

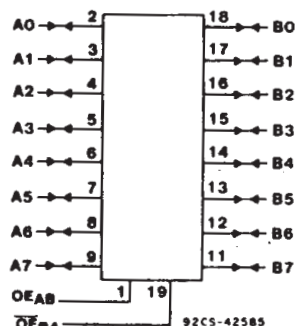
# CD54/74AC623

## CD54/74ACT623

Advance Information



Data sheet acquired from Harris Semiconductor  
SCHS286A – October 2003



FUNCTIONAL DIAGRAM

## Octal-Bus Transceiver, 3-State, Non-Inverting

## Type Features:

- Buffered inputs
- Typical propagation delay:  
4.5 ns @  $V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$ ,  $C_L = 50\text{ pF}$

The RCA CD54/74AC623 and CD54/74ACT623 octal-bus transceivers use the RCA ADVANCED CMOS technology. They are non-inverting, 3-state, bidirectional transceiver-buffers that allow for two-way transmission from "A" bus to "B" bus or "B" bus to "A" bus, depending on the logic levels of the Output Enable ( $\overline{OE}_{AB}$ ,  $\overline{OE}_{BA}$ ) inputs.

The dual Output Enable provision gives these devices the capability to store data by simultaneously enabling  $\overline{OE}_{AB}$  and  $\overline{OE}_{BA}$ . Each output reinforces its input under these conditions, and when all other data sources to the bus lines are at high-impedance, both sets of bus lines will remain in their last states.

The CD74AC623 is supplied in 20-lead dual-in-line plastic packages (E suffix) and in 20-lead small-outline packages (M, M96, and NSR suffixes). The CD74ACT623 is supplied in 20-lead small-outline packages (M96 suffix). Both package types are operable over the following temperature ranges: Commercial (0 to  $70^\circ\text{C}$ ); Industrial ( $-40$  to  $+85^\circ\text{C}$ ); and Extended Industrial/Military ( $-55$  to  $+125^\circ\text{C}$ ).

The CD54AC623 and CD54ACT623, available in chip form (H suffix), are operable over the  $-55$  to  $+125^\circ\text{C}$  temperature range.

## Family Features:

- Exceeds 2-kV ESD Protection - MIL-STD-883, Method 3015
- SCR-Latchup-resistant CMOS process and circuit design
- Speed of bipolar FAST\*/AS/S with significantly reduced power consumption
- Balanced propagation delays
- AC types feature 1.5-V to 5.5-V operation and balanced noise immunity at 30% of the supply
- $\pm 24\text{-mA}$  output drive current
  - Fanout to 15 FAST\* ICs
  - Drives 50-ohm transmission lines

\*FAST is a Registered Trademark of Fairchild Semiconductor Corp.

TRUTH TABLE

| OUTPUT ENABLE INPUTS |                      | OPERATION                           |
|----------------------|----------------------|-------------------------------------|
| $\overline{OE}_{BA}$ | $\overline{OE}_{AB}$ |                                     |
| L                    | L                    | B DATA TO A BUS                     |
| H                    | H                    | A DATA TO B BUS                     |
| H                    | L                    | ISOLATION                           |
| L                    | H                    | B DATA TO A BUS,<br>A DATA TO B BUS |

H = High level, L = Low level

Note: To prevent excess currents in the High-Z (isolation) modes, all I/O terminals should be terminated with 10 k $\Omega$  to 1 M $\Omega$  resistors.

This data sheet is applicable to the CD74AC623 and CD54/74ACT623. The CD54AC623 was not acquired from Harris Semiconductor.

# Technical Data

## CD54/74AC623

## CD54/74ACT623

### MAXIMUM RATINGS, Absolute-Maximum Values:

|                                                                                                          |                                                     |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| DC SUPPLY-VOLTAGE ( $V_{CC}$ )                                                                           | -0.5 to 6 V                                         |
| DC INPUT DIODE CURRENT, $I_{IK}$ (for $V_I < -0.5$ V or $V_I > V_{CC} + 0.5$ V)                          | $\pm 20$ mA                                         |
| DC OUTPUT DIODE CURRENT, $I_{OK}$ (for $V_O < -0.5$ V or $V_O > V_{CC} + 0.5$ V)                         | $\pm 50$ mA                                         |
| DC OUTPUT SOURCE OR SINK CURRENT per Output Pin, $I_O$ (for $V_O > -0.5$ V or $V_O < V_{CC} + 0.5$ V)    | $\pm 50$ mA                                         |
| DC $V_{CC}$ or GROUND CURRENT ( $I_{CC}$ or $I_{GND}$ )                                                  | $\pm 100$ mA*                                       |
| POWER DISSIPATION PER PACKAGE ( $P_D$ ):                                                                 |                                                     |
| For $T_A = -55$ to $+100^\circ\text{C}$ (PACKAGE TYPE E)                                                 | 500 mW                                              |
| For $T_A = +100$ to $+125^\circ\text{C}$ (PACKAGE TYPE E)                                                | Derate Linearly at 8 mW/ $^\circ\text{C}$ to 300 mW |
| For $T_A = -55$ to $+70^\circ\text{C}$ (PACKAGE TYPE M)                                                  | 400 mW                                              |
| For $T_A = +70$ to $+125^\circ\text{C}$ (PACKAGE TYPE M)                                                 | Derate Linearly at 6 mW/ $^\circ\text{C}$ to 70 mW  |
| OPERATING-TEMPERATURE RANGE ( $T_A$ )                                                                    | -55 to $+125^\circ\text{C}$                         |
| STORAGE TEMPERATURE ( $T_{stg}$ )                                                                        | -65 to $+150^\circ\text{C}$                         |
| LEAD TEMPERATURE (DURING SOLDERING):                                                                     |                                                     |
| At distance $1/16 \pm 1/32$ in. ( $1.59 \pm 0.79$ mm) from case for 10 s maximum                         | $+265^\circ\text{C}$                                |
| Unit inserted into PC board min. thickness $1/16$ in. ( $1.59$ mm) with solder contacting lead tips only | $+300^\circ\text{C}$                                |

\*For up to 4 outputs per device; add  $\pm 25$  mA for each additional output.

