



# AiP74HC/HCT237

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

### 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℃~+105℃ and add electrical characteristics of -40℃~+105℃ |
|            |         |                                                                                           |



## 1、General Description

The AiP74HC/HCT237 is a 3-to-8 line decoder, demultiplexer with latches at the three address inputs ( $A_n$ ). 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 +105°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<br>PCS/tube | 40<br>tube/box      | 1000<br>PCS/box  | Dimensions of plastic enclosure: 19.0mm×6.4mm<br>Pin spacing: 2.54mm |
| AiP74HCT237DA16.TB | DIP16          | 74HCT237     | 25<br>PCS/tube | 40<br>tube/box      | 1000<br>PCS/box  | Dimensions of plastic enclosure: 19.0mm×6.4mm<br>Pin spacing: 2.54mm |
| AiP74HC237SA16.TB  | SOP16          | 74HC237      | 50<br>PCS/tube | 200<br>tube/box     | 10000<br>PCS/box | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing: 1.27mm |
| AiP74HCT237SA16.TB | SOP16          | 74HCT237     | 50<br>PCS/tube | 200<br>tube/box     | 10000<br>PCS/box | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing: 1.27mm |
| AiP74HC237TA16.TB  | TSSOP16        | 74HC237      | 96<br>PCS/tube | 200<br>tube/box     | 19200<br>PCS/box | Dimensions of plastic enclosure: 5.0mm×4.4mm<br>Pin spacing: 0.65mm  |
| AiP74HCT237TA16.TB | TSSOP16        | 74HCT237     | 96<br>PCS/tube | 200<br>tube/box     | 19200<br>PCS/box | Dimensions of plastic enclosure: 5.0mm×4.4mm<br>Pin spacing: 0.65mm  |

**Reel packing specifications:**

| Part number        | Packaging form | Marking code | Reel quantity | Boxed reel quantity | Notes                                                               |
|--------------------|----------------|--------------|---------------|---------------------|---------------------------------------------------------------------|
| AiP74HC237SA16.TR  | SOP16(1)       | 74HC237      | 2500 PCS/reel | 5000 PCS/box        | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing:1.27mm |
| AiP74HCT237SA16.TR | SOP16(1)       | 74HCT237     | 2500 PCS/reel | 5000 PCS/box        | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing:1.27mm |
| AiP74HC237SA16.TR  | SOP16(2)       | 74HC237      | 2500 PCS/reel | 2500 PCS/box        | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing:1.27mm |
| AiP74HCT237SA16.TR | SOP16(2)       | 74HCT237     | 2500 PCS/reel | 2500 PCS/box        | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing:1.27mm |
| AiP74HC237TA16.TR  | TSSOP16        | 74HC237      | 2500 PCS/reel | 5000 PCS/box        | Dimensions of plastic enclosure: 5.0mm×4.4mm<br>Pin spacing:0.65mm  |
| AiP74HCT237TA16.TR | TSSOP16        | 74HCT237     | 2500 PCS/reel | 5000 PCS/box        | Dimensions of plastic enclosure: 5.0mm×4.4mm<br>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

