AiP74LVC1G18
1-to-2 Demultiplexer；3-state

Product Specification

Specification Revision History：

Version	Date	Description
2017-05-A1	2017-05	New
2023-04-B1	2023-04	Update the template

Contents

1、General Description

The AiP74LVC1G18 is a 1-of-2 non-inverting demultiplexer with a 3-state output. The device buffers the data on input pin A and passes it either to output 1Y or 2Y, depending on whether the state of the select input (pin S) is LOW or HIGH. Input can be driven from either 3.3 or 5V devices. These features allow the use of these devices in a mixed 3.3 and 5V environment.

Features:

- Wide supply voltage range from 1.65V to 5.5V
- 5V tolerant inputs for interfacing with 5V logic
- ±24mA output drive (V_{CC}=3.0V)
- CMOS low power consumption
- Specified from -40℃ to +125℃
- Packaging information: SOT-23-6/ SOT-363

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LVC1G18GB236.TR	SOT-23-6	AUXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74LVC1G18GC363.TR	SOT-363	AUXX	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

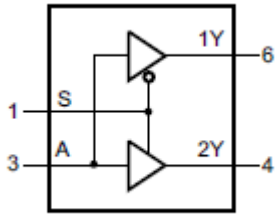
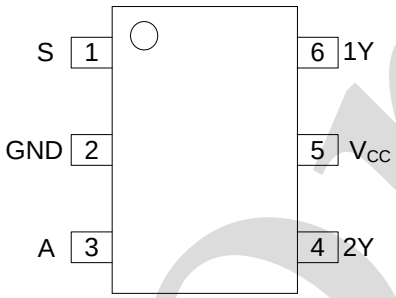


Figure 1. Logic symbol

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	S	data select
2	GND	ground (0V)
3	A	data input
4	2Y	data output
5	V_{CC}	supply voltage
6	1Y	data output

2.4、Function Table

Input		Output	
S	**A**	**1Y**	**2Y**
L	L	L	Z
L	H	H	Z
H	L	Z	L
H	H	Z	H

Note: H=HIGH voltage level; L=LOW voltage level; Z=high-impedance OFF-state.

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 clamping current	I_{IK}	$V_I < 0V$	-50	-	mA
input voltage	V_I	-	-0.5	+6.5	V
output clamping current	I_{OK}	$V_O > V_{CC}$ or $V_O < 0V$	-	±50	mA
output voltage	V_O	Active mode	-0.5	V_{CC}+0.5	V
		Power-down mode	-0.5	+6.5	V
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	℃
total power dissipation	P_{tot}	-	-	300	mW
Soldering temperature	T_L	10s	260		℃

Note: When V_{CC}=0V (Power-down mode), the output voltage can be 5.5V in normal operation.

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	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

(T_{amb}=-40℃ to +85℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.65V to 1.95V		0.65× V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.7	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7× V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V		-	-	0.35× V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.3× V_{CC}	V
HIGH-level output voltage	V_{OH}	V_I = V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=1.65V to 5.5V	V_{CC} - 0.1	-	-	V
			I_O=-4mA; V_{CC}=1.65V	1.2	-	-	V
			I_O=-8mA; V_{CC}=2.3V	1.9	-	-	V
			I_O=-12mA; V_{CC}=2.7V	2.2	-	-	V
			I_O=-24mA; V_{CC}=3.0V	2.3	-	-	V
			I_O=-32mA; V_{CC}=4.5V	3.8	-	-	V
LOW-level output voltage	V_{OL}	V_I = V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.65V to 5.5V	-	-	0.10	V
			I_O=4mA; V_{CC}=1.65V	-	-	0.45	V
			I_O=8mA; V_{CC}=2.3V	-	-	0.30	V
			I_O=12mA; V_{CC}=2.7V	-	-	0.40	V
			I_O=24mA; V_{CC}=3.0V	-	-	0.55	V
			I_O=32mA; V_{CC}=4.5V	-	-	0.55	V
input leakage current	I_I	V_I=5.5V or GND; V_{CC}=0V to 5.5V		-	-	±1	uA
OFF-state output current	I_{OZ}	V_I=V_{IH} or V_{IL}; V_O=V_{CC} or GND; V_{CC}=3.6V		-	-	±2	uA
power-off leakage current	I_{OFF}	V_I or V_O=5.5V; V_{CC}=0V		-	-	±2	uA
supply current	I_{CC}	V_I=5.5V or GND; I_O=0A; V_{CC}=1.65V to 5.5V		-	-	4	uA
additional supply current	ΔI_{CC}	per pin; V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.3V to 5.5V		-	-	500	uA
input capacitance	C_I	V_{CC}=3.3V; V_I= GND to V_{CC}		-	2.5	-	pF

Note: All typical values are measured at V_{CC}=3.3V and T_{amb}=25℃.

