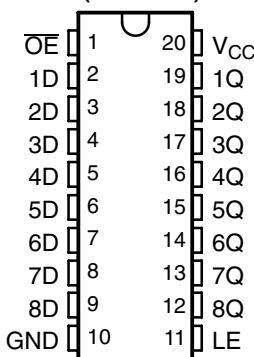


SN54BCT573, SN74BCT573 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

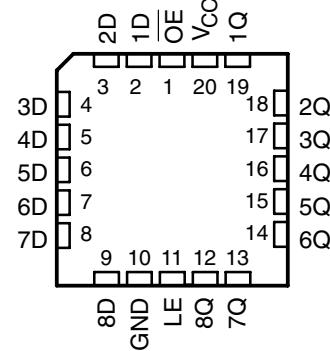
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- Operating Voltage Range of 4.5 V to 5.5 V
- State-of-the-Art BiCMOS Design
- Significantly Reduces I_{CCZ}
- Full Parallel Access for Loading

SN54BCT573 . . . J OR W PACKAGE
SN74BCT573 . . . DW, N, OR NS PACKAGE
(TOP VIEW)



SN54BCT573 . . . FK PACKAGE
(TOP VIEW)



description/ordering information

These 8-bit latches feature 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The eight latches of the 'BCT573 devices are transparent D-type latches. While the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When the latch enable is taken low, the Q outputs are latched at the logic levels that were set up at the D inputs.

A buffered output-enable (\overline{OE}) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide the capability to drive bus lines without interface or pullup components.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

\overline{OE} does not affect internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

ORDERING INFORMATION

| T_A | PACKAGE [†] | | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|--------------------------------|----------------------|---------------|-----------------------|------------------|
| $0^\circ C$ to $70^\circ C$ | PDIP – N | Tube | SN74BCT573N | SN74BCT573N |
| | SOIC – DW | Tube | SN74BCT573DW | BCT573 |
| | | Tape and reel | SN74BCT573DWR | |
| $-55^\circ C$ to $125^\circ C$ | SOP – NS | Tape and reel | SN74BCT573NSR | BCT573 |
| | CDIP – J | Tube | SNJ54BCT573J | SNJ54BCT573J |
| | CFP – W | Tube | SNJ54BCT573W | SNJ54BCT573W |
| | LCCC – FK | Tube | SNJ54BCT573FK | SNJ54BCT573FK |

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

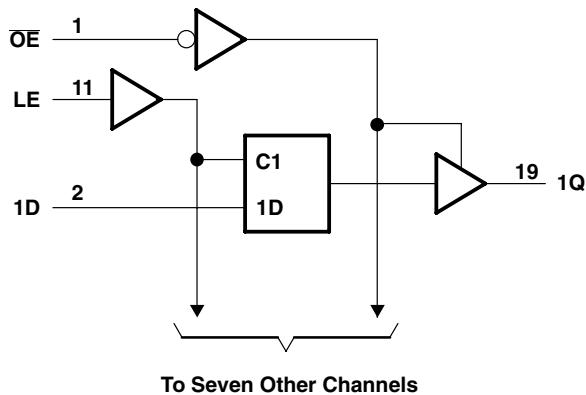
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FUNCTION TABLE (each latch)

| INPUTS | | | OUTPUT |
|--------|----|---|----------------|
| OE | LE | D | Q |
| L | H | H | H |
| L | H | L | L |
| L | L | X | Q ₀ |
| H | X | X | Z |

logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

[†] Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. The package thermal impedance is calculated in accordance with JEDEC 51-7.

SN54BCT573, SN74BCT573
OCTAL TRANSPARENT D-TYPE LATCHES
WITH 3-STATE OUTPUTS

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recommended operating conditions (see Note 3)

| | | SN54BCT573 | | | SN74BCT573 | | | UNIT |
|-----------------|--------------------------------|------------|-----|-----|------------|-----|-----|------|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| V _{CC} | Supply voltage | 4.5 | 5 | 5.5 | 4.5 | 5 | 5.5 | V |
| V _{IH} | High-level input voltage | | 2 | | 2 | | | V |
| V _{IL} | Low-level input voltage | | | 0.8 | | | 0.8 | V |
| I _{IK} | Input clamp current | | | -18 | | | -18 | mA |
| I _{OH} | High-level output current | | | -12 | | | -15 | mA |
| I _{OL} | Low-level output current | | | 48 | | | 64 | mA |
| T _A | Operating free-air temperature | -55 | 125 | 0 | 0 | 70 | | °C |

