# 74HC257; 74HCT257

## Quad 2-input multiplexer; 3-state

Rev. 05 — 13 January 2010 Product data sheet

## 1. General description

The 74HC257; 74HCT257 are high-speed Si-gate CMOS devices and are pin compatible with Low-power Schottky TTL (LSTTL).

The 74HC257 and 74HCT257 have four identical 2-input multiplexers with 3-state outputs, which select 4 bits of data from two sources and are controlled by a common data select input (S).

The data inputs from source 0 (1I0 to 4I0) are selected when input S is LOW and the data inputs from source 1 (1I1 to 4I1) are selected when S is HIGH. Data appears at the outputs (1Y to 4Y) in true (non-inverting) form from the selected inputs.

The 74HC257 and 74HCT257 are the logic implementation of a 4-pole, 2-position switch, where the position of the switch is determined by the logic levels applied to S. The outputs are forced to a high-impedance OFF-state when $\overline{OE}$ is HIGH.

The logic equations for the outputs are:

$$1\bar{Y} = \overline{OE} \bullet (1I1 \bullet S \bullet 1I0 \bullet \bar{S})$$

$$2\bar{Y} = \overline{OE} \bullet (2I1 \bullet S \bullet 2I0 \bullet \bar{S})$$

$$3\bar{Y} = \overline{OE} \bullet (3I1 \bullet S \bullet 3I0 \bullet \bar{S})$$

$$4\bar{Y} = \overline{OE} \bullet (4I1 \bullet S \bullet 4I0 \bullet \bar{S})$$

Except for their non-inverting (true) outputs the 74HC257; 74HCT257 are identical to the 74HC258.

## 2. Features

- Non-inverting data path
- 3-state outputs interface directly with system bus
- Complies with JEDEC standard no. 7A
- ESD protection:
  - HBM JESD22-A114E exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
- Multiple package options
- Specified from –40 °C to +85 °C and from –40 °C to +125 °C

## 3. Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| 74HC257N | −40 °C to +125 °C | DIP16 | plastic dual in-line package; 16 leads (300 mil) | SOT38-4 |
| 74HCT257N | | | | |
| 74HC257D | −40 °C to +125 °C | SO16 | plastic small outline package; 16 leads; body width 3.9 mm | SOT109-1 |
| 74HCT257D | | | | |
| 74HC257DB | −40 °C to +125 °C | SSOP16 | plastic shrink small outline package; 16 leads; body width 5.3 mm | SOT338-1 |
| 74HCT257DB | | | | |
| 74HC257PW | −40 °C to +125 °C | TSSOP16 | plastic thin shrink small outline package; 16 leads; body width 4.4 mm | SOT403-1 |
| 74HCT257PW | | | | |