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.65V to 1.95V		0.65× V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.7	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7× V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V		-	-	0.35× V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.3× V_{CC}	V
HIGH-level output voltage	V_{OH}	V_I = V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=1.65V to 5.5V	V_{CC} - 0.1	-	-	V
			I_O=-4mA; V_{CC}=1.65V	0.95	-	-	V
			I_O=-8mA; V_{CC}=2.3V	1.7	-	-	V
			I_O=-12mA; V_{CC}=2.7V	1.9	-	-	V
			I_O=-24mA; V_{CC}=3.0V	2.0	-	-	V
			I_O=-32mA; V_{CC}=4.5V	3.4	-	-	V
LOW-level output voltage	V_{OL}	V_I = V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.65V to 5.5V	-	-	0.10	V
			I_O=4mA; V_{CC}=1.65V	-	-	0.70	V
			I_O=8mA; V_{CC}=2.3V	-	-	0.45	V
			I_O=12mA; V_{CC}=2.7V	-	-	0.60	V
			I_O=24mA; V_{CC}=3.0V	-	-	0.80	V
			I_O=32mA; V_{CC}=4.5V	-	-	0.80	V
input leakage current	I_I	V_I=5.5V or GND; V_{CC}=0V to 5.5V		-	-	±1	uA
OFF-state output current	I_{OZ}	V_I=V_{IH} or V_{IL}; V_O=V_{CC} or GND; V_{CC}=3.6V		-	-	±2	uA
power-off leakage current	I_{OFF}	V_I or V_O=5.5V; V_{CC}=0V		-	-	±2	uA
supply current	I_{CC}	V_I=5.5V or GND; I_O=0A; V_{CC}=1.65V to 5.5V		-	-	4	uA
additional supply current	ΔI_{CC}	per pin; V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.3V to 5.5V		-	-	500	uA

3.3.3、AC Characteristics 1

(T_{amb}=-40℃ to +85℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
A to nY propagation delay	t_{PLH}, t_{PHL}	see Figure 3	V_{CC}=1.65V to 1.95V	-	15.3	23.0	ns
			V_{CC}=2.3V to 2.7V	-	9.6	14.4	ns
			V_{CC}=2.7V	-	9.6	14.4	ns
			V_{CC}=3.0V to 3.6V	-	9	13.5	ns
			V_{CC}=4.5V to 5.5V	-	6.9	10.4	ns
S to nY; enable time	t_{PZH}, t_{PZL}	see Figure 4	V_{CC}=1.65V to 1.95V	-	17.4	26.1	ns
			V_{CC}=2.3V to 2.7V	-	10.8	16.2	ns
			V_{CC}=2.7V	-	10.8	16.2	ns
			V_{CC}=3.0V to 3.6V	-	9.3	14.0	ns
			V_{CC}=4.5V to 5.5V	-	7.2	10.8	ns
S to nY; disable time	t_{PLZ}, t_{PHZ}	see Figure 4	V_{CC}=1.65V to 1.95V	-	14.4	21.6	ns
			V_{CC}=2.3V to 2.7V	-	8.1	12.2	ns
			V_{CC}=2.7V	-	10.5	15.8	ns
			V_{CC}=3.0V to 3.6V	-	9.9	14.9	ns
			V_{CC}=4.5V to 5.5V	-	9.6	14.4	ns

Note:

[1] Typical values are measured at T_{amb}=25℃ and V_{CC}=1.8V, 2.5V, 2.7V, 3.3V and 5.0V respectively.

3.3.4、AC Characteristics 2

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

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
A to nY propagation delay	t_{PLH}, t_{PHL}	see Figure 3	V_{CC}=1.65V to 1.95V	-	-	28.7	ns
			V_{CC}=2.3V to 2.7V	-	-	18.1	ns
			V_{CC}=2.7V	-	-	18.1	ns
			V_{CC}=3.0V to 3.6V	-	-	17.0	ns
			V_{CC}=4.5V to 5.5V	-	-	13.1	ns
S to nY; enable time	t_{PZH}, t_{PZL}	see Figure 4	V_{CC}=1.65V to 1.95V	-	-	32.7	ns
			V_{CC}=2.3V to 2.7V	-	-	20.4	ns
			V_{CC}=2.7V	-	-	20.3	ns
			V_{CC}=3.0V to 3.6V	-	-	17.4	ns
			V_{CC}=4.5V to 5.5V	-	-	13.5	ns
S to nY; disable time	t_{PLZ}, t_{PHZ}	see Figure 4	V_{CC}=1.65V to 1.95V	-	-	27.1	ns
			V_{CC}=2.3V to 2.7V	-	-	15.1	ns
			V_{CC}=2.7V	-	-	19.7	ns
			V_{CC}=3.0V to 3.6V	-	-	18.5	ns
			V_{CC}=4.5V to 5.5V	-	-	17.9	ns

