



# AiP74HC/HCT151 8-input Multiplexer

## Product Specification

### Specification Revision History:

Version	Date	Description
2012-06-A1	2012-06	New
2023-04-B1	2023-04	Update the template



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## 1、 General Description

The AiP74HC/HCT151 are 8-bit multiplexer with eight binary inputs (I0 to I7), three select inputs (S0 to S2) and an enable input ( $\bar{E}$ ). One of the eight binary inputs is selected by the select inputs and routed to the complementary outputs (Y and  $\bar{Y}$ ). A HIGH on  $\bar{E}$  forces the output Y LOW and output  $\bar{Y}$  HIGH. Inputs also 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 AiP74HC151: CMOS level
  - For AiP74HCT151: TTL level
- Low-power dissipation
- Non-inverting data path
- Specified from -40°C to +125°C
- Packaging information: DIP16/SOP16/TSSOP16

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

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74HC151DA16.TB	DIP16	74HC151	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP74HCT151DA16.TB	DIP16	74HCT151	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP74HC151SA16.TB	SOP16	74HC151	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
AiP74HCT151SA16.TB	SOP16	74HCT151	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
AiP74HC151TA16.TB	TSSOP16	74HC151	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm
AiP74HCT151TA16.TB	TSSOP16	74HCT151	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

**Reel packing specifications:**

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74HC151SA16.TR	SOP16	74HC151	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing:1.27mm
AiP74HCT151SA16.TR	SOP16	74HCT151	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing:1.27mm
AiP74HC151TA16.TR	TSSOP16	74HC151	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing:0.65mm
AiP74HCT151TA16.TR	TSSOP16	74HCT151	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 5.0mm×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

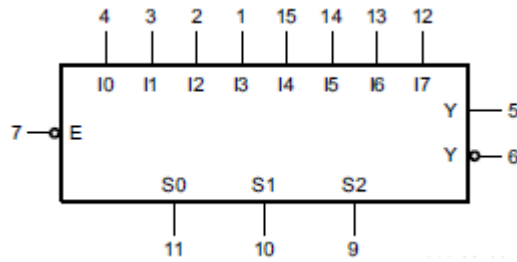


Figure 1. Logic symbol

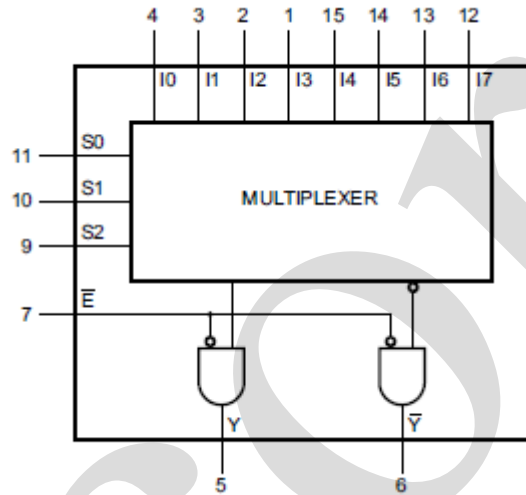


Figure 2. Functional diagram

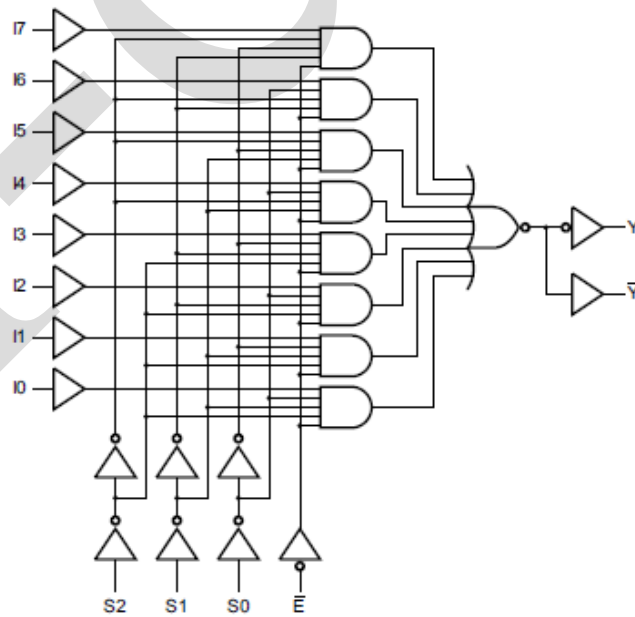
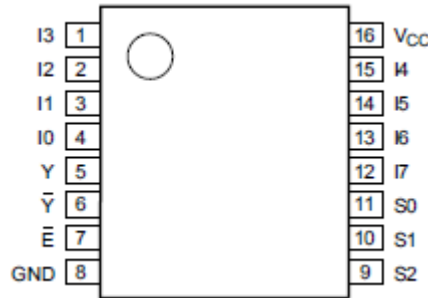


