



# SN74HC/HCT597 (LX)

## 8-bit Shift Register with Input Flip-flops

### Product Specification

#### Specification Revision History:

| Version    | Date    | Description |
|------------|---------|-------------|
| 2023-06-A1 | 2023-06 | New         |
|            |         |             |
|            |         |             |
|            |         |             |
|            |         |             |



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## 1、General Description

The 74HC597/74HCT597 is an 8-bit shift register with input flip-flops

### Features:

- Supply voltage range:  
SN74HC597: 2~6V  
SN74HCT597: 4.5~5.5V
- Input levels:  
SN74HC597: CMOS level  
SN74HCT597: TTL level
- Temperature range: -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                                                                      |
|--------------------|----------------|--------------|----------------|---------------------|------------------|----------------------------------------------------------------------------|
| SN74HC597N(LX)     | DIP16          | SN74HC597N   | 25<br>PCS/tube | 40<br>tube/box      | 1000<br>PCS/box  | Dimensions of plastic enclosure:<br>19.0mm×6.4mm<br>Pin spacing:<br>2.54mm |
| SN74HCT597N(LX)    | DIP16          | SN74HCT597N  | 25<br>PCS/tube | 40<br>tube/box      | 1000<br>PCS/box  | Dimensions of plastic enclosure:<br>19.0mm×6.4mm<br>Pin spacing:<br>2.54mm |
| SN74HC597D(LX)     | SOP16          | SN74HC597    | 50<br>PCS/tube | 200<br>tube/box     | 10000<br>PCS/box | Dimensions of plastic enclosure:<br>10.0mm×3.9mm<br>Pin spacing:<br>1.27mm |
| SN74HCT597D(LX)    | SOP16          | SN74HCT597   | 50<br>PCS/tube | 200<br>tube/box     | 10000<br>PCS/box | Dimensions of plastic enclosure:<br>10.0mm×3.9mm<br>Pin spacing:<br>1.27mm |
| SN74HC597PWR (LX)  | TSSOP16        | SN74HC597    | 96<br>PCS/tube | 200<br>tube/box     | 19200<br>PCS/box | Dimensions of plastic enclosure:<br>5.0mm×4.4mm<br>Pin spacing:<br>0.65mm  |
| SN74HCT597PWR (LX) | TSSOP16        | SN74HCT597   | 96<br>PCS/tube | 200<br>tube/box     | 19200<br>PCS/box | Dimensions of plastic enclosure:<br>5.0mm×4.4mm<br>Pin spacing:<br>0.65mm  |



**Reel packing specifications:**

| Part number       | Packaging form | Marking code | Reel quantity | Boxed reel quantity | Notes                                                                |
|-------------------|----------------|--------------|---------------|---------------------|----------------------------------------------------------------------|
| SN74HC597DR(LX)   | SOP16          | SN74HC597    | 4000 PCS/reel | 8000 PCS/box        | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing: 1.27mm |
| SN74HCT597DR(LX)  | SOP16          | SN74HCT597   | 4000 PCS/reel | 8000 PCS/box        | Dimensions of plastic enclosure: 10.0mm×3.9mm<br>Pin spacing: 1.27mm |
| SN74HC597PWR(LX)  | TSSOP16        | SN74HC597    | 5000 PCS/reel | 10000 PCS/box       | Dimensions of plastic enclosure: 5.0mm×4.4mm<br>Pin spacing: 0.65mm  |
| SN74HCT597PWR(LX) | TSSOP16        | SN74HCT597   | 5000 PCS/reel | 10000 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

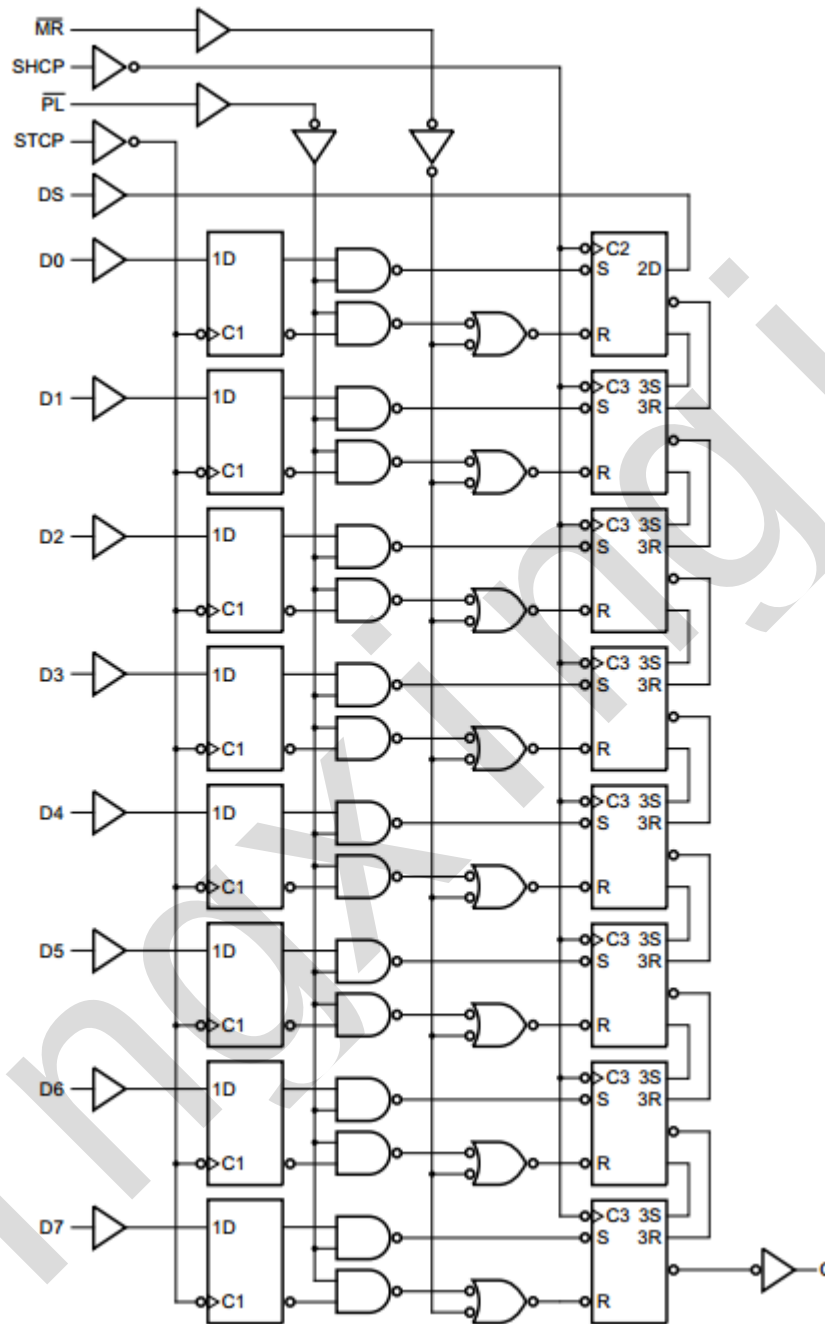
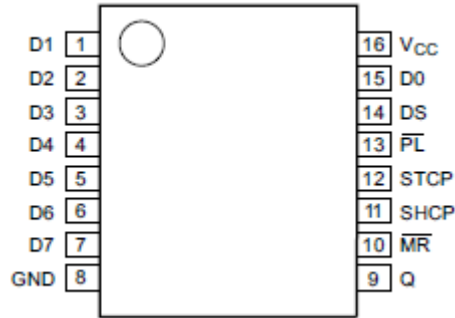


