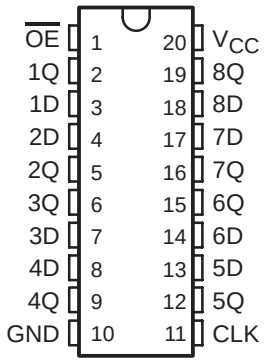
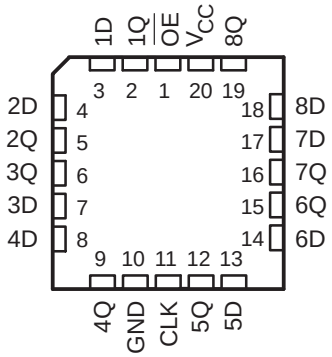
- **Eight D-Type Flip-Flops in a Single Package**
- **3-State Bus-Driving True Outputs**
- **Full Parallel Access for Loading**
- **Buffered Control Inputs**
- **Package Options Include Plastic Small-Outline (SOIC) and Shrink Small-Outline (SSOP) Packages, Ceramic Chip Carriers, and Plastic and Ceramic DIPs**

**SN54F374 . . . J PACKAGE**
**SN74F374 . . . DB, DW, OR N PACKAGE**
**(TOP VIEW)**




**SN54F374 . . . FK PACKAGE**
**(TOP VIEW)**




## description

These 8-bit flip-flops 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 flip-flops of the ′F374 are edge-triggered D-type flip-flops. On the positive transition of the clock (CLK) input, the Q outputs are set to the logic levels that were set up at the data (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) or a high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and the increased drive provide the capability to drive bus lines without need for interface or pullup components.

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

The SN74F374 is available in TI's shrink small-outline package (DB), which provides the same I/O pin count and functionality of standard small-outline packages in less than half the printed-circuit-board area.

The SN54F374 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74F374 is characterized for operation from 0°C to 70°C.

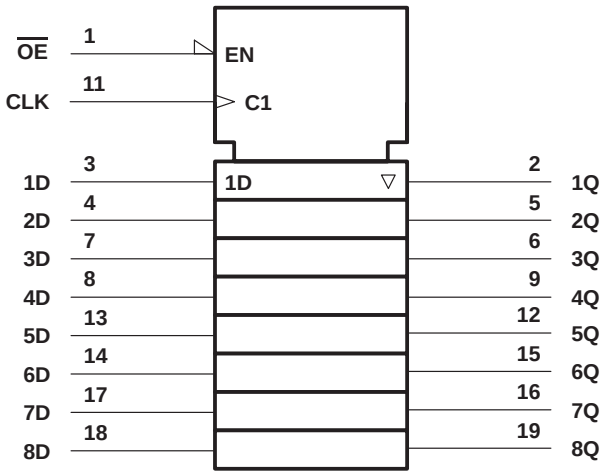
**FUNCTION TABLE**
**(each flip-flop)**

| INPUTS | | | OUTPUT |
|---|---|---|---|
| $\overline{OE}$ | CLK | D | Q |
| L | ↑ | H | H |
| L | ↑ | L | L |
| L | H or L | X | $Q_0$ |
| H | X | X | Z |

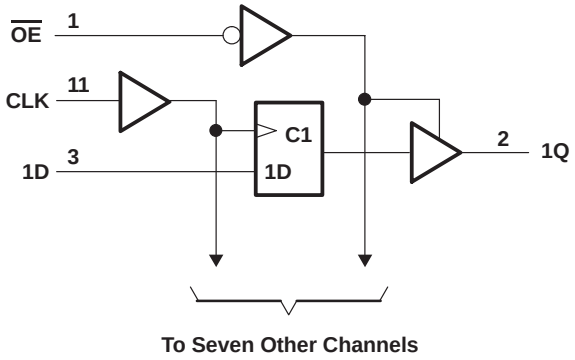
PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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### logic symbol†




### logic diagram (positive logic)




† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

Supply voltage range, $V_{CC}$ . . . . . −0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1) . . . . . −1.2 V to 7 V
Input current range . . . . . −30 mA to 5 mA
Voltage range applied to any output in the disabled or power-off state . . . . . −0.5 V to 5.5 V
Voltage range applied to any output in the high state . . . . . −0.5 V to $V_{CC}$
Current into any output in the low state: SN54F374 . . . . . 40 mA
SN74F374 . . . . . 48 mA
Operating free-air temperature range: SN54F374 . . . . . −55°C to 125°C
SN74F374 . . . . . 0°C to 70°C
Storage temperature range . . . . . −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.

NOTE 1: The input voltage ratings may be exceeded provided the input current ratings are observed.

### recommended operating conditions

| | | SN54F374 | | | SN74F374 | | | 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 | | | −3 | | | −3 | mA |
| $I_{OL}$ | Low-level output current | | | 20 | | | 24 | mA |
| $T_A$ | Operating free-air temperature | −55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | TEST CONDITIONS | | SN54F374 | | | SN74F374 | | | 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 | $I_{OH}$ = − 1 mA | 2.5 | 3.4 | | 2.5 | 3.4 | | V |
| | | $I_{OH}$ = − 3 mA | 2.4 | 3.3 | | 2.4 | 3.3 | | |
| | $V_{CC}$ = 4.75 V, | $I_{OH}$ = − 1 mA to −3 mA | | | | 2.7 | | | |
| $V_{OL}$ | $V_{CC}$ = 4.5 V | $I_{OL}$ = 20 mA | | 0.3 | 0.5 | | | | V |
| | | $I_{OL}$ = 24 mA | | | | | 0.35 | 0.5 | |
| $I_{OZH}$ | $V_{CC}$ = 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 |
| $I_I$ | $V_{CC}$ = 5.5 V, | $V_I$ = 7 V | | | 0.1 | | | 0.1 | 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 | −60 | | −150 | −60 | | −150 | mA |
| $I_{CCZ}$ | $V_{CC}$ = 5.5 V, | See Note 2 | | 55 | 86 | | 55 | 86 | mA |

† All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
‡ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.
NOTE 2: $I_{CCZ}$ is measured with $\overline{OE}$ at 4.5 V and all other inputs grounded.

