



# **AiP74HC/HCT237**

## **3-to-8 Line Decoder/Demultiplexer with Address latches**

### **Product Specification**

**Specification Revision History:**

<b>Version</b>	<b>Date</b>	<b>Description</b>
2012-06-A1	2012-06	New
2023-04-B1	2023-04	Update the template



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## 1、 General Description

The AiP74HC/HCT237 is a 3-to-8 line decoder, demultiplexer with latches at the three address inputs (An). The AiP74HC/HCT237 essentially combines the 3-to-8 decoder function with a 3-bit storage latch. When the latch is enabled ( $\overline{LE}$ =LOW), the AiP74HC/HCT237 acts as a 3-to-8 active LOW decoder. When the latch enable ( $\overline{LE}$ ) goes from LOW-to-HIGH, the last data present at the inputs before this transition, is stored in the latches. Further address changes are ignored as long as  $\overline{LE}$  remains HIGH. The output enable input ( $\overline{E1}$  and  $E2$ ) controls the state of the outputs independent of the address inputs or latch operation. All outputs are HIGH unless  $\overline{E1}$  is LOW and  $E2$  is HIGH. The AiP74HC/HCT237 is ideally suited for implementing non-overlapping decoders in 3-state systems and strobes (stored address) applications in bus-oriented systems.

### Features:

- Input levels:
  - For AiP74HC237: CMOS level
  - For AiP74HCT237: TTL level
- Combines 3-to-8 decoder with 3-bit latch
- Multiple input enable for easy expansion or independent controls
- Active HIGH mutually exclusive outputs
- Low-power dissipation
- 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
AiP74HC237DA16.TB	DIP16	74HC237	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP74HCT237DA16.TB	DIP16	74HCT237	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP74HC237SA16.TB	SOP16	74HC237	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
AiP74HCT237SA16.TB	SOP16	74HCT237	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
AiP74HC237TA16.TB	TSSOP16	74HC237	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm
AiP74HCT237TA16.TB	TSSOP16	74HCT237	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
AiP74HC237SA16.TR	SOP16	74HC237	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing:1.27mm
AiP74HCT237SA16.TR	SOP16	74HCT237	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing:1.27mm
AiP74HC237TA16.TR	TSSOP16	74HC237	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing:0.65mm
AiP74HCT237TA16.TR	TSSOP16	74HCT237	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

