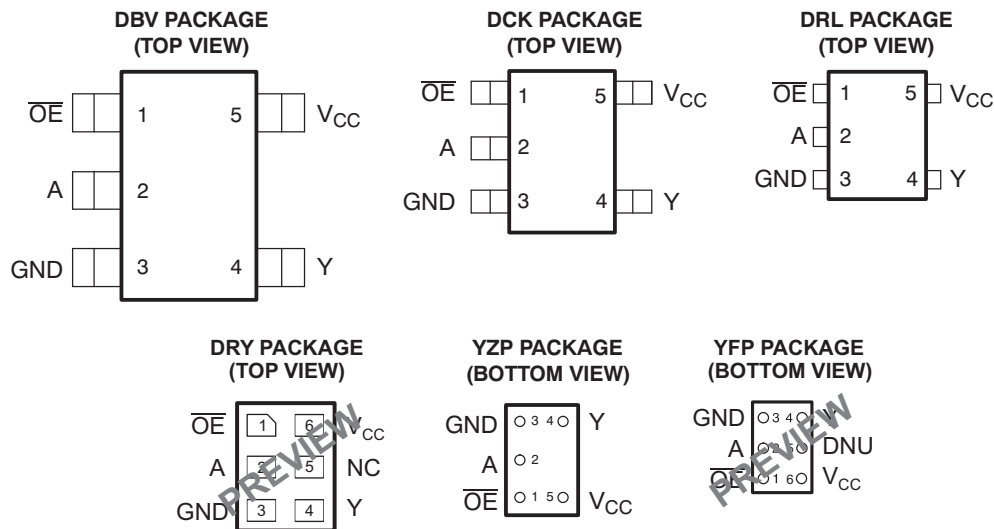


FEATURES

- Available in the Texas Instruments NanoFree™ Package
- Low Static-Power Consumption ($I_{CC} = 0.9 \mu\text{A Max}$)
- Low Dynamic-Power Consumption ($C_{pd} = 4 \text{ pF Typ at } 3.3 \text{ V}$)
- Low Input Capacitance ($C_i = 1.5 \text{ pF Typ}$)
- Low Noise – Overshoot and Undershoot $<10\%$ of V_{CC}
- Input-Disable Feature Allows Floating Input Conditions
- I_{off} Supports Partial-Power-Down Mode Operation
- Input Hysteresis Allows Slow Input Transition and Better Switching Noise Immunity at Input
- Wide Operating V_{CC} Range of 0.8 V to 3.6 V
- Optimized for 3.3-V Operation
- 3.6-V I/O Tolerant to Support Mixed-Mode Signal Operation
- $t_{pd} = 4.6 \text{ ns Max at } 3.3 \text{ V}$
- Suitable for Point-to-Point Applications
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Performance Tested Per JESD 22
 - 2000-V Human-Body Model (A114-B, Class II)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)
- ESD Protection Exceeds $\pm 5000 \text{ V}$ With Human-Body Model



NC – No internal connection
See mechanical drawings for dimensions.

DESCRIPTION/ORDERING INFORMATION

The AUP family is TI's premier solution to the industry's low-power needs in battery-powered portable applications. This family ensures a very low static and dynamic power consumption across the entire V_{CC} range of 0.8 V to 3.6 V, resulting in an increased battery life. This product also maintains excellent signal integrity (see Figures 1 and 2).

This bus buffer gate is a single line driver with a 3-state output. The output is disabled when the output-enable (\overline{OE}) input is high. This device has the input-disable feature, which allows floating input signals.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

NanoFree is a trademark of Texas Instruments.

SN74AUP1G125 LOW-POWER SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

SCES595H–JULY 2004–REVISED MAY 2007

DESCRIPTION/ORDERING INFORMATION (CONTINUED)

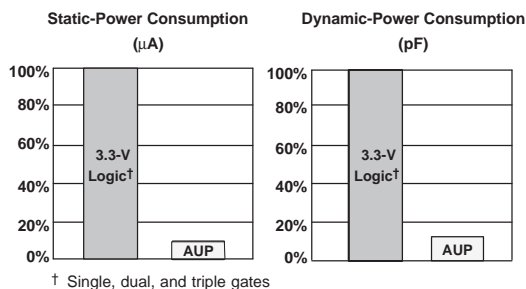


Figure 1. AUP – The Lowest-Power Family

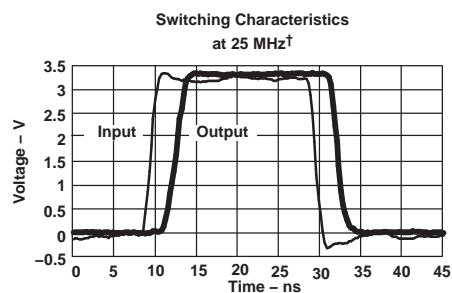


Figure 2. Excellent Signal Integrity

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.