Figure 1. Logic symbol

### 2.2、Pin Configurations



### 2.3、Pin Description

| Pin No. | Pin Name               | Description                                                |
|---------|------------------------|------------------------------------------------------------|
| 1       | D1                     | parallel data output                                       |
| 2       | D2                     | parallel data output                                       |
| 3       | D3                     | parallel data output                                       |
| 4       | D4                     | parallel data output                                       |
| 5       | D5                     | parallel data output                                       |
| 6       | D6                     | parallel data output                                       |
| 7       | D7                     | parallel data output                                       |
| 8       | GND                    | ground (0V)                                                |
| 9       | Q                      | serial data output                                         |
| 10      | $\overline{\text{MR}}$ | asynchronous master reset input (active LOW)               |
| 11      | SHCP                   | shift register clock input (LOW-to-HIGH, edge-triggered)   |
| 12      | STCP                   | storage register clock input (LOW-to-HIGH, edge-triggered) |
| 13      | $\overline{\text{PL}}$ | parallel load input (active LOW)                           |
| 14      | DS                     | serial data input                                          |
| 15      | D0                     | parallel data inputs                                       |
| 16      | V <sub>CC</sub>        | supply voltage                                             |

### 2.4、Function Table

| Input         |      |                        |                        | Function                                                                     |
|---------------|------|------------------------|------------------------|------------------------------------------------------------------------------|
| STCP          | SHCP | $\overline{\text{PL}}$ | $\overline{\text{MR}}$ |                                                                              |
| ↑             | X    | X                      | X                      | data loaded to input latches                                                 |
| ↑             | X    | L                      | H                      | data loaded from inputs to shift register                                    |
| No clock edge | X    | L                      | H                      | data transferred from input flip-flops to shift register                     |
| X             | X    | L                      | L                      | invalid logic, state of shift register is indeterminate when signals removed |
| X             | X    | H                      | L                      | shift register cleared                                                       |
| X             | ↑    | H                      | H                      | shift register clocked $Q_n = Q_{n-1}$ , $Q_0 = \text{DS}$                   |

Note: H=HIGH voltage level; L=LOW voltage level. ↑=LOW-to-HIGH transition .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   | V    |
| supply current          | I <sub>CC</sub>  | -                                                                |           | -    | 50   | mA   |
| ground current          | I <sub>GND</sub> | -                                                                |           | -50  | -    | mA   |
| 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>   | -0.5V < V <sub>O</sub> < V <sub>CC</sub> +0.5V                   |           | -    | ±25  | mA   |
| storage temperature     | T <sub>stg</sub> | -                                                                |           | -65  | +150 | °C   |
| soldering temperature   | T <sub>L</sub>   | 10s                                                              | DIP       | 245  |      | °C   |
|                         |                  |                                                                  | SOP/TSSOP | 260  |      |      |

#### 3.2、Recommended Operating Conditions

| Parameter           | Symbol    | Conditions | Min. | Typ. | Max.     | Unit |
|---------------------|-----------|------------|------|------|----------|------|
| <b>SN74HC597</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    |
| ambient temperature | $T_{amb}$ | -          | -40  | -    | +125     | °C   |
| <b>SN74HCT597</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    |
| ambient temperature | $T_{amb}$ | -          | -40  | -    | +125     | °C   |





### 3.3、Electrical Characteristics

#### 3.3.1、DC Characteristics 1

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

| Parameter                 | Symbol          | $V_{CC}$ | Conditions                                                                                           | Min. | Typ. | Max.    | Unit          |
|---------------------------|-----------------|----------|------------------------------------------------------------------------------------------------------|------|------|---------|---------------|
| <b>SN74HC597</b>          |                 |          |                                                                                                      |      |      |         |               |
| HIGH-level input voltage  | $V_{IH}$        | 2.0V     | -                                                                                                    | 1.5  | 1.2  | -       | V             |
|                           |                 | 4.5V     | -                                                                                                    | 3.15 | 2.4  | -       | V             |
|                           |                 | 6.0V     | -                                                                                                    | 4.2  | 3.2  | -       | V             |
| LOW-level input voltage   | $V_{IL}$        | 2.0V     | -                                                                                                    | -    | 0.8  | 0.5     | V             |
|                           |                 | 4.5V     | -                                                                                                    | -    | 2.1  | 1.35    | V             |
|                           |                 | 6.0V     | -                                                                                                    | -    | 2.8  | 1.8     | V             |
| HIGH-level output voltage | $V_{OH}$        | 2.0V     | $I_O = -20\mu\text{A}$                                                                               | 1.9  | 2.0  | -       | V             |
|                           |                 | 4.5V     | $I_O = -20\mu\text{A}$                                                                               | 4.4  | 4.5  | -       | V             |
|                           |                 | 6.0V     | $I_O = -20\mu\text{A}$                                                                               | 5.9  | 6.0  | -       | V             |
|                           |                 | 4.5V     | $I_O = -4.0\text{mA}$                                                                                | 3.84 | 4.32 | -       | V             |
|                           |                 | 6.0V     | $I_O = -5.2\text{mA}$                                                                                | 5.34 | 5.81 | -       | V             |
| LOW-level output voltage  | $V_{OL}$        | 2.0V     | $I_O = 20\mu\text{A}$                                                                                | -    | 0    | 0.1     | V             |
|                           |                 | 4.5V     | $I_O = 20\mu\text{A}$                                                                                | -    | 0    | 0.1     | V             |
|                           |                 | 6.0V     | $I_O = 20\mu\text{A}$                                                                                | -    | 0    | 0.1     | V             |
|                           |                 | 4.5V     | $I_O = 4.0\text{mA}$                                                                                 | -    | 0.15 | 0.33    | V             |
|                           |                 | 6.0V     | $I_O = 5.2\text{mA}$                                                                                 | -    | 0.16 | 0.33    | V             |
| input leakage current     | $I_I$           | 6.0V     | $V_I = V_{CC}$ or GND                                                                                | -    | -    | $\pm 2$ | $\mu\text{A}$ |
| supply current            | $I_{CC}$        | 6.0V     | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}$                                                             | -    | -    | 80      | $\mu\text{A}$ |
| <b>SN74HCT597</b>         |                 |          |                                                                                                      |      |      |         |               |
| HIGH-level input voltage  | $V_{IH}$        | 4.5~5.5V | -                                                                                                    | 2.0  | 1.6  | -       | V             |
| LOW-level input voltage   | $V_{IL}$        | 4.5~5.5V | -                                                                                                    | -    | 1.2  | 0.8     | V             |
| HIGH-level output voltage | $V_{OH}$        | 4.5V     | $I_O = -20\mu\text{A}$                                                                               | 4.4  | 4.5  | -       | V             |
|                           |                 |          | $I_O = -4.0\text{mA}$                                                                                | 3.84 | 4.32 | -       | V             |
| LOW-level output voltage  | $V_{OL}$        | 4.5V     | $I_O = 20\mu\text{A}$                                                                                | -    | 0    | 0.1     | V             |
|                           |                 |          | $I_O = 4.0\text{mA}$                                                                                 | -    | 0.15 | 0.33    | V             |
| input leakage current     | $I_I$           | 5.5V     | $V_I = V_{CC}$ or GND                                                                                | -    | -    | $\pm 2$ | $\mu\text{A}$ |
| supply current            | $I_{CC}$        | 6.0V     | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}$                                                             | -    | -    | 80      | $\mu\text{A}$ |
| additional supply current | $\Delta I_{CC}$ | 4.5~5.5V | One input at $V_I = V_{CC} - 2.1\text{V}$ ;<br>Other inputs at $V_{CC}$ or GND;<br>$I_O = 0\text{A}$ | -    | -    | 135     | $\mu\text{A}$ |



