



AiP74HC/HCT154

4-to-16 Line Decoder/Demultiplexer

Product Specification

Specification Revision History:

Version	Date	Description
2024-06-A0	2024-06	New
2024-09-A1	2024-09	Modify the parameters



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1、General Description

The AiP74HC/HCT154 is a 4-to-16 line decoder/demultiplexer.

Features:

- Supply voltage range:
AiP74HC154: 2V to 6V
AiP74HCT154: 4.5 V to 5.5V
- Input levels:
AiP74HC154: CMOS level
AiP74HCT154: TTL level
- Temperature range: -40°C to +125°C
- Packaging information: SOP24/SSOP24/TSSOP24/DHVQFN24

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74HC154SA24.TB	SOP24	74HC154	30 PCS/tube	80 tube/box	2400 PCS/box	Dimensions of plastic enclosure: 15.4mm×7.5mm Pin spacing: 1.27mm
AiP74HCT154SA24.TB	SOP24	74HCT154	30 PCS/tube	80 tube/box	2400 PCS/box	Dimensions of plastic enclosure: 15.4mm×7.5mm Pin spacing: 1.27mm
AiP74HC154VA24.TB	SSOP24	74HC154	60 PCS/tube	100 tube/box	6000 PCS/box	Dimensions of plastic enclosure: 8.2mm×5.3mm Pin spacing: 0.65mm
AiP74HCT154VA24.TB	SSOP24	74HCT154	60 PCS/tube	100 tube/box	6000 PCS/box	Dimensions of plastic enclosure: 8.2mm×5.3mm Pin spacing: 0.65mm
AiP74HC154TA24.TB	TSSOP24	74HC154	62 PCS/tube	200 tube/box	12400 PCS/box	Dimensions of plastic enclosure: 7.8mm×4.4mm Pin spacing: 0.65mm
AiP74HCT154TA24.TB	TSSOP24	74HCT154	62 PCS/tube	200 tube/box	12400 PCS/box	Dimensions of plastic enclosure: 7.8mm×4.4mm Pin spacing: 0.65mm



Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74HC154SA24.TR	SOP24	74HC154	1250PCS/reel	1250PCS/box	Dimensions of plastic enclosure: 15.4mm×7.5mm Pin spacing: 1.27mm
AiP74HCT154SA24.TR	SOP24	74HCT154	1250PCS/reel	1250PCS/box	Dimensions of plastic enclosure: 15.4mm×7.5mm Pin spacing: 1.27mm
AiP74HC154VA24.TR	SSOP24	74HC154	2500PCS/reel	5000PCS/box	Dimensions of plastic enclosure: 8.2mm×5.3mm Pin spacing: 0.65mm
AiP74HCT154VA24.TR	SSOP24	74HCT154	2500PCS/reel	5000PCS/box	Dimensions of plastic enclosure: 8.2mm×5.3mm Pin spacing: 0.65mm
AiP74HC154TA24.TR	TSSOP24	74HC154	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 7.8mm×4.4mm Pin spacing: 0.65mm
AiP74HCT154TA24.TR	TSSOP24	74HCT154	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 7.8mm×4.4mm Pin spacing: 0.65mm
AiP74HC154QE24.TR	DHVQFN24	74HC154	3000PCS/reel	3000PCS/box	Dimensions of plastic enclosure: 5.5mm×3.5mm Pin spacing: 0.5mm
AiP74HCT154QE24.TR	DHVQFN24	74HCT154	3000PCS/reel	3000PCS/box	Dimensions of plastic enclosure: 5.5mm×3.5mm 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