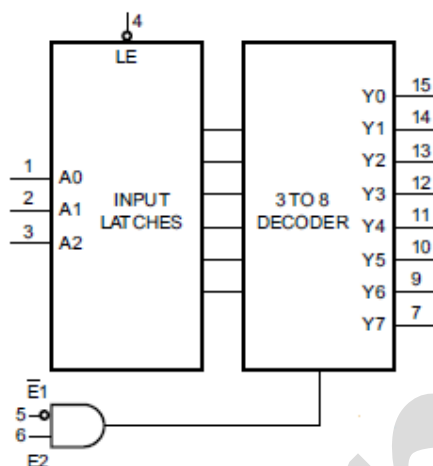


Figure 1. Logic symbol

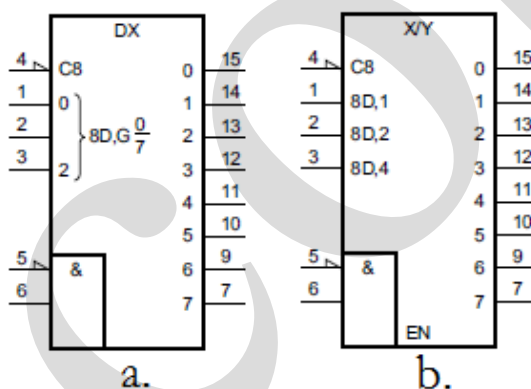


Figure 2. IEC logic symbol

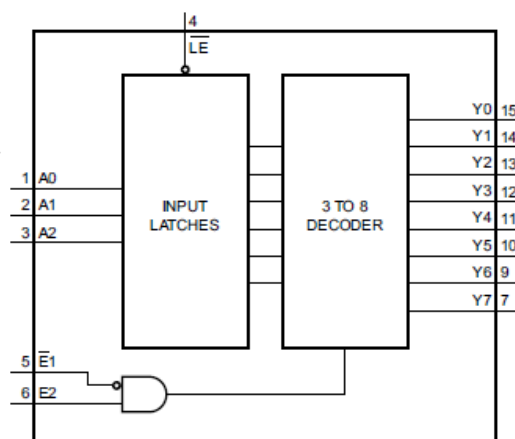


Figure 3. Functional diagram

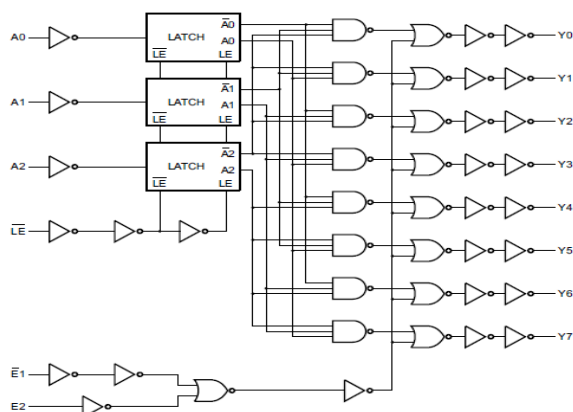
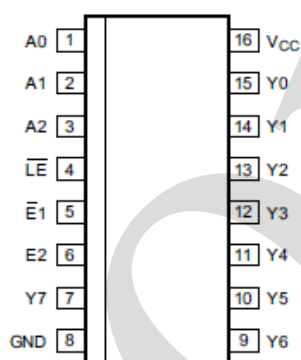


Figure 4. Logic diagram

## 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 |    |    |    |    |    |    |    |
|-----------------|-----------------|----|----|----|----|--------|----|----|----|----|----|----|----|
| $\overline{LE}$ | $\overline{E1}$ | 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 <sub>CC</sub>  | -                                                                |     | -0.5 | +7.0 | V    |
| input clamping current  | I <sub>IK</sub>  | V <sub>I</sub> < -0.5V or V <sub>I</sub> > V <sub>CC</sub> +0.5V |     | -    | ±20  | mA   |
| output clamping current | I <sub>OK</sub>  | V <sub>O</sub> < -0.5V or V <sub>O</sub> > V <sub>CC</sub> +0.5V |     | -    | ±20  | mA   |
| output current          | I <sub>O</sub>   | V <sub>O</sub> = -0.5V to V <sub>CC</sub> +0.5V                  |     | -    | ±25  | mA   |
| supply current          | I <sub>CC</sub>  | -                                                                |     | -    | +50  | mA   |
| ground current          | I <sub>GND</sub> | -                                                                |     | -50  | -    | mA   |
| storage temperature     | T <sub>stg</sub> | -                                                                |     | -65  | +150 | °C   |
| total power dissipation | P <sub>tot</sub> | -                                                                |     | -    | 500  | mW   |
| Soldering temperature   | T <sub>L</sub>   | 10s                                                              | DIP | 245  |      | °C   |
|                         |                  |                                                                  | SOP | 250  |      | °C   |

Note:

[1] For DIP16 packages: above 70°C the value of  $P_{tot}$  derates linearly with 12mW/K.

[2] For SOP16 packages: above 70°C the value of  $P_{tot}$  derates linearly with 8mW/K.

[3] For (T)SSOP16 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 |
|-------------------------------------|---------------------|---------------|------|------|----------|------|
| <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  | -    | +105     | °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  | -    | +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 |
|---------------------------|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------|------|------|------|------|
| AiP74HC237                |                 |                                                                                   |                                               |      |      |      |      |
| HIGH-level input voltage  | V <sub>IH</sub> | V <sub>CC</sub> =2.0V                                                             |                                               | 1.5  | 1.2  | -    | V    |
|                           |                 | V <sub>CC</sub> =4.5V                                                             |                                               | 3.15 | 2.4  | -    | V    |
|                           |                 | V <sub>CC</sub> =6.0V                                                             |                                               | 4.2  | 3.2  | -    | V    |
| LOW-level input voltage   | V <sub>IL</sub> | V <sub>CC</sub> =2.0V                                                             |                                               | -    | 0.8  | 0.5  | V    |
|                           |                 | V <sub>CC</sub> =4.5V                                                             |                                               | -    | 2.1  | 1.35 | V    |
|                           |                 | V <sub>CC</sub> =6.0V                                                             |                                               | -    | 2.8  | 1.8  | V    |
| HIGH-level output voltage | V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                               | I <sub>O</sub> =-20uA; V <sub>CC</sub> =2.0V  | 1.9  | 2.0  | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-20uA; V <sub>CC</sub> =4.5V  | 4.4  | 4.5  | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-20uA; V <sub>CC</sub> =6.0V  | 5.9  | 6.0  | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-4.0mA; V <sub>CC</sub> =4.5V | 3.98 | 4.32 | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-5.2mA; V <sub>CC</sub> =6.0V | 5.48 | 5.81 | -    | V    |
| LOW-level output voltage  | V <sub>OL</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                               | I <sub>O</sub> =20uA; V <sub>CC</sub> =2.0V   | -    | 0    | 0.1  | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =20uA; V <sub>CC</sub> =4.5V   | -    | 0    | 0.1  | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =20uA; V <sub>CC</sub> =6.0V   | -    | 0    | 0.1  | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =4.0mA; V <sub>CC</sub> =4.5V  | -    | 0.15 | 0.26 | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =5.2mA; V <sub>CC</sub> =6.0V  | -    | 0.16 | 0.26 | V    |
| input leakage current     | I <sub>I</sub>  | V <sub>I</sub> =V <sub>CC</sub> or GND; V <sub>CC</sub> =6.0V                     |                                               | -    | -    | ±0.1 | uA   |
| supply current            | I <sub>CC</sub> | V <sub>I</sub> =V <sub>CC</sub> or GND; I <sub>O</sub> =0A; V <sub>CC</sub> =6.0V |                                               | -    | -    | 8.0  | uA   |
| input capacitance         | C <sub>I</sub>  | -                                                                                 |                                               | -    | 3.5  | -    | pF   |
| AiP74HCT237               |                 |                                                                                   |                                               |      |      |      |      |



