



AiP74HC/HCT574

Octal D-type flip-flop; positive edge-trigger; 3-state

Product Specification

Specification Revision History:

Version	Date	Description
2019-06-A1	2019-06	New
2021-12-A2	2021-12	Modify ordering information
2022-01-A3	2022-01	Modify ambient temperature to $-40^{\circ}\text{C}\sim+105^{\circ}\text{C}$ and add electrical characteristics of $-40^{\circ}\text{C}\sim+105^{\circ}\text{C}$



1、 General Description

The AiP74HC/HCT574 is an octal positive-edge triggered D-type flip-flop with 3-state outputs. The device features a clock (CP) and output enable (\overline{OE}) inputs. The flip-flops will store the state of their individual D-inputs that meet the set-up and hold time requirements on the LOW-to-HIGH clock (CP) transition. A HIGH on \overline{OE} causes the outputs to assume a high-impedance OFF-state. Operation of the \overline{OE} input does not affect the state of the flip-flops. Inputs also include clamp diodes, this enables the use of current limiting resistors to interface inputs to voltages in excess of V_{CC} .

Features:

- Input levels:
 - For AiP74HC574: CMOS level
 - For AiP74HCT574: TTL level
- 3-state non-inverting outputs for bus oriented applications
- 8-bit positive, edge-triggered register
- Common 3-state output enable input
- Specified from -40°C to +105°C
- Packaging information: DIP20/SOP20/TSSOP20

**Ordering Information:****Tube packing specifications:**

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74HC574DA20.TB	DIP20	74HC574	18 PCS/tube	40 tube/box	720 PCS/box	Dimensions of plastic enclosure: 26.3mm×6.4mm Pin spacing: 2.54mm
AiP74HCT574DA20.TB	DIP20	74HCT574	18 PCS/tube	40 tube/box	720 PCS/box	Dimensions of plastic enclosure: 26.3mm×6.4mm Pin spacing: 2.54mm
AiP74HC574SA20.TB	SOP20(1)	74HC574	35 PCS/tube	80 tube/box	2800 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74HCT574SA20.TB	SOP20(1)	74HCT574	35 PCS/tube	80 tube/box	2800 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74HC574SA20.TB	SOP20(2)	74HC574	36 PCS/tube	80 tube/box	2880 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74HCT574SA20.TB	SOP20(2)	74HCT574	36 PCS/tube	80 tube/box	2880 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74HC574TA20.TB	TSSOP20	74HC574	70 PCS/tube	200 tube/box	14000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74HCT574TA20.TB	TSSOP20	74HCT574	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
AiP74HC574SA20.TR	SOP20	74HC574	1000PCS/reel	1000PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing:1.27mm
AiP74HCT574SA20.TR	SOP20	74HCT574	1000PCS/reel	1000PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing:1.27mm
AiP74HC574TA20.TR	TSSOP20	74HC574	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing:0.65mm
AiP74HCT574TA20.TR	TSSOP20	74HCT574	4000PCS/reel	8000PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing:0.65mm

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

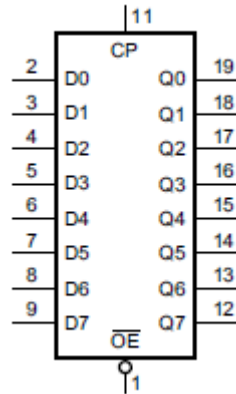


Figure 1. Logic symbol

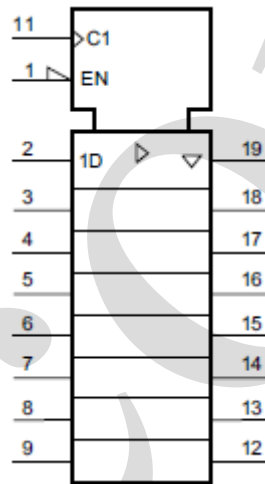


Figure 2. IEC logic symbol

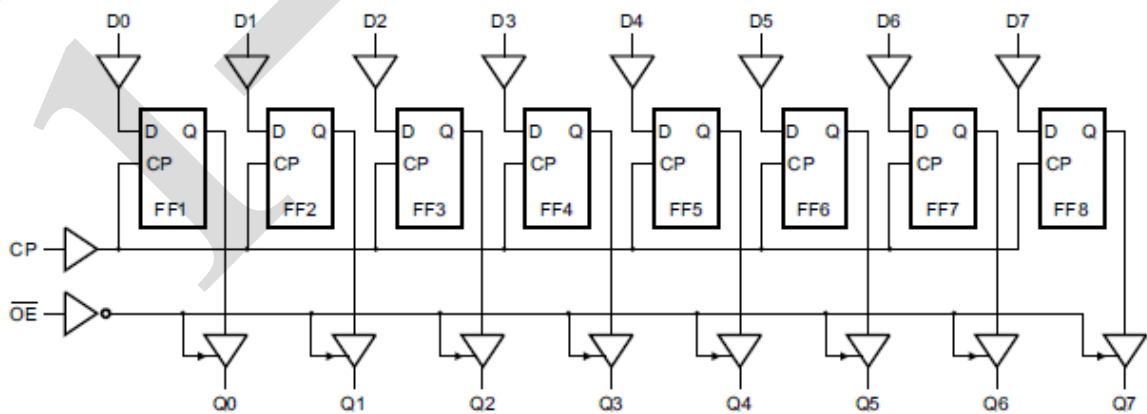


Figure 3. Logic diagram

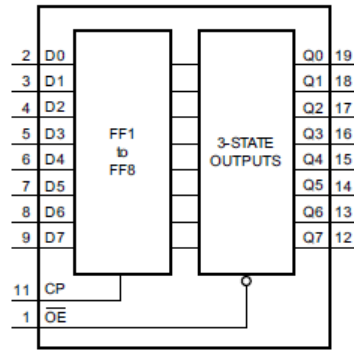
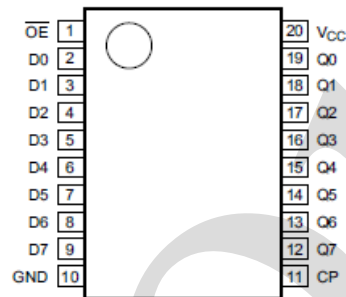


