

# SN54ALS574B, SN54AS574, SN54AS575 SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575 OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH 3-STATE OUTPUTS

SDAS165B – JUNE 1982 – REVISED JULY 1995

- 3-State Buffer-Type Noninverting Outputs Drive Bus Lines Directly
- Bus-Structured Pinout
- Buffered Control Inputs
- SN74ALS575A and 'AS575 Have Synchronous Clear
- Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), Standard Plastic (N, NT) and Ceramic (J, JT) 300-mil DIPs, and Ceramic Flat (W) Packages

## description

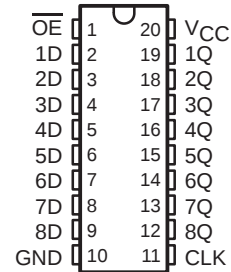
These octal D-type edge-triggered flip-flops feature 3-state outputs designed specifically for bus driving. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The eight flip-flops enter data on the low-to-high transition of the clock (CLK) input. The SN74ALS575A, SN54AS575, and SN74AS575 may be synchronously cleared by taking the clear (CLR) input low.

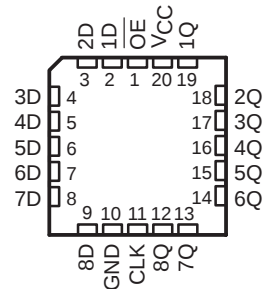
The output-enable ( $\overline{OE}$ ) input does not affect internal operations of the flip-flops. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

The SN54ALS574B, SN54AS574, and SN54AS575 are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74ALS574B, SN74ALS575A, SN74AS574, and SN74AS575 are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

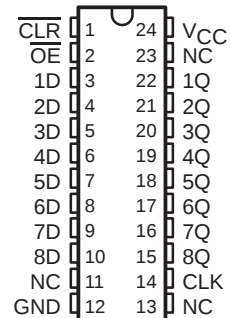
SN54ALS574B, SN54AS574 . . . J OR W PACKAGE  
SN74ALS574B, SN74AS574 . . . DW OR N PACKAGE  
(TOP VIEW)



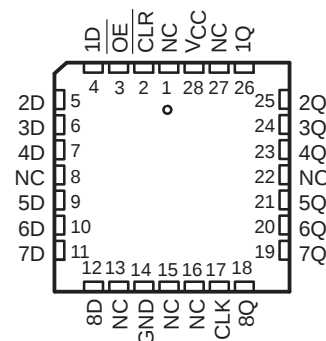
SN54ALS574B, SN54AS574 . . . FK PACKAGE  
(TOP VIEW)



SN54AS575 . . . JT OR W PACKAGE  
SN74ALS575A, SN74AS575 . . . DW OR NT PACKAGE  
(TOP VIEW)



SN54AS575 . . . FK PACKAGE  
(TOP VIEW)



NC – No internal connection

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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# SN54ALS574B, SN54AS574, SN54AS575 SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575 OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH 3-STATE OUTPUTS

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## Function Tables

SN54ALS574B, SN74ALS574B, SN54AS574, SN74AS574  
(each flip-flop)

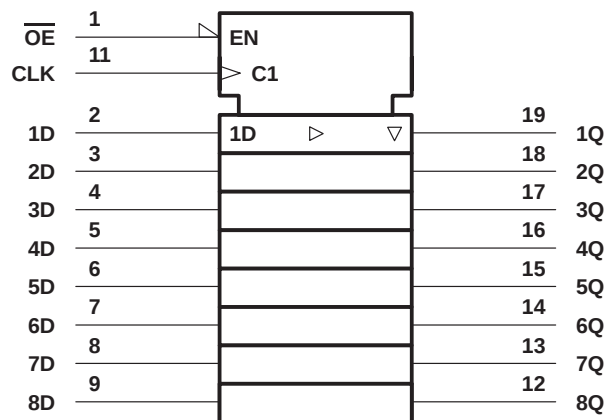
| INPUTS                 |     |   | OUTPUT<br>Q    |
|------------------------|-----|---|----------------|
| $\overline{\text{OE}}$ | CLK | D |                |
| L                      | ↑   | H | H              |
| L                      | ↑   | L | L              |
| L                      | L   | X | Q <sub>0</sub> |
| H                      | X   | X | Z              |

SN74ALS575A, SN54AS575, SN74AS575  
(each flip-flop)

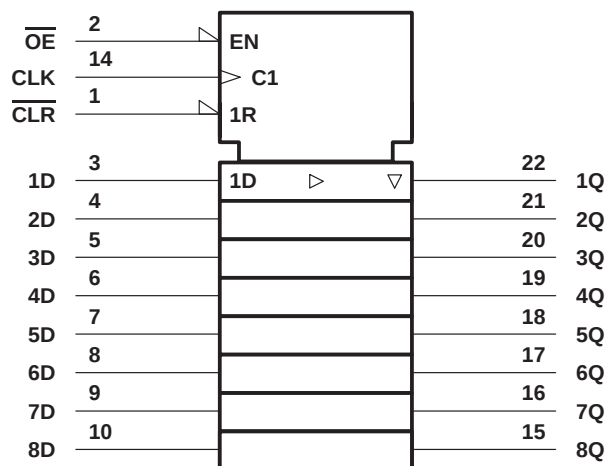
| INPUTS                 |                         |     |   | OUTPUT<br>Q    |
|------------------------|-------------------------|-----|---|----------------|
| $\overline{\text{OE}}$ | $\overline{\text{CLR}}$ | CLK | D |                |
| L                      | L                       | ↑   | X | L              |
| L                      | H                       | ↑   | H | H              |
| L                      | H                       | ↑   | L | L              |
| L                      | H                       | L   | X | Q <sub>0</sub> |
| H                      | X                       | H   | X | Z              |

