



AiP74CBTLV3245

8-Bit Bus Switch with Output Enable

Product Specification

Specification Revision History:

Version	Date	Description
2024-03-A0	2024-03	New
2024-06-A1	2024-06	Modify the parameters
2025-12-A2	2025-12	Add SSOP20 and DHVQFN20 package form



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1、General Description

AiP74CBTLV3245 is an 8-bit bus switch with output enable. The circuit has a common enable control port ($\overline{OE}$), which is Schmitt designed.

To ensure the high-impedance OFF-state during power-up or power-down, it is recommended that $\overline{OE}$ connect an external pull-up resistor to V_{CC} .

When the circuit is in power down state ($V_{CC}=0V$), the control port and the switch port are in high resistance state, which can effectively prevent backflow and circuit damage.

Features:

- Power supply voltage: 2.3V to 3.6V
- ON resistance typical: 2.8Ω ($V_{CC}=3.3V$)
- Rail-to-rail analog switch
- Power down ($V_{CC}=0V$) anti-backflow function
- Specified from $-40^{\circ}C$ to $+125^{\circ}C$
- Package information: SSOP20/TSSOP20/VQFN20/DHVQFN20



Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74CBTLV3245 VB20.TB	SSOP20	CBTLV3245	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 0.635mm
AiP74CBTLV3245 TA20.TB	TSSOP20	74CBTLV3245	70 PCS/tube	200 tube/box	14000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74CBTLV3245 VB20.TR	SSOP20	CBTLV3245	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 0.635mm
AiP74CBTLV3245 TA20.TR	TSSOP20	74CBTLV3245	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74CBTLV3245 QK20.TR	VQFN20	74CBTLV3245	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 4.5mm×3.5mm Pin spacing: 0.50mm
AiP74CBTLV3245 QE20.TR	DHVQFN20	CBTLV3245	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 4.5mm×2.5mm Pin spacing: 0.50mm

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

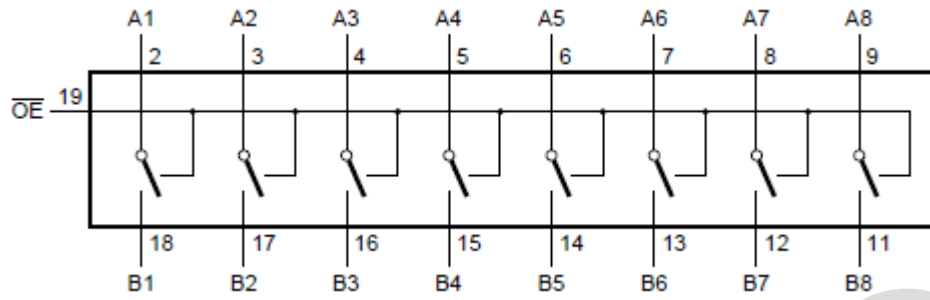
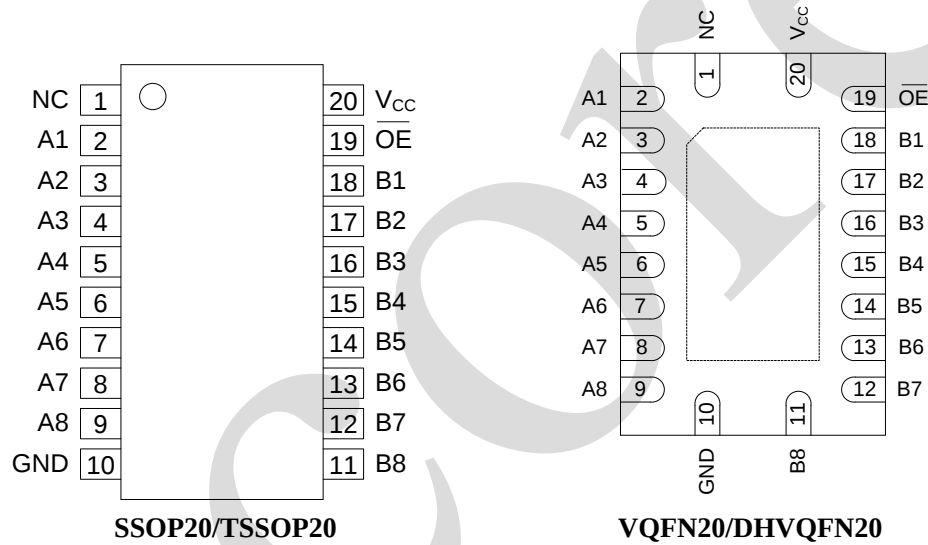


