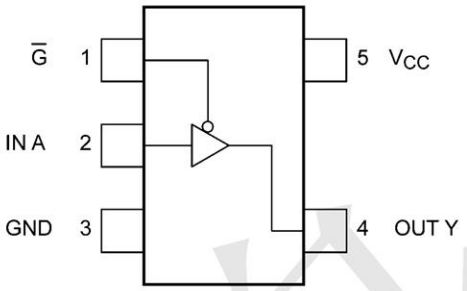
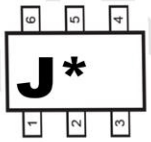
Features

- Wide operating temperature range: T_{opr} = -40 to 125 ℃ (Note 2)
- High output current: ±24 mA (min) at V_{CC} = 3.0 V
- Super high speed operation: t_{pd} = 2.6 ns (typ.) at V_{CC} = 5.0 V, C_L = 50 pF
- Operation voltage range: V_{CC} = 1.65 to 5.5 V
- 5.5 V tolerant inputs
- 5.5 V power down protection output

Pin Configuration



Marking Information



" J " is part number,fixed

" * " is internal code

Input A	Input $\overline{G}$	Output Y
X	H	Z
L	L	L
H	L	H

X: Don't care
Z: High impedance

Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Note	Rating	Unit
Supply voltage	V_{CC}		-0.5 to 6.0	V
Input voltage	V_{IN}		-0.5 to 6.0	V
DC output voltage	V_{OUT}	(Note 1)	-0.5 to 6.0	V
		(Note 2)	-0.5 to V_{CC} + 0.5	
Input diode current	I_{IK}		-20	mA
Output diode current	I_{OK}	(Note 3)	-20	mA
DC output current	I_{OUT}		±50	mA
V_{CC}/ground current	I_{CC}		±50	mA
Power dissipation	P_D		200	mW
Storage temperature	T_{stg}		-65 to 150	°C

Note 1: V_{CC} = 0 V or high impedance condition
Note 2: High (H) or Low (L) state. I_{OUT} absolute maximum rating must be observed.
Note 3: V_{OUT} < GND

Operating Ranges (Note)

Characteristics	Symbol	Note	Test Condition	Rating	Unit
Supply voltage	V_{CC}		—	1.65 to 5.5	V
		(Note 1)	—	1.5 to 5.5	
Input voltage	V_{IN}		—	0 to 5.5	V
Output voltage	V_{OUT}	(Note 2)	—	0 to 5.5	V
		(Note 3)	—	0 to V_{CC}	
Operating temperature	T_{opr}	(Note 4)	—	-40 to 125	°C
		(Note 5)	—	-40 to 85	
Input rise and fall time	dt/dv		V_{CC} = 1.8 ± 0.15 V, 2.5 ± 0.2 V	0 to 20	ns/V
			V_{CC} = 3.3 ± 0.3 V	0 to 10	
			V_{CC} = 5.0 ± 0.5 V	0 to 5	

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: Data retention only
Note 2: V_{CC} = 0 V or high impedance condition
Note 3: High (H) or Low (L) state.
Note 4: For devices with the ordering part number ending in J(CT.
Note 5: For devices except those with the ordering part number ending in J(CT.

Electrical Characteristics

DC Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition		V_{CC} (V)	Min	Typ.	Max	Unit
High-level input voltage	V_{IH}	—		1.65 to 1.95	V_{CC} × 0.88	—	—	V
				2.3 to 5.5	V_{CC} × 0.75	—	—	
Low-level input voltage	V_{IL}	—		1.65 to 1.95	—	—	V_{CC} × 0.12	V
				2.3 to 5.5	—	—	V_{CC} × 0.25	
High-level output voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -100 μA	1.65	1.55	1.65	—	V
				2.3	2.2	2.3	—	
				3.0	2.9	3.0	—	
				4.5	4.4	4.5	—	
			I_{OH} = -8 mA	2.3	1.9	2.15	—	
			I_{OH} = -16 mA	3.0	2.4	2.8	—	
			I_{OH} = -24 mA	3.0	2.3	2.68	—	
			I_{OH} = -32 mA	4.5	3.8	4.2	—	
Low-level output voltage	V_{OL}	V_{IN} = V_{IL}	I_{OL} = 100 μA	1.65	—	0.0	0.1	V
				2.3	—	0.0	0.1	
				3.0	—	0.0	0.1	
				4.5	—	0.0	0.1	
			I_{OL} = 8 mA	2.3	—	0.1	0.3	
			I_{OL} = 16 mA	3.0	—	0.15	0.4	
			I_{OL} = 24 mA	3.0	—	0.22	0.55	
			I_{OL} = 32 mA	4.5	—	0.22	0.55	
Input leakage current	I_{IN}	V_{IN} = 5.5 V or GND		0 to 5.5	—	—	±1.0	μA
3-state output OFF-state leakage current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = 0 to 5.5 V		1.65 to 5.5	—	—	±1.0	μA
Power-OFF leakage current	I_{OFF}	V_{IN} or V_{OUT} = 5.5 V		0	—	—	1	μA
Quiescent supply current	I_{CC}	V_{IN} = V_{CC} or GND		5.5	—	—	2	μA

