



AiP74HC/HCT541

Octal Buffer/Line Driver; 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/HCT541 is an octal non-inverting buffer/line driver with 3-state outputs. The device features two output enables ($\overline{OE}1$ and $\overline{OE}2$). A HIGH on $\overline{OE}n$ causes the outputs to assume a high-impedance OFF-state. Inputs include clamp diodes that enable the use of current limiting resistors to interface inputs to voltages in excess of V_{CC} .

Features:

- Input levels:
 - For AiP74HC541: CMOS level
 - For AiP74HCT541: TTL level
- Non-Inverting outputs
- 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
AiP74HC541DA20.TB	DIP20	74HC541	18 PCS/tube	40 tube/box	720 PCS/box	Dimensions of plastic enclosure: 26.3mm×6.4mm Pin spacing: 2.54mm
AiP74HCT541DA20.TB	DIP20	74HCT541	18 PCS/tube	40 tube/box	720 PCS/box	Dimensions of plastic enclosure: 26.3mm×6.4mm Pin spacing: 2.54mm
AiP74HC541SA20.TB	SOP20	74HC541	35 PCS/tube	80 tube/box	2800 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74HCT541SA20.TB	SOP20	74HCT541	35 PCS/tube	80 tube/box	2800 PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing: 1.27mm
AiP74HC541TA20.TB	TSSOP20	74HC541	70 PCS/tube	200 tube/box	14000 PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing: 0.65mm
AiP74HCT541TA20.TB	TSSOP20	74HCT541	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
AiP74HC541SA20.TR	SOP20	74HC541	1000PCS/reel	1000PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing:1.27mm
AiP74HCT541SA20.TR	SOP20	74HCT541	1000PCS/reel	1000PCS/box	Dimensions of plastic enclosure: 12.8mm×7.5mm Pin spacing:1.27mm
AiP74HC541TA20.TR	TSSOP20	74HC541	2500PCS/reel	5000PCS/box	Dimensions of plastic enclosure: 6.5mm×4.4mm Pin spacing:0.65mm
AiP74HCT541TA20.TR	TSSOP20	74HCT541	2500PCS/reel	5000PCS/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

