AiP74AVC1T45
Supply Translating Transceiver;3-state

Product Specification

Specification Revision History:

Version	Date	Description
2022-11-A1	2022-11	New

Contents

1、General Description

The AiP74AVC1T45 is a single bit, dual supply transceiver with 3-state output that enables bidirectional level translation. The device suitable for translating between any of the low voltage nodes (0.8V, 1.2V, 1.5V, 1.8V, 2.5V and 3.3V).

Features:

- Wide supply voltage range:
  $V_{CC(A)}$: 0.8V to 3.6V
  $V_{CC(B)}$: 0.8V to 3.6V
- Inputs accept voltages up to 3.6V
- High-impedance when $V_{CC(A)}$ or $V_{CC(B)}$ =0V
- Specified from -40℃ to +125℃
- Packaging information: SOT23-6/SOT363

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74AVC1T45GB236.TR	SOT23-6	DYXX	3000 PCS/reel	30000 PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74AVC1T45GC363.TR	SOT363	DYXX	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

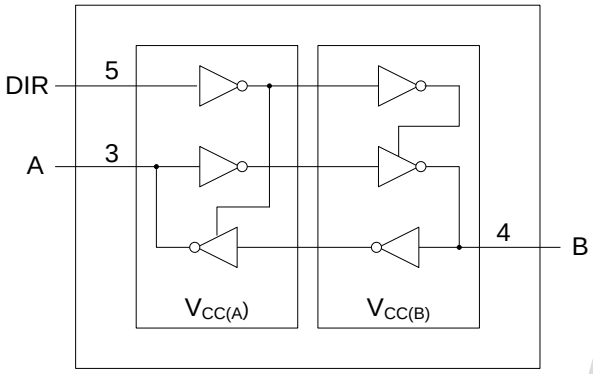


Figure 1. Logic diagram

2.2、Pin Configurations

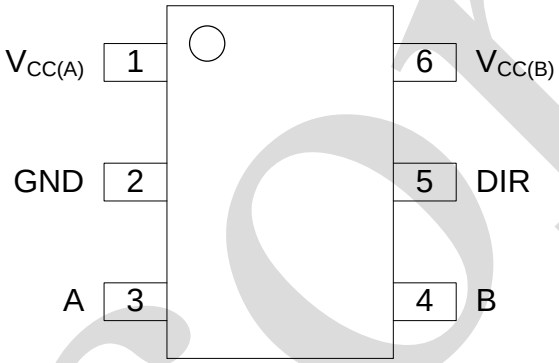


Figure 2. Pin configurations

2.3、Pin Description

Pin No.	Pin Name	Description
1	$V_{CC(A)}$	supply voltage port A and DIR
2	GND	ground (0V)
3	A	data input or output
4	B	data input or output
5	DIR	direction control
6	$V_{CC(B)}$	supply voltage port B

2.4、Function Table

H=HIGH voltage level; L=LOW voltage level; X=don't care; Z=high-impedance OFF-state.

Supply voltage	Input	Input/output[1]	
$V_{CC(A)}$, $V_{CC(B)}$	DIR[2]	A	B
0.8V to 3.6V	L	A=B	input
0.8V to 3.6V	H	input	B=A
GND[3]	X	Z	Z

Note:

[1] The input circuit of the data I/O is always active.

[2] The DIR input circuit is referenced to $V_{CC(A)}$.

[3] If at least one of $V_{CC(A)}$ or $V_{CC(B)}$ is at GND level, the device goes into suspend mode.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

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

Characteristic	Symbol	Conditions	Min.	Max.	Unit
Supply Voltage A	$V_{CC(A)}$	-	-0.5	+4.6	V
Supply Voltage B	$V_{CC(B)}$	-	-0.5	+4.6	V
input clamping current	I_{IK}	V_I<0V	-50	-	mA
Input Voltage	V_I	-	-0.5	+4.6	V
output clamping current	I_{OK}	V_O<0V	-50	-	mA
output voltage	V_O	Active mode	-0.5	V_{CCO}+0.5	V
		Suspend or 3-state mode	-0.5	+4.6	V
output current	I_O	V_O=0V to V_{CCO}	-	±50	mA
supply current	I_{CC}	$I_{CC(A)}$ or $I_{CC(B)}$	-	100	mA
ground current	I_{GND}	-	-100	-	mA
Storage Temperature	T_{stg}	-	-65	+150	℃
total power dissipation	P_{tot}	-	-	250	mW
Soldering Temperature	T_L	10s	260		℃

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage A	$V_{CC(A)}$	-	0.8	-	3.6	V
supply voltage B	$V_{CC(B)}$	-	0.8	-	3.6	V
input voltage	V_I	-	0	-	3.6	V
output voltage	V_O	Active mode	0	-	V_{CCO}	V
		Suspend or 3-state mode	0	-	3.6	V
ambient temperature	T_{amb}	-	-40	-	+125	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

