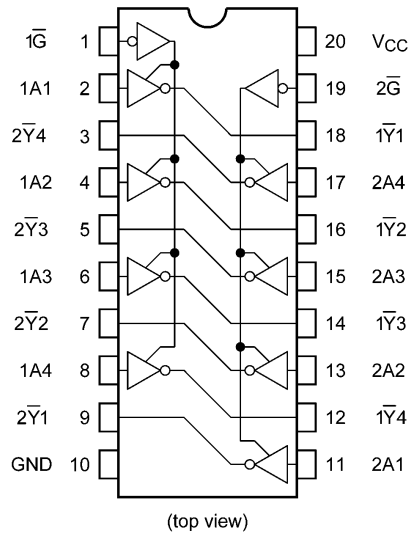
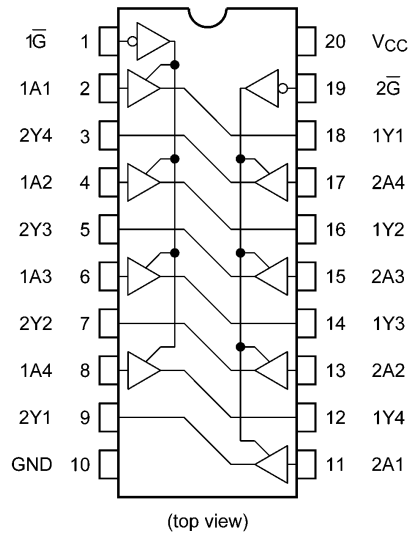


5. Pin Assignment

74HCT240D

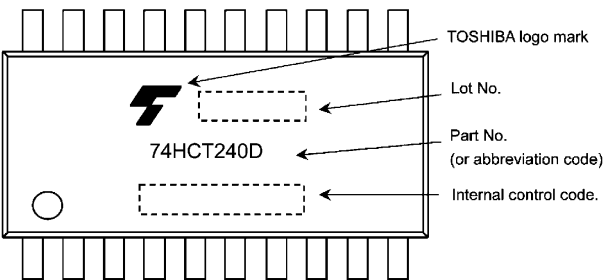


74HCT244D

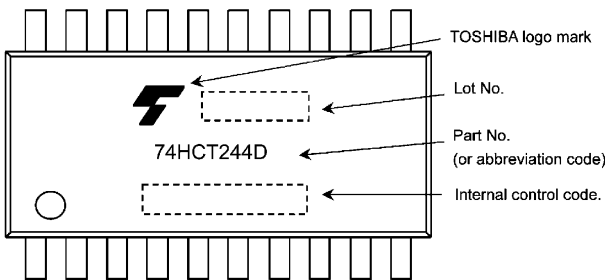


6. Marking

74HCT240D

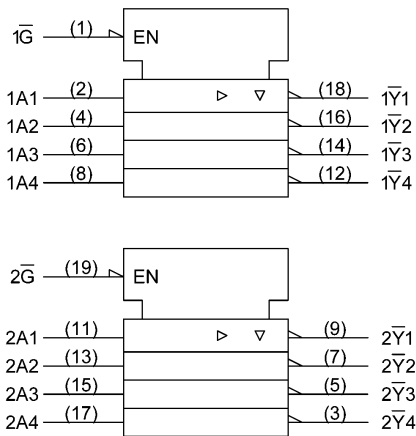


74HCT244D

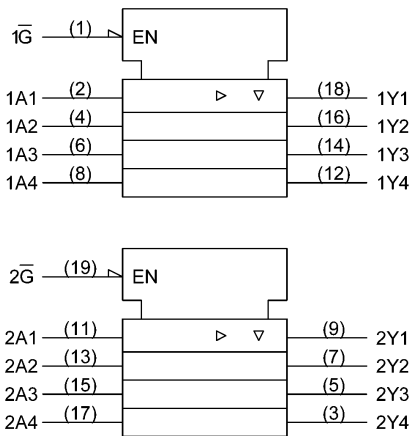


7. IEC Logic Symbol

74HCT240D



74HCT244D



8. Truth Table

Input $\bar{G}$	Input A_n	Output Y_n	Output $\bar{Y}_n$
L	L	L	H
L	H	H	L
H	X	Z	Z

X: Don't care

Z: High impedance

Y_n : 74HCT244D

$\bar{Y}_n$: 74HCT240D

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}		± 20	mA
Output diode current	I_{OK}		± 20	mA
Output current	I_{OUT}		± 35	mA
V_{CC} /ground current	I_{CC}		± 75	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: P_D derates linearly with -8 mW/°C above 85 °C