Figure 1. Block Diagram

2.2、Pin Configurations





2.3、Pin Description

Pin No.	Pin Name	Description
1	NC	not connected
2	A1	A1 input/output
3	A2	A2 input/output
4	A3	A3 input/output
5	A4	A4 input/output
6	A5	A5 input/output
7	A6	A6 input/output
8	A7	A7 input/output
9	A8	A8 input/output
10	GND	ground (0V)
11	B8	B8 input/output
12	B7	B7 input/output
13	B6	B6 input/output
14	B5	B5 input/output
15	B4	B4 input/output
16	B3	B3 input/output
17	B2	B2 input/output
18	B1	B1 input/output
19	OE	output enable input (active LOW)
20	V _{CC}	power supply voltage

2.4、Function Table

Input	Input/Output
OE	An, Bn
L	An=Bn
H	Z

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



3、Electrical Parameter

3.1、Absolute Maximum Ratings

Characteristic	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+4.6	V
input voltage	V_I	control input	-0.5	+4.6	V
switch voltage	V_{SW}	enable and disable mode	-0.5	$V_{CC}+0.5$	V
input clamping current	I_{IK}	$V_I < -0.5V$	-50	-	mA
switch clamping current	I_{SK}	$V_I < -0.5V$	-50	-	mA
switch current	I_{SW}	$V_{SW}=0$ to V_{CC}	-	± 128	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}	-	2.3	-	3.6	V
input voltage	V_I	-	0	-	3.6	V
switch voltage	V_{SW}	enable and disable mode	0	-	V_{CC}	V
operating temperature	T_{amb}	-	-40	-	+125	°C

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

($T_{amb}=-40^{\circ}C$ to $+85^{\circ}C$, GND=0V, unless otherwise specified)

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input Voltage	V_{IH}	2.3V to 2.7V	-	1.7	-	-	V
		3.0V to 3.6V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	2.3V to 2.7V	-	-	-	0.7	V
		3.0V to 3.6V	-	-	-	0.9	V
input leakage current	I_I	3.6V	pin OE; $V_I=GND$ to V_{CC}	-	-	± 1	μA
OFF-state leakage current	$I_S(OFF)$	3.6V	-	-	-	± 1	μA
ON-state leakage current	$I_S(ON)$	3.6V	-	-	-	± 1	μA
power-off leakage current	I_{OFF}	0V	V_I or $V_O=0V$ to 3.6V	-	-	± 10	μA
supply current	I_{CC}	3.6V	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{SW}=GND$ or V_{CC}	-	-	10	μA
additional supply current	ΔI_{CC}	3.6V	pin OE; $V_I=V_{CC}-0.6V$; $V_{SW}=GND$ or V_{CC}	-	-	300	μA
ON resistance	R_{ON}	2.3V to 2.7V see Figure 2 to 4	$I_{sw}=64mA$; $V_I=0V$	-	3.3	8	Ω
			$I_{sw}=24mA$; $V_I=0V$	-	3.2	8	Ω
			$I_{sw}=15mA$; $V_I=1.7V$	-	10.8	40	Ω
		3.0V to 3.6V	$I_{sw}=64mA$; $V_I=0V$	-	2.8	7	Ω



		see Figure 5 to 7	Isw=24mA; V _I =0V	-	2.8	7	Ω
			Isw=15mA; V _I =2.4V	-	7.1	15	Ω

Note:

[1] All the typical values are measured at V_{CC}=2.5V, 3.3V (unless otherwise specified) and T_{amb}=25℃.

