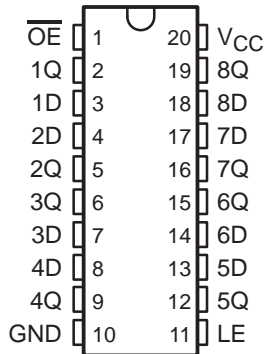


# SN54HC373, SN74HC373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

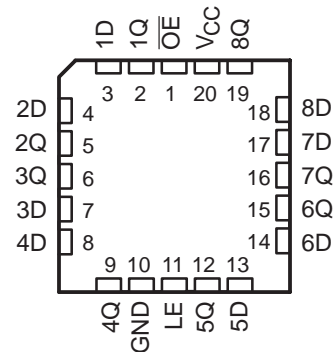
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- Wide Operating Voltage Range of 2 V to 6 V
- High-Current 3-State True Outputs Can Drive Up To 15 LSTTL Loads
- Low Power Consumption, 80- $\mu$ A Max  $I_{CC}$
- Typical  $t_{pd} = 13$  ns
- $\pm 6$ -mA Output Drive at 5 V
- Low Input Current of 1  $\mu$ A Max
- Eight High-Current Latches in a Single Package
- Full Parallel Access for Loading

SN54HC373 . . . J OR W PACKAGE  
SN74HC373 . . . DB, DW, N, NS, OR PW PACKAGE  
(TOP VIEW)



SN54HC373 . . . 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 'HC373 devices are transparent D-type latches. While the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the levels that were set up at the D inputs.

## ORDERING INFORMATION

| T <sub>A</sub> | PACKAGE†   |              | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|----------------|------------|--------------|-----------------------|------------------|
| -40°C to 85°C  | PDIP – N   | Tube of 20   | SN74HC373N            | SN74HC373N       |
|                | SOIC – DW  | Tube of 25   | SN74HC373DW           | HC373            |
|                |            | Reel of 2000 | SN74HC373DWR          |                  |
|                | SOP – NS   | Reel of 2000 | SN74HC373NSR          | HC373            |
|                | SSOP – DB  | Reel of 2000 | SN74HC373DBR          | HC373            |
|                | TSSOP – PW | Tube of 70   | SN74HC373PW           | HC373            |
| Reel of 2000   |            | SN74HC373PWR |                       |                  |
| Reel of 250    |            | SN74HC373PWT |                       |                  |
| -55°C to 125°C | CDIP – J   | Tube of 20   | SNJ54HC373J           | SNJ54HC373J      |
|                | CFP – W    | Tube of 85   | SNJ54HC373W           | SNJ54HC373W      |
|                | LCCC – FK  | Tube of 55   | SNJ54HC373FK          | SNJ54HC373FK     |

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



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# SN54HC373, SN74HC373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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## description/ordering information (continued)

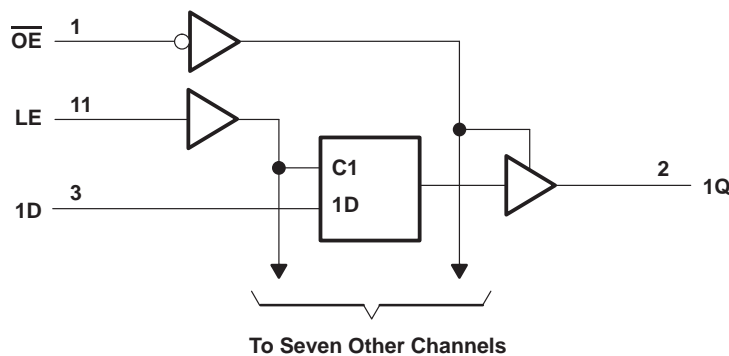
An output-enable ( $\overline{OE}$ ) input places the eight outputs in either a normal logic state (high or low logic levels) or the high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide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

$\overline{OE}$  does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are off.