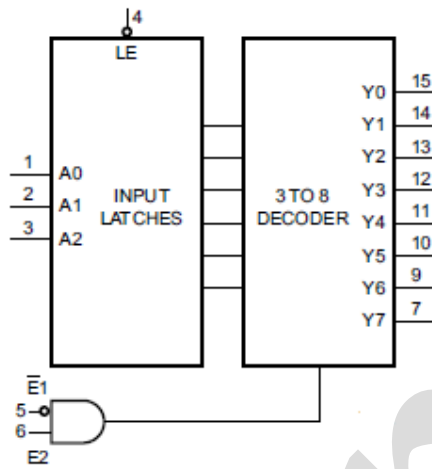


Figure 1. Logic symbol

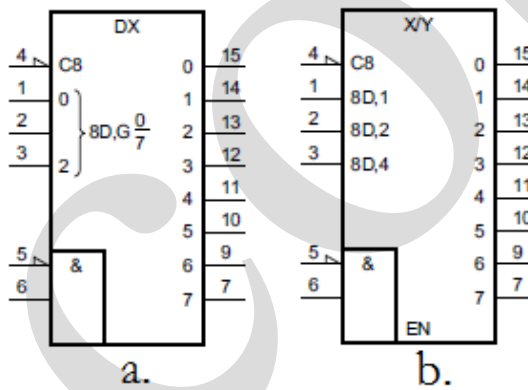


Figure 2. IEC logic symbol

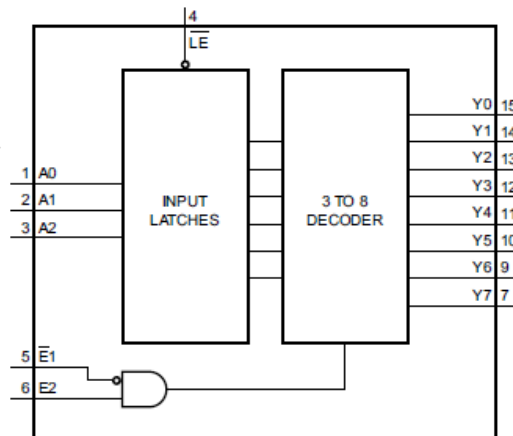


Figure 3. Functional diagram

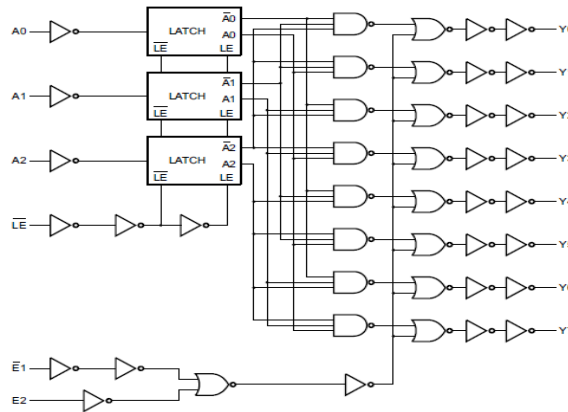
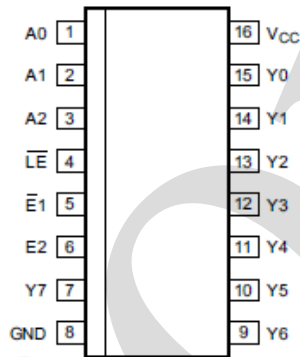


Figure 4. Logic diagram

## 2.2. Pin Configurations



## 2.3. Pin Description

Pin No.	Pin Name	Description
1	A0	data input
2	A1	data input
3	A2	data input
4	LE	latch enable input (active LOW)
5	E1	data enable input (active LOW)
6	E2	data enable input (active HIGH)
7	Y7	output
8	GND	ground (0V)
9	Y6	output
10	Y5	output
11	Y4	output
12	Y3	output
13	Y2	output
14	Y1	output
15	Y0	output
16	V <sub>CC</sub>	supply voltage



## 2.4、Function Table

Input						Output							
$\bar{LE}$	$\bar{E1}$	E2	A0	A1	A2	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
H	L	H	X	X	X	stable							
X	H	X	X	X	X	L	L	L	L	L	L	L	L
X	X	L	X	X	X	L	L	L	L	L	L	L	L
L	L	H	L	L	L	H	L	L	L	L	L	L	L
L	L	H	H	L	L	L	H	L	L	L	L	L	L
L	L	H	L	H	L	L	L	H	L	L	L	L	L
L	L	H	H	H	L	L	L	L	H	L	L	L	L
L	L	H	L	L	H	L	L	L	L	H	L	L	L
L	L	H	H	L	H	L	L	L	L	L	H	L	L
L	L	H	L	H	H	L	L	L	L	L	L	H	L
L	L	H	H	H	H	L	L	L	L	L	L	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	°C	
total power dissipation	$P_{tot}$	-	-	500	mW	
Soldering temperature	$T_L$	10s	DIP		245	°C
			SOP/TSSOP		260	°C





