



AiP74LVC1G32-Q1

Single 2-input Or Gate

Product Specification

Specification Revision History:

Version	Date	Description
2023-08-A0	2023-08	New
2024-03-A1	2024-03	Modify parameters
2024-04-A2	2024-04	Modify the content



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1、General Description

The AiP74LVC1G32-Q1 provides one 2-input OR function.

Inputs can be driven from either 3.3V or 5V devices. This feature allows the use of these devices as translators in mixed 3.3V and 5V applications.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

Features:

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
- Wide supply voltage range from 1.65V to 5.5V
- Input accepts voltages up to 5.5V
- $\pm 24\text{mA}$ output drive ($V_{CC}=3.0\text{V}$)
- High-impedance when $V_{CC}=0\text{V}$
- ESD-HBM: 2000V (AEC-Q100-002)
- ESD-CDM: All pins 750V(AEC-Q100-011)
- LATCH-UP: $\pm 100\text{mA}$, $T_a=125^\circ\text{C}$ (AEC-Q100-004)
- Specified from -40°C to $+125^\circ\text{C}$
- Packaging information: SOT23-5

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC1G32-Q1GB235.TR	SOT23-5	ALQXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm

Note 1: "XX" refers to variable content, meaning year and package batch serial number.

Note 2: If the physical information is inconsistent with the ordering information, please refer to the actual product.



2、Block Diagram And Pin Description

2.1、Block Diagram

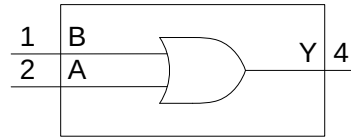
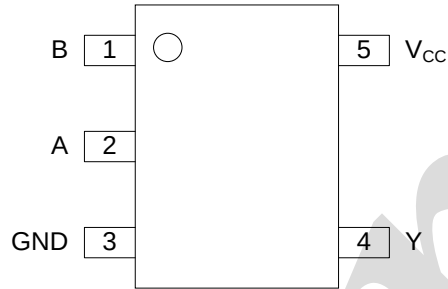


Figure 1. Logic symbol

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	B	data input
2	A	data input
3	GND	ground (0V)
4	Y	data output
5	Vcc	supply voltage

2.4、Function Table

Input		Output
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

Note: H=HIGH voltage level; L=LOW voltage level.



3、Electrical Parameter

3.1、Absolute Maximum Ratings

(Voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+6.5	V
input voltage	V_I	-	-0.5	+6.5	V
output voltage	V_O	Active mode	-0.5	$V_{CC}+0.5$	V
		Power-down mode; $V_{CC}=0V$	-0.5	+6.5	V
input clamping current	I_{IK}	$V_I < 0V$	-50	-	mA
output clamping current	I_{OK}	$V_O > V_{CC}$ or $V_O < 0V$	-	± 50	mA
output current	I_O	$V_O=0V$ to V_{CC}	-	± 50	mA
supply current	I_{CC}	-	-	100	mA
ground current	I_{GND}	-	-100	-	mA
storage temperature	T_{stg}	-	-65	+150	°C
soldering temperature	T_L	10s	260		°C

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	1.65	-	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	Active mode	0	-	V_{CC}	V
		Power-down mode; $V_{CC}=0V$	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	°C