10. Operating Ranges (Note)

Characteristics	Symbol	Note	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}	(Note 1)	-40 to 125	°C
Input rise and fall times	t_r, t_f		0 to 500	ns

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.

Note 1: Operating Range spec of $T_{opr} = -40$ °C to 125 °C is applicable only for the products which manufactured after July 2020.

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}	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OH} = -20\text{ }\mu\text{A}$	4.5	4.4	4.5	V
			$I_{OH} = -6\text{ mA}$	4.5	4.18	4.31	
Low-level output voltage	V_{OL}	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OL} = 20\text{ }\mu\text{A}$	4.5	—	0.0	V
			$I_{OL} = 6\text{ mA}$	4.5	—	0.17	
3-state output OFF-state leakage current	I_{OZ}	$V_{IN} = V_{IH}$ or V_{IL} $V_{OUT} = V_{CC}$ or GND	5.5	—	—	± 0.5	μA
Input leakage current	I_{IN}	$V_{IN} = V_{CC}$ or GND	5.5	—	—	± 0.1	μA
Quiescent supply current	I_{CC}	$V_{IN} = V_{CC}$ or GND	5.5	—	—	4.0	μA
	I_{CCT}	Per input: $V_{IN} = 0.5\text{ V}$ or 2.4 V Other input: V_{CC} or GND	5.5	—	—	2.0	mA

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

Characteristics	Symbol	Test Condition	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}	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OH} = -20\text{ }\mu\text{A}$	4.5	4.4	V
			$I_{OH} = -6\text{ mA}$	4.5	4.13	
Low-level output voltage	V_{OL}	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OL} = 20\text{ }\mu\text{A}$	4.5	—	V
			$I_{OL} = 6\text{ mA}$	4.5	—	
3-state output OFF-state leakage current	I_{OZ}	$V_{IN} = V_{IH}$ or V_{IL} $V_{OUT} = V_{CC}$ or GND	5.5	—	± 5.0	μA
Input leakage current	I_{IN}	$V_{IN} = V_{CC}$ or GND	5.5	—	± 1.0	μA
Quiescent supply current	I_{CC}	$V_{IN} = V_{CC}$ or GND	5.5	—	40.0	μA
	I_{CCT}	Per input: $V_{IN} = 0.5\text{ V}$ or 2.4 V Other input: V_{CC} or GND	5.5	—	2.9	mA

11.3. DC Characteristics (Note) (Unless otherwise specified, $T_a = -40\text{ to }125\text{ }^{\circ}\text{C}$)

Characteristics	Symbol	Test Condition	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}	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OH} = -20\text{ }\mu\text{A}$	4.5	4.4	V
			$I_{OH} = -6\text{ mA}$	4.5	3.7	
Low-level output voltage	V_{OL}	$V_{IN} = V_{IH}$ or V_{IL}	$I_{OL} = 20\text{ }\mu\text{A}$	4.5	—	V
			$I_{OL} = 6\text{ mA}$	4.5	—	
3-state output OFF-state leakage current	I_{OZ}	$V_{IN} = V_{IH}$ or V_{IL} $V_{OUT} = V_{CC}$ or GND	5.5	—	± 5.0	μA
Input leakage current	I_{IN}	$V_{IN} = V_{CC}$ or GND	5.5	—	± 1.0	μA
Quiescent supply current	I_{CC}	$V_{IN} = V_{CC}$ or GND	5.5	—	80.0	μA
	I_{CCT}	Per input: $V_{IN} = 0.5\text{ V}$ or 2.4 V Other input: V_{CC} or GND	5.5	—	2.9	mA

Note: Operating Range spec of $T_{opr} = -40\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$ is applicable only for the products which manufactured after July 2020.

