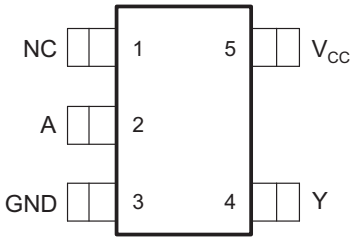
# SN74AUC1G14
# SINGLE SCHMITT-TRIGGER INVERTER

SCES375O – SEPTEMBER 2001 – REVISED AUGUST 2007

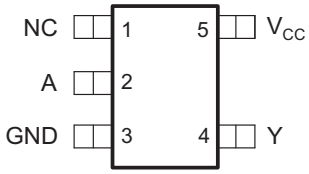
## FEATURES

- **Available in the Texas Instruments NanoFree™ Package**
- **Optimized for 1.8-V Operation and Is 3.6-V I/O Tolerant to Support Mixed-Mode Signal Operation**
- **$I_{off}$ Supports Partial-Power-Down Mode Operation**
- **Sub-1-V Operable**
- **Max $t_{pd}$ of 2.5 ns at 1.8 V**
- **Low Power Consumption, 10-µA Max $I_{CC}$**
- **±8-mA Output Drive at 1.8 V**
- **Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II**
- **ESD Protection Exceeds JESD 22**
  - **2000-V Human-Body Model (A114-A)**
  - **200-V Machine Model (A115-A)**
  - **1000-V Charged-Device Model (C101)**

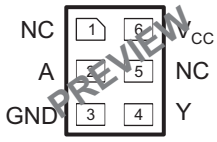
**DBV PACKAGE**
**(TOP VIEW)**




**DCK PACKAGE**
**(TOP VIEW)**

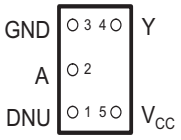



**DRY PACKAGE**
**(TOP VIEW)**






**YZP PACKAGE**
**(BOTTOM VIEW)**




See mechanical drawings for dimensions.
DNU – Do not use
NC – No internal connection

## DESCRIPTION/ORDERING INFORMATION

This single Schmitt-trigger inverter is operational at 0.8-V to 2.7-V $V_{CC}$, but is designed specifically for 1.65-V to 1.95-V $V_{CC}$ operation.

The SN74AUC1G14 contains one inverter and performs the Boolean function $Y = \overline{A}$. The device functions as an independent inverter, but because of Schmitt action, it may have different input threshold levels for positive-going ($V_{T+}$) and negative-going ($V_{T-}$) signals.

NanoFree™ package technology is a major breakthrough in IC packaging concepts, using the die as the package.

This device is fully specified for partial-power-down applications using $I_{off}$. The $I_{off}$ circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

For more information about AUC Little Logic devices, please refer to the TI application report, *Applications of Texas Instruments AUC Sub-1-V Little Logic Devices,* literature number SCEA027.

## ORDERING INFORMATION

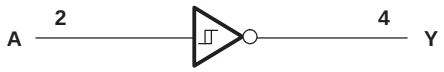
| $T_A$ | PACKAGE(1)(2) | | ORDERABLE PART NUMBER | TOP-SIDE MARKING(3) |
|---|---|---|---|---|
| –40°C to 85°C | NanoFree™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free) | Reel of 3000 | SN74AUC1G14YZPR | _ _ _UF_ |
| | SON – DRY | Reel of 5000 | SN74AUC1G14DRYR | PREVIEW |
| | SOT (SOT-23) – DBV | Reel of 3000 | SN74AUC1G14DBVR | U14_ |
| | SOT (SC-70) – DCK | Reel of 3000 | SN74AUC1G14DCKR | UF_ |

(1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.
(2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.
(3) DBV/DCK/DRY: The actual top-side marking has one additional character that designates the assembly/test site.
YZP: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the assembly/test site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).

## FUNCTION TABLE

| INPUT A | OUTPUT Y |
|---|---|
| H | L |
| L | H |

## LOGIC DIAGRAM (POSITIVE LOGIC)




## Absolute Maximum Ratings(1)

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

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage range | | –0.5 | 3.6 | V |
| $V_I$ | Input voltage range(2) | | –0.5 | 3.6 | V |
| $V_O$ | Voltage range applied to any output in the high-impedance or power-off state(2) | | –0.5 | 3.6 | V |
| $V_O$ | Output voltage range(2) | | –0.5 | $V_{CC}$ + 0.5 | V |
| $I_{IK}$ | Input clamp current | $V_I$ < 0 | | –50 | mA |
| $I_{OK}$ | Output clamp current | $V_O$ < 0 | | –50 | mA |
| $I_O$ | Continuous output current | | | ±20 | mA |
| | Continuous current through $V_{CC}$ or GND | | | ±100 | mA |
| $\theta_{JA}$ | Package thermal impedance(3) | DBV package | | 206 | °C/W |
| | | DCK package | | 252 | |
| | | DRY package | | 234 | |
| | | YZP package | | 132 | |
| $T_{stg}$ | Storage temperature range | | –65 | 150 | °C |

(1) 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.
(2) The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
(3) The package thermal impedance is calculated in accordance with JESD 51-7.