ORDERING INFORMATION

| T_A | PACKAGE ⁽¹⁾⁽²⁾ | | ORDERABLE PART NUMBER | TOP-SIDE MARKING ⁽³⁾ |
|---------------------|---|------------------|-----------------------|---------------------------------|
| –40°C to 85°C | NanoStar™ – WCSP (DSBGA) 0.23-mm Large Bump – YFP (Pb-free) | Reel of 3000 | SN74AUP1G125YFPR | PREVIEW |
| | NanoStar™ – WCSP (DSBGA) 0.23-mm Large Bump – YZP (Pb-free) | Reel of 3000 | SN74AUP1G125YZPR | ___ HM _ |
| | SON – DRY | Reel of 5000 | SN74AUP1G125DRYR | PREVIEW |
| | SOT (SOT-23) – DBV | Reel of 3000 | SN74AUP1G125DBVR | H25_ |
| | | Reel of 250 | SN74AUP1G125DBVT | |
| | SOT (SC-70) – DCK | Reel of 3000 | SN74AUP1G125DCKR | HM_ |
| | | Reel of 250 | SN74AUP1G125DCKT | |
| SOT (SOT-553) – DRL | Reel of 4000 | SN74AUP1G125DRLR | | |

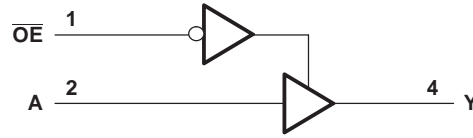
- (1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.
- (2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.
- (3) DBV/DCK/DRL/DRY: The actual top-side marking has one additional character that designates the assembly/test site. YFP/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

| INPUTS | | OUTPUT Y |
|-----------------|------------------|-------------|
| \overline{OE} | A | |
| L | H | H |
| L | L | L |
| H | X ⁽¹⁾ | Z |

- (1) Floating inputs allowed.

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 | 4.6 | V |
| V_I | Input voltage range ⁽²⁾ | -0.5 | 4.6 | V |
| V_O | Voltage range applied to any output in the high-impedance or power-off state ⁽²⁾ | -0.5 | 4.6 | V |
| V_O | Output voltage range in the high or low state ⁽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 | | ±50 | mA |
| θ_{JA} | Package thermal impedance ⁽³⁾ | DBV package | 206 | °C/W |
| | | DCK package | 252 | |
| | | DRL package | 142 | |
| | | DRY package | 234 | |
| | | YFP/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.

SN74AUP1G125

LOW-POWER SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

SCES595H–JULY 2004–REVISED MAY 2007

Recommended Operating Conditions⁽¹⁾

| | | MIN | MAX | UNIT |
|-----------------|------------------------------------|-----------------------------------|------------------------|------------------------|
| V _{CC} | Supply voltage | 0.8 | 3.6 | V |
| V _{IH} | High-level input voltage | V _{CC} = 0.8 V | V _{CC} | 3.6 |
| | | V _{CC} = 1.1 V to 1.95 V | 0.65 × V _{CC} | 3.6 |
| | | V _{CC} = 2.3 V to 2.7 V | 1.6 | 3.6 |
| | | V _{CC} = 3 V to 3.6 V | 2 | 3.6 |
| V _{IL} | Low-level input voltage | V _{CC} = 0.8 V | 0 | |
| | | V _{CC} = 1.1 V to 1.95 V | 0 | 0.35 × V _{CC} |
| | | V _{CC} = 2.3 V to 2.7 V | 0 | 0.7 |
| | | V _{CC} = 3 V to 3.6 V | 0 | 0.9 |
| V _O | Output voltage | Active state | 0 | V _{CC} |
| | | 3-state | 0 | 3.6 |
| I _{OH} | High-level output current | V _{CC} = 0.8 V | | –20 |
| | | V _{CC} = 1.1 V | | –1.1 |
| | | V _{CC} = 1.4 V | | –1.7 |
| | | V _{CC} = 1.65 V | | –1.9 |
| | | V _{CC} = 2.3 V | | –3.1 |
| | | V _{CC} = 3 V | | –4 |
| I _{OL} | Low-level output current | V _{CC} = 0.8 V | | 20 |
| | | V _{CC} = 1.1 V | | 1.1 |
| | | V _{CC} = 1.4 V | | 1.7 |
| | | V _{CC} = 1.65 V | | 1.9 |
| | | V _{CC} = 2.3 V | | 3.1 |
| | | V _{CC} = 3 V | | 4 |
| Δt/Δv | Input transition rise or fall rate | V _{CC} = 0.8 V to 3.6 V | | 200 |
| T _A | Operating free-air temperature | | –40 | 85 |

(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 of Floating CMOS Inputs*, literature number SCBA004.