|                           |                 |                                                                                               |                |      |           |         |
|---------------------------|-----------------|-----------------------------------------------------------------------------------------------|----------------|------|-----------|---------|
| 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 $V_{IL}$ ;<br>$V_{CC}=4.5V$                                                 | $I_O=-20\mu A$ | 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 $V_{IL}$ ;<br>$V_{CC}=4.5V$                                                 | $I_O=20\mu A$  | -    | 0         | V       |
|                           |                 |                                                                                               | $I_O=4.0mA$    | -    | 0.16      | V       |
| input leakage current     | $I_I$           | $V_I=V_{CC}$ or GND; $V_{CC}=5.5V$                                                            | -              | -    | $\pm 0.1$ | $\mu A$ |
| supply current            | $I_{CC}$        | $V_I=V_{CC}$ or GND; $I_O=0A$ ; $V_{CC}=5.5V$                                                 | -              | -    | 8.0       | $\mu A$ |
| additional supply current | $\Delta I_{CC}$ | $V_I=V_{CC}-2.1V$ ;<br>other inputs at $V_{CC}$ or GND; $I_O=0A$ ;<br>$V_{CC}=4.5V$ to $5.5V$ | -              | 100  | 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 |
|---------------------------|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------|------|------|------|------|
| AiP74HC237                |                 |                                                                                   |                                               |      |      |      |      |
| HIGH-level input voltage  | V <sub>IH</sub> | V <sub>CC</sub> =2.0V                                                             |                                               | 1.5  | -    | -    | V    |
|                           |                 | V <sub>CC</sub> =4.5V                                                             |                                               | 3.15 | -    | -    | V    |
|                           |                 | V <sub>CC</sub> =6.0V                                                             |                                               | 4.2  | -    | -    | V    |
| LOW-level input voltage   | V <sub>IL</sub> | V <sub>CC</sub> =2.0V                                                             |                                               | -    | -    | 0.5  | V    |
|                           |                 | V <sub>CC</sub> =4.5V                                                             |                                               | -    | -    | 1.35 | V    |
|                           |                 | V <sub>CC</sub> =6.0V                                                             |                                               | -    | -    | 1.8  | V    |
| HIGH-level output voltage | V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                               | I <sub>O</sub> =-20uA; V <sub>CC</sub> =2.0V  | 1.9  | -    | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-20uA; V <sub>CC</sub> =4.5V  | 4.4  | -    | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-20uA; V <sub>CC</sub> =6.0V  | 5.9  | -    | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-4.0mA; V <sub>CC</sub> =4.5V | 3.84 | -    | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-5.2mA; V <sub>CC</sub> =6.0V | 5.34 | -    | -    | V    |
| LOW-level output voltage  | V <sub>OL</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                               | I <sub>O</sub> =20uA; V <sub>CC</sub> =2.0V   | -    | -    | 0.1  | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =20uA; V <sub>CC</sub> =4.5V   | -    | -    | 0.1  | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =20uA; V <sub>CC</sub> =6.0V   | -    | -    | 0.1  | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =4.0mA; V <sub>CC</sub> =4.5V  | -    | -    | 0.33 | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =5.2mA; V <sub>CC</sub> =6.0V  | -    | -    | 0.33 | V    |
| input leakage current     | I <sub>I</sub>  | V <sub>I</sub> =V <sub>CC</sub> or GND; V <sub>CC</sub> =6.0V                     |                                               | -    | -    | ±1.0 | uA   |
| supply current            | I <sub>CC</sub> | V <sub>I</sub> =V <sub>CC</sub> or GND; I <sub>O</sub> =0A; V <sub>CC</sub> =6.0V |                                               | -    | -    | 80   | uA   |
| AiP74HCT237               |                 |                                                                                   |                                               |      |      |      |      |
| HIGH-level input voltage  | V <sub>IH</sub> | V <sub>CC</sub> =4.5V to 5.5V                                                     |                                               | 2.0  | -    | -    | V    |
| LOW-level input voltage   | V <sub>IL</sub> | V <sub>CC</sub> =4.5V to 5.5V                                                     |                                               | -    | -    | 0.8  | V    |
| HIGH-level output voltage | V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ;<br>V <sub>CC</sub> =4.5V    | I <sub>O</sub> =-20uA                         | 4.4  | -    | -    | V    |
|                           |                 |                                                                                   | I <sub>O</sub> =-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 | $\Delta I_{CC}$ | $V_I=V_{CC}-2.1V;$<br>other inputs at $V_{CC} \text{ or } GND; I_O=0A;$<br>$V_{CC}=4.5V \text{ to } 5.5V$ |               | - | - | 450       | $\mu A$ |

