



AiP74CB3Q3245

8-Bit Bus Switch with Output Enable and Charge Pump

Product specification

Manual release resume:

Version	Date	Description
2024-09-A0	2024-09	New
2025-02-A1	2025-02	Modify the parameters
2025-09-A2	2025-09	Add VQFN20 package form



Contents

1、General Description	3
2、Block Diagram and Pin Description	4
2.1、Block Diagram	4
2.2、Pin Configurations.....	4
2.3、Pin Description.....	5
2.4、Function Table	5
3、Electrical Parameter	5
3.1、Absolute Maximum Ratings.....	5
3.2、Recommended Operating Conditions.....	6
3.3、Electrical Characteristics	6
3.3.1、DC Characteristics.....	6
3.3.2、AC Characteristics.....	7
4、Characteristic curve	7
5、Testing Circuit	8
5.1、AC Testing Circuit.....	8
5.2、Test data.....	8
5.3、AC Testing Waveforms	8
5.4、Measurement Points	9
6、Package Information.....	10
6.1、SOP20	10
6.2、TSSOP20.....	11
6.3、DHVQFN20	12
6.4、VQFN20.....	13
7、Statements And Notes	14
7.1、The name and content of Hazardous substances or Elements in the product	14
7.2、Notes	14



1、General Description

AiP74CB3Q3245 is an 8-bit bus switch with output enable and charge pump. A built-in charge pump is used to increase the gate voltage of the NMOS pass transistor, enabling the circuit to transmit 5.5V switching signals when $V_{CC}=3.3V$.

Features:

- supply voltage range: 2.3V to 3.6V
- overvoltage transmission characteristics:
 $V_{CC}=2.5V$, $V_{sw}=0V$ to 5.5V
 $V_{CC}=3.3V$, $V_{sw}=0V$ to 5.5V
- low power consumption: $I_{CC}=0.5mA$ (Typical)
- rail-to-rail switching on I/O ports
- temperature range: $-40^{\circ}C$ to $+125^{\circ}C$
- packaging information: SOP20/TSSOP20/DHVQFN20/VQFN20

Ordering information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74CB3Q3245SA20.TR	SOP20	74CB3Q3245	2000 PCS/reel	2000 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74CB3Q3245TA20.TR	TSSOP20	74CB3Q3245	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74CB3Q3245QE20.TR	DHVQFN20	74CB3Q3245	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 4.5mm×2.5mm Pin spacing: 0.5mm
AiP74CB3Q3245QK20.TR	VQFN20	74CB3Q3245	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 4.5mm×3.5mm Pin spacing: 0.5mm

Note: If the material object is inconsistent with the ordering information, please take the material object as the standard.