Electrical Characteristics

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

| PARAMETER | TEST CONDITIONS | V _{CC} | T _A = 25°C | | | T _A = –40°C to 85°C | | UNIT |
|-------------------|----------------------------|--|------------------------|-----|-----|--------------------------------|-----|------|
| | | | MIN | TYP | MAX | MIN | MAX | |
| V _{OL} | I _{OH} = –20 μA | 0.8 V to 3.6 V | V _{CC} – 0.1 | | | V _{CC} – 0.1 | | V |
| | I _{OH} = –1.1 mA | 1.1 V | 0.75 × V _{CC} | | | 0.7 × V _{CC} | | |
| | I _{OH} = –1.7 mA | 1.4 V | 1.11 | | | 1.03 | | |
| | I _{OH} = –1.9 mA | 1.65 V | 1.32 | | | 1.3 | | |
| | I _{OH} = –2.3 mA | 2.3 V | 2.05 | | | 1.97 | | |
| | I _{OH} = –3.1 mA | | 1.9 | | | 1.85 | | |
| | I _{OH} = –2.7 mA | 3 V | 2.72 | | | 2.67 | | |
| | I _{OH} = –4 mA | | 2.6 | | | 2.55 | | |
| V _{OL} | I _{OL} = 20 μA | 0.8 V to 3.6 V | 0.1 | | | 0.1 | | V |
| | I _{OL} = 1.1 mA | 1.1 V | 0.3 × V _{CC} | | | 0.3 × V _{CC} | | |
| | I _{OL} = 1.7 mA | 1.4 V | 0.31 | | | 0.37 | | |
| | I _{OL} = 1.9 mA | 1.65 V | 0.31 | | | 0.35 | | |
| | I _{OL} = 2.3 mA | 2.3 V | 0.31 | | | 0.33 | | |
| | I _{OL} = 3.1 mA | | 0.44 | | | 0.45 | | |
| | I _{OL} = 2.7 mA | 3 V | 0.31 | | | 0.33 | | |
| | I _{OL} = 4 mA | | 0.44 | | | 0.45 | | |
| I _I | A or \overline{OE} input | V _I = GND to 3.6 V | 0 V to 3.6 V | | | 0.1 | 0.5 | μA |
| I _{off} | | V _I or V _O = 0 V to 3.6 V | 0 V | | | 0.2 | 0.6 | μA |
| ΔI _{off} | | V _I or V _O = 0 V to 3.6 V | 0 V to 0.2 V | | | 0.2 | 0.6 | μA |
| I _{OZ} | | V _O = V _{CC} or GND | 3.6 V | | | 0.1 | 0.5 | μA |
| I _{CC} | | V _I = GND or (V _{CC} to 3.6 V), \overline{OE} = GND, I _O = 0 | 0.8 V to 3.6 V | | | 0.5 | 0.9 | μA |
| ΔI _{CC} | A input | V _I = V _{CC} – 0.6 V ⁽¹⁾ , I _O = 0 | 3.3 V | | | 40 | 50 | μA |
| | \overline{OE} input | | 3.3 V | | | 110 | 120 | |
| | All inputs | V _I = GND to 3.6 V, \overline{OE} = V _{CC} ⁽²⁾ | 0.8 V to 3.6 V | | | 0 | 0 | |
| C _I | | V _I = V _{CC} or GND | 0 V | | | 1.5 | | pF |
| | | V _I = V _{CC} or GND | 3.6 V | | | 1.5 | | |
| C _O | | V _O = V _{CC} or GND | 3.6 V | | | 3 | | pF |