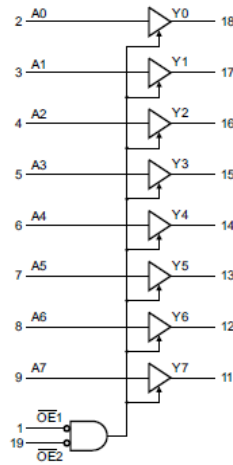


Figure 1. Logic symbol

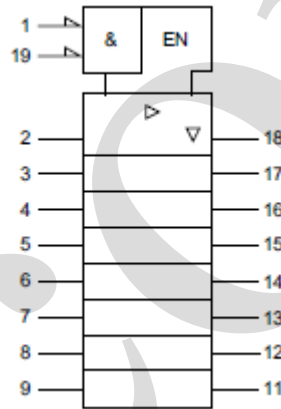


Figure 2. IEC logic symbol

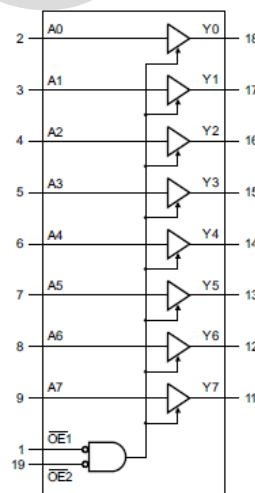


Figure 3. Functional diagram

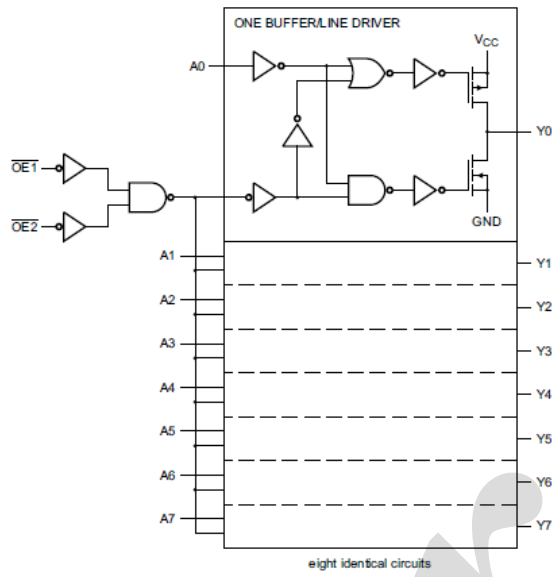
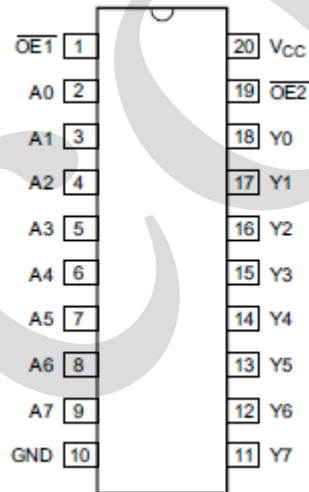


Figure 4. Logic diagram

2.2. Pin Configurations





2.3、Pin Description

Pin No.	Pin Name	Description
1	$\overline{\text{OE1}}$	output enable input (active LOW)
2	A0	data input
3	A1	data input
4	A2	data input
5	A3	data input
6	A4	data input
7	A5	data input
8	A6	data input
9	A7	data input
10	GND	ground (0V)
11	Y7	data output
12	Y6	data output
13	Y5	data output
14	Y4	data output
15	Y3	data output
16	Y2	data output
17	Y1	data output
18	Y0	data output
19	$\overline{\text{OE2}}$	output enable input (active LOW)
20	V _{CC}	supply voltage

2.4、Function Table

Input		Output	
$\overline{\text{OE1}}$	$\overline{\text{OE2}}$	An	Yn
L	L	L	L
L	L	H	H
X	H	X	Z
H	X	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

(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	

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
AiP74HC541						
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
AiP74HCT541						
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	
AiP74HC541							
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 capacitance	C_I	-	-	3.5	-	pF	
AiP74HCT541							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5V \text{ to } 5.5V$	2.0	1.6	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=4.5V \text{ to } 5.5V$	-	1.2	0.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL};$ $V_{CC}=4.5V$	$I_O=-20\mu A$	4.4	4.5	-	V
			$I_O=-6.0mA$	3.98	4.32	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL};$ $V_{CC}=4.5V$	$I_O=20\mu A$	-	0	0.1	V
			$I_O=6.0mA$	-	0.16	0.26	V
input leakage current	I_I	$V_I=V_{CC} \text{ or } GND;$ $V_{CC}=5.5V$	-	-	± 0.1	μA	
OFF-state output current	I_{OZ}	$V_I=V_{IH} \text{ or } V_{IL}; V_{CC}=5.5V;$ $V_O=V_{CC} \text{ or } GND$	-	-	± 0.5	μA	
supply current	I_{CC}	$V_I=V_{CC} \text{ or } GND; I_O=0A; V_{CC}=5.5V$	-	-	8.0	μA	
additional supply current	ΔI_{CC}	per input pin; $V_I=V_{CC}-2.1V;$ other inputs at V_{CC} or GND; $V_{CC}=4.5V$ to $5.5V; I_O=0A$	An input	-	70	252	μA
			$\overline{OE}1$ input	-	150	540	μA
			$\overline{OE}2$ input	-	100	360	μA
input capacitance	C_I	-	-	3.5	-	pF	