FUNCTION TABLE  
(each latch)

| INPUTS          |    |   | OUTPUT |
|-----------------|----|---|--------|
| $\overline{OE}$ | 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)†

|   |                |
|---|----------------|
| Supply voltage range, $V_{CC}$ .....  | -0.5 V to 7 V  |
| Input clamp current, $I_{IK}$ ( $V_I < 0$ or $V_I > V_{CC}$ ) (see Note 1) .....  | $\pm 20$ mA    |
| Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ ) (see Note 1) ..... | $\pm 20$ mA    |
| Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ ) .....                  | $\pm 35$ mA    |
| Continuous current through $V_{CC}$ or GND .....                                  | $\pm 70$ mA    |
| Package thermal impedance, $\theta_{JA}$ (see Note 2):                            |                |
| DB package .....  | 70°C/W         |
| DW package .....  | 58°C/W         |
| N package .....   | 69°C/W         |
| NS package .....  | 60°C/W         |
| PW package .....  | 83°C/W         |
| Storage temperature range, $T_{stg}$ .....  | -65°C to 150°C |

† 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 JESD 51-7.

# SN54HC373, SN74HC373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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## recommended operating conditions (see Note 3)

|                 |                                 | SN54HC373               |     |                 | SN74HC373 |     |                 | UNIT |
|-----------------|---------------------------------|-------------------------|-----|-----------------|-----------|-----|-----------------|------|
|                 |                                 | MIN                     | NOM | MAX             | MIN       | NOM | MAX             |      |
| V <sub>CC</sub> | Supply voltage                  | 2                       | 5   | 6               | 2         | 5   | 6               | V    |
| V <sub>IH</sub> | High-level input voltage        | V <sub>CC</sub> = 2 V   |     | 1.5             | 1.5       |     | V               |      |
|                 |                                 | V <sub>CC</sub> = 4.5 V |     | 3.15            | 3.15      |     |                 |      |
|                 |                                 | V <sub>CC</sub> = 6 V   |     | 4.2             | 4.2       |     |                 |      |
| V <sub>IL</sub> | Low-level input voltage         | V <sub>CC</sub> = 2 V   |     |                 | 0.5       |     | 0.5             | V    |
|                 |                                 | V <sub>CC</sub> = 4.5 V |     |                 | 1.35      |     | 1.35            |      |
|                 |                                 | V <sub>CC</sub> = 6 V   |     |                 | 1.8       |     | 1.8             |      |
| V <sub>I</sub>  | Input voltage                   | 0                       |     | V <sub>CC</sub> | 0         |     | V <sub>CC</sub> | V    |
| V <sub>O</sub>  | Output voltage                  | 0                       |     | V <sub>CC</sub> | 0         |     | V <sub>CC</sub> | V    |
| Δt/Δv           | Input transition rise/fall time | V <sub>CC</sub> = 2 V   |     |                 | 1000      |     | 1000            | ns   |
|                 |                                 | V <sub>CC</sub> = 4.5 V |     |                 | 500       |     | 500             |      |
|                 |                                 | V <sub>CC</sub> = 6 V   |     |                 | 400       |     | 400             |      |
| T <sub>A</sub>  | Operating free-air temperature  | -55                     |     | 125             | -40       |     | 85              | °C   |