Figure 3. Logic diagram



## 2.2、Pin Configurations



## 2.3、Pin Description

Pin No.	Pin Name	Description
1	I3	data input
2	I2	data input
3	I1	data input
4	I0	data input
5	Y	multiplexer output
6	$\bar{Y}$	complementary multiplexer output
7	$\bar{E}$	enable input (active LOW)
8	GND	ground (0V)
9	S2	common data select input
10	S1	common data select input
11	S0	common data select input
12	I7	data input
13	I6	data input
14	I5	data input
15	I4	data input
16	V <sub>CC</sub>	supply voltage

## 2.4、Function Table

Input												Output	
$\bar{E}$	S2	S1	S0	I0	I1	I2	I3	I4	I5	I6	I7	$\bar{Y}$	Y
H	X	X	X	X	X	X	X	X	X	X	X	H	L
L	L	L	L	L	X	X	X	X	X	X	X	H	L
L	L	L	L	H	X	X	X	X	X	X	X	L	H
L	L	L	H	X	L	X	X	X	X	X	X	H	L
L	L	L	H	X	H	X	X	X	X	X	X	L	H
L	L	H	L	X	X	L	X	X	X	X	X	H	L
L	L	H	L	X	X	H	X	X	X	X	X	L	H
L	L	H	H	X	X	X	L	X	X	X	X	H	L
L	L	H	H	X	X	X	H	X	X	X	X	L	H
L	H	L	L	X	X	X	X	L	X	X	X	H	L
L	H	L	L	X	X	X	X	H	X	X	X	L	H
L	H	L	H	X	X	X	X	X	L	X	X	H	L



L	H	L	H	X	X	X	X	X	H	X	X	L	H
L	H	H	L	X	X	X	X	X	X	L	X	H	L
L	H	H	L	X	X	X	X	X	X	H	X	L	H
L	H	H	H	X	X	X	X	X	X	X	L	H	L
L	H	H	H	X	X	X	X	X	X	X	H	L	H

Note: H=HIGH voltage level; L=LOW voltage level; X=don't care.

### 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 $V_I > V_{CC}+0.5V$	-	$\pm 20$	mA	
output clamping current	$I_{OK}$	$V_O < -0.5V$ or $V_O > V_{CC}+0.5V$	-	$\pm 20$	mA	
output current	$I_O$	$V_O = -0.5V$ to $(V_{CC}+0.5V)$	-	$\pm 25$	mA	
supply current	$I_{CC}$	-	-	+50	mA	
ground current	$I_{GND}$	-	-50	-	mA	
storage temperature	$T_{stg}$	-	-65	+150	$^{\circ}C$	
total power dissipation	$P_{tot}$	-	-	500	mW	
soldering temperature	$T_L$	10s	DIP		245	$^{\circ}C$
			SOP/TSSOP		260	

#### 3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>AiP74HC151</b>						
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	-	+125	$^{\circ}C$
<b>AiP74HCT151</b>						
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	+25	+125	$^{\circ}C$