## Recommended Operating Conditions(1)

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | | 0.8 | 2.7 | V |
| $V_I$ | Input voltage | | 0 | 3.6 | V |
| $V_O$ | Output voltage | | 0 | $V_{CC}$ | V |
| $I_{OH}$ | High-level output current | $V_{CC}$ = 0.8 V | | –0.7 | mA |
| | | $V_{CC}$ = 1.1 V | | –3 | |
| | | $V_{CC}$ = 1.4 V | | –5 | |
| | | $V_{CC}$ = 1.65 V | | –8 | |
| | | $V_{CC}$ = 2.3 V | | –9 | |
| $I_{OL}$ | Low-level output current | $V_{CC}$ = 0.8 V | | 0.7 | mA |
| | | $V_{CC}$ = 1.1 V | | 3 | |
| | | $V_{CC}$ = 1.4 V | | 5 | |
| | | $V_{CC}$ = 1.65 V | | 8 | |
| | | $V_{CC}$ = 2.3 V | | 9 | |
| $T_A$ | Operating free-air temperature | | –40 | 85 | °C |

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

## Electrical Characteristics

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

| PARAMETER | TEST CONDITIONS | $V_{CC}$ | MIN | TYP(1) | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{T+}$ Positive-going input threshold voltage | | 0.8 V | | 0.5 | | V |
| | | 1.1 V | 0.51 | | 0.86 | |
| | | 1.4 V | 0.65 | | 1 | |
| | | 1.65 V | 0.79 | | 1.16 | |
| | | 2.3 V | 1.11 | | 1.56 | |
| $V_{T-}$ Negative-going input threshold voltage | | 0.8 V | | 0.3 | | V |
| | | 1.1 V | 0.22 | | 0.53 | |
| | | 1.4 V | 0.3 | | 0.58 | |
| | | 1.65 V | 0.39 | | 0.62 | |
| | | 2.3 V | 0.58 | | 0.87 | |
| $\Delta V_T$ Hysteresis ($V_{T+} - V_{T-}$) | | 0.8 V | | 0.21 | | V |
| | | 1.1 V | 0.25 | | 0.38 | |
| | | 1.4 V | 0.31 | | 0.5 | |
| | | 1.65 V | 0.37 | | 0.62 | |
| | | 2.3 V | 0.48 | | 0.77 | |
| $V_{OH}$ | $I_{OH}$ = –100 µA | 0.8 V to 2.7 V | $V_{CC}$ – 0.1 | | | V |
| | $I_{OH}$ = –0.7 mA | 0.8 V | | 0.55 | | |
| | $I_{OH}$ = –3 mA | 1.1 V | 0.8 | | | |
| | $I_{OH}$ = –5 mA | 1.4 V | 1 | | | |
| | $I_{OH}$ = –8 mA | 1.65 V | 1.2 | | | |
| | $I_{OH}$ = –9 mA | 2.3 V | 1.8 | | | |
| $V_{OL}$ | $I_{OL}$ = 100 µA | 0.8 V to 2.7 V | | | 0.2 | V |
| | $I_{OL}$ = 0.7 mA | 0.8 V | | 0.25 | | |
| | $I_{OL}$ = 3 mA | 1.1 V | | | 0.3 | |
| | $I_{OL}$ = 5 mA | 1.4 V | | | 0.4 | |
| | $I_{OL}$ = 8 mA | 1.65 V | | | 0.45 | |
| | $I_{OL}$ = 9 mA | 2.3 V | | | 0.6 | |
| $I_I$ A input | $V_I = V_{CC}$ or GND | 0 to 2.7 V | | | ±5 | µA |
| $I_{off}$ | $V_I$ or $V_O$ = 2.7 V | 0 | | | ±10 | µA |
| $I_{CC}$ | $V_I = V_{CC}$ or GND, $I_O$ = 0 | 0.8 V to 2.7 V | | | 10 | µA |
| $C_i$ | $V_I = V_{CC}$ or GND | 2.5 V | | 3.5 | | pF |

(1) All typical values are at $T_A$ = 25°C.

## Switching Characteristics

over recommended operating free-air temperature range, $C_L$ = 15 pF (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 0.8 V | $V_{CC}$ = 1.2 V ± 0.1 V | | $V_{CC}$ = 1.5 V ± 0.1 V | | $V_{CC}$ = 1.8 V ± 0.15 V | | | $V_{CC}$ = 2.5 V ± 0.2 V | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TYP | MIN | MAX | MIN | MAX | MIN | TYP | MAX | MIN | MAX | |
| $t_{pd}$ | A | Y | 5.8 | 0.7 | 4 | 0.6 | 2.3 | 0.5 | 1.2 | 1.9 | 0.5 | 1.6 | ns |

## Switching Characteristics

over recommended operating free-air temperature range, $C_L$ = 30 pF (unless otherwise noted) (see Figure 1)