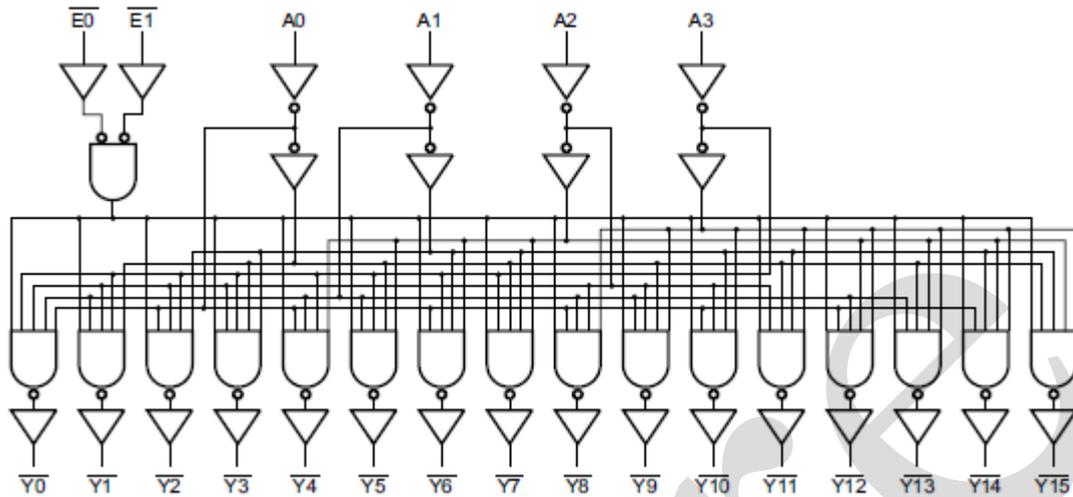
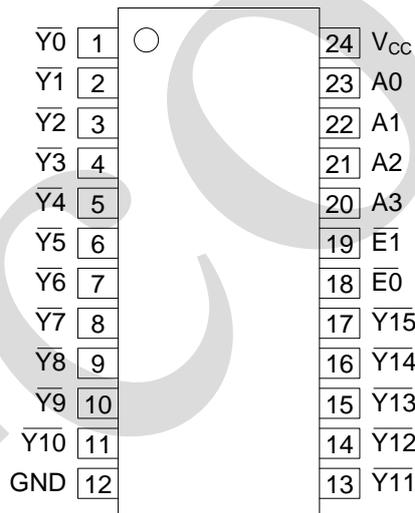


Figure 1. Functional diagram

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17	$\bar{Y}0, \bar{Y}1, \bar{Y}2, \bar{Y}3, \bar{Y}4, \bar{Y}5, \bar{Y}6, \bar{Y}7, \bar{Y}8, \bar{Y}9, \bar{Y}10, \bar{Y}11, \bar{Y}12, \bar{Y}13, \bar{Y}14, \bar{Y}15$	data output (active LOW)
12	GND	ground (0 V)
18, 19	$\bar{E}0, \bar{E}1$	enable input (active LOW)
23, 22, 21, 20	A0, A1, A2, A3	address input
24	Vcc	supply voltage



2.4、Function Table

INPUTS						OUTPUTS																		
$\bar{E}0$	$\bar{E}1$	A0	A1	A2	A3	$\bar{Y}0$	$\bar{Y}1$	$\bar{Y}2$	$\bar{Y}3$	$\bar{Y}4$	$\bar{Y}5$	$\bar{Y}6$	$\bar{Y}7$	$\bar{Y}8$	$\bar{Y}9$	$\bar{Y}10$	$\bar{Y}11$	$\bar{Y}12$	$\bar{Y}13$	$\bar{Y}14$	$\bar{Y}15$			
H	H	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
H	L	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
L	H	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
		H	L	L	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
		L	H	L	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
		H	H	L	L	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
		L	L	H	L	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	
		H	L	H	L	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H
		L	H	H	L	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
		H	H	H	L	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H
		L	L	L	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H
		H	L	L	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H
		L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H
		H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H
		L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H
		H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H
		L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L		

Note:

H = HIGH voltage level

L = LOW voltage level

X = don't care.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

($T_{amb}=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+7	V
supply current	I_{CC}	-	-	50	mA
ground current	I_{GND}	-	-50	-	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	$-0.5V < V_O < V_{CC}+0.5V$	-	± 25	mA
storage temperature	T_{stg}	-	-65	+150	$^{\circ}C$
soldering temperature	T_L	10s	260		$^{\circ}C$



3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
AiP74HC154						
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	°C
AiP74HCT154						
supply voltage	V_{CC}	-	4.5	5.0	5.5	V
input voltage	V_I	-	0	-	V_{CC}	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	°C