(T_{amb}=25℃, voltages are referenced to GND (ground=0V), unless otherwise specified) [1]

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
HIGH-level output voltage	V_{OH}	V_I=V_{IH} or V_{IL}; I_O=-1.5mA; $V_{CC(A)}$=$V_{CC(B)}$=0.8V	-	0.69	-	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}; I_O=1.5mA; $V_{CC(A)}$=$V_{CC(B)}$=0.8V	-	0.07	-	V
input leakage current	I_I	DIR input; V_I=0V or 3.6V; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V	-	-	±1	uA
OFF-state output current	I_{OZ}	A or B port; V_O=0V or V_{CCO}; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V[2]	-	-	±2.5	uA
power-off current leakage	I_{OFF}	A port; V_I or V_O=0V to 3.6V; $V_{CC(A)}$=0V; $V_{CC(B)}$=0.8V to 3.6V	-	-	±1	uA
		B port; V_I or V_O=0V to 3.6V; $V_{CC(B)}$=0V; $V_{CC(A)}$=0.8V to 3.6V	-	-	±1	uA

Note:

[1] V_{CCO} is the supply voltage associated with the output port.

[2] For I/O ports, the parameter I_{OZ} includes the input leakage current.

3.3.2、DC Characteristics 2

(T_{amb}=-40℃ to +85℃, voltages are referenced to GND (ground=0V), unless otherwise specified) [1][2]

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	data input	V_{CCI}=0.8V	0.70V_{CCI}	-	-	V
			V_{CCI}=1.1V to 1.95V	0.65V_{CCI}	-	-	V
			V_{CCI}=2.3V to 2.7V	1.6	-	-	V
			V_{CCI}=3.0V to 3.6V	2	-	-	V
		DIR input	$V_{CC(A)}$=0.8V	0.70$V_{CC(A)}$	-	-	V
			$V_{CC(A)}$=1.1V to 1.95V	0.65$V_{CC(A)}$	-	-	V
			$V_{CC(A)}$=2.3V to 2.7V	1.6	-	-	V
			$V_{CC(A)}$=3.0V to 3.6V	2	-	-	V
LOW-level input voltage	V_{IL}	data input	V_{CCI}=0.8V	-	-	0.30V_{CCI}	V
			V_{CCI}=1.1V to 1.95V	-	-	0.35V_{CCI}	V
			V_{CCI}=2.3V to 2.7V	-	-	0.7	V
			V_{CCI}=3.0V to 3.6V	-	-	0.9	V
		DIR input	$V_{CC(A)}$=0.8V	-	-	0.30$V_{CC(A)}$	V
			$V_{CC(A)}$=1.1V to 1.95V	-	-	0.35$V_{CC(A)}$	V
			$V_{CC(A)}$=2.3V to 2.7V	-	-	0.7	V
			$V_{CC(A)}$=3.0V to 3.6V	-	-	0.9	V
HIGH-level output voltage	V_{OH}	V_I=V_{IH} or V_{IL}	I_O=-100uA; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V	V_{CCO}-0.1	-	-	V
			I_O=-3mA; $V_{CC(A)}$=$V_{CC(B)}$=1.1V	0.85	-	-	V
			I_O=-6mA; $V_{CC(A)}$=$V_{CC(B)}$=1.4V	1.05	-	-	V

			I_O=-8 mA; $V_{CC(A)}$=$V_{CC(B)}$=1.65V	1.2	-	-	V
			I_O=-9mA; $V_{CC(A)}$=$V_{CC(B)}$=2.3V	1.75	-	-	V
			I_O=-12mA; $V_{CC(A)}$=$V_{CC(B)}$=3.0V	2.3	-	-	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V	-	-	0.1	V
			I_O=3mA; $V_{CC(A)}$=$V_{CC(B)}$=1.1V	-	-	0.25	V
			I_O=6mA; $V_{CC(A)}$=$V_{CC(B)}$=1.4V	-	-	0.35	V
			I_O=8mA; $V_{CC(A)}$=$V_{CC(B)}$=1.65V	-	-	0.45	V
			I_O=9mA; $V_{CC(A)}$=$V_{CC(B)}$=2.3V	-	-	0.55	V
			I_O=12mA; $V_{CC(A)}$=$V_{CC(B)}$=3.0V	-	-	0.7	V
input leakage current	I_I	DIR input; V_I=0V or 3.6V; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V		-	-	±1	uA
OFF-state output current	I_{OZ}	A or B port; V_O=0V or V_{CCO}; $V_{CC(A)}$=$V_{CC(B)}$=3.6V[3]		-	-	±5	uA
power-off leakage current	I_{OFF}	A port; V_I or V_O=0V to 3.6V; $V_{CC(A)}$=0V; $V_{CC(B)}$=0.8V to 3.6V		-	-	±5	uA
		B port; V_I or V_O=0V to 3.6V; $V_{CC(B)}$=0V; $V_{CC(A)}$=0.8V to 3.6V		-	-	±5	uA
supply current	I_{CC}	A port; V_I=0V or V_{CCI}; I_O=0A	$V_{CC(A)}$=0.8V to 3.6V; $V_{CC(B)}$=0.8V to 3.6V	-	-	8	uA
			$V_{CC(A)}$=3.6V; $V_{CC(B)}$=0V	-	-	8	uA
			$V_{CC(A)}$=0V; $V_{CC(B)}$=3.6V	-2	-	-	uA
		B port; V_I=0V or V_{CCI}; I_O=0A	$V_{CC(A)}$=0.8V to 3.6V; $V_{CC(B)}$=0.8V to 3.6V	-	-	8	uA
			$V_{CC(A)}$=3.6V; $V_{CC(B)}$=0V	-2	-	-	uA
			$V_{CC(A)}$=0V; $V_{CC(B)}$=3.6V	-	-	8	uA
		A plus B port ($I_{CC(A)}$+$I_{CC(B)}$); I_O=0A;V_I=0V or V_{CCI}; $V_{CC(A)}$=0.8V to 3.6V; $V_{CC(B)}$=0.8V to 3.6V[1]		-	-	16	uA