NOTE 3: All unused inputs of the device must be held at V<sub>CC</sub> 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   |                           | V <sub>CC</sub> | T <sub>A</sub> = 25°C |       |      | SN54HC373 |       | SN74HC373 |       | UNIT |
|-----------------|---|---------------------------|-----------------|-----------------------|-------|------|-----------|-------|-----------|-------|------|
|                 |   |                           |                 | MIN                   | TYP   | MAX  | MIN       | MAX   | MIN       | MAX   |      |
| V <sub>OH</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>       | I <sub>OH</sub> = -20 μA  | 2 V             | 1.9                   | 1.998 |      | 1.9       |       | 1.9       | V     |      |
|                 |   |                           | 4.5 V           | 4.4                   | 4.499 |      | 4.4       |       | 4.4       |       |      |
|                 |   |                           | 6 V             | 5.9                   | 5.999 |      | 5.9       |       | 5.9       |       |      |
|                 |   | I <sub>OH</sub> = -6 mA   | 4.5 V           | 3.98                  | 4.3   |      | 3.7       |       | 3.84      |       |      |
|                 |   | I <sub>OH</sub> = -7.8 mA | 6 V             | 5.48                  | 5.8   |      | 5.2       |       | 5.34      |       |      |
| V <sub>OL</sub> | V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>       | I <sub>OL</sub> = 20 μA   | 2 V             |                       | 0.002 | 0.1  |           | 0.1   |           | 0.1   | V    |
|                 |   |                           | 4.5 V           |                       | 0.001 | 0.1  |           | 0.1   |           | 0.1   |      |
|                 |   |                           | 6 V             |                       | 0.001 | 0.1  |           | 0.1   |           | 0.1   |      |
|                 |   | I <sub>OL</sub> = 6 mA    | 4.5 V           |                       | 0.17  | 0.26 |           | 0.4   |           | 0.33  |      |
|                 |   | I <sub>OL</sub> = 7.8 mA  | 6 V             |                       | 0.15  | 0.26 |           | 0.4   |           | 0.33  |      |
| I <sub>I</sub>  | V <sub>I</sub> = V <sub>CC</sub> or 0                     |                           | 6 V             |                       | ±0.1  | ±100 |           | ±1000 |           | ±1000 | nA   |
| I <sub>OZ</sub> | V <sub>O</sub> = V <sub>CC</sub> or 0                     |                           | 6 V             |                       | ±0.01 | ±0.5 |           | ±10   |           | ±5    | μA   |
| I <sub>CC</sub> | V <sub>I</sub> = V <sub>CC</sub> or 0, I <sub>O</sub> = 0 |                           | 6 V             |                       |       | 8    |           | 160   |           | 80    | μA   |
| C <sub>i</sub>  |   |                           | 2 V to 6 V      |                       | 3     | 10   |           | 10    |           | 10    | pF   |



**SN54HC373, SN74HC373**  
**OCTAL TRANSPARENT D-TYPE LATCHES**  
**WITH 3-STATE OUTPUTS**

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timing requirements over recommended operating free-air temperature range (unless otherwise noted)

|                                      | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     | SN54HC373 |     | SN74HC373 |     | UNIT |
|--------------------------------------|----------|--------------------------|-----|-----------|-----|-----------|-----|------|
|                                      |          | MIN                      | MAX | MIN       | MAX | MIN       | MAX |      |
| $t_w$ Pulse duration, LE high        | 2 V      | 80                       | 120 | 100       |     |           |     | ns   |
|                                      | 4.5 V    | 16                       | 24  | 20        |     |           |     |      |
|                                      | 6 V      | 14                       | 20  | 17        |     |           |     |      |
| $t_{su}$ Setup time, data before LE↓ | 2 V      | 50                       | 75  | 63        |     |           |     | ns   |
|                                      | 4.5 V    | 10                       | 15  | 13        |     |           |     |      |
|                                      | 6 V      | 9                        | 13  | 11        |     |           |     |      |
| $t_h$ Hold time, data after LE↓      | 2 V      | 20                       | 26  | 24        |     |           |     | ns   |
|                                      | 4.5 V    | 10                       | 13  | 12        |     |           |     |      |
|                                      | 6 V      | 10                       | 13  | 12        |     |           |     |      |