## 4. Functional diagram

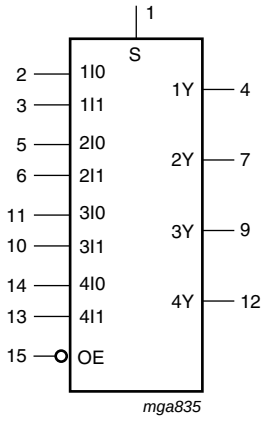



**Fig 1. Logic symbol**

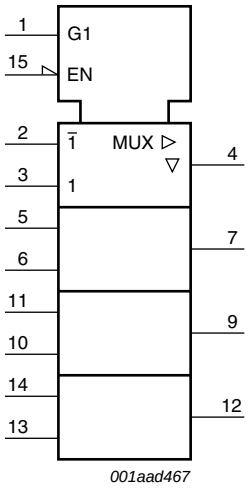



**Fig 2. IEC logic symbol**

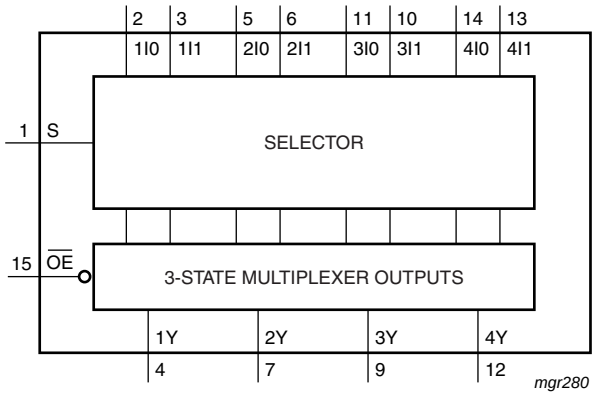



**Fig 3. Functional diagram**

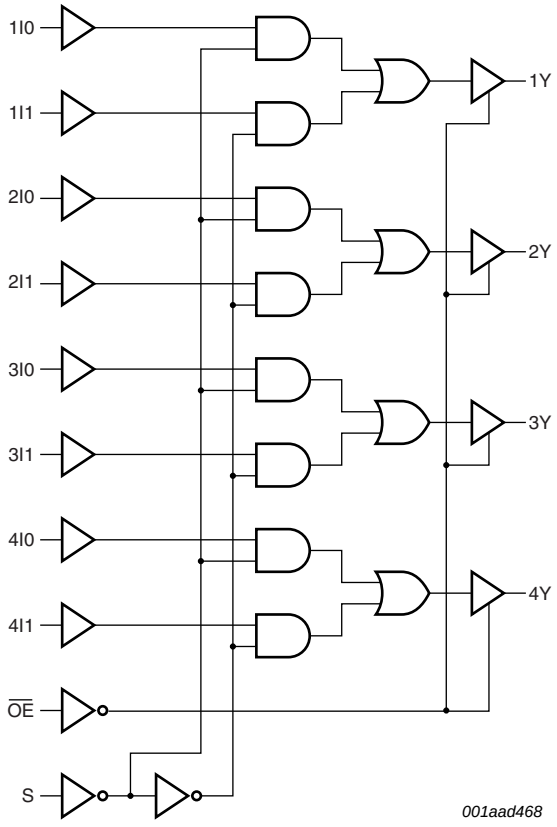



**Fig 4. Logic diagram**

# 5. Pinning information

## 5.1 Pinning

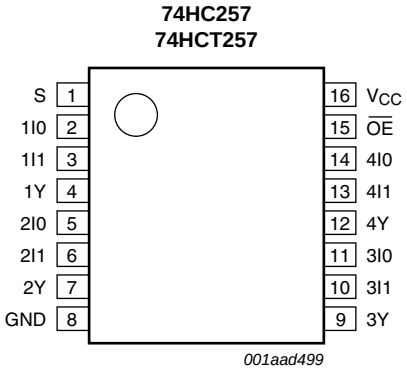



**Fig 5. Pin configuration DIP16, SO16, SSOP16 and TSSOP16**

## 5.2 Pin description

**Table 2. Pin description**

| Symbol | Pin | Description |
|---|---|---|
| S | 1 | common data select input |
| 1I0 to 4I0 | 2, 5, 11, 14 | data input from source 0 |
| 1I1 to 4I1 | 3, 6, 10, 13 | data input from source 1 |
| 1Y to 4Y | 4, 7, 9, 12 | 3-state multiplexer output |
| GND | 8 | ground (0 V) |
| $\overline{OE}$ | 15 | 3-state output enable input (active LOW) |
| $V_{CC}$ | 16 | supply voltage |

# 6. Functional description

## 6.1 Function table

**Table 3. Function table[1]**

| Control | | Input | | Output |
|---|---|---|---|---|
| $\overline{OE}$ | S | nI0 | nI1 | nY |
| H | X | X | X | Z |
| L | H | X | L | L |
| L | H | X | H | H |
| L | L | L | X | L |
| L | L | H | X | H |

[1] H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

## 7. Limiting values

**Table 4. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | | –0.5 | +7 | V |
| $I_{IK}$ | input clamping current | $V_I < –0.5$ V or $V_I > V_{CC} + 0.5$ V | | - | ±20 | mA |
| $I_{OK}$ | output clamping current | $V_O < –0.5$ V or $V_O > V_{CC} + 0.5$ V | | - | ±20 | mA |
| $I_O$ | output current | $V_O = –0.5$ V to $V_{CC} + 0.5$ V | | - | ±35 | mA |
| $I_{CC}$ | supply current | | | - | +70 | mA |
| $I_{GND}$ | ground current | | | - | –70 | mA |
| $T_{stg}$ | storage temperature | | | –65 | +150 | °C |
| $P_{tot}$ | total power dissipation | | | | | |
| | DIP16 package | | [1] | - | 750 | mW |
| | SO16 package | | [2] | - | 500 | mW |
| | SSOP16 package | | [3] | - | 500 | mW |
| | TSSOP16 package | | [3] | - | 500 | mW |

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

[2] For SO16 packages: above 70 °C, $P_{tot}$ derates linearly with 8 mW/K.

[3] For SSOP16 and TSSOP16 packages: above 60 °C, $P_{tot}$ derates linearly with 5.5 mW/K.

## 8. Recommended operating conditions

**Table 5. Recommended operating conditions**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Type 74HC257** | | | | | | |
| $V_{CC}$ | supply voltage | | 2.0 | 5.0 | 6.0 | V |
| $V_I$ | input voltage | | 0 | - | $V_{CC}$ | V |
| $V_O$ | output voltage | | 0 | - | $V_{CC}$ | V |
| $\Delta t/\Delta V$ | input transition rise and fall rates | $V_{CC} = 2.0$ V | - | - | 625 | ns |
| | | $V_{CC} = 4.5$ V | - | 1.67 | 139 | ns |
| | | $V_{CC} = 6.0$ V | - | - | 83 | ns |
| $T_{amb}$ | ambient temperature | | –40 | - | +125 | °C |
| **Type 74HCT257** | | | | | | |
| $V_{CC}$ | supply voltage | | 4.5 | 5.0 | 5.5 | V |
| $V_I$ | input voltage | | 0 | - | $V_{CC}$ | V |
| $V_O$ | output voltage | | 0 | - | $V_{CC}$ | V |
| $\Delta t/\Delta V$ | input transition rise and fall rates | $V_{CC} = 4.5$ V | - | 1.67 | 139 | ns |
| $T_{amb}$ | ambient temperature | | –40 | - | +125 | °C |