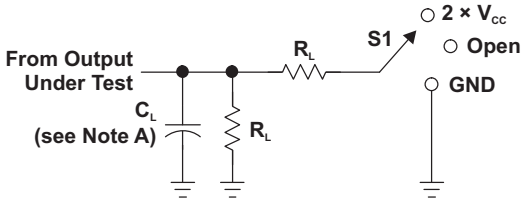
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 1.8 V ± 0.15 V | | | $V_{CC}$ = 2.5 V ± 0.2 V | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | MIN | MAX | |
| $t_{pd}$ | A | Y | 0.7 | 1.6 | 2.5 | 0.5 | 2.5 | ns |

## Operating Characteristics

$T_A$ = 25°C

| PARAMETER | | TEST CONDITIONS | $V_{CC}$ = 0.8 V | $V_{CC}$ = 1.2 V | $V_{CC}$ = 1.5 V | $V_{CC}$ = 1.8 V | $V_{CC}$ = 2.5 V | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | | TYP | TYP | TYP | TYP | TYP | |
| $C_{pd}$ | Power dissipation capacitance | f = 10 MHz | 14 | 15 | 15 | 16 | 19 | pF |

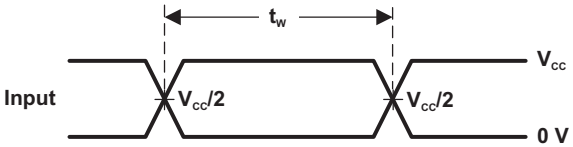
## PARAMETER MEASUREMENT INFORMATION



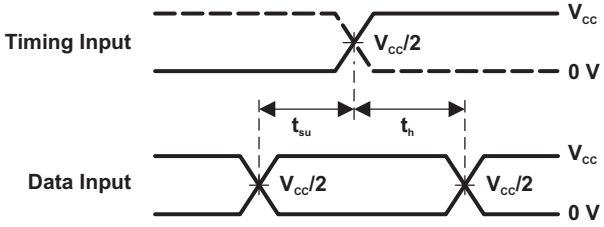

LOAD CIRCUIT

| TEST | S1 |
|---|---|
| $t_{PLH}/t_{PHL}$ | Open |
| $t_{PLZ}/t_{PZL}$ | 2 × $V_{CC}$ |
| $t_{PHZ}/t_{PZH}$ | GND |

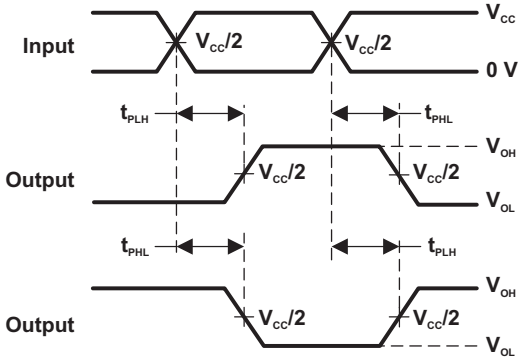
| $V_{CC}$ | $C_L$ | $R_L$ | $V_\Delta$ |
|---|---|---|---|
| 0.8 V | 15 pF | 2 kΩ | 0.1 V |
| 1.2 V ± 0.1 V | 15 pF | 2 kΩ | 0.1 V |
| 1.5 V ± 0.1 V | 15 pF | 2 kΩ | 0.1 V |
| 1.8 V ± 0.15 V | 15 pF | 2 kΩ | 0.15 V |
| 2.5 V ± 0.2 V | 15 pF | 2 kΩ | 0.15 V |
| 1.8 V ± 0.15 V | 30 pF | 1 kΩ | 0.15 V |
| 2.5 V ± 0.2 V | 30 pF | 500 Ω | 0.15 V |



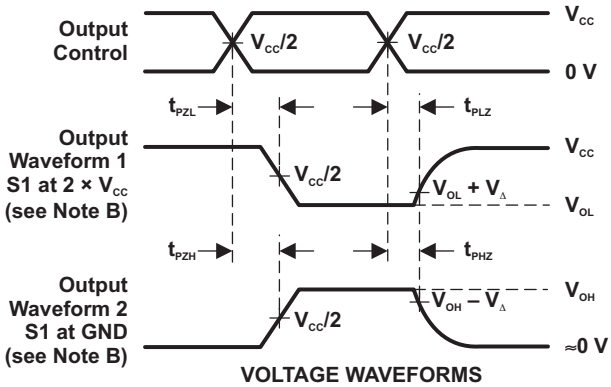

VOLTAGE WAVEFORMS
PULSE DURATION




VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES




VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS




VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING

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. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, $Z_O$ = 50 Ω, slew rate ≥ 1 V/ns.
D. The outputs are measured one at a time, with one transition per measurement.
E. $t_{PLZ}$ and $t_{PHZ}$ are the same as $t_{dis}$.
F. $t_{PZL}$ and $t_{PZH}$ are the same as $t_{en}$.
G. $t_{PLH}$ and $t_{PHL}$ are the same as $t_{pd}$.