4、Testing Circuit

4.1、AC Testing Circuit

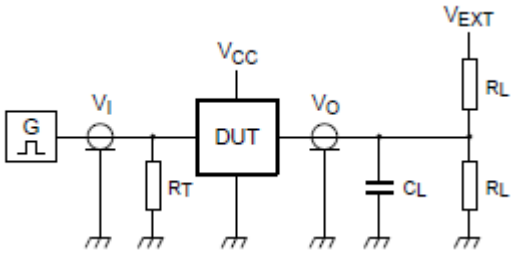


Figure 2. Test circuit for measuring switching times

Definitions for test circuit:

R_L=Load resistance.

C_L=Load capacitance including jig and probe capacitance.

R_T=Termination resistance; should be equal to the output impedance Z_o of the pulse generator.

V_{EXT}=External voltage for measuring switching times.

4.2、AC Testing Waveforms

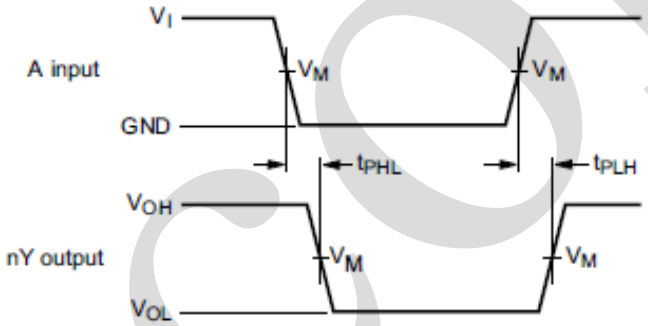


Figure 3. The input A to output Y propagation delays

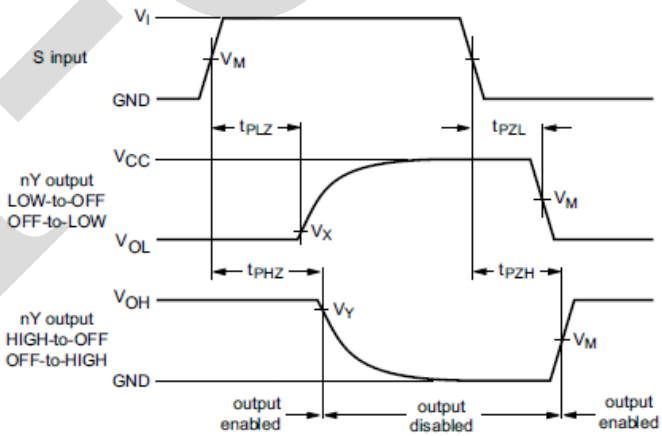


Figure 4. 3-state enable and disable times

4.3、Measurement Points

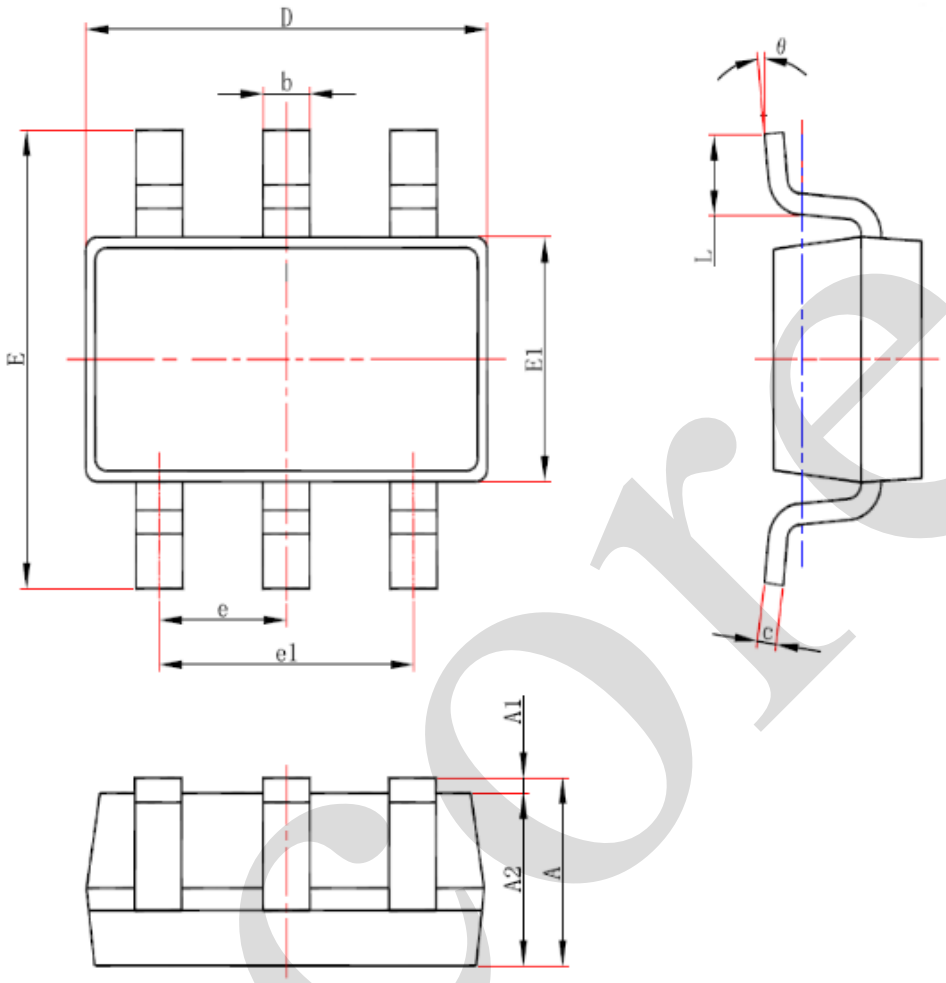
V_{CC}	V_M	Input	
		V_I	$t_r = t_f$
1.65V to 1.95V	$0.5 \times V_{CC}$	V_{CC}	≤ 2.0ns
2.3V to 2.7V	$0.5 \times V_{CC}$	V_{CC}	≤ 2.0ns
2.7V	1.5V	2.7V	≤ 2.5ns
3.0V to 3.6V	1.5V	2.7V	≤ 2.5ns
4.5V to 5.5V	$0.5 \times V_{CC}$	V_{CC}	≤ 2.5ns