### 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 |
|---------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------|------|------|------|
| AiP74HC237                |                  |                                                                                                                                        |                                               |      |      |      |      |
| HIGH-level input voltage  | V <sub>IH</sub>  | V <sub>CC</sub> =2.0V                                                                                                                  |                                               | 1.5  | -    | -    | V    |
|                           |                  | V <sub>CC</sub> =4.5V                                                                                                                  |                                               | 3.15 | -    | -    | V    |
|                           |                  | V <sub>CC</sub> =6.0V                                                                                                                  |                                               | 4.2  | -    | -    | V    |
| LOW-level input voltage   | V <sub>IL</sub>  | V <sub>CC</sub> =2.0V                                                                                                                  |                                               | -    | -    | 0.5  | V    |
|                           |                  | V <sub>CC</sub> =4.5V                                                                                                                  |                                               | -    | -    | 1.35 | V    |
|                           |                  | V <sub>CC</sub> =6.0V                                                                                                                  |                                               | -    | -    | 1.8  | V    |
| HIGH-level output voltage | V <sub>OH</sub>  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                    | I <sub>O</sub> =-20uA; V <sub>CC</sub> =2.0V  | 1.9  | -    | -    | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =-20uA; V <sub>CC</sub> =4.5V  | 4.4  | -    | -    | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =-20uA; V <sub>CC</sub> =6.0V  | 5.9  | -    | -    | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =-4.0mA; V <sub>CC</sub> =4.5V | 3.7  | -    | -    | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =-5.2mA; V <sub>CC</sub> =6.0V | 5.2  | -    | -    | V    |
| LOW-level output voltage  | V <sub>OL</sub>  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                    | I <sub>O</sub> =20uA; V <sub>CC</sub> =2.0V   | -    | -    | 0.1  | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =20uA; V <sub>CC</sub> =4.5V   | -    | -    | 0.1  | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =20uA; V <sub>CC</sub> =6.0V   | -    | -    | 0.1  | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =4.0mA; V <sub>CC</sub> =4.5V  | -    | -    | 0.4  | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =5.2mA; V <sub>CC</sub> =6.0V  | -    | -    | 0.4  | V    |
| input leakage current     | I <sub>I</sub>   | V <sub>I</sub> =V <sub>CC</sub> or GND; V <sub>CC</sub> =6.0V                                                                          |                                               | -    | -    | ±1.0 | uA   |
| supply current            | I <sub>CC</sub>  | V <sub>I</sub> =V <sub>CC</sub> or GND; I <sub>O</sub> =0A; V <sub>CC</sub> =6.0V                                                      |                                               | -    | -    | 160  | uA   |
| AiP74HCT237               |                  |                                                                                                                                        |                                               |      |      |      |      |
| HIGH-level input voltage  | V <sub>IH</sub>  | V <sub>CC</sub> =4.5V to 5.5V                                                                                                          |                                               | 2.0  | -    | -    | V    |
| LOW-level input voltage   | V <sub>IL</sub>  | V <sub>CC</sub> =4.5V to 5.5V                                                                                                          |                                               | -    | -    | 0.8  | V    |
| HIGH-level output voltage | V <sub>OH</sub>  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ;<br>V <sub>CC</sub> =4.5V                                                         | I <sub>O</sub> =-20uA                         | 4.4  | -    | -    | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =-4.0mA                        | 3.7  | -    | -    | V    |
| LOW-level output voltage  | V <sub>OL</sub>  | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ;<br>V <sub>CC</sub> =4.5V                                                         | I <sub>O</sub> =20uA                          | -    | -    | 0.1  | V    |
|                           |                  |                                                                                                                                        | I <sub>O</sub> =4.0mA                         | -    | -    | 0.4  | V    |
| input leakage current     | I <sub>I</sub>   | V <sub>I</sub> =V <sub>CC</sub> or GND; V <sub>CC</sub> =5.5V                                                                          |                                               | -    | -    | ±1.0 | uA   |
| supply current            | I <sub>CC</sub>  | V <sub>I</sub> =V <sub>CC</sub> or GND; I <sub>O</sub> =0A; V <sub>CC</sub> =5.5V                                                      |                                               | -    | -    | 160  | uA   |
| additional supply current | ΔI <sub>CC</sub> | V <sub>I</sub> =V <sub>CC</sub> -2.1V;<br>other inputs at V <sub>CC</sub> or GND; I <sub>O</sub> =0A;<br>V <sub>CC</sub> =4.5V to 5.5V |                                               | -    | -    | 490  | uA   |



## 3.3.4、AC Characteristics 1

(T<sub>amb</sub>=25℃, GND=0V; t<sub>r</sub>=t<sub>f</sub>=6ns; C<sub>L</sub>=50pF, unless otherwise specified.)