## logic symbols†

SN54ALS574B, SN74ALS574B,  
SN54AS574, SN74AS574



SN74ALS575A, SN54AS575,  
SN74AS575

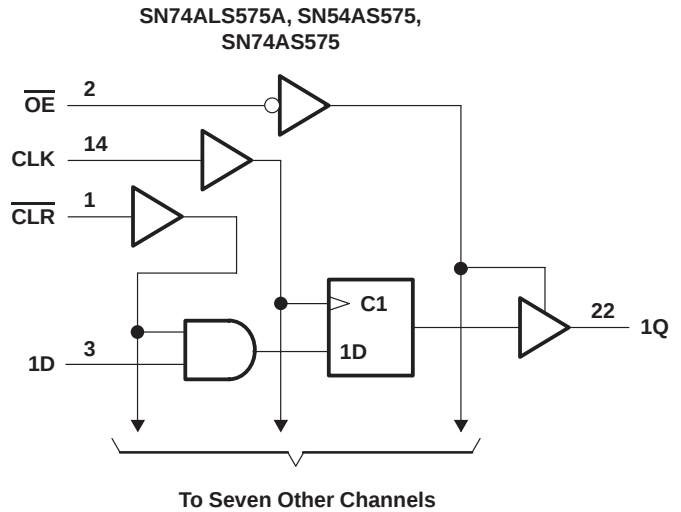
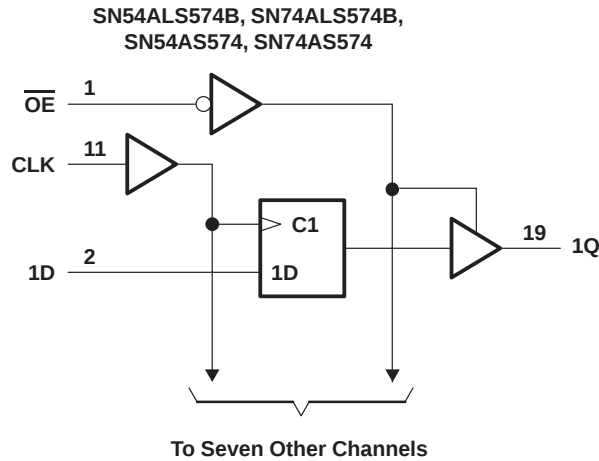


† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.  
Pin numbers shown are for the DW, J, JT, N, and NT packages.

**SN54ALS574B, SN54AS574, SN54AS575  
SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575  
OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH 3-STATE OUTPUTS**

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**logic diagrams (positive logic)**



Pin numbers shown are for the DW, J, JT, N, and NT packages.

**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>**

|                                                           |                |
|-----------------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$                                  | 7 V            |
| Input voltage, $V_I$                                      | 7 V            |
| Voltage applied to a disabled 3-state output              | 5.5 V          |
| Operating free-air temperature range, $T_A$ : SN54ALS574B | –55°C to 125°C |
| SN74ALS574B, SN74ALS575A                                  | 0°C to 70°C    |
| Storage temperature range                                 | –65°C to 150°C |

<sup>†</sup> 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.

**recommended operating conditions**

|             |                                  |                               | SN54ALS574B |     |     | SN74ALS574B<br>SN74ALS575A |     |      | 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          |                               |             |     | 0.7 |                            |     | 0.8  | V    |
| $I_{OH}$    | High-level output current        |                               |             |     | –1  |                            |     | –2.6 | mA   |
| $I_{OL}$    | Low-level output current         |                               |             |     | 12  |                            |     | 24   | mA   |
| $f_{clock}$ | Clock frequency                  | 'ALS574B                      | 0           |     | 28  | 0                          |     | 35   | MHz  |
|             |                                  | SN74ALS575A                   |             |     |     | 0                          |     | 30   |      |
| $t_w$       | Pulse duration                   | 'ALS574B, CLK high or low     | 16.5        |     |     | 14                         |     |      | ns   |
|             |                                  | SN74ALS575A, CLK high or low  |             |     |     | 16.5                       |     |      |      |
| $t_{su}$    | Setup time before CLK $\uparrow$ | Data                          | 15          |     |     | 15                         |     |      | ns   |
|             |                                  | SN74ALS575A, $\overline{CLR}$ |             |     |     | 15                         |     |      |      |
| $t_h$       | Hold time after CLK $\uparrow$   | Data                          | 4           |     |     | 0                          |     |      | ns   |
|             |                                  | SN74ALS575A, $\overline{CLR}$ |             |     |     | 0                          |     |      |      |
| $T_A$       | Operating free-air temperature   |                               | –55         |     | 125 | 0                          |     | 70   | °C   |



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**SN54ALS574B, SN54AS574, SN54AS575**  
**SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575**  
**OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH 3-STATE OUTPUTS**

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

| PARAMETER          |             | TEST CONDITIONS                                                         | SN54ALS574B      |                  |      | SN74ALS574B<br>SN74ALS575A |                  |      | UNIT          |
|--------------------|-------------|-------------------------------------------------------------------------|------------------|------------------|------|----------------------------|------------------|------|---------------|
|                    |             |                                                                         | MIN              | TYP <sup>†</sup> | MAX  | MIN                        | TYP <sup>†</sup> | MAX  |               |
| $V_{IK}$           |             | $V_{CC} = 4.5\text{ V}$ ,<br>$I_I = -18\text{ mA}$                      |                  |                  | -1.2 |                            |                  | -1.2 | V             |
| $V_{OH}$           |             | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$ ,<br>$I_{OH} = -0.4\text{ mA}$ | $V_{CC} - 2$     |                  |      | $V_{CC} - 2$               |                  |      | V             |
|                    |             | $V_{CC} = 4.5\text{ V}$ ,<br>$I_{OH} = -1\text{ mA}$                    | 2.4              | 3.3              |      |                            |                  |      |               |
|                    |             | $V_{CC} = 4.5\text{ V}$ ,<br>$I_{OH} = -2.6\text{ mA}$                  |                  |                  |      | 2.4                        | 3.2              |      |               |
| $V_{OL}$           |             | $V_{CC} = 4.5\text{ V}$ ,<br>$I_{OL} = 12\text{ mA}$                    |                  | 0.25             | 0.4  |                            | 0.25             | 0.4  | V             |
|                    |             | $V_{CC} = 4.5\text{ V}$ ,<br>$I_{OL} = 24\text{ mA}$                    |                  |                  |      |                            | 0.35             | 0.5  |               |
| $I_{OZH}$          |             | $V_{CC} = 5.5\text{ V}$ ,<br>$V_O = 2.7\text{ V}$                       |                  |                  | 20   |                            |                  | 20   | $\mu\text{A}$ |
| $I_{OZL}$          |             | $V_{CC} = 5.5\text{ V}$ ,<br>$V_O = 0.4\text{ V}$                       |                  |                  | -20  |                            |                  | -20  | $\mu\text{A}$ |
| $I_I$              |             | $V_{CC} = 5.5\text{ V}$ ,<br>$V_I = 7\text{ V}$                         |                  |                  | 0.1  |                            |                  | 0.1  | mA            |
| $I_{IH}$           |             | $V_{CC} = 5.5\text{ V}$ ,<br>$V_I = 2.7\text{ V}$                       |                  |                  | 20   |                            |                  | 20   | $\mu\text{A}$ |
| $I_{IL}$           |             | $V_{CC} = 5.5\text{ V}$ ,<br>$V_I = 0.4\text{ V}$                       |                  |                  | -0.2 |                            |                  | -0.2 | mA            |
| $I_{O}^{\ddagger}$ |             | $V_{CC} = 5.5\text{ V}$ ,<br>$V_O = 2.25\text{ V}$                      | -20              |                  | -112 | -30                        |                  | -112 | mA            |
| $I_{CC}$           | 'ALS574B    | $V_{CC} = 5.5\text{ V}$                                                 | Outputs high     |                  | 11   | 18                         | 11               | 18   | mA            |
|                    |             |                                                                         | Outputs low      |                  | 17   | 27                         | 17               | 27   |               |
|                    |             |                                                                         | Outputs disabled |                  | 17   | 28                         | 17               | 28   |               |
|                    | SN74ALS575A | $V_{CC} = 5.5\text{ V}$                                                 | Outputs high     |                  | 10   | 17                         | 10               | 17   |               |
|                    |             |                                                                         | Outputs low      |                  | 15   | 24                         | 15               | 24   |               |
|                    |             |                                                                         | Outputs disabled |                  | 16   | 30                         | 16               | 30   |               |