## 3.3、Electrical Characteristics

### 3.3.1、DC Characteristics 1

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC151</b>							
HIGH-level input voltage	$V_{IH}$	$V_{CC}=2.0\text{V}$	1.5	1.2	-	V	
		$V_{CC}=4.5\text{V}$	3.15	2.4	-	V	
		$V_{CC}=6.0\text{V}$	4.2	3.2	-	V	
LOW-level input voltage	$V_{IL}$	$V_{CC}=2.0\text{V}$	-	0.8	0.5	V	
		$V_{CC}=4.5\text{V}$	-	2.1	1.35	V	
		$V_{CC}=6.0\text{V}$	-	2.8	1.8	V	
HIGH-level output voltage	$V_{OH}$	$V_I=V_{IH}$ or $V_{IL}$	$I_O=-20\mu\text{A}; V_{CC}=2.0\text{V}$	1.9	2.0	-	V
			$I_O=-20\mu\text{A}; V_{CC}=4.5\text{V}$	4.4	4.5	-	V
			$I_O=-20\mu\text{A}; V_{CC}=6.0\text{V}$	5.9	6.0	-	V
			$I_O=-4.0\text{mA}; V_{CC}=4.5\text{V}$	3.98	4.32	-	V
			$I_O=-5.2\text{mA}; V_{CC}=6.0\text{V}$	5.48	5.81	-	V
LOW-level output voltage	$V_{OL}$	$V_I=V_{IH}$ or $V_{IL}$	$I_O=20\mu\text{A}; V_{CC}=2.0\text{V}$	-	0	0.1	V
			$I_O=20\mu\text{A}; V_{CC}=4.5\text{V}$	-	0	0.1	V
			$I_O=20\mu\text{A}; V_{CC}=6.0\text{V}$	-	0	0.1	V
			$I_O=4.0\text{mA}; V_{CC}=4.5\text{V}$	-	0.15	0.26	V
			$I_O=5.2\text{mA}; V_{CC}=6.0\text{V}$	-	0.16	0.26	V
input leakage current	$I_I$	$V_I=V_{CC}$ or GND; $V_{CC}=6.0\text{V}$	-	-	$\pm 1.0$	$\mu\text{A}$	
supply current	$I_{CC}$	$V_I=V_{CC}$ or GND; $I_O=0\text{A}; V_{CC}=6.0\text{V}$	-	-	8.0	$\mu\text{A}$	
input capacitance	$C_I$	-	-	3.5	-	pF	
<b>AiP74HCT151</b>							
HIGH-level input voltage	$V_{IH}$	$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	2.0	1.6	-	V	
LOW-level input voltage	$V_{IL}$	$V_{CC}=4.5\text{V}$ to $5.5\text{V}$	-	1.2	0.8	V	
HIGH-level output voltage	$V_{OH}$	$V_I=V_{IH}$ or $V_{IL}; V_{CC}=4.5\text{V}$	$I_O=-20\mu\text{A}$	4.4	4.5	-	V
			$I_O=-4.0\text{mA}$	3.98	4.32	-	V
LOW-level output voltage	$V_{OL}$	$V_I=V_{IH}$ or $V_{IL}; V_{CC}=4.5\text{V}$	$I_O=20\mu\text{A}$	-	0	0.1	V
			$I_O=4.0\text{mA}$	-	0.15	0.26	V
input leakage current	$I_I$	$V_I=V_{CC}$ or GND; $V_{CC}=5.5\text{V}$	-	-	$\pm 1.0$	$\mu\text{A}$	
supply current	$I_{CC}$	$V_I=V_{CC}$ or GND; $I_O=0\text{A}; V_{CC}=5.5\text{V}$	-	-	8.0	$\mu\text{A}$	
additional supply current	$\Delta I_{CC}$	$V_I=V_{CC}-2.1\text{V};$ other inputs at $V_{CC}$ or GND; $I_O=0\text{A};$ $V_{CC}=4.5\text{V}$ to $5.5\text{V}$	per input pin; In inputs	-	-	162	$\mu\text{A}$
			per input pin; $\bar{E}$ input	-	-	108	$\mu\text{A}$
			per input pin; Sn input	-	-	540	$\mu\text{A}$
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	
<b>AiP74HC151</b>							
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	$V_{OH}$	$V_I = V_{IH}$ 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
			$I_O = -4.0\text{mA}; V_{CC} = 4.5\text{V}$	3.84	-	-	V
			$I_O = -5.2\text{mA}; V_{CC} = 6.0\text{V}$	5.34	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH}$ 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
			$I_O = 4.0\text{mA}; V_{CC} = 4.5\text{V}$	-	-	0.33	V
			$I_O = 5.2\text{mA}; V_{CC} = 6.0\text{V}$	-	-	0.33	V
input leakage current	$I_I$	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0\text{V}$	-	-	$\pm 1.0$	$\mu\text{A}$	
supply current	$I_{CC}$	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 6.0\text{V}$	-	-	80	$\mu\text{A}$	
<b>AiP74HCT151</b>							
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	$V_{OH}$	$V_I = V_{IH}$ or $V_{IL}; V_{CC} = 4.5\text{V}$	$I_O = -20\mu\text{A}$	4.4	-	-	V
			$I_O = -4.0\text{mA}$	3.84	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH}$ or $V_{IL}; V_{CC} = 4.5\text{V}$	$I_O = 20\mu\text{A}$	-	-	0.1	V
			$I_O = 4.0\text{mA}$	-	-	0.33	V
input leakage current	$I_I$	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5\text{V}$	-	-	$\pm 1.0$	$\mu\text{A}$	
supply current	$I_{CC}$	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 5.5\text{V}$	-	-	80	$\mu\text{A}$	
additional supply current	$\Delta I_{CC}$	$V_I = V_{CC} - 2.1\text{V};$ other inputs at $V_{CC}$ or GND; $I_O = 0\text{A};$ $V_{CC} = 4.5\text{V}$ to $5.5\text{V}$	per input pin; In inputs	-	-	203	$\mu\text{A}$
			per input pin; $\bar{E}$ input	-	-	135	$\mu\text{A}$
			per input pin; Sn input	-	-	675	$\mu\text{A}$