Figure 4. Functional diagram

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	OE	3-state output enable input (active LOW)
2	D0	data input
3	D1	data input
4	D2	data input
5	D3	data input
6	D4	data input
7	D5	data input
8	D6	data input
9	D7	data input
10	GND	ground (0V)
11	CP	clock input (LOW-to-HIGH, edge-triggered)
12	Q7	3-state flip-flop output
13	Q6	3-state flip-flop output
14	Q5	3-state flip-flop output
15	Q4	3-state flip-flop output
16	Q3	3-state flip-flop output
17	Q2	3-state flip-flop output
18	Q1	3-state flip-flop output
19	Q0	3-state flip-flop output
20	V _{CC}	supply voltage



2.4、Function Table

Operating modes	Input			Internal flip-flop	Output
	$\overline{\text{OE}}$	CP	Dn		Qn
Load and read register	L	↑	l	L	L
	L	↑	h	H	H
Load register and disable output	H	↑	l	L	Z
	H	↑	h	H	Z

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

h=HIGH voltage level one set-up time prior to the LOW-to-HIGH clock transition;

l=LOW voltage level one set-up time prior to the LOW-to-HIGH clock transition;

↑=LOW-to-HIGH clock transition.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

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

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+7.0	V
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	$-0.5V < V_O < V_{CC}+0.5V$	-	±35	mA
supply current	I_{CC}	-	-	70	mA
ground current	I_{GND}	-	-70	-	mA
storage temperature	T_{stg}	-	-65	+150	°C
total power dissipation	P_{tot}	-	-	500	mW
Soldering temperature	T_L	10s	DIP	245	°C
			SOP	250	°C

Note:

[1] For DIP20 packages: above 70°C the value of P_{tot} derates linearly with 12mW/K.

[2] For SOP20 packages: above 70°C the value of P_{tot} derates linearly with 8mW/K.

[3] For (T)SSOP20 packages: above 60°C the value of P_{tot} derates linearly with 5.5mW/K.



3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
AiP74HC574						
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
input transition rise and fall rate	$\Delta t/\Delta V$	$V_{CC}=2.0V$	-	-	625	ns/V
		$V_{CC}=4.5V$	-	1.67	139	ns/V
		$V_{CC}=6.0V$	-	-	83	ns/V
ambient temperature	T_{amb}	-	-40	-	+105	°C
AiP74HCT574						
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
input transition rise and fall rate	$\Delta t/\Delta V$	$V_{CC}=4.5V$	-	1.67	139	ns/V
ambient temperature	T_{amb}	-	-40	-	+105	°C

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC574							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0V$	1.5	1.2	-	V	
		$V_{CC}=4.5V$	3.15	2.4	-	V	
		$V_{CC}=6.0V$	4.2	3.2	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0V$	-	0.8	0.5	V	
		$V_{CC}=4.5V$	-	2.1	1.35	V	
		$V_{CC}=6.0V$	-	2.8	1.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O=-20\mu A; V_{CC}=2.0V$	1.9	2.0	-	V
			$I_O=-20\mu A; V_{CC}=4.5V$	4.4	4.5	-	V
			$I_O=-20\mu A; V_{CC}=6.0V$	5.9	6.0	-	V
			$I_O=-6.0mA; V_{CC}=4.5V$	3.98	4.32	-	V
			$I_O=-7.8mA; V_{CC}=6.0V$	5.48	5.81	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O=20\mu A; V_{CC}=2.0V$	-	0	0.1	V
			$I_O=20\mu A; V_{CC}=4.5V$	-	0	0.1	V
			$I_O=20\mu A; V_{CC}=6.0V$	-	0	0.1	V
			$I_O=6.0mA; V_{CC}=4.5V$	-	0.15	0.26	V
			$I_O=7.8mA; V_{CC}=6.0V$	-	0.16	0.26	V
input leakage current	I_I	$V_I=V_{CC} \text{ or } GND; V_{CC}=6.0V$	-	-	± 0.1	μA	
OFF-state output current	I_{OZ}	$V_I=V_{IH} \text{ or } V_{IL}; V_{CC}=6.0V;$ $V_O=V_{CC} \text{ or } GND$	-	-	± 0.5	μA	
supply current	I_{CC}	$V_I=V_{CC} \text{ or } GND; I_O=0A; V_{CC}=6.0V$	-	-	8.0	μA	
input	C_I	-	-	3.5	-	pF	



capacitance							
AiP74HCT574							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V$ to $5.5V$		2.0	1.6	-	V
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V$ to $5.5V$		-	1.2	0.8	V
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL} ; $V_{CC}=4.5V$	$I_O=-20\mu A$	4.4	4.5	-	V
			$I_O=-6.0mA$	3.98	4.32	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL} ; $V_{CC}=4.5V$	$I_O=20\mu A$	-	0	0.1	V
			$I_O=6.0mA$	-	0.16	0.26	V
input leakage current	I_I	$V_I=V_{CC}$ or GND; $V_{CC}=5.5V$		-	-	± 0.1	μA
OFF-state output current	I_{OZ}	$V_I=V_{IH}$ or V_{IL} ; $V_{CC}=5.5V$; $V_O=V_{CC}$ or GND		-	-	± 0.5	μA
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=5.5V$		-	-	8.0	μA
additional supply current	ΔI_{CC}	per input pin; $V_I=V_{CC}-2.1V$; other inputs at V_{CC} or GND; $I_O=0A$; $V_{CC}=4.5V$ to $5.5V$	per input pin; Dn inputs	-	50	180	μA
			per input pin; OE input	-	125	450	μA
			per input pin; CP input	-	150	540	μA
input capacitance	C_I	-		-	3.5	-	pF