| Parameter                     | Symbol          | Conditions                                                           |                                             | Min. | Typ. | Max. | Unit |
|-------------------------------|-----------------|----------------------------------------------------------------------|---------------------------------------------|------|------|------|------|
| AiP74HC237                    |                 |                                                                      |                                             |      |      |      |      |
| propagation delay             | t <sub>pd</sub> | An to Yn;<br>see Figure 6                                            | V <sub>CC</sub> =2.0V                       | -    | 52   | 160  | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | -    | 19   | 32   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 16   | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | -    | 15   | 27   | ns   |
|                               |                 | LE to Yn;<br>see Figure 6                                            | V <sub>CC</sub> =2.0V                       | -    | 61   | 190  | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | -    | 22   | 38   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 19   | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | -    | 18   | 32   | ns   |
|                               |                 | E1 to Yn;<br>see Figure 7                                            | V <sub>CC</sub> =2.0V                       | -    | 47   | 145  | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | -    | 17   | 29   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 14   | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | -    | 14   | 25   | ns   |
|                               |                 | E2 to Yn;<br>see Figure 6                                            | V <sub>CC</sub> =2.0V                       | -    | 47   | 145  | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | -    | 17   | 29   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 14   | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | -    | 14   | 25   | ns   |
| transition time               | t <sub>t</sub>  | Yn;<br>see Figure 6, 7                                               | V <sub>CC</sub> =2.0V                       | -    | 19   | 75   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | -    | 7    | 15   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | -    | 6    | 13   | ns   |
| pulse width                   | t <sub>w</sub>  | LE HIGH;<br>see Figure 8                                             | V <sub>CC</sub> =2.0V                       | 50   | 11   | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | 10   | 4    | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | 9    | 3    | -    | ns   |
| set-up time                   | t <sub>su</sub> | An to LE;<br>see Figure 8                                            | V <sub>CC</sub> =2.0V                       | 50   | 6    | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | 10   | 2    | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | 9    | 2    | -    | ns   |
| hold time                     | t <sub>h</sub>  | An to LE;<br>see Figure 8                                            | V <sub>CC</sub> =2.0V                       | 30   | 3    | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =4.5V                       | 6    | 1    | -    | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =6.0V                       | 5    | 1    | -    | ns   |
| power dissipation capacitance | C <sub>PD</sub> | C <sub>L</sub> =50pF; f=1MHz; V <sub>I</sub> =GND to V <sub>CC</sub> |                                             | -    | 60   | -    | pF   |
| AiP74HCT237                   |                 |                                                                      |                                             |      |      |      |      |
| propagation delay             | t <sub>pd</sub> | An to Yn;<br>see Figure 6                                            | V <sub>CC</sub> =4.5V                       | -    | 22   | 38   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 19   | -    | ns   |
|                               |                 | LE to Yn;<br>see Figure 6                                            | V <sub>CC</sub> =4.5V                       | -    | 25   | 42   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 21   | -    | ns   |
|                               |                 | E1 to Yn;<br>see Figure 7                                            | V <sub>CC</sub> =4.5V                       | -    | 20   | 35   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 17   | -    | ns   |
|                               |                 | E2 to Yn;<br>see Figure 6                                            | V <sub>CC</sub> =4.5V                       | -    | 20   | 35   | ns   |
|                               |                 |                                                                      | V <sub>CC</sub> =5.0V; C <sub>L</sub> =15pF | -    | 17   | -    | ns   |
| transition time               | t <sub>t</sub>  | Yn; V <sub>CC</sub> =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).

$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o)$  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  $+85^{\circ}C$ ,  $GND=0V$ ;  $t_r=t_f=6ns$ ;  $C_L=50pF$ , unless otherwise specified.)

| Parameter         | Symbol   | Conditions                              | Min.          | Typ. | Max. | Unit   |
|-------------------|----------|-----------------------------------------|---------------|------|------|--------|
| <b>AiP74HC237</b> |          |                                         |               |      |      |        |
| propagation delay | $t_{pd}$ | An to Yn;<br>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;<br>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;<br>see Figure 7  | $V_{CC}=2.0V$ | -    | -    | 180 ns |
|                   |          |                                         | $V_{CC}=4.5V$ | -    | -    | 36 ns  |
|                   |          |                                         | $V_{CC}=6.0V$ | -    | -    | 31 ns  |
|                   |          | E2 to Yn;<br>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;<br>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;<br>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 $\overline{LE}$ ;<br>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 $\overline{LE}$ ;<br>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 $Y_n$ ;<br>see Figure 6                        | $V_{CC}=4.5V$ | -  | - | 48 | ns |
|                    |          | $\overline{LE}$ to $Y_n$ ;<br>see Figure 6           | $V_{CC}=4.5V$ | -  | - | 53 | ns |
|                    |          | $\overline{E1}$ to $Y_n$ ;<br>see Figure 7           | $V_{CC}=4.5V$ | -  | - | 44 | ns |
|                    |          | E2 to $Y_n$ ;<br>see Figure 6                        | $V_{CC}=4.5V$ | -  | - | 41 | ns |
| transition time    | $t_t$    | $Y_n$ ; $V_{CC}=4.5V$ ; 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  $+105^{\circ}C$ , GND=0V;  $t_r=t_f=6ns$ ;  $C_L=50pF$ , unless otherwise specified.)

