



AiP74LVT/LVTH244

3.3V Octal Buffer/Line Driver; 3-state

Product Specification

Specification Revision History:

Version	Date	Description
2023-08-A1	2023-08	New



Contents

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



1、General Description

The AiP74LVT244/LVTH244 is an octal buffer that is ideal for driving bus lines. The device features two output enables ($\overline{1OE}$, $\overline{2OE}$), each controlling four of the 3-state outputs.

Features:

- Octal bus interface
- 3-state buffers
- Output capability: +64mA and -32mA
- Input and output interface capability to systems at 5V supply
- Bus hold data inputs eliminate need for external pull-up resistors to hold unused inputs
- No bus current loading when output is tied to 5V bus
- Specified from -40°C to +125°C
- Packaging information: SOP20/TSSOP20/DHVQFN20

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74LVT244 SA20.TB	SOP20	74LVT244	35 PCS/tube	80 tube/box	2800 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74LVTH244 SA20.TB	SOP20	74LVTH244	35 PCS/tube	80 tube/box	2800 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74LVT244 TA20.TB	TSSOP20	74LVT244	70 PCS/tube	200 tube/box	14000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74LVTH244 TA20.TB	TSSOP20	74LVTH244	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
AiP74LVT244 SA20.TR	SOP20	74LVT244	2000 PCS/reel	2000 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74LVTH244 SA20.TR	SOP20	74LVTH244	2000 PCS/reel	2000 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74LVT244 TA20.TR	TSSOP20	74LVT244	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74LVTH244 TA20.TR	TSSOP20	74LVTH244	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74LVT244 QE20.TR	DHVQFN20	74LVT244	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 4.5mm×2.5mm Pin spacing: 0.5mm
AiP74LVTH244 QE20.TR	DHVQFN20	74LVTH244	3000 PCS/reel	3000 PCS/box	Dimensions of plastic enclosure: 4.5mm×2.5mm Pin spacing: 0.5mm

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

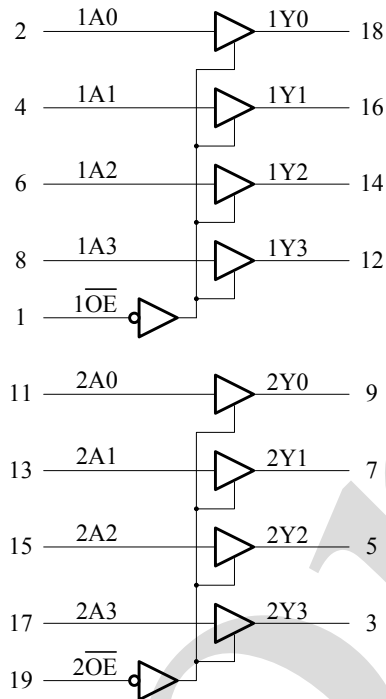
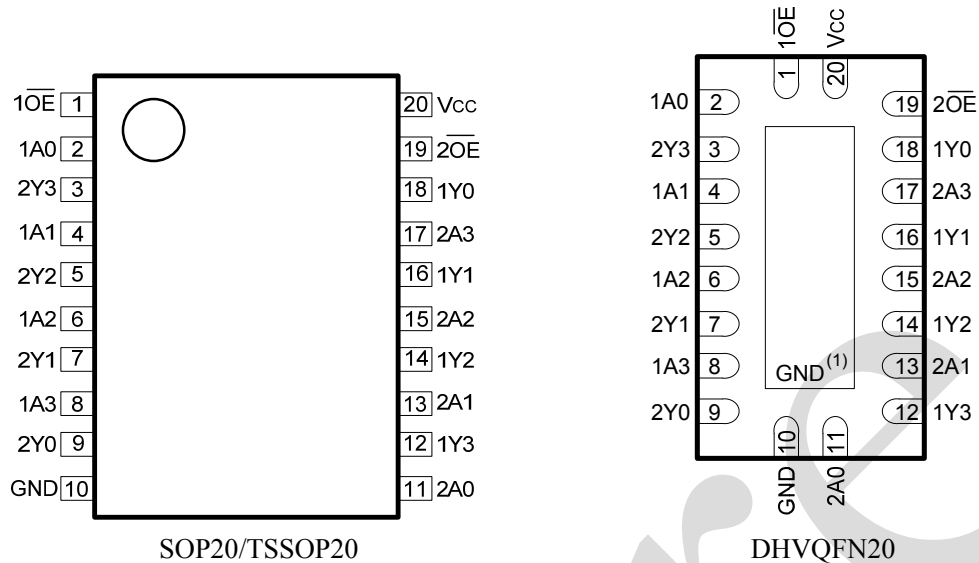


