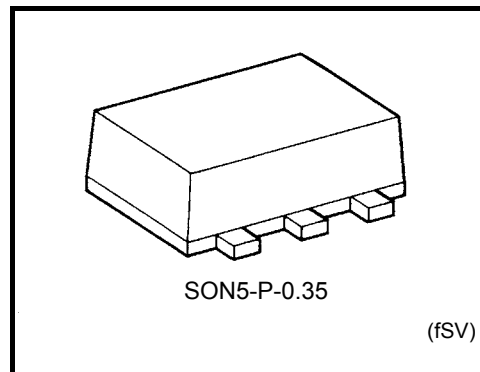


TC7SH125FS

Bus Buffer

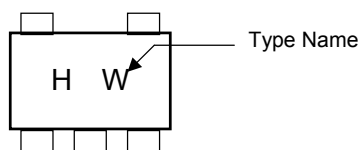
Features

High speed: $t_{pd} = 3.8 \text{ ns}$ (typ.) at $V_{CC} = 5 \text{ V}$
 Low power dissipation: $I_{CC} = 2 \text{ }\mu\text{A}$ (max) at $T_a = 25^\circ\text{C}$
 High noise immunity: $V_{NIH} = V_{NIL} = 28\% V_{CC}$ (min)
 5.5V tolerant input.
 Wide operating voltage range: $V_{CC} (\text{opr}) = 2\sim 5.5 \text{ V}$

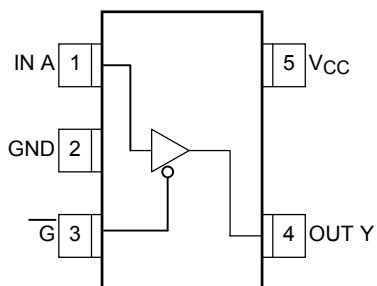


Weight : 0.001 g (Typ.)

Marking



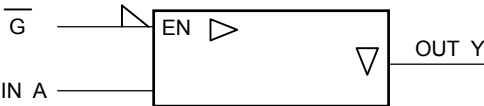
Pin Assignment (top view)



Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage range	V _{CC}	−0.5~7.0	V
DC input voltage	V _{IN}	−0.5~7.0	V
DC output voltage	V _{OUT}	−0.5~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	50	mW
Storage temperature	T _{stg}	−65~150	°C

Logic Diagram



Truth Table

\overline{G}	A	Y
H	X	Z
L	L	L
L	H	H

Recommended Operating Conditions

Characteristics	Symbol	Rating	Unit
Supply voltage	V _{CC}	2.0~5.5	V
Input voltage	V _{IN}	0~5.5	V
Output voltage	V _{OUT}	0~V _{CC}	V
Operating temperature	T _{opr}	−40~85	°C
Input rise and fall time	dt/dv	0~100 (V _{CC} = 3.3 ± 0.3 V)	ns/V
		0~20 (V _{CC} = 5 ± 0.5 V)	

Electrical Characteristics
DC Characteristics

Characteristics	Symbol	Test Circuit	Test Condition		Ta = 25°C			Ta = -40~85°C		Unit
					V _{CC} (V)	Min	Typ.	Max	Min	Max
High-level input voltage	V _{IH}	—	—	—	2.0	1.5	—	—	1.5	—
					3.0~5.5	V _{CC} × 0.7	—	—	V _{CC} × 0.7	—
Low-level input voltage	V _{IL}	—	—	—	2.0	—	—	0.50	—	0.50
					3.0~5.5	—	—	V _{CC} × 0.3	—	V _{CC} × 0.3
High-level output voltage	V _{OH}	—	V _{IN} = V _{IH} or V _{IL}	I _{OH} = -50 μA	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 mA	3.0	2.58	—	—	2.48	—
				I _{OH} = -8 mA	4.5	3.94	—	—	3.80	—
Low-level output voltage	V _{OL}	—	V _{IN} = V _{IH}	I _{OL} = 50 μA	2.0	—	0	0.1	—	0.1
					3.0	—	0	0.1	—	0.1
					4.5	—	0	0.1	—	0.1
				I _{OL} = 4 mA	3.0	—	—	0.36	—	0.44
				I _{OL} = 8 mA	4.5	—	—	0.36	—	0.44
3-state output off-state current	I _{OZ}	—	V _{IN} = V _{IH} or V _{IL} V _{OUT} = V _{CC} or GND		5.5	—	—	±0.25	—	±2.5
Input leakage current	I _{IN}	—	V _{IN} = 5.5 V or GND		0~5.5	—	—	±0.1	—	±1.0
Quiescent supply current	I _{CC}	—	V _{IN} = V _{CC} or GND		5.5	—	—	2.0	—	20.0