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

| | | | $V_{CC}$ = 5 V, $T_A$ = 25°C | | SN54F374 | | SN74F374 | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | ′F374 | | | | | | |
| | | | MIN | MAX | MIN | MAX | MIN | MAX | |
| $f_{clock}$ | Clock frequency | | 0 | 100 | 0 | 60 | 0 | 70 | MHz |
| $t_w$ | Pulse duration | CLK high | 7 | | 7 | | 7 | | ns |
| | | CLK low | 6 | | 6 | | 6 | | |
| $t_{su}$ | Setup time, data before CLK↑ | High | 2 | | 2.5 | | 2 | | ns |
| | | Low | 2 | | 2 | | 2 | | |
| $t_h$ | Hold time, data after CLK↑ | High | 2 | | 2 | | 2 | | ns |
| | | Low | 2 | | 2.5 | | 2 | | |

## switching characteristics (see Note 3)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 5 V, $C_L$ = 50 pF, $R_L$ = 500 Ω, $T_A$ = 25°C | | | $V_{CC}$ = 4.5 V to 5.5 V, $C_L$ = 50 pF, $R_L$ = 500 Ω, $T_A$ = MIN to MAX† | | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ′F374 | | | SN54F374 | | SN74F374 | | |
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| $f_{max}$ | | | 100 | | | 60 | | 70 | | MHz |
| $t_{PLH}$ | CLK | Q | 3.2 | 6.1 | 8.5 | 3.2 | 10.5 | 3.2 | 10 | ns |
| $t_{PHL}$ | | | 3.2 | 6.1 | 8.5 | 3.2 | 11 | 3.2 | 10 | |
| $t_{PZH}$ | $\overline{OE}$ | Q | 1.2 | 8.6 | 11.5 | 1.2 | 14 | 1.2 | 12.5 | ns |
| $t_{PZL}$ | | | 1.2 | 5.4 | 7.5 | 1.2 | 10 | 1.2 | 8.5 | |
| $t_{PHZ}$ | $\overline{OE}$ | Q | 1.2 | 4.9 | 7 | 1.2 | 8 | 1.2 | 8 | ns |
| $t_{PLZ}$ | | | 1.2 | 3.9 | 5.5 | 1.2 | 7.5 | 1.2 | 6.5 | |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
NOTE 3: Load circuits and waveforms are shown in Section 1.

## 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) |
|---|---|---|---|---|---|---|---|---|---|
| 5962-9759001Q2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001Q2A SNJ54F 374FK |
| 5962-9759001QRA | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QRA SNJ54F374J |
| 5962-9759001QRA | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QRA SNJ54F374J |
| 5962-9759001QSA | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QSA SNJ54F374W |
| 5962-9759001QSA | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QSA SNJ54F374W |
| JM38510/34105B2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105B2A |
| JM38510/34105B2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105B2A |
| JM38510/34105B2A.A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105B2A |
| JM38510/34105B2A.A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105B2A |
| JM38510/34105BRA | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BRA |
| JM38510/34105BRA | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BRA |
| JM38510/34105BRA.A | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BRA |
| JM38510/34105BRA.A | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BRA |
| JM38510/34105BSA | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BSA |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| JM38510/34105BSA | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BSA |
| JM38510/34105BSA.A | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BSA |
| JM38510/34105BSA.A | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BSA |
| M38510/34105B2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105B2A |
| M38510/34105B2A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105B2A |
| M38510/34105BRA | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BRA |
| M38510/34105BRA | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BRA |
| M38510/34105BSA | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BSA |
| M38510/34105BSA | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | JM38510/ 34105BSA |
| SN54F374J | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54F374J |
| SN54F374J | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54F374J |
| SN54F374J.A | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54F374J |
| SN54F374J.A | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | SN54F374J |
| SN74F374DBR | Active | Production | SSOP (DB) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DBR | Active | Production | SSOP (DB) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DBR.A | Active | Production | SSOP (DB) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DBR.A | Active | Production | SSOP (DB) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DW | Obsolete | Production | SOIC (DW) \| 20 | - | - | Call TI | Call TI | 0 to 70 | F374 |
| SN74F374DW | Obsolete | Production | SOIC (DW) \| 20 | - | - | Call TI | Call TI | 0 to 70 | F374 |
| SN74F374DWR | Active | Production | SOIC (DW) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DWR | Active | Production | SOIC (DW) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DWR.A | Active | Production | SOIC (DW) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374DWR.A | Active | Production | SOIC (DW) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | F374 |
| SN74F374N | Active | Production | PDIP (N) \| 20 | 20 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74F374N |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| SN74F374N | Active | Production | PDIP (N) \| 20 | 20 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74F374N |
| SN74F374N.A | Active | Production | PDIP (N) \| 20 | 20 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74F374N |
| SN74F374N.A | Active | Production | PDIP (N) \| 20 | 20 \| TUBE | Yes | NIPDAU | N/A for Pkg Type | 0 to 70 | SN74F374N |
| SN74F374NSR | Active | Production | SOP (NS) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74F374 |
| SN74F374NSR | Active | Production | SOP (NS) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74F374 |
| SN74F374NSR.A | Active | Production | SOP (NS) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74F374 |
| SN74F374NSR.A | Active | Production | SOP (NS) \| 20 | 2000 \| LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74F374 |
| SNJ54F374FK | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001Q2A SNJ54F 374FK |
| SNJ54F374FK | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001Q2A SNJ54F 374FK |
| SNJ54F374FK.A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001Q2A SNJ54F 374FK |
| SNJ54F374FK.A | Active | Production | LCCC (FK) \| 20 | 55 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001Q2A SNJ54F 374FK |
| SNJ54F374J | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QRA SNJ54F374J |
| SNJ54F374J | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QRA SNJ54F374J |
| SNJ54F374J.A | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QRA SNJ54F374J |
| SNJ54F374J.A | Active | Production | CDIP (J) \| 20 | 20 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QRA SNJ54F374J |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| SNJ54F374W | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QS A SNJ54F374W |
| SNJ54F374W | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QS A SNJ54F374W |
| SNJ54F374W.A | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QS A SNJ54F374W |
| SNJ54F374W.A | Active | Production | CFP (W) \| 20 | 25 \| TUBE | No | SNPB | N/A for Pkg Type | -55 to 125 | 5962-9759001QS A SNJ54F374W |

(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.

**Important Information and Disclaimer:**The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

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 SN54F374, SN74F374 :**

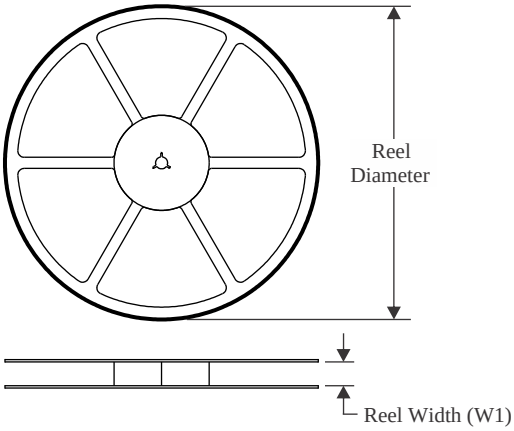
- Catalog : SN74F374
- Military : SN54F374

NOTE: Qualified Version Definitions:

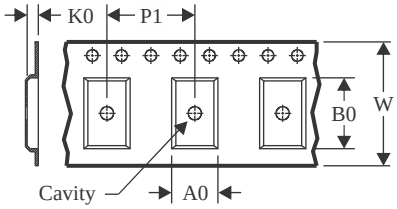
- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