Figure 1. Logic symbol



2.2、Pin Configurations



Note: (1) This is not a supply pin. The substrate is attached to this pad using conductive die attach material. There is no electrical or mechanical requirement to solder this pad. However, 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, 19	$\overline{1OE}$, $\overline{2OE}$	output enable input (active low)
2, 4, 6, 8	1A0, 1A1, 1A2, 1A3	data input
9, 7, 5, 3	2Y0, 2Y1, 2Y2, 2Y3	data output
10	GND	ground (0 V)
11, 13, 15, 17	2A0, 2A1, 2A2, 2A3	data input
18, 16, 14, 12	1Y0, 1Y1, 1Y2, 1Y3	data output
20	V_{CC}	supply voltage

2.4、Function Table

Control	Input	Output
$\overline{nOE}$	nAn	nYn
L	L	L
L	H	H
H	X	Z

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



3、Electrical Parameter

3.1、Absolute Maximum Ratings

($T_{amb}=25^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified)

Characteristic	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+4.6	V
input voltage	V_I	-	-0.5	+7.0	V
output voltage	V_O	output in OFF-state or HIGH-state ^[1]	-0.5	+7.0	V
input clamping current	I_{IK}	$V_I < 0\text{V}$	-50	-	mA
output clamping current	I_{OK}	$V_O < 0\text{V}$	-50	-	mA
output current	I_O	output in LOW-state	-	128	mA
		output in HIGH-state	-64	-	mA
storage temperature	T_{stg}	-	-65	+150	$^{\circ}\text{C}$
junction temperature	T_j	-	-	+150	$^{\circ}\text{C}$
soldering temperature	T_L	10s	260		$^{\circ}\text{C}$

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	2.7	-	3.6	V
input voltage	V_I	-	0	-	5.5	V
HIGH-level output current	I_{OH}	-	-12	-	-	mA
LOW-level output current	I_{OL}	none	-	-	32	mA
		current duty cycle $\leq 50\%$; $f_i \geq 1\text{kHz}$	-	-	64	mA
ambient temperature	T_{amb}	-	-40	-	+125	$^{\circ}\text{C}$