## 9. Static characteristics

**Table 6. Static characteristics**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | 25 °C | | | −40 °C to +85 °C | | −40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| **74HC257** | | | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 2.0 V | 1.5 | 1.2 | - | 1.5 | - | 1.5 | - | V |
| | | $V_{CC}$ = 4.5 V | 3.15 | 2.4 | - | 3.15 | - | 3.15 | - | V |
| | | $V_{CC}$ = 6.0 V | 4.2 | 3.2 | - | 4.2 | - | 4.2 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 2.0 V | - | 0.8 | 0.5 | - | 0.5 | - | 0.5 | V |
| | | $V_{CC}$ = 4.5 V | - | 2.1 | 1.35 | - | 1.35 | - | 1.35 | V |
| | | $V_{CC}$ = 6.0 V | - | 2.8 | 1.8 | - | 1.8 | - | 1.8 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | | | | | |
| | | $I_O$ = −20 μA; $V_{CC}$ = 2.0 V | 1.9 | 2.0 | - | 1.9 | - | 1.9 | - | V |
| | | $I_O$ = −20 μA; $V_{CC}$ = 4.5 V | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | $I_O$ = −20 μA; $V_{CC}$ = 6.0 V | 5.9 | 6.0 | - | 5.9 | - | 5.9 | - | V |
| | | $I_O$ = −6.0 mA; $V_{CC}$ = 4.5 V | 3.98 | 4.32 | - | 3.84 | - | 3.7 | - | V |
| | | $I_O$ = −7.8 mA; $V_{CC}$ = 6.0 V | 5.48 | 5.81 | - | 5.34 | - | 5.2 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$ | | | | | | | | |
| | | $I_O$ = 20 μA; $V_{CC}$ = 2.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 20 μA; $V_{CC}$ = 4.5 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 20 μA; $V_{CC}$ = 6.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O$ = 6.0 mA; $V_{CC}$ = 4.5 V | - | 0.15 | 0.26 | - | 0.33 | - | 0.4 | V |
| | | $I_O$ = 7.8 mA; $V_{CC}$ = 6.0 V | - | 0.16 | 0.26 | - | 0.33 | - | 0.4 | V |
| $I_I$ | input leakage current | $V_I$ = $V_{CC}$ or GND; $V_{CC}$ = 6.0 V | - | - | ±0.1 | - | ±1.0 | ±1.0 | ±1.0 | μA |
| $I_{OZ}$ | OFF-state output current | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_O$ = $V_{CC}$ or GND; $V_{CC}$ = 6.0 V | - | - | ±0.5 | - | ±5.0 | ±10.0 | ±10.0 | μA |
| $I_{CC}$ | supply current | $V_I$ = $V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 6.0 V | - | - | 8.0 | - | 80 | 160 | 160 | μA |
| $C_i$ | input capacitance | | - | 3.5 | - | | | | | pF |
| **74HCT257** | | | | | | | | | | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | 2.0 | 1.6 | - | 2.0 | - | 2.0 | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 4.5 V to 5.5 V | - | 1.2 | 0.8 | - | 0.8 | - | 0.8 | V |
| $V_{OH}$ | HIGH-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 4.5 V | | | | | | | | |
| | | $I_O$ = −20 μA | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | $I_O$ = −6 mA | 3.98 | 4.32 | - | 3.84 | - | 3.7 | - | V |
| $V_{OL}$ | LOW-level output voltage | $V_I$ = $V_{IH}$ or $V_{IL}$; $V_{CC}$ = 4.5 V | | | | - | 0.1 | - | 0.1 | |
| | | $I_O$ = 20 μA | - | 0 | 0.1 | - | 0.33 | - | 0.4 | V |
| | | $I_O$ = 6.0 mA | - | 0.15 | 0.26 | - | ±1.0 | - | ±1.0 | V |
| $I_I$ | input leakage current | $V_I$ = $V_{CC}$ or GND; $V_{CC}$ = 5.5 V | - | - | ±0.1 | - | ±5.0 | - | ±10 | μA |

**Table 6. Static characteristics** *…continued*

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V).*

| Symbol | Parameter | Conditions | 25 °C | | | −40 °C to +85 °C | | −40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| $I_{OZ}$ | OFF-state output current | $V_I = V_{IH}$ or $V_{IL}$; $V_{CC}$ = 5.5 V; $V_O = V_{CC}$ or GND per input pin; other inputs at $V_{CC}$ or GND; $I_O$ = 0 A | - | - | ±0.5 | - | 80 | - | 160 | μA |
| $I_{CC}$ | supply current | $V_I = V_{CC}$ or GND; $I_O$ = 0 A; $V_{CC}$ = 5.5 V | - | - | 8.0 | | | | | μA |
| $\Delta I_{CC}$ | additional supply current | $V_I = V_{CC} - 2.1$ V; other inputs at $V_{CC}$ or GND; $V_{CC}$ = 4.5 V to 5.5 V; $I_O$ = 0 A | | | | | | | | |
| | | per input pin; nI0, nI1 inputs | - | 40 | 144 | - | 180 | - | 196 | μA |
| | | per input pin; $\overline{OE}$ input | - | 135 | 486 | - | 608 | - | 662 | μA |
| | | per input pin; S input | - | 70 | 252 | - | 315 | - | 343 | μA |
| $C_I$ | input capacitance | | - | 3.5 | - | | | | | pF |