 (1) One input at V_{CC} – 0.6 V, other input at V_{CC} or GND

 (2) To show I_{CC} is very low when the input-disable feature is enabled

SN74AUP1G125

LOW-POWER SINGLE BUS BUFFER GATE

WITH 3-STATE OUTPUT

SCES595H–JULY 2004–REVISED MAY 2007

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 5$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | V_{CC} | $T_A = 25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to 85°C | | UNIT |
|-----------|-----------------|----------------|----------------------------------|--------------------------|-----|------|--|------|------|
| | | | | MIN | TYP | MAX | MIN | MAX | |
| t_{pd} | A | Y | 0.8 V | 18.1 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 4.3 | 7.4 | 12.6 | 2.7 | 15.3 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 3.3 | 5.2 | 8.5 | 1 | 10.2 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 2.6 | 4.1 | 6.8 | 1.3 | 8.3 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 2 | 2.9 | 4.7 | 1.1 | 5.8 | |
| t_{en} | \overline{OE} | Y | 0.8 V | 19.1 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 5.1 | 9.3 | 15.9 | 3.6 | 19.2 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 4.1 | 6.6 | 10.5 | 2.5 | 12.7 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 3.2 | 5.3 | 8.7 | 2.1 | 10.3 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 2.5 | 3.8 | 6 | 1.6 | 7.2 | |
| t_{dis} | \overline{OE} | Y | 0.8 V | 12.1 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 2.4 | 4.1 | 6.9 | 2.2 | 7.7 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 1.8 | 2.9 | 4.5 | 1.7 | 5.1 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 1 | 2.9 | 4.3 | 1.5 | 4.7 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 1 | 1.8 | 2.7 | 1 | 3.3 | |
| | | | $3.3\text{ V} \pm 0.3\text{ V}$ | 1.2 | 2.2 | 3.2 | 1.1 | 4 | |

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 10$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | V_{CC} | $T_A = 25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to 85°C | | UNIT |
|-----------|-----------------|-------------|----------------------------------|--------------------------|------|------|--|------|------|
| | | | | MIN | TYP | MAX | MIN | MAX | |
| t_{pd} | A or B | Y | 0.8 V | 20.5 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 4.6 | 8.4 | 13.7 | 3.6 | 16.6 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 3.5 | 5.9 | 9.3 | 2.4 | 11.1 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 3.9 | 4.7 | 7.5 | 1.3 | 9.1 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 2.3 | 3.4 | 5.3 | 1.6 | 6.4 | |
| t_{en} | \overline{OE} | Y | 0.8 V | 21.8 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 4.9 | 10.2 | 16.8 | 4.4 | 20.2 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 3.9 | 7.3 | 11.2 | 3.3 | 13.5 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 3.4 | 5.8 | 9.2 | 2.7 | 11 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 2.5 | 4.3 | 6.4 | 2.1 | 7.8 | |
| t_{dis} | \overline{OE} | Y | 0.8 V | 13 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 3.8 | 6.6 | 11.7 | 1.2 | 14 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 2.2 | 4.7 | 7.9 | 1.3 | 9.3 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 2.4 | 4.4 | 6.4 | 2.2 | 7.5 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 1.3 | 3.1 | 4.9 | 1.2 | 5.4 | |
| t_{dis} | \overline{OE} | Y | $3.3\text{ V} \pm 0.3\text{ V}$ | 1.9 | 3.4 | 5 | 1.9 | 5.6 | |

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 15$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | V_{CC} | $T_A = 25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to 85°C | | UNIT |
|-----------|-----------------|-------------|----------------------------------|--------------------------|------|------|--|------|------|
| | | | | MIN | TYP | MAX | MIN | MAX | |
| t_{pd} | A or B | Y | 0.8 V | 22.5 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 5.8 | 9.3 | 15.1 | 4.3 | 17.9 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 4.4 | 6.6 | 10.2 | 3 | 12.1 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 3.5 | 5.3 | 8.3 | 2.3 | 9.9 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 2.7 | 3.9 | 5.8 | 1.9 | 7 | |
| t_{en} | \overline{OE} | Y | 0.8 V | 25.2 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 7 | 11.3 | 18.1 | 5.4 | 21.4 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 5.5 | 8.1 | 12.2 | 4.1 | 14.5 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 4.3 | 6.5 | 10.1 | 3.3 | 12 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 3.4 | 4.8 | 7.1 | 2.6 | 8.4 | |
| t_{dis} | \overline{OE} | Y | 0.8 V | 14 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 3.7 | 5.8 | 8.2 | 3.3 | 11 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 5.5 | 3.9 | 5.9 | 2.1 | 8 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 3.3 | 4.5 | 6.6 | 2.9 | 7.4 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 2.3 | 3.2 | 4.3 | 1.8 | 5.1 | |
| t_{dis} | \overline{OE} | Y | $3.3\text{ V} \pm 0.3\text{ V}$ | 2.4 | 4.8 | 6.2 | 3.1 | 6.7 | |