3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC541							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0\text{V}$	1.5	-	-	V	
		$V_{CC}=4.5\text{V}$	3.15	-	-	V	
		$V_{CC}=6.0\text{V}$	4.2	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0\text{V}$	-	-	0.5	V	
		$V_{CC}=4.5\text{V}$	-	-	1.35	V	
		$V_{CC}=6.0\text{V}$	-	-	1.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O = -20\mu\text{A}; V_{CC}=2.0\text{V}$	1.9	-	-	V
			$I_O = -20\mu\text{A}; V_{CC}=4.5\text{V}$	4.4	-	-	V
			$I_O = -20\mu\text{A}; V_{CC}=6.0\text{V}$	5.9	-	-	V
			$I_O = -6.0\text{mA}; V_{CC}=4.5\text{V}$	3.84	-	-	V
			$I_O = -7.8\text{mA}; V_{CC}=6.0\text{V}$	5.34	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O = 20\mu\text{A}; V_{CC}=2.0\text{V}$	-	-	0.1	V
			$I_O = 20\mu\text{A}; V_{CC}=4.5\text{V}$	-	-	0.1	V
			$I_O = 20\mu\text{A}; V_{CC}=6.0\text{V}$	-	-	0.1	V
			$I_O = 6.0\text{mA}; V_{CC}=4.5\text{V}$	-	-	0.33	V
			$I_O = 7.8\text{mA}; V_{CC}=6.0\text{V}$	-	-	0.33	V
input leakage current	I_I	$V_I = V_{CC} \text{ or } \text{GND}; V_{CC}=6.0\text{V}$	-	-	± 1.0	μA	
OFF-state output current	I_{OZ}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC}=6.0\text{V}; V_O = V_{CC} \text{ or } \text{GND}$	-	-	± 5.0	μA	
supply current	I_{CC}	$V_I = V_{CC} \text{ or } \text{GND}; I_O = 0\text{A}; V_{CC}=6.0\text{V}$	-	-	80	μA	
AiP74HCT541							
HIGH-level input voltage	V_{IH}	$V_{CC}=4.5\text{V to } 5.5\text{V}$	2.0	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=4.5\text{V to } 5.5\text{V}$	-	-	0.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC}=4.5\text{V}$	$I_O = -20\mu\text{A}$	4.4	-	-	V
			$I_O = -6.0\text{mA}$	3.84	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC}=4.5\text{V}$	$I_O = 20\mu\text{A}$	-	-	0.1	V
			$I_O = 6.0\text{mA}$	-	-	0.33	V
input leakage current	I_I	$V_I = V_{CC} \text{ or } \text{GND}; V_{CC}=5.5\text{V}$	-	-	± 1.0	μA	
OFF-state output current	I_{OZ}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC}=5.5\text{V}; V_O = V_{CC} \text{ or } \text{GND}$	-	-	± 5.0	μA	
supply current	I_{CC}	$V_I = V_{CC} \text{ or } \text{GND}; I_O = 0\text{A}; V_{CC}=5.5\text{V}$	-	-	80	μA	
additional supply current	ΔI_{CC}	per input pin; $V_I = V_{CC} - 2.1\text{V};$ other inputs at V_{CC} or GND; $V_{CC}=4.5\text{V}$ to $5.5\text{V}; I_O = 0\text{A}$	An input	-	-	315	μA
			$\overline{\text{OE1}}$ input	-	-	675	μA
			$\overline{\text{OE2}}$ input	-	-	450	μA