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

## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) |
|---|---|---|---|---|---|---|---|---|
| SN74AUC1G14DBVR | ACTIVE | SOT-23 | DBV | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUC1G14DBVRE4 | ACTIVE | SOT-23 | DBV | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUC1G14DBVRG4 | ACTIVE | SOT-23 | DBV | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUC1G14DCKR | ACTIVE | SC70 | DCK | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUC1G14DCKRE4 | ACTIVE | SC70 | DCK | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUC1G14DCKRG4 | ACTIVE | SC70 | DCK | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUC1G14YZPR | ACTIVE | DSBGA | YZP | 5 | 3000 | Green (RoHS & no Sb/Br) | SNAGCU | Level-1-260C-UNLIM |

(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) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
**TBD:** The Pb-Free/Green conversion plan has not been defined.
**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

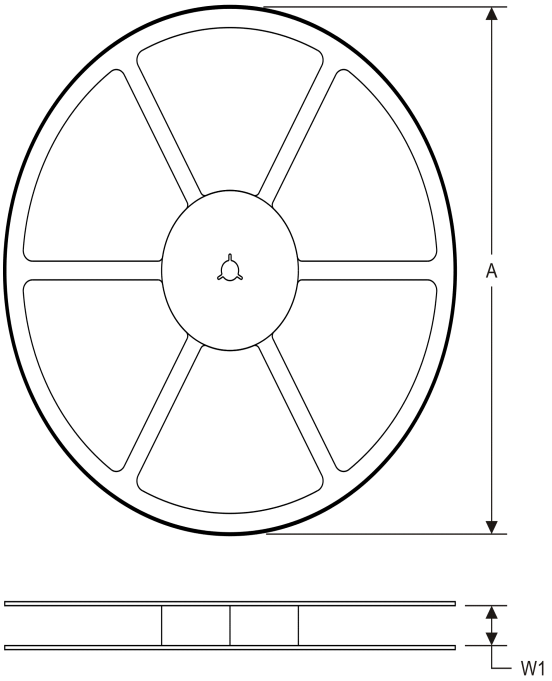


**OTHER QUALIFIED VERSIONS OF SN74AUC1G14 :**
- Enhanced Product: SN74AUC1G14-EP

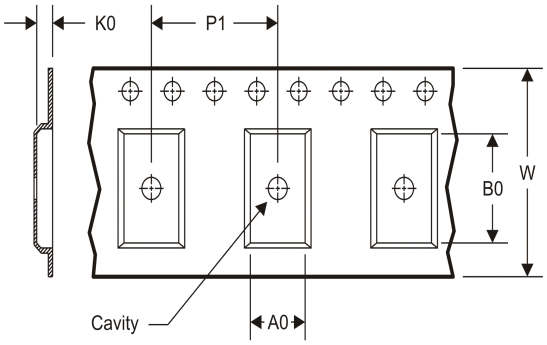
NOTE: Qualified Version Definitions:
- Enhanced Product - Supports Defense, Aerospace and Medical Applications

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**




**TAPE DIMENSIONS**



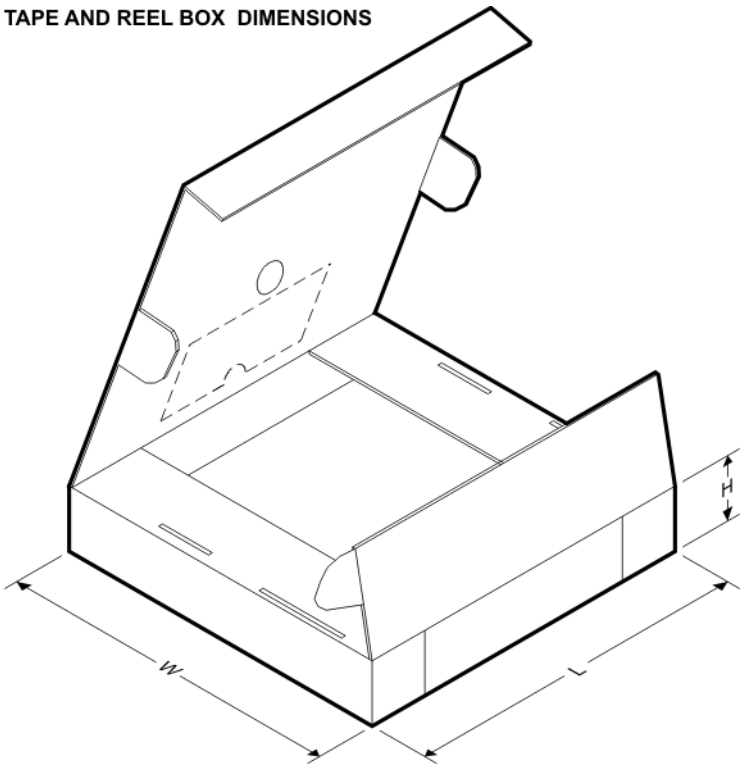

| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74AUC1G14DBVR | SOT-23 | DBV | 5 | 3000 | 178.0 | 9.0 | 3.23 | 3.17 | 1.37 | 4.0 | 8.0 | Q3 |
| SN74AUC1G14DCKR | SC70 | DCK | 5 | 3000 | 178.0 | 9.0 | 2.4 | 2.5 | 1.2 | 4.0 | 8.0 | Q3 |
| SN74AUC1G14YZPR | DSBGA | YZP | 5 | 3000 | 180.0 | 8.4 | 1.02 | 1.52 | 0.63 | 4.0 | 8.0 | Q1 |