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
AiP74HC154							
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	$I_O=-20\mu\text{A}$	1.9	2.0	-	V
		4.5V	$I_O=-20\mu\text{A}$	4.4	4.5	-	V
		6.0V	$I_O=-20\mu\text{A}$	5.9	6.0	-	V
		4.5V	$I_O=-4.0\text{mA}$	3.84	4.32	-	V
		6.0V	$I_O=-5.2\text{mA}$	5.34	5.81	-	V
LOW-level output voltage	V_{OL}	2.0V	$I_O=20\mu\text{A}$	-	0	0.1	V
		4.5V	$I_O=20\mu\text{A}$	-	0	0.1	V
		6.0V	$I_O=20\mu\text{A}$	-	0	0.1	V
		4.5V	$I_O=4.0\text{mA}$	-	0.15	0.33	V
		6.0V	$I_O=5.2\text{mA}$	-	0.16	0.33	V
input leakage current	I_I	6.0V	$V_I=V_{CC}$ or GND	-	-	± 10	μA
supply current	I_{CC}	6.0V	$V_I=V_{CC}$ or GND; $I_O=0\text{A}$	-	-	80	μA
AiP74HCT154							
HIGH-level input voltage	V_{IH}	4.5V to 5.5V	-	2.0	1.6	-	V
LOW-level input voltage	V_{IL}	4.5V to 5.5V	-	-	1.2	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	$I_O=-20\mu\text{A}$	4.4	4.5	-	V
			$I_O=-4.0\text{mA}$	3.84	4.32	-	V
LOW-level	V_{OL}	4.5V	$I_O=20\mu\text{A}$	-	0	0.1	V



output voltage			$I_O=4.0mA$	-	0.15	0.33	V
input leakage current	I_I	5.5V	$V_I=V_{CC}$ or GND	-	-	± 10	μA
supply current	I_{CC}	6.0V	$V_I=V_{CC}$ or GND; $I_O=0A$	-	-	80	μA
additional supply current	ΔI_{CC}	4.5V to 5.5V	One input at $V_I=V_{CC}-2.1V$; Other inputs at V_{CC} or GND; $I_O=0A$	-	-	135	μA

3.3.2、DC Characteristics 2

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

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
AiP74HC154							
HIGH-level input voltage	V_{IH}	2.0V	-	1.5	-	-	V
		4.5V	-	3.15	-	-	V
		6.0V	-	4.2	-	-	V
LOW-level input voltage	V_{IL}	2.0V	-	-	-	0.5	V
		4.5V	-	-	-	1.35	V
		6.0V	-	-	-	1.8	V
HIGH-level output voltage	V_{OH}	2.0V	$I_O=-20\mu A$	1.9	-	-	V
		4.5V	$I_O=-20\mu A$	4.4	-	-	V
		6.0V	$I_O=-20\mu A$	5.9	-	-	V
		4.5V	$I_O=-4.0mA$	3.7	-	-	V
		6.0V	$I_O=-5.2mA$	5.2	-	-	V
LOW-level output voltage	V_{OL}	2.0V	$I_O=20\mu A$	-	-	0.1	V
		4.5V	$I_O=20\mu A$	-	-	0.1	V
		6.0V	$I_O=20\mu A$	-	-	0.1	V
		4.5V	$I_O=4.0mA$	-	-	0.4	V
		6.0V	$I_O=5.2mA$	-	-	0.4	V
input leakage current	I_I	6.0V	$V_I=V_{CC}$ or GND	-	-	± 20	μA
supply current	I_{CC}	6.0V	$V_I=V_{CC}$ or GND; $I_O=0A$	-	-	160	μA
AiP74HCT154							
HIGH-level input voltage	V_{IH}	4.5V to 5.5V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	4.5V to 5.5V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	$I_O=-20\mu A$	4.4	-	-	V
			$I_O=-4.0mA$	3.7	-	-	V
LOW-level output voltage	V_{OL}	4.5V	$I_O=20\mu A$	-	-	0.1	V
			$I_O=4.0mA$	-	-	0.4	V
input leakage current	I_I	5.5V	$V_I=V_{CC}$ or GND	-	-	± 20	μA
supply current	I_{CC}	6.0V	$V_I=V_{CC}$ or GND; $I_O=0A$	-	-	160	μA
additional supply current	ΔI_{CC}	4.5V to 5.5V	One input at $V_I=V_{CC}-2.1V$; Other inputs at V_{CC} or GND; $I_O=0A$	-	-	147	μA



3.3.3、AC Characteristics 1

(T_{amb}=-40°C to +85°C, unless otherwise specified.)

