

74AHC374-Q100; 74AHCT374-Q100

Octal D-type flip-flop; positive edge-trigger; 3-state

Rev. 1 — 11 March 2014

Product data sheet

1. General description

The 74AHC374-Q100; 74AHCT374-Q100 is a high-speed Si-gate CMOS device and is pin compatible with Low-power Schottky TTL (LSTTL). It is specified in compliance with JEDEC standard No. 7-A.

The 74AHC374-Q100; 74AHCT374-Q100 comprises eight D-type flip-flops featuring separate D-type inputs for each flip-flop and 3-state outputs for bus oriented applications. A clock input (CP) and an output enable input (\overline{OE}) are common to all flip-flops.

The eight flip-flops will store the state of their individual D inputs that meet the set-up and hold times requirements for the LOW-to-HIGH CP transition.

When \overline{OE} is LOW the content of the eight flip-flops is available at the outputs. When \overline{OE} is HIGH, the outputs go to the high-impedance OFF-state. Operation of the \overline{OE} input does not affect the state of the flip-flops.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
 - ◆ Specified from -40°C to $+85^{\circ}\text{C}$ and from -40°C to $+125^{\circ}\text{C}$
- Balanced propagation delays
- All inputs have Schmitt-trigger actions
- Inputs accept voltages higher than V_{CC}
- Common 3-state output enable input
- Input levels:
 - ◆ For 74AHC374-Q100: CMOS level
 - ◆ For 74AHCT374-Q100: TTL level
- ESD protection:
 - ◆ MIL-STD-883, method 3015 exceeds 2000 V
 - ◆ HBM JESD22-A114F exceeds 2000 V
 - ◆ MM JESD22-A115-A exceeds 200 V ($C = 200 \text{ pF}$, $R = 0 \Omega$)
- Multiple package options

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3. Ordering information

Table 1. Ordering information

| Type number | Package | | | | Version |
|-----------------------|-------------------|---------|--|--|----------|
| | Temperature range | Name | Description | | |
| 74AHC374-Q100 | | | | | |
| 74AHC374D-Q100 | −40 °C to +125 °C | SO20 | plastic small outline package; 20 leads; body width 7.5 mm | | SOT163-1 |
| 74AHC374PW-Q100 | −40 °C to +125 °C | TSSOP20 | plastic thin shrink small outline package; 20 leads; body width 4.4 mm | | SOT360-1 |
| 74AHCT374-Q100 | | | | | |
| 74AHCT374D-Q100 | −40 °C to +125 °C | SO20 | plastic small outline package; 20 leads; body width 7.5 mm | | SOT163-1 |
| 74AHCT374PW-Q100 | −40 °C to +125 °C | TSSOP20 | plastic thin shrink small outline package; 20 leads; body width 4.4 mm | | SOT360-1 |