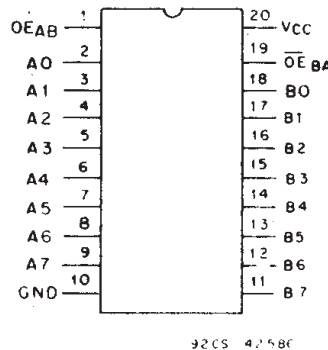
### RECOMMENDED OPERATING CONDITIONS:

For maximum reliability, normal operating conditions should be selected so that operation is always within the following ranges:

| CHARACTERISTIC                                                                    | LIMITS |          | UNITS            |
|-----------------------------------------------------------------------------------|--------|----------|------------------|
|                                                                                   | MIN.   | MAX.     |                  |
| Supply-Voltage Range, $V_{CC}$ *:<br>(For $T_A$ = Full Package-Temperature Range) |        |          |                  |
| AC Types                                                                          | 1.5    | 5.5      | V                |
| ACT Types                                                                         | 4.5    | 5.5      | V                |
| DC Input or Output Voltage, $V_I$ , $V_O$                                         | 0      | $V_{CC}$ | V                |
| Operating Temperature, $T_A$                                                      | -55    | +125     | $^\circ\text{C}$ |
| Input Rise and Fall Slew Rate, $dt/dv$                                            |        |          |                  |
| at 1.5 V to 3 V (AC Types)                                                        | 0      | 50       | ns/V             |
| at 3.6 V to 5.5 V (AC Types)                                                      | 0      | 20       | ns/V             |
| at 4.5 V to 5.5 V (ACT Types)                                                     | 0      | 10       | ns/V             |

\*Unless otherwise specified, all voltages are referenced to ground.

9



TERMINAL ASSIGNMENT

# CD54/74AC623

## CD54/74ACT623

### STATIC ELECTRICAL CHARACTERISTICS: AC Series

| CHARACTERISTICS                                  | TEST CONDITIONS                                                                              |                        | V <sub>CC</sub><br>(V) | AMBIENT TEMPERATURE (T <sub>A</sub> ) - °C |      |            |      |             |      | UNITS |
|--------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------|------------------------|--------------------------------------------|------|------------|------|-------------|------|-------|
|                                                  |                                                                                              |                        |                        | +25                                        |      | -40 to +85 |      | -55 to +125 |      |       |
|                                                  | V <sub>I</sub><br>(V)                                                                        | I <sub>O</sub><br>(mA) |                        | MIN.                                       | MAX. | MIN.       | MAX. | MIN.        | MAX. |       |
| High-Level Input Voltage<br>V <sub>IH</sub>      |                                                                                              |                        | 1.5                    | 1.2                                        | —    | 1.2        | —    | 1.2         | —    | V     |
|                                                  |                                                                                              |                        | 3                      | 2.1                                        | —    | 2.1        | —    | 2.1         | —    |       |
|                                                  |                                                                                              |                        | 5.5                    | 3.85                                       | —    | 3.85       | —    | 3.85        | —    |       |
| Low-Level Input Voltage<br>V <sub>IL</sub>       |                                                                                              |                        | 1.5                    | —                                          | 0.3  | —          | 0.3  | —           | 0.3  | V     |
|                                                  |                                                                                              |                        | 3                      | —                                          | 0.9  | —          | 0.9  | —           | 0.9  |       |
|                                                  |                                                                                              |                        | 5.5                    | —                                          | 1.65 | —          | 1.65 | —           | 1.65 |       |
| High-Level Output Voltage<br>V <sub>OH</sub>     | V <sub>IH</sub><br>or<br>V <sub>IL</sub>                                                     | -0.05                  | 1.5                    | 1.4                                        | —    | 1.4        | —    | 1.4         | —    | V     |
|                                                  |                                                                                              | -0.05                  | 3                      | 2.9                                        | —    | 2.9        | —    | 2.9         | —    |       |
|                                                  |                                                                                              | -0.05                  | 4.5                    | 4.4                                        | —    | 4.4        | —    | 4.4         | —    |       |
|                                                  |                                                                                              | -4                     | 3                      | 2.58                                       | —    | 2.48       | —    | 2.4         | —    |       |
|                                                  |                                                                                              | -24                    | 4.5                    | 3.94                                       | —    | 3.8        | —    | 3.7         | —    |       |
|                                                  | #, *                                                                                         | -75                    | 5.5                    | —                                          | —    | 3.85       | —    | —           | —    |       |
|                                                  |                                                                                              | -50                    | 5.5                    | —                                          | —    | —          | —    | 3.85        | —    |       |
| Low-Level Output Voltage<br>V <sub>OL</sub>      | V <sub>IH</sub><br>or<br>V <sub>IL</sub>                                                     | 0.05                   | 1.5                    | —                                          | 0.1  | —          | 0.1  | —           | 0.1  | V     |
|                                                  |                                                                                              | 0.05                   | 3                      | —                                          | 0.1  | —          | 0.1  | —           | 0.1  |       |
|                                                  |                                                                                              | 0.05                   | 4.5                    | —                                          | 0.1  | —          | 0.1  | —           | 0.1  |       |
|                                                  |                                                                                              | 12                     | 3                      | —                                          | 0.36 | —          | 0.44 | —           | 0.5  |       |
|                                                  |                                                                                              | 24                     | 4.5                    | —                                          | 0.36 | —          | 0.44 | —           | 0.5  |       |
|                                                  | #, *                                                                                         | 75                     | 5.5                    | —                                          | —    | —          | 1.65 | —           | —    |       |
|                                                  |                                                                                              | 50                     | 5.5                    | —                                          | —    | —          | —    | —           | 1.65 |       |
| Input Leakage Current<br>I <sub>I</sub>          | V <sub>CC</sub><br>or<br>GND                                                                 |                        | 5.5                    | —                                          | ±0.1 | —          | ±1   | —           | ±1   | μA    |
| 3-State Leakage Current<br>I <sub>OZ</sub>       | V <sub>IH</sub><br>or<br>V <sub>IL</sub><br>V <sub>O</sub> =<br>V <sub>CC</sub><br>or<br>GND |                        | 5.5                    | —                                          | ±0.5 | —          | ±5   | —           | ±10  | μA    |
| Quiescent Supply Current, MSI<br>I <sub>CC</sub> | V <sub>CC</sub><br>or<br>GND                                                                 | 0                      | 5.5                    | —                                          | 8    | —          | 80   | —           | 160  | μA    |

#Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.