3.3.2、DC Characteristics 2

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input Voltage	V _{IH}	2.3V to 2.7V	-	1.7	-	-	V
		3.0V to 3.6V	-	2.0	-	-	V
LOW-level input voltage	V _{IL}	2.3V to 2.7V	-	-	-	0.7	V
		3.0V to 3.6V	-	-	-	0.9	V
input leakage current	I _I	3.6V	pin OE; V _I =GND to V _{CC}	-	-	±20	uA
OFF-state leakage current	I _S (OFF)	3.6V	-	-	-	±20	uA
ON-state leakage current	I _S (ON)	3.6V	-	-	-	±20	uA
power-off leakage current	I _{OFF}	0V	V _I or V _O =0V to 3.6V	-	-	±50	uA
supply current	I _{CC}	3.6V	V _I =V _{CC} or GND; I _O =0A; V _{sw} =GND or V _{CC}	-	-	50	uA
additional supply current	ΔI _{CC}	3.6V	pin OE; V _I =V _{CC} -0.6V; V _{sw} =GND or V _{CC}	-	-	2000	uA
ON resistance	R _{ON}	2.3V to 2.7V see Figure 2 to 4	Isw=64mA; V _I =0V	-	-	15	Ω
			Isw=24mA; V _I =0V	-	-	15	Ω
			Isw=15mA; V _I =1.7V	-	-	60	Ω
		3.0V to 3.6V see Figure 5 to 7	Isw=64mA; V _I =0V	-	-	11	Ω
			Isw=24mA; V _I =0V	-	-	11	Ω
			Isw=15mA; V _I =2.4V	-	-	25.5	Ω

3.3.3、AC Characteristics 1

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit
propagation delay	t _{PLH} , t _{PHL}	2.3V to 2.7V	An to Bn; Bn to An see Figure 9	-	-	0.13	ns
		3.0V to 3.6V		-	-	0.20	ns
enable time	t _{PZH} , t _{PZL}	2.3V to 2.7V	OE to An/Bn see Figure 10	-	3.4	5.5	ns
		3.0V to 3.6V		-	3.0	4.9	ns
disable time	t _{PLZ} , t _{PHZ}	2.3V to 2.7V	OE to An/Bn see Figure 10	-	3.0	5.5	ns
		3.0V to 3.6V		-	3.4	5.8	ns

Note:

[1] All the typical values are measured at V_{CC}=2.5V/3.3V (unless otherwise specified) and T_{amb}=25℃.



3.3.4、AC Characteristics 2

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

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
propagation delay	t_{PLH} , t_{PHL}	2.3V to 2.7V	An to Bn; Bn to An see Figure 9	-	-	0.20	ns
		3.0V to 3.6V		-	-	0.31	ns
enable time	t_{PZH} , t_{PZL}	2.3V to 2.7V	$\overline{OE}$ to An/Bn see Figure 10	-	-	8.0	ns
		3.0V to 3.6V		-	-	7.0	ns
disable time	t_{PLZ} , t_{PHZ}	2.3V to 2.7V	$\overline{OE}$ to An/Bn see Figure 10	-	-	8.0	ns
		3.0V to 3.6V		-	-	8.5	ns

4、Characteristic Curve

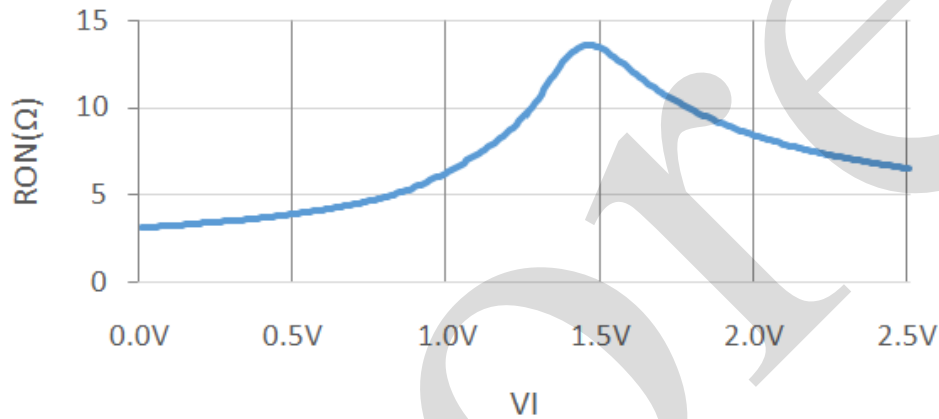


Figure 2. The Relation between ON resistance and input voltage
($V_{CC} = 2.5V$, $I_{SW} = 15mA$, $T_{amb} = 25^{\circ}\text{C}$)