4. Functional diagram

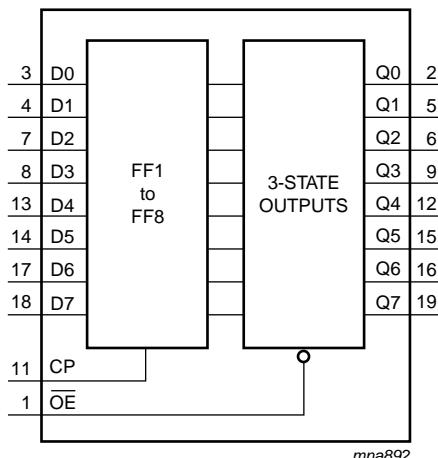


Fig 1. Functional diagram

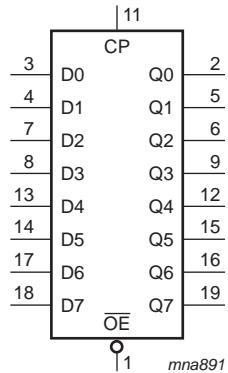


Fig 2. Logic symbol

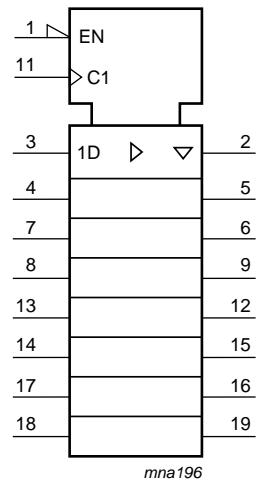


Fig 3. IEC logic symbol

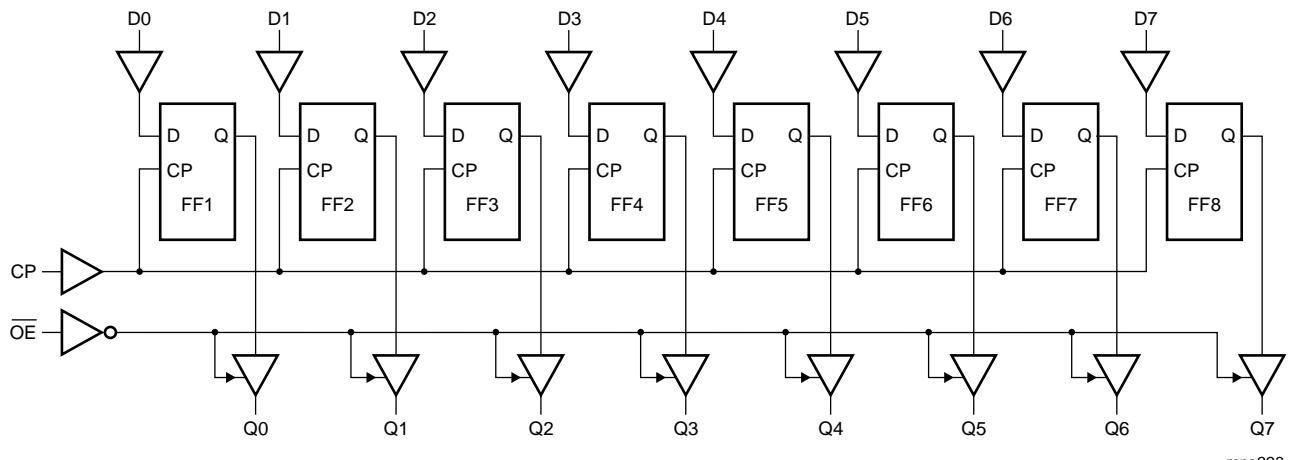


Fig 4. Logic diagram

5. Pinning information

5.1 Pinning

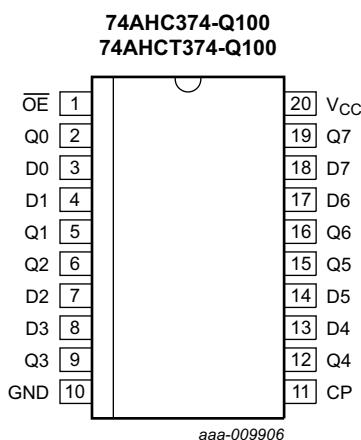


Fig 5. Pin configuration SO20 and TSSOP20

5.2 Pin description

Table 2. Pin description

| Symbol | Pin | Description |
|-----------------|-----|---|
| OE | 1 | 3-state output enable input (active LOW) |
| Q0 | 2 | 3-state flip-flop output |
| D0 | 3 | data input |
| D1 | 4 | data input |
| Q1 | 5 | 3-state flip-flop output |
| Q2 | 6 | 3-state flip-flop output |
| D2 | 7 | data input |
| D3 | 8 | data input |
| Q3 | 9 | 3-state flip-flop output |
| GND | 10 | ground (0 V) |
| CP | 11 | clock input (LOW-to-HIGH, edge triggered) |
| Q4 | 12 | 3-state flip-flop output |
| D4 | 13 | data input |
| D5 | 14 | data input |
| Q5 | 15 | 3-state flip-flop output |
| Q6 | 16 | 3-state flip-flop output |
| D6 | 17 | data input |
| D7 | 18 | data input |
| Q7 | 19 | 3-state flip-flop output |
| V _{CC} | 20 | supply voltage |

6. Functional description

Table 3. Function table^[1]

| Operating mode | Control | | Input Dn | Internal flip-flop | Output Q0 to Q7 |
|-----------------------------------|---------|----|-------------|-----------------------|--------------------|
| | OE | CP | | | |
| Load and read register | L | ↑ | I | L | L |
| | L | ↑ | h | H | H |
| Load register and disable outputs | H | ↑ | I | L | Z |
| | H | ↑ | h | H | Z |

[1] H = HIGH voltage level;
h = HIGH voltage level one setup time prior to the LOW-to-HIGH CP transition;
L = LOW voltage level;
I = LOW voltage level one setup time prior to the LOW-to-HIGH CP transition;
↑ = LOW-to-HIGH CP transition;
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 | +7.0 | V |
| V _I | input voltage | | -0.5 | +7.0 | V |
| I _{IK} | input clamping current | V _I < -0.5 V | [1] | -20 | - mA |
| I _{OK} | output clamping current | V _O < -0.5 V or V _O > V _{CC} + 0.5 V | [1] | -20 | +20 mA |
| I _O | output current | V _O = -0.5 V to (V _{CC} + 0.5 V) | -25 | +25 | mA |
| I _{cc} | supply current | | - | +75 | mA |
| I _{GND} | ground current | | -75 | - | mA |
| T _{stg} | storage temperature | | -65 | +150 | °C |
| P _{tot} | total power dissipation | T _{amb} = -40 °C to +125 °C | [2] | - | 500 mW |

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SO20 packages: above 70 °C the value of P_{tot} derates linearly at 8 mW/K.

For TSSOP20 packages: above 60 °C the value of P_{tot} derates linearly at 5.5 mW/K.