## 10. Dynamic characteristics

**Table 7. Dynamic characteristics**

*Voltages are referenced to GND (ground = 0 V); For test circuit see Figure 8.*

| Symbol | Parameter | Conditions | | 25 °C | | −40 °C to +85 °C | −40 °C to +125 °C | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | Typ | Max | Max | Max | |
| **74HC257** | | | | | | | | |
| $t_{pd}$ | propagation delay | nI0 to nY or nI1 to nY; see Figure 6 | [1] | | | | | |
| | | $V_{CC}$ = 2.0 V | | 36 | 110 | 140 | 165 | ns |
| | | $V_{CC}$ = 4.5 V | | 13 | 22 | 28 | 33 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | 11 | - | - | - | ns |
| | | $V_{CC}$ = 6.0 V | | 10 | 19 | 24 | 28 | ns |
| | | S to nY; see Figure 6 | | | | | | |
| | | $V_{CC}$ = 2.0 V | | 47 | 150 | 190 | 225 | ns |
| | | $V_{CC}$ = 4.5 V | | 17 | 30 | 38 | 45 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | 14 | - | - | - | ns |
| | | $V_{CC}$ = 6.0 V | | 14 | 26 | 33 | 38 | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to nY; see Figure 7 | [2] | | | | | |
| | | $V_{CC}$ = 2.0 V | | 33 | 150 | 190 | 225 | ns |
| | | $V_{CC}$ = 4.5 V | | 12 | 30 | 38 | 45 | ns |
| | | $V_{CC}$ = 6.0 V | | 10 | 26 | 33 | 38 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to nY; see Figure 7 | [3] | | | | | |
| | | $V_{CC}$ = 2.0 V | | 41 | 150 | 190 | 225 | ns |
| | | $V_{CC}$ = 4.5 V | | 15 | 30 | 38 | 45 | ns |
| | | $V_{CC}$ = 6.0 V | | 12 | 26 | 33 | 38 | ns |

**Table 7. Dynamic characteristics** *…continued*

*Voltages are referenced to GND (ground = 0 V); For test circuit see Figure 8.*

| Symbol | Parameter | Conditions | | 25 °C | | −40 °C to +85 °C | −40 °C to +125 °C | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | Typ | Max | Max | Max | |
| $t_t$ | transition time | see Figure 6 | [4] | | | | | |
| | | $V_{CC}$ = 2.0 V | | 14 | 60 | 75 | 90 | ns |
| | | $V_{CC}$ = 4.5 V | | 5 | 12 | 15 | 18 | ns |
| | | $V_{CC}$ = 6.0 V | | 4 | 10 | 13 | 15 | ns |
| $C_{PD}$ | power dissipation capacitance | per multiplexer; $V_I$ = GND to $V_{CC}$ | [5] | 45 | - | | | pF |
| **74HCT257** | | | | | | | | |
| $t_{pd}$ | propagation delay | nI0 to nY or nI1 to nY; see Figure 6 | [1] | | | | | |
| | | $V_{CC}$ = 4.5 V | | 16 | 30 | 38 | 45 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | 13 | - | - | | ns |
| | | S to nY; see Figure 6 | | | | | | |
| | | $V_{CC}$ = 4.5 V | | 20 | 35 | 44 | 53 | ns |
| | | $V_{CC}$ = 5.0 V; $C_L$ = 15 pF | | 17 | - | | | ns |
| $t_{en}$ | enable time | $\overline{OE}$ to nY; $V_{CC}$ = 4.5 V; see Figure 7 | [2] | 15 | 30 | 38 | 45 | ns |
| $t_{dis}$ | disable time | $\overline{OE}$ to nY; $V_{CC}$ = 4.5 V; see Figure 7 | [3] | 16 | 30 | 38 | 45 | ns |
| $t_t$ | transition time | $V_{CC}$ = 4.5 V; see Figure 6 | [4] | 5 | 12 | 15 | 18 | ns |
| $C_{PD}$ | power dissipation capacitance | per multiplexer; $V_I$ = GND to $V_{CC}$ | [5] | 45 | - | | | pF |

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

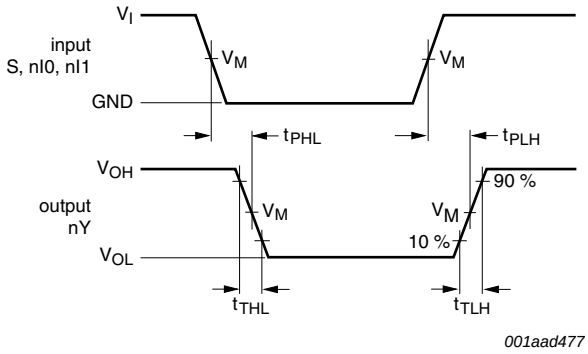
[2] $t_{en}$ is the same as $t_{PZH}$, $t_{PZL}$.

[3] $t_{dis}$ is the same as $t_{PHZ}$, $t_{PLZ}$.

[4] $t_t$ is the same as $t_{THL}$, $t_{TLH}$.

[5] $C_{PD}$ is used to determine the dynamic power dissipation ($P_D$ in μW).
$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ 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;
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of outputs.