### 3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>AiP74HC237</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	°C
<b>AiP74HCT237</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	-	+125	°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	
<b>AiP74HC237</b>							
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
			$I_O=-4.0mA; V_{CC}=4.5V$	3.98	4.32	-	V
			$I_O=-5.2mA; V_{CC}=6.0V$	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
			$I_O=4.0mA; V_{CC}=4.5V$	-	0.15	0.26	V
			$I_O=5.2mA; V_{CC}=6.0V$	-	0.16	0.26	V
input leakage current	$I_I$	$V_I=V_{CC} \text{ or } GND; V_{CC}=6.0V$	-	-	$\pm 1.0$	$\mu A$	
supply current	$I_{CC}$	$V_I=V_{CC} \text{ or } GND; I_O=0A; V_{CC}=6.0V$	-	-	8.0	$\mu A$	
input capacitance	$C_I$	-	-	3.5	-	pF	
<b>AiP74HCT237</b>							



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
			$I_O=-4.0mA$	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
			$I_O=4.0mA$	-	0.16	0.26	V
input leakage current	$I_I$	$V_I=V_{CC}$ or GND; $V_{CC}=5.5V$	-	-	$\pm 1.0$	$\mu A$	
supply current	$I_{CC}$	$V_I=V_{CC}$ or GND; $I_O=0A$ ; $V_{CC}=5.5V$	-	-	8.0	$\mu A$	
additional supply current	$\Delta I_{CC}$	$V_I=V_{CC}-2.1V$ ; other inputs at $V_{CC}$ or GND; $I_O=0A$ ; $V_{CC}=4.5V$ to $5.5V$	-	-	360	$\mu A$	
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	
<b>AiP74HC237</b>							
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
			$I_O=-4.0mA$ ; $V_{CC}=4.5V$	3.84	-	-	V
			$I_O=-5.2mA$ ; $V_{CC}=6.0V$	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
			$I_O=4.0mA$ ; $V_{CC}=4.5V$	-	-	0.33	V
			$I_O=5.2mA$ ; $V_{CC}=6.0V$	-	-	0.33	V
input leakage current	$I_I$	$V_I=V_{CC}$ or GND; $V_{CC}=6.0V$	-	-	$\pm 1.0$	$\mu A$	
supply current	$I_{CC}$	$V_I=V_{CC}$ or GND; $I_O=0A$ ; $V_{CC}=6.0V$	-	-	80	$\mu A$	
<b>AiP74HCT237</b>							
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
			$I_O=-4.0mA$	3.84	-	-	V



LOW-level output voltage	$V_{OL}$	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC}=4.5V$	$I_O=20\mu A$	-	-	0.1	V
			$I_O=4.0mA$	-	-	0.33	V
input leakage current	$I_I$	$V_I=V_{CC} \text{ or } GND; V_{CC}=5.5V$	-	-	$\pm 1.0$	$\mu A$	
supply current	$I_{CC}$	$V_I=V_{CC} \text{ or } GND; I_O=0A; V_{CC}=5.5V$	-	-	80	$\mu A$	
additional supply current	$\Delta I_{CC}$	$V_I=V_{CC}-2.1V;$ other inputs at $V_{CC} \text{ or } GND; I_O=0A;$ $V_{CC}=4.5V \text{ to } 5.5V$	-	-	450	$\mu A$	