\*Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

Technical Data  
**CD54/74AC623**  
**CD54/74ACT623**

STATIC ELECTRICAL CHARACTERISTICS: ACT Series

| CHARACTERISTICS                                                                                         | TEST CONDITIONS                                                               |                        | V <sub>CC</sub><br>(V) | AMBIENT TEMPERATURE (T <sub>A</sub> ) - °C |      |            |      |             |      | UNITS |
|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------|------------------------|--------------------------------------------|------|------------|------|-------------|------|-------|
|                                                                                                         |                                                                               |                        |                        | +25                                        |      | -40 to +85 |      | -55 to +125 |      |       |
|                                                                                                         | V <sub>I</sub><br>(V)                                                         | I <sub>O</sub><br>(mA) |                        | MIN.                                       | MAX. | MIN.       | MAX. | MIN.        | MAX. |       |
| High-Level Input Voltage<br>V <sub>IH</sub>                                                             |                                                                               |                        | 4.5 to 5.5             | 2                                          | —    | 2          | —    | 2           | —    | V     |
| Low-Level Input Voltage<br>V <sub>IL</sub>                                                              |                                                                               |                        | 4.5 to 5.5             | —                                          | 0.8  | —          | 0.8  | —           | 0.8  | V     |
| High-Level Output Voltage<br>V <sub>OH</sub>                                                            | V <sub>IH</sub> or V <sub>IL</sub><br>#, * {                                  | -0.05                  | 4.5                    | 4.4                                        | —    | 4.4        | —    | 4.4         | —    | V     |
|                                                                                                         |                                                                               | -24                    | 4.5                    | 3.94                                       | —    | 3.8        | —    | 3.7         | —    |       |
|                                                                                                         |                                                                               | -75                    | 5.5                    | —                                          | —    | 3.85       | —    | —           | —    |       |
|                                                                                                         |                                                                               | -50                    | 5.5                    | —                                          | —    | —          | —    | 3.85        | —    |       |
| Low-Level Output Voltage<br>V <sub>OL</sub>                                                             | V <sub>IH</sub> or V <sub>IL</sub><br>#, * {                                  | 0.05                   | 4.5                    | —                                          | 0.1  | —          | 0.1  | —           | 0.1  | V     |
|                                                                                                         |                                                                               | 24                     | 4.5                    | —                                          | 0.36 | —          | 0.44 | —           | 0.5  |       |
|                                                                                                         |                                                                               | 75                     | 5.5                    | —                                          | —    | —          | 1.65 | —           | —    |       |
|                                                                                                         |                                                                               | 50                     | 5.5                    | —                                          | —    | —          | —    | —           | 1.65 |       |
| Input Leakage Current<br>I <sub>I</sub>                                                                 | V <sub>CC</sub> or GND                                                        |                        | 5.5                    | —                                          | ±0.1 | —          | ±1   | —           | ±1   | μA    |
| 3-State Leakage Current<br>I <sub>OZ</sub>                                                              | V <sub>IH</sub> or V <sub>IL</sub><br>V <sub>O</sub> = V <sub>CC</sub> or GND |                        | 5.5                    | —                                          | ±0.5 | —          | ±5   | —           | ±10  | μA    |
| Quiescent Supply Current, MSI<br>I <sub>CC</sub>                                                        | V <sub>CC</sub> or GND                                                        | 0                      | 5.5                    | —                                          | 8    | —          | 80   | —           | 160  | μA    |
| Additional Quiescent Supply Current per Input Pin<br>TTL Inputs High<br>1 Unit Load<br>ΔI <sub>CC</sub> | V <sub>CC</sub> -2.1                                                          |                        | 4.5 to 5.5             | —                                          | 2.4  | —          | 2.8  | —           | 3    | mA    |

9

#Test one output at a time for a 1-second maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.

\*Test verifies a minimum 50-ohm transmission-line-drive capability at +85°C, 75 ohms at +125°C.

ACT INPUT LOADING TABLE

| INPUT                | UNIT LOAD* |
|----------------------|------------|
| $A_n, B_n$           | 0.83       |
| $\overline{OE}_{BA}$ | 0.64       |
| $\overline{OE}_{AB}$ | 0.15       |

\*Unit load is  $\Delta I_{CC}$  limit specified in Static Characteristics Chart, e.g., 2.4 mA max. @ 25°C.

# **CD54/74AC623** **CD54/74ACT623**

**SWITCHING CHARACTERISTICS: AC Series;  $t_r, t_f = 3 \text{ ns}$ ,  $C_L = 50 \text{ pF}$** 

| CHARACTERISTICS                                                                                         | SYMBOL                               | V <sub>CC</sub><br>(V) | AMBIENT TEMPERATURE (T <sub>A</sub> ) - °C |                     |                 |                     | UNITS |
|---------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|--------------------------------------------|---------------------|-----------------|---------------------|-------|
|                                                                                                         |                                      |                        | -40 to +85                                 |                     | -55 to +125     |                     |       |
|                                                                                                         |                                      |                        | MIN.                                       | MAX.                | MIN.            | MAX.                |       |
| Propagation Delays:<br>Data to Output                                                                   | t <sub>PLH</sub><br>t <sub>PHL</sub> | 1.5<br>3.3*<br>5†      | —<br>3.5<br>2.5                            | 108<br>12.2<br>8.7  | —<br>3.4<br>2.4 | 120<br>13.4<br>9.6  | ns    |
| Output Disable<br>to Output                                                                             | t <sub>PLZ</sub><br>t <sub>PHZ</sub> | 1.5<br>3.3<br>5        | —<br>4.8<br>3.5                            | 153<br>17.1<br>12.2 | —<br>4.7<br>3.4 | 168<br>18.8<br>13.4 | ns    |
| Output Enable<br>to Output                                                                              | t <sub>PZL</sub><br>t <sub>PZH</sub> | 1.5<br>3.3<br>5        | —<br>4.8<br>3.5                            | 153<br>17.1<br>12.2 | —<br>4.7<br>3.4 | 168<br>18.8<br>13.4 | ns    |
| Power Dissipation Capacitance                                                                           | C <sub>PD</sub> §                    | —                      | 66 Typ.                                    |                     | 66 Typ.         |                     | pF    |
| Min. (Valley) V <sub>OH</sub><br>During Switching of Other Outputs<br>(Output Under Test Not Switching) | V <sub>OHV</sub><br>See<br>Fig. 1    | 5                      | 4 Typ. @ 25°C                              |                     |                 |                     | V     |
| Max. (Peak) V <sub>OL</sub><br>During Switching of Other Outputs<br>(Output Under Test Not Switching)   | V <sub>OLP</sub><br>See<br>Fig. 1    | 5                      | 1 Typ. @ 25°C                              |                     |                 |                     | V     |
| Input Capacitance                                                                                       | C <sub>I</sub>                       | —                      | —                                          | 10                  | —               | 10                  | pF    |
| 3-State Output Capacitance                                                                              | C <sub>O</sub>                       | —                      | —                                          | 15                  | —               | 15                  | pF    |