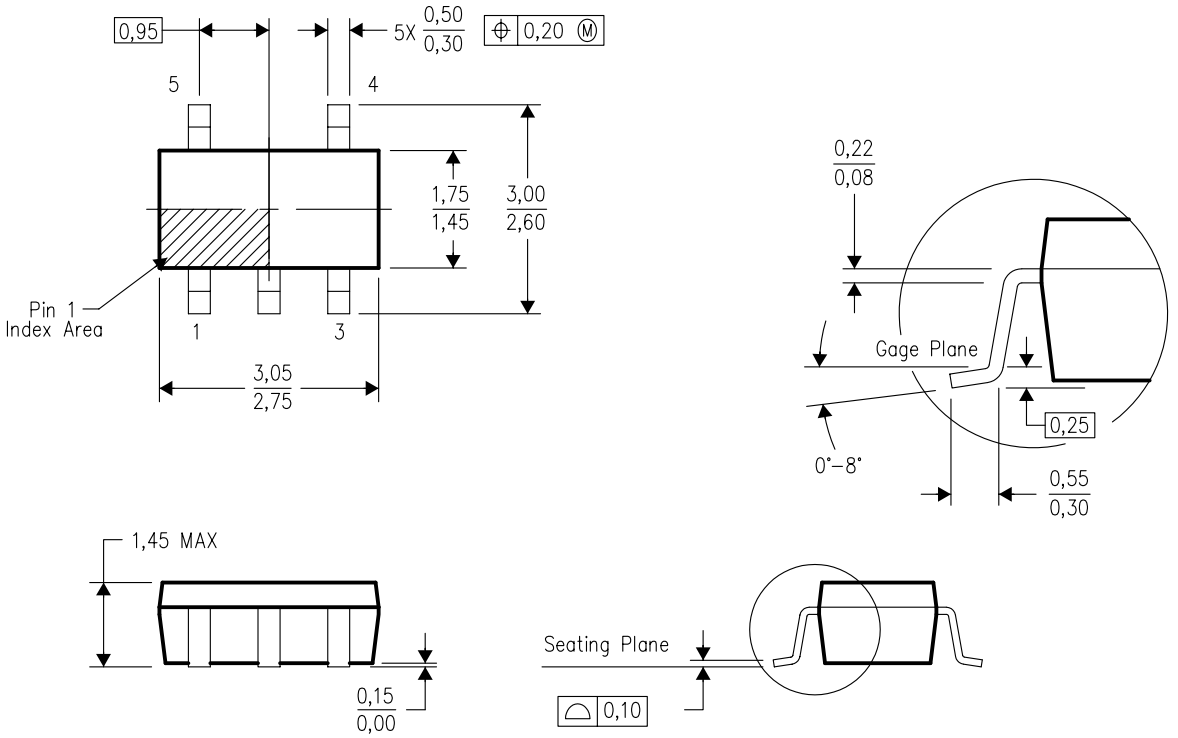
TAPE AND REEL BOX DIMENSIONS




*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74AUC1G14DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 180.0 | 18.0 |
| SN74AUC1G14DCKR | SC70 | DCK | 5 | 3000 | 180.0 | 180.0 | 18.0 |
| SN74AUC1G14YZPR | DSBGA | YZP | 5 | 3000 | 220.0 | 220.0 | 34.0 |