11.4. AC Characteristics (Unless otherwise specified, $T_a = 25^\circ\text{C}$, Input: $t_r = t_f = 6\text{ ns}$)

Characteristics	Part Number	Symbol	Note	Test Condition	C_L (pF)	V_{CC} (V)	Min	Typ.	Max	Unit
Output transition time		t_{TLH}, t_{THL}		—	50	4.5	—	7	12	ns
						5.5	—	6	11	
Propagation delay time	74HCT240D	t_{PLH}, t_{PHL}		—	50	4.5	—	15	22	ns
						5.5	—	13	20	
					150	4.5	—	21	30	
						5.5	—	16	27	
Propagation delay time	74HCT244D	t_{PLH}, t_{PHL}		—	50	4.5	—	15	25	ns
						5.5	—	13	22	
					150	4.5	—	21	33	
						5.5	—	18	29	
3-state output enable time		t_{PZL}, t_{PZH}		$R_L = 1\text{ k}\Omega$	50	4.5	—	17	30	ns
						5.5	—	14	27	
					150	4.5	—	23	38	
						5.5	—	20	34	
3-state output disable time		t_{PLZ}, t_{PHZ}		$R_L = 1\text{ k}\Omega$	50	4.5	—	16	30	ns
						5.5	—	13	27	
Input capacitance		C_{IN}		—			—	5	10	pF
Output capacitance		C_{OUT}		—			—	10	—	pF
Power dissipation capacitance	74HCT240D	C_{PD}	(Note 1)	—			—	33	—	pF
	74HCT244D	C_{PD}		—			—	31	—	

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.

$$I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/8 \text{ (per bit)}$$

11.5. AC Characteristics (Unless otherwise specified, $T_a = -40$ to 85°C , Input: $t_r = t_f = 6\text{ ns}$)

Characteristics	Part Number	Symbol	Test Condition	C_L (pF)	V_{CC} (V)	Min	Max	Unit
Output transition time		t_{TLH}, t_{THL}	—	50	4.5	—	15	ns
					5.5	—	14	
Propagation delay time	74HCT240D	t_{PLH}, t_{PHL}	—	50	4.5	—	28	ns
					5.5	—	25	
				150	4.5	—	38	
					5.5	—	34	
Propagation delay time	74HCT244D	t_{PLH}, t_{PHL}	—	50	4.5	—	31	ns
					5.5	—	28	
				150	4.5	—	41	
					5.5	—	37	
3-state output enable time		t_{PZL}, t_{PZH}	$R_L = 1\text{ k}\Omega$	50	4.5	—	38	ns
					5.5	—	34	
				150	4.5	—	48	
					5.5	—	43	
3-state output disable time		t_{PLZ}, t_{PHZ}	$R_L = 1\text{ k}\Omega$	50	4.5	—	38	ns
					5.5	—	34	
Input capacitance		C_{IN}	—			—	10	pF