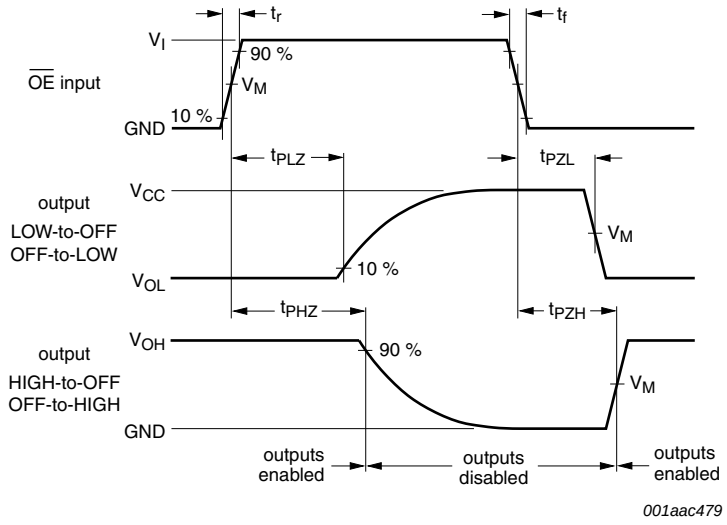
## 11. Waveforms




Measurement points are given in Table 8.

$V_{OL}$ and $V_{OH}$ are typical voltage output levels that occur with the output load.

**Fig 6. Propagation delays input (S, nI0, nI1) to output (nY) and output (nY) transition times**



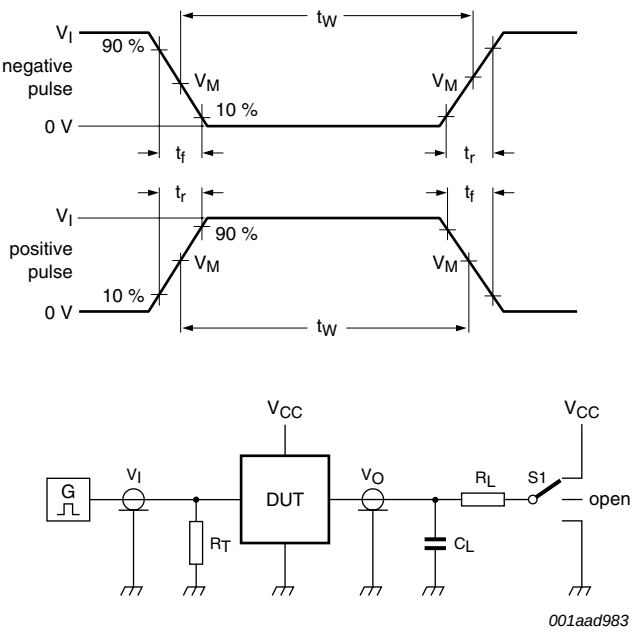

Measurement points are given in Table 8.

$V_{OL}$ and $V_{OH}$ are typical voltage output levels that occur with the output load.

**Fig 7. 3-state output enable and disable times**

**Table 8. Measurement points**

| Type | Input | Output |
|---|---|---|
| | $V_M$ | $V_M$ |
| 74HC257 | $0.5V_{CC}$ | $0.5V_{CC}$ |
| 74HCT257 | 1.3 V | 1.3 V |




Measurement points are given in Table 8 and test data is given in Table 9.

Definitions test circuit:

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

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

$R_L$ = Load resistor.

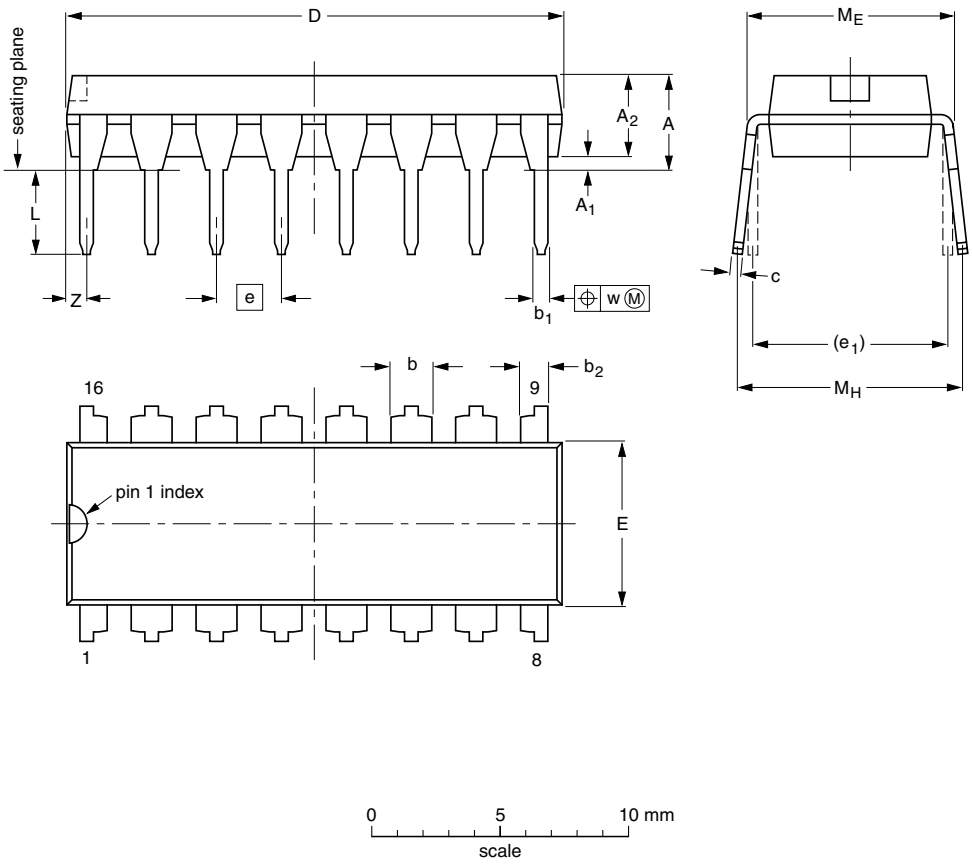
**Fig 8. Test circuit for switching times**