8. Recommended operating conditions

Table 5. Operating conditions

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------------------|-------------------------------------|----------------------------------|-----|-----|-----------------|------|
| 74AHC374-Q100 | | | | | | |
| V _{CC} | supply voltage | | 2.0 | 5.0 | 5.5 | V |
| V _I | input voltage | | 0 | - | 5.5 | V |
| V _O | output voltage | | 0 | - | V _{CC} | V |
| T _{amb} | ambient temperature | | -40 | +25 | +125 | °C |
| Δt/ΔV | input transition rise and fall rate | V _{CC} = 3.0 V to 3.6 V | - | - | 100 | ns/V |
| | | V _{CC} = 4.5 V to 5.5 V | - | - | 20 | ns/V |
| 74AHCT374-Q100 | | | | | | |
| V _{CC} | supply voltage | | 4.5 | 5.0 | 5.5 | V |
| V _I | input voltage | | 0 | - | 5.5 | V |
| V _O | output voltage | | 0 | - | V _{CC} | V |
| T _{amb} | ambient temperature | | -40 | +25 | +125 | °C |
| Δt/ΔV | input transition rise and fall rate | V _{CC} = 4.5 V to 5.5 V | - | - | 20 | ns/V |

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 | |
| 74AHC374-Q100 | | | | | | | | | | |
| V _{IH} | HIGH-level input voltage | V _{CC} = 2.0 V | 1.5 | - | - | 1.5 | - | 1.5 | - | V |
| | | V _{CC} = 3.0 V | 2.1 | - | - | 2.1 | - | 2.1 | - | V |
| | | V _{CC} = 5.5 V | 3.85 | - | - | 3.85 | - | 3.85 | - | V |
| V _{IL} | LOW-level input voltage | V _{CC} = 2.0 V | - | - | 0.5 | - | 0.5 | - | 0.5 | V |
| | | V _{CC} = 3.0 V | - | - | 0.9 | - | 0.9 | - | 0.9 | V |
| | | V _{CC} = 5.5 V | - | - | 1.65 | - | 1.65 | - | 1.65 | V |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | | | | | | | | |
| | | I _O = −50 μA; V _{CC} = 2.0 V | 1.9 | 2.0 | - | 1.9 | - | 1.9 | - | V |
| | | I _O = −50 μA; V _{CC} = 3.0 V | 2.9 | 3.0 | - | 2.9 | - | 2.9 | - | V |
| | | I _O = −50 μA; V _{CC} = 4.5 V | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | I _O = −4.0 mA; V _{CC} = 3.0 V | 2.58 | - | - | 2.48 | - | 2.40 | - | V |
| | | I _O = −8.0 mA; V _{CC} = 4.5 V | 3.94 | - | - | 3.80 | - | 3.70 | - | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | | | | | | | | |
| | | I _O = 50 μA; V _{CC} = 2.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | I _O = 50 μA; V _{CC} = 3.0 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | I _O = 50 μA; V _{CC} = 4.5 V | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | I _O = 4.0 mA; V _{CC} = 3.0 V | - | - | 0.36 | - | 0.44 | - | 0.55 | V |
| | | I _O = 8.0 mA; V _{CC} = 4.5 V | - | - | 0.36 | - | 0.44 | - | 0.55 | V |

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_I | input leakage current | $V_I = 5.5 \text{ V}$ or GND; $V_{CC} = 0 \text{ V}$ to 5.5 V | - | - | 0.1 | - | 1.0 | - | 2.0 | μA |
| I_{OZ} | OFF-state output current | $V_I = V_{IH}$ or V_{IL} ; $V_O = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$ | - | - | ±0.25 | - | ±2.5 | - | ±10.0 | μA |
| I_{CC} | supply current | $V_I = V_{CC}$ or GND; $I_O = 0 \text{ A}$; $V_{CC} = 5.5 \text{ V}$ | - | - | 4.0 | - | 40 | - | 80 | μA |
| C_I | input capacitance | $V_I = V_{CC}$ or GND | - | 3 | 10 | - | 10 | - | 10 | pF |
| C_O | output capacitance | | - | 4 | - | - | - | - | - | pF |