### 3.3.2、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          | $V_{CC}$ | Conditions                                                                                           | Min. | Typ. | Max.    | Unit          |
|---------------------------|-----------------|----------|------------------------------------------------------------------------------------------------------|------|------|---------|---------------|
| <b>SN74HC597</b>          |                 |          |                                                                                                      |      |      |         |               |
| HIGH-level input voltage  | $V_{IH}$        | 2.0V     | -                                                                                                    | 1.5  | -    | -       | V             |
|                           |                 | 4.5V     | -                                                                                                    | 3.15 | -    | -       | V             |
|                           |                 | 6.0V     | -                                                                                                    | 4.2  | -    | -       | V             |
| LOW-level input voltage   | $V_{IL}$        | 2.0V     | -                                                                                                    | -    | -    | 0.5     | V             |
|                           |                 | 4.5V     | -                                                                                                    | -    | -    | 1.35    | V             |
|                           |                 | 6.0V     | -                                                                                                    | -    | -    | 1.8     | V             |
| HIGH-level output voltage | $V_{OH}$        | 2.0V     | $I_O = -20\mu\text{A}$                                                                               | 1.9  | -    | -       | V             |
|                           |                 | 4.5V     | $I_O = -20\mu\text{A}$                                                                               | 4.4  | -    | -       | V             |
|                           |                 | 6.0V     | $I_O = -20\mu\text{A}$                                                                               | 5.9  | -    | -       | V             |
|                           |                 | 4.5V     | $I_O = -4.0\text{mA}$                                                                                | 3.7  | -    | -       | V             |
|                           |                 | 6.0V     | $I_O = -5.2\text{mA}$                                                                                | 5.2  | -    | -       | V             |
| LOW-level output voltage  | $V_{OL}$        | 2.0V     | $I_O = 20\mu\text{A}$                                                                                | -    | -    | 0.1     | V             |
|                           |                 | 4.5V     | $I_O = 20\mu\text{A}$                                                                                | -    | -    | 0.1     | V             |
|                           |                 | 6.0V     | $I_O = 20\mu\text{A}$                                                                                | -    | -    | 0.1     | V             |
|                           |                 | 4.5V     | $I_O = 4.0\text{mA}$                                                                                 | -    | -    | 0.4     | V             |
|                           |                 | 6.0V     | $I_O = 5.2\text{mA}$                                                                                 | -    | -    | 0.4     | V             |
| input leakage current     | $I_I$           | 6.0V     | $V_I = V_{CC}$ or GND                                                                                | -    | -    | $\pm 4$ | $\mu\text{A}$ |
| supply current            | $I_{CC}$        | 6.0V     | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}$                                                             | -    | -    | 160     | $\mu\text{A}$ |
| <b>SN74HCT597</b>         |                 |          |                                                                                                      |      |      |         |               |
| HIGH-level input voltage  | $V_{IH}$        | 4.5~5.5V | -                                                                                                    | 2.0  | -    | -       | V             |
| LOW-level input voltage   | $V_{IL}$        | 4.5~5.5V | -                                                                                                    | -    | -    | 0.8     | V             |
| HIGH-level output voltage | $V_{OH}$        | 4.5V     | $I_O = -20\mu\text{A}$                                                                               | 4.4  | -    | -       | V             |
|                           |                 |          | $I_O = -4.0\text{mA}$                                                                                | 3.7  | -    | -       | V             |
| LOW-level output voltage  | $V_{OL}$        | 4.5V     | $I_O = 20\mu\text{A}$                                                                                | -    | -    | 0.1     | V             |
|                           |                 |          | $I_O = 4.0\text{mA}$                                                                                 | -    | -    | 0.4     | V             |
| input leakage current     | $I_I$           | 5.5V     | $V_I = V_{CC}$ or GND                                                                                | -    | -    | $\pm 4$ | $\mu\text{A}$ |
| supply current            | $I_{CC}$        | 6.0V     | $V_I = V_{CC}$ or GND; $I_O = 0\text{A}$                                                             | -    | -    | 160     | $\mu\text{A}$ |
| additional supply current | $\Delta I_{CC}$ | 4.5~5.5V | One input at $V_I = V_{CC} - 2.1\text{V}$ ;<br>Other inputs at $V_{CC}$ or GND;<br>$I_O = 0\text{A}$ | -    | -    | 147     | $\mu\text{A}$ |