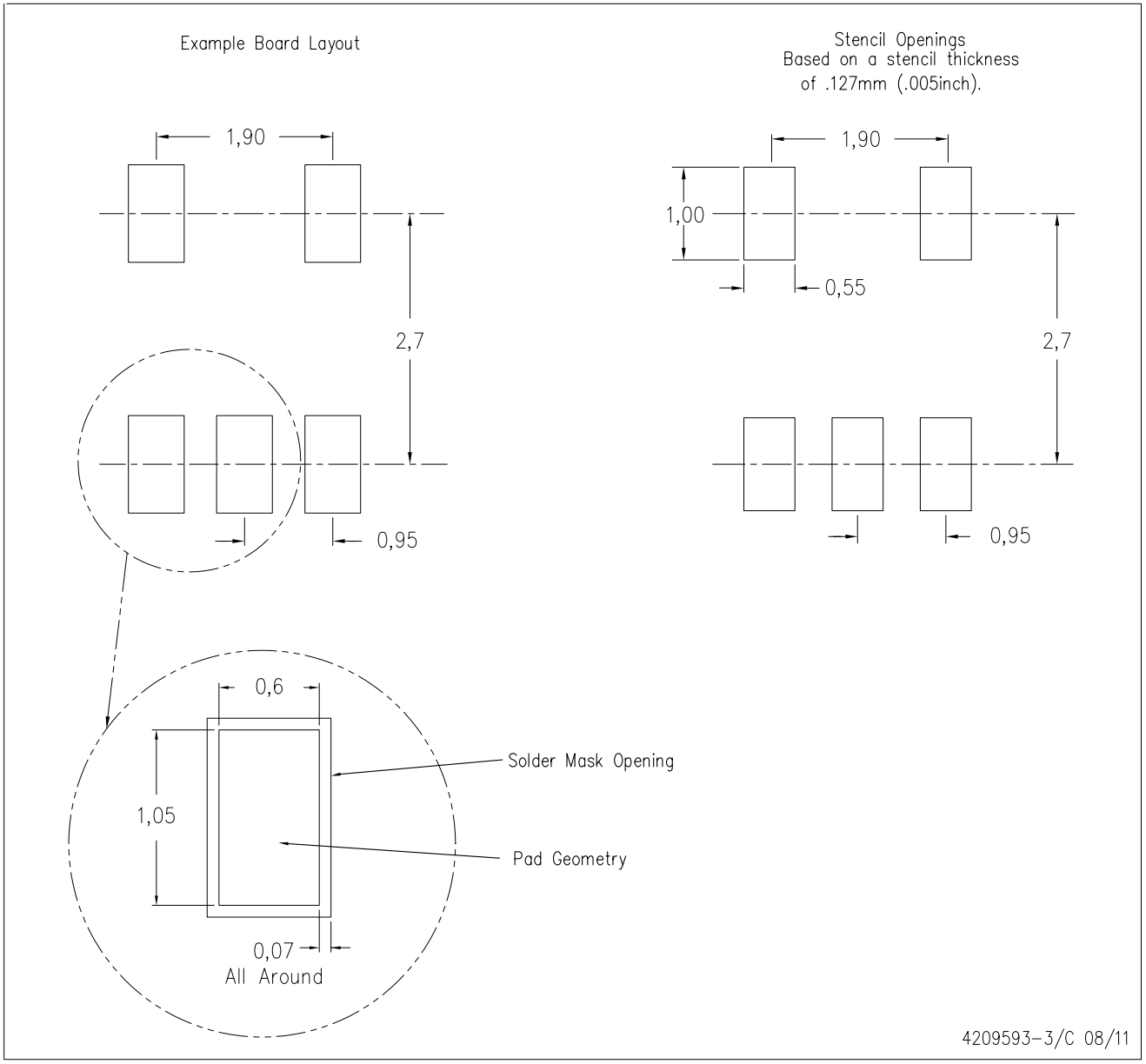
## DBV (R–PDSO–G5) PLASTIC SMALL–OUTLINE PACKAGE




4073253–4/K 03/2006

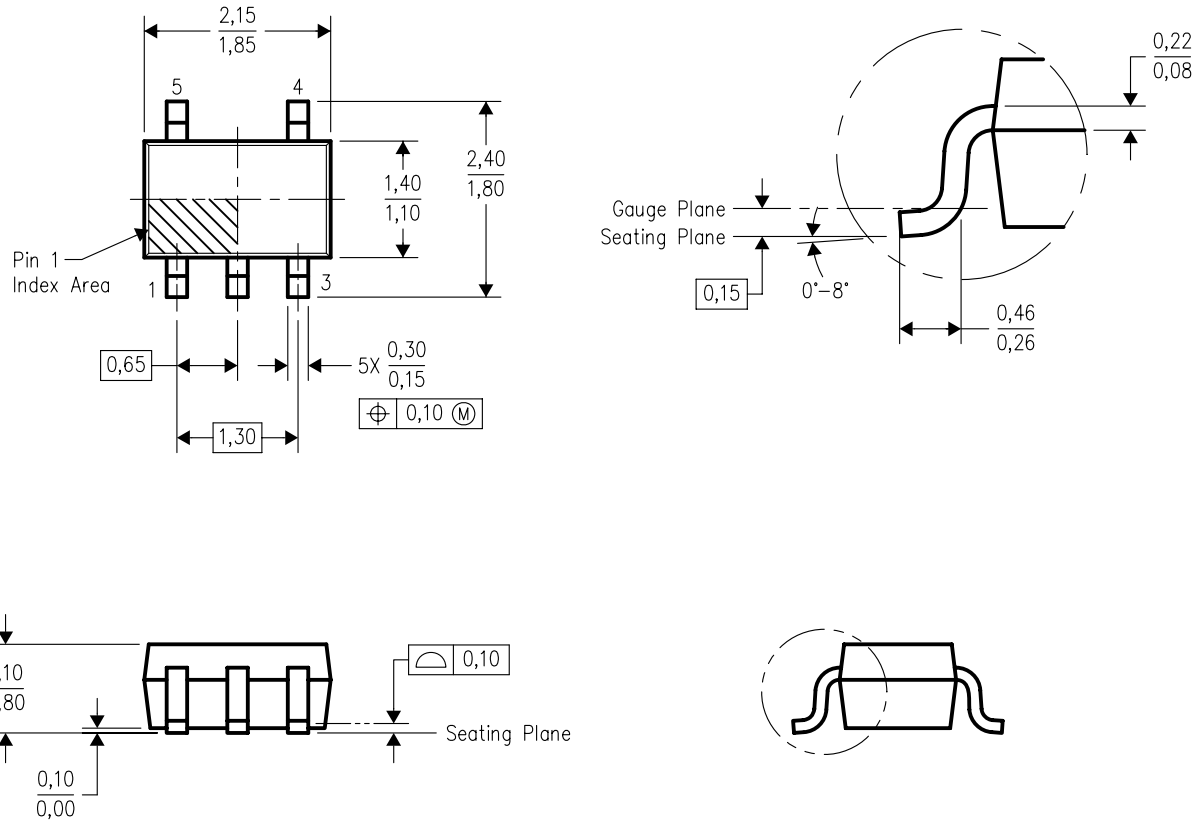
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
D. Falls within JEDEC MO–178 Variation AA.