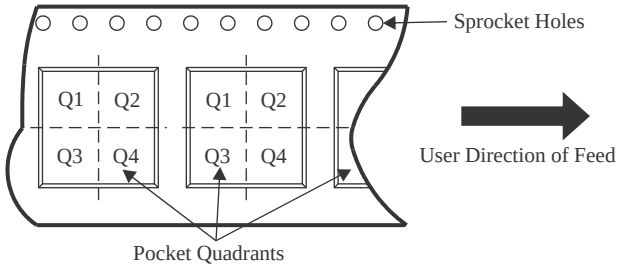



**TAPE DIMENSIONS**




| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

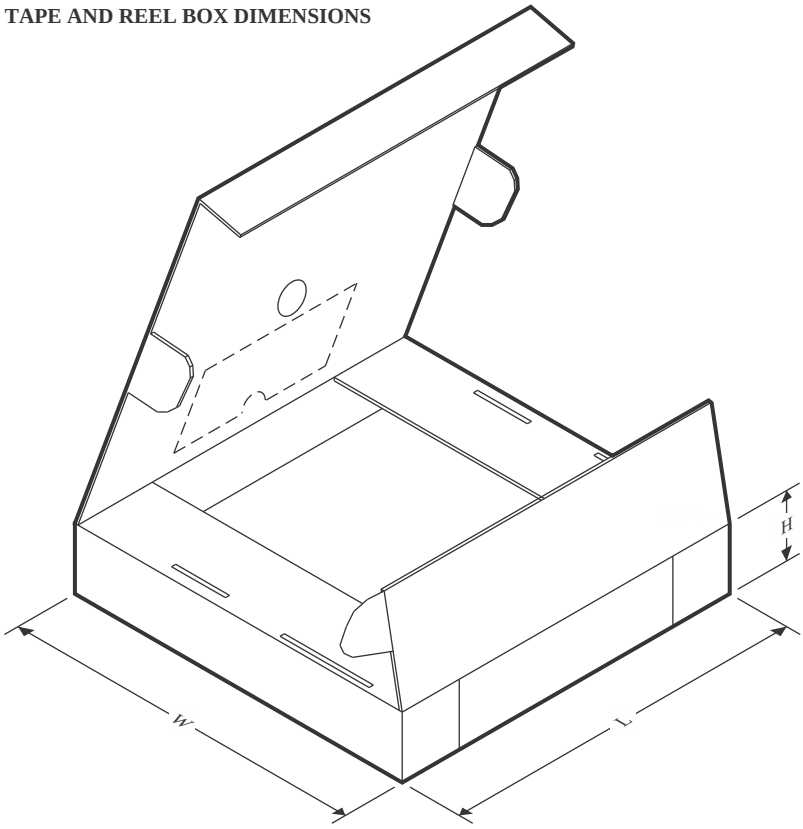
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74F374DBR | SSOP | DB | 20 | 2000 | 330.0 | 16.4 | 8.2 | 7.5 | 2.5 | 12.0 | 16.0 | Q1 |
| SN74F374DWR | SOIC | DW | 20 | 2000 | 330.0 | 24.4 | 10.8 | 13.3 | 2.7 | 12.0 | 24.0 | Q1 |
| SN74F374NSR | SOP | NS | 20 | 2000 | 330.0 | 24.4 | 8.4 | 13.0 | 2.5 | 12.0 | 24.0 | Q1 |

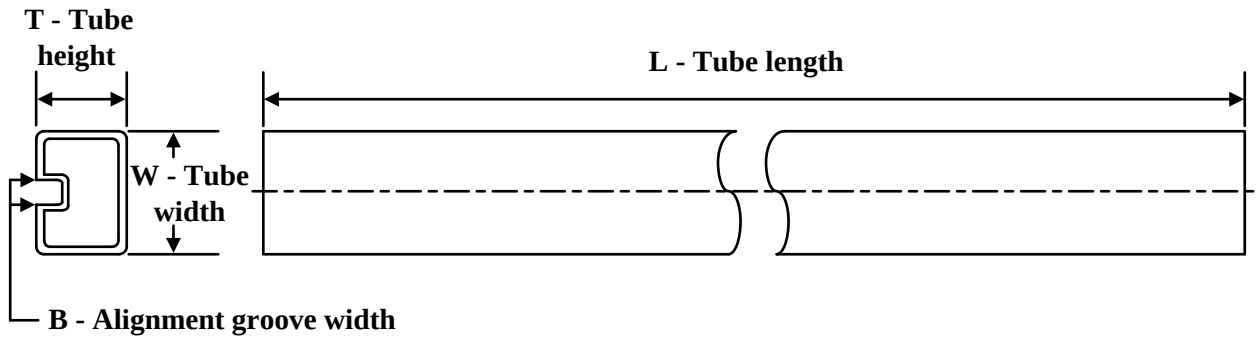
TAPE AND REEL BOX DIMENSIONS




*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74F374DBR | SSOP | DB | 20 | 2000 | 353.0 | 353.0 | 32.0 |
| SN74F374DWR | SOIC | DW | 20 | 2000 | 356.0 | 356.0 | 45.0 |
| SN74F374NSR | SOP | NS | 20 | 2000 | 356.0 | 356.0 | 45.0 |