74AHCT374-Q100

| | | | | | | | | | | |
|-----------------|---------------------------|---|------|-----|-------|------|------|------|-------|----|
| V_{IH} | HIGH-level input voltage | $V_{CC} = 4.5 \text{ V}$ to 5.5 V | 2.0 | - | - | 2.0 | - | 2.0 | - | V |
| V_{IL} | LOW-level input voltage | $V_{CC} = 4.5 \text{ V}$ to 5.5 V | - | - | 0.8 | - | 0.8 | - | 0.8 | V |
| V_{OH} | HIGH-level output voltage | $V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 4.5 \text{ V}$ | | | | | | | | |
| | | $I_O = -50 \mu\text{A}$ | 4.4 | 4.5 | - | 4.4 | - | 4.4 | - | V |
| | | $I_O = -8.0 \text{ mA}$ | 3.94 | - | - | 3.80 | - | 3.70 | - | V |
| V_{OL} | LOW-level output voltage | $V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 4.5 \text{ V}$ | | | | | | | | |
| | | $I_O = 50 \mu\text{A}$ | - | 0 | 0.1 | - | 0.1 | - | 0.1 | V |
| | | $I_O = 8.0 \text{ mA}$ | - | - | 0.36 | - | 0.44 | - | 0.55 | V |
| I_I | input leakage current | $V_I = 5.5 \text{ V}$ or GND; $V_{CC} = 0 \text{ V}$ to 5.5 V | - | - | 0.1 | - | 1.0 | - | 2.0 | μA |
| I_{OZ} | OFF-state output current | $V_I = V_{IH}$ or V_{IL} ; $V_O = V_{CC}$ or GND per input pin; other inputs at V_{CC} or GND; $I_O = 0 \text{ A}$; $V_{CC} = 5.5 \text{ V}$ | - | - | ±0.25 | - | ±2.5 | - | ±10.0 | μA |
| I_{CC} | supply current | $V_I = V_{CC}$ or GND; $I_O = 0 \text{ A}$; $V_{CC} = 5.5 \text{ V}$ | - | - | 4.0 | - | 40 | - | 80 | μA |
| ΔI_{CC} | additional supply current | per input pin; $V_I = V_{CC} - 2.1 \text{ V}$; other pins at V_{CC} or GND; $I_O = 0 \text{ A}$; $V_{CC} = 4.5 \text{ V}$ to 5.5 V | - | - | 1.35 | - | 1.5 | - | 1.5 | mA |
| C_I | input capacitance | $V_I = V_{CC}$ or GND | - | 3 | 10 | - | 10 | - | 10 | pF |
| C_O | output capacitance | | - | 4 | - | - | - | - | - | pF |

10. Dynamic characteristics

Table 7. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 9](#).

| Symbol | Parameter | Conditions | 25 °C | | | −40 °C to +85 °C | | −40 °C to +125 °C | | Unit |
|----------------------|-------------------|--|-------|--------------------|------|------------------|------|-------------------|------|------|
| | | | Min | Typ ^[1] | Max | Min | Max | Min | Max | |
| 74AHC374-Q100 | | | | | | | | | | |
| t_{pd} | propagation delay | CP to Qn; see Figure 6 and Figure 8 ^[2] | | | | | | | | |
| | | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | - | 6.4 | 12.7 | 1.0 | 15.0 | 1.0 | 16.0 | ns |
| | | $C_L = 50 \text{ pF}$ | - | 8.4 | 16.2 | 1.0 | 18.5 | 1.0 | 20.5 | ns |
| | | $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | - | 4.4 | 8.1 | 1.0 | 9.5 | 1.0 | 10.0 | ns |
| | | $C_L = 50 \text{ pF}$ | - | 5.7 | 10.1 | 1.0 | 11.5 | 1.0 | 12.5 | ns |
| t_{en} | enable time | OE to Qn; see Figure 7 ^[3] | | | | | | | | |
| | | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | - | 5.5 | 11.0 | 1.0 | 13.0 | 1.0 | 14.0 | ns |
| | | $C_L = 50 \text{ pF}$ | - | 7.3 | 14.5 | 1.0 | 16.5 | 1.0 | 18.0 | ns |
| | | $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | - | 3.9 | 7.6 | 1.0 | 9.0 | 1.0 | 9.5 | ns |
| | | $C_L = 50 \text{ pF}$ | - | 5.2 | 9.6 | 1.0 | 11.0 | 1.0 | 12.0 | ns |
| t_{dis} | disable time | OE to Qn; see Figure 7 ^[4] | | | | | | | | |
| | | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | - | 5.6 | 10.5 | 1.0 | 12.5 | 1.0 | 13.0 | ns |
| | | $C_L = 50 \text{ pF}$ | - | 9.4 | 14.0 | 1.0 | 16.0 | 1.0 | 17.5 | ns |
| | | $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | - | 4.2 | 6.8 | 1.0 | 8.0 | 1.0 | 8.5 | ns |
| | | $C_L = 50 \text{ pF}$ | - | 6.4 | 8.8 | 1.0 | 10.0 | 1.0 | 11.0 | ns |
| f_{max} | maximum frequency | see Figure 6 | | | | | | | | |
| | | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | 80 | 130 | - | 70 | - | 70 | - | MHz |
| | | $C_L = 50 \text{ pF}$ | 55 | 85 | - | 50 | - | 50 | - | MHz |
| | | $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | | | | | | | | |
| | | $C_L = 15 \text{ pF}$ | 130 | 185 | - | 110 | - | 110 | - | MHz |
| | | $C_L = 50 \text{ pF}$ | 85 | 120 | - | 75 | - | 75 | - | MHz |
| t_w | pulse width | CP HIGH or LOW; see Figure 6 | | | | | | | | |
| | | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ | 5.0 | - | - | 5.5 | - | 5.5 | - | ns |
| | | $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | 5.0 | - | - | 5.0 | - | 5.0 | - | ns |
| t_{su} | set-up time | Dn to CP; see Figure 8 | | | | | | | | |
| | | $V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$ | 4.5 | - | - | 4.0 | - | 4.0 | - | ns |
| | | $V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | 3.0 | - | - | 3.0 | - | 3.0 | - | ns |