Note:

[1] V_{CCO} is the supply voltage associated with the output port.

[2] V_{CCI} is the supply voltage associated with the data input port.

[3] For I/O ports, the parameter I_{OZ} includes the input leakage current.

3.3.3、DC Characteristics 3

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified) [1][2]

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	data input	V_{CCI}=0.8V	0.70V_{CCI}	-	-	V
			V_{CCI}=1.1V to 1.95V	0.65V_{CCI}	-	-	V
			V_{CCI}=2.3V to 2.7V	1.6	-	-	V
			V_{CCI}=3.0V to 3.6V	2	-	-	V
		DIR input	$V_{CC(A)}$=0.8V	0.70$V_{CC(A)}$	-	-	V
			$V_{CC(A)}$=1.1V to 1.95V	0.65$V_{CC(A)}$	-	-	V
			$V_{CC(A)}$=2.3V to 2.7V	1.6	-	-	V
			$V_{CC(A)}$=3.0V to 3.6V	2	-	-	V
LOW-level input voltage	V_{IL}	data input	V_{CCI}=0.8V	-	-	0.30V_{CCI}	V
			V_{CCI}=1.1V to 1.95V	-	-	0.35V_{CCI}	V
			V_{CCI}=2.3V to 2.7V	-	-	0.7	V
			V_{CCI}=3.0V to 3.6V	-	-	0.9	V
		DIR input	$V_{CC(A)}$=0.8V	-	-	0.30$V_{CC(A)}$	V
			$V_{CC(A)}$=1.1V to 1.95V	-	-	0.35$V_{CC(A)}$	V
			$V_{CC(A)}$=2.3V to 2.7V	-	-	0.7	V
			$V_{CC(A)}$=3.0V to 3.6V	-	-	0.9	V
HIGH-level output voltage	V_{OH}	V_I=V_{IH} or V_{IL}	I_O=-100uA; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V	V_{CCO}-0.1	-	-	V
			I_O=-3mA; $V_{CC(A)}$=$V_{CC(B)}$=1.1V	0.85	-	-	V
			I_O=-6mA; $V_{CC(A)}$=$V_{CC(B)}$=1.4V	1.05	-	-	V
			I_O=-8 mA; $V_{CC(A)}$=$V_{CC(B)}$=1.65V	1.2	-	-	V
			I_O=-9mA; $V_{CC(A)}$=$V_{CC(B)}$=2.3V	1.75	-	-	V
			I_O=-12mA; $V_{CC(A)}$=$V_{CC(B)}$=3.0V	2.3	-	-	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V	-	-	0.1	V
			I_O=3mA; $V_{CC(A)}$=$V_{CC(B)}$=1.1V	-	-	0.25	V
			I_O=6mA; $V_{CC(A)}$=$V_{CC(B)}$=1.4V	-	-	0.35	V
			I_O=8mA; $V_{CC(A)}$=$V_{CC(B)}$=1.65V	-	-	0.45	V
			I_O=9mA; $V_{CC(A)}$=$V_{CC(B)}$=2.3V	-	-	0.55	V
			I_O=12mA; $V_{CC(A)}$=$V_{CC(B)}$=3.0V	-	-	0.7	V