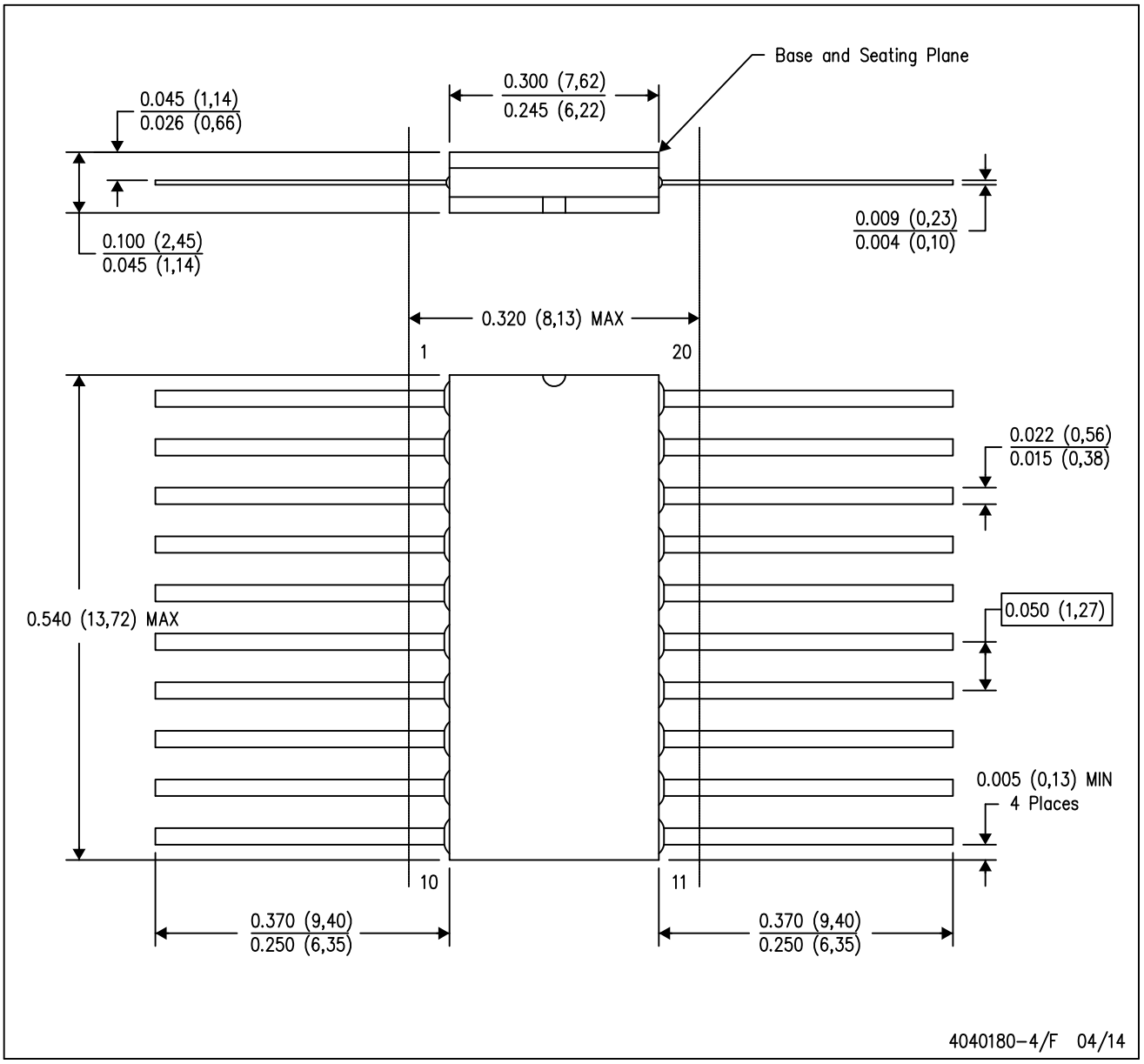
## TUBE




*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (µm) | B (mm) |
|---|---|---|---|---|---|---|---|---|
| 5962-9759001Q2A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| 5962-9759001QSA | W | CFP | 20 | 25 | 506.98 | 26.16 | 6220 | NA |
| JM38510/34105B2A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| JM38510/34105B2A.A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| JM38510/34105BSA | W | CFP | 20 | 25 | 506.98 | 26.16 | 6220 | NA |
| JM38510/34105BSA.A | W | CFP | 20 | 25 | 506.98 | 26.16 | 6220 | NA |
| M38510/34105B2A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| M38510/34105BSA | W | CFP | 20 | 25 | 506.98 | 26.16 | 6220 | NA |
| SN74F374N | N | PDIP | 20 | 20 | 506 | 13.97 | 11230 | 4.32 |
| SN74F374N.A | N | PDIP | 20 | 20 | 506 | 13.97 | 11230 | 4.32 |
| SNJ54F374FK | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| SNJ54F374FK.A | FK | LCCC | 20 | 55 | 506.98 | 12.06 | 2030 | NA |
| SNJ54F374W | W | CFP | 20 | 25 | 506.98 | 26.16 | 6220 | NA |
| SNJ54F374W.A | W | CFP | 20 | 25 | 506.98 | 26.16 | 6220 | NA |

W (R–GDFP–F20) CERAMIC DUAL FLATPACK



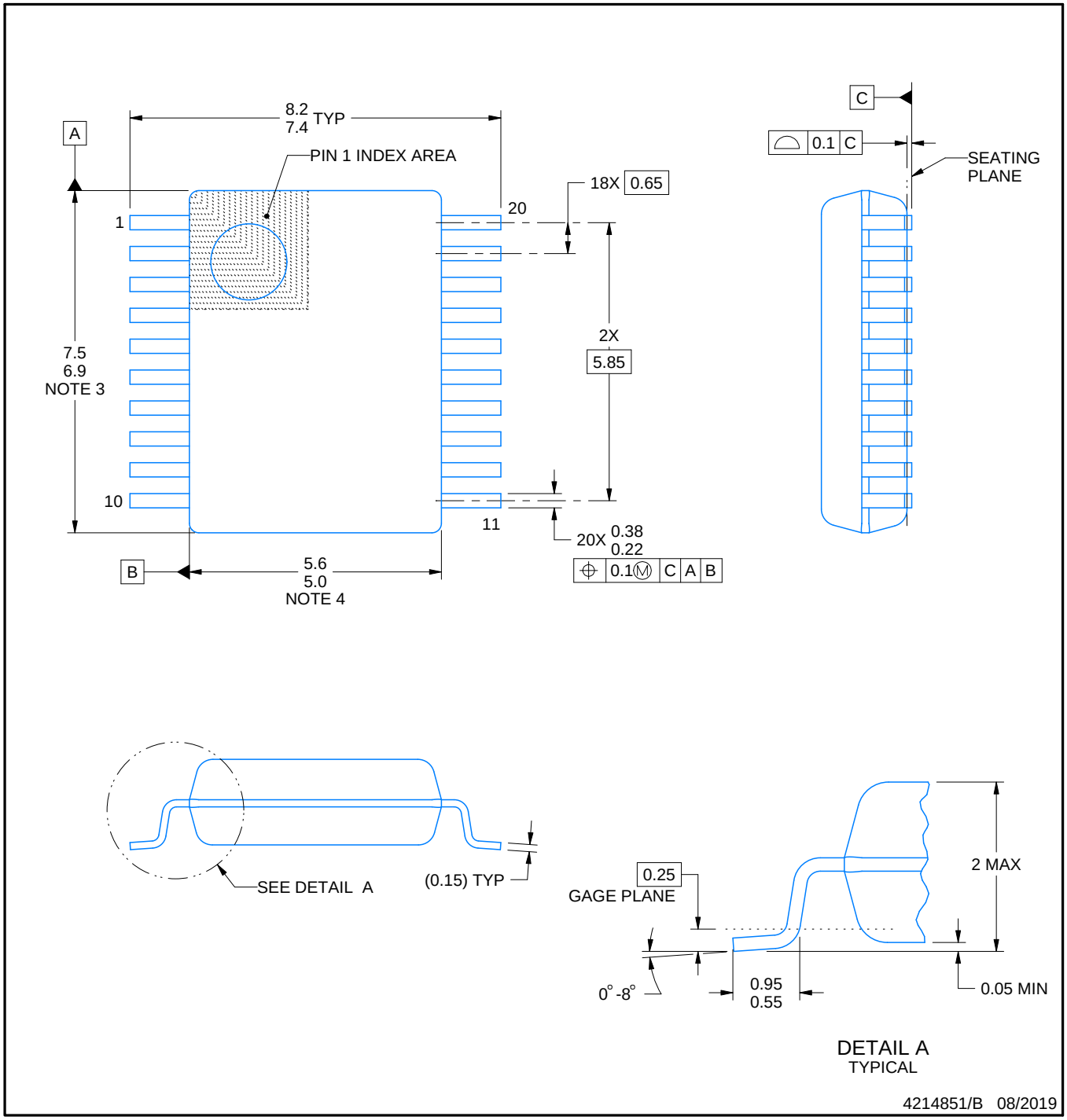

NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a ceramic lid using glass frit.
D. Index point is provided on cap for terminal identification only.
E. Falls within Mil–Std 1835 GDFP2–F20