4.4、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_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
1.65V to 1.95V	V_{CC}	≤ 3ns	30pF	1kΩ	open	GND	$2 \times V_{CC}$
2.3V to 2.7V	V_{CC}	≤ 3ns	30pF	500Ω	open	GND	6V
2.7V	2.7V	≤ 3ns	50pF	500Ω	open	GND	6V
3.0V to 3.6V	2.7V	≤ 3ns	50pF	500Ω	open	GND	$2 \times V_{CC}$
4.5V to 5.5V	V_{CC}	≤ 3ns	50pF	500Ω	open	GND	$2 \times V_{CC}$

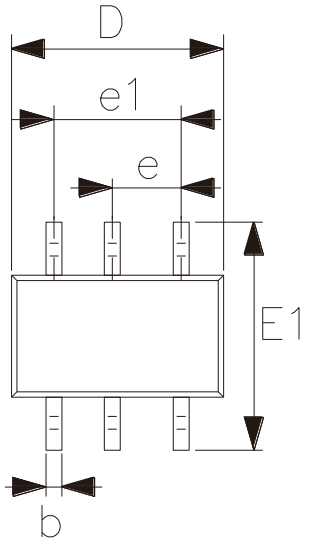
5、Package Information

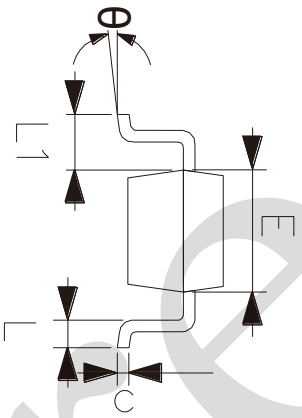
5.1、SOT-23-6

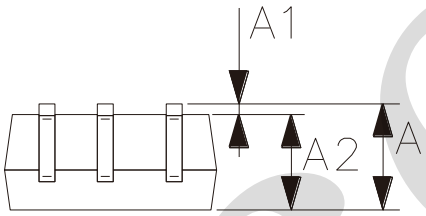


Symbol	Dimensions (mm)	
	Min.	Max.
A	-	1.25
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°

5.2、SOT-363







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
E1	2.15	2.45
E	1.15	1.35
e	0.65	
e1	1.20	1.40
L	0.26	0.46
L1	0.525	
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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