DC Characteristics (Unless otherwise specified, T_a = -40 to 85 °C)

Characteristics	Symbol	Test Condition		V_{CC} (V)	Min	Max	Unit
High-level input voltage	V_{IH}	—		1.65 to 1.95	V_{CC} × 0.88	—	V
				2.3 to 5.5	V_{CC} × 0.75	—	
Low-level input voltage	V_{IL}	—		1.65 to 1.95	—	V_{CC} × 0.12	V
				2.3 to 5.5	—	V_{CC} × 0.25	
High-level output voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -100 μA	1.65	1.55	—	V
				2.3	2.2	—	
				3.0	2.9	—	
				4.5	4.4	—	
			I_{OH} = -8 mA	2.3	1.9	—	
			I_{OH} = -16 mA	3.0	2.4	—	
			I_{OH} = -24 mA	3.0	2.3	—	
			I_{OH} = -32 mA	4.5	3.8	—	
Low-level output voltage	V_{OL}	V_{IN} = V_{IL}	I_{OL} = 100 μA	1.65	—	0.1	V
				2.3	—	0.1	
				3.0	—	0.1	
				4.5	—	0.1	
			I_{OL} = 8 mA	2.3	—	0.3	
			I_{OL} = 16 mA	3.0	—	0.4	
			I_{OL} = 24 mA	3.0	—	0.55	
			I_{OL} = 32 mA	4.5	—	0.55	
Input leakage current	I_{IN}	V_{IN} = 5.5 V or GND		0 to 5.5	—	±10.0	μA
3-state output OFF-state leakage current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = 0 to 5.5 V		1.65 to 5.5	—	±10.0	μA
Power-OFF leakage current	I_{OFF}	V_{IN} or V_{OUT} = 5.5 V		0	—	10	μA
Quiescent supply current	I_{CC}	V_{IN} = V_{CC} or GND		5.5	—	20	μA

DC Characteristics (Note) (Unless otherwise specified, T_a = -40 to 125 ℃)

Characteristics	Symbol	Test Condition		V_{CC} (V)	Min	Max	Unit
High-level input voltage	V_{IH}	—		1.65 to 1.95	V_{CC} × 0.88	—	V
				2.3 to 5.5	V_{CC} × 0.75	—	
Low-level input voltage	V_{IL}	—		1.65 to 1.95	—	V_{CC} × 0.12	V
				2.3 to 5.5	—	V_{CC} × 0.25	
High-level output voltage	V_{OH}	V_{IN} = V_{IH} or V_{IL}	I_{OH} = -100 μA	1.65	1.55	—	V
				2.3	2.2	—	
				3.0	2.9	—	
				4.5	4.4	—	
			I_{OH} = -8 mA	2.3	1.7	—	
			I_{OH} = -16 mA	3.0	2.2	—	
			I_{OH} = -24 mA	3.0	2.0	—	
			I_{OH} = -32 mA	4.5	3.4	—	
Low-level output voltage	V_{OL}	V_{IN} = V_{IL}	I_{OL} = 100 μA	1.65	—	0.1	V
				2.3	—	0.1	
				3.0	—	0.1	
				4.5	—	0.1	
			I_{OL} = 8 mA	2.3	—	0.45	
			I_{OL} = 16 mA	3.0	—	0.6	
			I_{OL} = 24 mA	3.0	—	0.8	
			I_{OL} = 32 mA	4.5	—	0.8	
Input leakage current	I_{IN}	V_{IN} = 5.5 V or GND		0 to 5.5	—	±20.0	μA
3-state output OFF-state leakage current	I_{OZ}	V_{IN} = V_{IH} or V_{IL} V_{OUT} = 0 to 5.5 V		1.65 to 5.5	—	±20.0	μA
Power-OFF leakage current	I_{OFF}	V_{IN} or V_{OUT} = 5.5 V		0	—	100	μA
Quiescent supply current	I_{CC}	V_{IN} = V_{CC} or GND		5.5	—	200	μA

Note: For devices with the ordering part number ending in J(CT.