# PACKAGE OUTLINE

## DB0020A

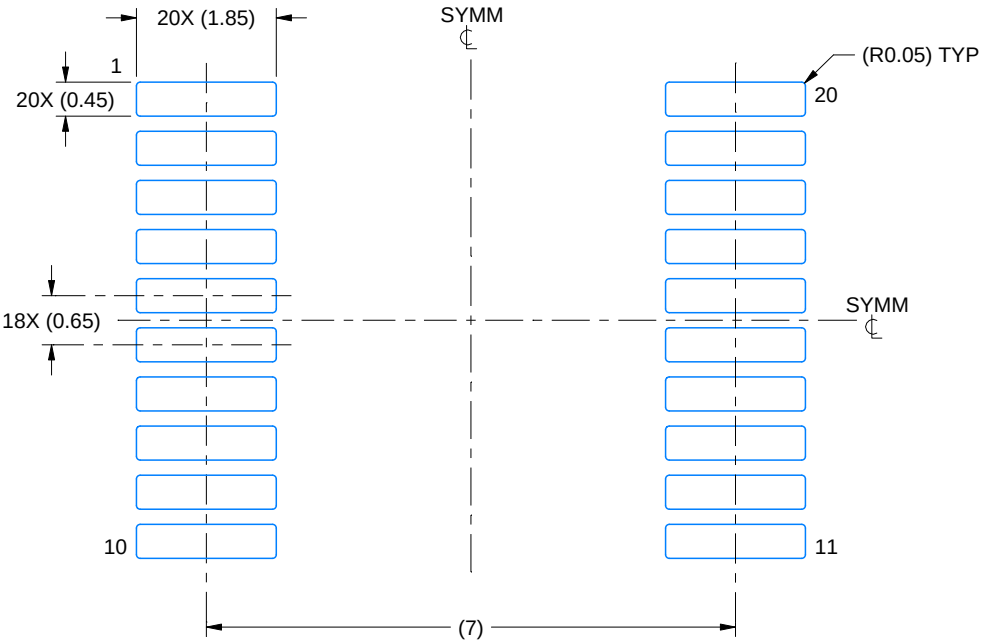
## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE

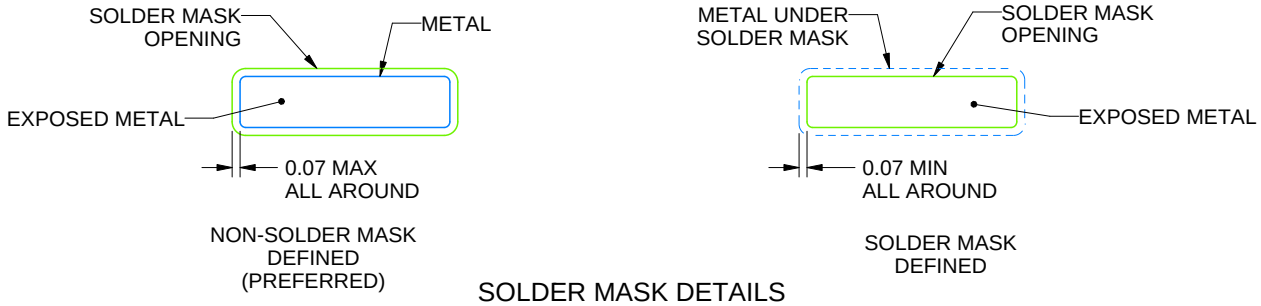



NOTES:

1. All linear dimensions are in millimeters. Any 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 0.25 mm per side.
5. Reference JEDEC registration MO-150.




LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X




SOLDER MASK DETAILS

4214851/B 08/2019

NOTES: (continued)

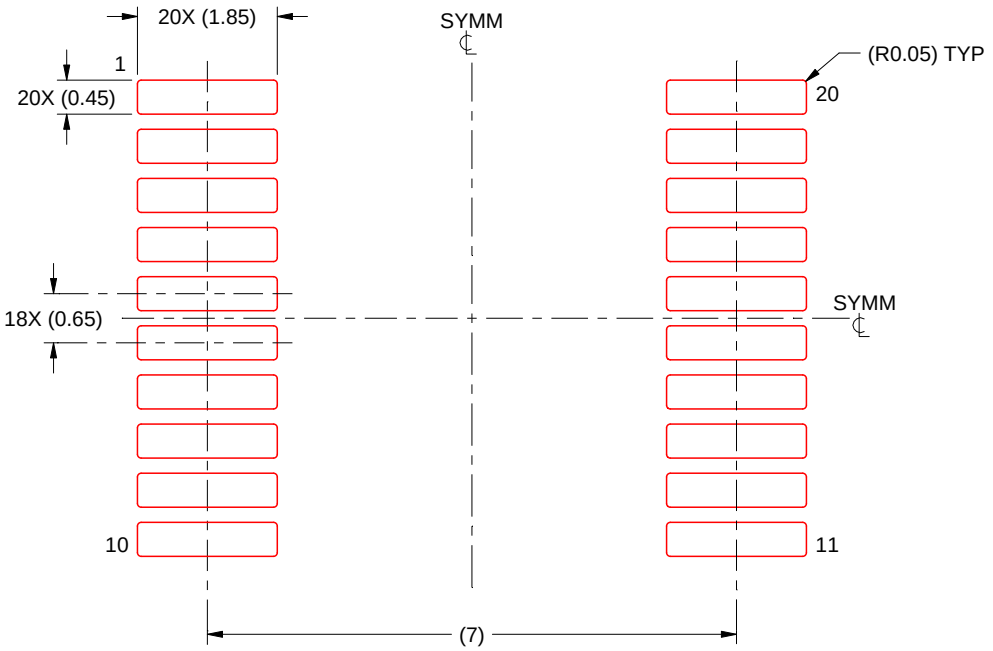
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