### 3.3.3、DC Characteristics 3

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC237</b>							
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	$V_{OH}$	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O=-20\mu A; V_{CC}=2.0V$	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
			$I_O=-4.0mA; V_{CC}=4.5V$	3.7	-	-	V
			$I_O=-5.2mA; V_{CC}=6.0V$	5.2	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH} \text{ or } V_{IL}$	$I_O=20\mu A; V_{CC}=2.0V$	-	-	0.1	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
			$I_O=4.0mA; V_{CC}=4.5V$	-	-	0.4	V
			$I_O=5.2mA; V_{CC}=6.0V$	-	-	0.4	V
input leakage current	$I_I$	$V_I=V_{CC} \text{ or } GND; V_{CC}=6.0V$	-	-	$\pm 1.0$	$\mu A$	
supply current	$I_{CC}$	$V_I=V_{CC} \text{ or } GND; I_O=0A; V_{CC}=6.0V$	-	-	160	$\mu A$	
<b>AiP74HCT237</b>							
HIGH-level input voltage	$V_{IH}$	$V_{CC}=4.5V \text{ to } 5.5V$	2.0	-	-	V	
LOW-level input voltage	$V_{IL}$	$V_{CC}=4.5V \text{ to } 5.5V$	-	-	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	-	-	V
			$I_O=-4.0mA$	3.7	-	-	V
LOW-level output voltage	$V_{OL}$	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC}=4.5V$	$I_O=20\mu A$	-	-	0.1	V
			$I_O=4.0mA$	-	-	0.4	V
input leakage current	$I_I$	$V_I=V_{CC} \text{ or } GND; V_{CC}=5.5V$	-	-	$\pm 1.0$	$\mu A$	
supply current	$I_{CC}$	$V_I=V_{CC} \text{ or } GND; I_O=0A; V_{CC}=5.5V$	-	-	160	$\mu A$	
additional supply current	$\Delta I_{CC}$	$V_I=V_{CC}-2.1V;$ other inputs at $V_{CC} \text{ or } GND; I_O=0A;$ $V_{CC}=4.5V \text{ to } 5.5V$	-	-	490	$\mu A$	



### 3.3.4、AC Characteristics 1

( $T_{amb}=25^{\circ}C$ ,  $GND=0V$ ;  $t_r=t_f=6ns$ ;  $C_L=50pF$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC237</b>							
propagation delay	$t_{pd}$	An to Yn; see Figure 6	$V_{CC}=2.0V$	-	52	160	ns
			$V_{CC}=4.5V$	-	19	32	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	16	-	ns
			$V_{CC}=6.0V$	-	15	27	ns
		$\bar{LE}$ to Yn; see Figure 6	$V_{CC}=2.0V$	-	61	190	ns
			$V_{CC}=4.5V$	-	22	38	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	19	-	ns
			$V_{CC}=6.0V$	-	18	32	ns
		$\bar{E1}$ to Yn; see Figure 7	$V_{CC}=2.0V$	-	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
		E2 to Yn; 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	$t_t$	Yn; see Figure 6, 7	$V_{CC}=2.0V$	-	19	75	ns
			$V_{CC}=4.5V$	-	7	15	ns
			$V_{CC}=6.0V$	-	6	13	ns
			$V_{CC}=2.0V$	50	11	-	ns
pulse width	$t_w$	$\bar{LE}$ HIGH; see Figure 8	$V_{CC}=4.5V$	10	4	-	ns
			$V_{CC}=6.0V$	9	3	-	ns
			$V_{CC}=2.0V$	50	6	-	ns
set-up time	$t_{su}$	An to $\bar{LE}$ ; see Figure 8	$V_{CC}=4.5V$	10	2	-	ns
			$V_{CC}=6.0V$	9	2	-	ns
			$V_{CC}=2.0V$	30	3	-	ns
hold time	$t_h$	An to $\bar{LE}$ ; see Figure 8	$V_{CC}=4.5V$	6	1	-	ns
			$V_{CC}=6.0V$	5	1	-	ns
			$V_{CC}=2.0V$	30	3	-	ns
power dissipation capacitance	$C_{PD}$	$C_L=50pF$ ; $f=1MHz$ ; $V_I=GND$ to $V_{CC}$	-	60	-	pF	
<b>AiP74HCT237</b>							
propagation delay	$t_{pd}$	An to Yn; see Figure 6	$V_{CC}=4.5V$	-	22	38	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	19	-	ns
		$\bar{LE}$ to Yn; see Figure 6	$V_{CC}=4.5V$	-	25	42	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	21	-	ns
		$\bar{E1}$ to Yn; see Figure 7	$V_{CC}=4.5V$	-	20	35	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	17	-	ns
		E2 to Yn; see Figure 6	$V_{CC}=4.5V$	-	20	35	ns
			$V_{CC}=5.0V$ ; $C_L=15pF$	-	17	-	ns
transition time	$t_t$	Yn; $V_{CC}=4.5V$ ; see Figure 6, 7	-	7	15	ns	