3.3.3、DC Characteristics 3

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC541							
HIGH-level input voltage	V_{IH}	$V_{CC}=2.0\text{V}$	1.5	-	-	V	
		$V_{CC}=4.5\text{V}$	3.15	-	-	V	
		$V_{CC}=6.0\text{V}$	4.2	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC}=2.0\text{V}$	-	-	0.5	V	
		$V_{CC}=4.5\text{V}$	-	-	1.35	V	
		$V_{CC}=6.0\text{V}$	-	-	1.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O = -20\mu\text{A}; V_{CC} = 2.0\text{V}$	1.9	-	-	V
			$I_O = -20\mu\text{A}; V_{CC} = 4.5\text{V}$	4.4	-	-	V
			$I_O = -20\mu\text{A}; V_{CC} = 6.0\text{V}$	5.9	-	-	V
			$I_O = -6.0\text{mA}; V_{CC} = 4.5\text{V}$	3.7	-	-	V
			$I_O = -7.8\text{mA}; V_{CC} = 6.0\text{V}$	5.2	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O = 20\mu\text{A}; V_{CC} = 2.0\text{V}$	-	-	0.1	V
			$I_O = 20\mu\text{A}; V_{CC} = 4.5\text{V}$	-	-	0.1	V
			$I_O = 20\mu\text{A}; V_{CC} = 6.0\text{V}$	-	-	0.1	V
			$I_O = 6.0\text{mA}; V_{CC} = 4.5\text{V}$	-	-	0.4	V
			$I_O = 7.8\text{mA}; V_{CC} = 6.0\text{V}$	-	-	0.4	V
input leakage current	I_I	$V_I = V_{CC} \text{ or } \text{GND}; V_{CC} = 6.0\text{V}$	-	-	± 1.0	μA	
OFF-state output current	I_{OZ}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC} = 6.0\text{V}; V_O = V_{CC} \text{ or } \text{GND}$	-	-	± 10	μA	
supply current	I_{CC}	$V_I = V_{CC} \text{ or } \text{GND}; I_O = 0\text{A}; V_{CC} = 6.0\text{V}$	-	-	160	μA	
AiP74HCT541							
HIGH-level input voltage	V_{IH}	$V_{CC} = 4.5\text{V to } 5.5\text{V}$	2.0	-	-	V	
LOW-level input voltage	V_{IL}	$V_{CC} = 4.5\text{V to } 5.5\text{V}$	-	-	0.8	V	
HIGH-level output voltage	V_{OH}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC} = 4.5\text{V}$	$I_O = -20\mu\text{A}$	4.4	-	-	V
			$I_O = -6.0\text{mA}$	3.7	-	-	V
LOW-level output voltage	V_{OL}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC} = 4.5\text{V}$	$I_O = 20\mu\text{A}$	-	-	0.1	V
			$I_O = 6.0\text{mA}$	-	-	0.4	V
input leakage current	I_I	$V_I = V_{CC} \text{ or } \text{GND}; V_{CC} = 5.5\text{V}$	-	-	± 1.0	μA	
OFF-state output current	I_{OZ}	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC} = 5.5\text{V}; V_O = V_{CC} \text{ or } \text{GND}$	-	-	± 10	μA	
supply current	I_{CC}	$V_I = V_{CC} \text{ or } \text{GND}; I_O = 0\text{A}; V_{CC} = 5.5\text{V}$	-	-	160	μA	
additional supply current	ΔI_{CC}	per input pin; $V_I = V_{CC} - 2.1\text{V};$ other inputs at V_{CC} or GND; $V_{CC} = 4.5\text{V}$ to $5.5\text{V}; I_O = 0\text{A}$	An input	-	-	343	μA
			$\overline{\text{OE}}1$ input	-	-	735	μA
			$\overline{\text{OE}}2$ input	-	-	490	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	
AiP74HC541							
An to Yn propagation delay	t_{pd}	see Figure 6	$V_{CC}=2.0V$	-	33	115	ns
			$V_{CC}=4.5V$	-	12	23	ns
			$V_{CC}=5.0V; C_L=15pF$	-	10	-	ns
			$V_{CC}=6.0V$	-	10	20	ns
$\overline{O}En$ to Yn enable time	t_{en}	see Figure 7	$V_{CC}=2.0V$	-	55	160	ns
			$V_{CC}=4.5V$	-	20	32	ns
			$V_{CC}=6.0V$	-	16	27	ns
$\overline{O}En$ to Yn disable time	t_{dis}	see Figure 7	$V_{CC}=2.0V$	-	61	160	ns
			$V_{CC}=4.5V$	-	22	32	ns
			$V_{CC}=6.0V$	-	18	27	ns
transition time	t_t	see Figure 6	$V_{CC}=2.0V$	-	14	60	ns
			$V_{CC}=4.5V$	-	5	12	ns
			$V_{CC}=6.0V$	-	4	10	ns
power dissipation capacitance	C_{PD}	per buffer; $V_I=GND$ to V_{CC}	-	37	-	pF	
AiP74HCT541							
An to Yn propagation delay	t_{pd}	see Figure 6	$V_{CC}=4.5V$	-	15	28	ns
			$V_{CC}=5.0V; C_L=15pF$	-	12	-	ns
$\overline{O}En$ to Yn enable time	t_{en}	$V_{CC}=4.5V$; see Figure 7	-	21	35	ns	
$\overline{O}En$ to Yn disable time	t_{dis}	$V_{CC}=4.5V$; see Figure 7	-	21	35	ns	
transition time	t_t	$V_{CC}=4.5V$; see Figure 6	-	5	12	ns	
power dissipation capacitance	C_{PD}	per buffer; $V_I=GND$ to $V_{CC}-1.5V$	-	39	-	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 $+85^{\circ}\text{C}$, $GND = 0\text{V}$, $C_L = 50\text{pF}$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
AiP74HC541							
An to Yn propagation delay	t_{pd}	see Figure 6	$V_{CC} = 2.0\text{V}$	-	-	145	ns
			$V_{CC} = 4.5\text{V}$	-	-	29	ns
			$V_{CC} = 6.0\text{V}$	-	-	25	ns
$\overline{\text{OEn}}$ to Yn enable time	t_{en}	see Figure 7	$V_{CC} = 2.0\text{V}$	-	-	200	ns
			$V_{CC} = 4.5\text{V}$	-	-	40	ns
			$V_{CC} = 6.0\text{V}$	-	-	34	ns
$\overline{\text{OEn}}$ to Yn disable time	t_{dis}	see Figure 7	$V_{CC} = 2.0\text{V}$	-	-	200	ns
			$V_{CC} = 4.5\text{V}$	-	-	40	ns
			$V_{CC} = 6.0\text{V}$	-	-	34	ns
transition time	t_t	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
AiP74HCT541							
An to Yn propagation delay	t_{pd}	see Figure 6	$V_{CC} = 4.5\text{V}$	-	-	35	ns
$\overline{\text{OEn}}$ to Yn enable time	t_{en}	$V_{CC} = 4.5\text{V}$; see Figure 7		-	-	44	ns
$\overline{\text{OEn}}$ to Yn disable time	t_{dis}	$V_{CC} = 4.5\text{V}$; see Figure 7		-	-	44	ns
transition time	t_t	$V_{CC} = 4.5\text{V}$; see Figure 6		-	-	15	ns