SN74AUP1G125

LOW-POWER SINGLE BUS BUFFER GATE

WITH 3-STATE OUTPUT

SCES595H–JULY 2004–REVISED MAY 2007

Switching Characteristics

over recommended operating free-air temperature range, $C_L = 30$ pF (unless otherwise noted) (see [Figure 3](#) and [Figure 4](#))

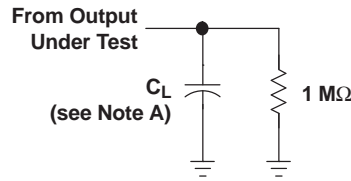
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | V_{CC} | $T_A = 25^\circ\text{C}$ | | | $T_A = -40^\circ\text{C}$ to 85°C | | UNIT |
|-----------|-----------------|-------------|----------------------------------|--------------------------|------|------|--|------|------|
| | | | | MIN | TYP | MAX | MIN | MAX | |
| t_{pd} | A or B | Y | 0.8 V | 29 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 7.4 | 12 | 18.7 | 6.6 | 21.4 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 5.7 | 8.6 | 12.5 | 4.9 | 14.7 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 4.8 | 6.9 | 10.1 | 3.1 | 12 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 3.9 | 5.1 | 7.2 | 3.3 | 8.7 | |
| t_{en} | \overline{OE} | Y | 0.8 V | 33.4 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 8.8 | 14.1 | 21.8 | 7.4 | 25.5 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 6.9 | 10.1 | 14.6 | 5.6 | 17.4 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 5.6 | 8.1 | 12 | 4.7 | 14.1 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 4.3 | 6.1 | 8.5 | 3.8 | 10 | |
| t_{dis} | \overline{OE} | Y | 0.8 V | 17.7 | | | | | ns |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 5.8 | 10 | 16 | 3.7 | 16 | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 5.7 | 7.7 | 10.9 | 1 | 10.7 | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 4.5 | 7.7 | 9.8 | 4.4 | 12.5 | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 3.9 | 5.6 | 7.4 | 3.2 | 9 | |
| | | | $3.3\text{ V} \pm 0.3\text{ V}$ | 3.3 | 8.4 | 10.7 | 6.6 | 10.8 | |

Operating Characteristics

$T_A = 25^\circ\text{C}$

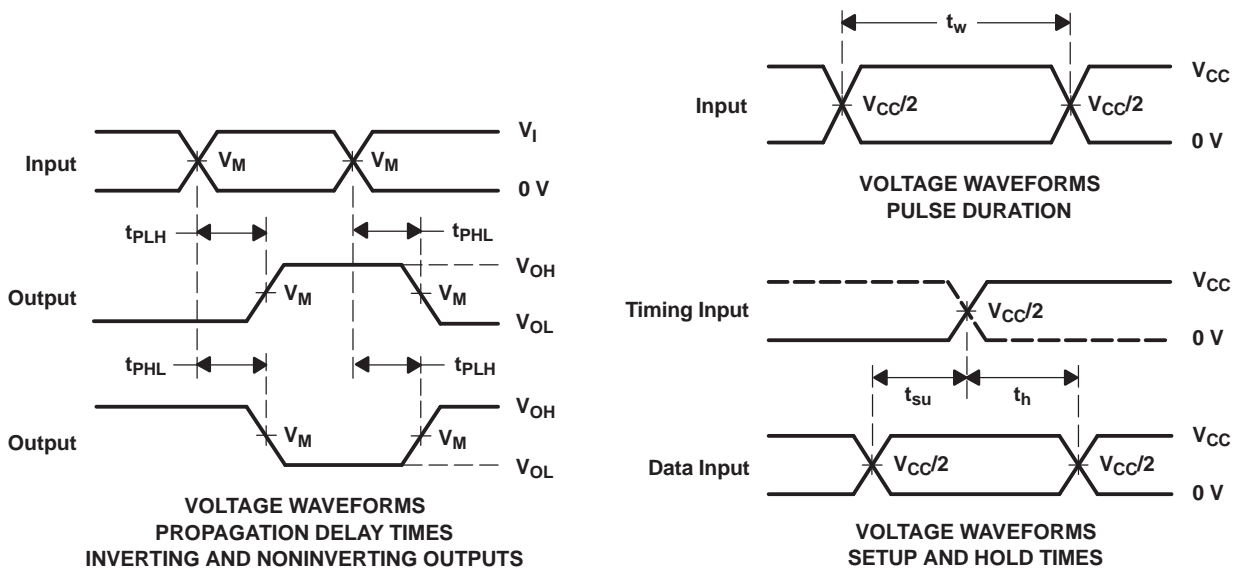
| PARAMETER | | TEST CONDITIONS | V_{CC} | TYP | UNIT | |
|-----------|-------------------------------|---------------------|----------------------------------|----------------------------------|------|----|
| C_{pd} | Power dissipation capacitance | Outputs enabled | $f = 10\text{ MHz}$ | 0.8 V | 3.8 | pF |
| | | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 3.8 | |
| | | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 3.7 | |
| | | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 3.8 | |
| | | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 3.9 | |
| | | | | $3.3\text{ V} \pm 0.3\text{ V}$ | 4 | |
| | Outputs disabled | $f = 10\text{ MHz}$ | 0.8 V | 0 | | |
| | | | $1.2\text{ V} \pm 0.1\text{ V}$ | 0 | | |
| | | | $1.5\text{ V} \pm 0.1\text{ V}$ | 0 | | |
| | | | $1.8\text{ V} \pm 0.15\text{ V}$ | 0 | | |
| | | | $2.5\text{ V} \pm 0.2\text{ V}$ | 0 | | |
| | | | $3.3\text{ V} \pm 0.3\text{ V}$ | 0 | | |