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC574							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0V$	1.5	-	-	V	
		$V_{CC}=4.5V$	3.15	-	-	V	
		$V_{CC}=6.0V$	4.2	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0V$	-	-	0.5	V	
		$V_{CC}=4.5V$	-	-	1.35	V	
		$V_{CC}=6.0V$	-	-	1.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL}	$I_O=-20\mu A$; $V_{CC}=2.0V$	1.9	-	-	V
			$I_O=-20\mu A$; $V_{CC}=4.5V$	4.4	-	-	V
			$I_O=-20\mu A$; $V_{CC}=6.0V$	5.9	-	-	V
			$I_O=-6.0mA$; $V_{CC}=4.5V$	3.84	-	-	V
			$I_O=-7.8mA$; $V_{CC}=6.0V$	5.34	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL}	$I_O=20\mu A$; $V_{CC}=2.0V$	-	-	0.1	V
			$I_O=20\mu A$; $V_{CC}=4.5V$	-	-	0.1	V
			$I_O=20\mu A$; $V_{CC}=6.0V$	-	-	0.1	V
			$I_O=6.0mA$; $V_{CC}=4.5V$	-	-	0.33	V
			$I_O=7.8mA$; $V_{CC}=6.0V$	-	-	0.33	V
input leakage current	I_I	$V_I=V_{CC}$ or GND; $V_{CC}=6.0V$	-	-	± 1.0	μA	
OFF-state output current	I_{OZ}	$V_I=V_{IH}$ or V_{IL} ; $V_{CC}=6.0V$; $V_O=V_{CC}$ or GND	-	-	± 5.0	μA	



supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=6.0V$		-	-	80	μA
AiP74HC574							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V$ to $5.5V$		2.0	-	-	V
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V$ to $5.5V$		-	-	0.8	V
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL} ; $V_{CC}=4.5V$	$I_O=-20\mu A$	4.4	-	-	V
			$I_O=-6.0mA$	3.84	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL} ; $V_{CC}=4.5V$	$I_O=20\mu A$	-	-	0.1	V
			$I_O=6.0mA$	-	-	0.33	V
input leakage current	I_I	$V_I=V_{CC}$ or GND; $V_{CC}=5.5V$		-	-	± 1.0	μA
OFF-state output current	I_{OZ}	$V_I=V_{IH}$ or V_{IL} ; $V_{CC}=5.5V$; $V_O=V_{CC}$ or GND		-	-	± 5.0	μA
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=5.5V$		-	-	80	μA
additional supply current	ΔI_{CC}	per input pin; $V_I=V_{CC}-2.1V$; other inputs at V_{CC} or GND; $I_O=0A$; $V_{CC}=4.5V$ to $5.5V$;	per input pin; Dn inputs	-	-	225	μA
			per input pin; OE input	-	-	563	μA
			per input pin; CP input	-	-	675	μA

3.3.3、DC Characteristics 3

($T_{amb}=-40^{\circ}C$ to $+105^{\circ}C$, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC574							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0V$	1.5	-	-	V	
		$V_{CC}=4.5V$	3.15	-	-	V	
		$V_{CC}=6.0V$	4.2	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0V$	-	-	0.5	V	
		$V_{CC}=4.5V$	-	-	1.35	V	
		$V_{CC}=6.0V$	-	-	1.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL}	$I_O=-20\mu A$; $V_{CC}=2.0V$	1.9	-	-	V
			$I_O=-20\mu A$; $V_{CC}=4.5V$	4.4	-	-	V
			$I_O=-20\mu A$; $V_{CC}=6.0V$	5.9	-	-	V
			$I_O=-6.0mA$; $V_{CC}=4.5V$	3.7	-	-	V
			$I_O=-7.8mA$; $V_{CC}=6.0V$	5.2	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL}	$I_O=20\mu A$; $V_{CC}=2.0V$	-	-	0.1	V
			$I_O=20\mu A$; $V_{CC}=4.5V$	-	-	0.1	V
			$I_O=20\mu A$; $V_{CC}=6.0V$	-	-	0.1	V
			$I_O=6.0mA$; $V_{CC}=4.5V$	-	-	0.4	V
			$I_O=7.8mA$; $V_{CC}=6.0V$	-	-	0.4	V
input leakage current	I_I	$V_I=V_{CC}$ or GND; $V_{CC}=6.0V$	-	-	± 1.0	μA	
OFF-state output current	I_{OZ}	$V_I=V_{IH}$ or V_{IL} ; $V_{CC}=6.0V$; $V_O=V_{CC}$ or GND	-	-	± 10	μA	
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=6.0V$	-	-	160	μA	
AiP74HCT574							



HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V$ to $5.5V$		2.0	-	-	V
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V$ to $5.5V$		-	-	0.8	V
HIGH-level output voltage	V_{OH}	$V_I = V_{IH}$ or V_{IL} ; $V_{CC}=4.5V$	$I_O=-20\mu A$	4.4	-	-	V
			$I_O=-6.0mA$	3.7	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH}$ or V_{IL} ; $V_{CC}=4.5V$	$I_O=20\mu A$	-	-	0.1	V
			$I_O=6.0mA$	-	-	0.4	V
input leakage current	I_I	$V_I=V_{CC}$ or GND; $V_{CC}=5.5V$		-	-	± 1.0	μA
OFF-state output current	I_{OZ}	$V_I=V_{IH}$ or V_{IL} ; $V_{CC}=5.5V$; $V_O=V_{CC}$ or GND		-	-	± 10	μA
supply current	I_{CC}	$V_I=V_{CC}$ or GND; $I_O=0A$; $V_{CC}=5.5V$		-	-	160	μA
additional supply current	ΔI_{CC}	per input pin; $V_I=V_{CC}-2.1V$; other inputs at V_{CC} or GND; $I_O=0A$; $V_{CC}=4.5V$ to $5.5V$;	per input pin; Dn inputs	-	-	245	μA
			per input pin; OE input	-	-	613	μA
			per input pin; CP input	-	-	735	μA

3.3.4. AC Characteristics 1

($T_{amb}=25^\circ C$, GND =0V, $C_L=50pF$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC574							
CP to Qn propagation delay	t_{pd}	see Figure 6	$V_{CC}=2.0V$	-	47	150	ns
			$V_{CC}=4.5V$	-	17	30	ns
			$V_{CC}=5.0V$; $C_L=15pF$	-	14	-	ns
			$V_{CC}=6.0V$	-	14	26	ns
OE to Qn enable time	t_{en}	see Figure 8	$V_{CC}=2.0V$	-	44	140	ns
			$V_{CC}=4.5V$	-	16	28	ns
			$V_{CC}=6.0V$	-	13	24	ns
OE to Qn disable time	t_{dis}	see Figure 8	$V_{CC}=2.0V$	-	39	125	ns
			$V_{CC}=4.5V$	-	14	25	ns
			$V_{CC}=6.0V$	-	11	21	ns
transition time	t_t	Qn output; see Figure 6	$V_{CC}=2.0V$	-	14	60	ns
			$V_{CC}=4.5V$	-	5	12	ns
			$V_{CC}=6.0V$	-	4	10	ns
pulse width	t_w	CP; HIGH or LOW; see Figure 7	$V_{CC}=2.0V$	80	14	-	ns
			$V_{CC}=4.5V$	16	5	-	ns
			$V_{CC}=6.0V$	14	4	-	ns
Dn to CP set-up time	t_{su}	see Figure 7	$V_{CC}=2.0V$	60	6	-	ns
			$V_{CC}=4.5V$	12	2	-	ns
			$V_{CC}=6.0V$	10	2	-	ns
Dn to CP hold time	t_h	see Figure 7	$V_{CC}=2.0V$	5	0	-	ns
			$V_{CC}=4.5V$	5	0	-	ns
			$V_{CC}=6.0V$	5	0	-	ns
maximum	f_{max}	CP input;	$V_{CC}=2.0V$	6.0	37	-	MHz



frequency		see Figure 6	$V_{CC}=4.5V$	30	112	-	MHz
			$V_{CC}=5.0V; C_L=15pF$	-	123	-	MHz
			$V_{CC}=6.0V$	35	133	-	MHz
power dissipation capacitance	C_{PD}	$C_L=50pF; f=1MHz; V_I=GND \text{ to } V_{CC}$	-	22	-	-	pF
AiP74HCT574							
CP to Qn propagation delay	t_{pd}	see Figure 6	$V_{CC}=4.5V$	-	18	33	ns
			$V_{CC}=5.0V; C_L=15pF$	-	15	-	ns
OE to Qn enable time	t_{en}	$V_{CC}=4.5V$; see Figure 8		-	19	33	ns
OE to Qn disable time	t_{dis}	$V_{CC}=4.5V$; see Figure 8		-	16	28	ns
transition time	t_t	Qn; $V_{CC}=4.5V$; see Figure 6		-	5	12	ns
pulse width	t_w	CP; HIGH or LOW; $V_{CC}=4.5V$; see Figure 7		16	7	-	ns
Dn to CP set-up time	t_{su}	$V_{CC}=4.5V$; see Figure 7		12	3	-	ns
Dn to CP hold time	t_h	$V_{CC}=4.5V$; see Figure 7		5	-1	-	ns
maximum frequency	f_{max}	CP input; see Figure 6	$V_{CC}=4.5V$	30	69	-	MHz
			$V_{CC}=5.0V; C_L=15pF$	-	76	-	MHz
power dissipation capacitance	C_{PD}	$C_L=50pF; f=1MHz; V_I=GND \text{ to } V_{CC}-1.5V$		-	25	-	pF

Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL} .

[2] t_{en} is the same as t_{PZL} and t_{PZH} .

[3] t_{dis} is the same as t_{PLZ} and t_{PHZ} .

[4] t_t is the same as t_{THL} and t_{TLH} .

[5] C_{PD} is used to determine the dynamic power dissipation (P_D in uW).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i =input frequency in MHz;

f_o =output frequency in MHz;

C_L =output load capacitance in pF;

V_{CC} =supply voltage in V;

N =number of inputs switching;

$\sum (C_L \times V_{CC}^2 \times f_o)$ =sum of outputs.