input leakage current	I_I	DIR input; V_I=0V or 3.6V; $V_{CC(A)}$=$V_{CC(B)}$=0.8V to 3.6V		-	-	±1.5	uA
OFF-state output current	I_{OZ}	A or B port; V_O=0V or V_{CCO}; $V_{CC(A)}$=$V_{CC(B)}$=3.6V[3]		-	-	±7.5	uA
power-off leakage current	I_{OFF}	A port; V_I or V_O=0V to 3.6V; $V_{CC(A)}$=0V; $V_{CC(B)}$=0.8V to 3.6V		-	-	±35	uA
		B port; V_I or V_O=0V to 3.6V; $V_{CC(B)}$=0V; $V_{CC(A)}$=0.8V to 3.6V		-	-	±35	uA
supply current	I_{CC}	A port; V_I=0V or V_{CCI}; I_O=0A	$V_{CC(A)}$=0.8V to 3.6V; $V_{CC(B)}$=0.8V to 3.6V	-	-	12	uA
			$V_{CC(A)}$=3.6V; $V_{CC(B)}$=0V	-	-	12	uA
			$V_{CC(A)}$=0V; $V_{CC(B)}$=3.6V	-8	-	-	uA
		B port; V_I=0V or V_{CCI}; I_O=0A	$V_{CC(A)}$=0.8V to 3.6V; $V_{CC(B)}$=0.8V to 3.6V	-	-	12	uA
			$V_{CC(A)}$=3.6V; $V_{CC(B)}$=0V	-8	-	-	uA
			$V_{CC(A)}$=0V; $V_{CC(B)}$=3.6V	-	-	12	uA
		A plus B port ($I_{CC(A)}$+$I_{CC(B)}$); I_O=0A;V_I=0V or V_{CCI}; $V_{CC(A)}$=0.8V to 3.6V; $V_{CC(B)}$=0.8V to 3.6V		-	-	24	uA

Note:

[1] V_{CCO} is the supply voltage associated with the output port.

[2] V_{CCI} is the supply voltage associated with the data input port.

[3] For I/O ports, the parameter I_{OZ} includes the input leakage current.

3.3.4、AC Characteristics 1

(T_{amb}=25℃, $V_{CC(A)}$=0.8V, voltages are referenced to GND (ground=0V), unless otherwise specified)[1][2]

Parameter	Symbol	Conditions	$V_{CC(B)}$						Unit
			0.8V	1.2V	1.5V	1.8V	2.5V	3.3V	
propagation delay	t_{PLH}, t_{PHL}	A to B	15.5	8.1	7.6	7.7	8.4	9.2	ns
		B to A	15.5	12.7	12.3	12.2	12.0	11.8	ns
disable time	t_{PLZ}, t_{PHZ}	DIR to A	12.2	12.2	12.2	12.2	12.2	12.2	ns
		DIR to B	11.7	7.9	7.6	8.2	8.7	10.2	ns
enable time	t_{PZL}, t_{PZH}	DIR to A	27.2	20.6	19.9	20.4	20.7	22.0	ns
		DIR to B	27.7	20.3	19.8	19.9	20.6	21.4	ns

3.3.5、AC Characteristics 2

(T_{amb}=25℃, $V_{CC(B)}$=0.8V, voltages are referenced to GND (ground=0V), unless otherwise specified)

Parameter	Symbol	Conditions	$V_{CC(A)}$						Unit
			0.8V	1.2V	1.5V	1.8V	2.5V	3.3V	
propagation delay	t_{PLH}, t_{PHL}	A to B	15.5	12.7	12.3	12.2	12.0	11.8	ns
		B to A	15.5	8.1	7.6	7.7	8.4	9.2	ns
disable time	t_{PLZ}, t_{PHZ}	DIR to A	12.2	4.9	3.8	3.7	2.8	3.4	ns
		DIR to B	11.7	9.2	9.0	8.8	8.7	8.6	ns
enable time	t_{PZL}, t_{PZH}	DIR to A	27.2	17.3	16.6	16.5	17.1	17.8	ns
		DIR to B	27.7	17.6	16.1	15.9	14.8	15.2	ns