**SWITCHING CHARACTERISTICS: ACT Series;  $t_r, t_f = 3 \text{ ns}$ ,  $C_L = 50 \text{ pF}$** 

| CHARACTERISTICS                                                                                         | SYMBOL                               | V <sub>CC</sub><br>(V) | AMBIENT TEMPERATURE (T <sub>A</sub> ) - °C |      |             |      | UNITS |
|---------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|--------------------------------------------|------|-------------|------|-------|
|                                                                                                         |                                      |                        | -40 to +85                                 |      | -55 to +125 |      |       |
|                                                                                                         |                                      |                        | MIN.                                       | MAX. | MIN.        | MAX. |       |
| Propagation Delays:<br>Data to Output                                                                   | t <sub>PLH</sub><br>t <sub>PHL</sub> | 5†                     | 2.7                                        | 9.6  | 2.7         | 10.6 | ns    |
| Output Disable<br>to Output                                                                             | t <sub>PLZ</sub><br>t <sub>PHZ</sub> | 5                      | 3.7                                        | 13.1 | 3.6         | 14.4 | ns    |
| Output Enable<br>to Output                                                                              | t <sub>PZH</sub><br>t <sub>PZL</sub> | 5                      | 3.7                                        | 13.1 | 3.6         | 14.4 | ns    |
| Power Dissipation Capacitance                                                                           | C <sub>PD</sub> §                    | —                      | 66 Typ.                                    |      | 66 Typ.     |      | pF    |
| Min. (Valley) V <sub>OH</sub><br>During Switching of Other Outputs<br>(Output Under Test Not Switching) | V <sub>OHV</sub><br>See<br>Fig. 1    | 5                      | 4 Typ. @ 25°C                              |      |             |      | V     |
| Max. (Peak) V <sub>OL</sub><br>During Switching of Other Outputs<br>(Output Under Test Not Switching)   | V <sub>OLP</sub><br>See<br>Fig. 1    | 5                      | 1 Typ. @ 25°C                              |      |             |      | V     |
| Input Capacitance                                                                                       | C <sub>I</sub>                       | —                      | —                                          | 10   | —           | 10   | pF    |
| 3-State Output Capacitance                                                                              | C <sub>O</sub>                       | —                      | —                                          | 15   | —           | 15   | pF    |

\*3.3 V: min. is @ 3.6 V  
max. is @ 3 V

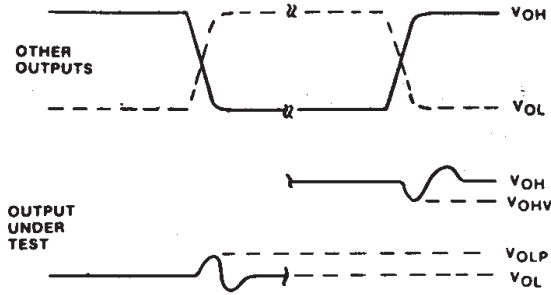
†5 V: min. is @ 5.5 V  
max. is @ 4.5 V

§ $C_{PD}$  is used to determine the dynamic power consumption, per channel.

For AC series:  $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$

For ACT series:  $P_D = V_{CC}^2 f_i (C_{PD} + C_L) + V_{CC} \Delta I_{CC}$  where  $f_i$  = input frequency  
 $C_L$  = output load capacitance  
 $V_{CC}$  = supply voltage.

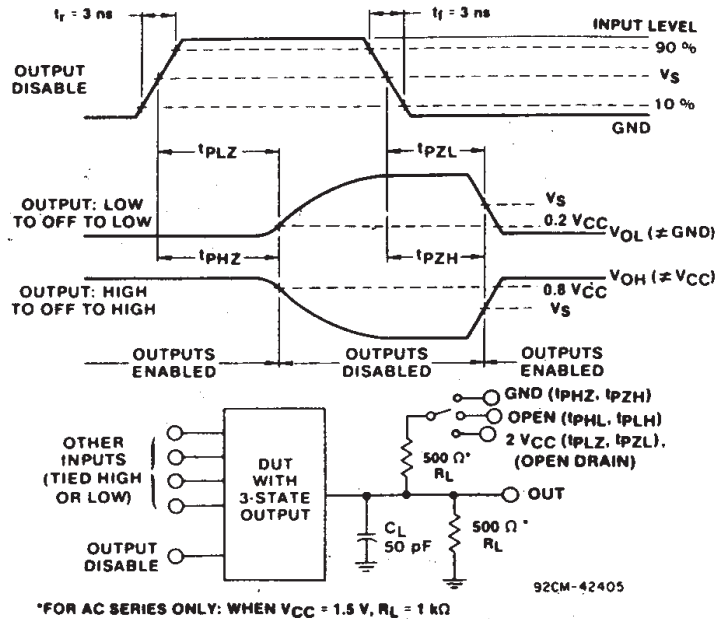
### PARAMETER MEASUREMENT INFORMATION



#### NOTES:

1.  $V_{OHV}$  and  $V_{OLP}$  are measured with respect to a ground reference near the output under test.
2. INPUT PULSES HAVE THE FOLLOWING CHARACTERISTICS:  
 $PRR \leq 1$  MHz,  $t_r = 3$  ns,  $t_f = 3$  ns, SKEW 1 ns.
3. R.F. FIXTURE WITH 700-MHz DESIGN RULES REQUIRED.  
 IC SHOULD BE SOLDERED INTO TEST BOARD AND BYPASSED WITH  $0.1 \mu F$  CAPACITOR. SCOPE AND PROBES REQUIRE 700-MHz BANDWIDTH.