switching characteristics over recommended operating free-air temperature range,  $C_L = 50$  pF (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT)    | TO (OUTPUT) | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     |     | SN54HC373 |     | SN74HC373 |     | UNIT |
|-----------|-----------------|-------------|----------|--------------------------|-----|-----|-----------|-----|-----------|-----|------|
|           |                 |             |          | MIN                      | TYP | MAX | MIN       | MAX | MIN       | MAX |      |
| $t_{pd}$  | D               | Q           | 2 V      |                          | 58  | 150 | 225       | 190 |           |     | ns   |
|           |                 |             | 4.5 V    |                          | 15  | 30  | 45        | 38  |           |     |      |
|           |                 |             | 6 V      |                          | 13  | 26  | 38        | 32  |           |     |      |
|           | LE              | Any Q       | 2 V      |                          | 73  | 175 | 265       | 220 |           |     |      |
|           |                 |             | 4.5 V    |                          | 18  | 35  | 53        | 44  |           |     |      |
|           |                 |             | 6 V      |                          | 15  | 30  | 45        | 38  |           |     |      |
| $t_{en}$  | $\overline{OE}$ | Any Q       | 2 V      |                          | 65  | 150 | 225       | 190 |           |     | ns   |
|           |                 |             | 4.5 V    |                          | 17  | 30  | 45        | 38  |           |     |      |
|           |                 |             | 6 V      |                          | 14  | 26  | 38        | 32  |           |     |      |
| $t_{dis}$ | $\overline{OE}$ | Any Q       | 2 V      |                          | 50  | 150 | 225       | 190 |           |     | ns   |
|           |                 |             | 4.5 V    |                          | 15  | 30  | 45        | 38  |           |     |      |
|           |                 |             | 6 V      |                          | 13  | 26  | 38        | 32  |           |     |      |
| $t_t$     |                 | Any Q       | 2 V      |                          | 28  | 60  | 90        | 75  |           |     | ns   |
|           |                 |             | 4.5 V    |                          | 8   | 12  | 18        | 15  |           |     |      |
|           |                 |             | 6 V      |                          | 6   | 10  | 15        | 13  |           |     |      |



# SN54HC373, SN74HC373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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switching characteristics over recommended operating free-air temperature range,  $C_L = 150 \text{ pF}$   
(unless otherwise noted) (see Figure 1)

| PARAMETER | FROM<br>(INPUT)        | TO<br>(OUTPUT) | $V_{CC}$ | $T_A = 25^\circ\text{C}$ |     |     | SN54HC373 |     | SN74HC373 |     | UNIT |
|-----------|------------------------|----------------|----------|--------------------------|-----|-----|-----------|-----|-----------|-----|------|
|           |                        |                |          | MIN                      | TYP | MAX | MIN       | MAX | MIN       | MAX |      |
| $t_{pd}$  | D                      | Q              | 2 V      | 82                       | 200 |     | 300       |     | 250       | ns  |      |
|           |                        |                | 4.5 V    | 22                       | 40  |     | 60        |     | 50        |     |      |
|           |                        |                | 6 V      | 19                       | 34  |     | 51        |     | 43        |     |      |
|           | LE                     | Any Q          | 2 V      | 100                      | 225 |     | 335       |     | 285       |     |      |
|           |                        |                | 4.5 V    | 24                       | 45  |     | 67        |     | 57        |     |      |
|           |                        |                | 6 V      | 20                       | 38  |     | 57        |     | 48        |     |      |
| $t_{en}$  | $\overline{\text{OE}}$ | Any Q          | 2 V      | 90                       | 200 |     | 300       |     | 250       | ns  |      |
|           |                        |                | 4.5 V    | 23                       | 40  |     | 60        |     | 50        |     |      |
|           |                        |                | 6 V      | 19                       | 34  |     | 51        |     | 43        |     |      |
| $t_t$     |                        | Any Q          | 2 V      | 45                       | 210 |     | 315       |     | 265       | ns  |      |
|           |                        |                | 4.5 V    | 17                       | 42  |     | 63        |     | 53        |     |      |
|           |                        |                | 6 V      | 13                       | 36  |     | 53        |     | 45        |     |      |

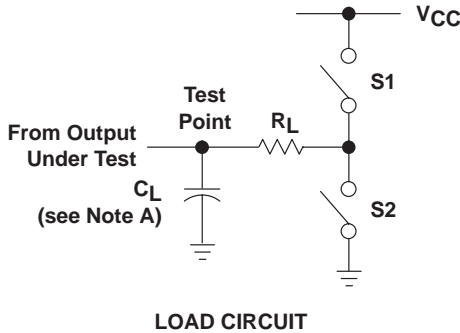
operating characteristics,  $T_A = 25^\circ\text{C}$

| PARAMETER  | TEST CONDITIONS | TYP | UNIT |
|--|-----------------|-----|------|
| $C_{pd}$ Power dissipation capacitance per latch | No load         | 100 | pF   |