### 3.3.3、DC Characteristics 2

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC151</b>							
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	$V_{OH}$	$V_I = V_{IH}$ 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
			$I_O = -4.0\text{mA}; V_{CC} = 4.5\text{V}$	3.7	-	-	V
			$I_O = -5.2\text{mA}; V_{CC} = 6.0\text{V}$	5.2	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH}$ 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
			$I_O = 4.0\text{mA}; V_{CC} = 4.5\text{V}$	-	-	0.4	V
			$I_O = 5.2\text{mA}; V_{CC} = 6.0\text{V}$	-	-	0.4	V
input leakage current	$I_I$	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0\text{V}$	-	-	$\pm 1.0$	$\mu\text{A}$	
supply current	$I_{CC}$	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 6.0\text{V}$	-	-	160	$\mu\text{A}$	
<b>AiP74HCT151</b>							
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	$V_{OH}$	$V_I = V_{IH}$ or $V_{IL}; V_{CC} = 4.5\text{V}$	$I_O = -20\mu\text{A}$	4.4	-	-	V
			$I_O = -4.0\text{mA}$	3.7	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH}$ or $V_{IL}; V_{CC} = 4.5\text{V}$	$I_O = 20\mu\text{A}$	-	-	0.1	V
			$I_O = 4.0\text{mA}$	-	-	0.4	V
input leakage current	$I_I$	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5\text{V}$	-	-	$\pm 1.0$	$\mu\text{A}$	
supply current	$I_{CC}$	$V_I = V_{CC}$ or GND; $I_O = 0\text{A}; V_{CC} = 5.5\text{V}$	-	-	160	$\mu\text{A}$	
additional supply current	$\Delta I_{CC}$	$V_I = V_{CC} - 2.1\text{V};$ other inputs at $V_{CC}$ or GND; $I_O = 0\text{A};$ $V_{CC} = 4.5\text{V}$ to $5.5\text{V}$	per input pin; In inputs	-	-	221	$\mu\text{A}$
			per input pin; $\bar{E}$ input	-	-	147	$\mu\text{A}$
			per input pin; Sn input	-	-	735	$\mu\text{A}$



