AiP74HC126-Q1
Quad Buffer/Line Driver; 3-state

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

Contents

1、General Description

The AiP74HC126-Q1 is a quad buffer/line driver with 3-state outputs.

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: 2~6V
- Input levels: CMOS level
- ESD-HBM:2000V(AEC-Q100-002)
- ESD-CDM: All pins 750V(AEC-Q100-011)
- LATCH-UP: ±100mA,Ta=125℃(AEC-Q100-004)
- Specified from -40℃ to +125℃
- Packaging information: SOP14

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74HC126-Q1SA14.TB	SOP14	74HC126Q	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74HC126-Q1SA14.TR	SOP14	74HC126Q	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm

Note: 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

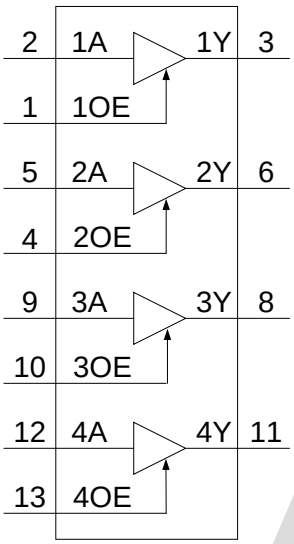
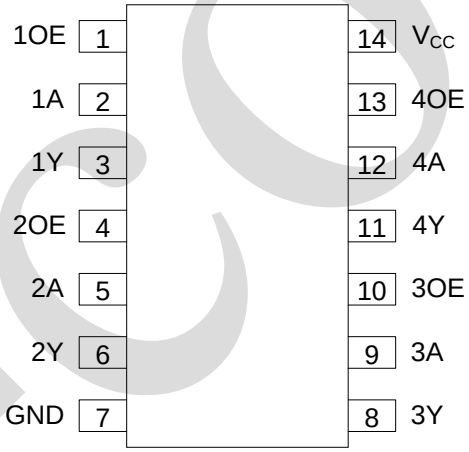


Figure 1. Logic symbol

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	1OE	output enable input (active HIGH)
2	1A	data input
3	1Y	data output
4	2OE	output enable input (active HIGH)
5	2A	data input
6	2Y	data output
7	GND	ground (0V)
8	3Y	data output
9	3A	data input
10	3OE	output enable input (active HIGH)
11	4Y	data output
12	4A	data input
13	4OE	output enable input (active HIGH)
14	V_{CC}	supply voltage

2.4、Function Table

Control	Input	Output
nOE	**nA**	**nY**
H	L	L
H	H	H
L	X	Z

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	+7	V
supply current	I_{CC}	-	-	70	mA
ground current	I_{GND}	-	-70	-	mA
input clamping current	I_{IK}	$V_I < -0.5V$ or $V_I > V_{CC}+0.5V$	-	±20	mA
output clamping current	I_{OK}	$V_O < -0.5V$ or $V_O > V_{CC}+0.5V$	-	±20	mA
output current	I_O	$-0.5V < V_O < V_{CC}+0.5V$	-	±35	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}	-	2.0	5.0	6.0	V
input voltage	V_I	-	0	-	V_{CC}	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	℃

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}	2.0V	-	1.5	1.2	-	V
		4.5V	-	3.15	2.4	-	V
		6.0V	-	4.2	3.2	-	V
LOW-level input voltage	V_{IL}	2.0V	-	-	0.8	0.5	V
		4.5V	-	-	2.1	1.35	V
		6.0V	-	-	2.8	1.8	V
HIGH-level output voltage	V_{OH}	2.0V	I_O=-20uA	1.9	2.0	-	V
		4.5V	I_O=-20uA	4.4	4.5	-	V
		6.0V	I_O=-20uA	5.9	6.0	-	V
		4.5V	I_O=-6.0mA	3.7	4.32	-	V
		6.0V	I_O=-7.8mA	5.2	5.81	-	V
LOW-level output voltage	V_{OL}	2.0V	I_O=20uA	-	0	0.1	V
		4.5V	I_O=20uA	-	0	0.1	V
		6.0V	I_O=20uA	-	0	0.1	V
		4.5V	I_O=6.0mA	-	0.15	0.4	V
		6.0V	I_O=7.8mA	-	0.16	0.4	V
input leakage current	I_I	6.0V	V_I=V_{CC} or GND	-	-	±2	uA
OFF-state output current	I_{OZ}	6.0V	V_I=V_{IH} or V_{IL}; V_O=V_{CC} or GND	-	-	±10	uA
supply current	I_{CC}	6.0V	V_I=V_{CC} or GND;I_O=0A	-	-	160	uA

Note: All typical values are measured at T_{amb}=25℃.