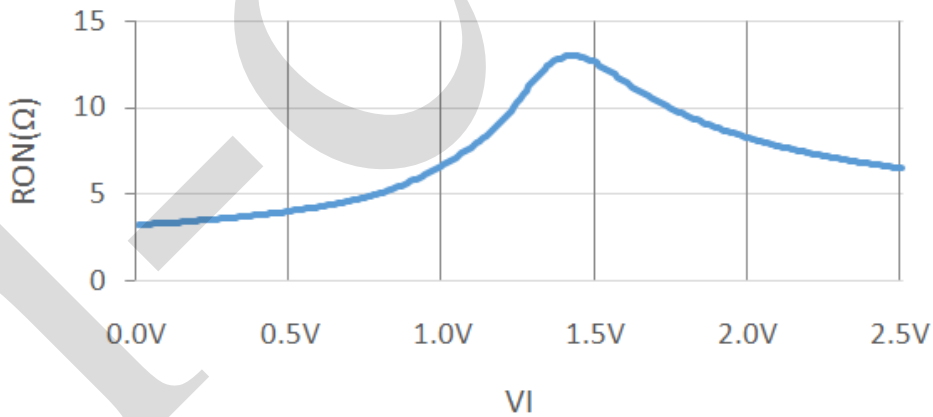


Figure 3. The Relation between ON resistance and input voltage
($V_{CC} = 2.5V$, $I_{SW} = 24mA$, $T_{amb} = 25^{\circ}\text{C}$)

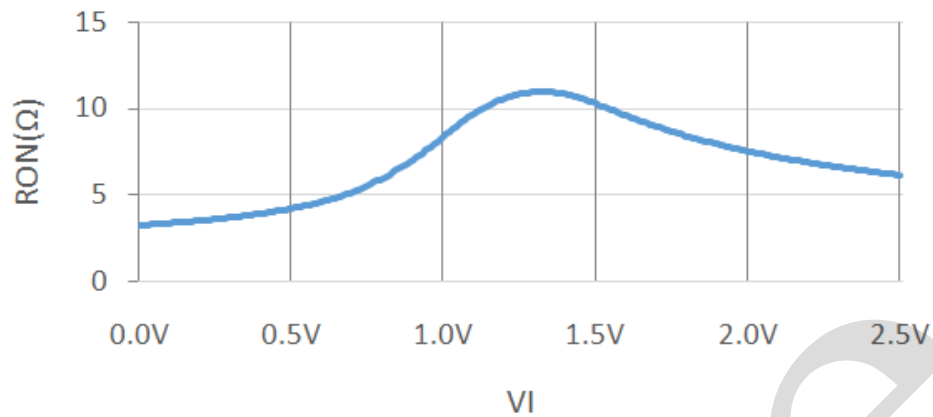


Figure 4. The Relation between ON resistance and input voltage
($V_{CC}=2.5V$, $I_{SW}=64mA$, $T_{amb}=25^{\circ}C$)

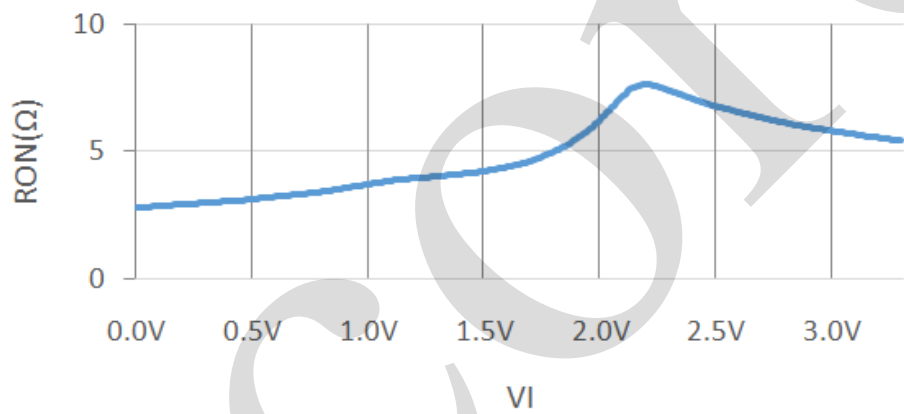


Figure 5. The Relation between ON resistance and input voltage
($V_{CC}=3.3V$, $I_{SW}=15mA$, $T_{amb}=25^{\circ}C$)