DBV (R–PDSO–G5) PLASTIC SMALL OUTLINE




NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
D. Publication IPC–7351 is recommended for alternate designs.
E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC–7525 for other stencil recommendations.

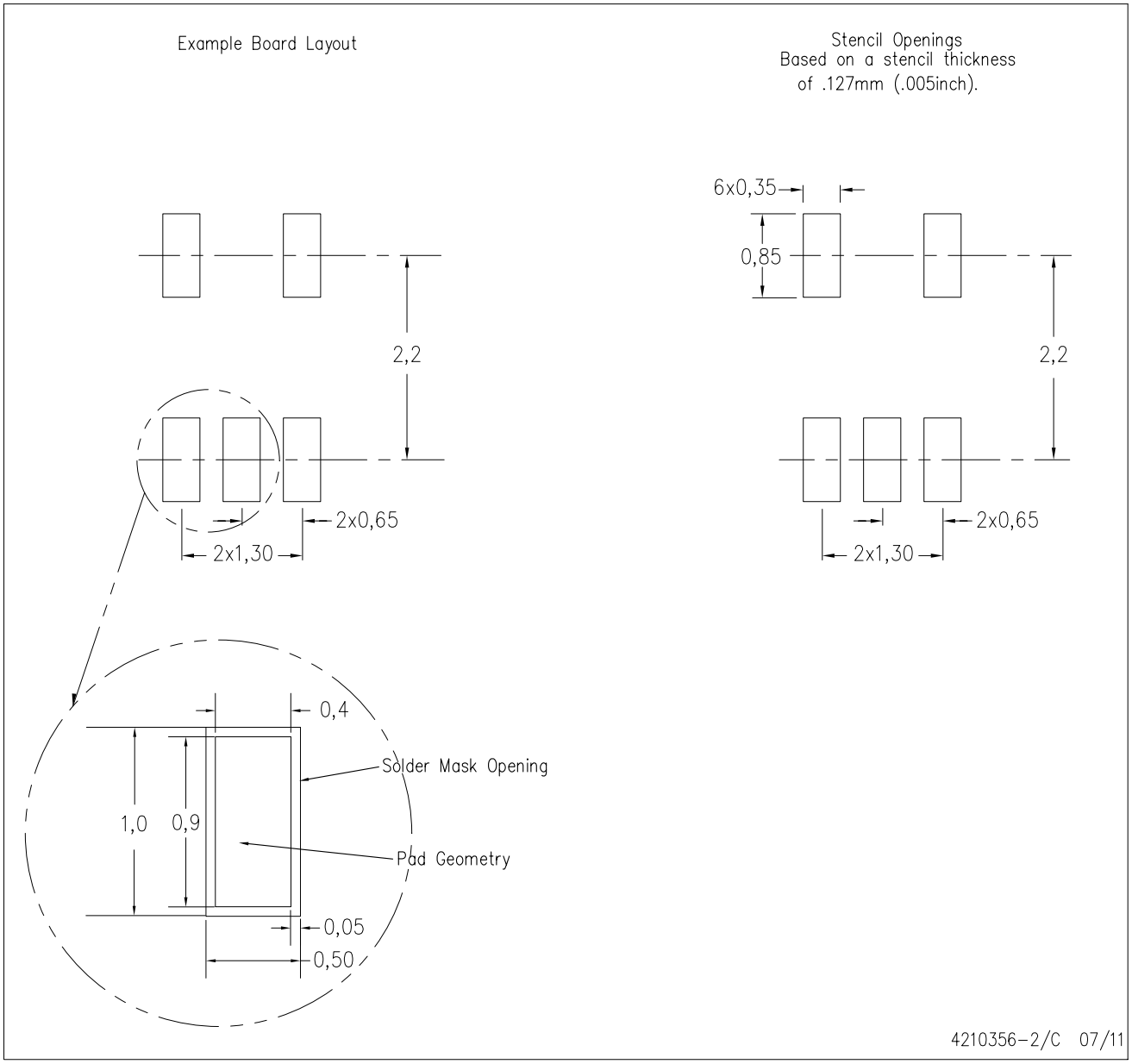
## DCK (R–PDSO–G5) PLASTIC SMALL–OUTLINE PACKAGE




