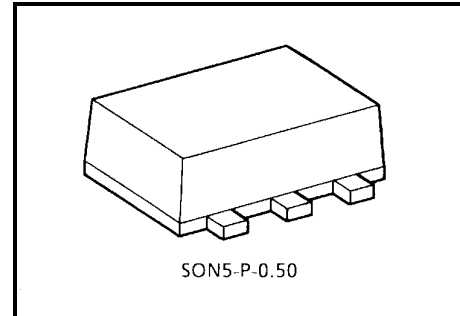


TC7SZU04AFE

Inverter

Features

- High output drive: ± 16 mA (typ.)
@ $V_{CC} = 3$ V
- Low quiescent power: $I_{CC} < 2$ μ A (max)
@ $V_{CC} = 5.5$ V, $T_a = 25^\circ\text{C}$
- Operation voltage range: $V_{CC} (\text{opr}) = 1.8 \sim 5.5$ V
- Supply voltage data retention: $V_{CC} = 1.5 \sim 5.5$ V
- Latch-up performance: ± 500 mA
- ESD performance: Human body model $> \pm 2000$ V
Machine model $> \pm 200$ V
- Power down protection is provided on all inputs.



Weight: 0.003 g (typ.)

Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Supply voltage range	V_{CC}	$-0.5 \sim 6$	V
DC input voltage	V_{IN}	$-0.5 \sim 6$	V
DC output voltage	V_{OUT}	$-0.5 \sim V_{CC} + 0.5$	V
Input diode current	I_{IK}	± 20	mA
Output diode current	I_{OK}	± 20	mA
DC output current	I_{OUT}	± 50	mA
DC V_{CC} /ground current	I_{CC}	± 50	mA
Power dissipation	P_D	150	mW
Storage temperature	T_{stg}	$-65 \sim 150$	$^\circ\text{C}$
Lead temperature (10 s)	T_L	260	$^\circ\text{C}$

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}	—	—		1.8	0.85 × V _{CC}	—	—	0.85 × V _{CC}	—
					2.3- 5.5	0.8 × V _{CC}	—	—	0.8 × V _{CC}	—
Low-level input voltage	V _{IL}	—	V _{IN} = V _{IH} or V _{IL}		1.8	—	—	0.15 × V _{CC}	—	0.15 × V _{CC}
					2.3- 5.5	—	—	0.2 × V _{CC}	—	0.2 × V _{CC}
High-level output voltage	V _{OH}	—	V _{IN} = V _{IL}	I _{OH} = -100 μA	1.8	1.6	1.8	—	1.6	—
					2.3	2.1	2.3	—	2.1	—
					3.0	2.7	3.0	—	2.7	—
					4.5	4.0	4.4	—	4.0	—
			V _{IN} = GND	I _{OH} = -4 mA	2.3	1.9	2.14	—	1.9	—
				I _{OH} = -8 mA	3.0	2.4	2.75	—	2.4	—
				I _{OH} = -12 mA	3.0	2.3	2.61	—	2.3	—
				I _{OH} = -16 mA	4.5	3.8	4.13	—	3.8	—
Low-level output voltage	V _{OL}	—	V _{IN} = V _{IH}	I _{OL} = 100 μA	1.8	—	0	0.2	—	0.2
					2.3	—	0	0.2	—	0.2
					3.0	—	0	0.3	—	0.3
					4.5	—	0	0.5	—	0.5
			V _{IN} = V _{CC}	I _{OL} = 4 mA	2.3	—	0.1	0.3	—	0.3
				I _{OL} = 8 mA	3.0	—	0.17	0.4	—	0.4
				I _{OL} = 12 mA	3.0	—	0.25	0.55	—	0.55
				I _{OL} = 16 mA	4.5	—	0.26	0.55	—	0.55
Input leakage current	I _{IN}	—	V _{IN} = 5.5 V or GND		0- 5.5	—	—	±1	—	±10
Quiescent supply current	I _{CC}	—	V _{IN} = V _{CC} or GND		5.5	—	—	2	—	20

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

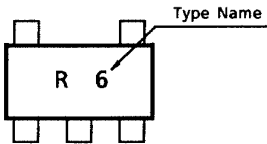
Characteristics	Symbol	Test Circuit	Test Condition	Ta = 25°C				Ta = -40~85°C		Unit
				VCC (V)	Min	Typ.	Max	Min	Max	
Propagation delay time	t_{PLH} t_{PHL}	—	$C_L = 15\text{ pF}$, $R_L = 1\text{ M}\Omega$	1.8	1.0	—	8.5	1.0	9.0	ns
				2.5 ± 0.2	0.8	—	6.2	0.8	6.5	
				3.3 ± 0.3	0.5	—	4.5	0.5	4.8	
				5.0 ± 0.5	0.5	—	3.9	0.5	4.1	
			$C_L = 50\text{ pF}$, $R_L = 500\text{ }\Omega$	3.3 ± 0.3	1.0	—	6.0	1.0	6.5	
				5.0 ± 0.5	0.8	—	5.0	0.8	5.5	
Input capacitance	C_{IN}	—	—	0-5.5	—	5	—	—	—	pF
Power dissipation capacitance	C_{PD}	—	(Note)	3.3	—	9	—	—	—	pF
				5.5	—	25	—	—	—	

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

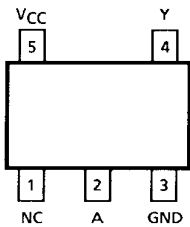
Average operating current can be obtained by the equation.

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

Marking



Pin Assignment (top view)



Truth Table

A	Y
L	H
H	L

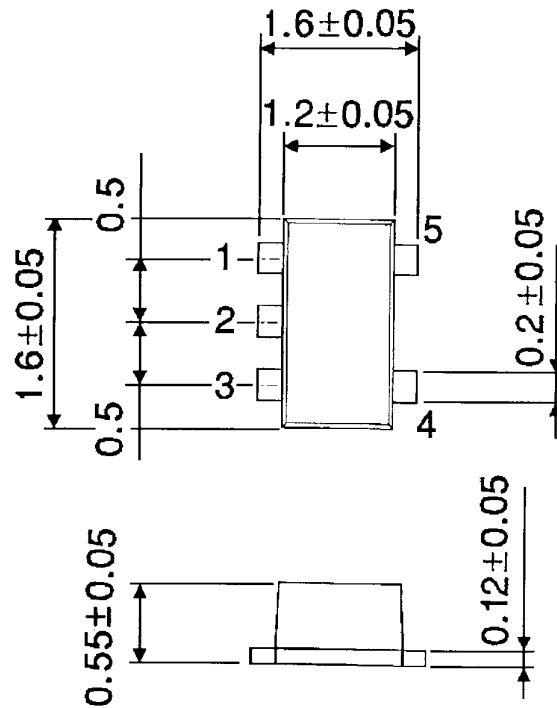
Logic Diagram



Package Dimensions

SON5-P-0.50

Unit : mm



Weight: 0.003 g (typ.)

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