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		
AiP74HC541								
An to Yn propagation delay	t_{pd}	see Figure 6	$V_{CC} = 2.0\text{V}$	-	-	175	ns	
			$V_{CC} = 4.5\text{V}$	-	-	35	ns	
			$V_{CC} = 6.0\text{V}$	-	-	30	ns	
$\overline{\text{OEn}}$ to Yn enable time	t_{en}	see Figure 7	$V_{CC} = 2.0\text{V}$	-	-	240	ns	
			$V_{CC} = 4.5\text{V}$	-	-	48	ns	
			$V_{CC} = 6.0\text{V}$	-	-	41	ns	
$\overline{\text{OEn}}$ to Yn disable time	t_{dis}	see Figure 7	$V_{CC} = 2.0\text{V}$	-	-	240	ns	
			$V_{CC} = 4.5\text{V}$	-	-	48	ns	
			$V_{CC} = 6.0\text{V}$	-	-	41	ns	
transition time	t_t	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	
AiP74HCT541								
An to Yn propagation delay	t_{pd}	see Figure 6	$V_{CC} = 4.5\text{V}$		-	-	42	ns
$\overline{\text{OEn}}$ to Yn enable time	t_{en}	$V_{CC} = 4.5\text{V}$; see Figure 7		-	-	53	ns	
$\overline{\text{OEn}}$ to Yn disable time	t_{dis}	$V_{CC} = 4.5\text{V}$; see Figure 7		-	-	53	ns	
transition time	t_t	$V_{CC} = 4.5\text{V}$; see Figure 6		-	-	18	ns	