3.3、Electrical Characteristics

3.3.1、DC Characteristics

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

Parameter	Symbol	Conditions		Min.	Typ. ^[1]	Max.	Unit
input clamping voltage	V _{IK}	V _{CC} =2.7V; I _{IK} =-18mA		-1.2	-0.9	-	V
HIGH-level input voltage	V _{IH}	-		2.0	-	-	V
LOW-level input voltage	V _{IL}	-		-	-	0.8	V
HIGH-level output voltage	V _{OH}	V _{CC} =2.7V; I _{OH} =-100uA		V _{CC} -0.2	V _{CC} -0.1	-	V
		V _{CC} =2.7V; I _{OH} =-8mA		2.4	2.5	-	V
		V _{CC} =3.0V; I _{OH} =-32mA		2.0	2.2	-	V
LOW-level output voltage	V _{OL}	V _{CC} =2.7V; I _{OL} =100uA		-	0.1	0.2	V
		V _{CC} =2.7V; I _{OL} =24mA		-	0.3	0.5	V
		V _{CC} =3.0V; I _{OL} =16mA		-	0.25	0.4	V
		V _{CC} =3.0V; I _{OL} =32mA		-	0.3	0.5	V
		V _{CC} =3.0V; I _{OL} =64mA		-	0.4	0.55	V
input leakage current	I _I	all input pins	V _{CC} =0V or 3.6V; V _I =5.5V	-	-	10	uA
		control pins	V _{CC} =3.6V; V _I =V _{CC} or GND	-	-	1	uA
		data pins ^[2]	V _{CC} =3.6V; V _I =V _{CC}	-	-	1	uA
			V _{CC} =3.6V; V _I =0V	-5	-1	-	uA
power-off leakage current	I _{OFF}	V _{CC} =0V; V _I or V _O =0V to 4.5V		-	1	+100	uA
bus hold LOW current	I _{BHL}	V _{CC} =3.0V; V _I =0.8V		75	130	-	uA
bus hold HIGH current	I _{BHH}	V _{CC} =3.0V; V _I =2.0V		-	-150	-75	uA
bus hold LOW overdrive current	I _{BHLO}	nAn input; V _{CC} =3.6V; V _I =0V to 3.6V ^[3]		500	-	-	uA
bus hold HIGH overdrive current	I _{BHHO}	nAn input; V _{CC} =3.6V; V _I =0V to 3.6V ^[3]		-	-	-500	uA
external current	I _{EX}	nYn output in HIGH-state when V _O >V _{CC} ; V _O =5.5V; V _{CC} =3.0V		-	60	125	uA
power-up/power-down output current	I _{O(pu/pd)}	V _{CC} ≤1.2V; V _O =0.5V to V _{CC} ; V _I =GND or V _{CC} ; nOE =don't care ^[4]		-	±1	±100	uA
OFF-state output current	I _{OZ}	V _{CC} =3.6V; V _I =V _{IH} or V _{IL}	V _O =3.0V	-	1	5	uA
			V _O =0.5V	-5	-1	-	uA
supply current	I _{CC}	V _{CC} =3.6V; V _I =GND or V _{CC} ; I _O =0A	output HIGH	-	0.13	0.19	mA
			output LOW	-	0.13	0.19	mA
			outputs disabled ^[5]	-	0.13	0.19	mA
additional supply current	ΔI _{CC}	per input pin; V _{CC} =3.0V to 3.6V; one input at V _{CC} -0.6V and other inputs at V _{CC} or GND ^[6]		-	0.1	0.2	mA



Note:

[1] All typical values are measured at $T_{amb}=25^{\circ}\text{C}$.

[2] Unused pins at V_{CC} or GND.

[3] This is the bus hold overdrive current required to force the input to the opposite logic state.

[4] This parameter is valid for any V_{CC} between 0V and 1.2V with a transition time of up to 10ms. From $V_{CC}=1.2\text{V}$ to $V_{CC}=3.3\text{V}\pm 0.3\text{V}$ a transition time of 100us is permitted. This parameter is valid for $T_{amb}=25^{\circ}\text{C}$ only.

[5] I_{CC} is measured with outputs pulled to V_{CC} or GND.

[6] This is the increase in supply current for each input at the specified voltage level other than V_{CC} or GND.

3.3.2、AC Characteristics

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

Parameter	Symbol	Conditions		Min.	Typ. ^[1]	Max.	Unit
LOW to HIGH propagation delay	t _{PLH}	nAn to nYn; see Figure 4	V _{CC} =2.7V	-	-	5.0	ns
			V _{CC} =3.0V to 3.6V	1	2.5	4.1	ns
HIGH to LOW propagation delay	t _{PHL}	nAn to nYn; see Figure 4	V _{CC} =2.7V	-	-	5.1	ns
			V _{CC} =3.0V to 3.6V	1	2.6	4.1	ns
OFF-state to HIGH propagation delay	t _{pZH}	nOE to nYn; see Figure 5	V _{CC} =2.7V	-	-	6.3	ns
			V _{CC} =3.0V to 3.6V	1	3.2	5.2	ns
OFF-state to LOW propagation delay	t _{pZL}	nOE to nYn; see Figure 5	V _{CC} =2.7V	-	-	6.7	ns
			V _{CC} =3.0V to 3.6V	1.1	3.1	5.2	ns
HIGH to OFF-state propagation delay	t _{PHZ}	nOE to nYn; see Figure 5	V _{CC} =2.7V	-	-	6.3	ns
			V _{CC} =3.0V to 3.6V	1.9	3.3	5.6	ns
LOW to OFF-state propagation delay	t _{PLZ}	nOE to nYn see Figure 5	V _{CC} =2.7V	-	-	5.6	ns
			V _{CC} =3.0V to 3.6V	1.8	3.3	5.1	ns