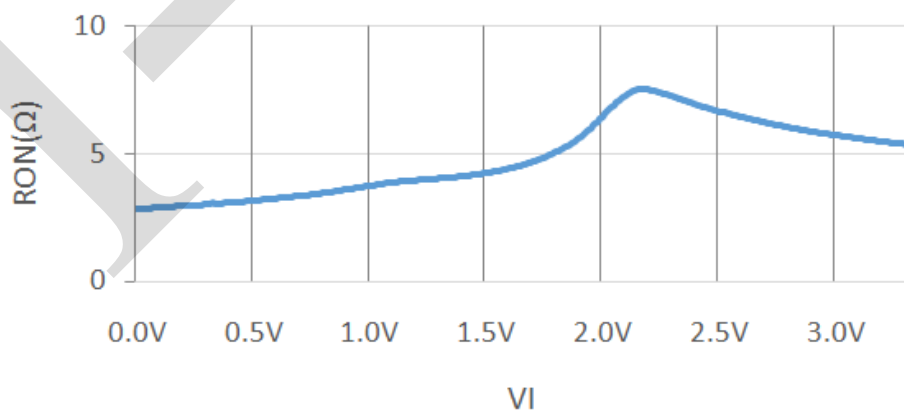


Figure 6. The Relation between ON resistance and input voltage
($V_{CC}=3.3V$, $I_{SW}=24mA$, $T_{amb}=25^{\circ}C$)

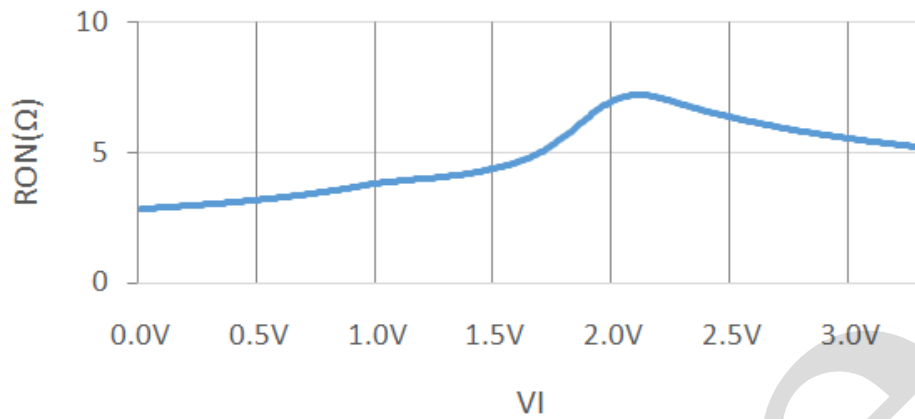


Figure 7. The Relation between ON resistance and input voltage
($V_{CC}=3.3V$, $I_{SW}=64mA$, $T_{amb}=25^{\circ}C$)