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

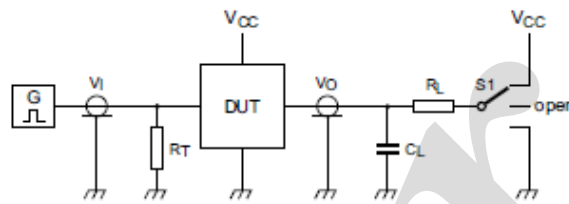
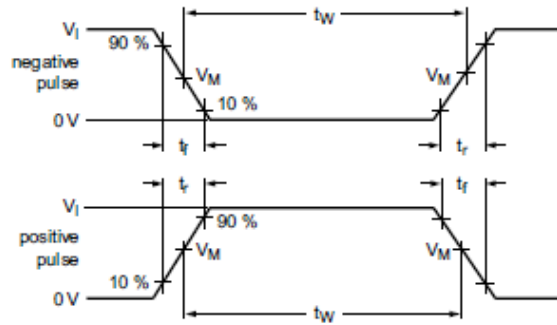


Figure 5. Test circuit for measuring switching times

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

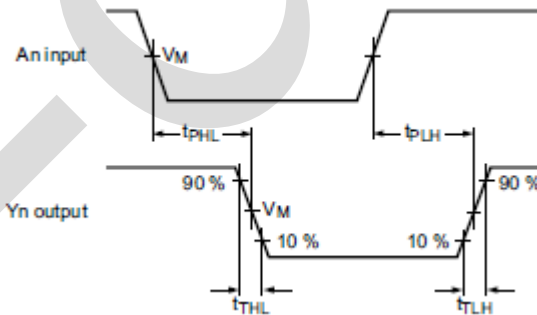


Figure 6. Input to output propagation delays

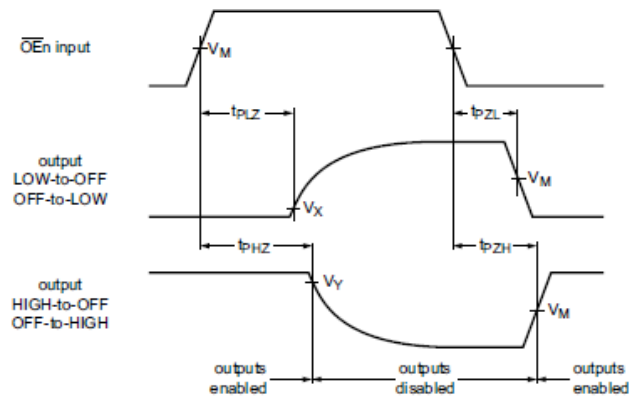


Figure 7. 3-state enable and disable times

4.3. Measurement Points

Type	Input		Output	
	V_M	V_M	V_X	V_Y
AiP74HC541	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$
AiP74HCT541	1.3V	1.3V	$0.1 \times V_{CC}$	$0.9 \times V_{CC}$