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC154								
An to \bar{Y}_n propagation delay	t _{PLH} , t _{PHL}	2.0V	C _L =50pF	see Figure 3	-	36	190	ns
		4.5V	C _L =50pF		-	13	38	ns
		5.0V	C _L =15pF		-	11	-	ns
		6.0V	C _L =50pF		-	10	33	ns
\bar{E}_n to \bar{Y}_n propagation delay		2.0V	C _L =50pF		-	39	190	ns
		4.5V	C _L =50pF		-	14	38	ns
		5.0V	C _L =15pF		-	11	-	ns
		6.0V	C _L =50pF		-	11	33	ns
transition time	t _{THL} , t _{TLH}	2.0V	C _L =50pF	-	19	95	ns	
		4.5V	C _L =50pF	-	7	19	ns	
		6.0V	C _L =50pF	-	6	16	ns	
AiP74HCT154								
An to \bar{Y}_n propagation delay	t _{PLH} , t _{PHL}	4.5V	C _L =50pF	see Figure 3	-	16	44	ns
		5.0V	C _L =15pF		-	13	-	ns
\bar{E}_n to \bar{Y}_n propagation delay		4.5V	C _L =50pF		-	15	40	ns
		5.0V	C _L =15pF		-	13	-	ns
transition time	t _{THL} , t _{TLH}	4.5V	C _L =50pF	-	7	19	ns	

3.3.4、AC Characteristics 2

(T_{amb}=-40°C to +125°C, unless otherwise specified.)

Parameter	Symbol	V _{CC}	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC154								
An to \bar{Y}_n propagation delay	t _{PLH} , t _{PHL}	2.0V	C _L =50pF	see Figure 3	-	-	225	ns
		4.5V	C _L =50pF		-	-	45	ns
		6.0V	C _L =50pF		-	-	38	ns
\bar{E}_n to \bar{Y}_n propagation delay		2.0V	C _L =50pF		-	-	225	ns
		4.5V	C _L =50pF		-	-	45	ns
		6.0V	C _L =50pF		-	-	38	ns
transition time	t _{THL} , t _{TLH}	2.0V	C _L =50pF	-	-	110	ns	
		4.5V	C _L =50pF	-	-	22	ns	
		6.0V	C _L =50pF	-	-	19	ns	
AiP74HCT154								
An to \bar{Y}_n propagation delay	t _{PLH} , t _{PHL}	4.5V	C _L =50pF	see Figure 3	-	-	53	ns
\bar{E}_n to \bar{Y}_n propagation delay		4.5V	C _L =50pF		-	-	48	ns
transition time	t _{THL} , t _{TLH}	4.5V	C _L =50pF		-	-	22	ns