**Table 9. Test data**

| Type | Input | | Load | | Switch position | | |
|---|---|---|---|---|---|---|---|
| | $V_I$ | $t_r$, $t_f$ | $C_L$ | $R_L$ | $t_{PHL}$, $t_{PLH}$ | $t_{PZH}$, $t_{PHZ}$ | $t_{PZL}$, $t_{PLZ}$ |
| 74HC257 | $V_{CC}$ | 6 ns | 50 pF | 1 kΩ | open | GND | $V_{CC}$ |
| 74HCT257 | 3 V | 6 ns | 50 pF | 1 kΩ | open | GND | $V_{CC}$ |

## 12. Package outline

**DIP16: plastic dual in-line package; 16 leads (300 mil)** **SOT38-4**




**DIMENSIONS (inch dimensions are derived from the original mm dimensions)**

| UNIT | A max. | $A_1$ min. | $A_2$ max. | b | $b_1$ | $b_2$ | c | D (1) | E (1) | e | $e_1$ | L | $M_E$ | $M_H$ | w | Z (1) max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 4.2 | 0.51 | 3.2 | 1.73<br>1.30 | 0.53<br>0.38 | 1.25<br>0.85 | 0.36<br>0.23 | 19.50<br>18.55 | 6.48<br>6.20 | 2.54 | 7.62 | 3.60<br>3.05 | 8.25<br>7.80 | 10.0<br>8.3 | 0.254 | 0.76 |
| inches | 0.17 | 0.02 | 0.13 | 0.068<br>0.051 | 0.021<br>0.015 | 0.049<br>0.033 | 0.014<br>0.009 | 0.77<br>0.73 | 0.26<br>0.24 | 0.1 | 0.3 | 0.14<br>0.12 | 0.32<br>0.31 | 0.39<br>0.33 | 0.01 | 0.03 |

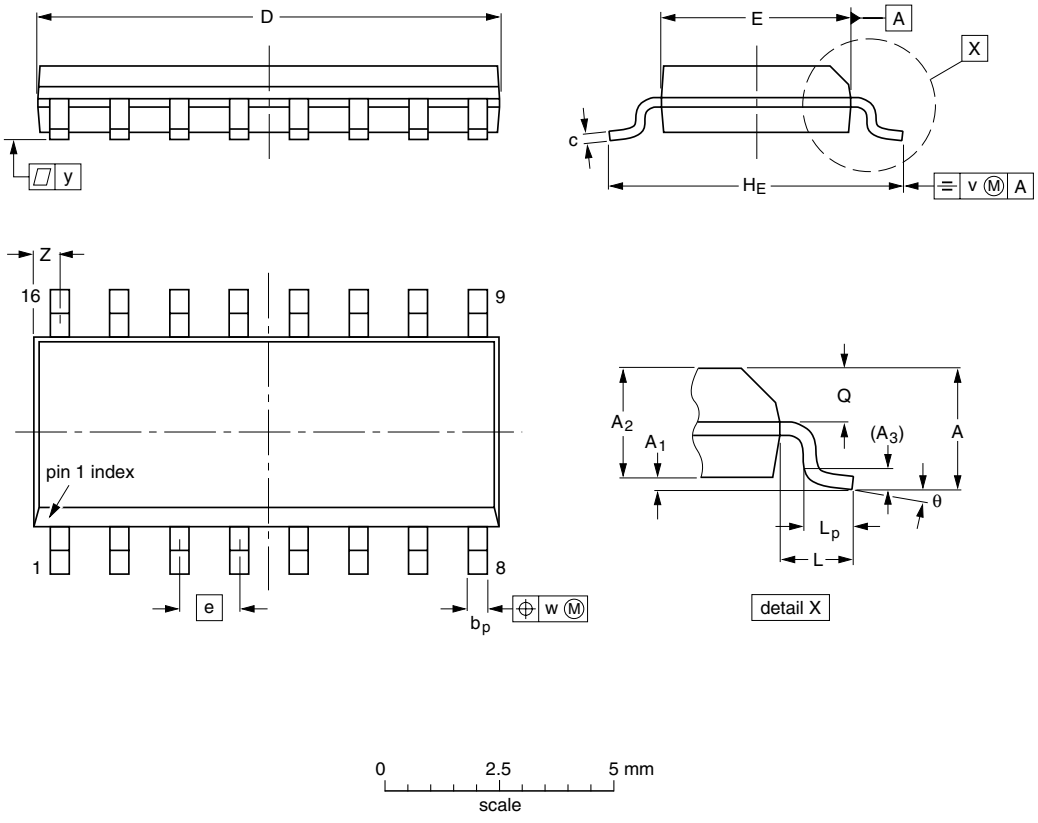
**Note**

1. Plastic or metal protrusions of 0.25 mm (0.01 inch) maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT38-4 | | | | | | ~~95-01-14~~<br>03-02-13 |