AC Characteristics (Unless otherwise specified, T_a = 25 °C, Input: $t_r = t_f$ = 3 ns)

Characteristics	Symbol	Note	Test Condition	V_{CC} (V)	C_L (pF)	Min	Typ.	Max	Unit
Propagation delay time	t_{PLH},t_{PHL}		R_L = 1 MΩ See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	15	2.0	5.3	11.0	ns
				2.5 ± 0.2		0.8	3.4	7.5	
				3.3 ± 0.3		0.5	2.5	5.2	
				5.0 ± 0.5		0.5	2.1	4.5	
			R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	3.3 ± 0.3	50	1.5	3.2	5.7	ns
				5.0 ± 0.5		0.8	2.6	5.0	
Output enable time	t_{PZL},t_{PZH}		R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	50	2.0	7.0	12.5	ns
				2.5 ± 0.2		1.5	4.6	8.5	
				3.3 ± 0.3		1.5	3.5	6.2	
				5.0 ± 0.5		0.8	2.8	5.5	
Output disable time	t_{PLZ},t_{PHZ}		R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	50	2.0	5.4	11.0	ns
				2.5 ± 0.2		1.5	3.5	8.0	
				3.3 ± 0.3		1.0	2.8	5.7	
				5.0 ± 0.5		0.5	2.1	4.7	
Input capacitance	C_{IN}		—	0 to 5.5	—	—	4	—	pF
Power dissipation capacitance	C_{PD}	(Note 1)	—	3.3	—	—	17	—	pF
				5.5		—	24	—	

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.

AC Characteristics
(Unless otherwise specified, T_a = -40 to 85 °C, Input: $t_r = t_f$ = 3 ns)

Characteristics	Symbol	Test Condition	V_{CC} (V)	C_L (pF)	Min	Max	Unit
Propagation delay time	t_{PLH},t_{PHL}	R_L = 1 MΩ See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	15	2.0	11.5	ns
			2.5 ± 0.2		0.8	8.0	
			3.3 ± 0.3		0.5	5.5	
			5.0 ± 0.5		0.5	4.8	
		R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	3.3 ± 0.3	50	1.5	6.0	ns
			5.0 ± 0.5		0.8	5.3	
Output enable time	t_{PZL},t_{PZH}	R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	50	2.0	13.0	ns
			2.5 ± 0.2		1.5	9.0	
			3.3 ± 0.3		1.5	6.5	
			5.0 ± 0.5		0.8	5.8	
Output disable time	t_{PLZ},t_{PHZ}	R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	50	2.0	12.0	ns
			2.5 ± 0.2		1.5	8.5	
			3.3 ± 0.3		1.0	6.0	
			5.0 ± 0.5		0.5	5.0	

AC Characteristics (Note)
(Unless otherwise specified, T_a = -40 to 125 °C, Input: $t_r = t_f$ = 3 ns)

Characteristics	Symbol	Test Condition	V_{CC} (V)	C_L (pF)	Min	Max	Unit
Propagation delay time	t_{PLH},t_{PHL}	R_L = 1 MΩ See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	15	2.0	13.0	ns
			2.5 ± 0.2		0.8	9.0	
			3.3 ± 0.3		0.5	6.5	
			5.0 ± 0.5		0.5	5.5	
		R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	3.3 ± 0.3	50	1.5	7.0	ns
			5.0 ± 0.5		0.8	6.0	
Output enable time	t_{PZL},t_{PZH}	R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	50	2.0	14.5	ns
			2.5 ± 0.2		1.5	10.0	
			3.3 ± 0.3		1.5	7.5	
			5.0 ± 0.5		0.8	6.5	
Output disable time	t_{PLZ},t_{PHZ}	R_L = 500 Ω See 9.7 AC Test Circuit, Table 9.7.1	1.8 ± 0.15	50	2.0	13.5	ns
			2.5 ± 0.2		1.5	9.5	
			3.3 ± 0.3		1.0	7.0	
			5.0 ± 0.5		0.5	5.5	

Note: For devices with the ordering part number ending in J(CT.