92CS-4240E



\*FOR AC SERIES ONLY: WHEN  $V_{CC} = 1.5$  V,  $R_L = 1$  k $\Omega$

Fig. 1 - Simultaneous switching transient waveforms.

Fig. 2 - Three-state propagation delay times and test circuit.

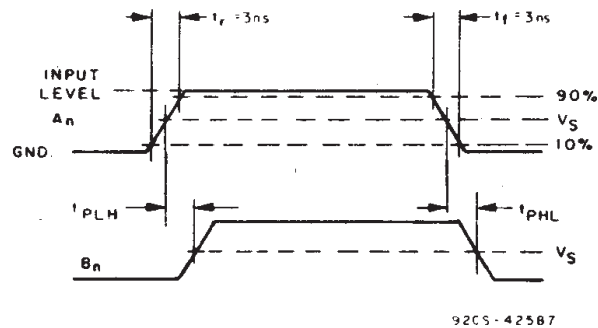
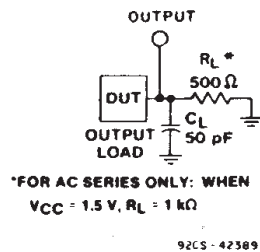


Fig. 3 - Propagation delay times and test circuit.

|                                 | CD54/74AC    | CD54/74ACT   |
|---------------------------------|--------------|--------------|
| Input Level                     | $V_{CC}$     | 3 V          |
| Input Switching Voltage, $V_S$  | $0.5 V_{CC}$ | 1.5 V        |
| Output Switching Voltage, $V_S$ | $0.5 V_{CC}$ | $0.5 V_{CC}$ |

## PACKAGING INFORMATION

| Orderable part number         | Status<br>(1) | Material type<br>(2) | Package   Pins | Package qty   Carrier | RoHS<br>(3) | Lead finish/<br>Ball material<br>(4) | MSL rating/<br>Peak reflow<br>(5) | Op temp (°C) | Part marking<br>(6) |
|-------------------------------|---------------|----------------------|----------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|---------------------|
| <a href="#">CD54ACT623F3A</a> | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | CD54ACT623F3A       |
| CD54ACT623F3A.A               | Active        | Production           | CDIP (J)   20  | 20   TUBE             | No          | SNPB                                 | N/A for Pkg Type                  | -55 to 125   | CD54ACT623F3A       |
| <a href="#">CD74AC623E</a>    | Active        | Production           | PDIP (N)   20  | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -55 to 125   | CD74AC623E          |
| CD74AC623E.A                  | Active        | Production           | PDIP (N)   20  | 20   TUBE             | Yes         | NIPDAU                               | N/A for Pkg Type                  | -55 to 125   | CD74AC623E          |
| <a href="#">CD74AC623M</a>    | Active        | Production           | SOIC (DW)   20 | 25   TUBE             | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -55 to 125   | AC623M              |
| CD74AC623M.A                  | Active        | Production           | SOIC (DW)   20 | 25   TUBE             | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -55 to 125   | AC623M              |
| <a href="#">CD74ACT623M96</a> | Active        | Production           | SOIC (DW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -55 to 125   | ACT623M             |
| CD74ACT623M96.A               | Active        | Production           | SOIC (DW)   20 | 2000   LARGE T&R      | Yes         | NIPDAU                               | Level-1-260C-UNLIM                | -55 to 125   | ACT623M             |

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

<sup>(2)</sup> **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.

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

<sup>(4)</sup> **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.

<sup>(5)</sup> **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.

<sup>(6)</sup> **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.

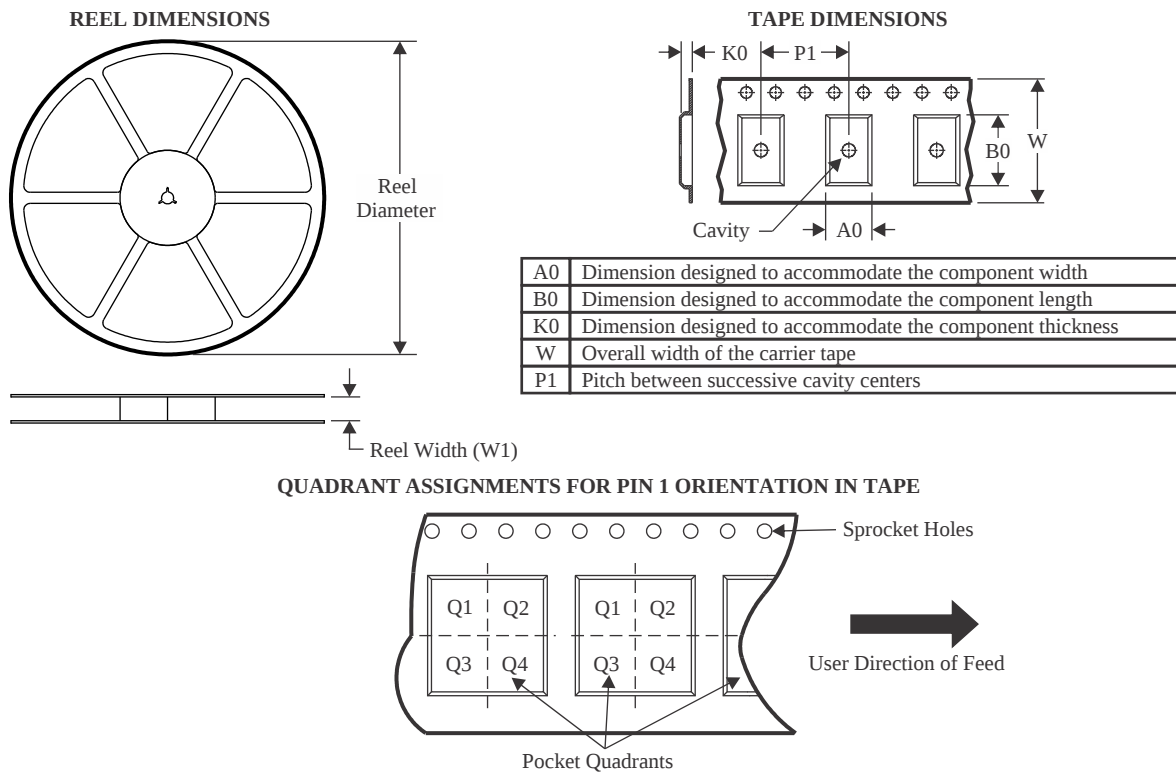
**OTHER QUALIFIED VERSIONS OF CD54ACT623, CD74ACT623 :**