4、Testing Circuit

4.1、DC Testing Circuit

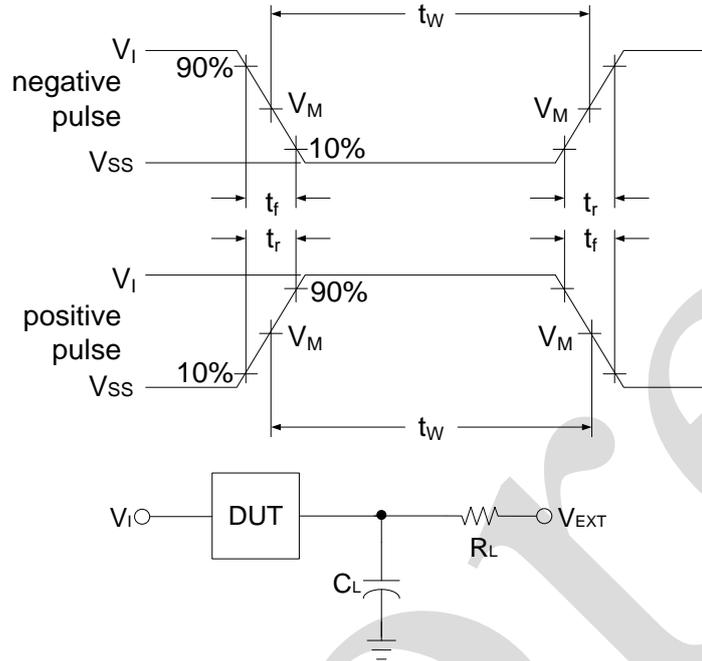


Figure 2. Load circuit

C_L includes probe and jig capacitance.

4.2、AC Testing Circuit

Type	Input		Load		V_{EXT}		
	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}/t_{PHL}	t_{PLZ}/t_{PZL}	t_{PHZ}/t_{PZH}
AiP74HC154	V_{CC}	3.0ns	15pF, 50pF	1K Ω	Open	V_{CC}	GND
AiP74HCT154	3.0V	3.0ns	15pF, 50pF	1K Ω	Open	V_{CC}	GND