3.3.5、AC Characteristics 2

($T_{amb} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $\text{GND} = 0\text{V}$, $C_L = 50\text{pF}$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC574							
CP to Qn propagation delay	t_{pd}	see Figure 6	$V_{CC} = 2.0\text{V}$	-	-	190	ns
			$V_{CC} = 4.5\text{V}$	-	-	35	ns
			$V_{CC} = 6.0\text{V}$	-	-	33	ns
$\overline{\text{OE}}$ to Qn enable time	t_{en}	see Figure 8	$V_{CC} = 2.0\text{V}$	-	-	175	ns
			$V_{CC} = 4.5\text{V}$	-	-	35	ns
			$V_{CC} = 6.0\text{V}$	-	-	30	ns
$\overline{\text{OE}}$ to Qn disable time	t_{dis}	see Figure 8	$V_{CC} = 2.0\text{V}$	-	-	155	ns
			$V_{CC} = 4.5\text{V}$	-	-	31	ns
			$V_{CC} = 6.0\text{V}$	-	-	26	ns
transition time	t_t	Qn output; see Figure 6	$V_{CC} = 2.0\text{V}$	-	-	75	ns
			$V_{CC} = 4.5\text{V}$	-	-	15	ns
			$V_{CC} = 6.0\text{V}$	-	-	13	ns
pulse width	t_w	CP; HIGH or LOW; see Figure 7	$V_{CC} = 2.0\text{V}$	100	-	-	ns
			$V_{CC} = 4.5\text{V}$	20	-	-	ns
			$V_{CC} = 6.0\text{V}$	17	-	-	ns
Dn to CP set-up time	t_{su}	see Figure 7	$V_{CC} = 2.0\text{V}$	75	-	-	ns
			$V_{CC} = 4.5\text{V}$	15	-	-	ns
			$V_{CC} = 6.0\text{V}$	13	-	-	ns
Dn to CP hold time	t_h	see Figure 7	$V_{CC} = 2.0\text{V}$	5	-	-	ns
			$V_{CC} = 4.5\text{V}$	5	-	-	ns
			$V_{CC} = 6.0\text{V}$	5	-	-	ns
maximum frequency	f_{max}	CP input; see Figure 6	$V_{CC} = 2.0\text{V}$	4.8	-	-	MHz
			$V_{CC} = 4.5\text{V}$	24	-	-	MHz
			$V_{CC} = 6.0\text{V}$	28	-	-	MHz
AiP74HCT574							
CP to Qn propagation delay	t_{pd}	see Figure 6	$V_{CC} = 4.5\text{V}$	-	-	41	ns
$\overline{\text{OE}}$ to Qn enable time	t_{en}	$V_{CC} = 4.5\text{V}$; see Figure 8		-	-	41	ns
$\overline{\text{OE}}$ to Qn disable time	t_{dis}	$V_{CC} = 4.5\text{V}$; see Figure 8		-	-	35	ns
transition time	t_t	Qn; $V_{CC} = 4.5\text{V}$; see Figure 6		-	-	15	ns
pulse width	t_w	CP; HIGH or LOW; $V_{CC} = 4.5\text{V}$; see Figure 7		20	-	-	ns
Dn to CP set-up time	t_{su}	$V_{CC} = 4.5\text{V}$; see Figure 7		15	-	-	ns
Dn to CP hold time	t_h	$V_{CC} = 4.5\text{V}$; see Figure 7		5	-	-	ns
maximum frequency	f_{max}	CP input; see Figure 6	$V_{CC} = 4.5\text{V}$	24	-	-	MHz



Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL} .

[2] t_{en} is the same as t_{PZL} and t_{PZH} .

[3] t_{dis} is the same as t_{PLZ} and t_{PHZ} .

[4] t_t is the same as t_{THL} and t_{TLH} .

3.3.6、 AC Characteristics 3

($T_{amb} = -40^{\circ}\text{C}$ to $+105^{\circ}\text{C}$, $GND = 0\text{V}$, $C_L = 50\text{pF}$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC574							
CP to Qn propagation delay	t_{pd}	see Figure 6	$V_{CC}=2.0\text{V}$	-	-	225	ns
			$V_{CC}=4.5\text{V}$	-	-	45	ns
			$V_{CC}=6.0\text{V}$	-	-	38	ns
$\overline{\text{OE}}$ to Qn enable time	t_{en}	see Figure 8	$V_{CC}=2.0\text{V}$	-	-	210	ns
			$V_{CC}=4.5\text{V}$	-	-	42	ns
			$V_{CC}=6.0\text{V}$	-	-	36	ns
$\overline{\text{OE}}$ to Qn disable time	t_{dis}	see Figure 8	$V_{CC}=2.0\text{V}$	-	-	190	ns
			$V_{CC}=4.5\text{V}$	-	-	38	ns
			$V_{CC}=6.0\text{V}$	-	-	32	ns
transition time	t_t	Qn output; see Figure 6	$V_{CC}=2.0\text{V}$	-	-	90	ns
			$V_{CC}=4.5\text{V}$	-	-	18	ns
			$V_{CC}=6.0\text{V}$	-	-	15	ns
pulse width	t_w	CP; HIGH or LOW; see Figure 7	$V_{CC}=2.0\text{V}$	120	-	-	ns
			$V_{CC}=4.5\text{V}$	24	-	-	ns
			$V_{CC}=6.0\text{V}$	20	-	-	ns
Dn to CP set-up time	t_{su}	see Figure 7	$V_{CC}=2.0\text{V}$	90	-	-	ns
			$V_{CC}=4.5\text{V}$	18	-	-	ns
			$V_{CC}=6.0\text{V}$	15	-	-	ns
Dn to CP hold time	t_h	see Figure 7	$V_{CC}=2.0\text{V}$	5	-	-	ns
			$V_{CC}=4.5\text{V}$	5	-	-	ns
			$V_{CC}=6.0\text{V}$	5	-	-	ns
maximum frequency	f_{max}	CP input; see Figure 6	$V_{CC}=2.0\text{V}$	4.0	-	-	MHz
			$V_{CC}=4.5\text{V}$	20	-	-	MHz
			$V_{CC}=6.0\text{V}$	24	-	-	MHz
AiP74HCT574							
CP to Qn propagation delay	t_{pd}	see Figure 6	$V_{CC}=4.5\text{V}$	-	-	50	ns
$\overline{\text{OE}}$ to Qn enable time	t_{en}	$V_{CC}=4.5\text{V}$; see Figure 8		-	-	50	ns
$\overline{\text{OE}}$ to Qn disable time	t_{dis}	$V_{CC}=4.5\text{V}$; see Figure 8		-	-	42	ns
transition time	t_t	Qn; $V_{CC}=4.5\text{V}$; see Figure 6		-	-	18	ns
pulse width	t_w	CP; HIGH or LOW; $V_{CC}=4.5\text{V}$; see Figure 7		24	-	-	ns
Dn to CP	t_{su}	$V_{CC}=4.5\text{V}$; see Figure 7		18	-	-	ns