- Catalog : [CD74ACT623](#)
- Military : [CD54ACT623](#)

NOTE: Qualified Version Definitions:

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

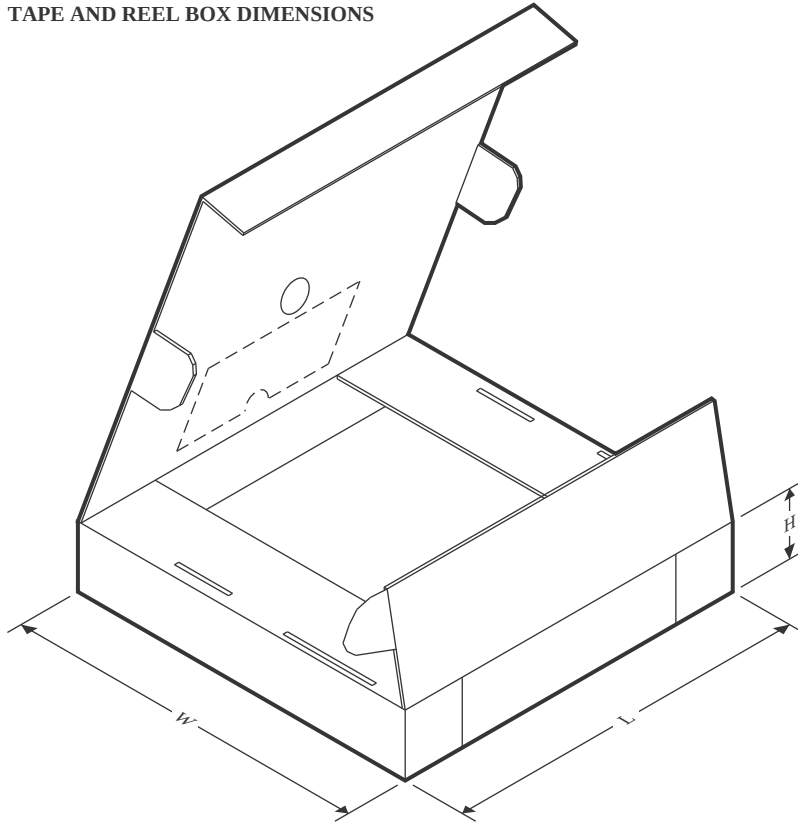
## TAPE AND REEL INFORMATION



\*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 |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| CD74ACT623M96 | 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) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| CD74ACT623M96 | SOIC         | DW              | 20   | 2000 | 356.0       | 356.0      | 45.0        |

## TUBE



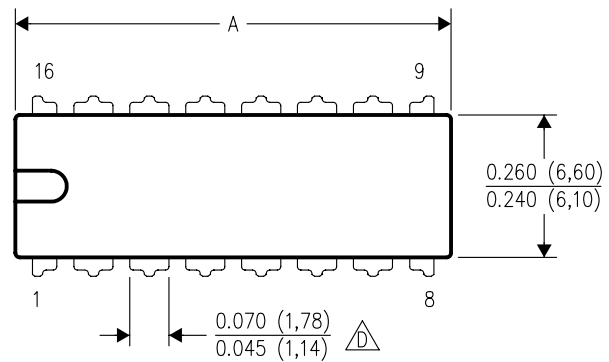
\*All dimensions are nominal

| Device       | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|--------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| CD74AC623E   | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| CD74AC623E.A | N            | PDIP         | 20   | 20  | 506    | 13.97  | 11230  | 4.32   |
| CD74AC623M   | DW           | SOIC         | 20   | 25  | 507    | 12.83  | 5080   | 6.6    |
| CD74AC623M.A | DW           | SOIC         | 20   | 25  | 507    | 12.83  | 5080   | 6.6    |

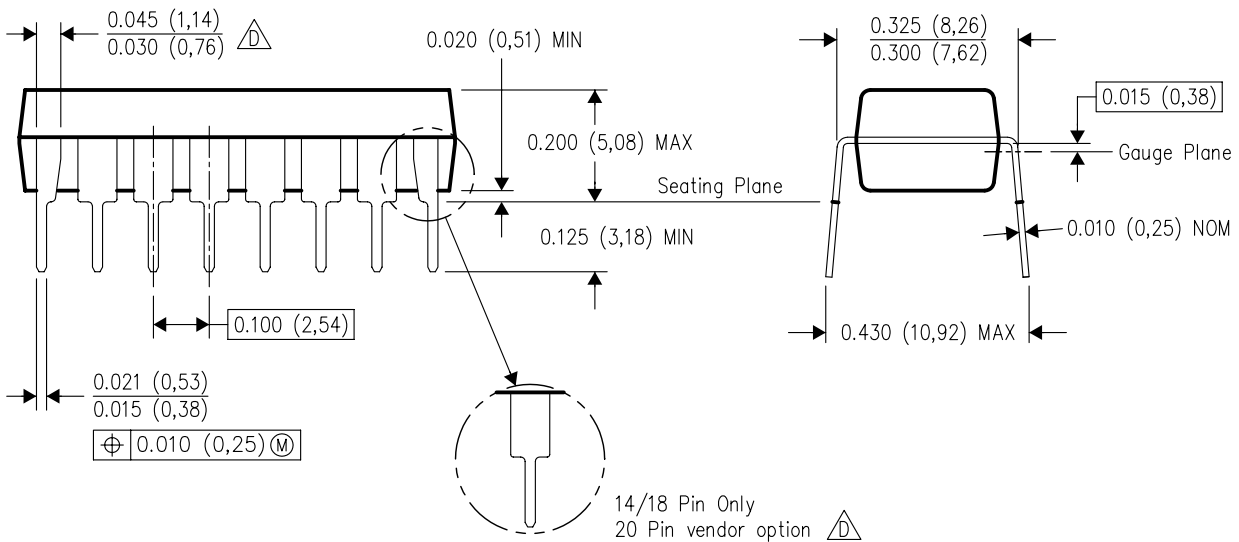
## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