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | SN54BCT573 | | | SN74BCT573 | | | UNIT |
|------------------------------|--|--------------------------|------------------|------|------------|------------------|-----------|------|
| | | MIN | TYP [†] | MAX | MIN | TYP [†] | MAX | |
| V _{IK} | V _{CC} = 4.5 V, I _I = -18 mA | | | -1.2 | | | -1.2 | V |
| V _{OH} | V _{CC} = 4.5 V | I _{OH} = -3 mA | 2.4 | 3.3 | 2.4 | 3.3 | | V |
| | | I _{OH} = -12 mA | 2 | 3.2 | | | | |
| | | I _{OH} = -15 mA | | | 2 | 3.1 | | |
| V _{OL} | V _{CC} = 4.5 V | I _{OL} = 48 mA | 0.38 | 0.55 | | | | V |
| | | I _{OL} = 64 mA | | | | | 0.42 0.55 | |
| I _I | V _{CC} = 5.5 V, V _I = 5.5 V | | | 0.4 | | | 0.4 | mA |
| I _{IH} | V _{CC} = 5.5 V, V _I = 2.7 V | | | 20 | | | 20 | μA |
| I _{IL} | V _{CC} = 5.5 V, V _I = 0.5 V | | | -0.6 | | | -0.6 | mA |
| I _{OS} [‡] | V _{CC} = 5.5 V, V _O = 0 | -100 | -225 | -100 | -225 | | | mA |
| I _{OZH} | V _{CC} = 5.5 V, V _O = 2.7 V | | | 50 | | | 50 | μA |
| I _{OZL} | V _{CC} = 5.5 V, V _O = 0.5 V | | | -50 | | | -50 | μA |
| I _{CCL} | V _{CC} = 5.5 V, Outputs open | | | 62 | | | 62 | mA |
| I _{CCH} | V _{CC} = 5.5 V, Outputs open | | | 8 | | | 8 | mA |
| I _{CCZ} | V _{CC} = 5.5 V, Outputs open | | | 8 | | | 8 | mA |
| C _i | V _{CC} = 5 V, V _I = 2.5 V or 0.5 V | | | 5.5 | | | 5.5 | PF |
| C _o | V _{CC} = 5 V, V _O = 2.5 V or 0.5 V | | | 7.5 | | | 7.5 | PF |

[†] All typical values are at V_{CC} = 5 V, T_A = 25°C.

[‡] Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

timing requirements over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

| | | V _{CC} = 5 V, T _A = 25°C | | SN54BCT573 | | SN74BCT573 | | UNIT |
|-----------------|-----------------------------|---|-----|------------|-----|------------|-----|------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | |
| t _w | Pulse duration, LE high | 4 | | 4 | | 4 | | ns |
| t _{su} | Setup time, data before LE↓ | 1 | | 2.5 | | 1 | | ns |
| t _h | Hold time, data after LE↓ | 4 | | 4 | | 4 | | ns |