4.3、AC Testing Waveforms

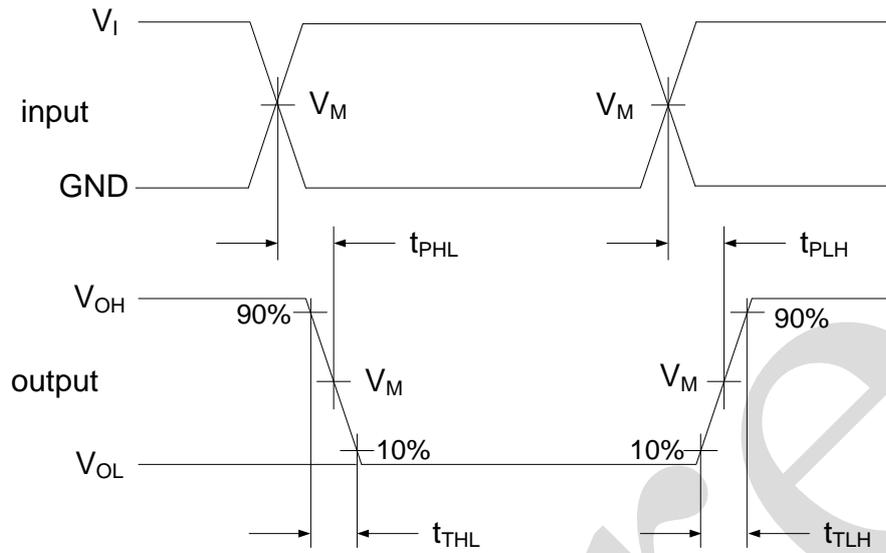


Figure 3 Propagation delay, output transition time

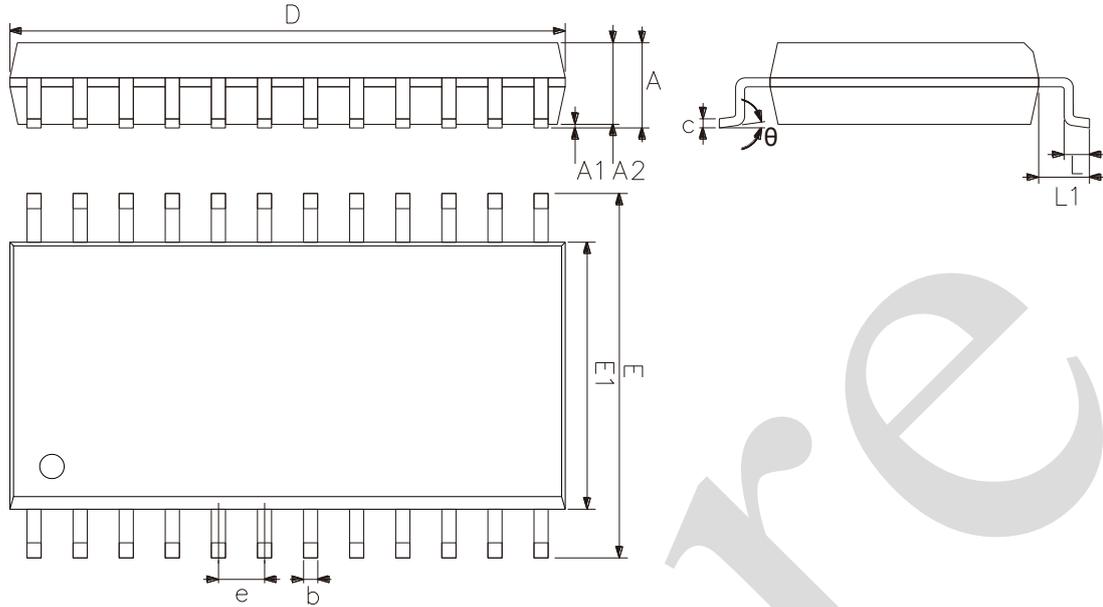
4.4、Measurement Points

Type	Input	Output
	V_M	V_M
AiP74HC154	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
AiP74HCT154	1.3V	1.3V



5、Package Information

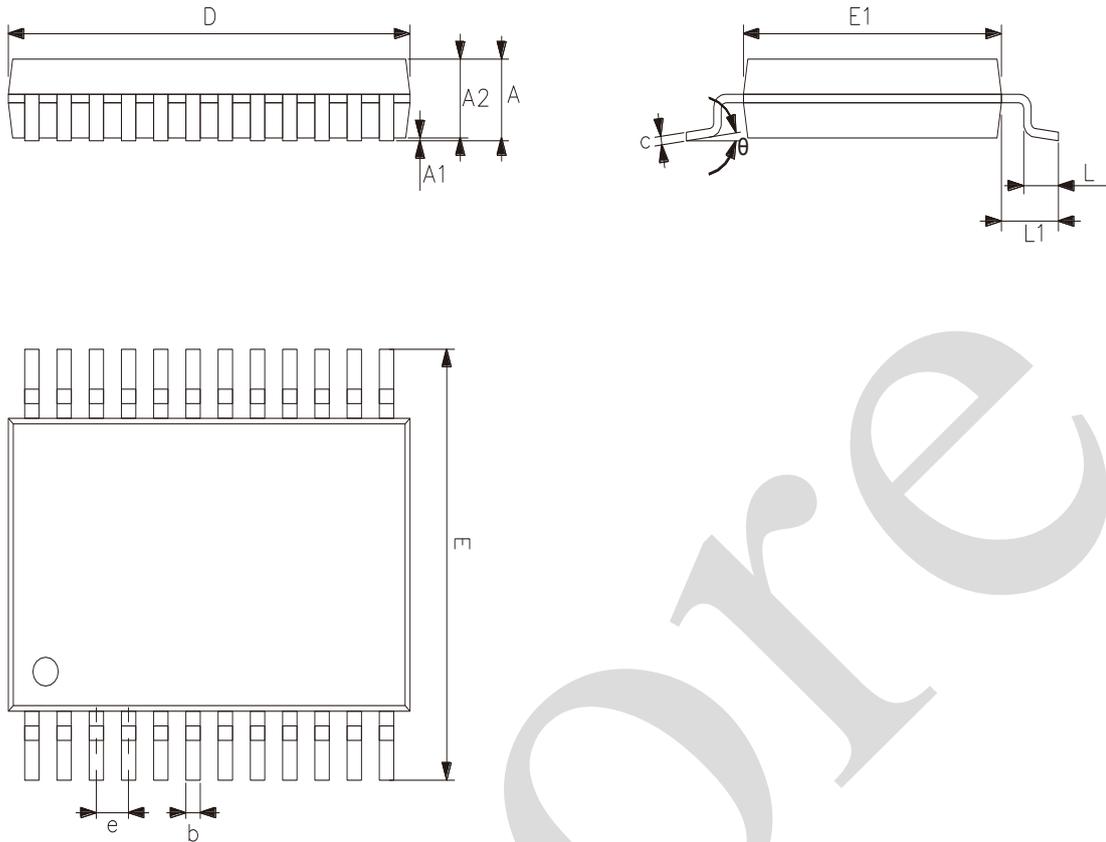
5.1、SOP24



2023/12/A	Dimensions In Millimeters	
	Symbol	Min.
A	2.35	2.65
A1	0.10	0.30
A2	2.13	2.44
b	0.39	0.47
c	0.25	0.30
D	15.19	15.55
E	10.10	10.57
E1	7.40	7.62
e	1.27	
L	0.41	1.00
L1	1.30	1.50
θ	0°	8°