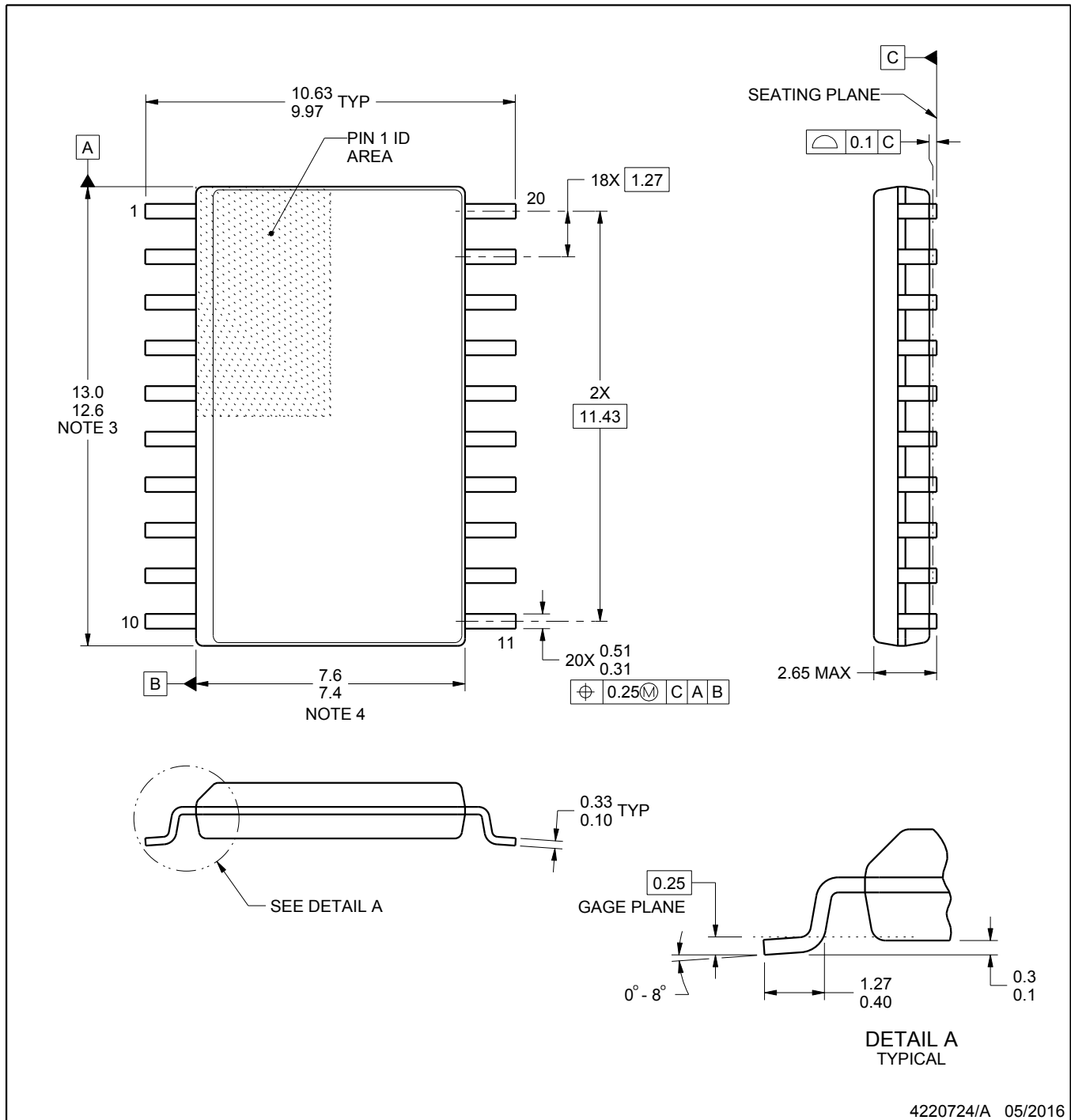
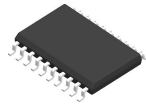
| PINS **             | 14               | 16               | 18               | 20               |
|---------------------|------------------|------------------|------------------|------------------|
| DIM                 |                  |                  |                  |                  |
| 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               |



14/18 Pin Only  
20 Pin vendor option

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:

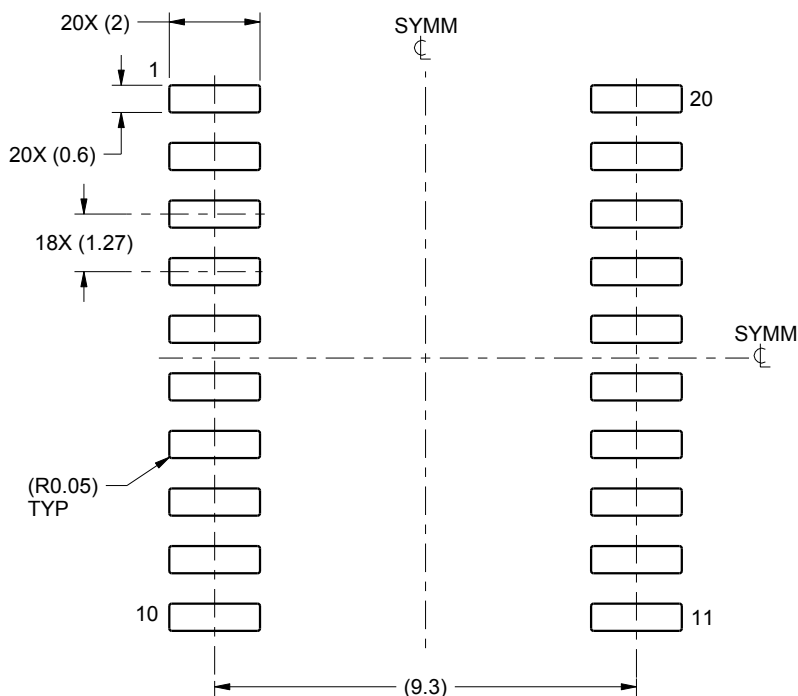
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate 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