### 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	
<b>AiP74HC151</b>							
propagation delay	$t_{pd}$	In to Y; see Figure 5 <sup>[1]</sup>	$V_{CC}=2.0V$	-	52	170	ns
			$V_{CC}=4.5V$	-	19	34	ns
			$V_{CC}=5.0V; C_L=15pF$	-	17	-	ns
			$V_{CC}=6.0V$	-	15	29	ns
		In to $\bar{Y}$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=2.0V$	-	58	185	ns
			$V_{CC}=4.5V$	-	21	37	ns
			$V_{CC}=5.0V; C_L=15pF$	-	17	-	ns
			$V_{CC}=6.0V$	-	17	31	ns
		Sn to Y; see Figure 6 <sup>[1]</sup>	$V_{CC}=2.0V$	-	61	185	ns
			$V_{CC}=4.5V$	-	22	37	ns
			$V_{CC}=5.0V; C_L=15pF$	-	19	-	ns
			$V_{CC}=6.0V$	-	18	31	ns
		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=2.0V$	-	61	205	ns
			$V_{CC}=4.5V$	-	22	41	ns
			$V_{CC}=5.0V; C_L=15pF$	-	19	-	ns
			$V_{CC}=6.0V$	-	18	35	ns
		$\bar{E}$ to Y; see Figure 6	$V_{CC}=2.0V$	-	41	125	ns
			$V_{CC}=4.5V$	-	15	25	ns
			$V_{CC}=5.0V; C_L=15pF$	-	12	-	ns
			$V_{CC}=6.0V$	-	12	21	ns
		$\bar{E}$ to $\bar{Y}$ ; see Figure 6	$V_{CC}=2.0V$	-	47	145	ns
			$V_{CC}=4.5V$	-	17	29	ns
			$V_{CC}=5.0V; C_L=15pF$	-	14	-	ns
			$V_{CC}=6.0V$	-	14	25	ns
transition time	$t_t$	Y, $\bar{Y}$ ; see Figure 5 <sup>[2]</sup>	$V_{CC}=2.0V$	-	19	75	ns
			$V_{CC}=4.5V$	-	7	15	ns
			$V_{CC}=6.0V$	-	6	13	ns
power dissipation capacitance	$C_{PD}$	$C_L=50pF; f=1MHz; V_I=GND$ to $V_{CC}$ <sup>[3]</sup>	-	40	-	pF	
<b>AiP74HCT151</b>							
propagation delay	$t_{pd}$	In to Y; see Figure 5 <sup>[1]</sup>	$V_{CC}=4.5V$	-	22	38	ns
			$V_{CC}=5.0V; C_L=15pF$	-	19	-	ns
		In to $\bar{Y}$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=4.5V$	-	22	38	ns
			$V_{CC}=5.0V; C_L=15pF$	-	19	-	ns
		Sn to Y; see Figure 6 <sup>[1]</sup>	$V_{CC}=4.5V$	-	23	41	ns
			$V_{CC}=5.0V; C_L=15pF$	-	20	-	ns
		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=4.5V$	-	25	43	ns
			$V_{CC}=5.0V; C_L=15pF$	-	20	-	ns
		$\bar{E}$ to Y; see Figure 6	$V_{CC}=4.5V$	-	16	29	ns
			$V_{CC}=5.0V; C_L=15pF$	-	13	-	ns



		$\bar{E}$ to $\bar{Y}$ ; see Figure 6	$V_{CC}=4.5V$	-	21	36	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	18	-	ns
transition time	$t_t$	$Y, \bar{Y}$ ; $V_{CC}=4.5V$ ; see Figure 5 <sup>[2]</sup>		-	7	15	ns
power dissipation capacitance	$C_{PD}$	$C_L=50pF$ ; $f=1MHz$ ; $V_I=GND$ to $V_{CC}-1.5V$ <sup>[3]</sup>		-	40	-	pF

Note:

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

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

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

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

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

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC151</b>							
propagation delay	$t_{pd}$	In to $Y$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	215	ns
			$V_{CC}=4.5V$	-	-	43	ns
			$V_{CC}=6.0V$	-	-	37	ns
		In to $\bar{Y}$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	230	ns
			$V_{CC}=4.5V$	-	-	46	ns
			$V_{CC}=6.0V$	-	-	39	ns
		Sn to $Y$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	230	ns
			$V_{CC}=4.5V$	-	-	46	ns
			$V_{CC}=6.0V$	-	-	39	ns
		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	255	ns
			$V_{CC}=4.5V$	-	-	51	ns
			$V_{CC}=6.0V$	-	-	43	ns
		$\bar{E}$ to $Y$ ; see Figure 6	$V_{CC}=2.0V$	-	-	155	ns
			$V_{CC}=4.5V$	-	-	31	ns
			$V_{CC}=6.0V$	-	-	26	ns
		$\bar{E}$ to $\bar{Y}$ ; see Figure 6	$V_{CC}=2.0V$	-	-	180	ns
$V_{CC}=4.5V$	-		-	36	ns		
$V_{CC}=6.0V$	-		-	31	ns		
transition time	$t_t$	$Y, \bar{Y}$ ; see Figure 5 <sup>[2]</sup>	$V_{CC}=2.0V$	-	-	95	ns
			$V_{CC}=4.5V$	-	-	19	ns
			$V_{CC}=6.0V$	-	-	16	ns
<b>AiP74HCT151</b>							
propagation	$t_{pd}$	In to $Y$ ;	$V_{CC}=4.5V$	-	-	48	ns



delay		see Figure 5 <sup>[1]</sup>					
		In to $\bar{Y}$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	48	ns
		Sn to Y; see Figure 6 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	51	ns
		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	54	ns
		$\bar{E}$ to Y; see Figure 6	$V_{CC}=4.5V$	-	-	36	ns
		$\bar{E}$ to $\bar{Y}$ ; see Figure 6	$V_{CC}=4.5V$	-	-	45	ns
transition time	$t_t$	Y, $\bar{Y}$ ; $V_{CC}=4.5V$ ; see Figure 5 <sup>[2]</sup>	-	-	19	ns	