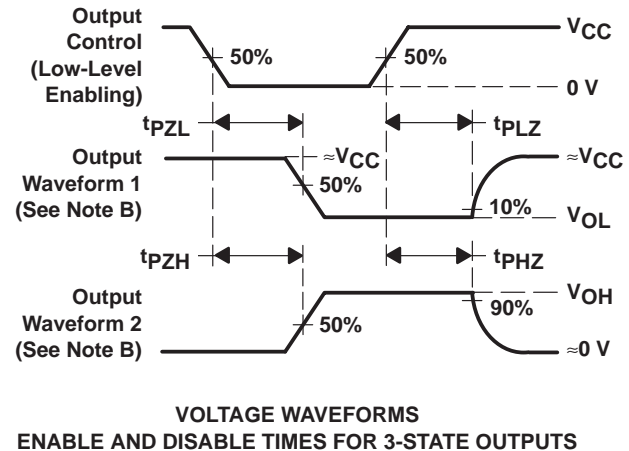
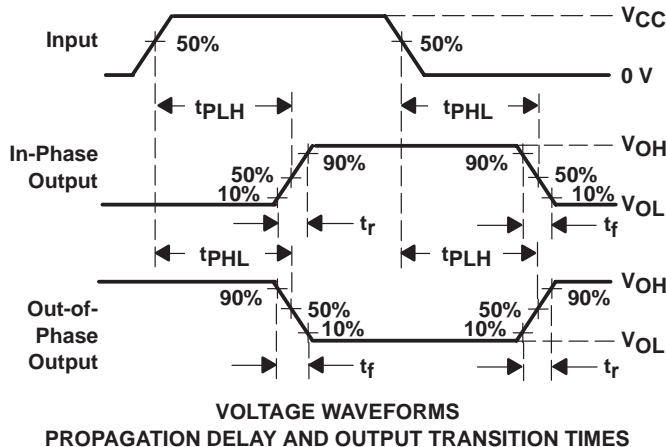
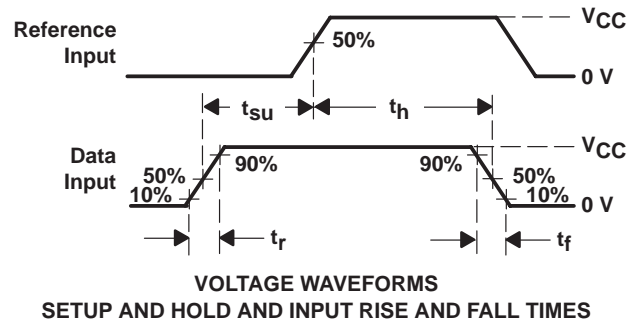
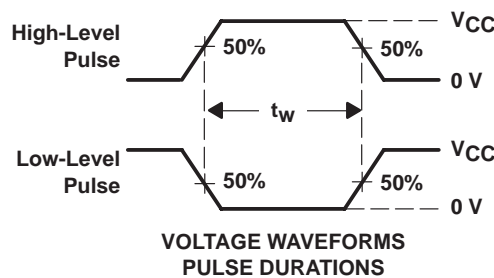
# SN54HC373, SN74HC373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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## PARAMETER MEASUREMENT INFORMATION



| PARAMETER         | $R_L$        | $C_L$                 | S1     | S2     |
|-------------------|--------------|-----------------------|--------|--------|
| $t_{en}$          | 1 k $\Omega$ | 50 pF<br>or<br>150 pF | Open   | Closed |
|                   |              |                       | Closed | Open   |
| $t_{dis}$         | 1 k $\Omega$ | 50 pF                 | Open   | Closed |
|                   |              |                       | Closed | Open   |
| $t_{pd}$ or $t_t$ | --           | 50 pF<br>or<br>150 pF | Open   | Open   |



- NOTES: A.  $C_L$  includes probe and test-fixture capacitance.  
 B. 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.  
 C. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics:  $PRR \leq 1$  MHz,  $Z_O = 50 \Omega$ ,  $t_r = 6$  ns,  $t_f = 6$  ns.  
 D. The outputs are measured one at a time with one input transition per measurement.  
 E.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .  
 F.  $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{en}$ .  
 G.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .

Figure 1. Load Circuit and Voltage Waveforms

PACKAGING INFORMATION

| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup>               |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|--|
| 5962-8407201VRA  | ACTIVE                | CDIP         | J               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| 5962-8407201VSA  | ACTIVE                | CFP          | W               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| 84072012A        | ACTIVE                | LCCC         | FK              | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| 8407201RA        | ACTIVE                | CDIP         | J               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| 8407201SA        | ACTIVE                | CFP          | W               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| JM38510/65403B2A | ACTIVE                | LCCC         | FK              | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| JM38510/65403BRA | ACTIVE                | CDIP         | J               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| SN54HC373J       | ACTIVE                | CDIP         | J               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| SN74HC373DBLE    | OBSOLETE              | SSOP         | DB              | 20   |             | None                    | Call TI          | Call TI                                    |
| SN74HC373DBR     | ACTIVE                | SSOP         | DB              | 20   | 2000        | Pb-Free (RoHS)          | CU NIPDAU        | Level-2-260C-1 YEAR/<br>Level-1-235C-UNLIM |
| SN74HC373DW      | ACTIVE                | SOIC         | DW              | 20   | 25          | Pb-Free (RoHS)          | CU NIPDAU        | Level-2-250C-1 YEAR/<br>Level-1-235C-UNLIM |
| SN74HC373DWR     | ACTIVE                | SOIC         | DW              | 20   | 2000        | Pb-Free (RoHS)          | CU NIPDAU        | Level-2-250C-1 YEAR/<br>Level-1-235C-UNLIM |
| SN74HC373N       | ACTIVE                | PDIP         | N               | 20   | 20          | Pb-Free (RoHS)          | CU NIPDAU        | Level-NC-NC-NC                             |
| SN74HC373N3      | OBSOLETE              | PDIP         | N               | 20   |             | None                    | Call TI          | Call TI                                    |
| SN74HC373NSR     | ACTIVE                | SO           | NS              | 20   | 2000        | Pb-Free (RoHS)          | CU NIPDAU        | Level-2-260C-1 YEAR/<br>Level-1-235C-UNLIM |
| SN74HC373PW      | ACTIVE                | TSSOP        | PW              | 20   | 70          | Pb-Free (RoHS)          | CU NIPDAU        | Level-1-250C-UNLIM                         |
| SN74HC373PWLE    | OBSOLETE              | TSSOP        | PW              | 20   |             | None                    | Call TI          | Call TI                                    |
| SN74HC373PWR     | ACTIVE                | TSSOP        | PW              | 20   | 2000        | Pb-Free (RoHS)          | CU NIPDAU        | Level-1-250C-UNLIM                         |
| SN74HC373PWT     | ACTIVE                | TSSOP        | PW              | 20   | 250         | Pb-Free (RoHS)          | CU NIPDAU        | Level-1-250C-UNLIM                         |
| SNJ54HC373FK     | ACTIVE                | LCCC         | FK              | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| SNJ54HC373J      | ACTIVE                | CDIP         | J               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |
| SNJ54HC373W      | ACTIVE                | CFP          | W               | 20   | 1           | None                    | Call TI          | Level-NC-NC-NC                             |

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - May not be currently available - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**None:** Not yet available Lead (Pb-Free).

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean "Pb-Free" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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J (R-GDIP-T\*\*)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



| DIM \ PINS ** | 14                     | 16                     | 18                     | 20                     |
|---------------|------------------------|------------------------|------------------------|------------------------|
| A             | 0.300<br>(7,62)<br>BSC | 0.300<br>(7,62)<br>BSC | 0.300<br>(7,62)<br>BSC | 0.300<br>(7,62)<br>BSC |
| B MAX         | 0.785<br>(19,94)       | .840<br>(21,34)        | 0.960<br>(24,38)       | 1.060<br>(26,92)       |
| B MIN         | —                      | —                      | —                      | —                      |
| C MAX         | 0.300<br>(7,62)        | 0.300<br>(7,62)        | 0.310<br>(7,87)        | 0.300<br>(7,62)        |
| C MIN         | 0.245<br>(6,22)        | 0.245<br>(6,22)        | 0.220<br>(5,59)        | 0.245<br>(6,22)        |