PARAMETER MEASUREMENT INFORMATION
(Propagation Delays, Setup and Hold Times, and Pulse Duration)



LOAD CIRCUIT

| | $V_{CC} = 0.8 \text{ V}$ | $V_{CC} = 1.2 \text{ V}$ $\pm 0.1 \text{ V}$ | $V_{CC} = 1.5 \text{ V}$ $\pm 0.1 \text{ V}$ | $V_{CC} = 1.8 \text{ V}$ $\pm 0.15 \text{ V}$ | $V_{CC} = 2.5 \text{ V}$ $\pm 0.2 \text{ V}$ | $V_{CC} = 3.3 \text{ V}$ $\pm 0.3 \text{ V}$ |
|-------|--------------------------|---|---|--|---|---|
| C_L | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF |
| V_M | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ |
| V_i | V_{CC} | V_{CC} | V_{CC} | V_{CC} | V_{CC} | V_{CC} |



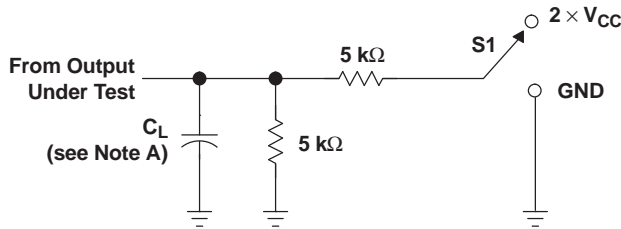
- NOTES: A. C_L includes probe and jig capacitance.
 B. All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r/t_f = 3 \text{ ns}$.
 C. The outputs are measured one at a time, with one transition per measurement.
 D. t_{PLH} and t_{PHL} are the same as t_{pd} .
 E. All parameters and waveforms are not applicable to all devices.

Figure 3. Load Circuit and Voltage Waveforms

SN74AUP1G125 LOW-POWER SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT

SCES595H—JULY 2004—REVISED MAY 2007

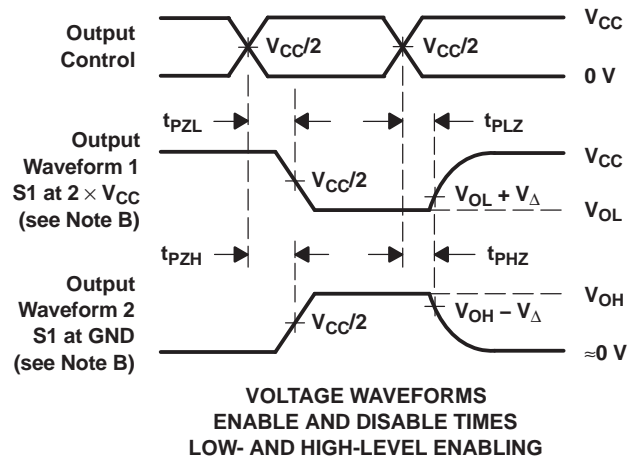
PARAMETER MEASUREMENT INFORMATION (Enable and Disable Times)



| TEST | S1 |
|-------------------|-------------------|
| t_{PLZ}/t_{PZL} | $2 \times V_{CC}$ |
| t_{PHZ}/t_{PZH} | GND |