2、Block Diagram and Pin Description

2.1、Block Diagram

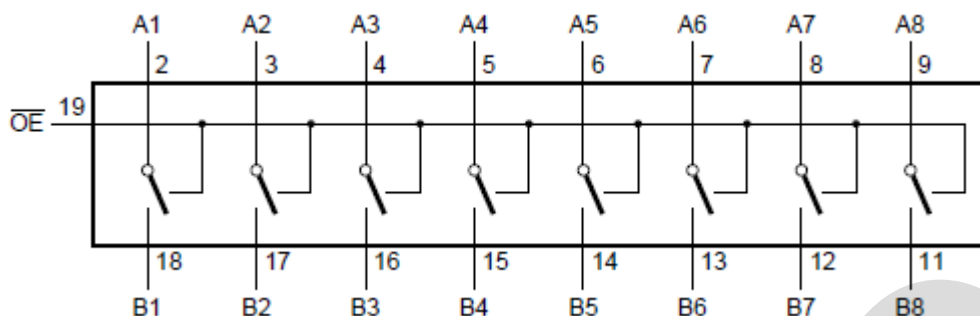
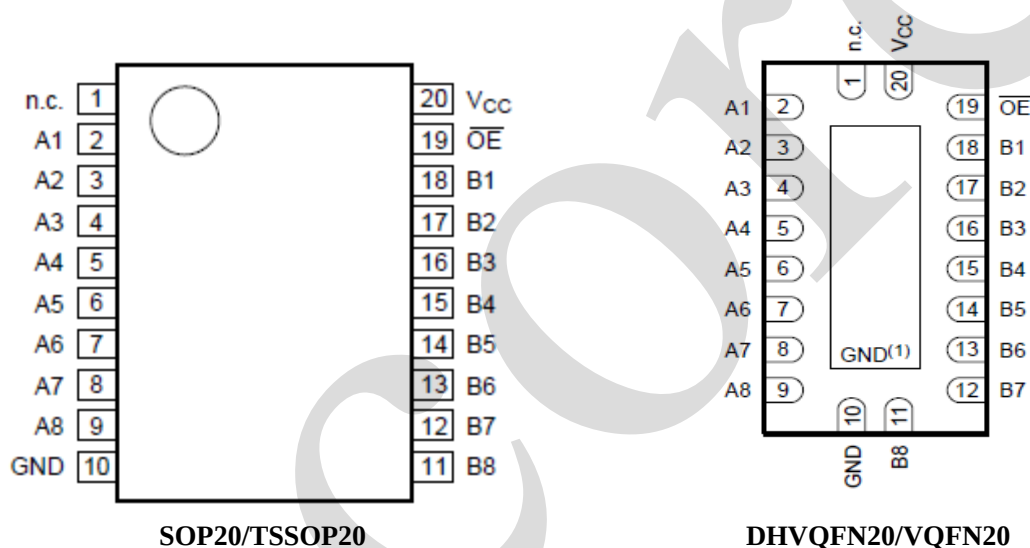


Figure 1. Logic diagram

2.2、Pin Configurations



Note:

(1) If it is soldered the solder land should remain floating or be connected to GND.



2.3、Pin Description

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

2.4、Function Table

Input	Function switch
OE	
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

Parameter	Symbol	Conditions	Min	Max	Unit
supply voltage	V _{CC}	-	-0.5	+4.6	V
input voltage	V _I	Input port OE	-0.5	+7.0	V
switch voltage	V _{SW}	-	-0.5	+7.0	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}	-	-	±120	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	Input port $\overline{OE}$	0	-	5.5	V
switch voltage	V_{SW}	-	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	°C
input transition rise and fall rate	$\Delta t/\Delta V$	Input port $\overline{OE}$; $V_{CC}=2.3V$ to $2.7V$	0	-	20	ns/V
		Input port $\overline{OE}$; $V_{CC}=2.7V$ to $3.6V$	0	-	10	ns/V

3.3、Electrical Characteristics

3.3.1、DC Characteristics

($T_{amb}=-40^{\circ}C$ to $+125^{\circ}C$, 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
		2.7V to 3.6V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	2.3V to 2.7V	-	-	-	0.7	V
		2.7V to 3.6V	-	-	-	0.8	V
input clamping voltage	V_{IK}	3.6V	An, Bn pins; $I_I=-18mA$	-	-	-1.8	V
input leakage current	I_I	3.6V	$\overline{OE}$ pin; $V_I=GND$ to 5.5V	-	-	± 1	μA
OFF-state leakage current	$I_S(OFF)$	3.6V	An, Bn pins	-	-	± 1	μA
power-off leakage current	I_{OFF}	0V	V_{SW} or $V_I=0V$ to 5.5V	-	-	± 1	μA
supply current	I_{CC}	3.6V	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{SW}=GND$ or V_{CC}	-	0.5	0.8	mA
additional supply current	ΔI_{CC}	3.6V	$\overline{OE}$ pin; one input at $V_I=3V$; other inputs at V_{CC} or GND	-	-	30	μA
On resistance	R_{ON}	2.3V	$I_{SW}=30mA$; $V_I=0V$	-	2.7	6	Ω
			$I_{SW}=-15mA$; $V_I=1.7V$	-	2.9	6	Ω
		3.0V	$I_{SW}=30mA$; $V_I=0V$	-	2.7	6	Ω
			$I_{SW}=-15mA$; $V_I=2.4V$	-	3.1	6	Ω