Note: [1] All typical values are at $V_{CC}=3.3\text{V}$ and $T_{amb}=25^{\circ}\text{C}$.



4、Testing Circuit

4.1、AC Testing Circuit

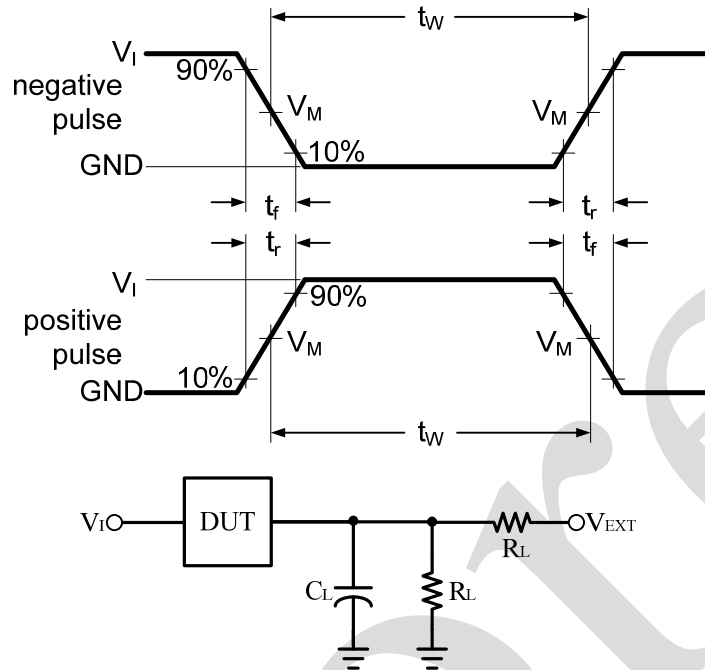


Figure 2. Test circuit for measuring switching times

C_L includes probe and jig capacitance.

R_L =Load resistance.