3.3、Electrical Characteristics

3.3.1、DC Characteristics

($T_{amb} = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Sym	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	1.65V to 1.95V	-	$0.65 \times V_{CC}$	-	-	V
		2.3V to 2.7V	-	1.7	-	-	V
		2.7V to 3.6V	-	2.0	-	-	V
		4.5V to 5.5V	-	$0.7 \times V_{CC}$	-	-	V
LOW-level input voltage	V_{IL}	1.65V to 1.95V	-	-	-	$0.35 \times V_{CC}$	V
		2.3V to 2.7V	-	-	-	0.7	V
		2.7V to 3.6V	-	-	-	0.8	V
		4.5V to 5.5V	-	-	-	$0.3 \times V_{CC}$	V
HIGH-level output voltage	V_{OH}	1.65V to 5.5V	$I_O = -100\mu\text{A}$	$V_{CC} - 0.1$	-	-	V
		1.65V	$I_O = -4\text{mA}$	0.95	1.54	-	V
		2.3V	$I_O = -8\text{mA}$	1.7	2.15	-	V
		2.7V	$I_O = -12\text{mA}$	1.9	2.50	-	V
		3.0V	$I_O = -24\text{mA}$	2.0	2.62	-	V
		4.5V	$I_O = -32\text{mA}$	3.4	4.11	-	V
LOW-level output voltage	V_{OL}	1.65V to 5.5V	$I_O = 100\mu\text{A}$	-	-	0.10	V
		1.65V	$I_O = 4\text{mA}$	-	0.07	0.70	V
		2.3V	$I_O = 8\text{mA}$	-	0.12	0.45	V
		2.7V	$I_O = 12\text{mA}$	-	0.17	0.60	V
		3.0V	$I_O = 24\text{mA}$	-	0.33	0.80	V
		4.5V	$I_O = 32\text{mA}$	-	0.39	0.80	V
input leakage current	I_I	0V to 5.5V	$V_I = 5.5\text{V}$ or GND	-	-	± 2	μA
power-off leakage	I_{OFF}	0V	V_I or $V_O = 5.5\text{V}$	-	-	± 2	μA
supply current	I_{CC}	1.65V to 5.5V	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}$	-	-	4	μA
additional supply current	ΔI_{CC}	2.3V to 5.5V	per input pin; $V_I = V_{CC} - 0.6\text{V}$; $I_O = 0\text{A}$	-	-	500	μA

Note: All typical values are measured at $T_{amb} = 25^{\circ}\text{C}$.



3.3.2、AC Characteristics

($T_{amb}=-40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
A, B and C to Y propagation delay	t_{PLH} , t_{PHL}	1.65V to 1.95V	see Figure 3	-	3.8	7.6	ns
		2.3V to 2.7V		-	2.9	5.8	ns
		2.7V		-	2.9	5.8	ns
		3.0V to 3.6V		-	2.5	5	ns
		4.5V to 5.5V		-	2.1	4.2	ns

Note:

[1] Typical values are measured at $T_{amb}=25^{\circ}\text{C}$ and $V_{CC}=1.8\text{V}$, 2.5V , 2.7V , 3.3V and 5.0V respectively.

4、Testing Circuit

4.1、AC Testing Circuit

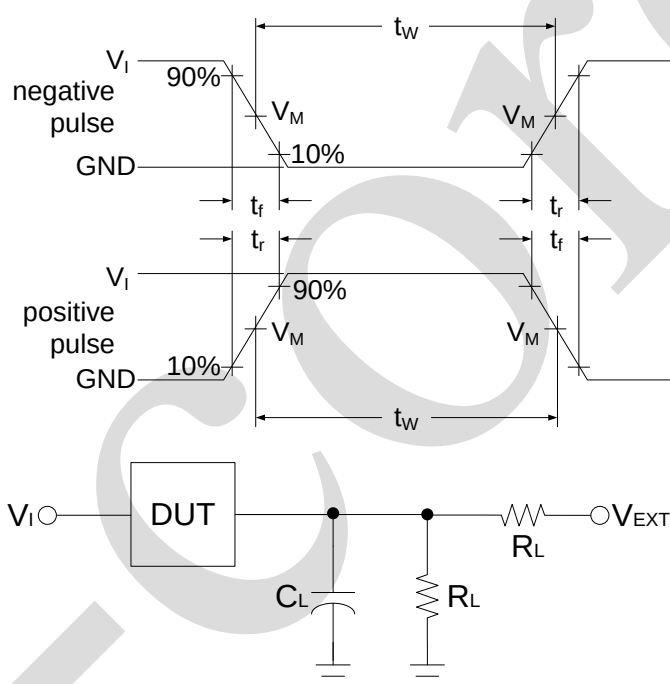


Figure 2. AC Testing Circuit

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.