Table 7. Dynamic characteristics ...continued

Voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 9](#).

| Symbol | Parameter | Conditions | 25 °C | | | -40 °C to +85 °C | | -40 °C to +125 °C | | Unit |
|--|-------------------------------|---|-------|--------------------|------|------------------|------|-------------------|------|------|
| | | | Min | Typ ^[1] | Max | Min | Max | Min | Max | |
| t _h | hold time | Dn to CP; see Figure 8 | | | | | | | | |
| | | V _{CC} = 3.0 V to 3.6 V | 2.0 | - | - | 2.0 | - | 2.0 | - | ns |
| | | V _{CC} = 4.5 V to 5.5 V | 2.0 | - | - | 2.0 | - | 2.0 | - | ns |
| C _{PD} | power dissipation capacitance | f _i = 1 MHz; V _I = GND to V _{CC} [5] | - | 10 | - | - | - | - | - | pF |
| 74AHCT374-Q100; V_{CC} = 4.5 V to 5.5 V | | | | | | | | | | |
| t _{pd} | propagation delay | CP to Qn; see Figure 6 and Figure 8 [2] | | | | | | | | |
| | | C _L = 15 pF | - | 4.3 | 9.4 | 1.0 | 10.5 | 1.0 | 12.0 | ns |
| | | C _L = 50 pF | - | 5.6 | 10.4 | 1.0 | 11.5 | 1.0 | 13.0 | ns |
| t _{en} | enable time | OE to Qn; see Figure 7 [3] | | | | | | | | |
| | | C _L = 15 pF | - | 3.5 | 10.2 | 1.0 | 11.5 | 1.0 | 13.0 | ns |
| | | C _L = 50 pF | - | 4.8 | 11.2 | 1.0 | 12.5 | 1.0 | 14.0 | ns |
| t _{dis} | disable time | OE to Qn; see Figure 7 [4] | | | | | | | | |
| | | C _L = 15 pF | - | 3.6 | 10.2 | 1.0 | 11.0 | 1.0 | 13.0 | ns |
| | | C _L = 50 pF | - | 5.7 | 11.2 | 1.0 | 12.0 | 1.0 | 14.0 | ns |
| f _{max} | maximum frequency | see Figure 6 | | | | | | | | |
| | | C _L = 15 pF | 90 | 140 | - | 80 | - | 80 | - | MHz |
| | | C _L = 50 pF | 85 | 130 | - | 75 | - | 75 | - | MHz |
| t _W | pulse width | CP HIGH or LOW; see Figure 6 | 6.5 | - | - | 6.5 | - | 6.5 | - | ns |
| t _{su} | set-up time | Dn to CP; see Figure 8 | 2.5 | - | - | 2.5 | - | 2.5 | - | ns |
| t _h | hold time | Dn to CP; see Figure 8 | 2.5 | - | - | 2.5 | - | 2.5 | - | ns |
| C _{PD} | power dissipation capacitance | f _i = 1 MHz; V _I = GND to V _{CC} [5] | - | 12 | - | - | - | - | - | pF |

[1] Typical values are measured at nominal supply voltage (V_{CC} = 3.3 V and V_{CC} = 5.0 V).[2] t_{pd} is the same as t_{PLH} and t_{PHL}.[3] t_{en} is the same as t_{PZH} and t_{PZL}.[4] t_{dis} is the same as t_{PHZ} and t_{PLZ}.[5] C_{PD} is used to determine the dynamic power dissipation (P_D in μ W).

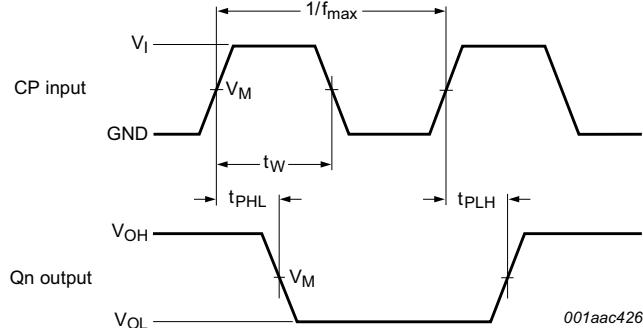
$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum(C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz;f_o = output frequency in MHz;C_L = output load capacitance in pF;V_{CC} = supply voltage in V;