Note:

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

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

Parameter	Symbol	V _{CC}	Conditions	Min.	Max.	Unit
propagation delay	t _{PLH} , t _{PHL}	2.3V to 2.7V	An to Bn Bn to An see Figure 4	-	0.12	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 5	1.5	9.0	ns
		3.0V to 3.6V		1.5	7.5	ns
disable time	t _{PLZ} , t _{PHZ}	2.3V to 2.7V	OE to An/Bn see Figure 5	1.5	9.0	ns
		3.0V to 3.6V		1.5	7.5	ns
maximum frequency	f _{max}	2.3V to 2.7V	OE pin; V _O >V _{CC} ; V _I =5V; R _L ≥1MΩ; C _L =0pF	-	5	MHz
		3.0V to 3.6V		-	18	MHz

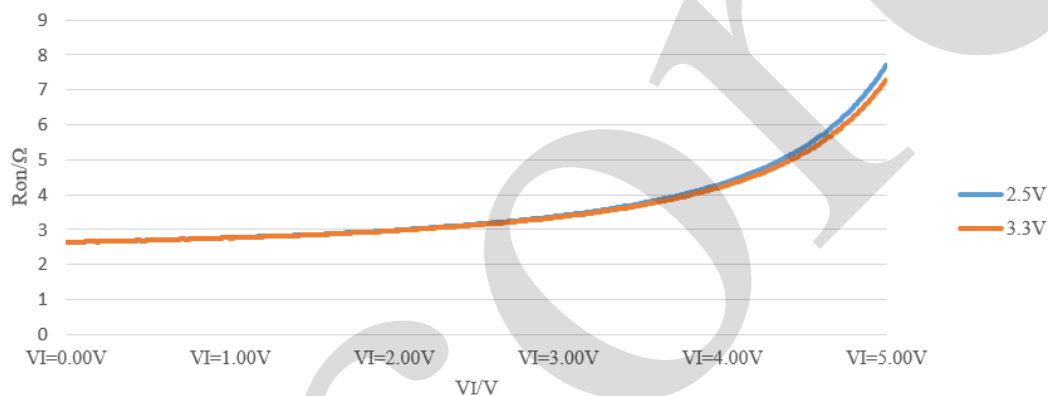
4、Characteristic curve

Figure 2. ON resistance as a function of input voltage

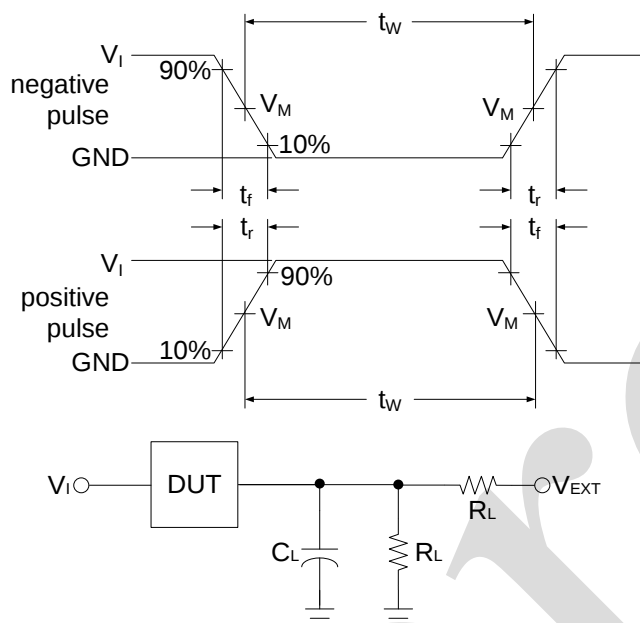
**5、Testing Circuit****5.1、AC Testing Circuit**

Figure 3. Load circuit

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.