3.3.6、AC Characteristics 3

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

Parameter	Symbol	Conditions	$V_{CC(B)}$										Unit
			1.2V±0.1V		1.5V±0.1V		1.8V±0.15V		2.5V±0.2V		3.3V±0.3V		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
propagation delay	t_{PLH}, t_{PHL}	A to B											
		$V_{CC(A)}$=1.1V to 1.3V	-	9.0	-	6.8	-	6.1	-	5.7	-	6.1	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	8.0	-	5.4	-	4.6	-	3.7	-	3.5	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	7.7	-	5.1	-	4.3	-	3.4	-	3.1	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	7.2	-	4.7	-	3.9	-	3.0	-	2.6	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	7.1	-	4.5	-	3.7	-	2.8	-	2.4	ns
		B to A											
		$V_{CC(A)}$=1.1V to 1.3V	-	9.0	-	8.0	-	7.7	-	7.2	-	7.1	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	6.8	-	5.4	-	5.1	-	4.7	-	4.5	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	6.1	-	4.6	-	4.4	-	3.9	-	3.7	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	5.7	-	3.8	-	3.4	-	3.0	-	2.8	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	6.1	-	3.6	-	3.1	-	2.6	-	2.4	ns
disable time	t_{PLZ}, t_{PHZ}	DIR to A											
		$V_{CC(A)}$=1.1V to 1.3V	-	8.8	-	8.8	-	8.8	-	8.8	-	8.8	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	6.3	-	6.3	-	6.3	-	6.3	-	6.3	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	5.5	-	5.5	-	5.5	-	5.5	-	5.5	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	4.2	-	4.2	-	4.2	-	4.2	-	4.2	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	4.7	-	4.7	-	4.7	-	4.7	-	4.7	ns
		DIR to B											
		$V_{CC(A)}$=1.1V to 1.3V	-	8.4	-	6.7	-	6.9	-	6.2	-	7.2	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	7.6	-	5.9	-	6.0	-	4.8	-	5.5	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	7.7	-	5.7	-	5.8	-	4.5	-	5.2	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	7.3	-	5.2	-	5.1	-	4.2	-	4.8	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	7.2	-	5.5	-	5.5	-	4.1	-	4.7	ns
enable time	t_{PZL}, t_{PZH}	DIR to A											
		$V_{CC(A)}$=1.1V to 1.3V	-	17.4	-	14.7	-	14.6	-	13.4	-	14.3	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	14.4	-	11.3	-	11.1	-	9.5	-	10.0	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	13.8	-	10.3	-	10.2	-	8.4	-	8.9	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	13.0	-	9.0	-	8.5	-	7.2	-	7.6	ns

		$V_{CC(A)}$=3.0V to 3.6V	-	13.3	-	9.1	-	8.6	-	6.7	-	7.1	ns
		DIR to B											
		$V_{CC(A)}$=1.1V to 1.3V	-	17.8	-	15.6	-	14.9	-	14.5	-	14.9	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	14.3	-	11.7	-	10.9	-	10.0	-	9.8	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	13.2	-	10.6	-	9.8	-	8.9	-	8.6	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	11.4	-	8.9	-	8.1	-	7.2	-	6.8	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	11.8	-	9.2	-	8.4	-	7.5	-	7.1	ns

3.3.7、AC Characteristics 4

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

Parameter	Symbol	Conditions	$V_{CC(B)}$										Unit
			1.2V±0.1V		1.5V±0.1V		1.8V±0.15V		2.5V±0.2V		3.3V±0.3V		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
propagation delay	t_{PLH}, t_{PHL}	A to B											
		$V_{CC(A)}$=1.1V to 1.3V	-	9.9	-	7.5	-	6.8	-	6.3	-	6.8	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	8.8	-	6.0	-	5.1	-	4.1	-	3.9	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	8.5	-	5.7	-	4.8	-	3.8	-	3.5	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	8.0	-	5.2	-	4.3	-	3.3	-	2.9	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	7.9	-	5.0	-	4.1	-	3.1	-	2.7	ns
		B to A											
		$V_{CC(A)}$=1.1V to 1.3V	-	9.9	-	8.8	-	8.5	-	8.0	-	7.9	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	7.5	-	6.0	-	5.7	-	5.2	-	5.0	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	6.8	-	5.1	-	4.9	-	4.3	-	4.1	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	6.3	-	4.2	-	3.8	-	3.3	-	3.1	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	6.8	-	4.0	-	3.5	-	2.9	-	2.7	ns
disable time	t_{PLZ}, t_{PHZ}	DIR to A											
		$V_{CC(A)}$=1.1V to 1.3V	-	9.7	-	9.7	-	9.7	-	9.7	-	9.7	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	7.0	-	7.0	-	7.0	-	7.0	-	7.0	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	6.1	-	6.1	-	6.1	-	6.1	-	6.1	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	4.7	-	4.7	-	4.7	-	4.7	-	4.7	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	5.2	-	5.2	-	5.2	-	5.2	-	5.2	ns
		DIR to B											
		$V_{CC(A)}$=1.1V to 1.3V	-	9.2	-	7.4	-	7.6	-	6.9	-	8.0	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	8.3	-	6.5	-	6.6	-	5.3	-	6.1	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	8.5	-	6.3	-	6.4	-	5.0	-	5.8	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	8.0	-	5.8	-	5.7	-	4.7	-	5.3	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	7.9	-	6.1	-	6.1	-	4.6	-	5.2	ns
enable time	t_{PZL}, t_{PZH}	DIR to A											
		$V_{CC(A)}$=1.1V to 1.3V	-	19.1	-	16.2	-	16.1	-	14.9	-	15.9	ns
		$V_{CC(A)}$=1.4V to 1.6V	-	15.8	-	12.5	-	12.3	-	10.5	-	11.1	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	15.3	-	11.4	-	11.3	-	9.3	-	9.9	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	14.3	-	10.0	-	9.5	-	8.0	-	8.4	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	14.7	-	10.1	-	9.6	-	7.5	-	7.9	ns
		DIR to B											
		$V_{CC(A)}$=1.1V to 1.3V	-	19.6	-	17.2	-	16.5	-	16.0	-	16.5	ns