| Parameter         | Symbol          | Conditions                                          |                       | Min. | Typ. | Max. | Unit |
|-------------------|-----------------|-----------------------------------------------------|-----------------------|------|------|------|------|
| AiP74HC237        |                 |                                                     |                       |      |      |      |      |
| propagation delay | t <sub>pd</sub> | An to Y <sub>n</sub> ;<br>see Figure 6              | V <sub>CC</sub> =2.0V | -    | -    | 240  | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | -    | -    | 48   | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | -    | -    | 41   | ns   |
|                   |                 | LE <sup>-</sup> to Y <sub>n</sub> ;<br>see Figure 6 | V <sub>CC</sub> =2.0V | -    | -    | 285  | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | -    | -    | 57   | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | -    | -    | 48   | ns   |
|                   |                 | E1 to Y <sub>n</sub> ;<br>see Figure 7              | V <sub>CC</sub> =2.0V | -    | -    | 220  | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | -    | -    | 44   | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | -    | -    | 38   | ns   |
|                   |                 | E2 to Y <sub>n</sub> ;<br>see Figure 6              | V <sub>CC</sub> =2.0V | -    | -    | 220  | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | -    | -    | 44   | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | -    | -    | 38   | ns   |
| transition time   | t <sub>t</sub>  | Y <sub>n</sub> ;<br>see Figure 6, 7                 | V <sub>CC</sub> =2.0V | -    | -    | 110  | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | -    | -    | 22   | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | -    | -    | 19   | ns   |
| pulse width       | t <sub>w</sub>  | LE <sup>-</sup> HIGH;<br>see Figure 8               | V <sub>CC</sub> =2.0V | 75   | -    | -    | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | 15   | -    | -    | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | 13   | -    | -    | ns   |
| set-up time       | t <sub>su</sub> | An to LE <sup>-</sup> ;<br>see Figure 8             | V <sub>CC</sub> =2.0V | 75   | -    | -    | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | 15   | -    | -    | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =6.0V | 13   | -    | -    | ns   |
| hold time         | t <sub>h</sub>  | An to LE <sup>-</sup> ;<br>see Figure 8             | V <sub>CC</sub> =2.0V | 45   | -    | -    | ns   |
|                   |                 |                                                     | V <sub>CC</sub> =4.5V | 9    | -    | -    | ns   |



|                    |          |                                                      |               |    |   |    |    |
|--------------------|----------|------------------------------------------------------|---------------|----|---|----|----|
|                    |          |                                                      | $V_{CC}=6.0V$ | 8  | - | -  | ns |
| <b>AiP74HCT237</b> |          |                                                      |               |    |   |    |    |
| propagation delay  | $t_{pd}$ | An to $\overline{Y_n}$ ; see Figure 6                | $V_{CC}=4.5V$ | -  | - | 57 | ns |
|                    |          | $\overline{LE}$ to $\overline{Y_n}$ ; see Figure 6   | $V_{CC}=4.5V$ | -  | - | 63 | ns |
|                    |          | $\overline{E1}$ to $\overline{Y_n}$ ; see Figure 7   | $V_{CC}=4.5V$ | -  | - | 53 | ns |
|                    |          | E2 to $\overline{Y_n}$ ; see Figure 6                | $V_{CC}=4.5V$ | -  | - | 50 | ns |
| transition time    | $t_t$    | $\overline{Y_n}$ ; $V_{CC}=4.5V$ ; 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

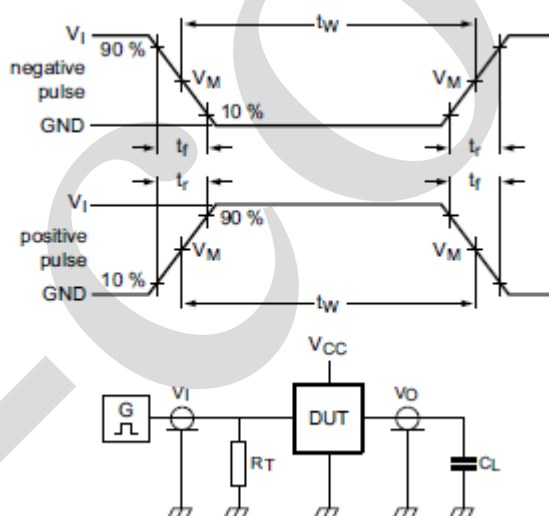


Figure 5. Test circuit for measuring switching times

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

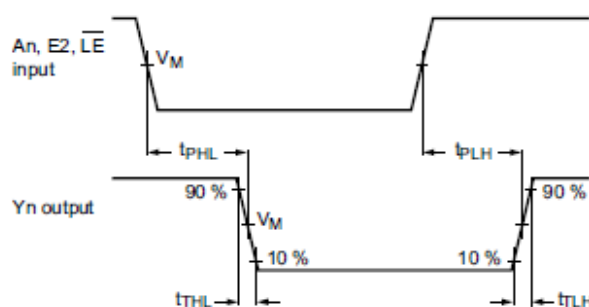


Figure 6. Propagation delay input (An) and enable inputs (E2, LE) to output (Yn) and output transition time

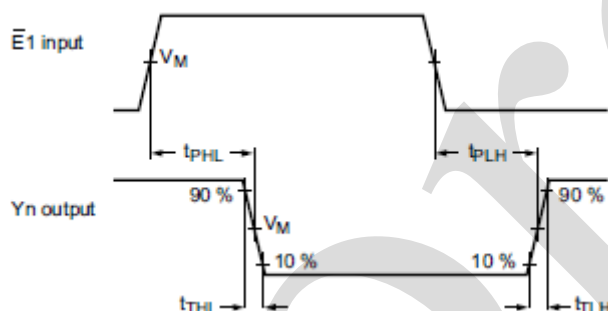


Figure 7. Propagation enable inputs (E1) to output (Yn) and output transition time

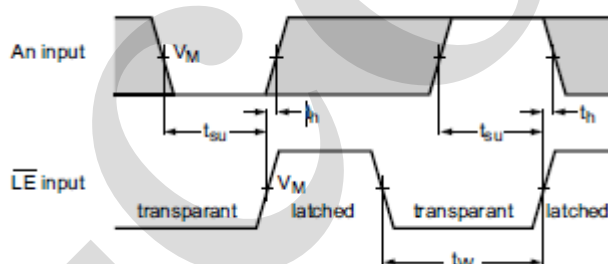


Figure 8. The data input (An) to latch enable input (LE) set-up times, latch enable input (LE) to data input (An) hold times and latch enable input (LE) pulse width