## DB0020A

## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE




SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4214851/B 08/2019

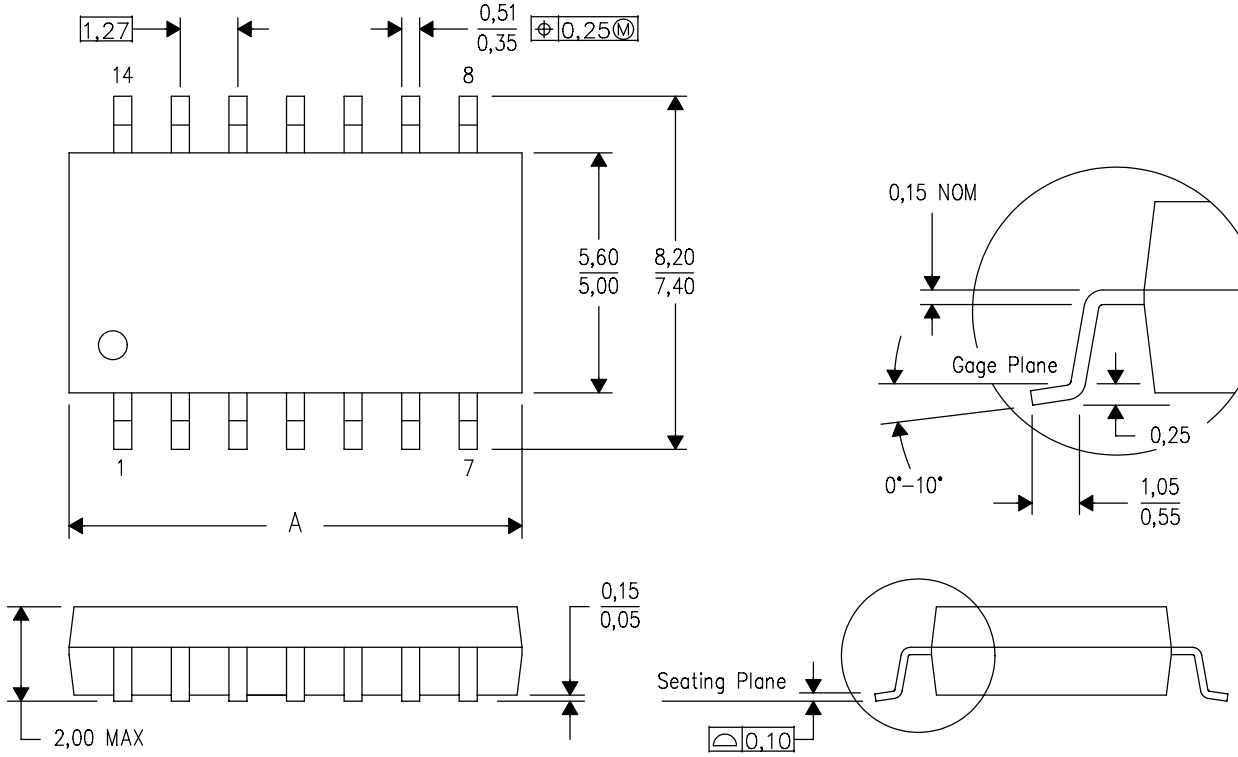
NOTES: (continued)

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.

## MECHANICAL DATA

**NS (R-PDSO-G**)** **PLASTIC SMALL-OUTLINE PACKAGE**

**14-PINS SHOWN**




| DIM \ PINS ** | 14 | 16 | 20 | 24 |
|---|---|---|---|---|
| A MAX | 10,50 | 10,50 | 12,90 | 15,30 |
| A MIN | 9,90 | 9,90 | 12,30 | 14,70 |

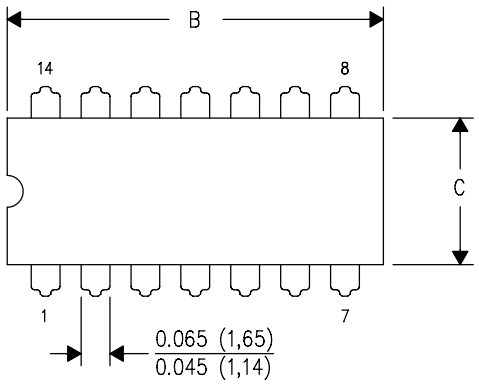
4040062/C 03/03

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.

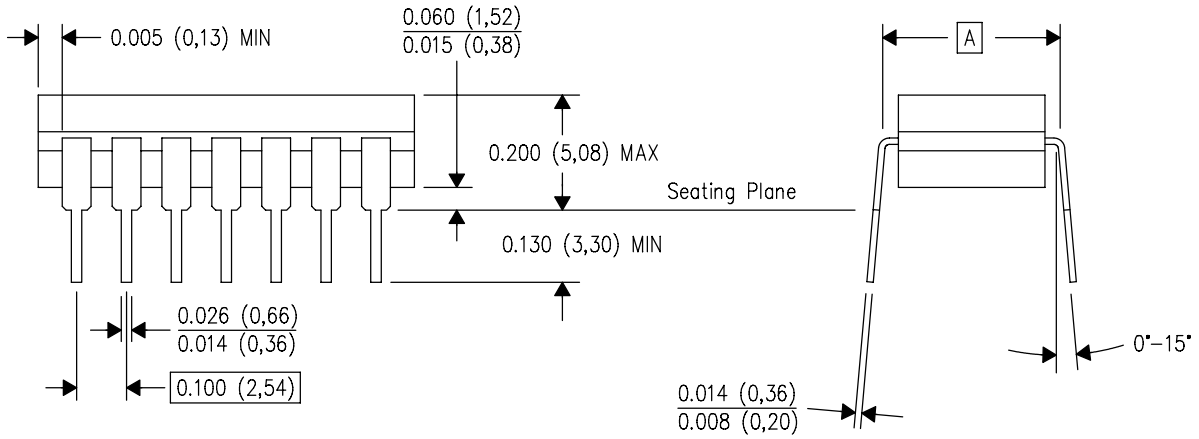
J (R–GDIP–T**)