4.2、Test Data

Supply voltage	Input		Load		V_{EXT}
V_{CC}	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}, t_{PHL}
1.65V to 1.95V	V_{CC}	$\leq 3ns$	30pF	1k Ω	open
2.3V to 2.7V	V_{CC}	$\leq 3ns$	30pF	500 Ω	open
2.7V	2.7V	$\leq 3ns$	50pF	500 Ω	open
3.0V to 3.6V	2.7V	$\leq 3ns$	50pF	500 Ω	open
4.5V to 5.5V	V_{CC}	$\leq 3ns$	50pF	500 Ω	open

4.3、AC Testing Waveforms

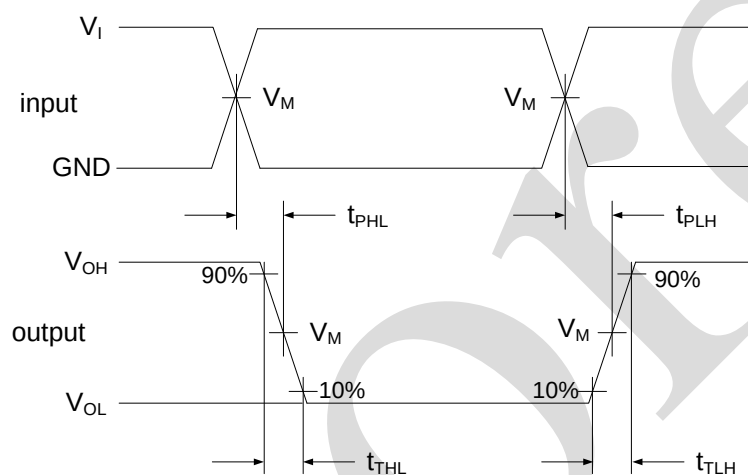


Figure 3. The input A, B to output Y propagation delays

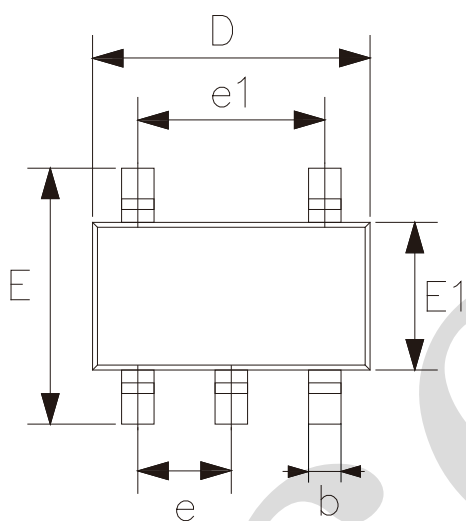
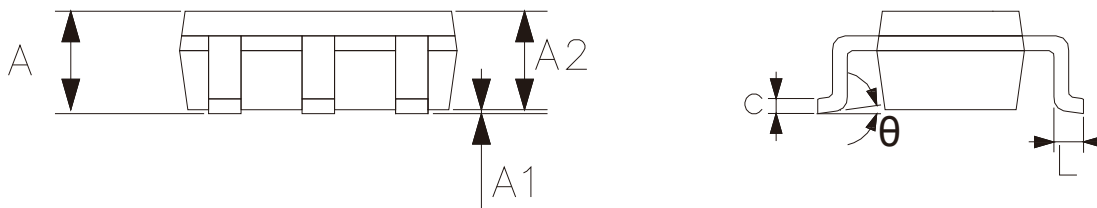
4.4、Measurement Points

Supply voltage	Input	Output
V_{CC}	V_M	V_M
1.65V to 1.95V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2.3V to 2.7V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
2.7V	1.5V	1.5V
3.0V to 3.6V	1.5V	1.5V
4.5V to 5.5V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$



5、Package Information

5.1、SOT23-5



2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	—	1.26
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°



6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、Notes

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