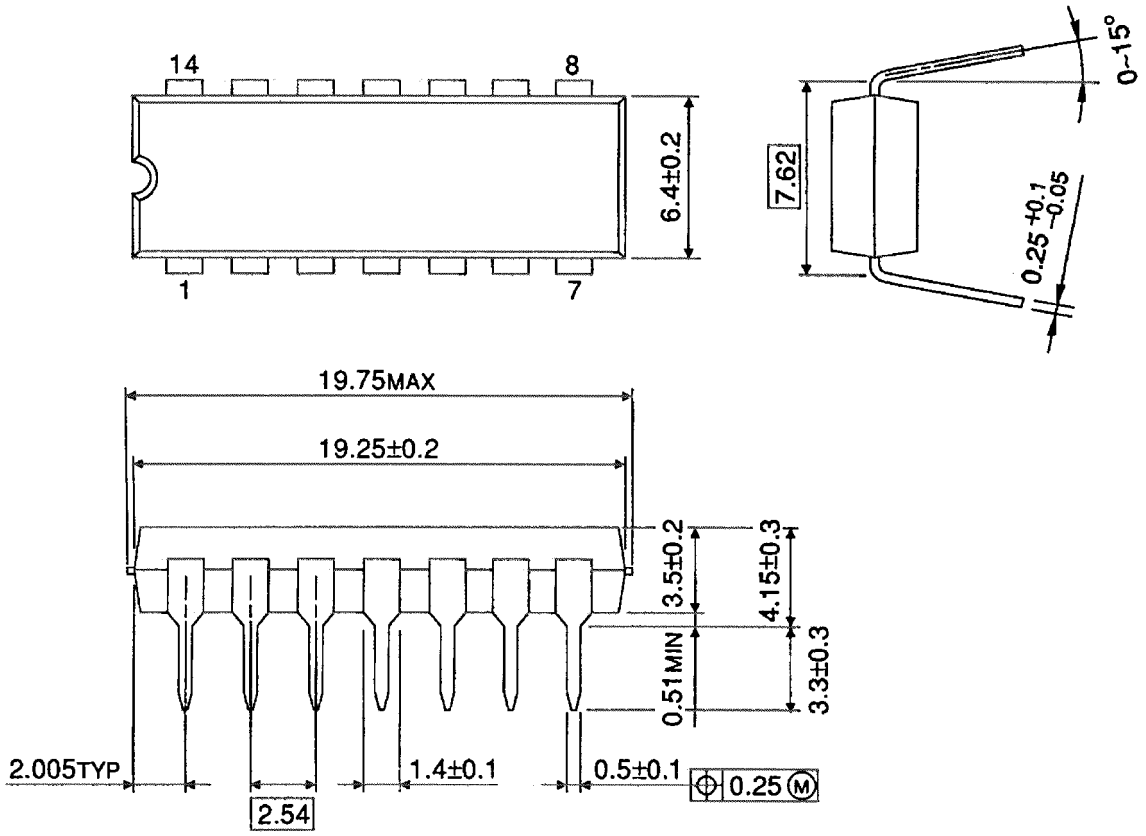


Waveform



Package Dimensions

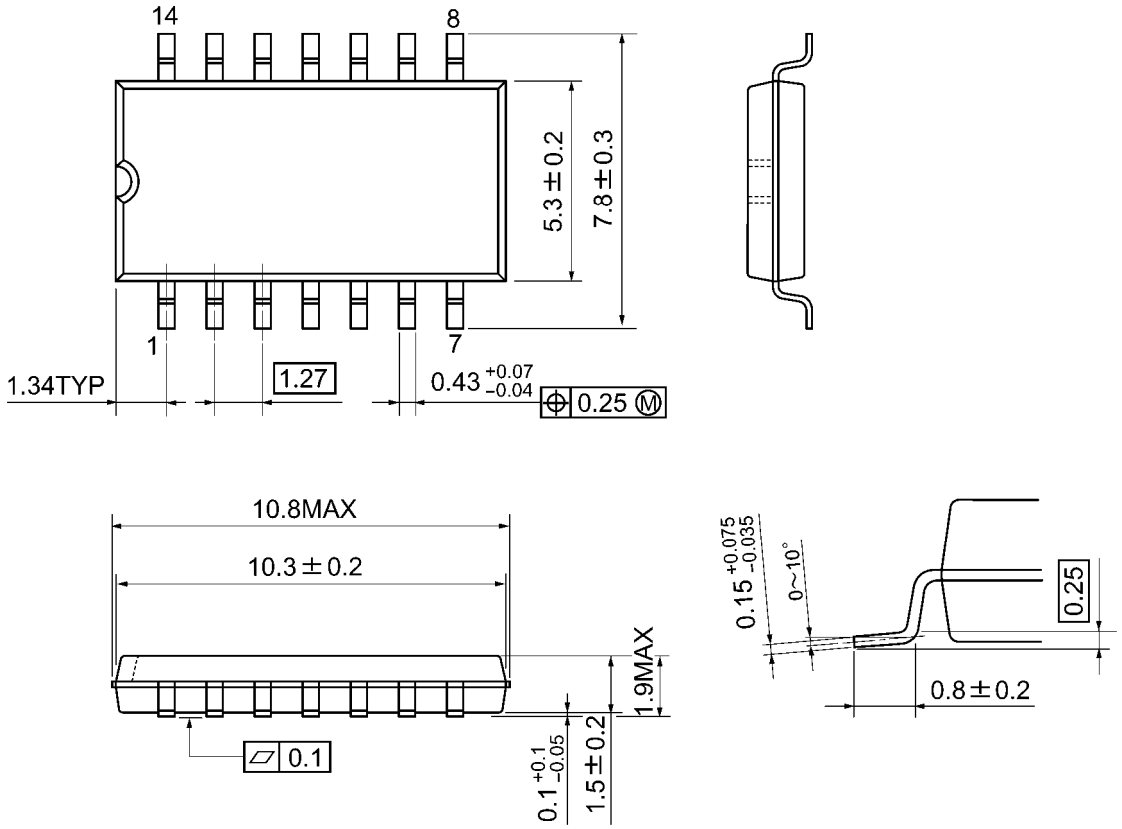
DIP14-P-300-2.54 Unit : mm



Weight: 0.96 g (typ.)

Package Dimensions

SOP14-P-300-1.27A Unit: mm



Weight: 0.18 g (typ.)

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