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

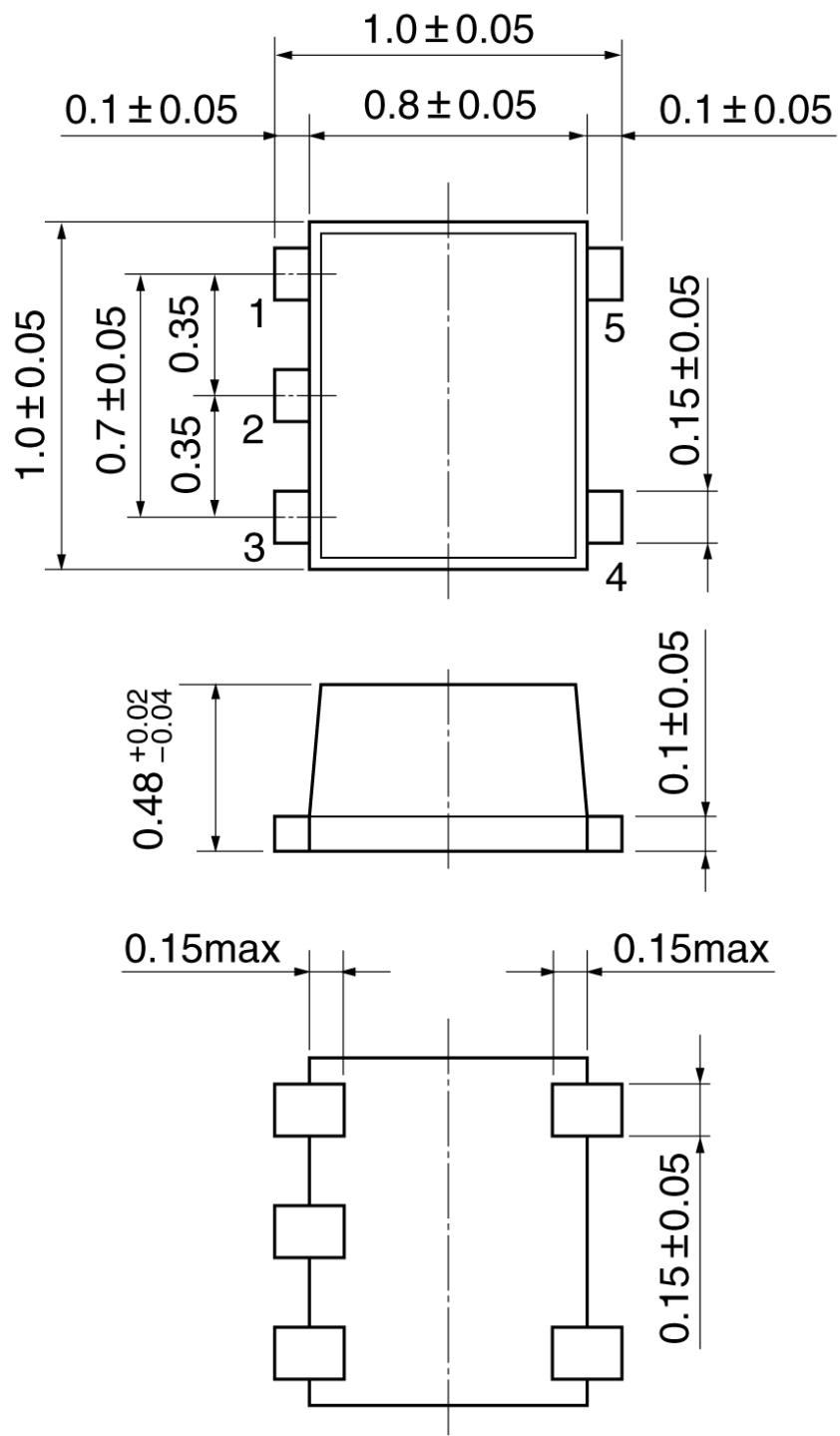
Characteristics	Symbol	Test Circuit	Test Condition		Ta = 25°C			Ta = -40~85°C		Unit
			V _{CC} (V)	C _L (pF)	Min	Typ.	Max	Min	Max	
Propagation delay time	t_{pLH} t_{pHL}	—	3.3 ± 0.3	15	—	5.6	8.0	1.0	9.5	ns
				50	—	8.1	11.5	1.0	13.0	
			5.0 ± 0.5	15	—	3.8	5.5	1.0	6.5	
				50	—	5.3	7.5	1.0	8.5	
3-state output enable time	t_{pZL} t_{pZH}	—	3.3 ± 0.3	15	—	5.4	8.0	1.0	9.5	ns
				50	—	7.9	11.5	1.0	13.0	
			5.0 ± 0.5	15	—	3.6	5.1	1.0	6.0	
				50	—	5.1	7.1	1.0	8.0	
3-state output disable time	t_{pLZ} t_{pHZ}	—	3.3 ± 0.3	50	—	9.5	13.2	1.0	15.0	ns
			5.0 ± 0.5	50	—	6.1	8.8	1.0	10.0	
Input capacitance	C _{IN}	—	—		—	4	10	—	10	pF
Output capacitance	C _{OUT}	—	—		—	6	—	—	—	pF
Power dissipation capacitance	C _{PD}	—	(Note)		—	14	—	—	—	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:

$$I_{CC (opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$

Package Dimensions



Weight: 0.001 g (typ.)

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