5.2、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_{PHZ}, t_{PZH}	t_{PLZ}, t_{PZL}
2.3V to 2.7V	V_{CC}	$\leq 2.5ns$	30pF	500 Ω	open	GND	$2 \times V_{CC}$
3.0V to 3.6V	V_{CC}	$\leq 2.5ns$	50pF	500 Ω	open	GND	$2 \times V_{CC}$

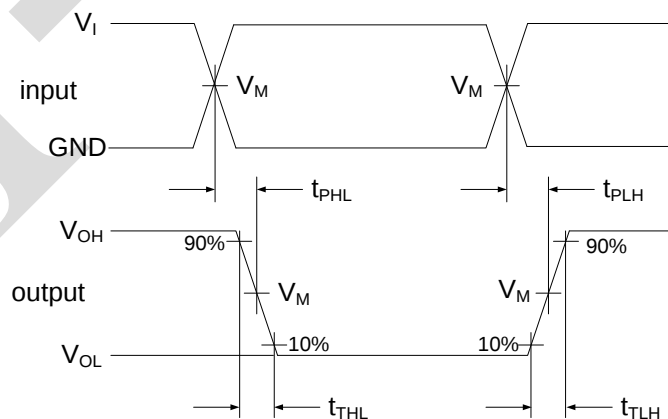
5.3、AC Testing Waveforms

Figure 4. Input (An/Bn) to output (Bn/An) propagation delays

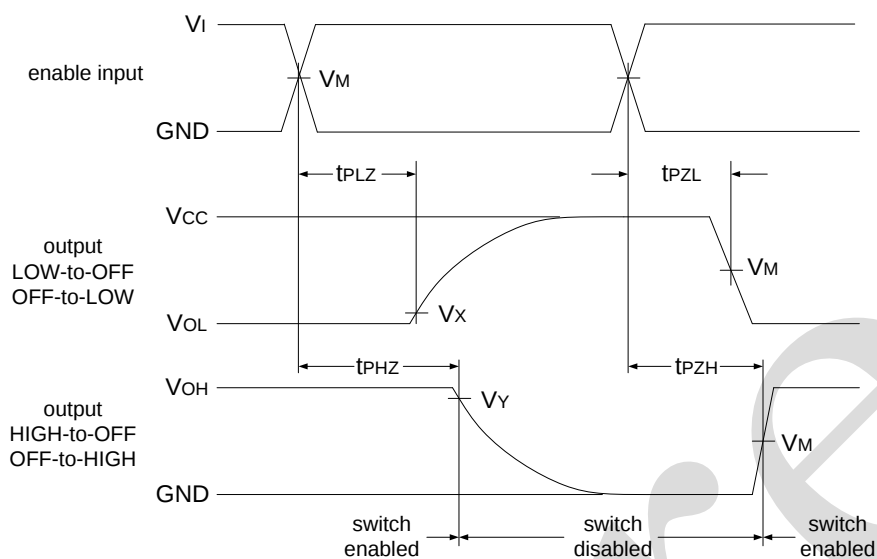
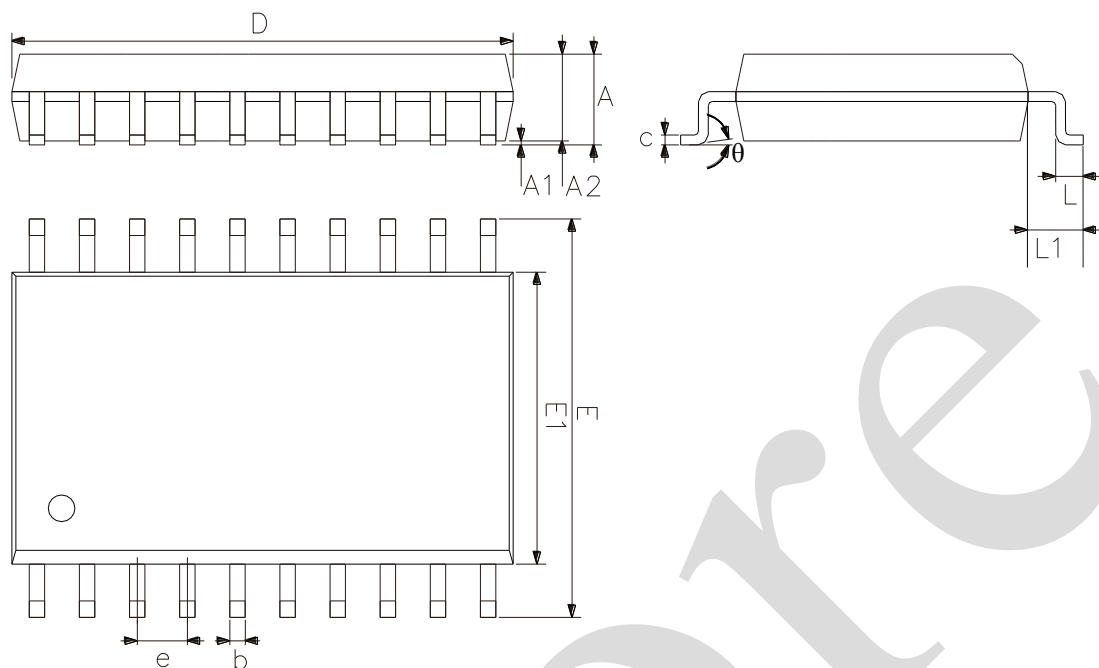