<sup>†</sup> All typical values are at  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ .

<sup>‡</sup> The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$ .

**switching characteristics (see Figure 1)**

| PARAMETER        | FROM<br>(INPUT) | TO<br>(OUTPUT) | V <sub>CC</sub> = 4.5 V to 5.5 V,<br>C <sub>L</sub> = 50 pF,<br>R1 = 500 Ω,<br>R2 = 500 Ω,<br>T <sub>A</sub> = MIN to MAX§ |     |             |     |             |     | UNIT |
|------------------|-----------------|----------------|----------------------------------------------------------------------------------------------------------------------------|-----|-------------|-----|-------------|-----|------|
|                  |                 |                | SN54ALS574B                                                                                                                |     | SN74ALS574B |     | SN74ALS575A |     |      |
|                  |                 |                | MIN                                                                                                                        | MAX | MIN         | MAX | MIN         | MAX |      |
| f <sub>max</sub> |                 |                | 28                                                                                                                         |     | 35          |     | 30          |     | MHz  |
| t <sub>PLH</sub> | CLK             | Q              | 4                                                                                                                          | 22  | 3           | 14  | 4           | 14  | ns   |
| t <sub>PHL</sub> |                 |                | 4                                                                                                                          | 17  | 4           | 14  | 4           | 14  |      |
| t <sub>PZH</sub> | OE              | Q              | 4                                                                                                                          | 21  | 3           | 18  | 4           | 18  | ns   |
| t <sub>PZL</sub> |                 |                | 4                                                                                                                          | 26  | 4           | 18  | 4           | 18  |      |
| t <sub>PHZ</sub> | OE              | Q              | 2                                                                                                                          | 16  | 1           | 10  | 2           | 10  | ns   |
| t <sub>PLZ</sub> |                 |                | 2                                                                                                                          | 25  | 2           | 12  | 3           | 13  |      |

<sup>\S</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.



**SN54ALS574B, SN54AS574, SN54AS575**  
**SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575**  
**OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH 3-STATE OUTPUTS**

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**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>**

|                                                                    |                |
|--------------------------------------------------------------------|----------------|
| Supply voltage, $V_{CC}$                                           | 7 V            |
| Input voltage, $V_I$                                               | 7 V            |
| Voltage applied to a disabled 3-state output                       | 5.5 V          |
| Operating free-air temperature range, $T_A$ : SN54AS574, SN54AS575 | –55°C to 125°C |
| SN74AS574, SN74AS575                                               | 0°C to 70°C    |
| Storage temperature range                                          | –65°C to 150°C |

<sup>†</sup> 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.

**recommended operating conditions**

|                      |                                | SN54AS574<br>SN54AS575                      |     |     | SN74AS574<br>SN74AS575 |     |     | UNIT |     |
|----------------------|--------------------------------|---------------------------------------------|-----|-----|------------------------|-----|-----|------|-----|
|                      |                                | MIN                                         | NOM | MAX | MIN                    | NOM | MAX |      |     |
| V <sub>CC</sub>      | Supply voltage                 |                                             | 4.5 | 5   | 5.5                    | 4.5 | 5   | 5.5  | V   |
| V <sub>IH</sub>      | High-level input voltage       |                                             | 2   |     |                        | 2   |     |      | V   |
| V <sub>IL</sub>      | Low-level input voltage        |                                             | 0.8 |     |                        | 0.8 |     |      | V   |
| I <sub>OH</sub>      | High-level output current      |                                             | −12 |     |                        | −15 |     |      | mA  |
| I <sub>OL</sub>      | Low-level output current       |                                             | 32  |     |                        | 48  |     |      | mA  |
| f <sub>clock</sub> * | Clock frequency                |                                             | 0   | 100 |                        | 0   | 90  |      | MHz |
| t <sub>w</sub> *     | Pulse duration                 | CLK high                                    | 5   |     |                        | 5.5 |     |      | ns  |
|                      |                                | CLK low                                     | 4   |     |                        | 5.5 |     |      |     |
| t <sub>su</sub> *    | Setup time before CLK↑         | Data                                        | 3   |     |                        | 5.5 |     |      | ns  |
|                      |                                | ‘AS575, $\overline{\text{CLR}}$ high or low | 6.5 |     |                        | 6.5 |     |      |     |
| t <sub>h</sub> *     | Hold time after CLK↑           | Data                                        | 3   |     |                        | 3   |     |      | ns  |
|                      |                                | ‘AS575, $\overline{\text{CLR}}$             | 0   |     |                        | 0   |     |      |     |
| T <sub>A</sub>       | Operating free-air temperature |                                             | −55 | 125 |                        | 0   | 70  |      | °C  |

\* On products compliant to MIL-STD-883, Class B, this parameter is based on characterization data but is not production tested.