### 3.3.3、AC Characteristics 1

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

| Parameter                     | Symbol                              | V <sub>CC</sub> | Conditions           | Min.                 | Typ.         | Max. | Unit |    |    |
|-------------------------------|-------------------------------------|-----------------|----------------------|----------------------|--------------|------|------|----|----|
| SN74HC597                     |                                     |                 |                      |                      |              |      |      |    |    |
| SHCP to Q propagation delay   | t <sub>PLH</sub> , t <sub>PHL</sub> | 2.0V            | C <sub>L</sub> =50pF | see Figure 5         | -            | 55   | 220  | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | -            | 20   | 44   | ns |    |
|                               |                                     | 5.0V            | C <sub>L</sub> =15pF |                      | -            | 17   | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | -            | 16   | 37   | ns |    |
| MR to Q propagation delay     |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 6         | -            | 58   | 220  | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | -            | 21   | 44   | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | -            | 17   | 37   | ns |    |
| STCP to Q propagation delay   |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 5         | -            | 80   | 315  | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | -            | 29   | 63   | ns |    |
|                               |                                     | 5.0V            | C <sub>L</sub> =15pF |                      | -            | 25   | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | -            | 23   | 54   | ns |    |
| PL to Q propagation delay     |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 7         | -            | 69   | 270  | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | -            | 25   | 54   | ns |    |
|                               |                                     | 5.0V            | C <sub>L</sub> =15pF |                      | -            | 21   | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | -            | 20   | 46   | ns |    |
| transition time               |                                     | tt              | 2.0V                 | C <sub>L</sub> =50pF | see Figure 5 | -    | 19   | 95 | ns |
|                               | 4.5V                                |                 | C <sub>L</sub> =50pF | -                    |              | 7    | 19   | ns |    |
|                               | 6.0V                                |                 | C <sub>L</sub> =50pF | -                    |              | 6    | 16   | ns |    |
| STCP(HIGH or LOW) pulse width | tw                                  | 2.0V            | C <sub>L</sub> =50pF | see Figure 5         | 100          | 11   | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | 20           | 4    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | 17           | 3    | -    | ns |    |
| SHCP(HIGH or LOW) pulse width |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 5         | 100          | 14   | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | 20           | 5    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | 17           | 4    | -    | ns |    |
| MR LOW                        |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 6         | 100          | 22   | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | 20           | 8    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | 17           | 6    | -    | ns |    |
| PL LOW                        |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 7         | 100          | 22   | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | 20           | 8    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |                      | 17           | 6    | -    | ns |    |
| Dn to STCP Set_up time        |                                     | tsu             | 2.0V                 | C <sub>L</sub> =50pF | see Figure 9 | 75   | 8    | -  | ns |
|                               |                                     |                 | 4.5V                 | C <sub>L</sub> =50pF |              | 15   | 3    | -  | ns |
|                               |                                     |                 | 6.0V                 | C <sub>L</sub> =50pF |              | 13   | 2    | -  | ns |
| DS to SHCP Set_up time        | 2.0V                                |                 | C <sub>L</sub> =50pF | see Figure 9         | 75           | 11   | -    | ns |    |
|                               | 4.5V                                |                 | C <sub>L</sub> =50pF |                      | 15           | 4    | -    | ns |    |
|                               | 6.0V                                |                 | C <sub>L</sub> =50pF |                      | 13           | 3    | -    | ns |    |
| PL to SHCP Set_up time        | 2.0V                                |                 | C <sub>L</sub> =50pF | see Figure 10        | 75           | 11   | -    | ns |    |
|                               | 4.5V                                |                 | C <sub>L</sub> =50pF |                      | 15           | 4    | -    | ns |    |
|                               | 6.0V                                |                 | C <sub>L</sub> =50pF |                      | 13           | 3    | -    | ns |    |
| Dn to STCP hold time          | th                                  | 2.0V            | C <sub>L</sub> =50pF | see Figure 9         | 5            | -3   | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |                      | 5            | -1   | -    | ns |    |



|                                     |            |      |                   |               |     |     |    |     |
|-------------------------------------|------------|------|-------------------|---------------|-----|-----|----|-----|
|                                     |            | 6.0V | $C_L=50\text{pF}$ |               | 5   | -1  | -  | ns  |
|                                     |            | 2.0V | $C_L=50\text{pF}$ |               | 5   | -3  | -  | ns  |
| DS TO SHCP<br>hold time             |            | 4.5V | $C_L=50\text{pF}$ | see Figure 9  | 5   | -1  | -  | ns  |
|                                     |            | 6.0V | $C_L=50\text{pF}$ |               | 5   | -1  | -  | ns  |
| PL TO SHCP<br>hold time             |            | 2.0V | $C_L=50\text{pF}$ | see Figure 10 | 5   | -6  | -  | ns  |
|                                     |            | 4.5V | $C_L=50\text{pF}$ |               | 5   | -2  | -  | ns  |
|                                     |            | 6.0V | $C_L=15\text{pF}$ |               | 5   | -2  | -  | ns  |
| MR to SHCP<br>recovery time         | trec       | 2.0V | $C_L=50\text{pF}$ | see Figure 8  | 75  | -3  | -  | ns  |
|                                     |            | 4.5V | $C_L=50\text{pF}$ |               | 15  | -1  | -  | ns  |
|                                     |            | 6.0V | $C_L=50\text{pF}$ |               | 13  | -1  | -  | ns  |
| SHCP<br>maximum<br>frequency        | fmax       | 2.0V | $C_L=50\text{pF}$ | see Figure 5  | 4.8 | 29  | -  | MHZ |
|                                     |            | 4.5V | $C_L=50\text{pF}$ |               | 24  | 87  | -  | MHZ |
|                                     |            | 5.0V | $C_L=15\text{pF}$ |               | -   | 96  | -  | MHZ |
|                                     |            | 6.0V | $C_L=50\text{pF}$ |               | 28  | 104 | -  | MHZ |
| <b>SN74HCT597</b>                   |            |      |                   |               |     |     |    |     |
| SHCP to Q<br>propagation<br>delay   |            | 4.5V | $C_L=50\text{pF}$ | see Figure 5  | -   | 23  | 50 | ns  |
|                                     |            | 5.0V | $C_L=15\text{pF}$ |               | -   | 20  | -  | ns  |
| MR to Q<br>propagation<br>delay     |            | 4.5V | $C_L=50\text{pF}$ | see Figure 6  | -   | 28  | 61 | ns  |
| STCP to Q<br>propagation<br>delay   | tPLH, tPHL | 4.5V | $C_L=50\text{pF}$ | see Figure 5  | -   | 33  | 71 | ns  |
|                                     |            | 5.0V | $C_L=15\text{pF}$ |               | -   | 29  | -  | ns  |
| PL to Q<br>propagation<br>delay     |            | 4.5V | $C_L=50\text{pF}$ | see Figure 7  | -   | 30  | 65 | ns  |
|                                     |            | 5.0V | $C_L=15\text{pF}$ |               | -   | 26  | -  | ns  |
| transition time                     | tt         | 4.5V | $C_L=50\text{pF}$ | see Figure 5  | -   | 7   | 19 | ns  |
| STCP(HIGH or<br>LOW)<br>pulse width |            | 4.5V | $C_L=50\text{pF}$ | see Figure 5  | 20  | 6   | -  | ns  |
| SHCP(HIGH<br>or LOW)<br>pulse width | tw         | 4.5V | $C_L=50\text{pF}$ | see Figure 5  | 20  | 7   | -  | ns  |
| MR LOW                              |            | 4.5V | $C_L=50\text{pF}$ | see Figure 6  | 31  | 14  | -  | ns  |
| PL LOW                              |            | 4.5V | $C_L=50\text{pF}$ | see Figure 7  | 25  | 10  | -  | ns  |
| Dn to STCP<br>Set up time           |            | 4.5V | $C_L=50\text{pF}$ | see Figure 9  | 15  | 5   | -  | ns  |
| DS to SHCP<br>Set up time           | tsu        | 4.5V | $C_L=50\text{pF}$ | see Figure 9  | 15  | 2   | -  | ns  |
| PL to SHCP<br>Set up time           |            | 4.5V | $C_L=50\text{pF}$ | see Figure 10 | 15  | 4   | -  | ns  |
| Dn to SHCP<br>hold time             |            | 4.5V | $C_L=50\text{pF}$ | see Figure 9  | 5   | -1  | -  | ns  |
| DS to SHCP<br>hold time             | th         | 4.5V | $C_L=50\text{pF}$ | see Figure 9  | 5   | -2  | -  | ns  |
| PL to SHCP<br>hold time             |            | 4.5V | $C_L=50\text{pF}$ | see Figure 10 | 5   | -2  | -  | ns  |