AC Test Circuit

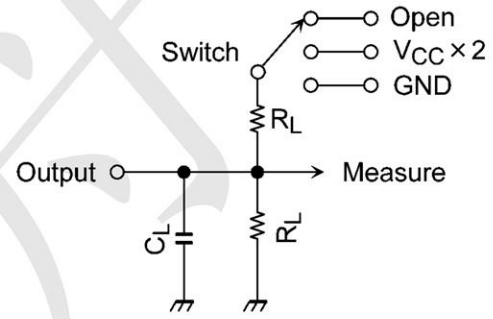
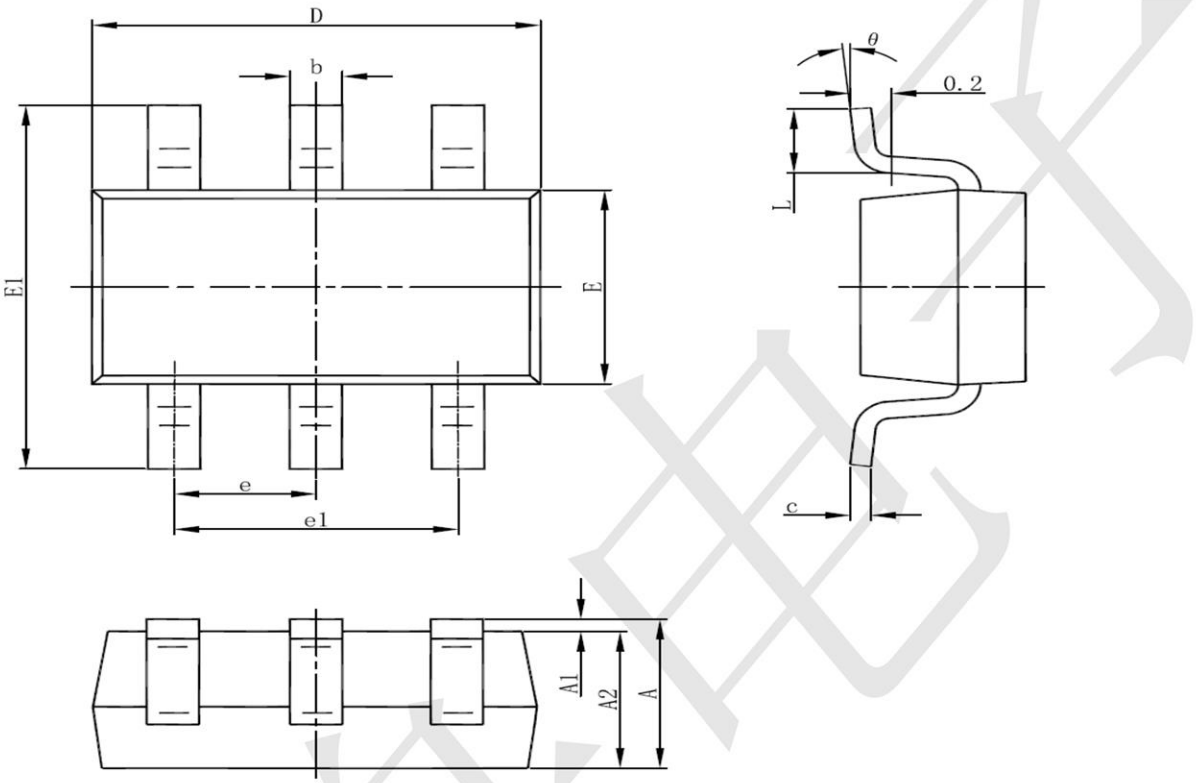


Table 9.7.1 Parameter for AC Test Circuit

Characteristics	Switch
t_{PLH}, t_{PHL}	Open
t_{PLZ}, t_{PZL}	V_{CC} × 2
t_{PHZ}, t_{PZH}	GND

SOT23-5 Package Outline Drawing



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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