14 LEADS SHOWN

# CERAMIC DUAL IN–LINE PACKAGE




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

# GENERIC PACKAGE VIEW

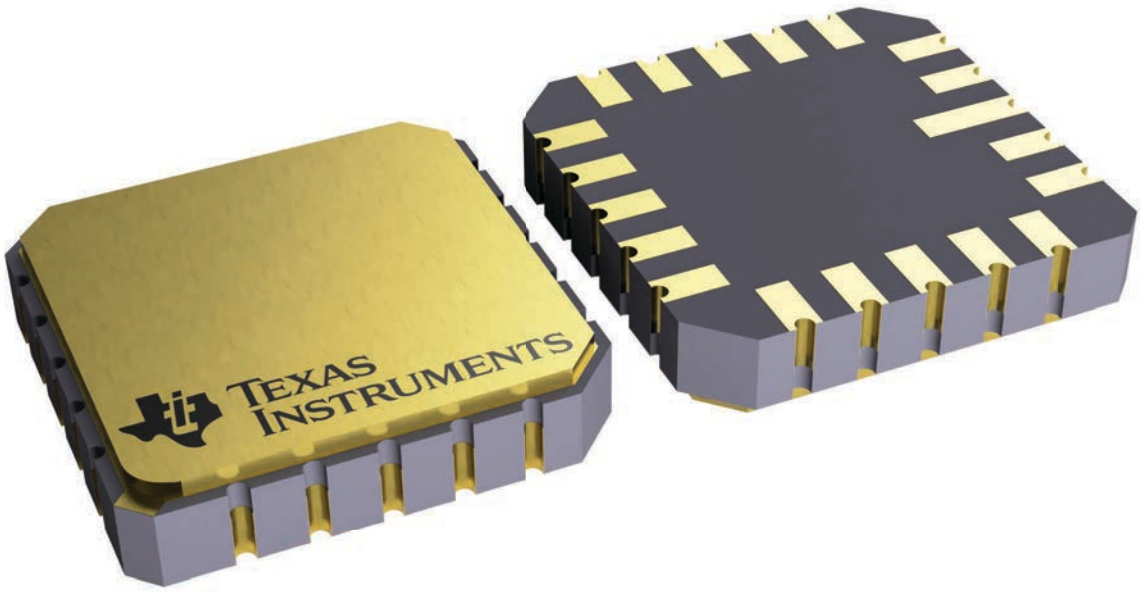
## FK 20

## LCCC - 2.03 mm max height

**8.89 x 8.89, 1.27 mm pitch**

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

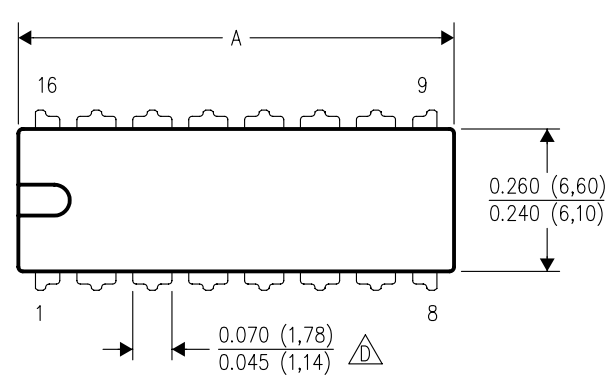



4229370VA\

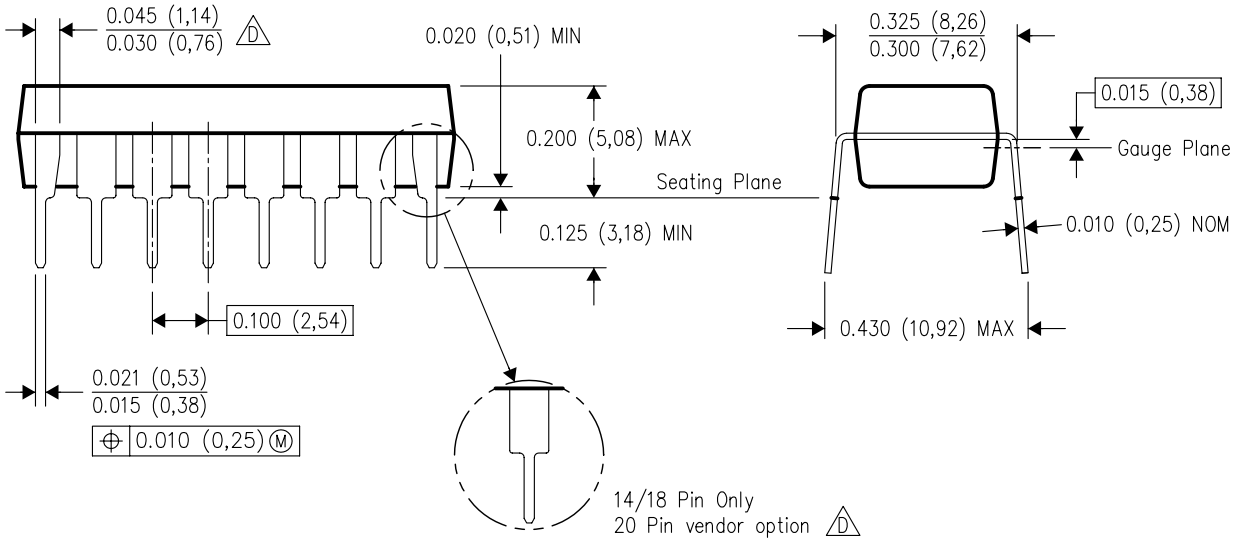
## N (R–PDIP–T**)

## PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN

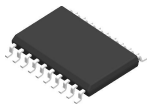



| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---|---|---|---|---|
| A MAX | 0.775 (19,69) | 0.775 (19,69) | 0.920 (23,37) | 1.060 (26,92) |
| A MIN | 0.745 (18,92) | 0.745 (18,92) | 0.850 (21,59) | 0.940 (23,88) |
| MS–001 VARIATION (C) | AA | BB | AC | AD |