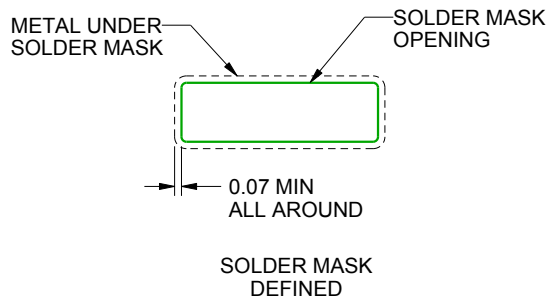
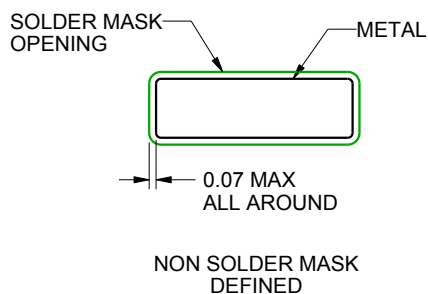
DW0020A

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.

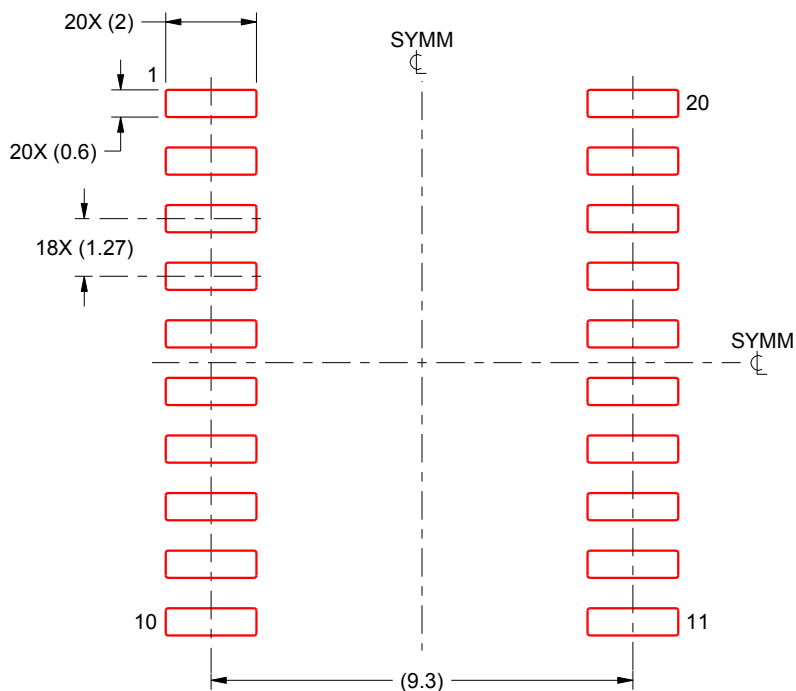
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## 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

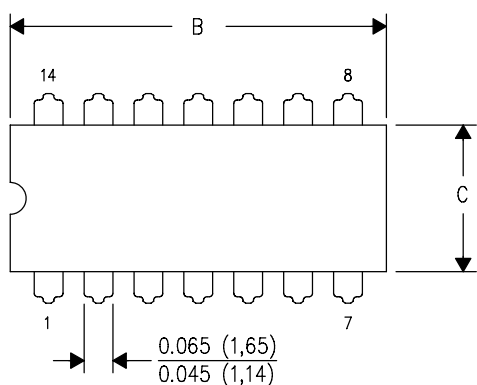
NOTES: (continued)

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.

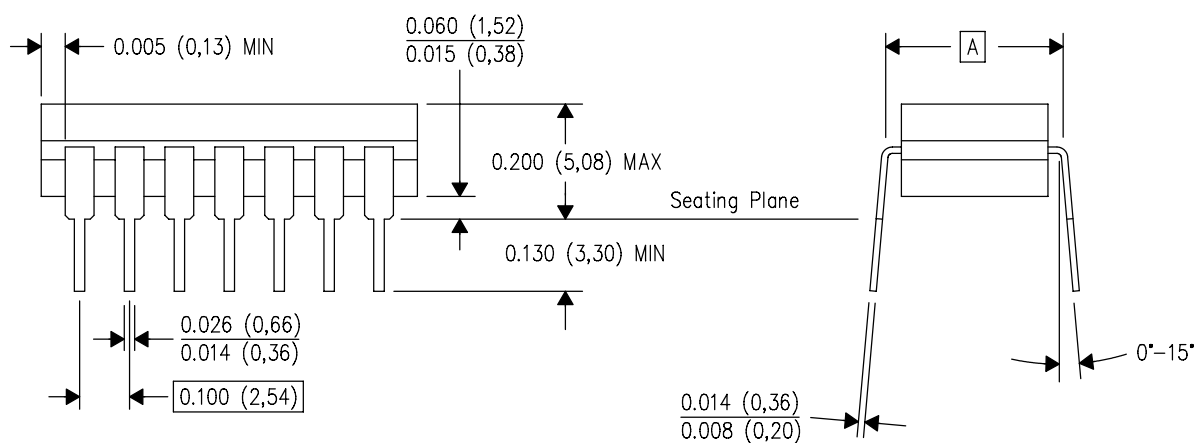
J (R-GDIP-T\*\*)

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.

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2025, Texas Instruments Incorporated