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
nA to nY propagation delay	t_{PLH}, t_{PHL}	2.0V	C_L=50pF	see Figure 3	-	8	24	ns
		4.5V	C_L=50pF		-	3	9	ns
		5.0V	C_L=15pF		-	2.8	-	ns
		6.0V	C_L=50pF		-	2.6	7.8	ns
nOE to nY enable time	t_{PZL}, t_{PZH}	2.0V	C_L=50pF	see Figure 4	-	8.3	24.9	ns
		4.5V	C_L=50pF		-	2.7	8.1	ns
		6.0V	C_L=50pF		-	2.1	6.3	ns
nOE to nY disable time	t_{PLZ}, t_{PHZ}	2.0V	C_L=50pF	see Figure 4	-	6.7	20.1	ns
		4.5V	C_L=50pF		-	4.3	12.9	ns
		6.0V	C_L=50pF		-	3.2	9.6	ns
transition time	t_{THL}, t_{TLH}	2.0V	C_L=50pF	see Figure 3	-	6.1	18.3	ns
		4.5V	C_L=50pF		-	2.2	6.6	ns
		6.0V	C_L=50pF		-	2.1	6.3	ns

Note: All typical values are measured at T_{amb}=25℃.

4、Testing Circuit

4.1、AC Testing Circuit

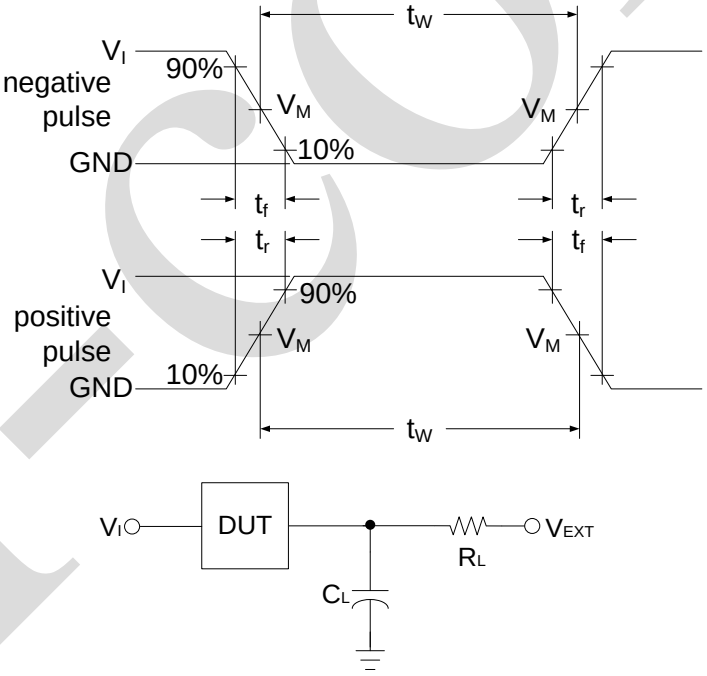


Figure 2. AC Testing Circuit

Definitions for test circuit:

C_L=load capacitance including jig and probe capacitance.

4.2、Test Data

Type	Input		Load		V_{EXT}		
	V_I	t_r , t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
AiP74HC126-Q1	V_{CC}	6.0ns	15pF, 50pF	1kΩ	open	GND	V_{CC}