**Fig 9. Package outline SOT38-4 (DIP16)**

**SO16: plastic small outline package; 16 leads; body width 3.9 mm** **SOT109-1**




**DIMENSIONS (inch dimensions are derived from the original mm dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | $D^{(1)}$ | $E^{(1)}$ | e | $H_E$ | L | $L_p$ | Q | v | w | y | $Z^{(1)}$ | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.75 | 0.25<br>0.10 | 1.45<br>1.25 | 0.25 | 0.49<br>0.36 | 0.25<br>0.19 | 10.0<br>9.8 | 4.0<br>3.8 | 1.27 | 6.2<br>5.8 | 1.05 | 1.0<br>0.4 | 0.7<br>0.6 | 0.25 | 0.25 | 0.1 | 0.7<br>0.3 | $8^o$<br>$0^o$ |
| inches | 0.069 | 0.010<br>0.004 | 0.057<br>0.049 | 0.01 | 0.019<br>0.014 | 0.0100<br>0.0075 | 0.39<br>0.38 | 0.16<br>0.15 | 0.05 | 0.244<br>0.228 | 0.041 | 0.039<br>0.016 | 0.028<br>0.020 | 0.01 | 0.01 | 0.004 | 0.028<br>0.012 | |

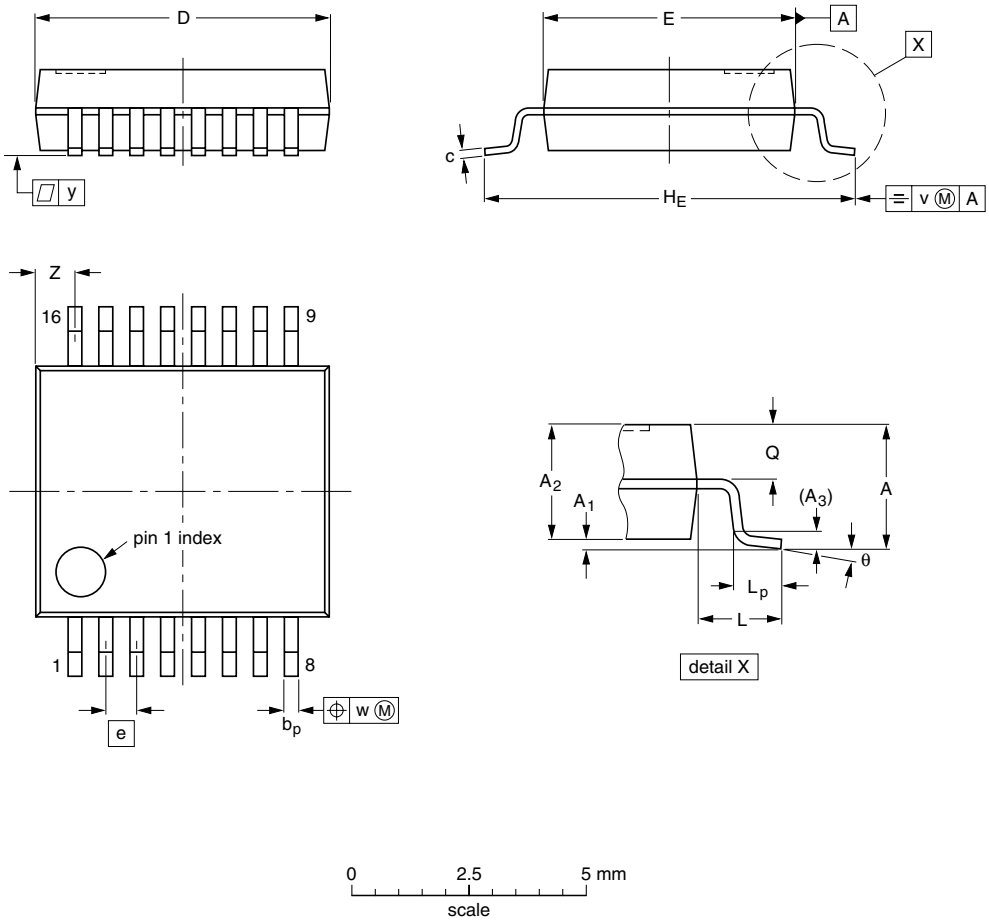
**Note**

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT109-1 | 076E07 | MS-012 | | | | ~~99-12-27~~<br>03-02-19 |