5、Testing Circuit

5.1、AC Testing Circuit

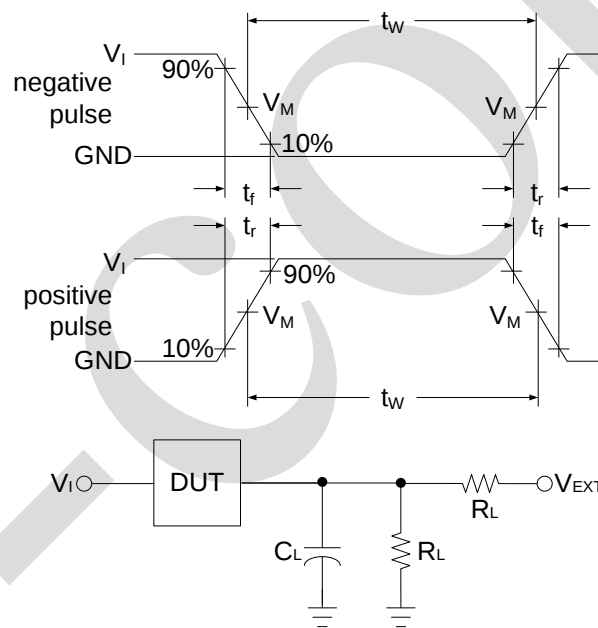


Figure 8. Test circuit for measuring switching times

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.

5.2、Testing Data

Supply voltage	Input		Load		V_{EXT}		
V_{CC}	V_I	t_r, t_f	C_L	R_L	t_{PLH}, t_{PHL}	t_{PHZ}, t_{PZH}	t_{PLZ}, t_{PZL}
2.3V to 2.7V	V_{CC}	$\leq 3.0ns$	30pF	500Ω	open	GND	$2 \times V_{CC}$
3.0V to 3.6V	V_{CC}	$\leq 3.0ns$	50pF	500Ω	open	GND	$2 \times V_{CC}$

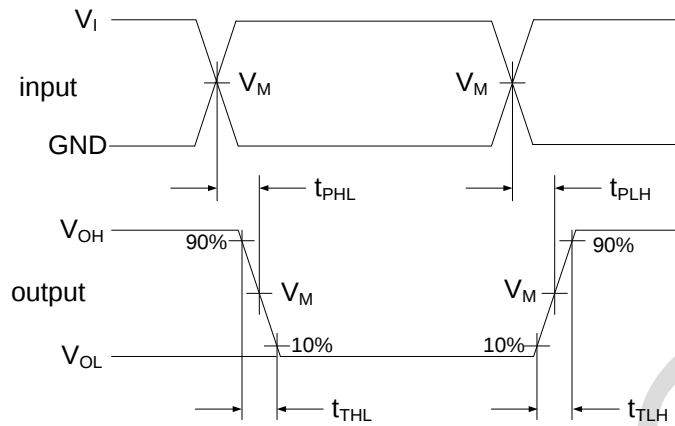
**5.3、AC Testing Waveforms**

Figure 9. Input (nA/nB) to output (nB/nA) propagation delays

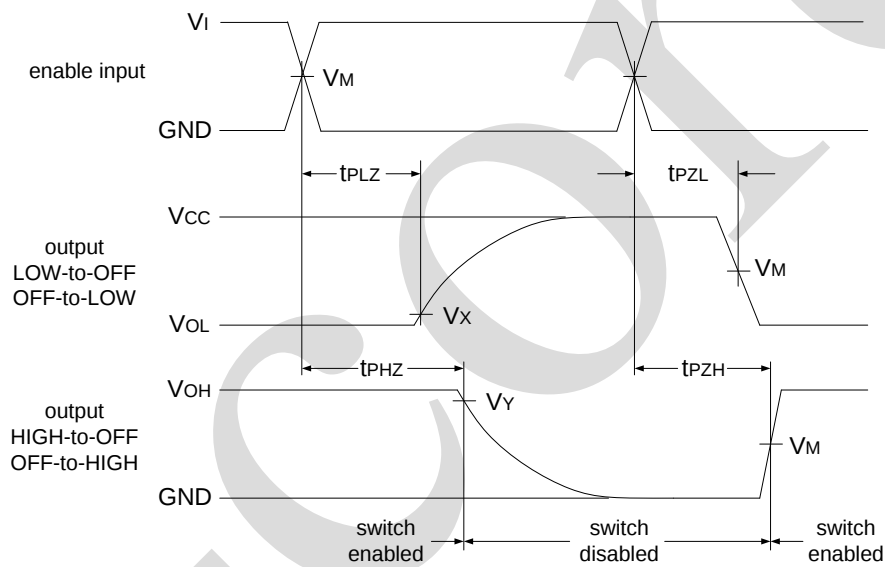
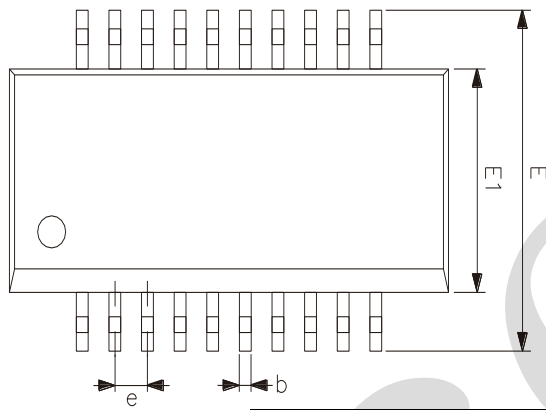
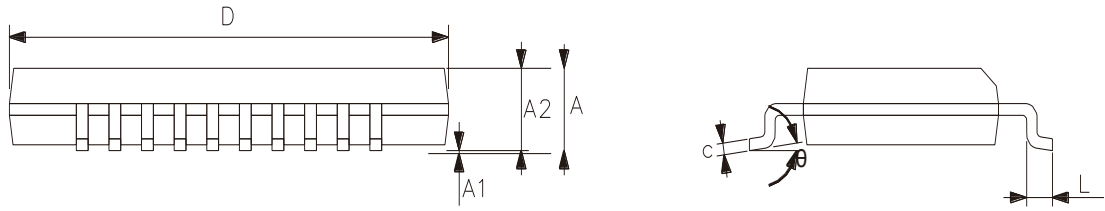