		$V_{CC(A)}$=1.4V to 1.6V	-	15.8	-	13.0	-	12.1	-	11.1	-	10.9	ns
		$V_{CC(A)}$=1.65V to 1.95V	-	14.6	-	11.8	-	10.9	-	9.9	-	9.6	ns
		$V_{CC(A)}$=2.3V to 2.7V	-	12.7	-	9.9	-	9.0	-	8.0	-	7.6	ns
		$V_{CC(A)}$=3.0V to 3.6V	-	13.1	-	10.2	-	9.3	-	8.3	-	7.9	ns

4、Testing Circuit

4.1、AC Testing Circuit

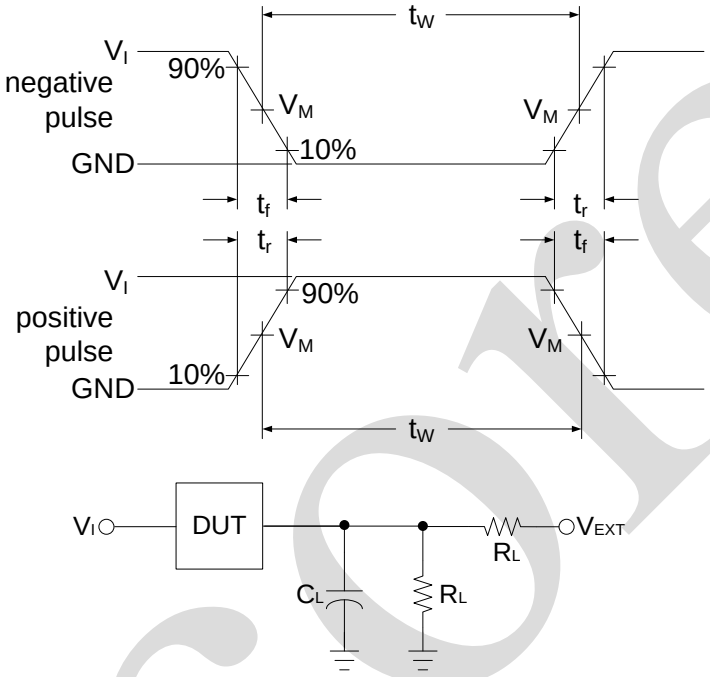


Figure 3. Test circuit for measuring switching times

C_L includes probe and jig capacitance.

R_L=Load resistance.

4.2、Test Data

Supply voltage	Input		Load		V_{EXT}		
$V_{CC(A)}$, $V_{CC(B)}$	V_I[1]	Δt/ΔV[2]	C_L	R_L	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}[3]
0.8V to 1.6V	V_{CCI}	≤1.0ns/V	15pF	2kΩ	open	GND	$2V_{CCO}$
1.65V to 2.7V	V_{CCI}	≤1.0ns/V	15pF	2kΩ	open	GND	$2V_{CCO}$
3.0V to 3.6V	V_{CCI}	≤1.0ns/V	15pF	2kΩ	open	GND	$2V_{CCO}$

Note:

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] dV/dt≥1.0V/ns

[3] V_{CCO} is the supply voltage associated with the output port.