## 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                |

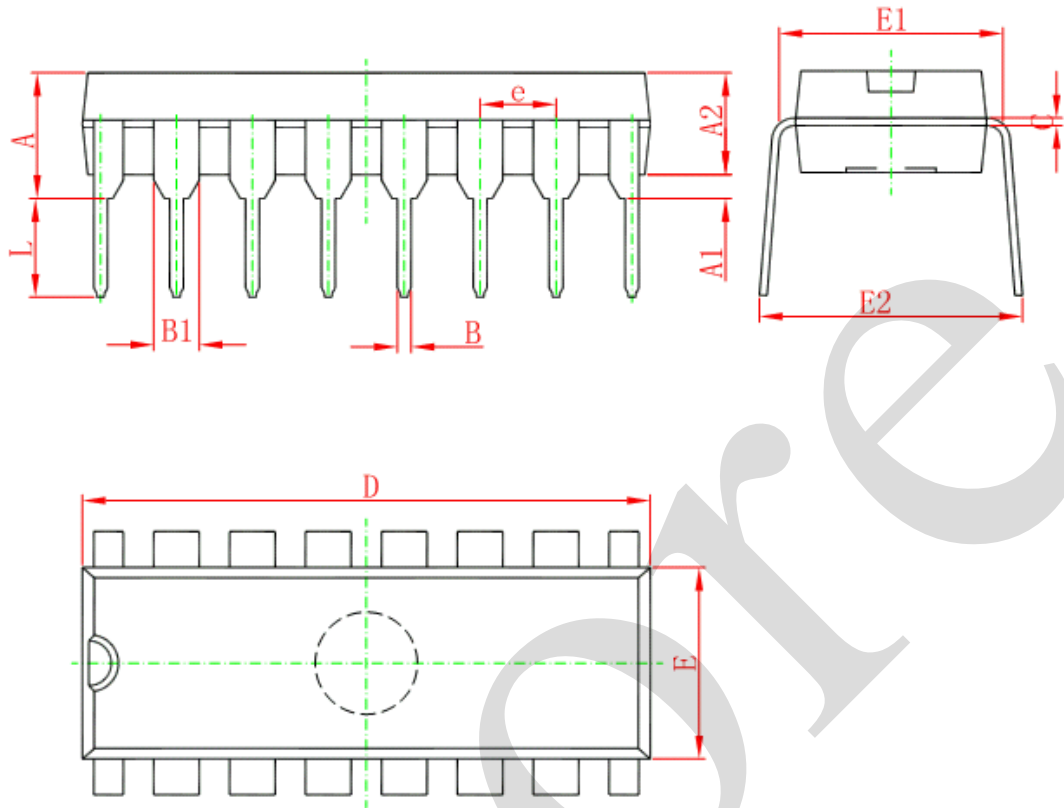
## 4.4、Test Data

| 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

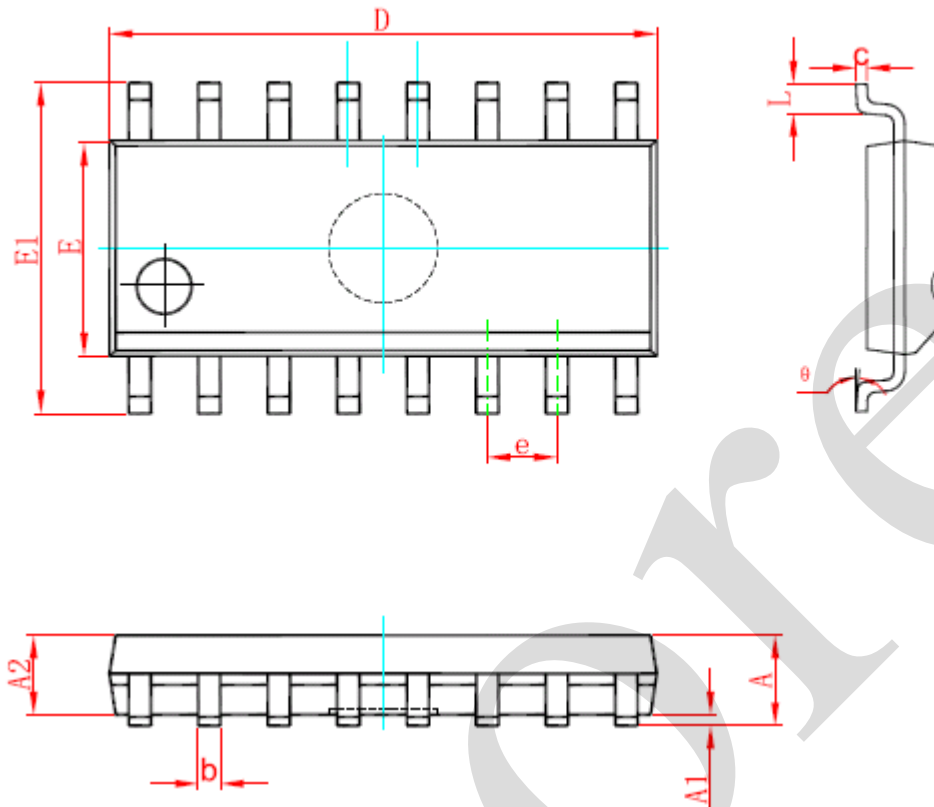
### 5.1、DIP16



| Symbol | Dimensions 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      | 18.800                    | 19.200 | 0.740                | 0.756 |
| 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 |