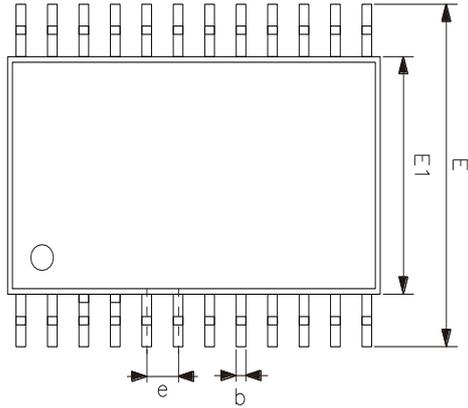
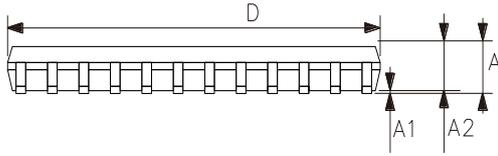
5.2、SSOP24



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	1.60	2.00
A1	0.05	0.25
A2	1.40	1.85
b	0.28	0.37
c	0.15	0.20
D	8.00	8.40
E	7.60	8.00
E1	5.10	5.50
e	0.65	
L	0.55	1.10
L1	1.15	1.35
θ	0°	8°



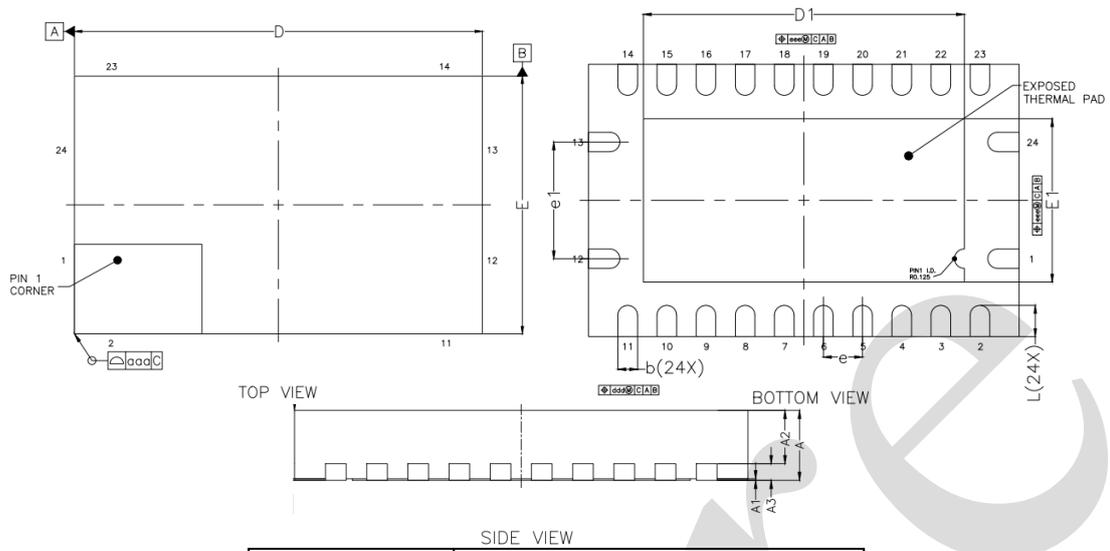
5.3、TSSOP24



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	7.70	7.90	
E	6.20	6.60	
E1	4.30	4.50	
e	0.65		
L	0.45	0.75	
θ	0°	8°	



5.4、DHVQFN24



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	5.40	5.60
E	3.40	3.60
e	0.50	
e1	1.50	
b	0.18	0.30
L	0.30	0.50
D1	3.95	4.25
E1	1.95	2.25



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	<p>○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard.</p> <p>×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.</p>									

6.2、 Notes

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

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