LOAD CIRCUIT

| | $V_{CC} = 0.8 \text{ V}$ | $V_{CC} = 1.2 \text{ V}$ $\pm 0.1 \text{ V}$ | $V_{CC} = 1.5 \text{ V}$ $\pm 0.1 \text{ V}$ | $V_{CC} = 1.8 \text{ V}$ $\pm 0.15 \text{ V}$ | $V_{CC} = 2.5 \text{ V}$ $\pm 0.2 \text{ V}$ | $V_{CC} = 3.3 \text{ V}$ $\pm 0.3 \text{ V}$ |
|--------------|--------------------------|---|---|--|---|---|
| C_L | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF | 5, 10, 15, 30 pF |
| V_M | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ |
| V_I | V_{CC} | V_{CC} | V_{CC} | V_{CC} | V_{CC} | V_{CC} |
| V_{Δ} | 0.1 V | 0.1 V | 0.1 V | 0.15 V | 0.15 V | 0.3 V |



- 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: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r/t_f = 3 \text{ ns}$.
 - 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. All parameters and waveforms are not applicable to all devices.

Figure 4. 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⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| 74AUP1G125DBVRE4 | ACTIVE | SOT-23 | DBV | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DBVRG4 | ACTIVE | SOT-23 | DBV | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DBVTE4 | ACTIVE | SOT-23 | DBV | 5 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DBVTG4 | ACTIVE | SOT-23 | DBV | 5 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DCKRE4 | ACTIVE | SC70 | DCK | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DCKRG4 | ACTIVE | SC70 | DCK | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DCKTE4 | ACTIVE | SC70 | DCK | 5 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DCKTG4 | ACTIVE | SC70 | DCK | 5 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| 74AUP1G125DRLRG4 | ACTIVE | SOT | DRL | 5 | 4000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUP1G125DBVR | ACTIVE | SOT-23 | DBV | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUP1G125DBVT | ACTIVE | SOT-23 | DBV | 5 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUP1G125DCKR | ACTIVE | SC70 | DCK | 5 | 3000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUP1G125DCKT | ACTIVE | SC70 | DCK | 5 | 250 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUP1G125DRLR | ACTIVE | SOT | DRL | 5 | 4000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74AUP1G125YZPR | 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.

OBSELETE: 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.

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TAPE AND REEL INFORMATION



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 |
|------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74AUP1G125DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 9.2 | 3.23 | 3.17 | 1.37 | 4.0 | 8.0 | Q3 |
| SN74AUP1G125DBVT | SOT-23 | DBV | 5 | 250 | 180.0 | 9.2 | 3.23 | 3.17 | 1.37 | 4.0 | 8.0 | Q3 |
| SN74AUP1G125DCKR | SC70 | DCK | 5 | 3000 | 180.0 | 9.2 | 2.24 | 2.34 | 1.22 | 4.0 | 8.0 | Q3 |
| SN74AUP1G125DCKT | SC70 | DCK | 5 | 250 | 180.0 | 9.2 | 2.24 | 2.34 | 1.22 | 4.0 | 8.0 | Q3 |
| SN74AUP1G125DRLR | SOT | DRL | 5 | 4000 | 180.0 | 9.2 | 1.78 | 1.78 | 0.69 | 4.0 | 8.0 | Q3 |
| SN74AUP1G125YZPR | DSBGA | YZP | 5 | 3000 | 180.0 | 8.4 | 1.02 | 1.52 | 0.66 | 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) |
|------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74AUP1G125DBVR | SOT-23 | DBV | 5 | 3000 | 202.0 | 201.0 | 28.0 |
| SN74AUP1G125DBVT | SOT-23 | DBV | 5 | 250 | 202.0 | 201.0 | 28.0 |
| SN74AUP1G125DCKR | SC70 | DCK | 5 | 3000 | 202.0 | 201.0 | 28.0 |
| SN74AUP1G125DCKT | SC70 | DCK | 5 | 250 | 202.0 | 201.0 | 28.0 |
| SN74AUP1G125DRLR | SOT | DRL | 5 | 4000 | 202.0 | 201.0 | 28.0 |
| SN74AUP1G125YZPR | DSBGA | YZP | 5 | 3000 | 220.0 | 220.0 | 34.0 |

DBV (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



- 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.