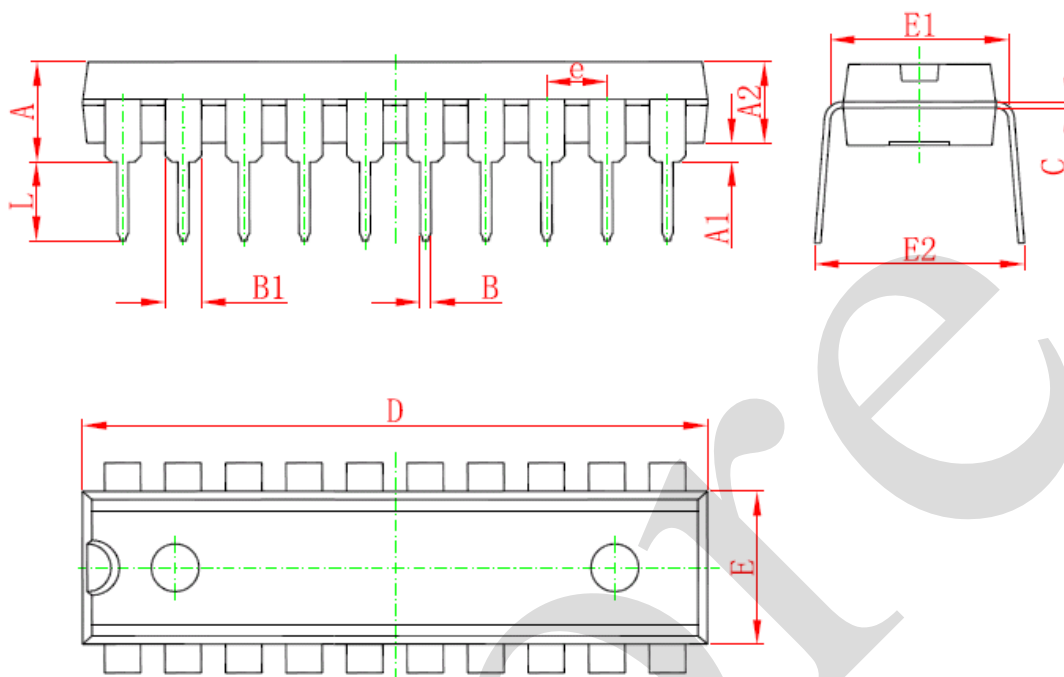
4.4. Test Data

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}
AiP74HC541	V_{CC}	6ns	15pF, 50pF	1k Ω	open	GND	V_{CC}
AiP74HCT541	3V	6ns	15pF, 50pF	1k Ω	open	GND	V_{CC}