**SN54BCT573, SN74BCT573
OCTAL TRANSPARENT D-TYPE LATCHES
WITH 3-STATE OUTPUTS**

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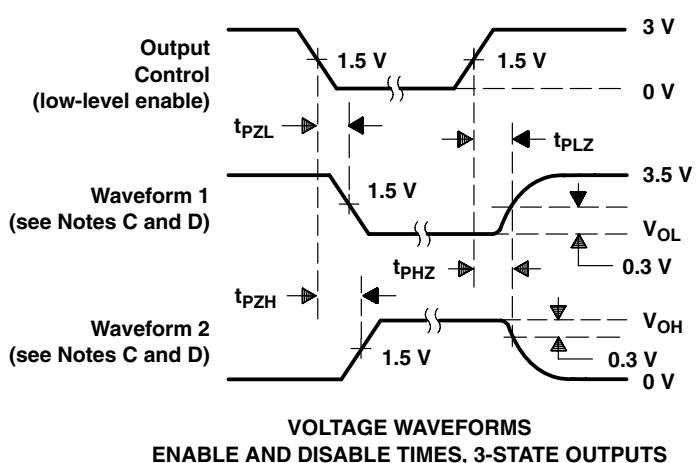
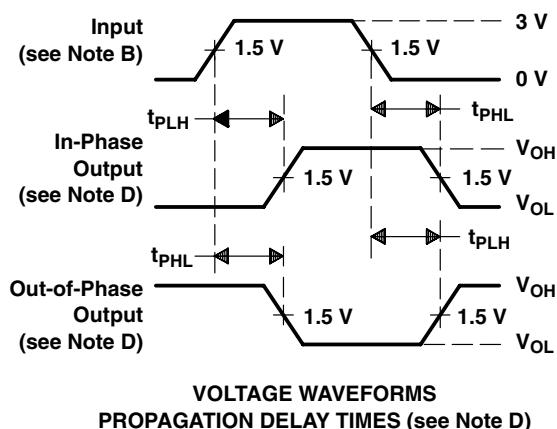
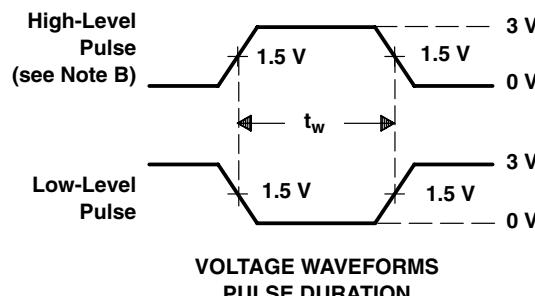
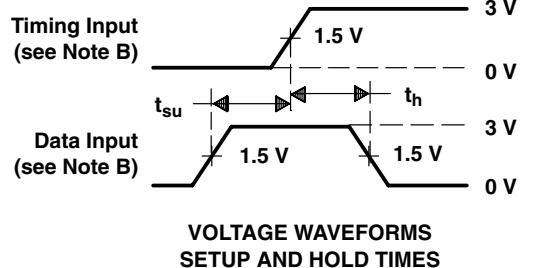
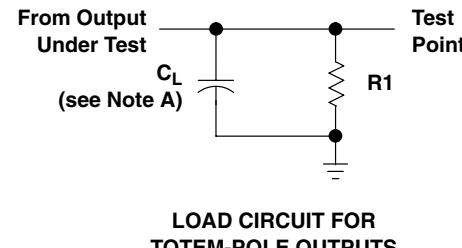
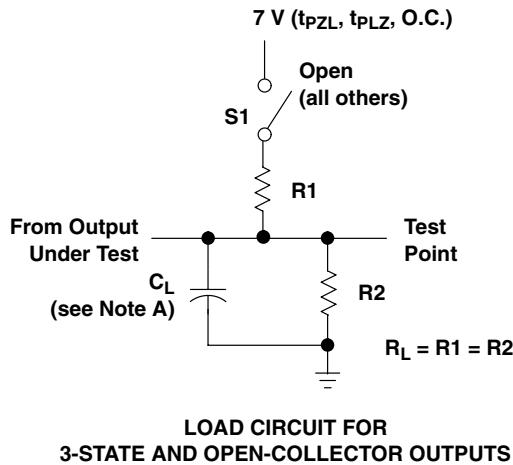
switching characteristics over recommended ranges of supply voltage and operating free-air temperature, $C_L = 50 \text{ pF}$ (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$ | | | SN54BCT573 | SN74BCT573 | UNIT | |
|-----------|-----------------|----------------|--|-----|-----|------------|------------|------|------|
| | | | MIN | TYP | MAX | MIN | MAX | | |
| t_{PLH} | D | Q | 2 | 5 | 7.2 | 1 | 9.8 | 2 | 8.4 |
| t_{PHL} | | | 2.8 | 5.9 | 8.2 | 1.5 | 10.3 | 2.8 | 9.6 |
| t_{PLH} | LE | Q | 2.4 | 6.1 | 7.2 | 2 | 9.7 | 2.4 | 8.1 |
| t_{PHL} | | | 2.9 | 5.2 | 7.1 | 2 | 8.8 | 2.9 | 7.8 |
| t_{PZH} | OE | Q | 3 | 6.2 | 8.5 | 2.5 | 11 | 3 | 10.4 |
| t_{PZL} | | | 4.3 | 7.1 | 9.3 | 3.5 | 11.5 | 4.3 | 11 |
| t_{PHZ} | OE | Q | 2.2 | 3.9 | 5.6 | 1.5 | 7.2 | 2.2 | 6 |
| t_{PLZ} | | | 1.7 | 3.6 | 5.2 | 1 | 7 | 1.7 | 6 |