|                             |      |      |                      |              |    |    |   |     |
|-----------------------------|------|------|----------------------|--------------|----|----|---|-----|
| MR to SHCP<br>recovery time | trec | 4.5V | C <sub>L</sub> =50pF | see Figure 8 | 15 | -2 | - | ns  |
| maximum<br>frequency        | fmax | 4.5V | C <sub>L</sub> =15pF | see Figure 5 | 24 | 75 | - | MHZ |
|                             |      | 5.0V | C <sub>L</sub> =15pF |              | -  | 83 | - | MHZ |



### 3.3.4、AC 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                              | V <sub>CC</sub> | Conditions           | Min.          | Typ.                 | Max. | Unit |    |    |
|-------------------------------|-------------------------------------|-----------------|----------------------|---------------|----------------------|------|------|----|----|
| SN74HC597                     |                                     |                 |                      |               |                      |      |      |    |    |
| SHCP to Q propagation delay   | t <sub>PLH</sub> , t <sub>PHL</sub> | 2.0V            | C <sub>L</sub> =50pF | see Figure 5  | -                    | -    | 265  | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |               | -                    | -    | 53   | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |               | -                    | -    | 45   | ns |    |
| MR to Q propagation delay     |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 6  | -                    | -    | 265  | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | -    | -    | 53 | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | -    | -    | 45 | ns |
| STCP to Q propagation delay   |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 5  | -                    | -    | 375  | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | -    | -    | 75 | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | -    | -    | 64 | ns |
| PL to Q propagation delay     |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 7  | -                    | -    | 325  | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | -    | -    | 65 | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | -    | -    | 55 | ns |
| transition time               | tt                                  | 2.0V            | C <sub>L</sub> =50pF | see Figure 5  | -                    | -    | 110  | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |               | -                    | -    | 22   | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |               | -                    | -    | 19   | ns |    |
| STCP(HIGH or LOW) pulse width | tw                                  | 2.0V            | C <sub>L</sub> =50pF | see Figure 5  | 120                  | -    | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |               | 24                   | -    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |               | 20                   | -    | -    | ns |    |
| SHCP(HIGH or LOW) pulse width |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 5  | 120                  | -    | -    | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | 24   | -    | -  | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | 20   | -    | -  | ns |
| MR LOW                        |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 6  | 120                  | -    | -    | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | 24   | -    | -  | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | 20   | -    | -  | ns |
| PL LOW                        |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 7  | 120                  | -    | -    | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | 24   | -    | -  | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | 20   | -    | -  | ns |
| Dn to STCP Set_up time        | tsu                                 | 2.0V            | C <sub>L</sub> =50pF | see Figure 9  | 90                   | -    | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |               | 18                   | -    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |               | 15                   | -    | -    | ns |    |
| DS to SHCP Set_up time        |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 9  | 90                   | -    | -    | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | 18   | -    | -  | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | 15   | -    | -  | ns |
| PL to SHCP Set_up time        |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 10 | 90                   | -    | -    | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | 18   | -    | -  | ns |
|                               |                                     |                 | 6.0V                 |               | C <sub>L</sub> =50pF | 15   | -    | -  | ns |
| Dn to STCP hold time          | th                                  | 2.0V            | C <sub>L</sub> =50pF | see Figure 9  | 5                    | -    | -    | ns |    |
|                               |                                     | 4.5V            | C <sub>L</sub> =50pF |               | 5                    | -    | -    | ns |    |
|                               |                                     | 6.0V            | C <sub>L</sub> =50pF |               | 5                    | -    | -    | ns |    |
| DS to SHCP hold time          |                                     | 2.0V            | C <sub>L</sub> =50pF | see Figure 9  | 5                    | -    | -    | ns |    |
|                               |                                     |                 | 4.5V                 |               | C <sub>L</sub> =50pF | 5    | -    | -  | ns |