4.3、AC Testing Waveforms

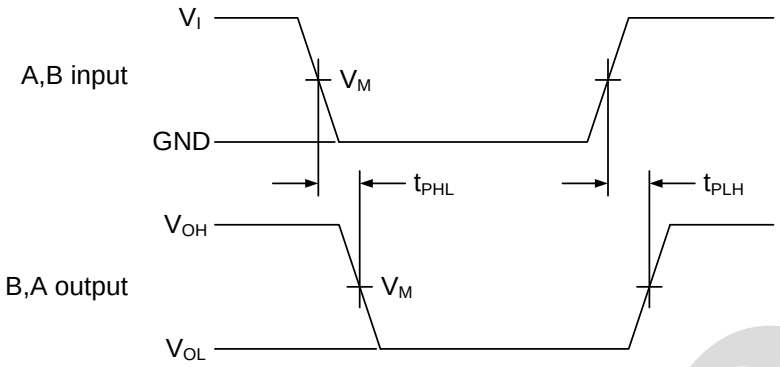


Figure 4. The data input (A, B) to output (B, A) propagation delay times

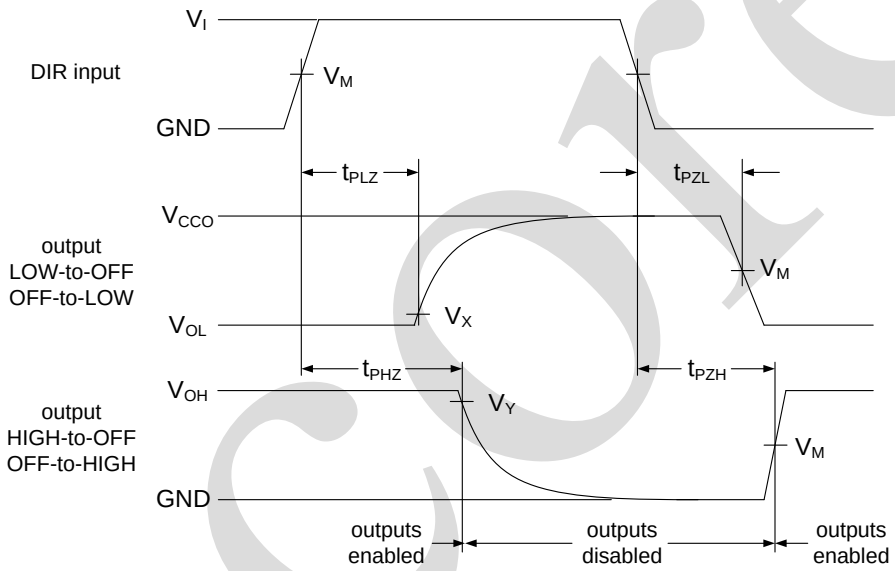


Figure 5. Enable and disable times

4.4、Measurement Points

Supply voltage	Input[1]	Output[2]		
$V_{CC(A)}$, $V_{CC(B)}$	V_M	V_M	V_X	V_Y
0.8V to 1.6V	$0.5V_{CCI}$	$0.5V_{CCO}$	V_{OL}+0.1V	V_{OH}-0.1V
1.65V to 2.7V	$0.5V_{CCI}$	$0.5V_{CCO}$	V_{OL}+0.15V	V_{OH}-0.15V
3.0V to 3.6V	$0.5V_{CCI}$	$0.5V_{CCO}$	V_{OL}+0.3V	V_{OH}-0.3V

Note:

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] V_{CCO} is the supply voltage associated with the output port.