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PARAMETER MEASUREMENT INFORMATION



NOTES:

- C_L includes probe and jig capacitance.
- All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $t_r = t_f \leq 2.5$ ns, duty cycle = 50%.
- Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- The outputs are measured one at a time with one transition per measurement.
- When measuring propagation delay times of 3-state outputs, switch S1 is open.
- All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package Pins | Package qty Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|------------------------------|---------------|----------------------|----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|---------------------|
| SN74BCT573DW | Active | Production | SOIC (DW) 20 | 25 TUBE | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | BCT573 |
| SN74BCT573DW.A | Active | Production | SOIC (DW) 20 | 25 TUBE | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | BCT573 |
| SN74BCT573N | Active | Production | PDIP (N) 20 | 20 TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74BCT573N |
| SN74BCT573N.A | Active | Production | PDIP (N) 20 | 20 TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74BCT573N |

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

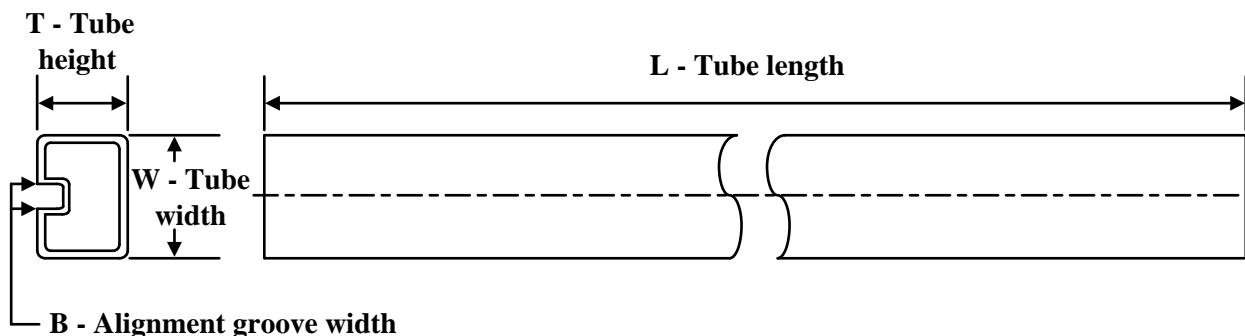
⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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TUBE


