AiP74LVC1G08-Q1
Single 2-input And Gate

Product　　　Specification

Specification Revision History：

Version	Date	Description
2022-09-A1	2022-09	New

Contents

1、General Description

The AiP74LVC1G08-Q1 provides one 2-input AND 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)
- Supply voltage range:1.65V to 5.5V
- Input accepts voltages up to 5.5V
- $\pm$24mA output drive (V_{CC}=3.0V)
- High-impedance when V_{CC}=0V
- ESD-HBM:2000V(AEC-Q100-002)
- ESD-CDM:All pins 500V,Corner pins 750V(AEC-Q100-011)
- LATCH-UP:$\pm$100mA,Ta=125℃(AEC-Q100-004)
- Specified from -40℃ to +125℃
- Packaging information: SOT-353

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC1G08-Q1GC353.TR	SOT-353	AEQXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing:0.65mm

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
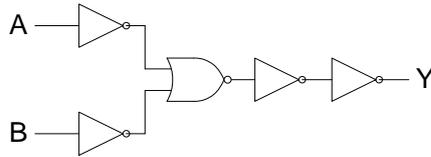
Figure 1. Logic diagram

2.2、Pin Configurations
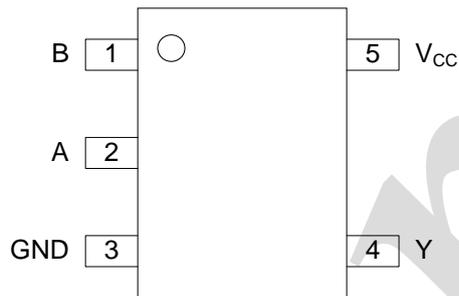
2.3、Pin Description

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

2.4、Function Table

Input		Output
A	**B**	**Y**
L	L	L
L	H	L
H	L	L
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
supply current	I_{CC}	-	-	100	mA
ground current	I_{GND}	-	-100	-	mA
input clamping current	I_{IK}	$V_I < 0V$	-50	-	mA
output current	I_O	V_O=0V to V_{CC}	-	±50	mA
output clamping current	I_{OK}	$V_O > V_{CC}$ or $V_O < 0V$	-	±50	mA
storage temperature	T_{stg}	-	-65	+150	℃
soldering temperature	T_L	10s	260		℃

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	℃

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3.3、Electrical Characteristics

3.3.1、DC Characteristics

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	1.65 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}	1.65 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}	1.65 to 5.5V	I_O=-100uA	V_{CC}-0.1	-	-	V
		1.65V	I_O=-4mA	0.95	1.54	-	V
		2.3V	I_O=-8mA	1.7	2.15	-	V
		2.7V	I_O=-12mA	1.9	2.50	-	V
		3.0V	I_O=-24mA	2.0	2.62	-	V
		4.5V	I_O=-32mA	3.4	4.11	-	V
LOW-level output voltage	V_{OL}	1.65 to 5.5V	I_O=100uA	-	-	0.10	V
		1.65V	I_O=4mA	-	0.07	0.70	V
		2.3V	I_O=8mA	-	0.12	0.45	V
		2.7V	I_O=12mA	-	0.17	0.60	V
		3.0V	I_O=24mA	-	0.33	0.80	V
		4.5V	I_O=32mA	-	0.39	0.80	V
input leakage current	I_I	0 to 5.5V	V_I=5.5V or GND	-	-	±1	uA
power-off leakage current	I_{OFF}	0V	V_I or V_O=5.5V	-	-	±2	uA
supply current	I_{CC}	1.65 to 5.5V	V_I=5.5V or GND I_O=0A	-	-	4	uA
additional supply current	ΔI_{CC}	2.3 to 5.5V	One input at V_I=V_{CC}-0.6V; Other inputs at V_{CC} or GND; I_O=0A	-	-	500	uA

3.3.2、AC Characteristics

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

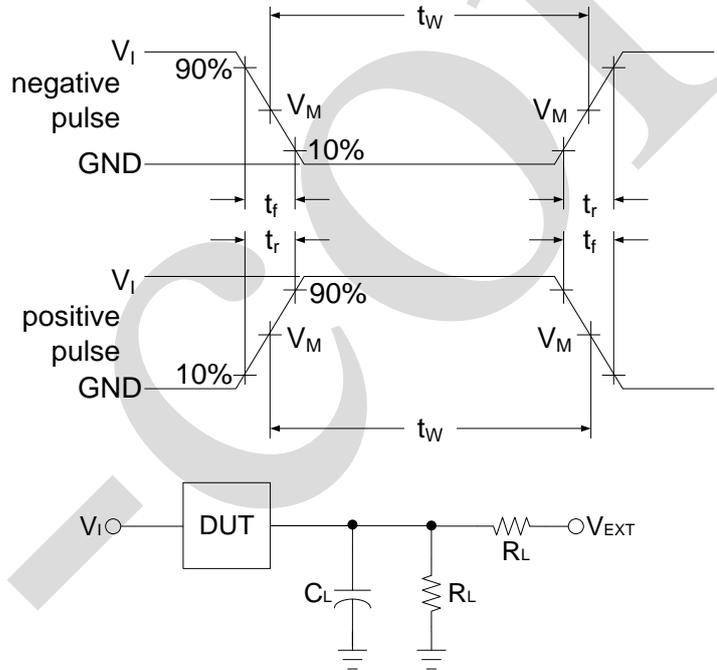| Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
propagation delay	t_{PHL}	1.65 to 1.95V	see Figure 3	-	-	20.8	ns
		2.3V to 2.7V		-	-	17.8	ns
		2.7V		-	-	17	ns
		3.0V to 3.6V		-	-	16.3	ns
		4.5V to 5.5V		-	-	15.5	ns
propagation delay	t_{PLH}	1.65 to 1.95V	see Figure 3	-	-	23	ns
		2.3V to 2.7V		-	-	17	ns
		2.7V		-	-	16.3	ns
		3.0V to 3.6V		-	-	14.8	ns
		4.5V to 5.5V		-	-	13.3	ns

4、Testing Circuit

4.1、AC Testing Circuit

Figure 2. Load circuit

C_L includes probe and jig capacitance.