pulse width	$t_w$	$\overline{LE}$ HIGH; $V_{CC}=4.5V$ ; see Figure 8	10	5	-	ns
set-up time	$t_{su}$	An to $\overline{LE}$ ; $V_{CC}=4.5V$ ; see Figure 8	10	2	-	ns
hold time	$t_h$	An to $\overline{LE}$ ; $V_{CC}=4.5V$ ; see Figure 8	5	0	-	ns
power dissipation capacitance	$C_{PD}$	$C_L=50pF$ ; $f=1MHz$ ; $V_I=GND$ to $V_{CC}-1.5V$	-	63	-	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).

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

 $f_i$ =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<sub>amb</sub>=-40°C to +85°C, GND=0V;  $t_r=t_f=6ns$ ;  $C_L=50pF$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC237</b>							
propagation delay	$t_{pd}$	An to Yn; see Figure 6	$V_{CC}=2.0V$	-	-	200	ns
			$V_{CC}=4.5V$	-	-	40	ns
			$V_{CC}=6.0V$	-	-	34	ns
		$\overline{LE}$ to Yn; see Figure 6	$V_{CC}=2.0V$	-	-	240	ns
			$V_{CC}=4.5V$	-	-	48	ns
			$V_{CC}=6.0V$	-	-	41	ns
		$\overline{E1}$ to Yn; see Figure 7	$V_{CC}=2.0V$	-	-	180	ns
			$V_{CC}=4.5V$	-	-	36	ns
			$V_{CC}=6.0V$	-	-	31	ns
		E2 to Yn; see Figure 6	$V_{CC}=2.0V$	-	-	180	ns
			$V_{CC}=4.5V$	-	-	36	ns
			$V_{CC}=6.0V$	-	-	31	ns
transition time	$t_t$	Yn; see Figure 6, 7	$V_{CC}=2.0V$	-	-	95	ns
			$V_{CC}=4.5V$	-	-	19	ns
			$V_{CC}=6.0V$	-	-	16	ns
pulse width	$t_w$	$\overline{LE}$ HIGH; see Figure 8	$V_{CC}=2.0V$	65	-	-	ns
			$V_{CC}=4.5V$	13	-	-	ns
			$V_{CC}=6.0V$	11	-	-	ns
set-up time	$t_{su}$	An to $\overline{LE}$ ; see Figure 8	$V_{CC}=2.0V$	65	-	-	ns
			$V_{CC}=4.5V$	13	-	-	ns
			$V_{CC}=6.0V$	11	-	-	ns
hold time	$t_h$	An to $\overline{LE}$ ; see Figure 8	$V_{CC}=2.0V$	40	-	-	ns
			$V_{CC}=4.5V$	8	-	-	ns



		$V_{CC}=6.0V$		7	-	-	ns
<b>AiP74HCT237</b>							
propagation delay	$t_{pd}$	An to Yn; see Figure 6	$V_{CC}=4.5V$	-	-	48	ns
		$\overline{LE}$ to Yn; see Figure 6	$V_{CC}=4.5V$	-	-	53	ns
		$\overline{E1}$ to Yn; see Figure 7	$V_{CC}=4.5V$	-	-	44	ns
		E2 to Yn; see Figure 6	$V_{CC}=4.5V$	-	-	41	ns
transition time	$t_t$	Yn; $V_{CC}=4.5V$ ; see Figure 6, 7		-	-	19	ns
pulse width	$t_w$	$\overline{LE}$ HIGH; $V_{CC}=4.5V$ ; see Figure 8		13	-	-	ns
set-up time	$t_{su}$	An to $\overline{LE}$ ; $V_{CC}=4.5V$ ; see Figure 8		13	-	-	ns
hold time	$t_h$	An to $\overline{LE}$ ; $V_{CC}=4.5V$ ; see Figure 8		5	-	-	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