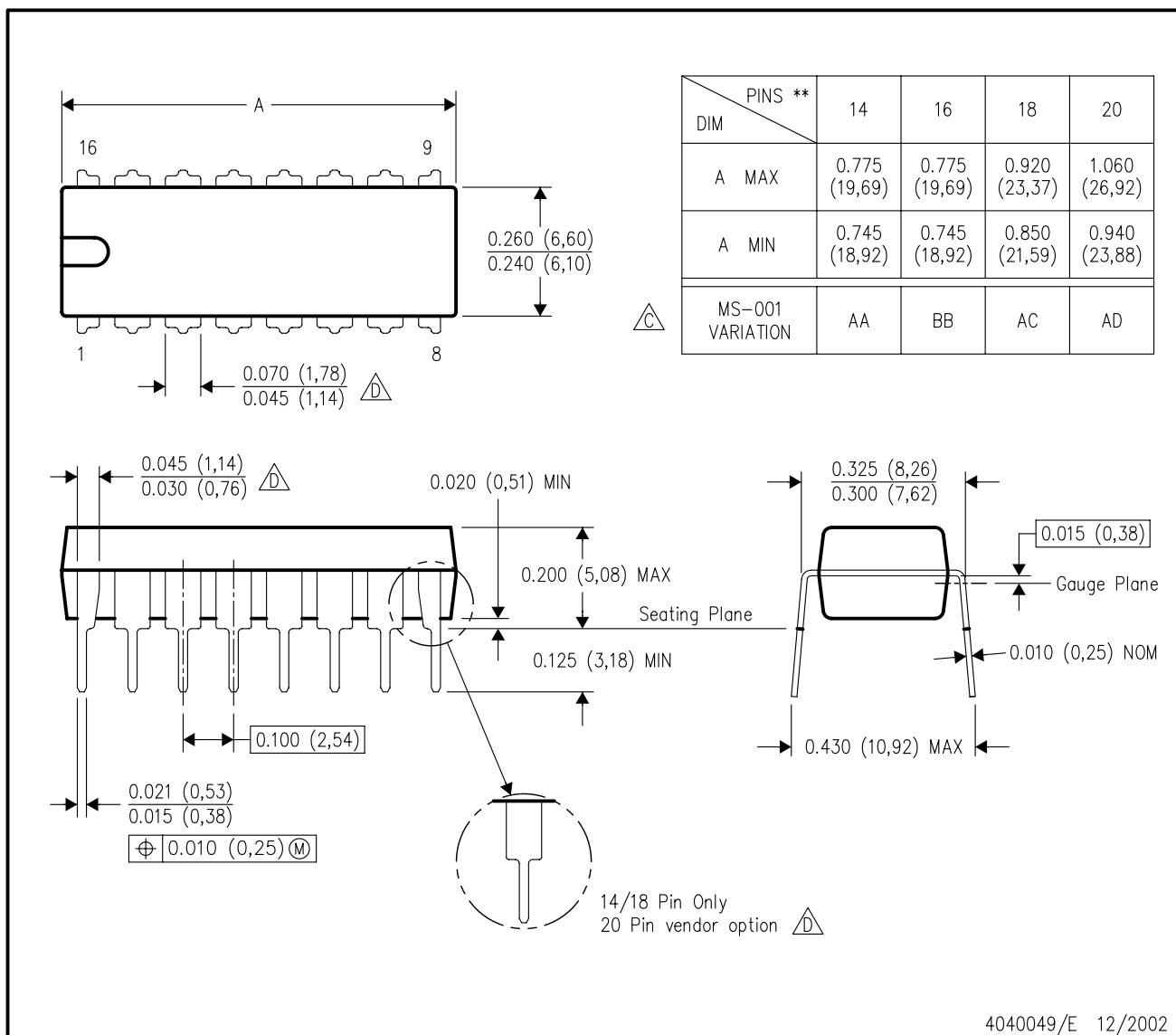
*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|----------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| SN74BCT573DW | DW | SOIC | 20 | 25 | 507 | 12.83 | 5080 | 6.6 |
| SN74BCT573DW.A | DW | SOIC | 20 | 25 | 507 | 12.83 | 5080 | 6.6 |
| SN74BCT573N | N | PDIP | 20 | 20 | 506 | 13.97 | 11230 | 4.32 |
| SN74BCT573N.A | N | PDIP | 20 | 20 | 506 | 13.97 | 11230 | 4.32 |

N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.

△ Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).

△ The 20 pin end lead shoulder width is a vendor option, either half or full width.