R_L=Load resistance.

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}	t_{PLZ}/t_{PZL}	t_{PHZ}/t_{PZH}
1.65V to 1.95V	V_{CC}	$\leq$ 3ns	30pF	1kΩ	Open	2×V_{CC}	GND
2.3V to 2.7V	V_{CC}	$\leq$ 3ns	30pF	500Ω	Open	2×V_{CC}	GND
2.7V	V_{CC}	$\leq$ 3ns	50pF	500Ω	Open	2×V_{CC}	GND
3.0V to 3.6V	V_{CC}	$\leq$ 3ns	50pF	500Ω	Open	2×V_{CC}	GND
4.5V to 5.5V	V_{CC}	$\leq$ 3ns	50pF	500Ω	Open	2×V_{CC}	GND

4.3、AC Testing Waveforms
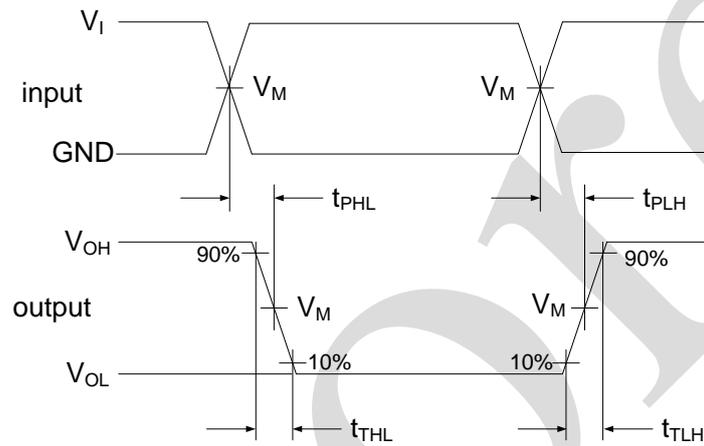
Figure 3. The input A, B to output Y propagation delays

4.4、Measurement Points

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

5、Package Information

5.1、SOT-353
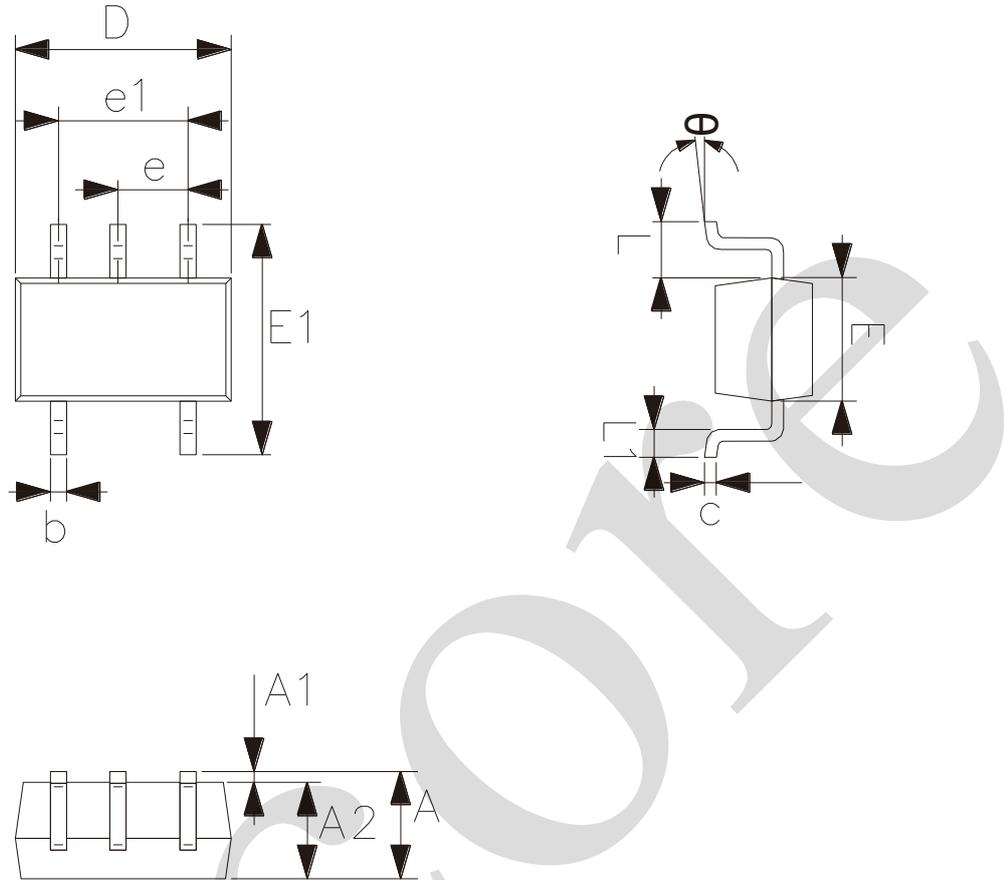
Symbol	Dimensions (mm)	
	Min.	Max.
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.15	0.35
c	0.11	0.175
D	2.00	2.20
E	1.15	1.35
E1	2.15	2.45
e	0.65	
e1	1.20	1.40
L	0.525	
L1	0.26	0.46
θ	0 °	8 °

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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