N = number of inputs switching;

$$\sum(C_L \times V_{CC}^2 \times f_o) = \text{sum of the outputs.}$$

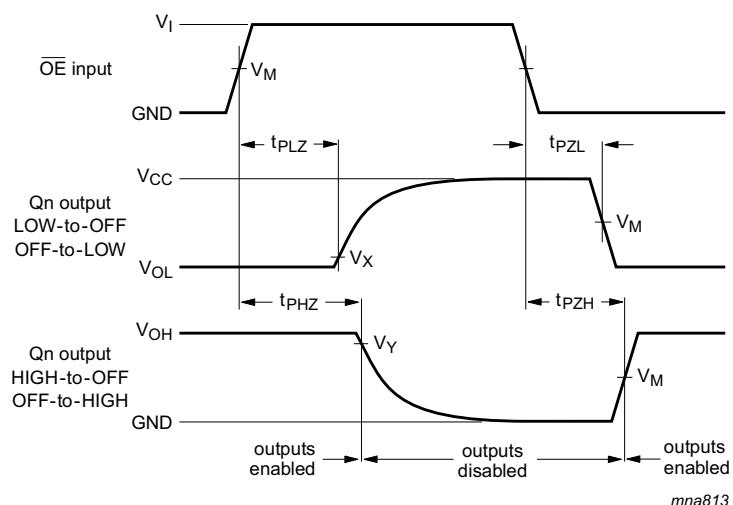
10.1 Waveforms



Measurement points are given in [Table 8](#).

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

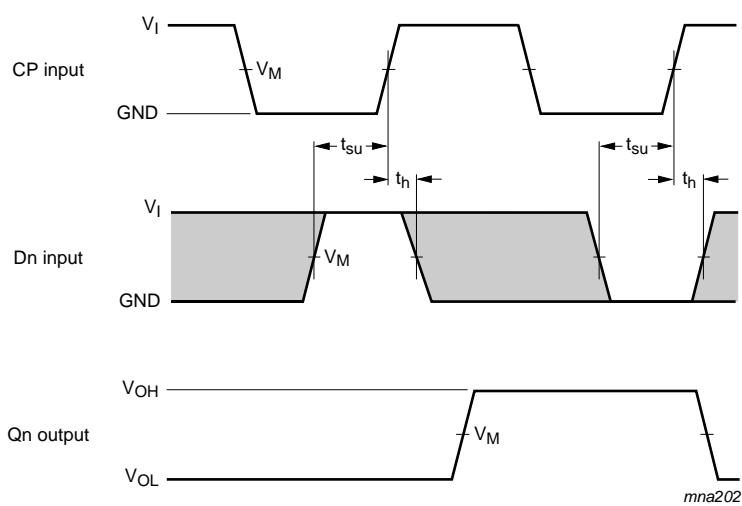
Fig 6. Clock pulse width, maximum frequency and input to output propagation delays



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. Enable and disable times



Measurement points are given in [Table 8](#).

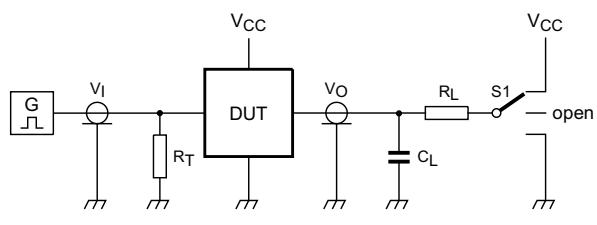
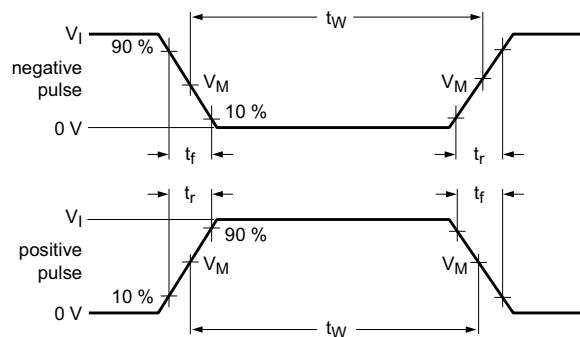
The shaded areas indicate when the input is permitted to change for predictable output performance.

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

Fig 8. Data set-up and hold times

Table 8. Measurement points

| Type | Input | Output | | | |
|----------------|---------------------|---------------------|--------------------------|--------------------------|-------|
| | | V_M | V_M | V_X | V_Y |
| 74AHC374-Q100 | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ | |
| 74AHCT374-Q100 | 1.5 V | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ | |



001aad983

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 resistance.

$S1$ = test selection switch.