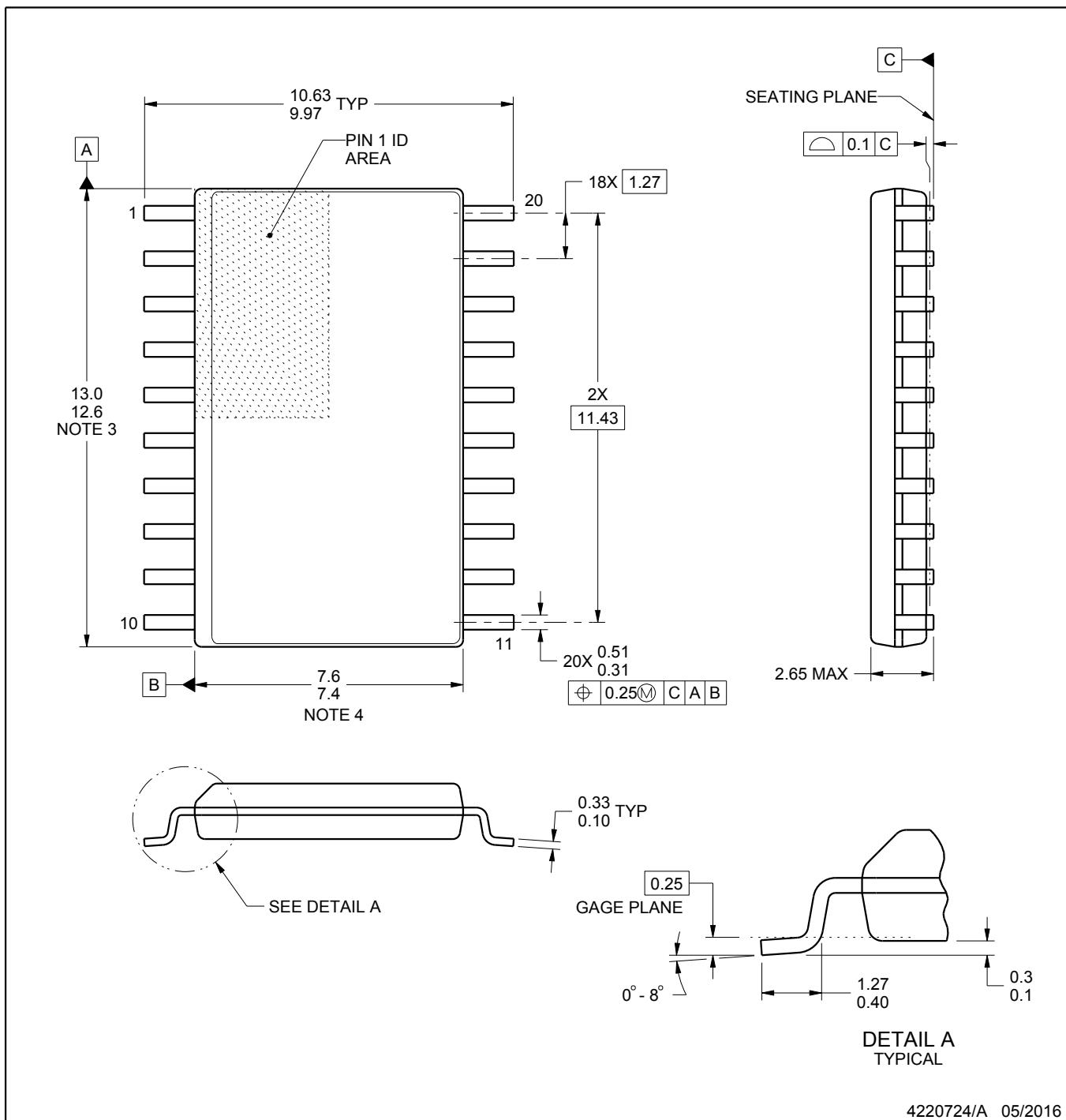
PACKAGE OUTLINE

DW0020A



SOIC - 2.65 mm max height

SOIC



NOTES:

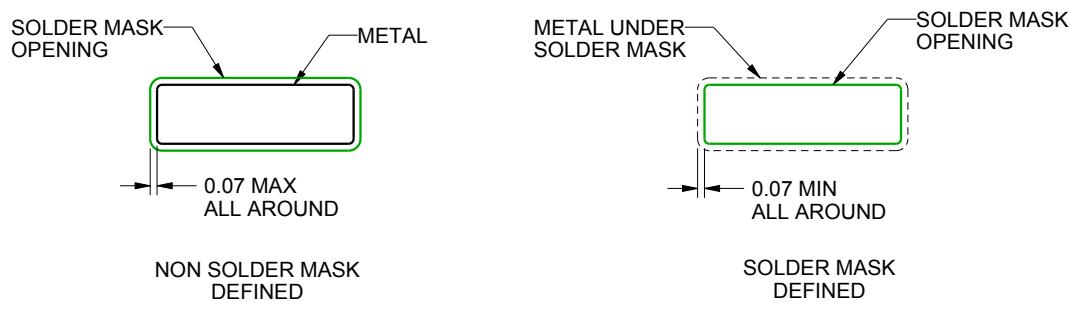
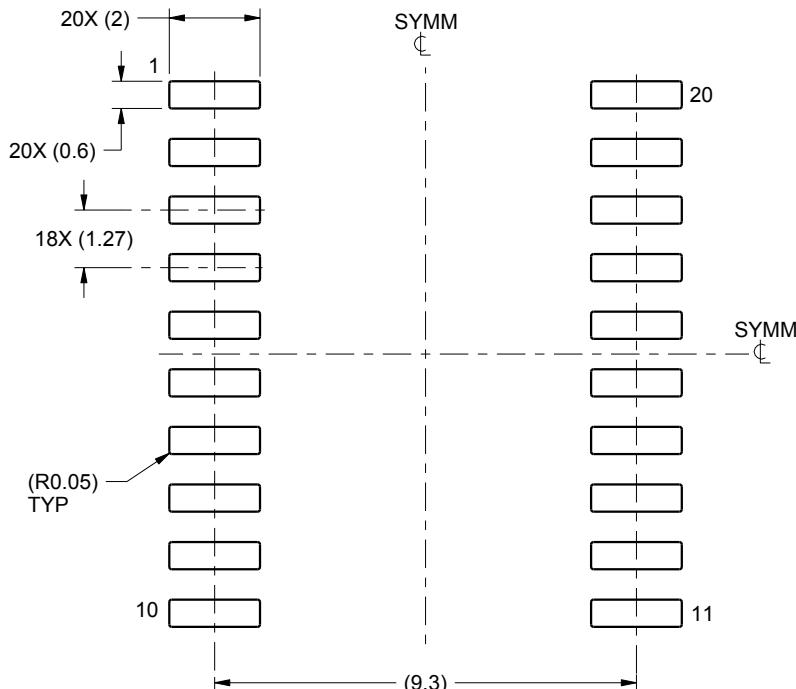
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm per side.
5. Reference JEDEC registration MS-013.

EXAMPLE BOARD LAYOUT

DW0020A

SOIC - 2.65 mm max height

SOIC



4220724/A 05/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

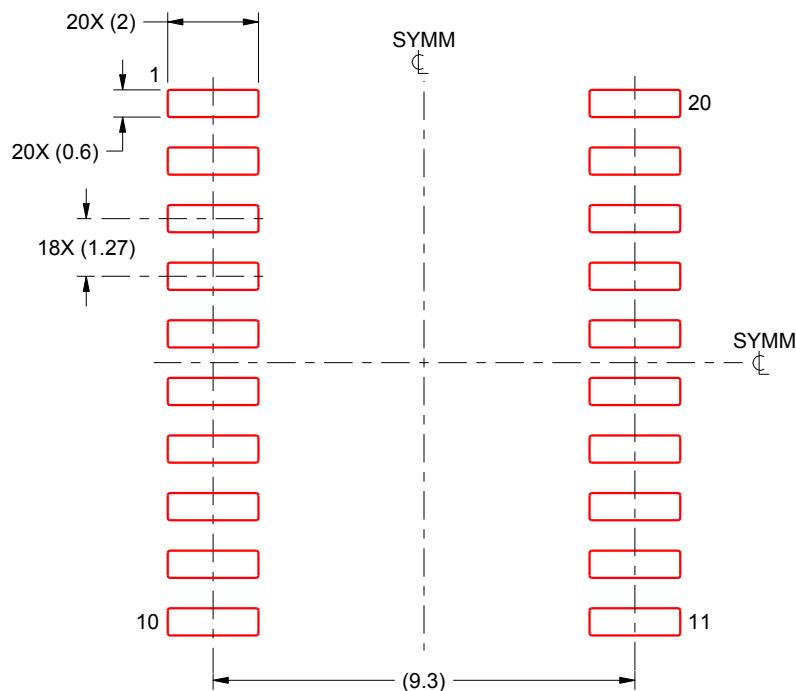
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DW0020A

SOIC - 2.65 mm max height

SOIC



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:6X

4220724/A 05/2016

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

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