11.6. AC Characteristics (Note)

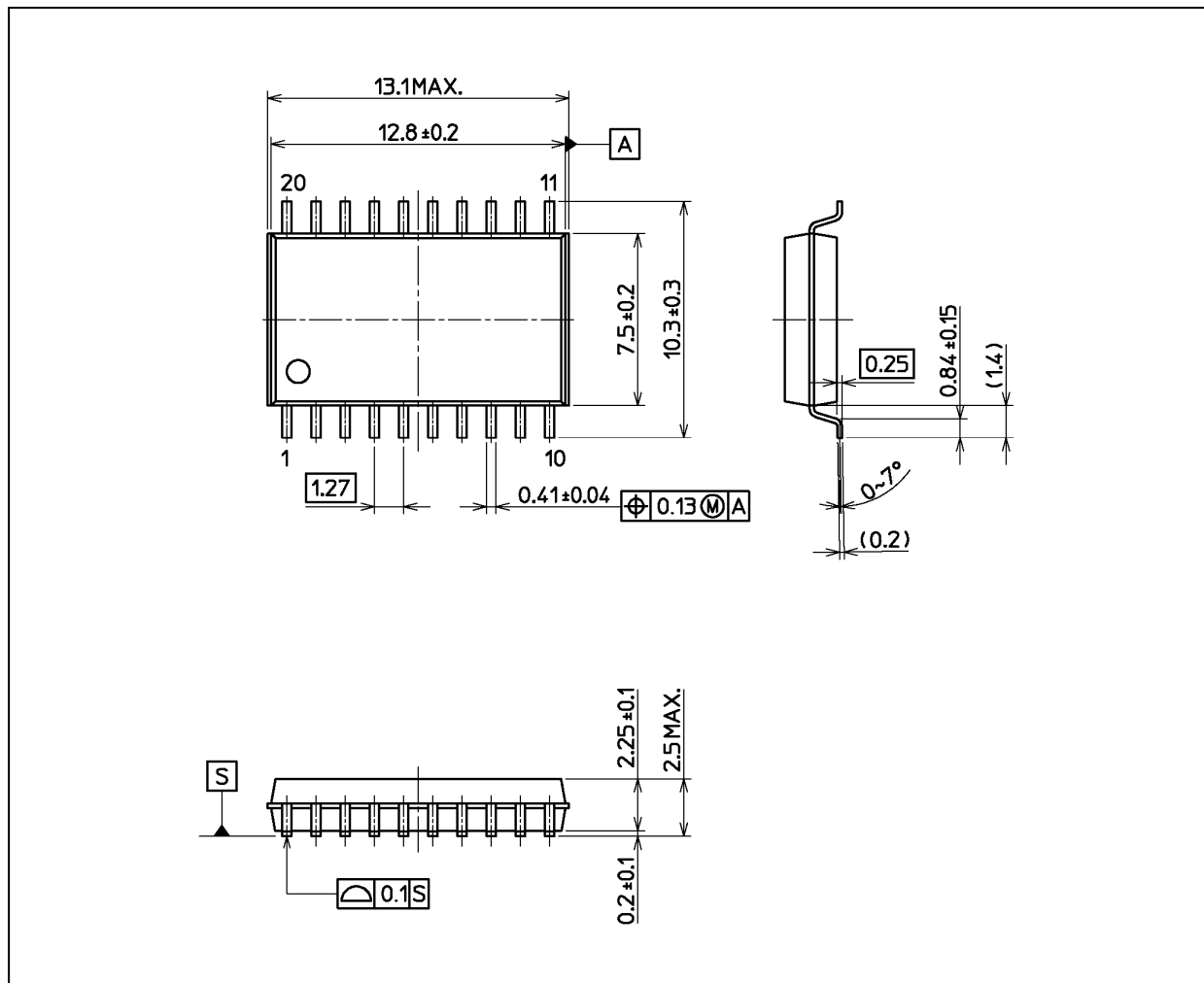
(Unless otherwise specified, $T_a = -40$ to $125\text{ }^{\circ}\text{C}$, Input: $t_r = t_f = 6\text{ ns}$)

Characteristics	Part Number	Symbol	Test Condition	C_L (pF)	V_{CC} (V)	Min	Max	Unit
Output transition time		t_{TLH}, t_{THL}		50	4.5	—	17	ns
					5.5	—	16	
Propagation delay time	74HCT240D	t_{PLH}, t_{PHL}	—	50	4.5	—	32	ns
					5.5	—	29	
				150	4.5	—	44	
					5.5	—	39	
Propagation delay time	74HCT244D	t_{PLH}, t_{PHL}	—	50	4.5	—	35	ns
					5.5	—	32	
				150	4.5	—	47	
					5.5	—	43	
3-state output enable time		t_{PZL}, t_{PZH}	$R_L = 1\text{ k}\Omega$	50	4.5	—	44	ns
					5.5	—	39	
				150	4.5	—	55	
					5.5	—	49	
3-state output disable time		t_{PLZ}, t_{PHZ}	$R_L = 1\text{ k}\Omega$	50	4.5	—	44	ns
					5.5	—	39	
Input capacitance		C_{IN}	—			—	10	pF

Note: Operating Range spec of $T_{opr} = -40\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$ is applicable only for the products which manufactured after July 2020.

Package Dimensions

Unit: mm



Weight: 0.51 g (typ.)

Package Name(s)
Nickname: SOIC20

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