**SN54ALS574B, SN54AS574, SN54AS575**  
**SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575**  
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**electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)**

| PARAMETER        |              | TEST CONDITIONS                                           |                          | SN54AS574<br>SN54AS575 |      |      | SN74AS574<br>SN74AS575 |      |     | UNIT |
|------------------|--------------|-----------------------------------------------------------|--------------------------|------------------------|------|------|------------------------|------|-----|------|
|                  |              |                                                           |                          | MIN                    | TYP† | MAX  | MIN                    | TYP† | MAX |      |
| V <sub>IK</sub>  |              | V <sub>CC</sub> = 4.5 V, I <sub>I</sub> = −18 mA          |                          | −1.2                   |      |      | −1.2                   |      |     | V    |
| V <sub>OH</sub>  |              | V <sub>CC</sub> = 4.5 V to 5.5 V, I <sub>OH</sub> = −2 mA |                          | V <sub>CC</sub> − 2    |      |      | V <sub>CC</sub> − 2    |      |     | V    |
|                  |              | V <sub>CC</sub> = 4.5 V                                   | I <sub>OH</sub> = −12 mA | 2.4                    | 3.2  |      |                        |      |     |      |
|                  |              |                                                           | I <sub>OH</sub> = −15 mA |                        |      |      | 2.4                    | 3.3  |     |      |
| V <sub>OL</sub>  |              | V <sub>CC</sub> = 4.5 V                                   | I <sub>OL</sub> = 32 mA  | 0.29                   |      | 0.5  |                        |      |     | V    |
|                  |              |                                                           | I <sub>OL</sub> = 48 mA  |                        |      | 0.34 |                        | 0.5  |     |      |
| I <sub>OZH</sub> |              | V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 2.7 V           |                          | 50                     |      |      | 50                     |      |     | μA   |
| I <sub>OZL</sub> |              | V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 0.4 V           |                          | −50                    |      |      | −50                    |      |     | μA   |
| I <sub>I</sub>   |              | V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 7 V             |                          | 0.1                    |      |      | 0.1                    |      |     | mA   |
| I <sub>IH</sub>  |              | V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 2.7 V           |                          | 20                     |      |      | 20                     |      |     | μA   |
| I <sub>IL</sub>  | OE, CLK, CLR | V <sub>CC</sub> = 5.5 V, V <sub>I</sub> = 0.4 V           |                          | −0.5                   |      |      | −0.5                   |      |     | mA   |
|                  | D            |                                                           |                          | −3                     |      |      | −2                     |      |     |      |
| I <sub>O</sub> ‡ |              | V <sub>CC</sub> = 5.5 V, V <sub>O</sub> = 2.25 V          |                          | −30                    | −112 | −30  | −112                   | mA   |     |      |
| I <sub>CC</sub>  | ‘AS574       | V <sub>CC</sub> = 5.5 V                                   | Outputs high             | 73                     | 116  | 73   | 116                    | mA   |     |      |
|                  |              |                                                           | Outputs low              | 85                     | 134  | 85   | 134                    |      |     |      |
|                  |              |                                                           | Outputs disabled         | 84                     | 134  | 84   | 134                    |      |     |      |
|                  | ‘AS575       | V <sub>CC</sub> = 5.5 V                                   | Outputs high             | 78                     | 126  | 78   | 126                    |      |     |      |
|                  |              |                                                           | Outputs low              | 89                     | 142  | 89   | 142                    |      |     |      |
|                  |              |                                                           | Outputs disabled         | 88                     | 142  | 88   | 142                    |      |     |      |

<sup>†</sup> All typical values are at  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ .

<sup>‡</sup> The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$ .

**switching characteristics (see Figure 1)**

| PARAMETER          | FROM<br>(INPUT) | TO<br>(OUTPUT) | V <sub>CC</sub> = 4.5 V to 5.5 V,<br>C <sub>L</sub> = 50 pF,<br>R <sub>1</sub> = 500 Ω,<br>R <sub>2</sub> = 500 Ω,<br>T <sub>A</sub> = MIN to MAX§ |     |                        |     | UNIT |
|--------------------|-----------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------|-----|------|
|                    |                 |                | SN54AS574<br>SN54AS575                                                                                                                             |     | SN74AS574<br>SN74AS575 |     |      |
|                    |                 |                | MIN                                                                                                                                                | MAX | MIN                    | MAX |      |
| f <sub>max</sub> * |                 |                | 100                                                                                                                                                |     | 90                     |     | MHz  |
| t <sub>PLH</sub>   | CLK             | Any Q          | 3                                                                                                                                                  | 11  | 3                      | 8   | ns   |
| t <sub>PHL</sub>   |                 |                | 4                                                                                                                                                  | 11  | 4                      | 9   |      |
| t <sub>PZH</sub>   | $\overline{OE}$ | Any Q          | 2                                                                                                                                                  | 7   | 2                      | 6   | ns   |
| t <sub>PZL</sub>   |                 |                | 3                                                                                                                                                  | 11  | 3                      | 10  |      |
| t <sub>PHZ</sub>   | $\overline{OE}$ | Any Q          | 2                                                                                                                                                  | 7   | 2                      | 6   | ns   |
| t <sub>PLZ</sub>   |                 |                | 2                                                                                                                                                  | 7   | 2                      | 6   |      |