Note:

[1]  $t_{pd}$  is the same as  $t_{PLH}$  and  $t_{PHL}$ .[2]  $t_t$  is the same as  $t_{THL}$  and  $t_{TLH}$ .

### 3.3.6、AC Characteristics 3

(T<sub>amb</sub>=-40°C to +125°C, GND=0V, C<sub>L</sub>=50pF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit			
<b>AiP74HC151</b>									
propagation delay	$t_{pd}$	In to Y; see Figure 5 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	255	ns		
			$V_{CC}=4.5V$	-	-	51	ns		
			$V_{CC}=6.0V$	-	-	43	ns		
		In to $\bar{Y}$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	280	ns		
			$V_{CC}=4.5V$	-	-	56	ns		
			$V_{CC}=6.0V$	-	-	48	ns		
		Sn to Y; see Figure 6 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	280	ns		
			$V_{CC}=4.5V$	-	-	56	ns		
			$V_{CC}=6.0V$	-	-	48	ns		
		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=2.0V$	-	-	310	ns		
			$V_{CC}=4.5V$	-	-	62	ns		
			$V_{CC}=6.0V$	-	-	53	ns		
		$\bar{E}$ to Y; see Figure 6	$V_{CC}=2.0V$	-	-	190	ns		
			$V_{CC}=4.5V$	-	-	38	ns		
			$V_{CC}=6.0V$	-	-	32	ns		
		$\bar{E}$ to $\bar{Y}$ ; see Figure 6	$V_{CC}=2.0V$	-	-	220	ns		
			$V_{CC}=4.5V$	-	-	44	ns		
			$V_{CC}=6.0V$	-	-	38	ns		
		transition time	$t_t$	Y, $\bar{Y}$ ; see Figure 5 <sup>[2]</sup>	$V_{CC}=2.0V$	-	-	110	ns
					$V_{CC}=4.5V$	-	-	22	ns
					$V_{CC}=6.0V$	-	-	19	ns
		<b>AiP74HCT151</b>							
		propagation delay	$t_{pd}$	In to Y; see Figure 5 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	57	ns
				In to $\bar{Y}$ ; see Figure 5 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	57	ns



		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	62	ns
		Sn to $\bar{Y}$ ; see Figure 6 <sup>[1]</sup>	$V_{CC}=4.5V$	-	-	65	ns
		$\bar{E}$ to Y; see Figure 6	$V_{CC}=4.5V$	-	-	44	ns
		$\bar{E}$ to $\bar{Y}$ ; see Figure 6	$V_{CC}=4.5V$	-	-	54	ns
transition time	$t_t$	Y, $\bar{Y}$ ; $V_{CC}=4.5V$ ; see Figure 5 <sup>[2]</sup>		-	-	22	ns

Note:

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

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

## 4、Testing Circuit

### 4.1、AC Testing Circuit

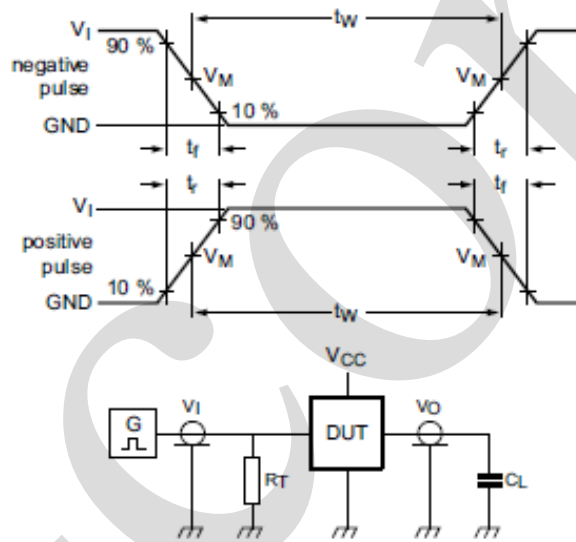


Figure 4. Test circuit for measuring switching times

Definitions for test circuit:

$C_L$ =Load capacitance including jig and probe capacitance.