Fig 9. Test circuit for measuring switching times

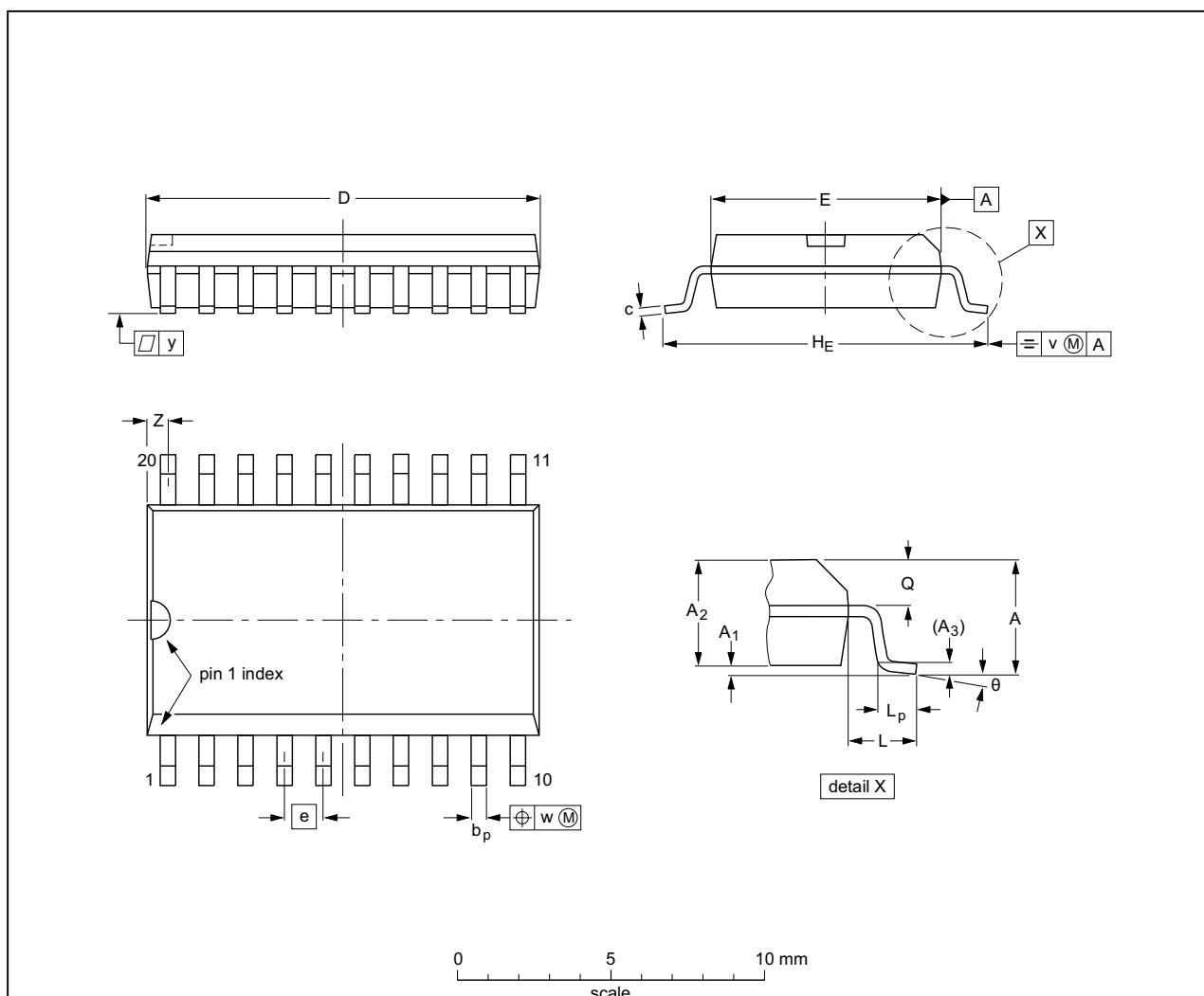
Table 9. Test data

| Type | Input | | Load | | S1 position |
|----------------|----------|-----------------------|--------------|---------------------|-------------|
| | V_I | t_r, t_f | C_L | R_L | |
| 74AHC374-Q100 | V_{CC} | $\leq 3.0 \text{ ns}$ | 15 pF, 50 pF | $1 \text{ k}\Omega$ | open |
| 74AHCT374-Q100 | 3.0 V | $\leq 3.0 \text{ ns}$ | 15 pF, 50 pF | $1 \text{ k}\Omega$ | open |

11. Package outline

SO20: plastic small outline package; 20 leads; body width 7.5 mm

SOT163-1



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 | 2.65 0.1 | 0.3 2.25 | 2.45 | 0.25 | 0.49 0.36 | 0.32 0.23 | 13.0 12.6 | 7.6 7.4 | 1.27 | 10.65 10.00 | 1.4 | 1.1 0.4 | 1.1 1.0 | 0.25 | 0.25 | 0.1 | 0.9 0.4 | 8° 0° |
| inches | 0.1 0.004 | 0.012 0.089 | 0.096 | 0.01 | 0.019 0.014 | 0.013 0.009 | 0.51 0.49 | 0.30 0.29 | 0.05 | 0.419 0.394 | 0.055 | 0.043 0.016 | 0.043 0.039 | 0.01 | 0.01 | 0.004 | 0.035 0.016 | 0° 0° |