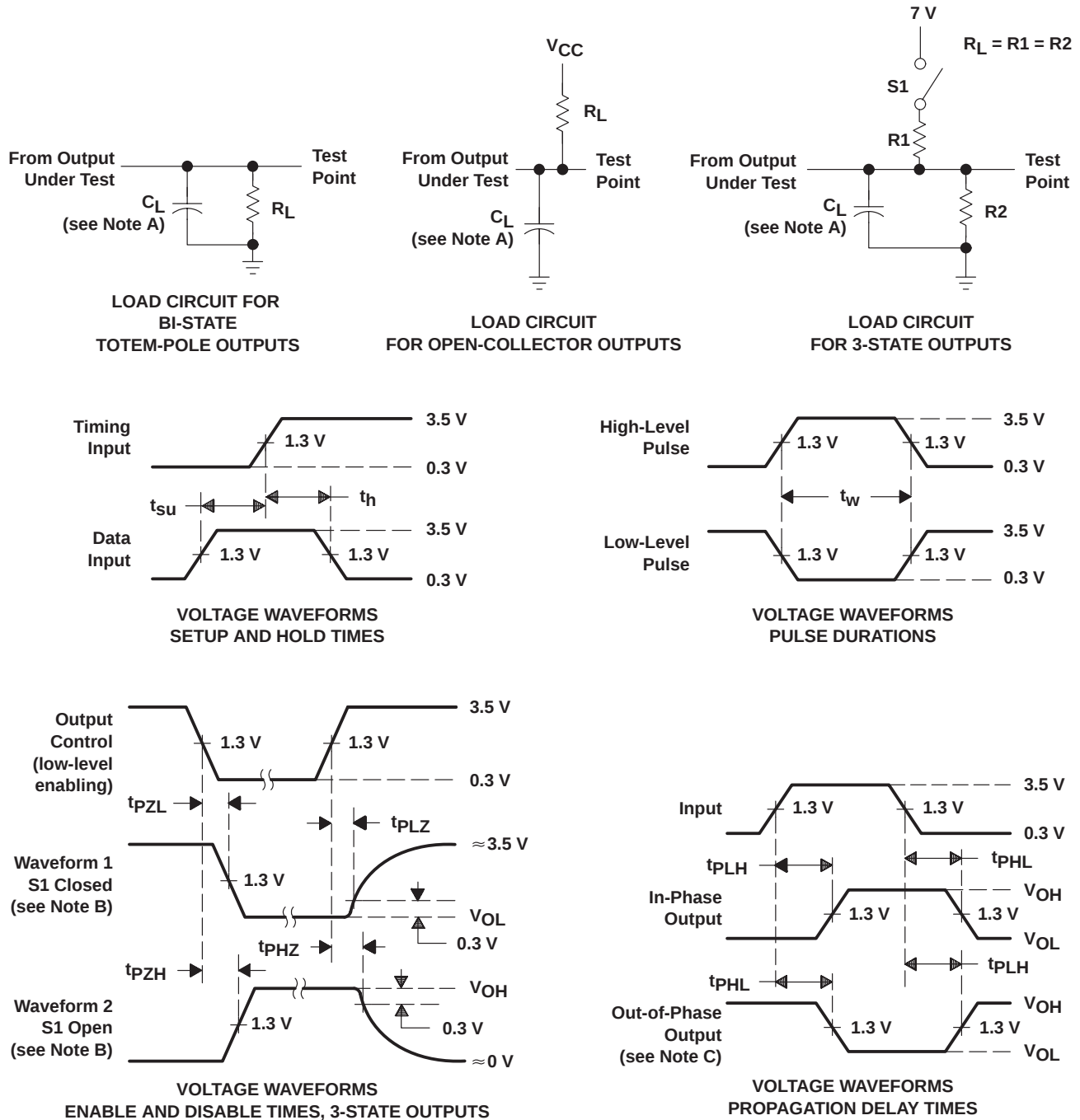
\* On products compliant to MIL-STD-883, Class B, this parameter is based on characterization data but is not production tested.

<sup>§</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

SN54ALS574B, SN54AS574, SN54AS575  
SN74ALS574B, SN74ALS575A, SN74AS574, SN74AS575  
**OCTAL D-TYPE EDGE-TRIGGERED FLIP-FLOPS WITH 3-STATE OUTPUTS**

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**PARAMETER MEASUREMENT INFORMATION  
SERIES 54ALS/74ALS AND 54AS/74AS DEVICES**



- NOTES: A.  $C_L$  includes probe and jig 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. When measuring propagation delay items of 3-state outputs, switch S1 is open.  
D. All input pulses have the following characteristics:  $PRR \leq 1$  MHz,  $t_r = t_f = 2$  ns, duty cycle = 50%.  
E. The outputs are measured one at a time with one transition per measurement.

**Figure 1. Load Circuits and Voltage Waveforms**

## PACKAGING INFORMATION

| Orderable Device | Status<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2)     | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5)         | Samples                 |
|------------------|---------------|--------------|-----------------|------|-------------|---------------------|--------------------------------------|----------------------|--------------|---------------------------------|-------------------------|
| 84001012A        | ACTIVE        | LCCC         | FK              | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 84001012A<br>SNJ54ALS<br>574BFB | <a href="#">Samples</a> |
| 8400101RA        | ACTIVE        | CDIP         | J               | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 8400101RA<br>SNJ54ALS574BJ      | <a href="#">Samples</a> |
| 8400101SA        | ACTIVE        | CFP          | W               | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 8400101SA<br>SNJ54ALS574BW      | <a href="#">Samples</a> |
| JM38510/37104B2A | ACTIVE        | LCCC         | FK              | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>37104B2A            | <a href="#">Samples</a> |
| JM38510/37104BRA | ACTIVE        | CDIP         | J               | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>37104BRA            | <a href="#">Samples</a> |
| M38510/37104B2A  | ACTIVE        | LCCC         | FK              | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>37104B2A            | <a href="#">Samples</a> |
| M38510/37104BRA  | ACTIVE        | CDIP         | J               | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | JM38510/<br>37104BRA            | <a href="#">Samples</a> |
| SN54ALS574BJ     | ACTIVE        | CDIP         | J               | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54ALS574BJ                    | <a href="#">Samples</a> |
| SN54AS574J       | ACTIVE        | CDIP         | J               | 20   | 1           | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SN54AS574J                      | <a href="#">Samples</a> |
| SN74ALS574BDW    | ACTIVE        | SOIC         | DW              | 20   | 25          | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | ALS574B                         | <a href="#">Samples</a> |
| SN74ALS574BDWR   | ACTIVE        | SOIC         | DW              | 20   | 2000        | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | ALS574B                         | <a href="#">Samples</a> |
| SN74ALS574BDWRG4 | ACTIVE        | SOIC         | DW              | 20   | 2000        | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | ALS574B                         | <a href="#">Samples</a> |
| SN74ALS574BN     | ACTIVE        | PDIP         | N               | 20   | 20          | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74ALS574BN                    | <a href="#">Samples</a> |
| SN74ALS574BNE4   | ACTIVE        | PDIP         | N               | 20   | 20          | RoHS & Green        | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74ALS574BN                    | <a href="#">Samples</a> |
| SN74ALS574BNSR   | ACTIVE        | SO           | NS              | 20   | 2000        | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | ALS574B                         | <a href="#">Samples</a> |
| SN74ALS575ADW    | ACTIVE        | SOIC         | DW              | 24   | 25          | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | ALS575A                         | <a href="#">Samples</a> |
| SN74AS574DW      | ACTIVE        | SOIC         | DW              | 20   | 25          | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | AS574                           | <a href="#">Samples</a> |
| SN74AS574DWR     | ACTIVE        | SOIC         | DW              | 20   | 2000        | RoHS & Green        | NIPDAU                               | Level-1-260C-UNLIM   | 0 to 70      | AS574                           | <a href="#">Samples</a> |