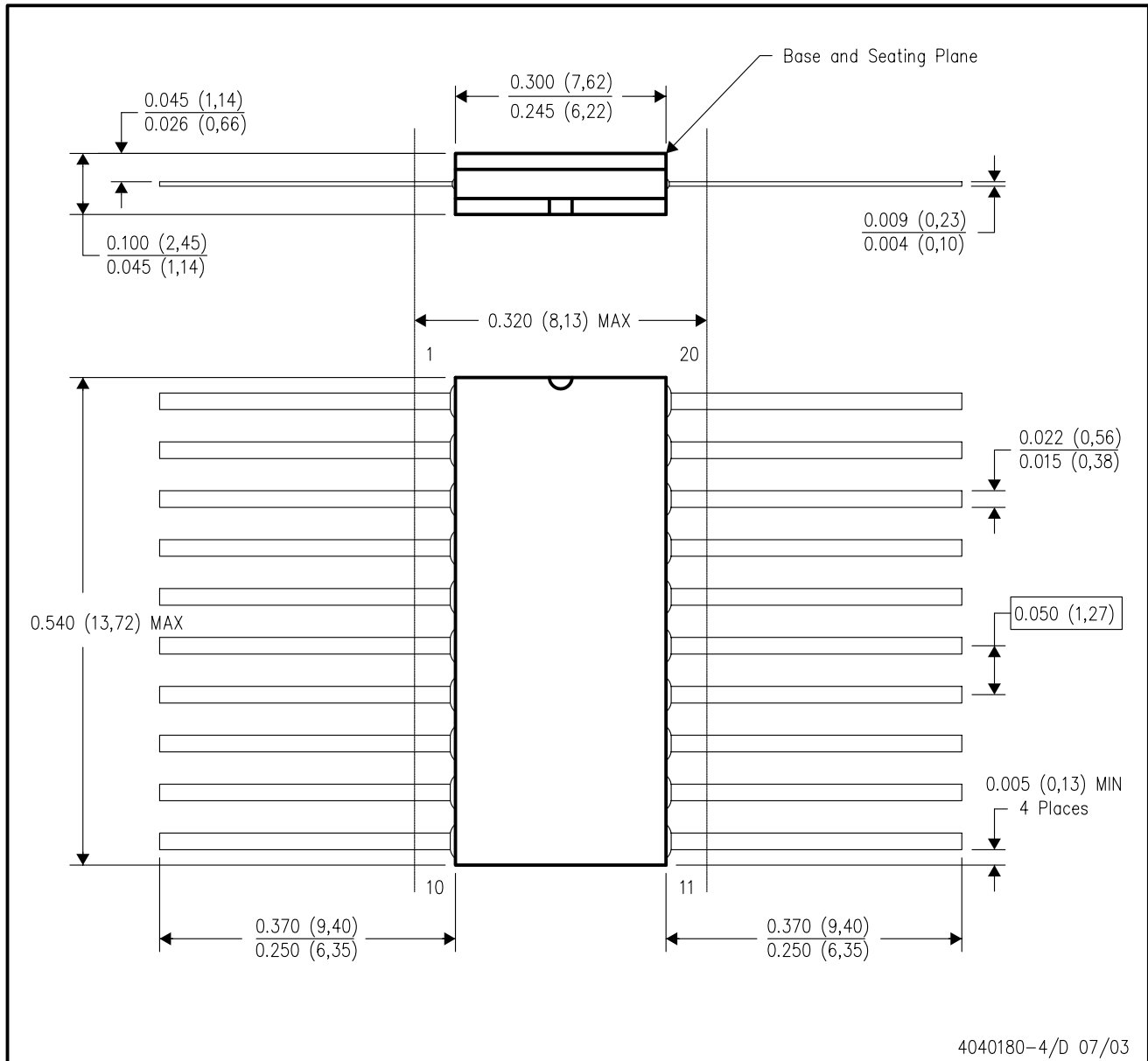


4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package is hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package can be hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only.
  - E. Falls within Mil-Std 1835 GDFP2-F20

FK (S-CQCC-N\*\*)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



4040140/D 10/96

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package can be hermetically sealed with a metal lid.
  - D. The terminals are gold plated.
  - E. Falls within JEDEC MS-004