set-up time						
Dn to CP hold time	t_h	$V_{CC}=4.5V$; see Figure 7	5	-	-	ns
maximum frequency	f_{max}	CP input; see Figure 6	$V_{CC}=4.5V$	20	-	MHz

Note:

- [1] t_{pd} is the same as t_{PLH} and t_{PHL} .
- [2] t_{en} is the same as t_{PZL} and t_{PZH} .
- [3] t_{dis} is the same as t_{PLZ} and t_{PHZ} .
- [4] t_t is the same as t_{THL} and t_{TLH} .

4、Testing Circuit

4.1、AC Testing Circuit

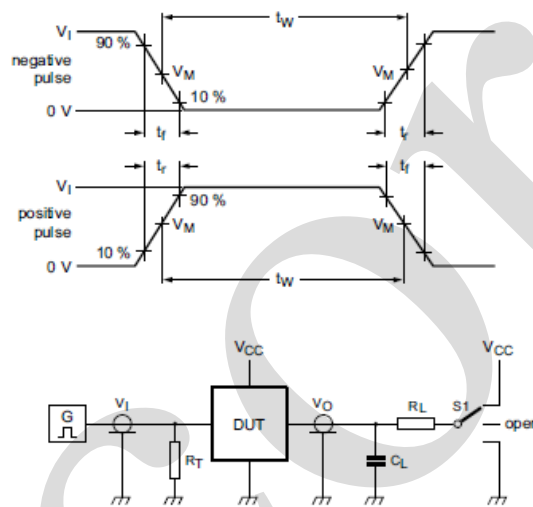


Figure 5. Test circuit for measuring switching times

Definitions for test circuit:

R_L =Load resistance.

C_L =Load capacitance including jig and probe capacitance.

R_T =Termination resistance should be equal to the output impedance Z_o of the pulse generator.

S1=Test selection switch.

4.2、AC Testing Waveforms

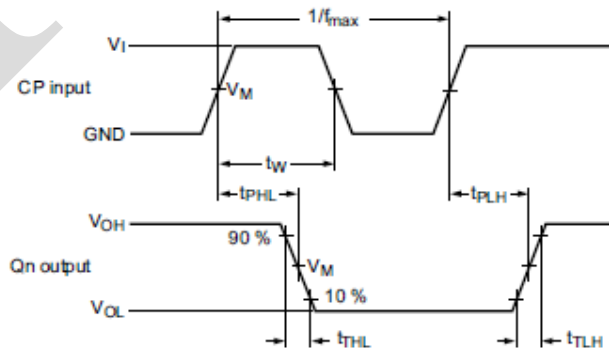


Figure 6. Propagation delay input (CP) to output (Qn), output transition time, clock input (CP) pulse width and the maximum frequency (CP)

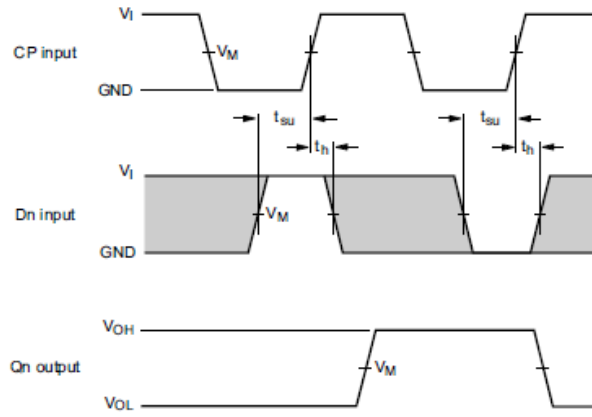


Figure 7. The data input (D) to clock input (CP) set-up times and clock input (CP) to data input (D) hold times