( $T_{amb}=-40^{\circ}C$  to  $+125^{\circ}C$ ,  $GND=0V$ ;  $t_r=t_f=6ns$ ;  $C_L=50pF$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>AiP74HC237</b>							
propagation delay	$t_{pd}$	An to Yn; see Figure 6	$V_{CC}=2.0V$	-	-	240	ns
			$V_{CC}=4.5V$	-	-	48	ns
			$V_{CC}=6.0V$	-	-	41	ns
		$\overline{LE}$ to Yn; see Figure 6	$V_{CC}=2.0V$	-	-	285	ns
			$V_{CC}=4.5V$	-	-	57	ns
			$V_{CC}=6.0V$	-	-	48	ns
		$\overline{E1}$ to Yn; see Figure 7	$V_{CC}=2.0V$	-	-	220	ns
			$V_{CC}=4.5V$	-	-	44	ns
			$V_{CC}=6.0V$	-	-	38	ns
		E2 to Yn; see Figure 6	$V_{CC}=2.0V$	-	-	220	ns
			$V_{CC}=4.5V$	-	-	44	ns
			$V_{CC}=6.0V$	-	-	38	ns
transition time	$t_t$	Yn; see Figure 6, 7	$V_{CC}=2.0V$	-	-	110	ns
			$V_{CC}=4.5V$	-	-	22	ns
			$V_{CC}=6.0V$	-	-	19	ns
pulse width	$t_w$	$\overline{LE}$ HIGH; see Figure 8	$V_{CC}=2.0V$	75	-	-	ns
			$V_{CC}=4.5V$	15	-	-	ns
			$V_{CC}=6.0V$	13	-	-	ns
set-up time	$t_{su}$	An to $\overline{LE}$ ; see Figure 8	$V_{CC}=2.0V$	75	-	-	ns
			$V_{CC}=4.5V$	15	-	-	ns
			$V_{CC}=6.0V$	13	-	-	ns
hold time	$t_h$	An to $\overline{LE}$ ; see Figure 8	$V_{CC}=2.0V$	45	-	-	ns
			$V_{CC}=4.5V$	9	-	-	ns



		$V_{CC}=6.0V$		8	-	-	ns
<b>AiP74HCT237</b>							
propagation delay	$t_{pd}$	An to $Y_n$ ; see Figure 6	$V_{CC}=4.5V$	-	-	57	ns
		$\overline{LE}$ to $Y_n$ ; see Figure 6	$V_{CC}=4.5V$	-	-	63	ns
		$\overline{E1}$ to $Y_n$ ; see Figure 7	$V_{CC}=4.5V$	-	-	53	ns
		E2 to $Y_n$ ; see Figure 6	$V_{CC}=4.5V$	-	-	50	ns
transition time	$t_t$	$Y_n$ ; $V_{CC}=4.5V$ ; see Figure 6, 7		-	-	22	ns
pulse width	$t_w$	$\overline{LE}$ HIGH; $V_{CC}=4.5V$ ; see Figure 8		15	-	-	ns
set-up time	$t_{su}$	An to $\overline{LE}$ ; $V_{CC}=4.5V$ ; see Figure 8		15	-	-	ns
hold time	$t_h$	An to $\overline{LE}$ ; $V_{CC}=4.5V$ ; see Figure 8		5	-	-	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