Figure 5. Enable and disable times

5.4、Measurement Points

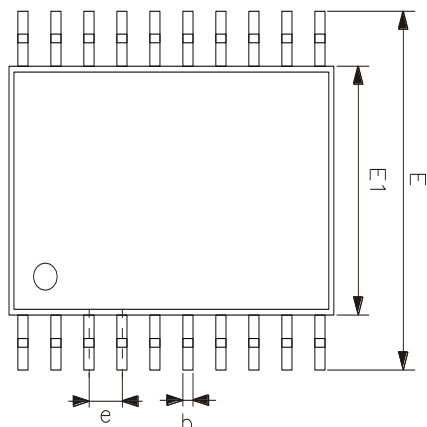
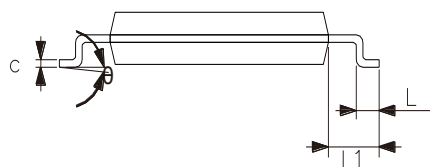
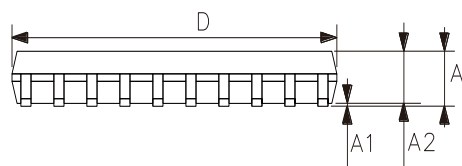
Supply Voltage	Input	Output		
V_{CC}	V_M	V_M	V_X	V_Y
2.3V to 2.7V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
3.0V to 3.6V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$

**6、Package Information****6.1、SOP20**

2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	2.47	2.65
A1	0.05	0.30
A2	2.20	2.44
b	0.35	0.50
c	0.15	0.30
D	12.54	12.94
E	10.00	10.60
E1	7.30	7.70
e	1.27	
L	0.40	1.05
L1	1.30	1.50
θ	0°	8°