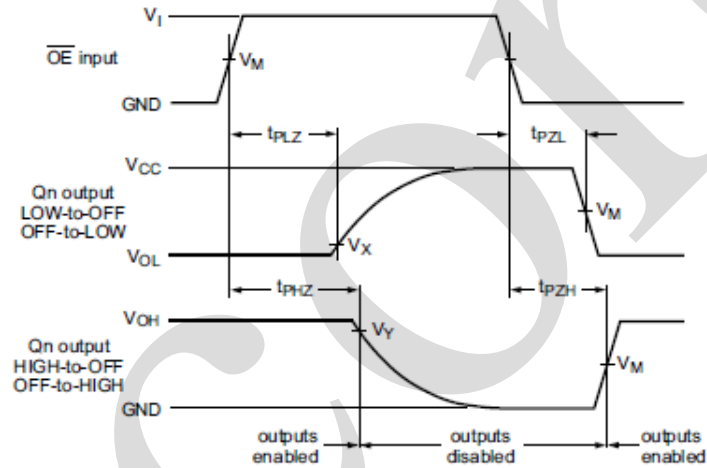


Figure 8. Enable and disable times

4.3. Measurement Points

Type	Input		Output	
	V_M	V_M	V_X	V_Y
AiP74HC574	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$
AiP74HCT574	1.3V	1.3V	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$

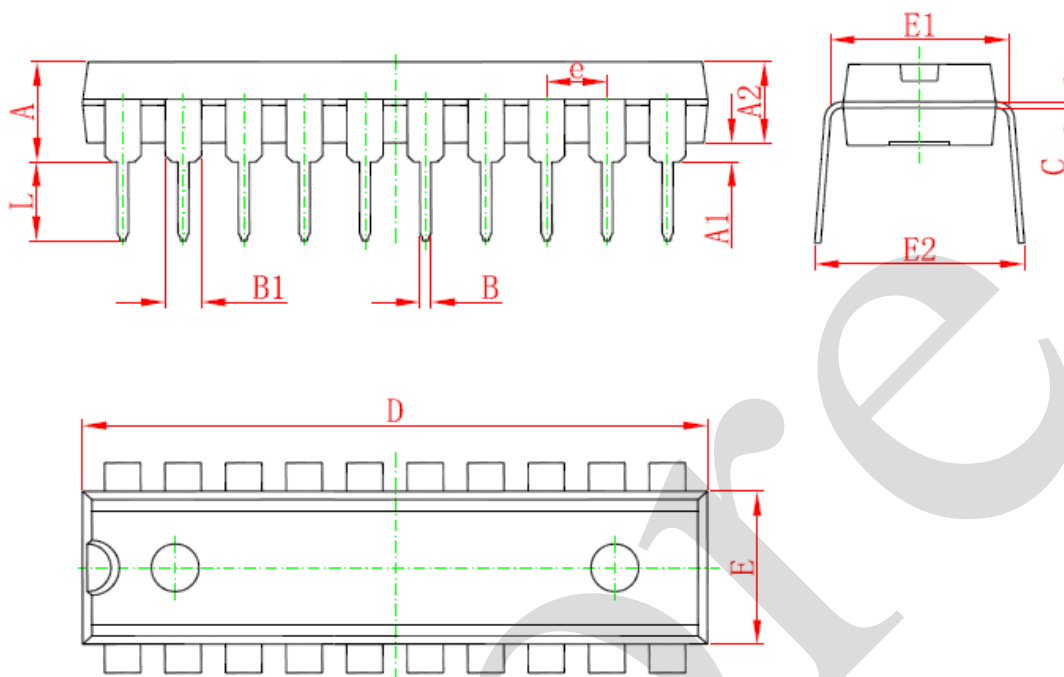
4.4. Test Data

Type	Input		Load		S1 position		
	V_I	t_r, t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
AiP74HC574	V_{CC}	6ns	15pF, 50pF	1k Ω	open	GND	V_{CC}
AiP74HCT574	3V	6ns	15pF, 50pF	1k Ω	open	GND	V_{CC}