4.2、AC Testing Waveforms

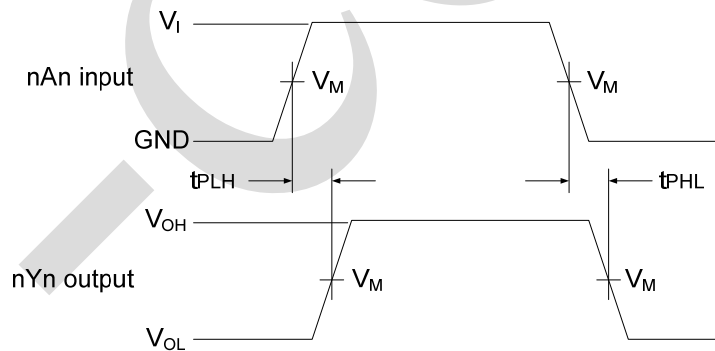


Figure 3. Input (nAn) to output (nYn) propagation delays

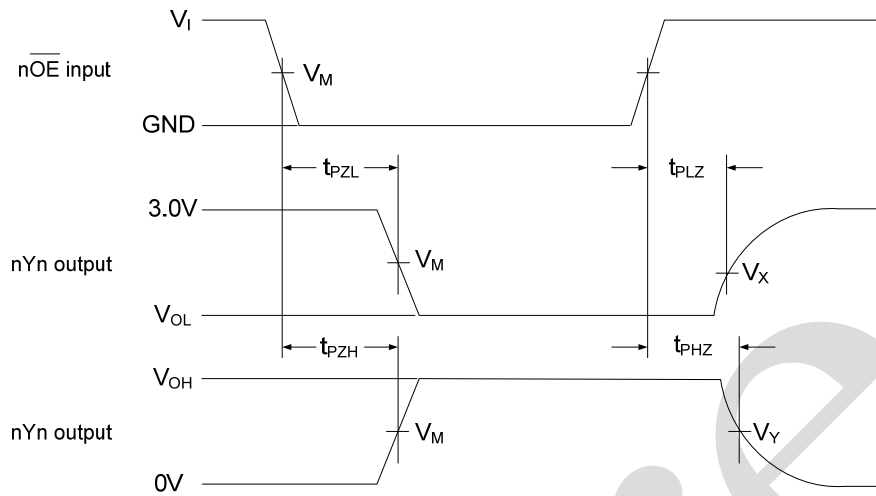


Figure 4. 3-state output enable and disable times

4.3、 Measurement Points

Input	Output		
V_M	V_M	V_X	V_Y
1.5V	1.5V	$V_{OL}+0.3V$	$V_{OH}-0.3V$

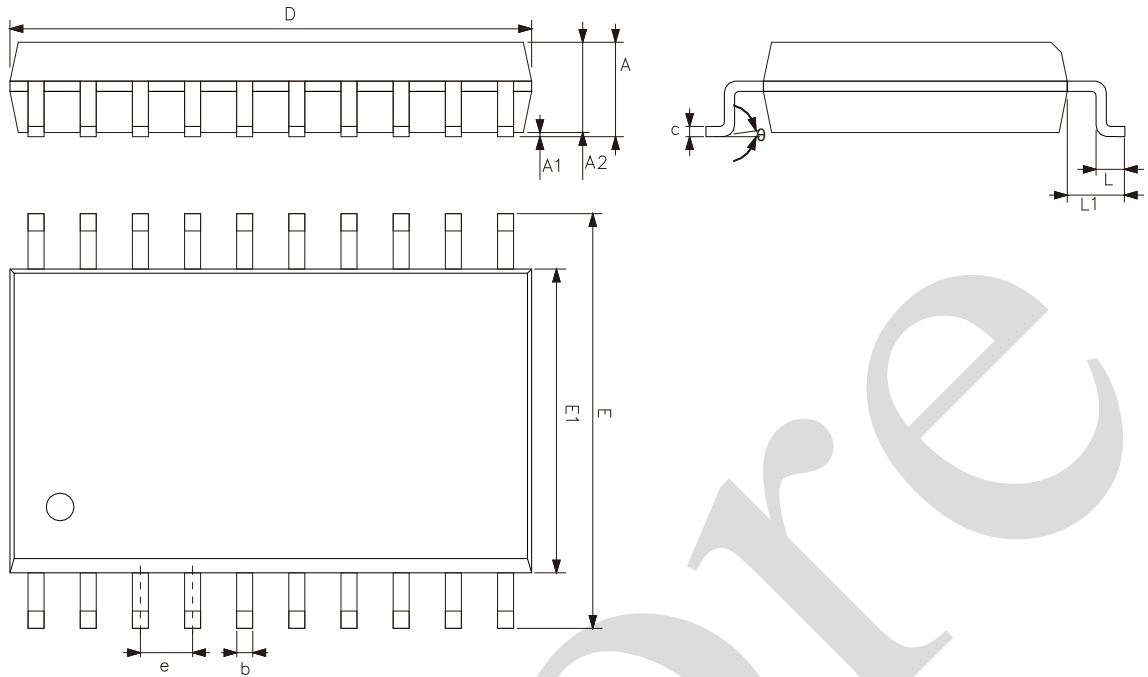
4.4、 Test Data

Input				Load		V_{EXT}		
V_I	f_i	t_w	t_r, t_f	C_L	R_L	t_{PHZ}, t_{PZH}	t_{PLZ}, t_{PZL}	t_{PLH}, t_{PHL}
2.7V	$\leq 10\text{MHz}$	500ns	$\leq 2.5\text{ns}$	50pF	500 Ω	GND	6V	open