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



4.2、AC Testing Waveforms

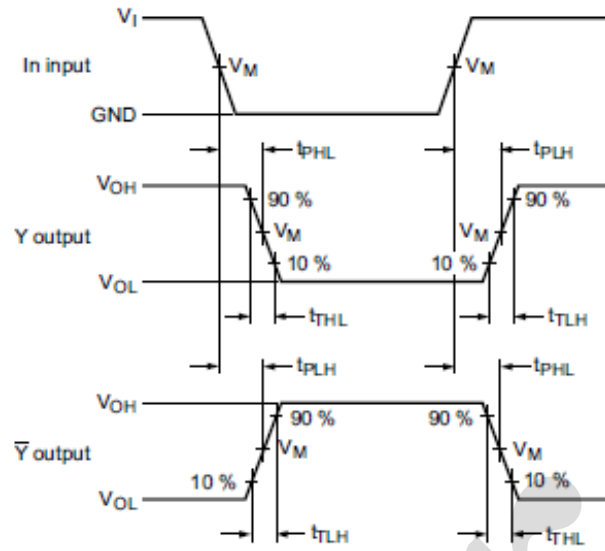


Figure 5. Propagation delay input (In) to output (Y,  $\bar{Y}$ ) and the output (Y,  $\bar{Y}$ ) transition time

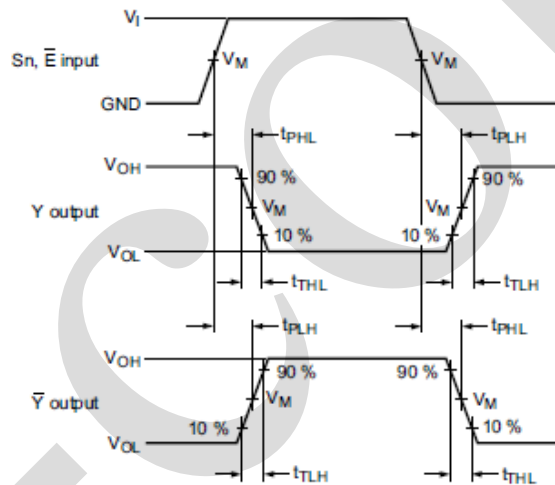


Figure 6. Propagation delay input (Sn,  $\bar{E}$ ) to output (Y,  $\bar{Y}$ ) and output (Y,  $\bar{Y}$ ) transitions time

4.3、Measurement Points

Type	Input	Output
	$V_M$	$V_M$
AiP74HC151	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
AiP74HCT151	1.3V	1.3V

4.4、Test Data

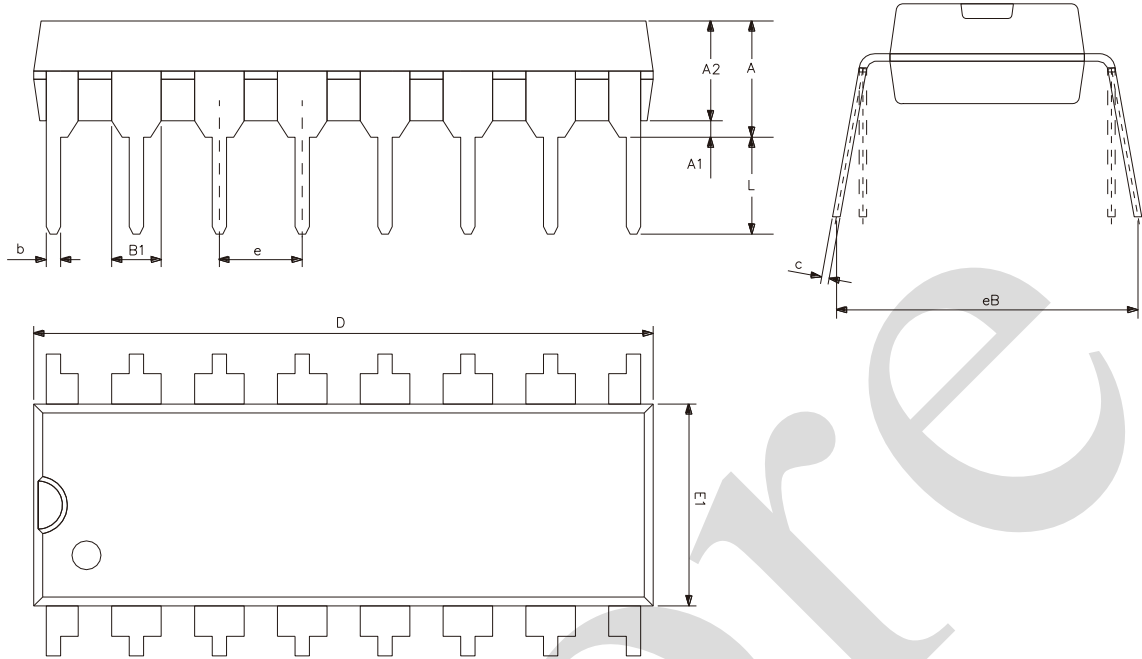
Type	Input		Load	Test
	$V_I$	$t_r, t_f$	$C_L$	
AiP74HC151	$V_{CC}$	6ns	15pF, 50pF	$t_{PHL}, t_{PLH}$
AiP74HCT151	3V	6ns	15pF, 50pF	$t_{PHL}, t_{PLH}$