Figure 10. Enable and disable times

5.4、Measurement Points

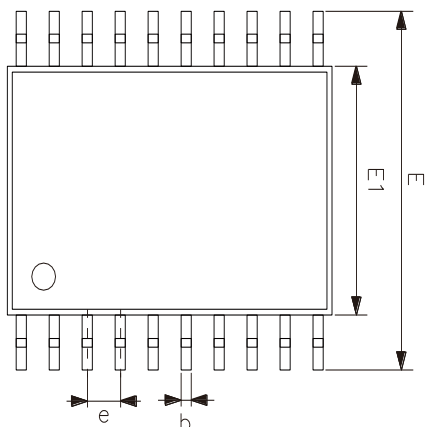
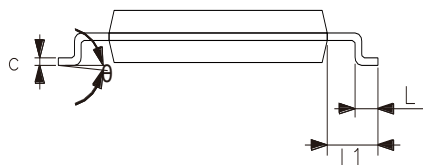
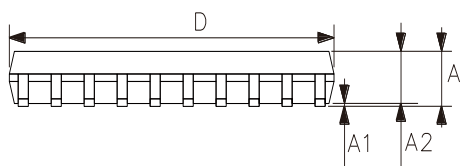
Supply voltage	Input		Output		
V_{CC}	V_I	V_M	V_M	V_X	V_Y
2.3V to 2.7V	V_{CC}	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
3.0V to 3.6V	V_{CC}	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$

**6、Package Information****6.1、SSOP20**

2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.75
A1	0.10	0.25
A2	1.30	1.55
b	0.23	0.31
c	0.19	0.25
D	8.50	8.75
E	5.80	6.20
E1	3.80	4.00
e	0.635	
L	0.40	0.80
θ	0°	8°