4093553–3/G 01/2007

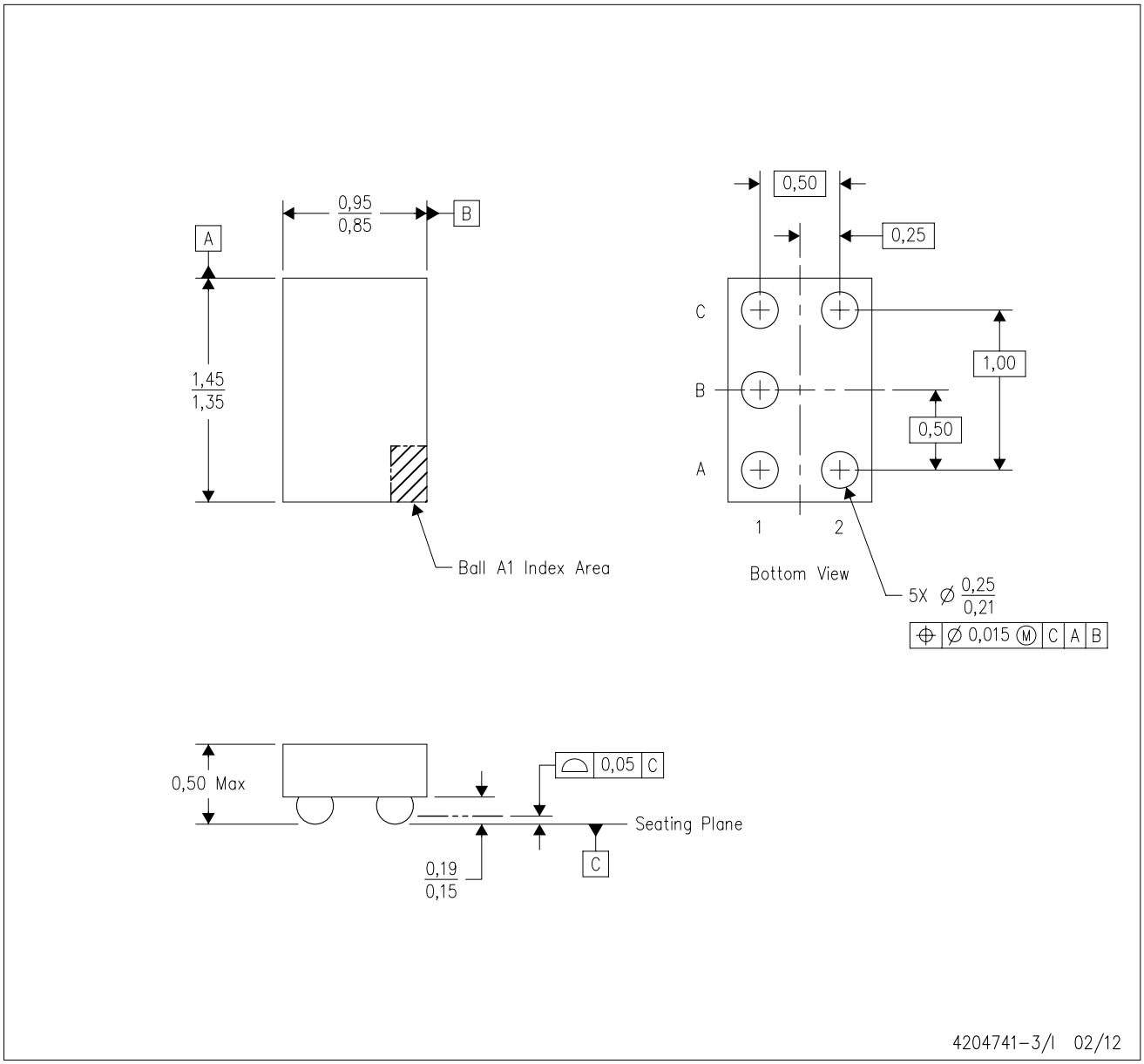
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
D. Falls within JEDEC MO–203 variation AA.

DCK (R–PDSO–G5) PLASTIC SMALL OUTLINE




NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
D. Publication IPC–7351 is recommended for alternate designs.
E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC–7525 for other stencil recommendations.

YZP (R–XBGA–N5) DIE–SIZE BALL GRID ARRAY




NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. NanoFree™ package configuration.
D. This package is a Pb–free solder ball design. Refer to the 5 YEP package (drawing 4204725) for tin–lead (SnPb).

**NanoFree is a trademark of Texas Instruments.**

## IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

| **Products** | | **Applications** | |
|---|---|---|---|
| Audio | www.ti.com/audio | Automotive and Transportation | www.ti.com/automotive |
| Amplifiers | amplifier.ti.com | Communications and Telecom | www.ti.com/communications |
| Data Converters | dataconverter.ti.com | Computers and Peripherals | www.ti.com/computers |
| DLP® Products | www.dlp.com | Consumer Electronics | www.ti.com/consumer-apps |
| DSP | dsp.ti.com | Energy and Lighting | www.ti.com/energy |
| Clocks and Timers | www.ti.com/clocks | Industrial | www.ti.com/industrial |
| Interface | interface.ti.com | Medical | www.ti.com/medical |
| Logic | logic.ti.com | Security | www.ti.com/security |
| Power Mgmt | power.ti.com | Space, Avionics and Defense | www.ti.com/space-avionics-defense |
| Microcontrollers | microcontroller.ti.com | Video and Imaging | www.ti.com/video |
| RFID | www.ti-rfid.com | | |
| OMAP Mobile Processors | www.ti.com/omap | | |
| Wireless Connectivity | www.ti.com/wirelessconnectivity | | |
| | **TI E2E Community Home Page** | | e2e.ti.com |

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265