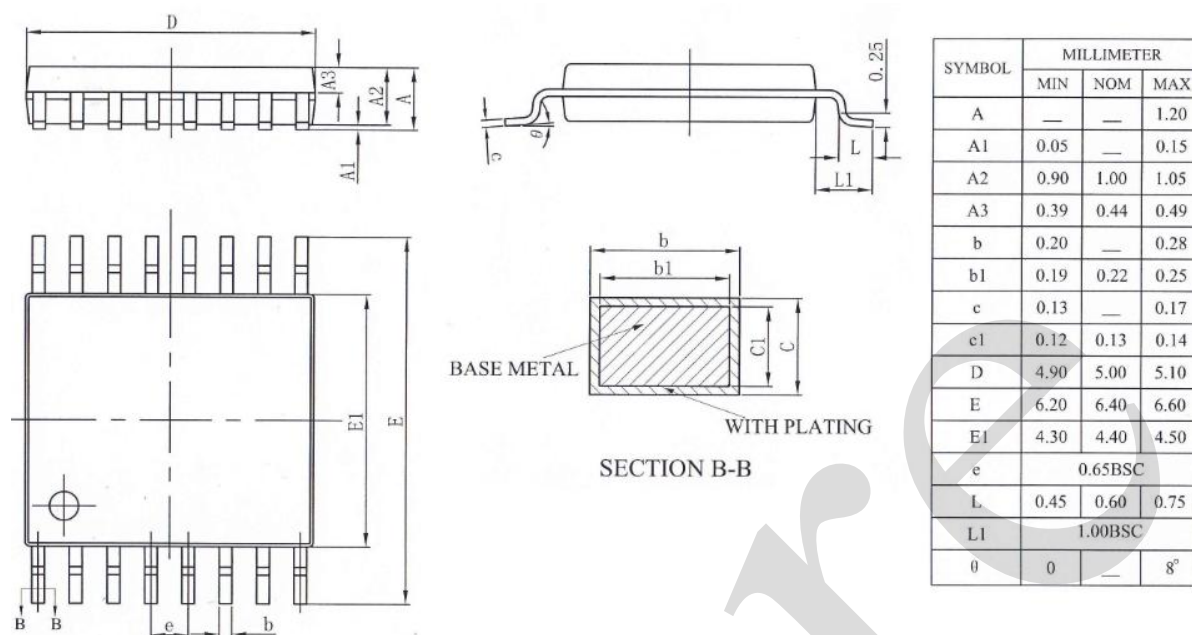
## 5.2、SOP16



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 1.350                     | 1.750  | 0.053                | 0.069 |
| A1     | 0.100                     | 0.250  | 0.004                | 0.010 |
| A2     | 1.350                     | 1.550  | 0.053                | 0.061 |
| b      | 0.330                     | 0.510  | 0.013                | 0.020 |
| c      | 0.170                     | 0.250  | 0.007                | 0.010 |
| D      | 9.800                     | 10.200 | 0.386                | 0.402 |
| E      | 3.800                     | 4.000  | 0.150                | 0.157 |
| E1     | 5.800                     | 6.200  | 0.228                | 0.244 |
| e      | 1.270 (BSC)               |        | 0.050 (BSC)          |       |
| L      | 0.400                     | 1.270  | 0.016                | 0.050 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |



## 5.3、TSSOP16





## 6、Statements And Notes

### 6.1、The name and content of Hazardous substances or Elements in the product

| Part name               | Hazardous substances or Elements                                                                                                                                                                                                                                                 |                               |                               |                               |                          |                                |                   |                       |                           |                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------|--------------------------------|-------------------|-----------------------|---------------------------|----------------------|
|                         | Lead and lead compounds                                                                                                                                                                                                                                                          | Mercury and mercury compounds | Cadmium and cadmium compounds | Hexavalent chromium compounds | Polybrominated biphenyls | Polybrominated biphenyl ethers | Dibutyl phthalate | Butylbenzyl phthalate | Di-2-ethylhexyl phthalate | Diisobutyl phthalate |
| Lead frame              | ○                                                                                                                                                                                                                                                                                | ○                             | ○                             | ○                             | ○                        | ○                              | ○                 | ○                     | ○                         | ○                    |
| Plastic resin           | ○                                                                                                                                                                                                                                                                                | ○                             | ○                             | ○                             | ○                        | ○                              | ○                 | ○                     | ○                         | ○                    |
| Chip                    | ○                                                                                                                                                                                                                                                                                | ○                             | ○                             | ○                             | ○                        | ○                              | ○                 | ○                     | ○                         | ○                    |
| The lead                | ○                                                                                                                                                                                                                                                                                | ○                             | ○                             | ○                             | ○                        | ○                              | ○                 | ○                     | ○                         | ○                    |
| Plastic sheet installed | ○                                                                                                                                                                                                                                                                                | ○                             | ○                             | ○                             | ○                        | ○                              | ○                 | ○                     | ○                         | ○                    |
| explanation             | <p>○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard.</p> <p>×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.</p> |                               |                               |                               |                          |                                |                   |                       |                           |                      |

### 6.2、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.