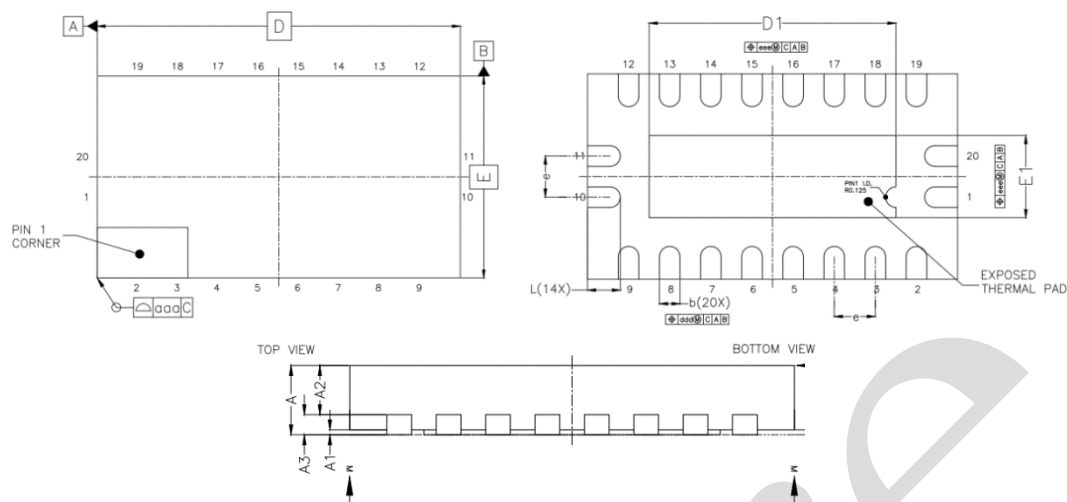
6.2、TSSOP20



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°



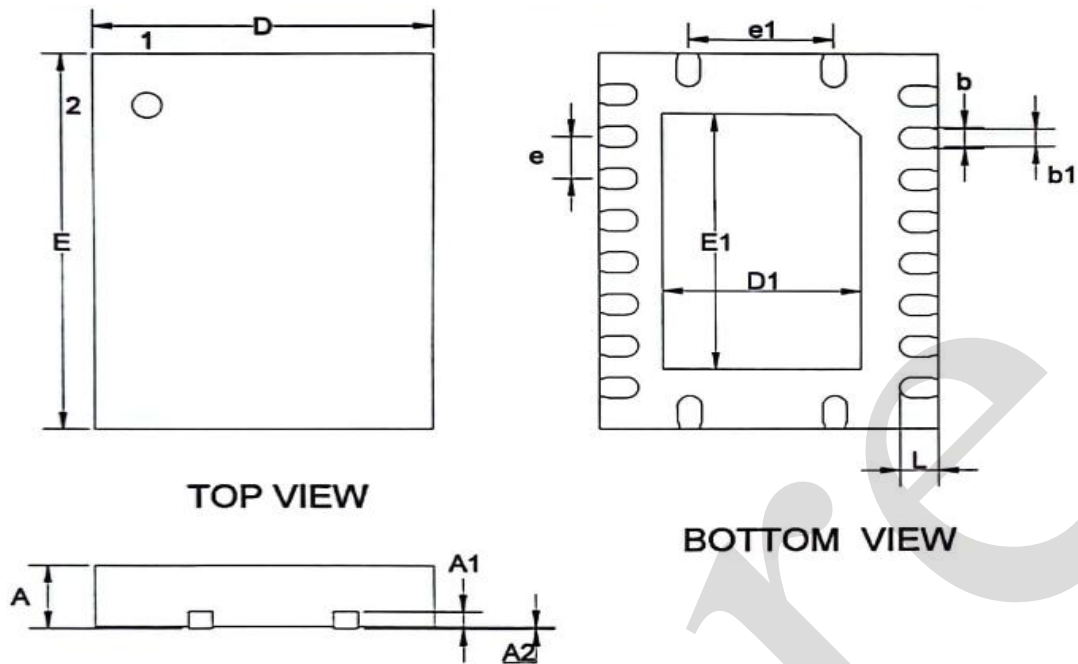
6.3、DHVQFN20



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



6.4、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



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.

The information in this chapter is provided for reference only and i-Core disclaims any express or implied warranties, including but not limited to applicability, special application or non-infringement of third party rights.

This product is not suitable for critical equipment such as life-saving, life-sustaining or safety equipment. It is also not suitable for applications that may result in personal injury, death, or serious property or environmental damage due to product malfunction or failure. I-Core will not be liable for any damages incurred by the customers at their own risk for such applications.

The customer is responsible for conducting all necessary tests i-Core's application to avoid failure in the application or the application of the customer's third party users. I-Core does not accept any liability.

The Company reserves the right to change or improve the information published in this chapter at any time. The information in this chapter are subject to change without notice. We recommend the customer to consult our sales staff before purchasing.

Please obtain related materials from i-Core's regular channels and we are not responsible for its content if it is provided by sources other than our company.

In case of any conflict between the Chinese and English version, the version is subject to the Chinese one.