DCK (R-PDSO-G5)

PLASTIC SMALL-OUTLINE PACKAGE



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

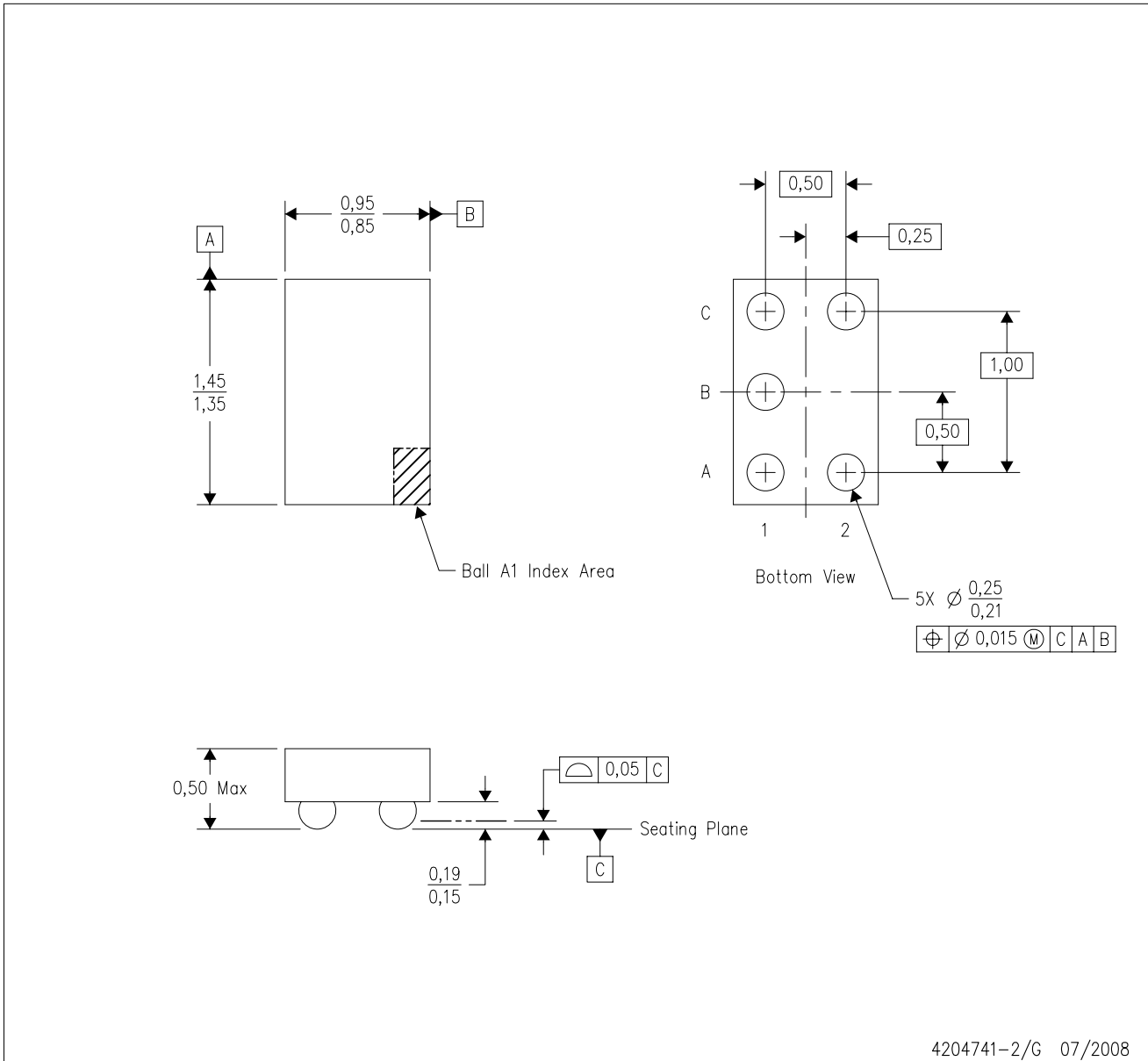


4205622-2/D 08/2007

- 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. Body dimensions do not include mold flash, interlead flash, protrusions, or gate burrs. Mold flash, interlead flash, protrusions, or gate burrs shall not exceed 0,15 per end or side.
 - D. JEDEC package registration is pending.

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 lead-free. Refer to the 5 YEP package (drawing 4204725) for tin-lead (SnPb).

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