## 5、Package Information

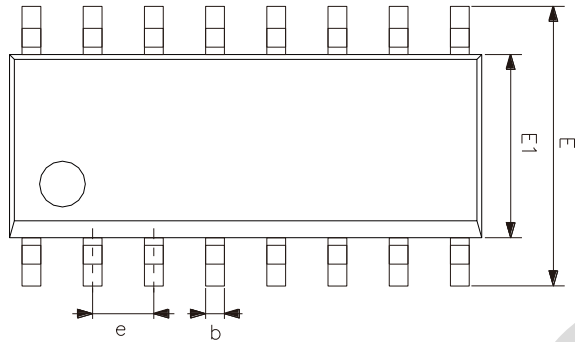
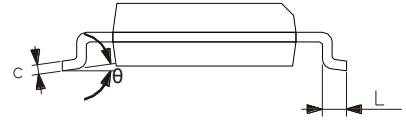
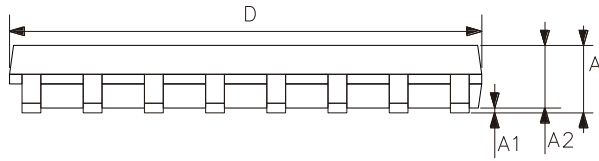
### 5.1、DIP16



Symbol	Dimensions (mm)	
	Min.	Max.
A2	3.20	3.60
A1	0.51	-
A	3.60	5.33
L	3.00	3.60
b	0.36	0.56
B1	1.52	
D	18.80	19.94
E1	6.20	6.60
e	2.54	
c	0.20	0.36
eB	7.62	9.30



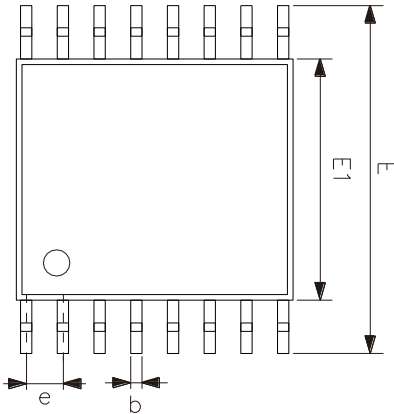
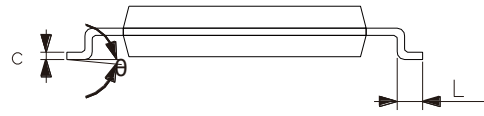
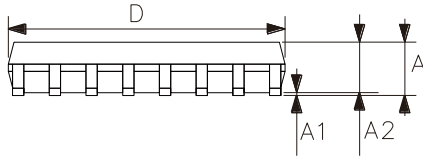
## 5.2、SOP16



Symbol	Dimensions (mm)	
	Min.	Max.
A	1.35	1.80
A1	0.10	0.25
A2	1.25	1.55
b	0.33	0.51
c	0.19	0.25
D	9.50	10.10
E	5.80	6.30
E1	3.70	4.10
e	1.27	
L	0.35	0.89
$\theta$	0°	8°



## 5.3. TSSOP16



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	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
$\theta$	0°	8°



## 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

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