N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

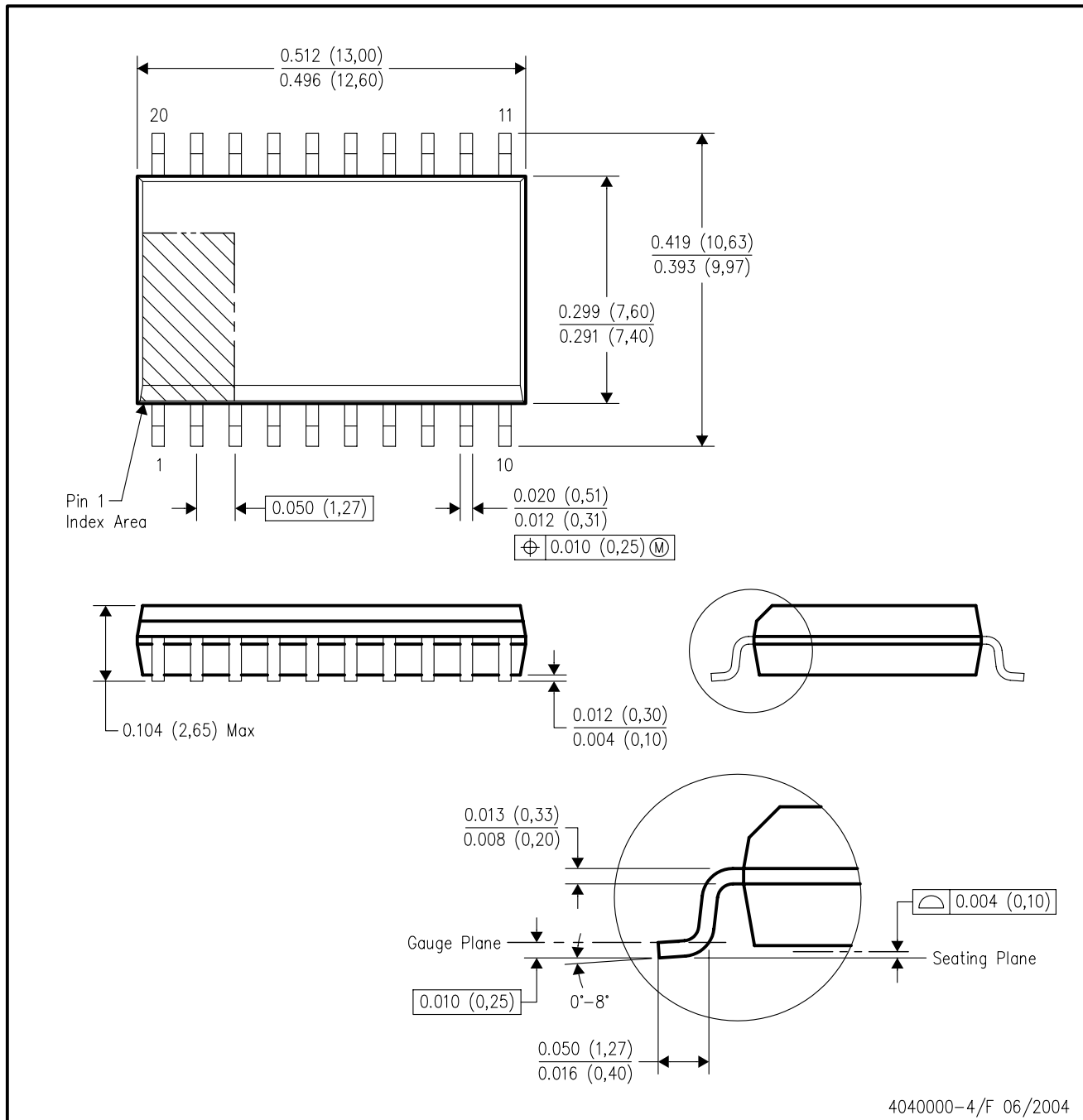
16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - $\triangle C$  Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - $\triangle D$  The 20 pin end lead shoulder width is a vendor option, either half or full width.

DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - D. Falls within JEDEC MS-013 variation AC.

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

DB (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-150

PW (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.  
 D. Falls within JEDEC MO-153



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