5、Typical Application Circuit And Application Note

5.1、Unidirectional Logic Level-shifting Application

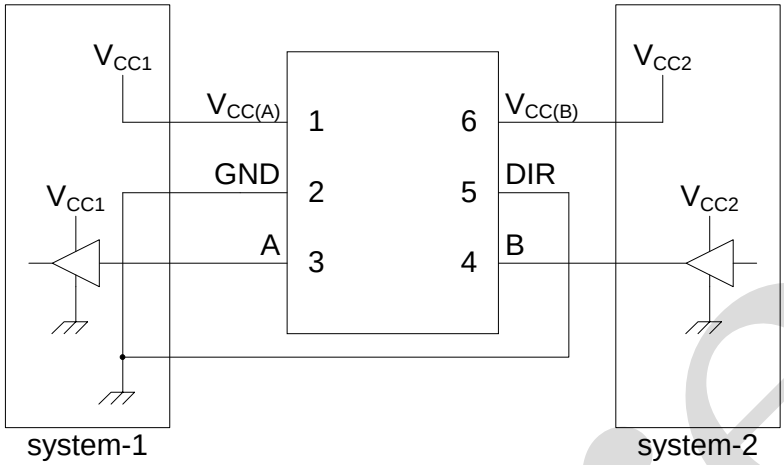


Figure 6. Unidirectional logic level-shifting application

5.2、Bidirectional logic level-shifting application

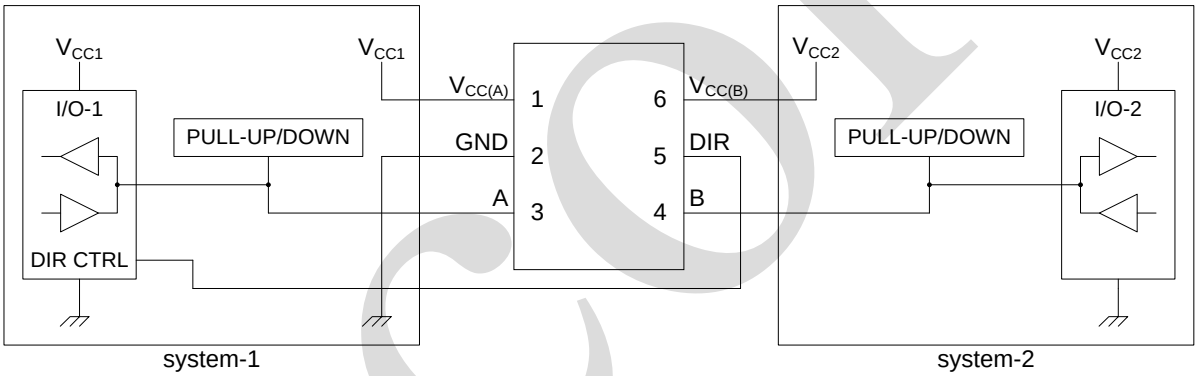
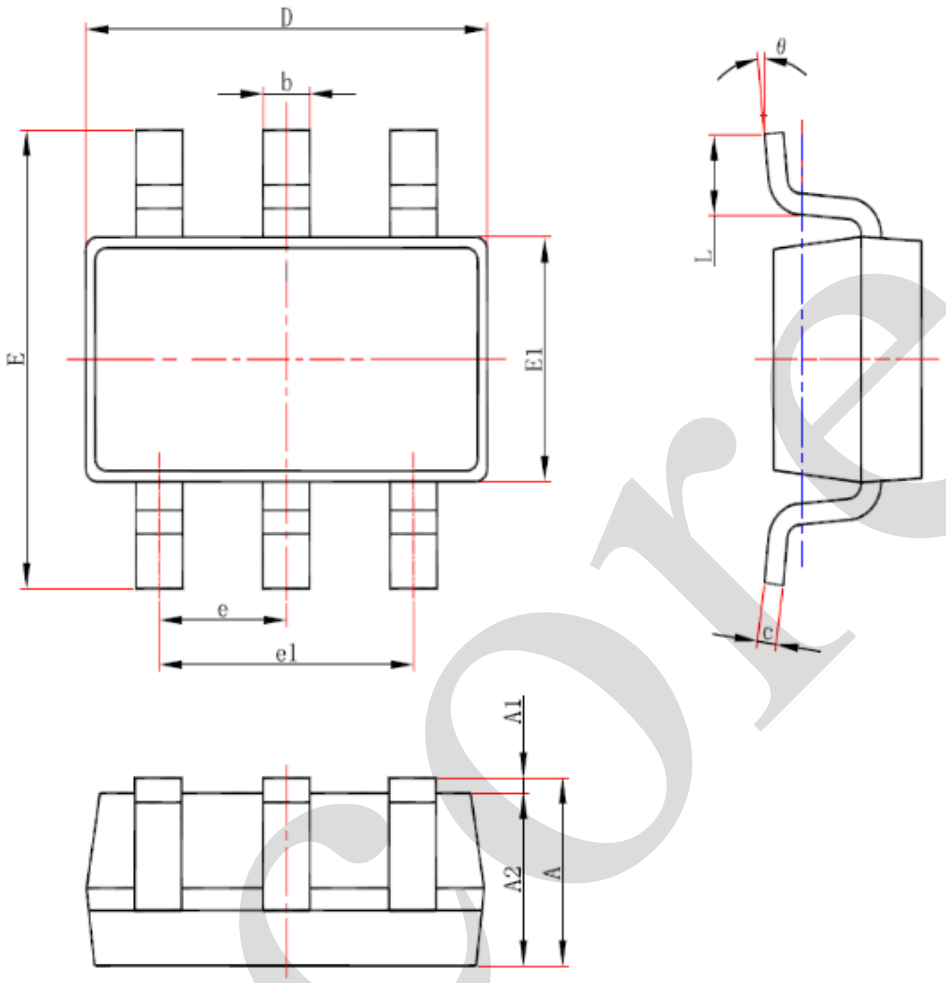


Figure 7. Bidirectional logic level-shifting application

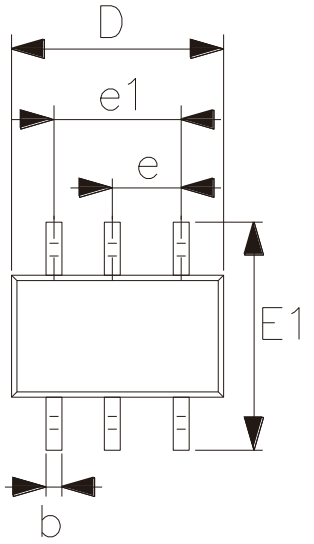
6、Package Information

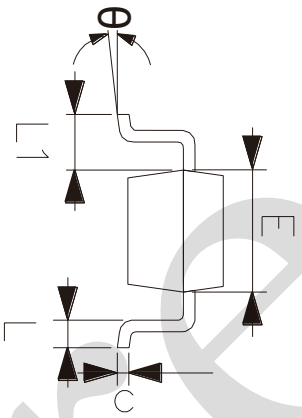
6.1、SOT23-6

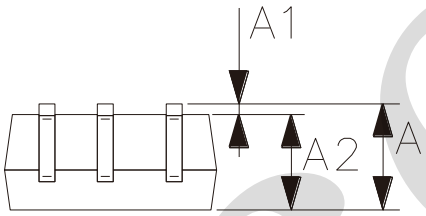


Symbol	Dimensions (mm)	
	Min.	Max.
A	-	1.25
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°

6.2、SOT363







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°

7、Statements And Notes

7.1、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.									

7.2、Notes

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