|                                                     |                                     |      |                      |                  |     |   |    |     |
|-----------------------------------------------------|-------------------------------------|------|----------------------|------------------|-----|---|----|-----|
|                                                     |                                     | 6.0V | C <sub>L</sub> =50pF |                  | 5   | - | -  | ns  |
| $\overline{\text{PL}}$ to SHCP<br>hold time         |                                     | 2.0V | C <sub>L</sub> =50pF | see Figure<br>10 | 5   | - | -  | ns  |
|                                                     |                                     | 4.5V | C <sub>L</sub> =50pF |                  | 5   | - | -  | ns  |
|                                                     |                                     | 6.0V | C <sub>L</sub> =15pF |                  | 5   | - | -  | ns  |
|                                                     |                                     |      |                      |                  |     |   |    |     |
| $\overline{\text{MR}}$ to SHCP<br>recovery time     | trec                                | 2.0V | C <sub>L</sub> =50pF | see Figure 8     | 90  | - | -  | ns  |
|                                                     |                                     | 4.5V | C <sub>L</sub> =50pF |                  | 18  | - | -  | ns  |
|                                                     |                                     | 6.0V | C <sub>L</sub> =50pF |                  | 15  | - | -  | ns  |
| SHCP<br>maximum<br>frequency                        | fmax                                | 2.0V | C <sub>L</sub> =50pF | see Figure 5     | 4.8 | - | -  | MHZ |
|                                                     |                                     | 4.5V | C <sub>L</sub> =50pF |                  | 24  | - | -  | MHZ |
|                                                     |                                     | 6.0V | C <sub>L</sub> =50pF |                  | 28  | - | -  | MHZ |
| SN74HCT597                                          |                                     |      |                      |                  |     |   |    |     |
| SHCP to Q<br>propagation<br>delay                   | t <sub>PLH</sub> , t <sub>PHL</sub> | 4.5V | C <sub>L</sub> =50pF | see Figure 5     | -   | - | 60 | ns  |
| $\overline{\text{MR}}$ to Q<br>propagation<br>delay |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 6     | -   | - | 74 | ns  |
| STCP to Q<br>propagation<br>delay                   |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 5     | -   | - | 86 | ns  |
| $\overline{\text{PL}}$ to Q<br>propagation<br>delay |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 7     | -   | - | 78 | ns  |
| transition time                                     | tt                                  | 4.5V | C <sub>L</sub> =50pF | see Figure 5     | -   | - | 22 | ns  |
| STCP(HIGH or<br>LOW)<br>pulse width                 | tw                                  | 4.5V | C <sub>L</sub> =50pF | see Figure 5     | 24  | - | -  | ns  |
| SHCP(HIGH<br>or LOW)<br>pulse width                 |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 5     | 24  | - | -  | ns  |
| $\overline{\text{MR}}$ LOW                          |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 6     | 38  | - | -  | ns  |
| $\overline{\text{PL}}$ LOW                          |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 7     | 30  | - | -  | ns  |
| Dn to STCP<br>Set up time                           | tsu                                 | 4.5V | C <sub>L</sub> =50pF | see Figure 9     | 18  | - | -  | ns  |
| DS to SHCP<br>Set up time                           |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 9     | 18  | - | -  | ns  |
| $\overline{\text{PL}}$ to SHCP<br>Set up time       |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure<br>10 | 18  | - | -  | ns  |
| Dn to SHCP<br>hold time                             | th                                  | 4.5V | C <sub>L</sub> =50pF | see Figure 9     | 5   | - | -  | ns  |
| DS to SHCP<br>hold time                             |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure 9     | 5   | - | -  | ns  |
| $\overline{\text{PL}}$ to SHCP<br>hold time         |                                     | 4.5V | C <sub>L</sub> =50pF | see Figure<br>10 | 5   | - | -  | ns  |
| $\overline{\text{MR}}$ to SHCP<br>recovery time     | trec                                | 4.5V | C <sub>L</sub> =50pF | see Figure 8     | 18  | - | -  | ns  |
| maximum<br>frequency                                | fmax                                | 4.5V | C <sub>L</sub> =15pF | see Figure 5     | 20  | - | -  | MHZ |



## 4、Testing Circuit

### 4.1、AC Testing Circuit

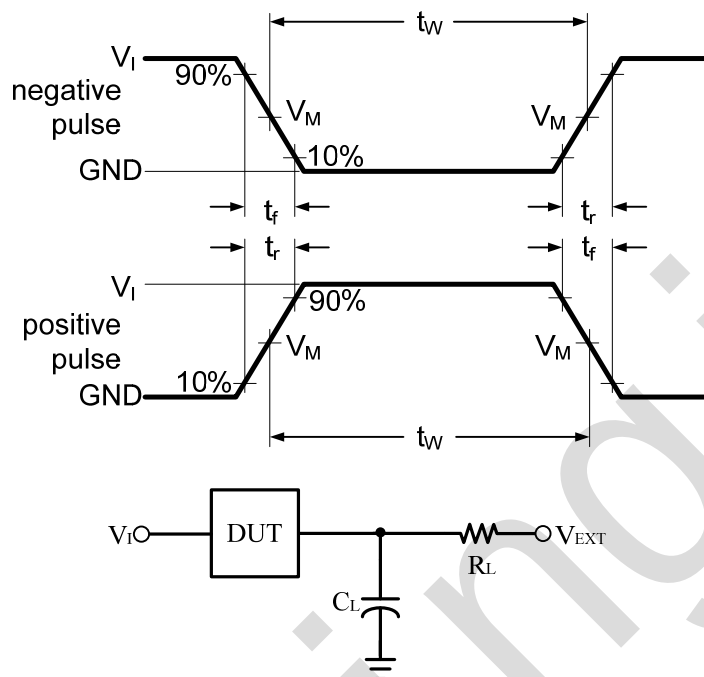


Figure 4. Test circuit for measuring switching times

$C_L$  includes probe and jig capacitance.

### 4.2、Test Data

| Type       | Input    |             | Load       |             | $V_{EXT}$         |                   |                   |
|------------|----------|-------------|------------|-------------|-------------------|-------------------|-------------------|
|            | $V_I$    | $t_r = t_f$ | $C_L$      | $R_L$       | $t_{PLH}/t_{PHL}$ | $t_{PLZ}/t_{PZL}$ | $t_{PHZ}/t_{PZH}$ |
| SN74HC597  | $V_{CC}$ | 3.0ns       | 15pF, 50pF | 1K $\Omega$ | Open              | $V_{CC}$          | GND               |
| SN74HCT597 | 3.0V     | 3.0ns       | 15pF, 50pF | 1K $\Omega$ | Open              | $V_{CC}$          | GND               |



### 4.3、AC Testing Waveforms

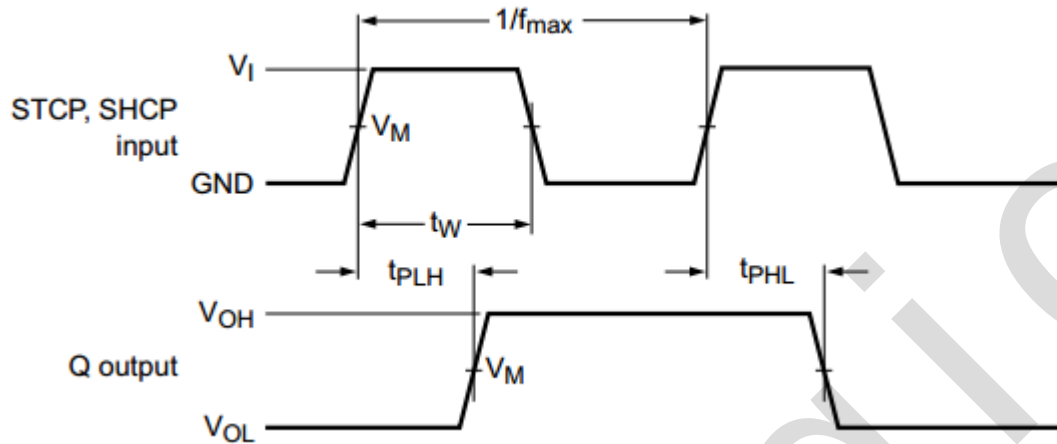


Figure 5. Shift clock and storage clock inputs to output, propagation delays, pulse widths and maximum clock frequency