| Orderable Device | Status<br>(1) | Package Type | Package<br>Drawing | Pins | Package<br>Qty | Eco Plan<br>(2)     | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5)         | Samples                 |
|------------------|---------------|--------------|--------------------|------|----------------|---------------------|--------------------------------------|----------------------|--------------|---------------------------------|-------------------------|
| SN74AS574N       | ACTIVE        | PDIP         | N                  | 20   | 20             | RoHS &<br>Non-Green | NIPDAU                               | N / A for Pkg Type   | 0 to 70      | SN74AS574N                      | <a href="#">Samples</a> |
| SNJ54ALS574BFK   | ACTIVE        | LCCC         | FK                 | 20   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 84001012A<br>SNJ54ALS<br>574BFK | <a href="#">Samples</a> |
| SNJ54ALS574BJ    | ACTIVE        | CDIP         | J                  | 20   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 8400101RA<br>SNJ54ALS574BJ      | <a href="#">Samples</a> |
| SNJ54ALS574BW    | ACTIVE        | CFP          | W                  | 20   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | 8400101SA<br>SNJ54ALS574BW      | <a href="#">Samples</a> |
| SNJ54AS574J      | ACTIVE        | CDIP         | J                  | 20   | 1              | Non-RoHS<br>& Green | SNPB                                 | N / A for Pkg Type   | -55 to 125   | SNJ54AS574J                     | <a href="#">Samples</a> |

(1) 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.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices 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.

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In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF SN54ALS574B, SN54AS574, SN74ALS574B, SN74AS574 :**

- Catalog : [SN74ALS574B](#), [SN74AS574](#)
  
- Military : [SN54ALS574B](#), [SN54AS574](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
  
- Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION



\*All dimensions are nominal

| Device         | Package Type | Package Drawing | Pins | SPQ  | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74ALS574BDWR | SOIC         | DW              | 20   | 2000 | 330.0              | 24.4               | 10.8    | 13.3    | 2.7     | 12.0    | 24.0   | Q1            |
| SN74ALS574BNSR | SO           | NS              | 20   | 2000 | 330.0              | 24.4               | 8.4     | 13.0    | 2.5     | 12.0    | 24.0   | Q1            |
| SN74AS574DWR   | SOIC         | DW              | 20   | 2000 | 330.0              | 24.4               | 10.8    | 13.3    | 2.7     | 12.0    | 24.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

| Device         | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74ALS574BDWR | SOIC         | DW              | 20   | 2000 | 367.0       | 367.0      | 45.0        |
| SN74ALS574BNSR | SO           | NS              | 20   | 2000 | 367.0       | 367.0      | 45.0        |
| SN74AS574DWR   | SOIC         | DW              | 20   | 2000 | 367.0       | 367.0      | 45.0        |

## TUBE



\*All dimensions are nominal

| Device           | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|------------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| 84001012A        | FK           | LCCC         | 20   | 1   | 506.98 | 12.06  | 2030   | NA     |
| JM38510/37104B2A | FK           | LCCC         | 20   | 1   | 506.98 | 12.06  | 2030   | NA     |
| M38510/37104B2A  | FK           | LCCC         | 20   | 1   | 506.98 | 12.06  | 2030   | NA     |
| SN74ALS574BDW    | DW           | SOIC         | 20   | 25  | 507    | 12.83  | 5080   | 6.6    |
| SN74ALS574BN     | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74ALS574BNE4   | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SN74ALS575ADW    | DW           | SOIC         | 24   | 25  | 506.98 | 12.7   | 4826   | 6.6    |
| SN74AS574DW      | DW           | SOIC         | 20   | 25  | 507    | 12.83  | 5080   | 6.6    |
| SN74AS574N       | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| SNJ54ALS574BFB   | FK           | LCCC         | 20   | 1   | 506.98 | 12.06  | 2030   | NA     |

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

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

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



| PINS **<br>DIM | 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)        |