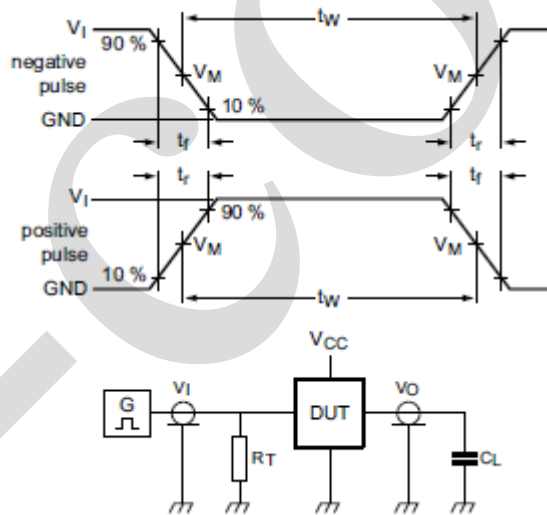


Figure 5. Test circuit for measuring switching times

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

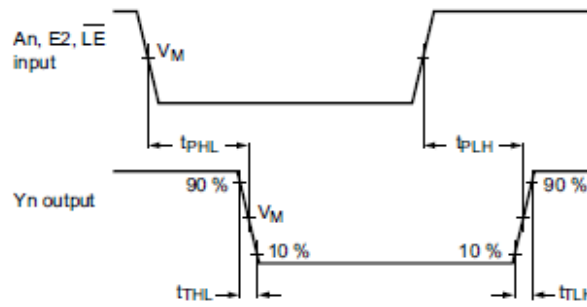


Figure 6. Propagation delay input (An) and enable inputs (E2, LE) to output (Yn) and output transition time

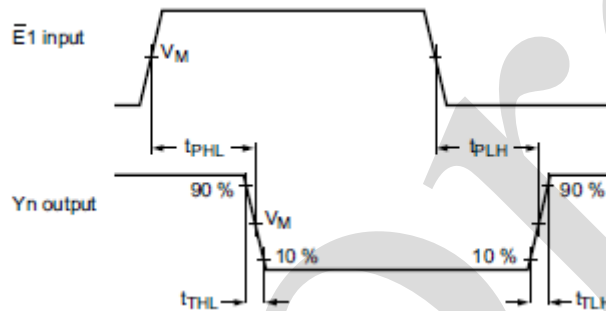


Figure 7. Propagation enable inputs (E1) to output (Yn) and output transition time

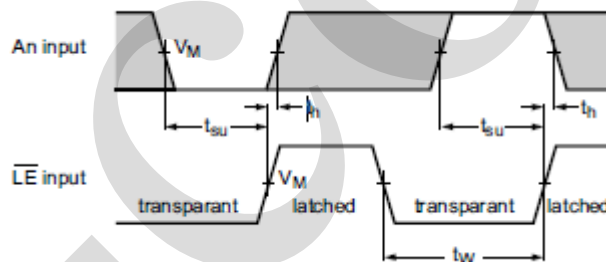


Figure 8. The data input (An) to latch enable input (LE) set-up times, latch enable input (LE) to data input (An) hold times and latch enable input (LE) pulse width

4.3、 Measurement Points

Type	Input	Output
	$V_M$	$V_M$
AiP74HC237	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$
AiP74HCT237	1.3V	1.3V