4.3、AC Testing Waveforms

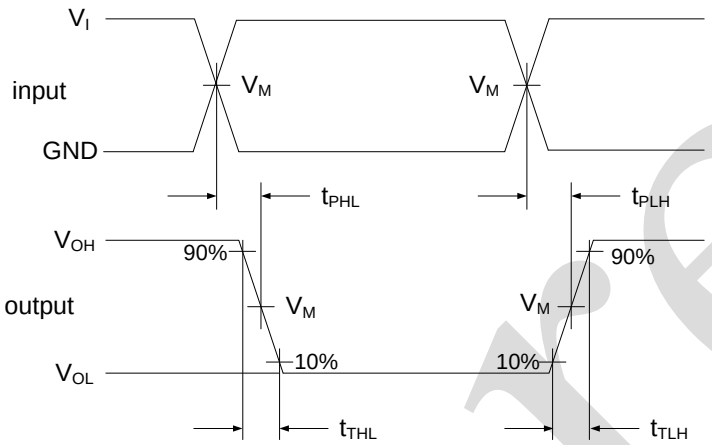


Figure 3. Input (nA) to output (nY) propagation delays

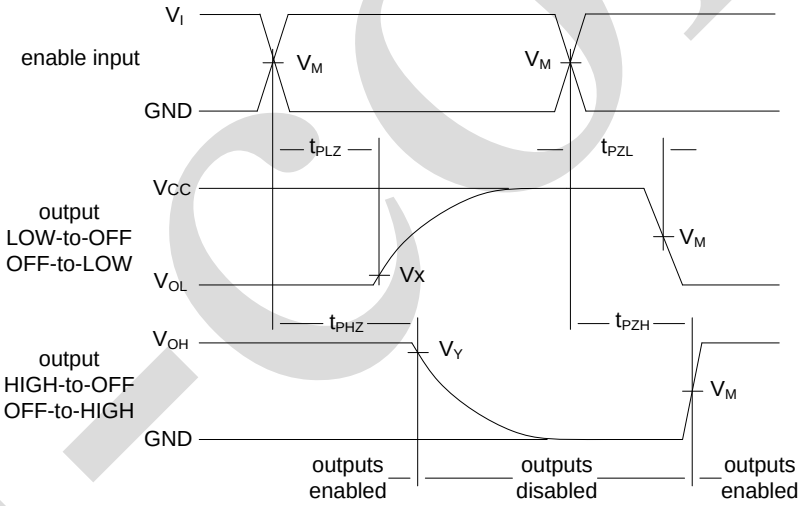


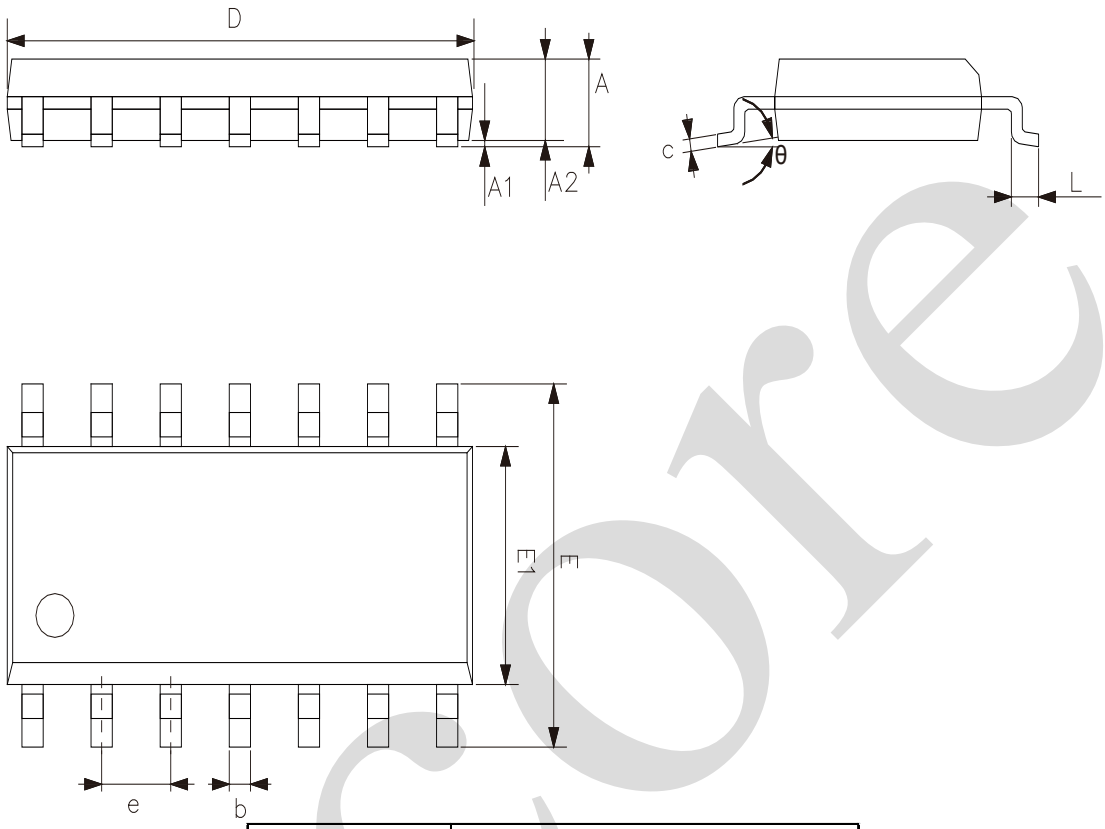
Figure 4. Enable and disable times

4.4、Measurement Points

Type	Input	Output		
	V_M	V_M	V_X	V_Y
AiP74HC126-Q1	0.5×V_{CC}	0.5×V_{CC}	0.1×V_{CC}	0.9×V_{CC}

5、Package Information

5.1、SOP14



2023/12/A	Dimensions In Millimeters	
Symbol	**Min.**	**Max.**
A	1.50	1.75
A1	0.05	0.25
A2	1.30	—
b	0.33	0.50
c	0.19	0.25
D	8.43	8.76
E	5.80	6.25
E1	3.75	4.00
e	1.27	
L	0.40	0.89
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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