**Fig 10. Package outline SOT109-1 (SO16)**

**SSOP16: plastic shrink small outline package; 16 leads; body width 5.3 mm** **SOT338-1**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | D (1) | E (1) | e | $H_E$ | L | $L_p$ | Q | v | w | y | Z (1) | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 2 | 0.21<br>0.05 | 1.80<br>1.65 | 0.25 | 0.38<br>0.25 | 0.20<br>0.09 | 6.4<br>6.0 | 5.4<br>5.2 | 0.65 | 7.9<br>7.6 | 1.25 | 1.03<br>0.63 | 0.9<br>0.7 | 0.2 | 0.13 | 0.1 | 1.00<br>0.55 | $8^o$<br>$0^o$ |

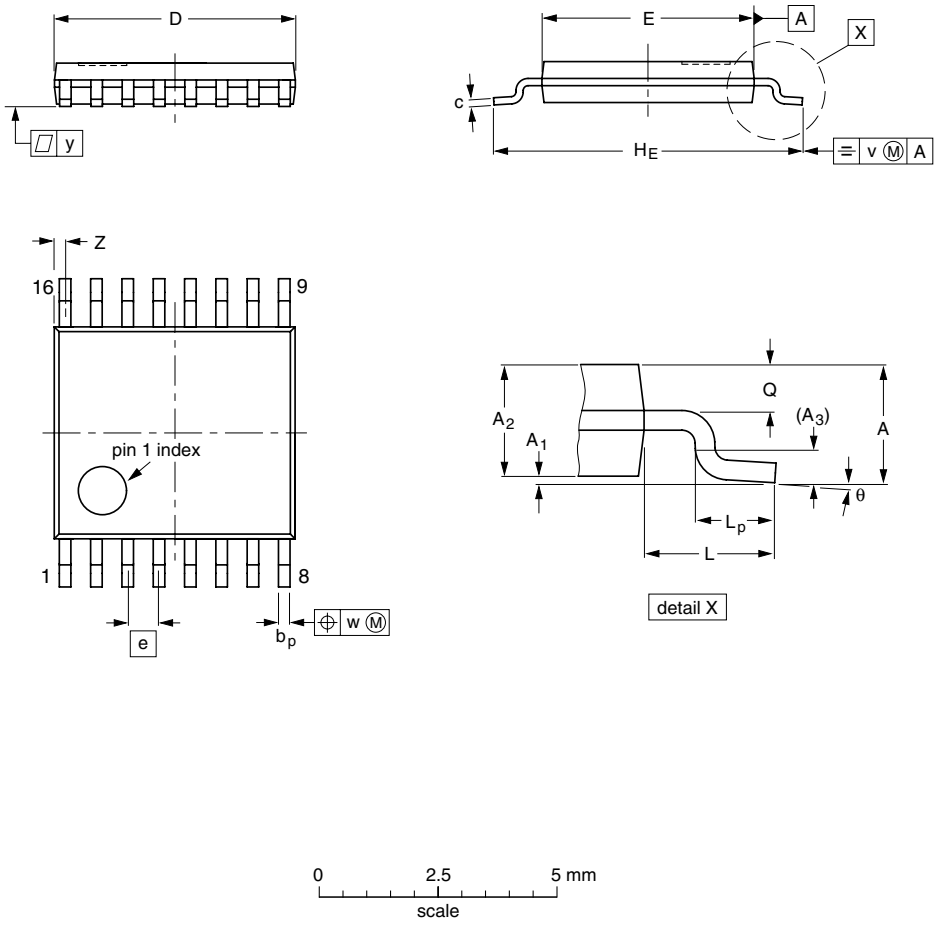
**Note**

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT338-1 | | MO-150 | | | | ~~99-12-27~~<br>03-02-19 |

**Fig 11. Package outline SOT338-1 (SSOP16)**

**TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm** **SOT403-1**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | $A_1$ | $A_2$ | $A_3$ | $b_p$ | c | D (1) | E (2) | e | $H_E$ | L | $L_p$ | Q | v | w | y | Z (1) | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1 | 0.15<br>0.05 | 0.95<br>0.80 | 0.25 | 0.30<br>0.19 | 0.2<br>0.1 | 5.1<br>4.9 | 4.5<br>4.3 | 0.65 | 6.6<br>6.2 | 1 | 0.75<br>0.50 | 0.4<br>0.3 | 0.2 | 0.13 | 0.1 | 0.40<br>0.06 | $8^o$<br>$0^o$ |

**Notes**

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT403-1 | | MO-153 | | | | ~~99-12-27~~<br>03-02-18 |

**Fig 12. Package outline SOT403-1 (TSSOP16)**

## 13. Revision history

**Table 10. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| 74HC_HCT257_5 | 20100113 | Product data sheet | - | 74HC_HCT257_4 |
| Modifications: | • Table 7 “Dynamic characteristics”: changed $\overline{3OE}$ to $\overline{OE}$ | | | |
| 74HC_HCT257_4 | 20090608 | Product data sheet | - | 74HC_HCT257_3 |
| 74HC_HCT257_3 | 20050920 | Product data sheet | - | 74HC_HCT257_CNV_2 |
| 74HC_HCT257_CNV_2 | 19980930 | Product specification | - | - |

# 14. Legal information

## 14.1 Data sheet status

| Document status[1][2] | Product status[3] | Definition |
|---|---|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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## 16. Contents





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