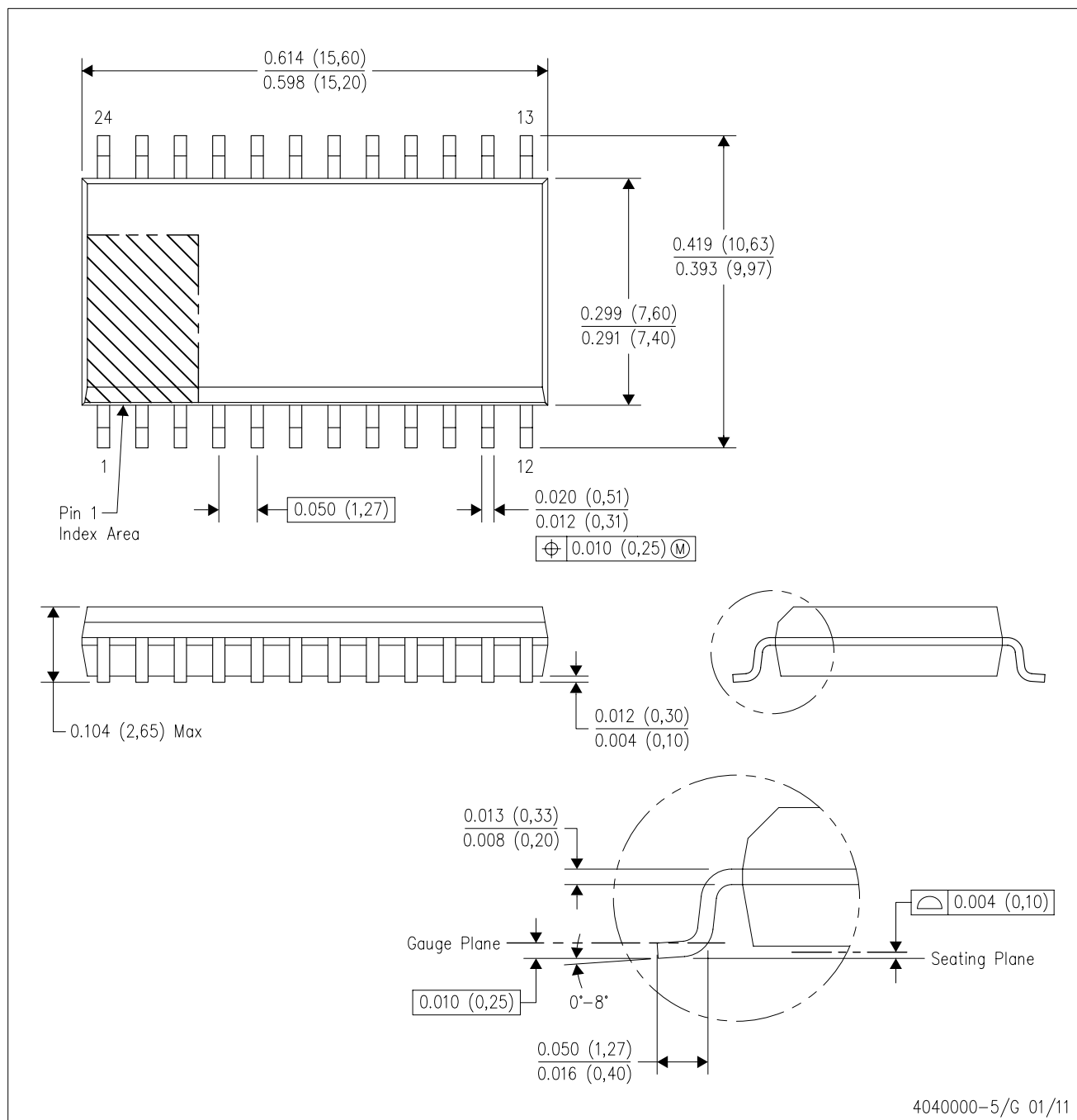


4040083/F 03/03

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

DW (R-PDSO-G24)

## PLASTIC SMALL OUTLINE



- NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.  
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 AD.

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

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE

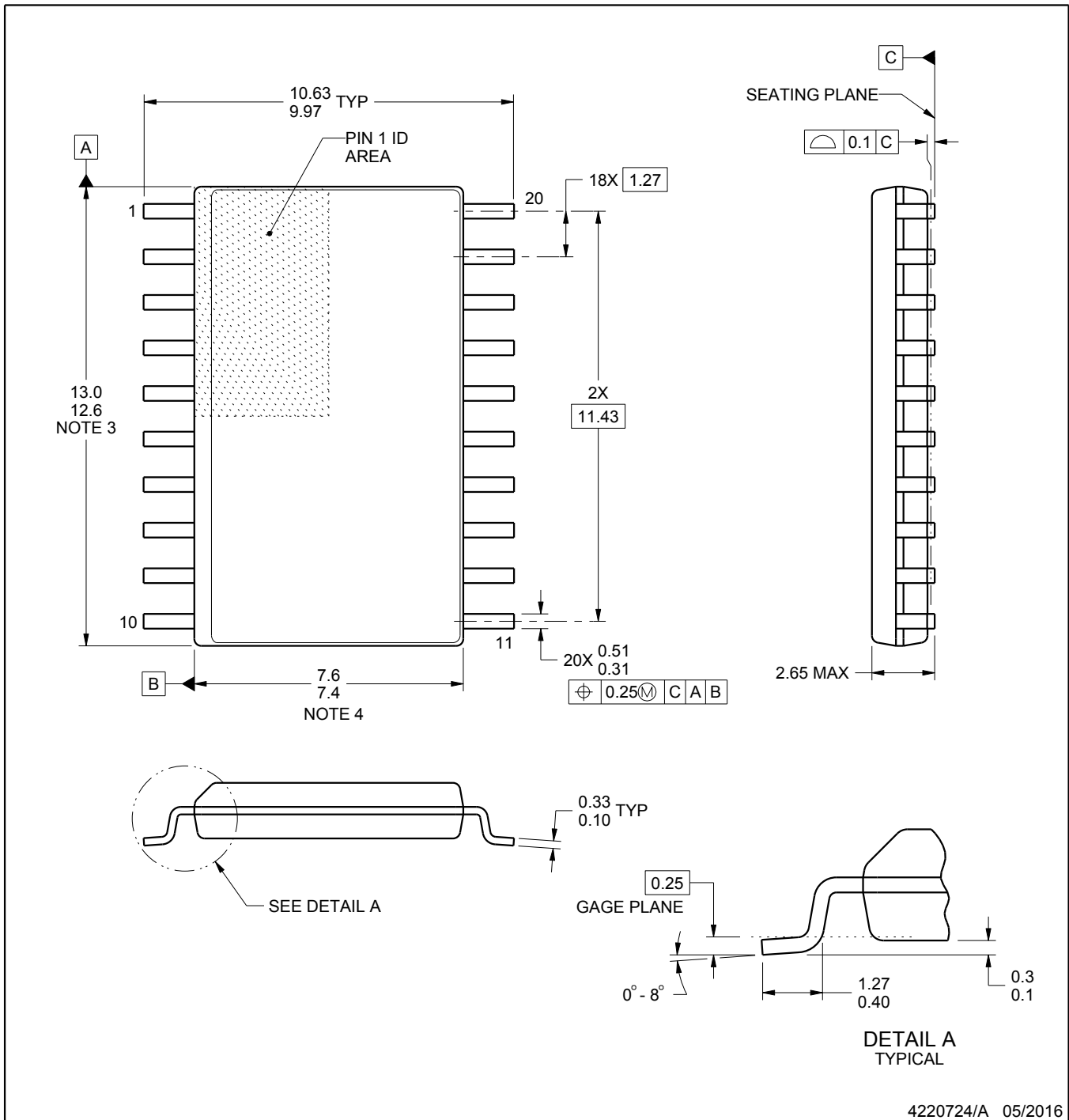
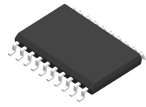


| PINS **<br>DIM      | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| A MAX               | 0.775<br>(19,69) | 0.775<br>(19,69) | 0.920<br>(23,37) | 1.060<br>(26,92) |
| A MIN               | 0.745<br>(18,92) | 0.745<br>(18,92) | 0.850<br>(21,59) | 0.940<br>(23,88) |
| MS-001<br>VARIATION | AA               | BB               | AC               | AD               |



4040049/E 12/2002

- 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.