4040049/E 12/2002

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

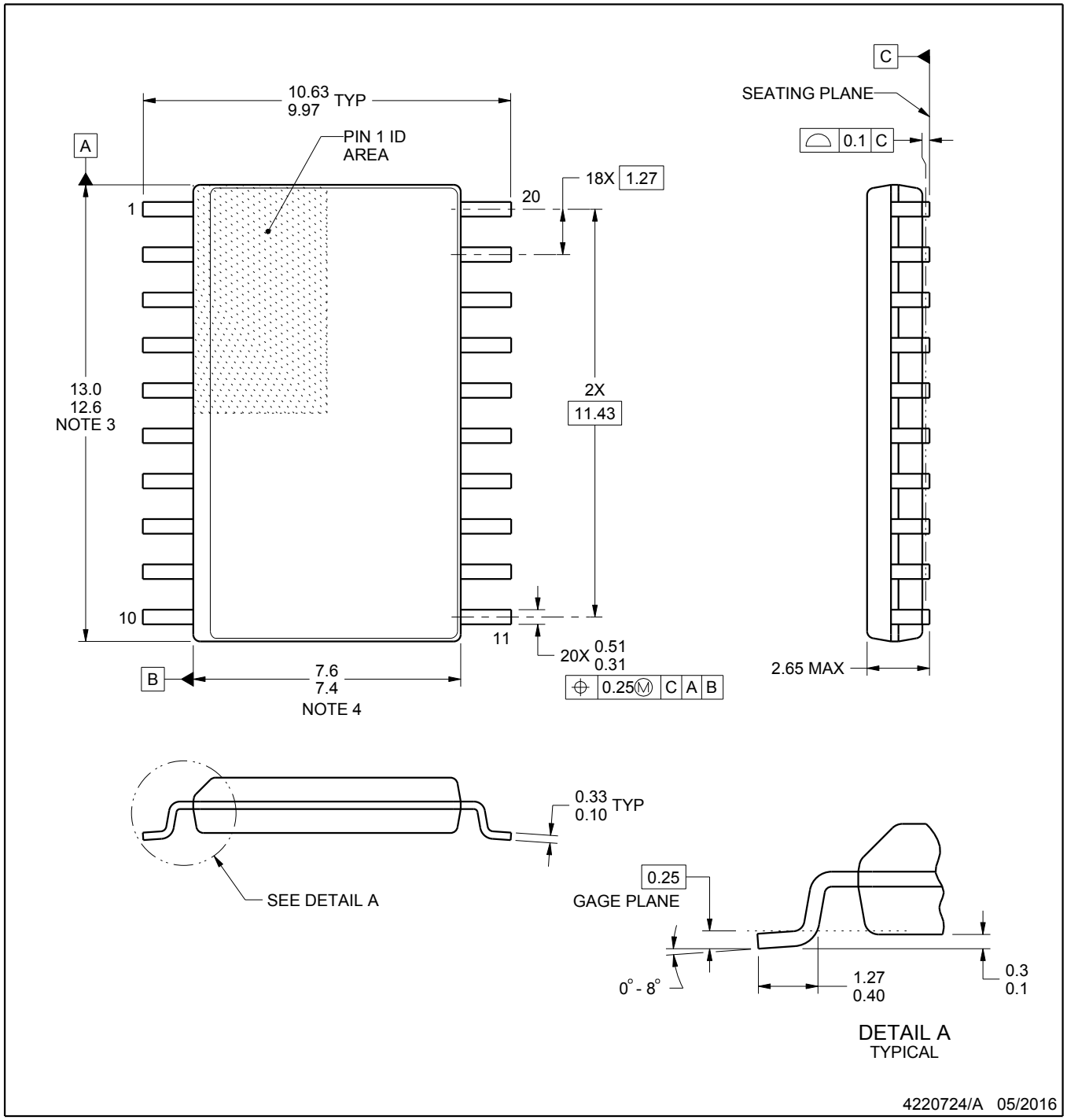


# PACKAGE OUTLINE

## DW0020A

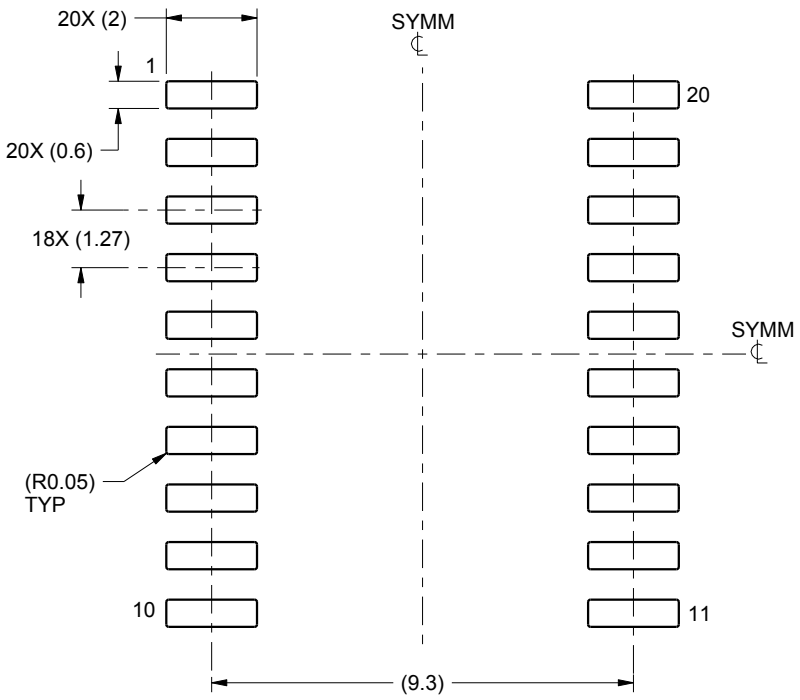
## SOIC - 2.65 mm max height

SOIC

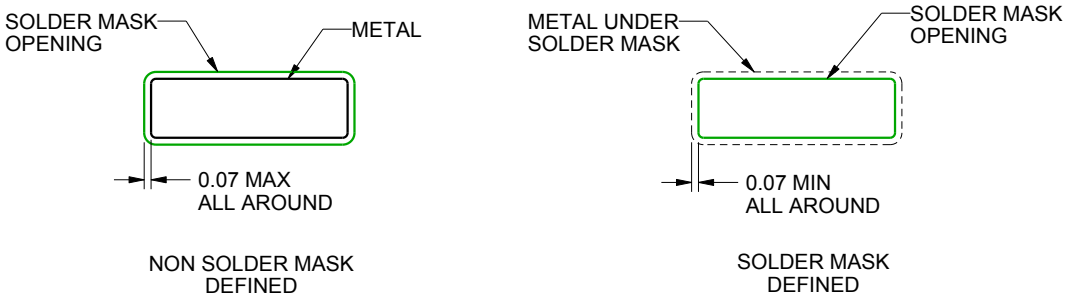



NOTES:

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.




LAND PATTERN EXAMPLE
SCALE:6X

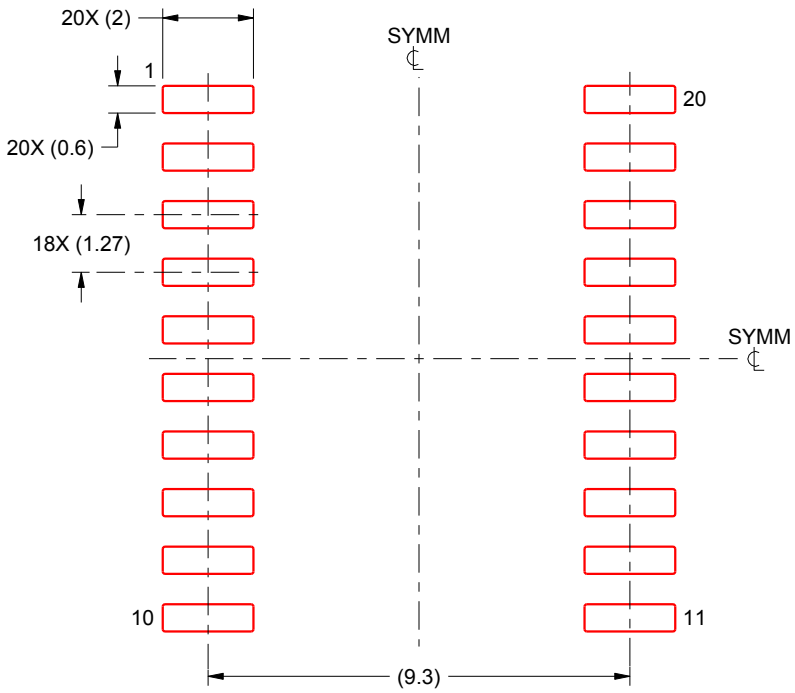



SOLDER MASK DETAILS

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.




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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