5、Package Information

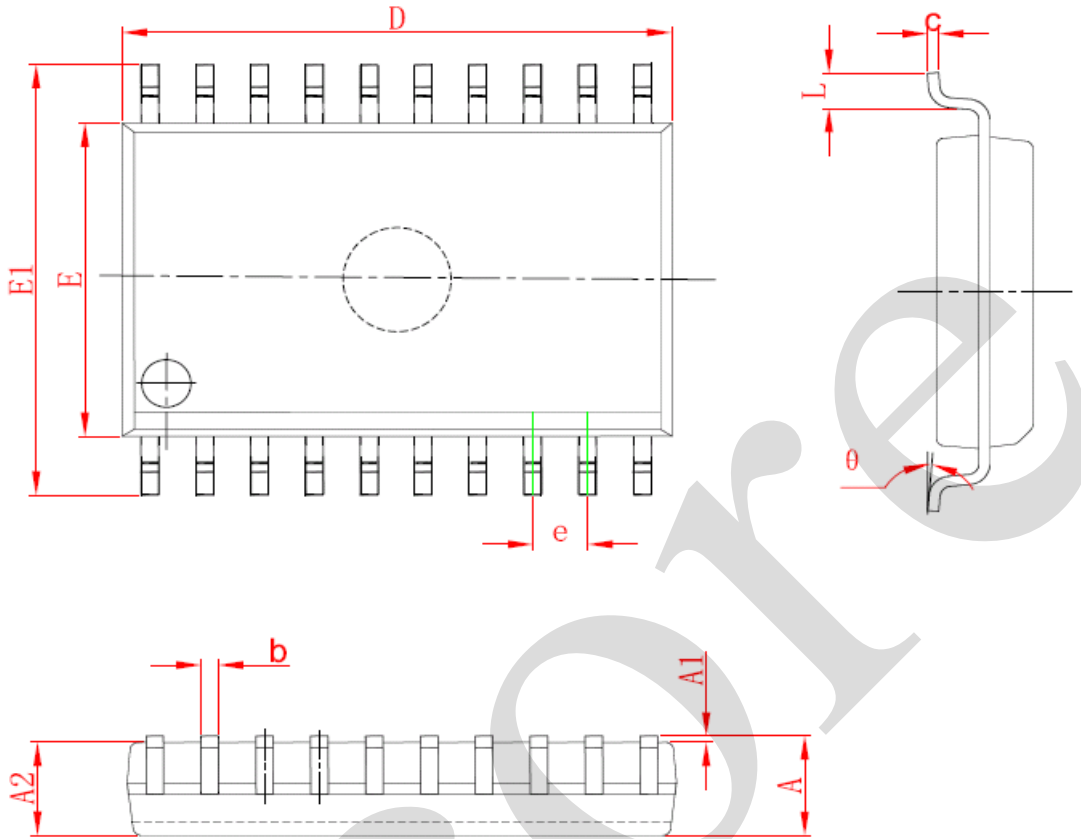
5.1、DIP20



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



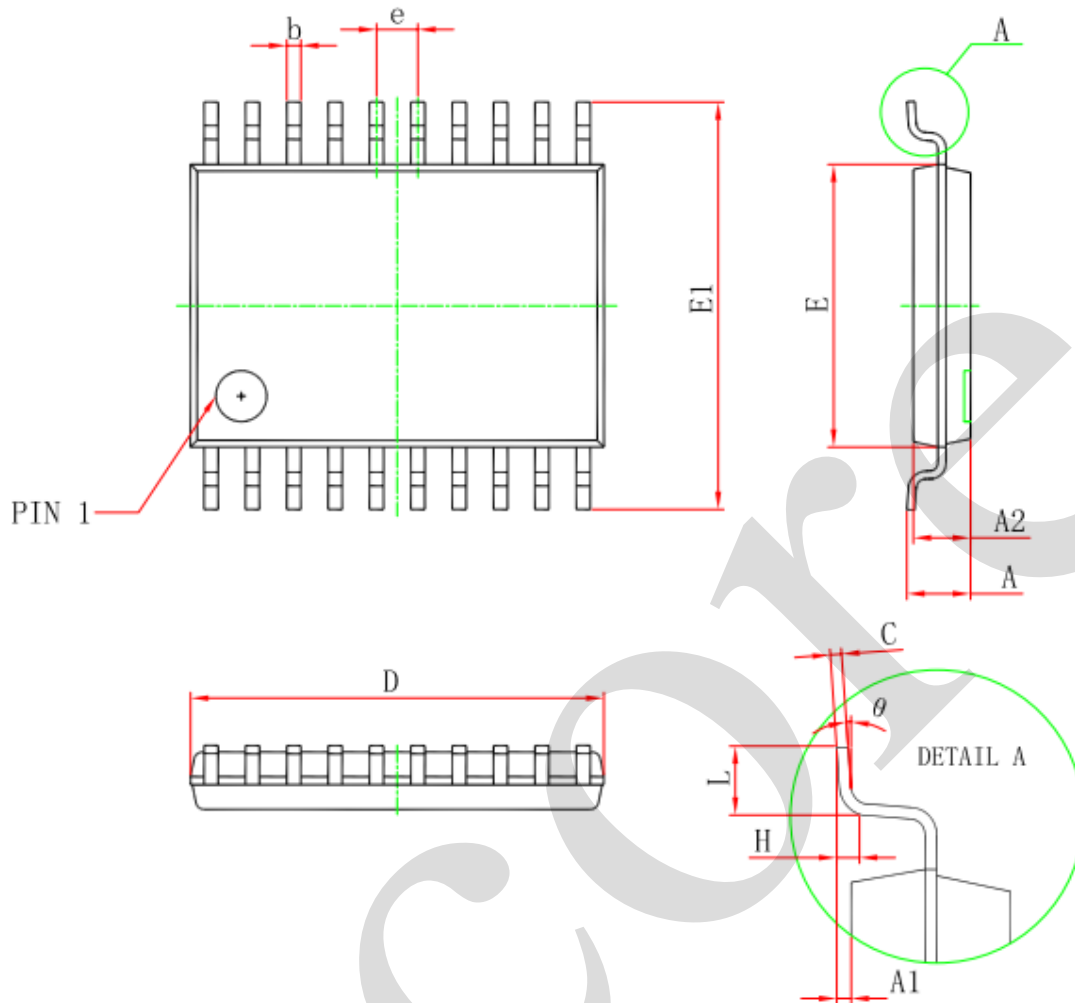
5.2、SOP20



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;

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