4220724/A 05/2016

## 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

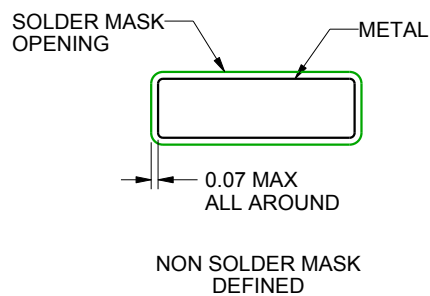
DW0020A

SOIC - 2.65 mm max height

SOIC



LAND PATTERN EXAMPLE  
SCALE:6X



SOLDER MASK DETAILS

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

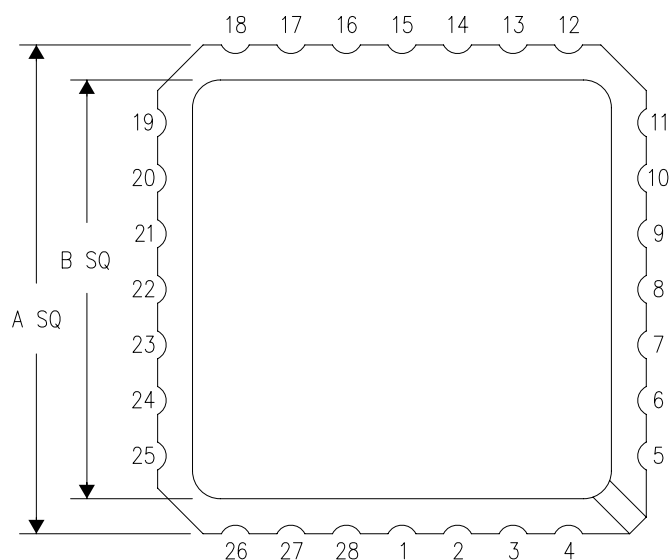
NOTES: (continued)

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.

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

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



| NO. OF<br>TERMINALS<br>** | A                |                  | B                |                  |
|---------------------------|------------------|------------------|------------------|------------------|
|                           | MIN              | MAX              | MIN              | MAX              |
| 20                        | 0.342<br>(8,69)  | 0.358<br>(9,09)  | 0.307<br>(7,80)  | 0.358<br>(9,09)  |
| 28                        | 0.442<br>(11,23) | 0.458<br>(11,63) | 0.406<br>(10,31) | 0.458<br>(11,63) |
| 44                        | 0.640<br>(16,26) | 0.660<br>(16,76) | 0.495<br>(12,58) | 0.560<br>(14,22) |
| 52                        | 0.740<br>(18,78) | 0.761<br>(19,32) | 0.495<br>(12,58) | 0.560<br>(14,22) |
| 68                        | 0.938<br>(23,83) | 0.962<br>(24,43) | 0.850<br>(21,6)  | 0.858<br>(21,8)  |
| 84                        | 1.141<br>(28,99) | 1.165<br>(29,59) | 1.047<br>(26,6)  | 1.063<br>(27,0)  |



4040140/D 01/11

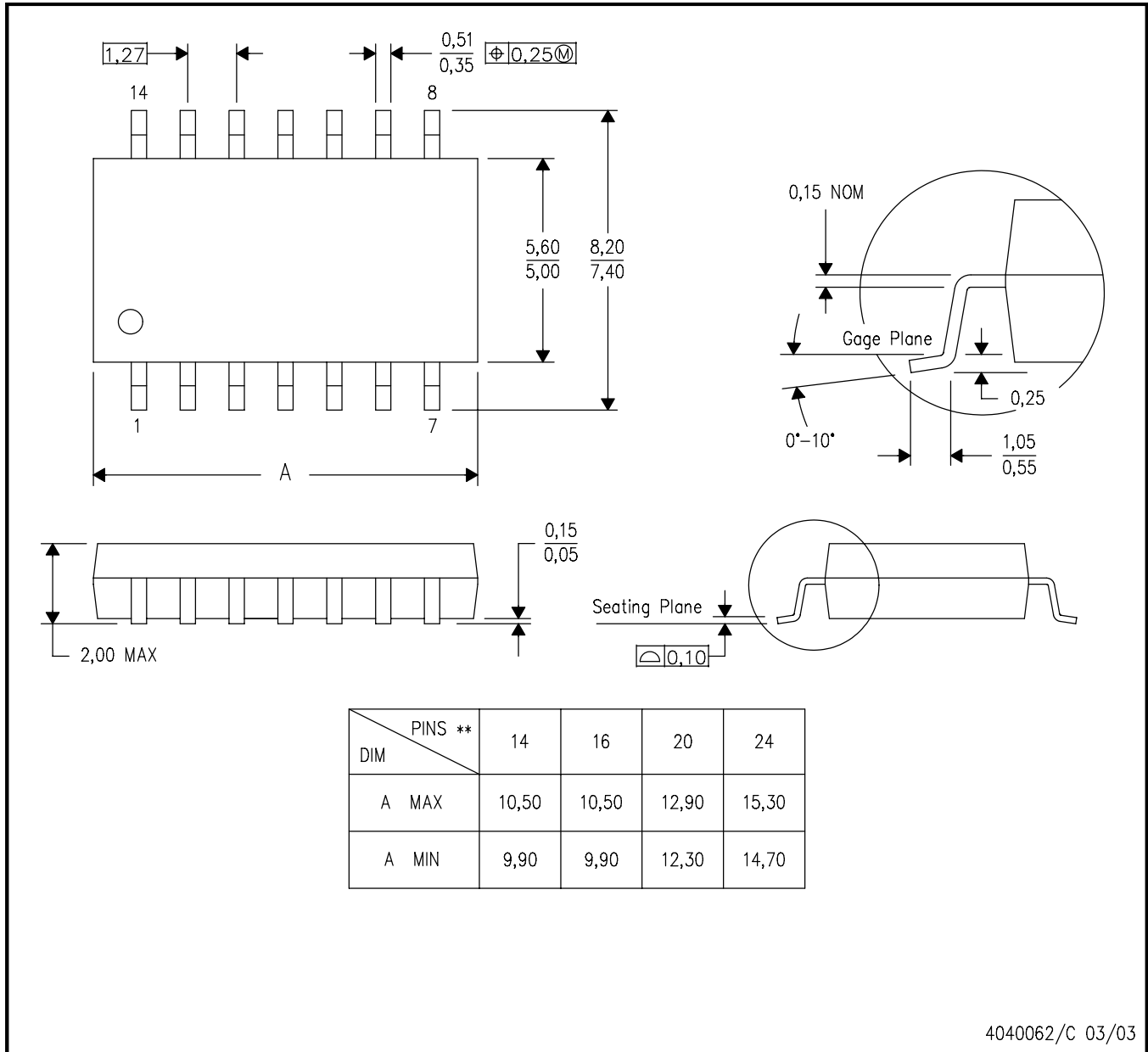
- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a metal lid.
  - Falls within JEDEC MS-004

# 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.

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