4.4、 Test Data

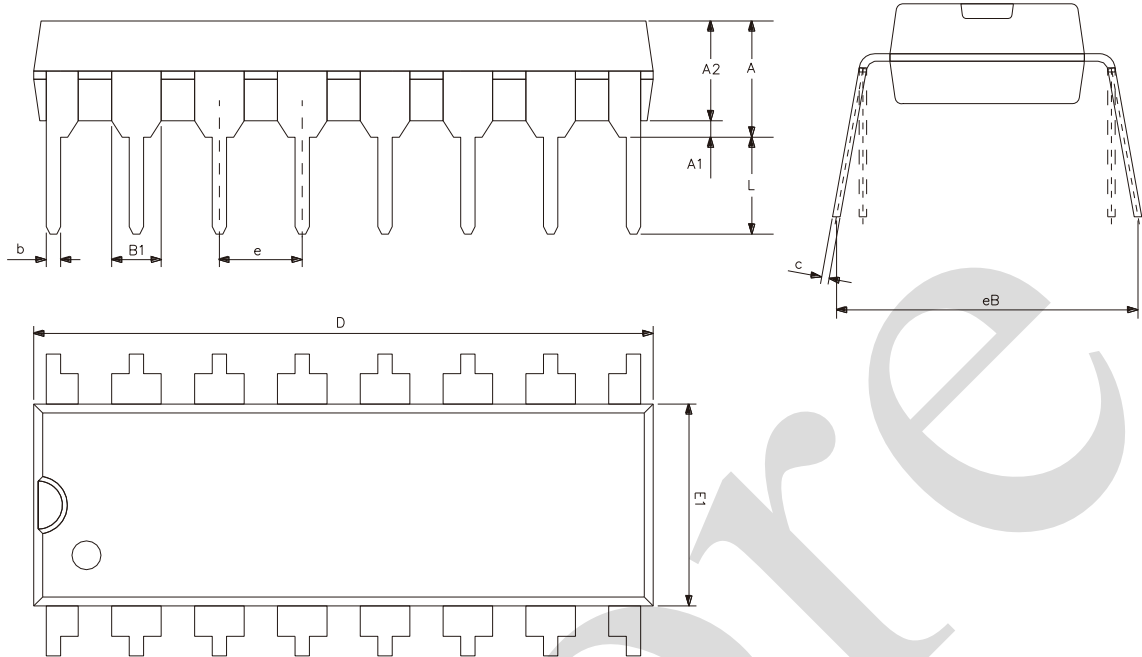
Type	Input		Load	Test
	$V_I$	$t_r, t_f$	$C_L$	
AiP74HC237	$V_{CC}$	6ns	15pF, 50pF	$t_{PLH}, t_{PHL}$
AiP74HCT237	3V	6ns	15pF, 50pF	$t_{PLH}, t_{PHL}$





## 5、Package Information

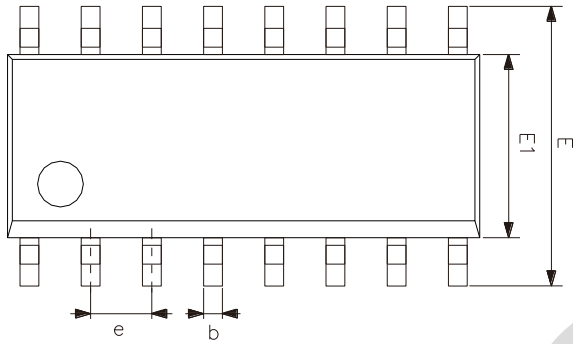
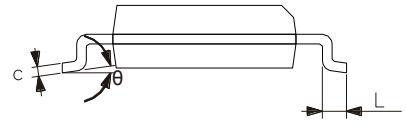
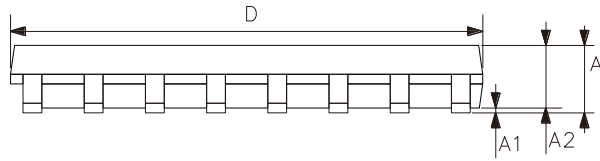
### 5.1、DIP16



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



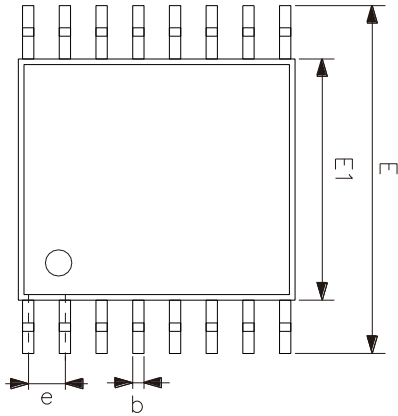
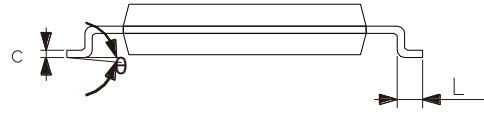
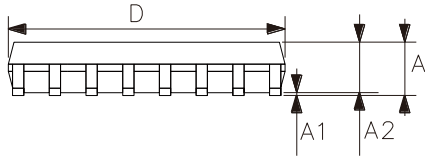
## 5.2、SOP16



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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