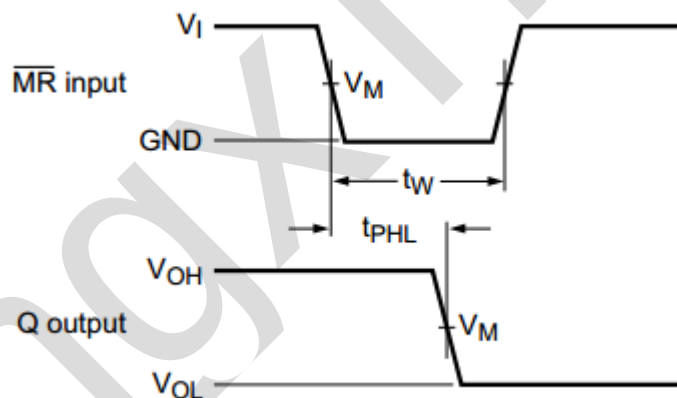


Figure 6. input ( $\overline{MR}$ ) to (Q), output propagation delays and ( $\overline{MR}$ ) pulse width

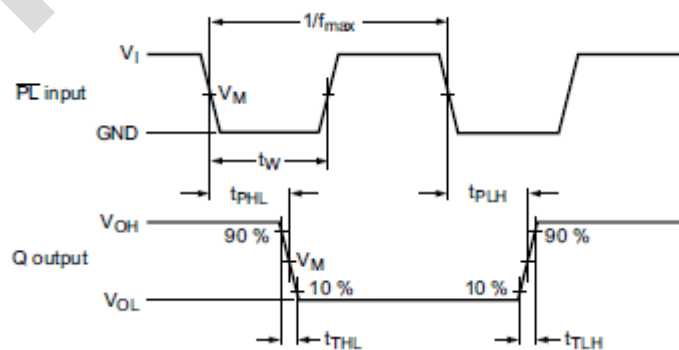


Figure 7 Input ( $\overline{PL}$ ) to (Q), output propagation delays,  $\overline{PL}$  pulse width and output transition times

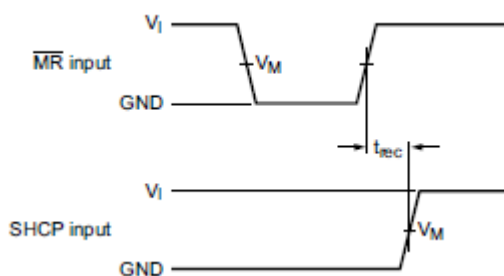


Figure 8 Input (MR) to shift clock (SHCP) and storage clock (STCP) recovery times