5、Package Information

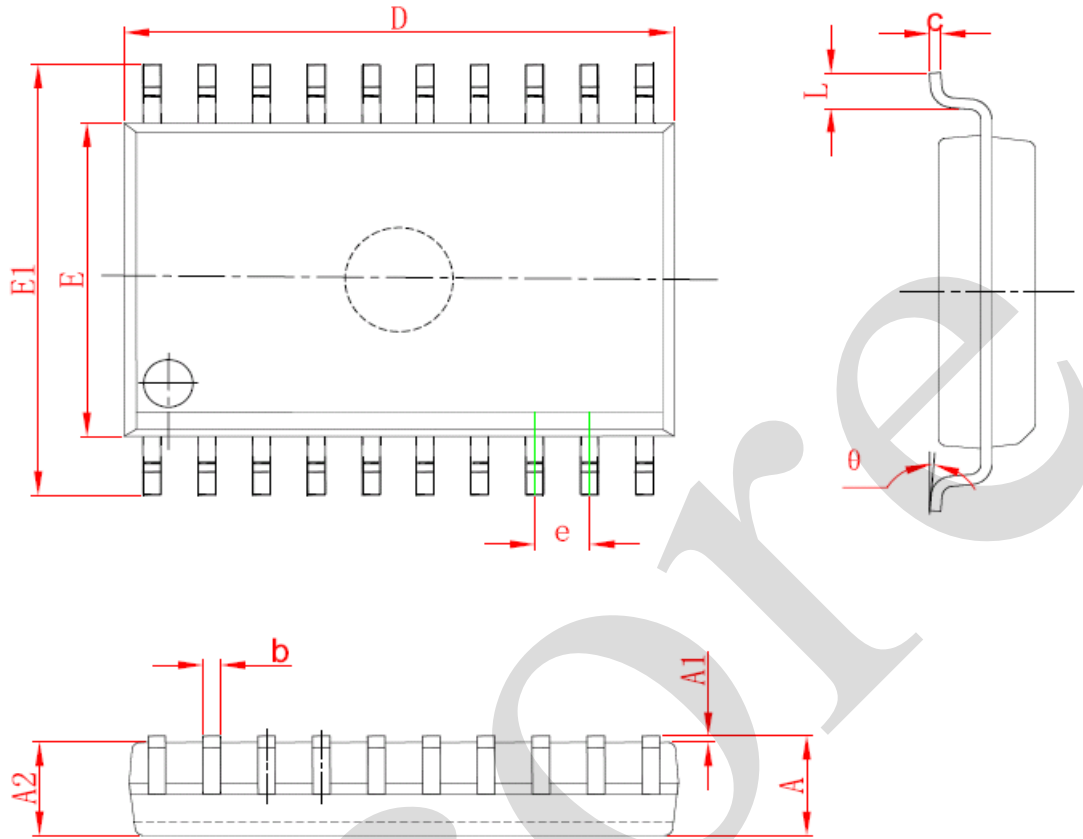
5.1、DIP20



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524 (BSC)		0.060 (BSC)	
C	0.204	0.360	0.008	0.014
D	25.950	26.550	1.022	1.045
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354



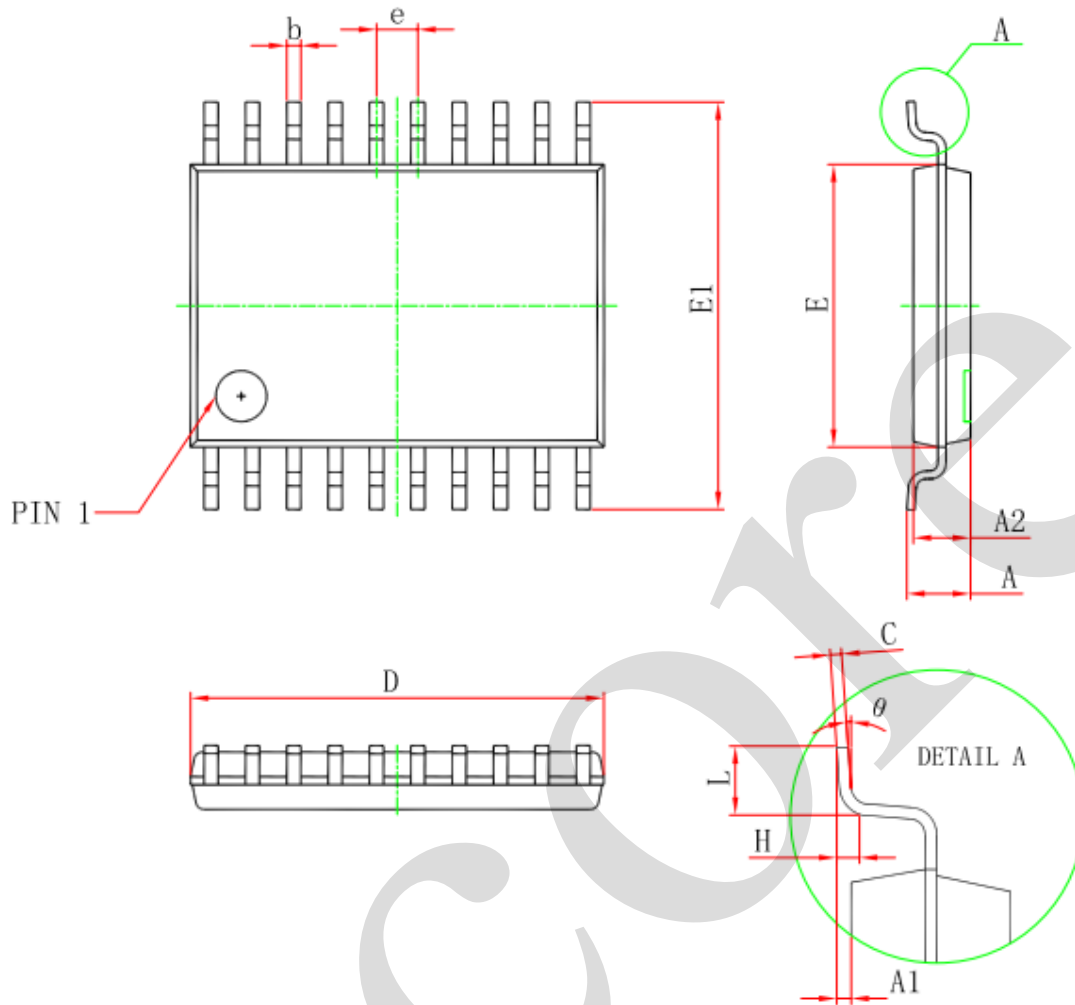
5.2、SOP20



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.350	2.650	0.093	0.104
A1	0.100	0.300	0.004	0.012
A2	2.100	2.500	0.083	0.098
b	0.330	0.510	0.013	0.020
c	0.204	0.330	0.008	0.013
D	12.520	13.000	0.493	0.512
E	7.400	7.600	0.291	0.299
E1	10.210	10.610	0.402	0.418
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



5.3、TSSOP20



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
D	6.400	6.600	0.252	0.259
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
e	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.200		0.047
A2	0.800	1.000	0.031	0.039
A1	0.050	0.150	0.002	0.006
e	0.65 (BSC)		0.026 (BSC)	
L	0.500	0.700	0.020	0.028
H	0.25(TYP)		0.01(TYP)	
θ	1°	7°	1°	7°



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、 Notion

Recommended carefully reading this information before the use of this product;

The information in this document are subject to change without notice;

This information is using to the reference only, the company is not responsible for any loss;

The company is not responsible for the any infringement of the third party patents or other rights of the responsibility.