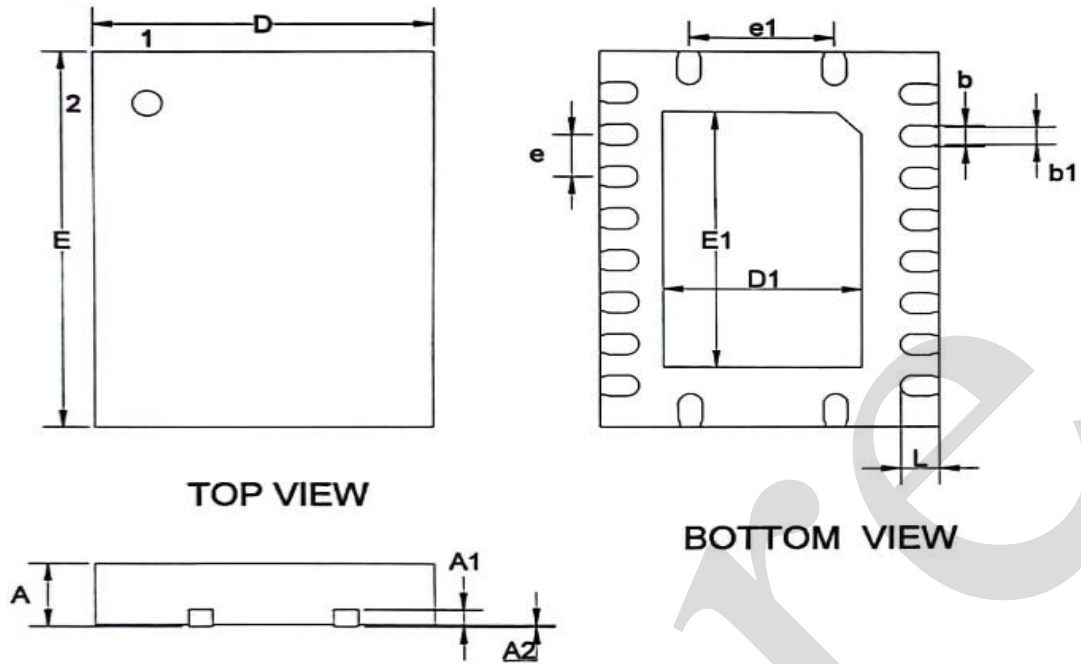
6.2、TSSOP20



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	6.40	6.60
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°



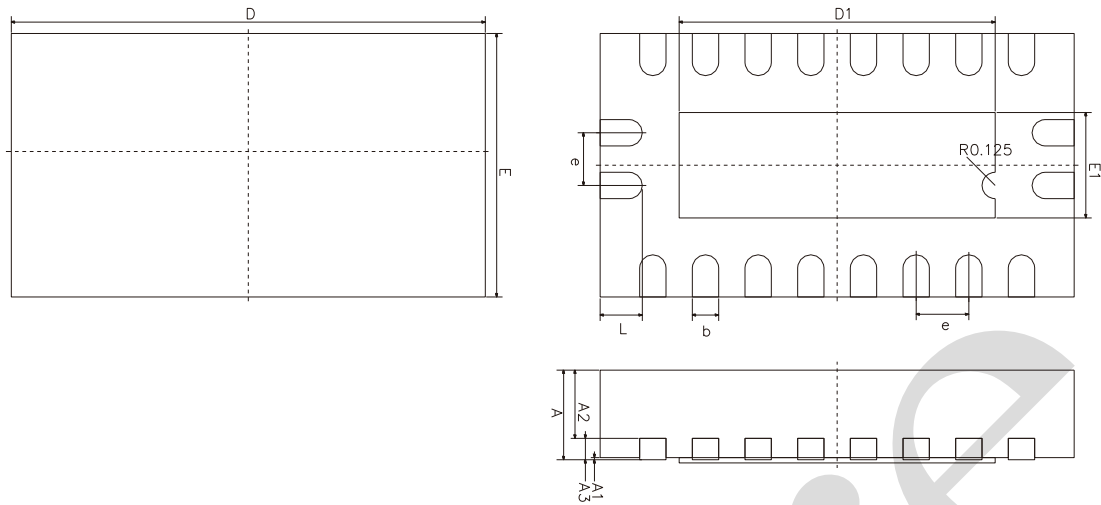
6.3、VQFN20



2024/06/B	Dimensions In Millimeters	
Symbol	Min	Max
A	0.70	0.80
A1	0.203 REF	
A2	0	0.05
b	0.20	0.30
b1	0.16	0.26
D	3.45	3.55
D1	2.00	2.10
E	4.45	4.55
E1	3.00	3.10
e	0.50	
e1	1.50	
L	0.35	0.45



6.4、DHVQFN20



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	0.80	1.00
A1	0.00	0.05
A2	0.60	0.70
A3	0.20	
D	4.40	4.60
E	2.40	2.60
e	0.50	
b	0.18	0.30
L	0.30	0.50
D1	2.70	3.15
E1	0.70	1.15



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

We recommend you to read this chapter carefully before using this product.

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