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 | | | |
| SOT163-1 | 075E04 | MS-013 | | | | 99-12-27 03-02-19 |

Fig 10. Package outline SOT163-1 (SO20)

TSSOP20: plastic thin shrink small outline package; 20 leads; body width 4.4 mm

SOT360-1

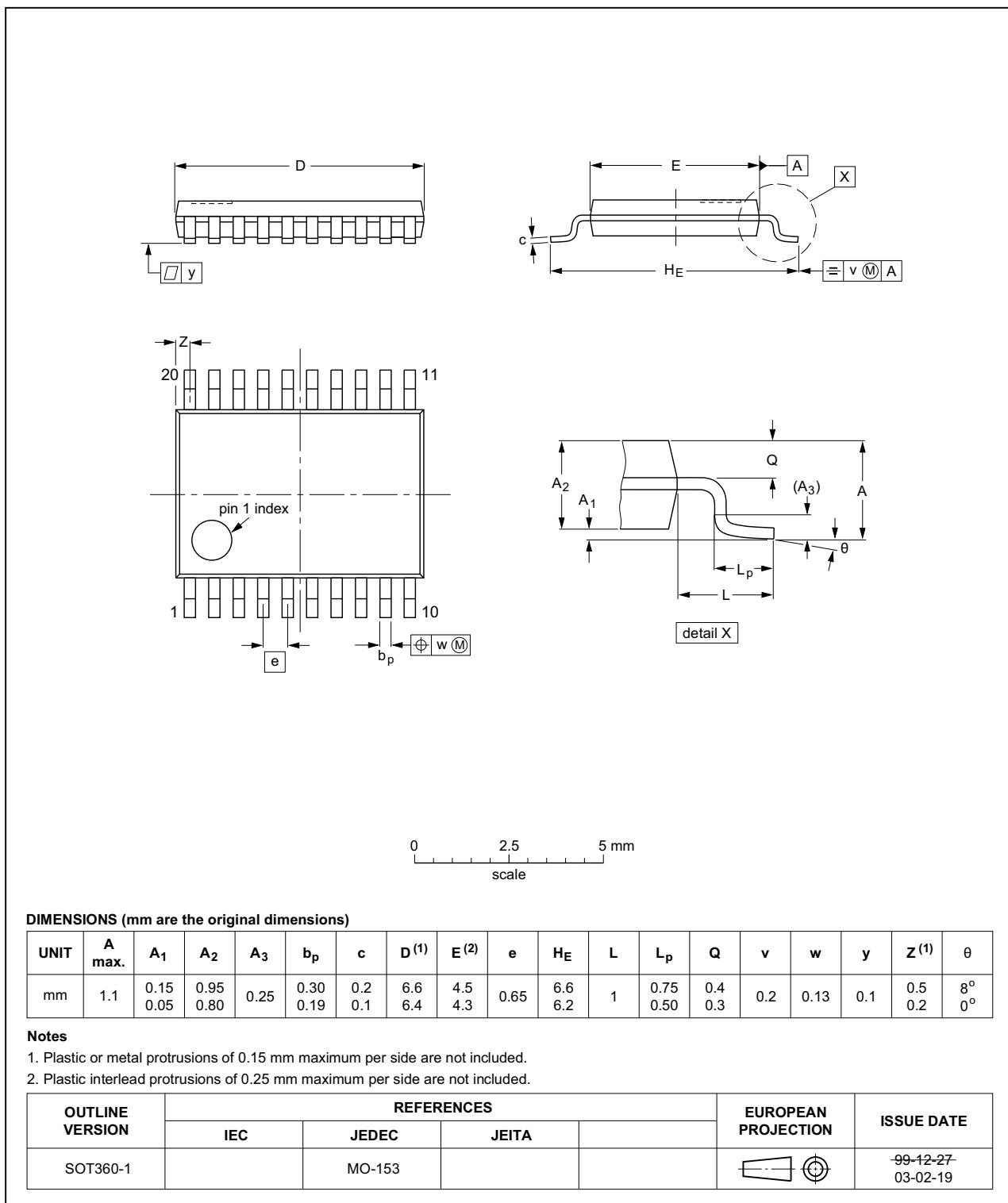


Fig 11. Package outline SOT360-1 (TSSOP20)

12. Abbreviations

Table 10. Abbreviations

| Acronym | Description |
|---------|--|
| CDM | Charged Device Model |
| CMOS | Complementary Metal-Oxide Semiconductor |
| DUT | Device Under Test |
| ESD | ElectroStatic Discharge |
| HBM | Human Body Model |
| LSTTL | Low-power Schottky Transistor-Transistor Logic |
| MIL | Military |
| MM | Machine Model |

13. Revision history

Table 11. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|------------------------|--------------|--------------------|---------------|------------|
| 74AHC_AHCT374_Q100 v.1 | 20140311 | Product data sheet | - | - |

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".

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