5、Package Information

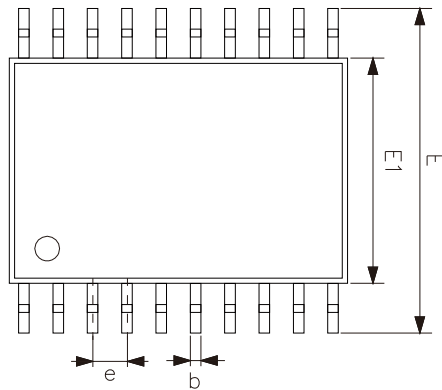
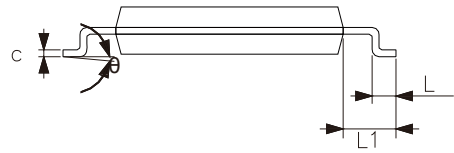
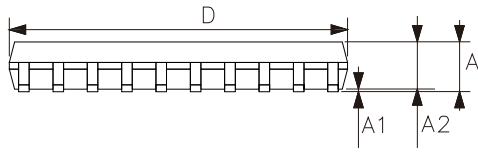
5.1、SOP20



Symbol	Dimensions (mm)	
	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°



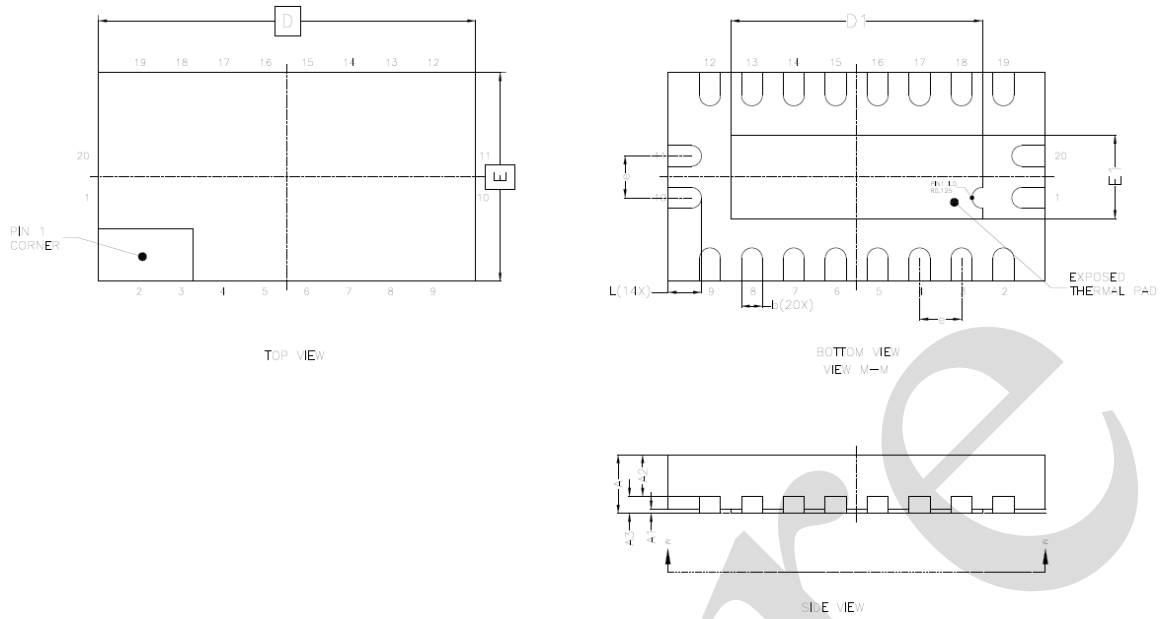
5.2、TSSOP20



Symbol	Dimensions (mm)	
	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°



5.3、DHVQFN20



Symbol	Dimensions (mm)	
	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、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

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

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