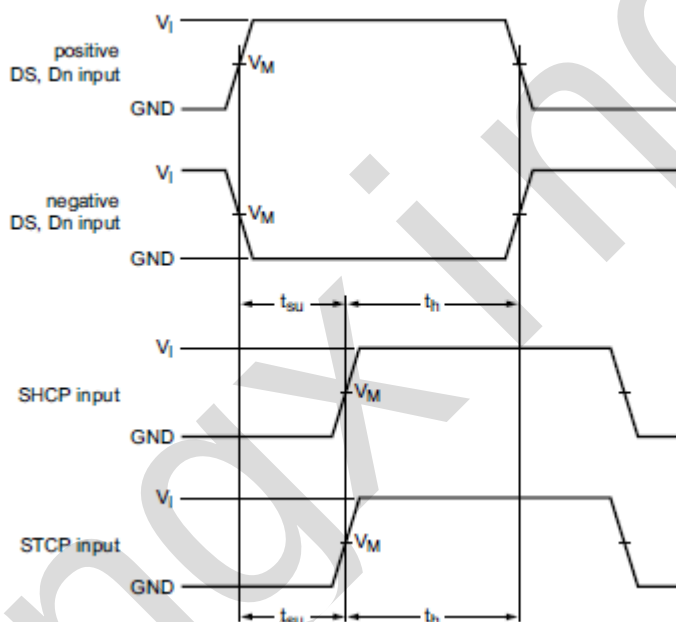


Figure 9 Hold and set-up times for (DS), (Dn) inputs to (SHCP), (STCP) inputs

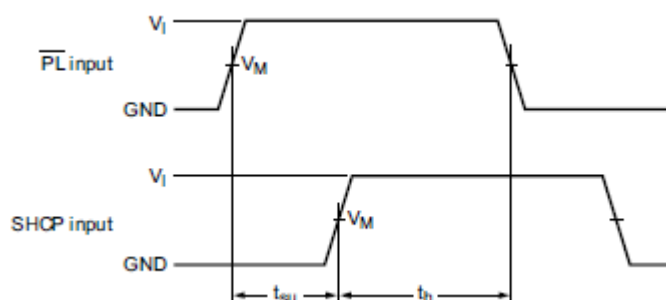




Figure 10 Set-up times for (PL) input to (SHCP) input

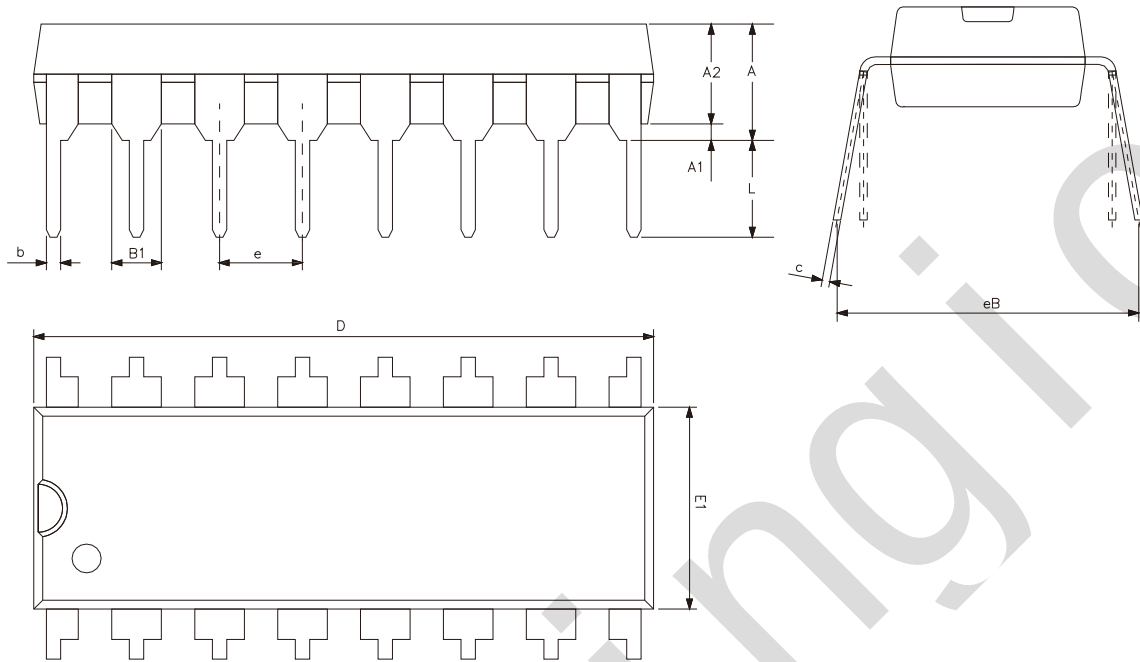
#### 4.4、Measurement Points

| Type       | Input               | Output              |                     |                     |
|------------|---------------------|---------------------|---------------------|---------------------|
|            | $V_M$               | $V_M$               | $V_X$               | $V_Y$               |
| SN74HC597  | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $0.1 \times V_{CC}$ | $0.9 \times V_{CC}$ |
| SN74HCT597 | 1.3V                | 1.3V                | $0.1 \times V_{CC}$ | $0.9 \times V_{CC}$ |



## 5、Package Information

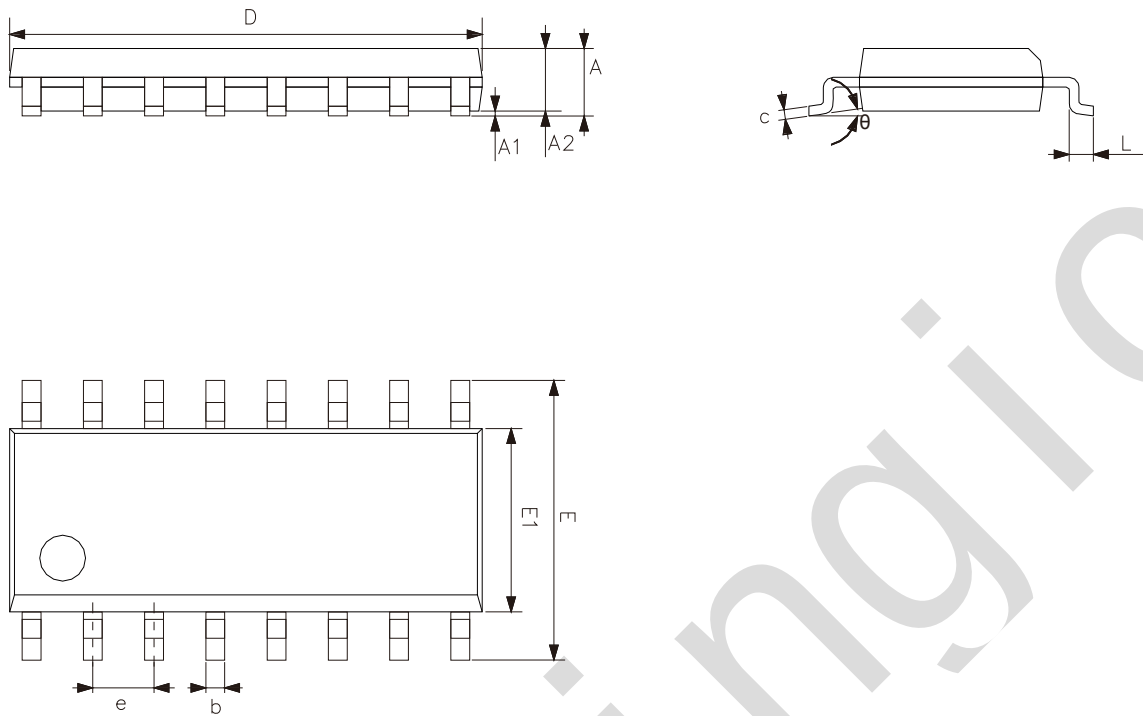
### 5.1、DIP16



| 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  |



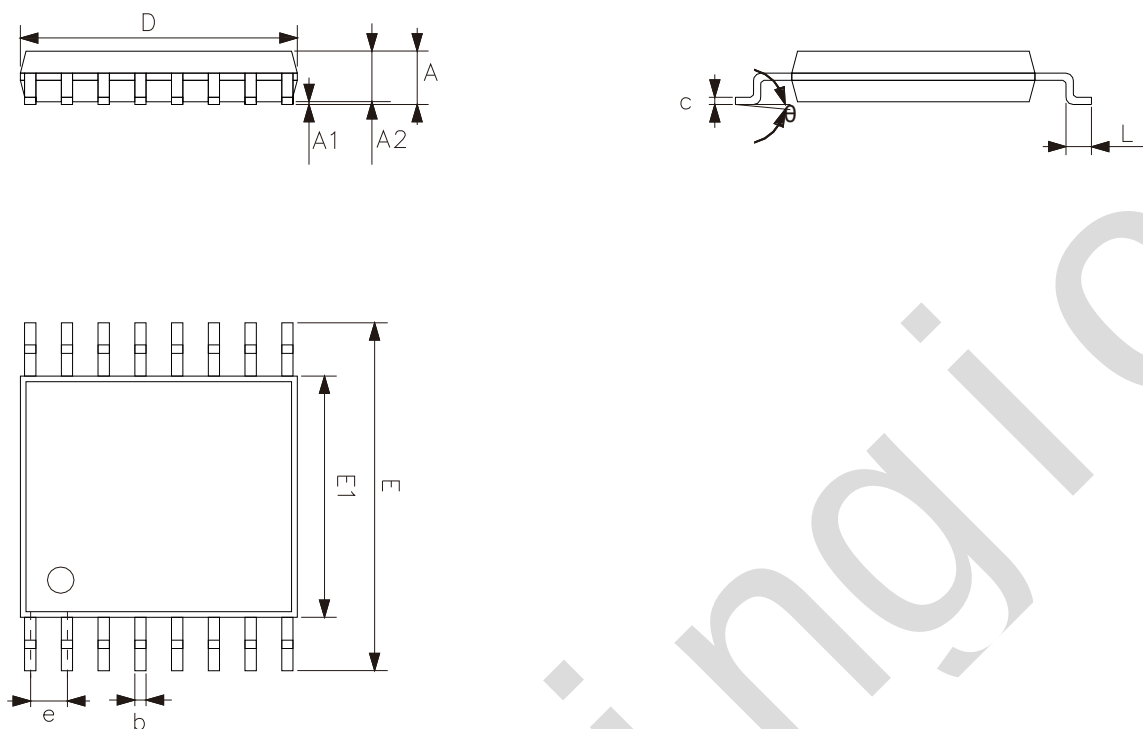
## 5.2、SOP16



| 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  |
| θ      | 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 |
| θ      | 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             | <p>○: Indicates that the content of hazardous substances or elements in the detection limit of the following 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、Notes

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

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