

## Advanced Power Management Unit

Check for Samples: [TPS658621D](#)

### 1 INTRODUCTION

#### 1.1 MAIN FEATURES

- **INTEGRATED POWER SUPPLIES**
  - 3 Programmable Step-Down converters
    - Software Controlled Enable/Forced PWM Mode
    - Automatic Power Saving Mode
    - Maximum 1.5 A Outputs (SM0 and SM2)
    - Maximum 2.0 A Output (SM1)
  - 11 Programmable General Purpose LDOs
    - 7 With Output Voltages of 1.25V to 3.3V
    - 2 With Output Voltages of 0.725V to 1.5V or 1.25V to 2.586V (factory configurable)
    - 1 “Always On” With Output Voltages of 1.25V to 3.3V
    - 1 With Output Voltage of 1.70V–2.475V
- **DISPLAY SUPPORT FUNCTIONS**
  - 4 PWM Outputs With Programmable Frequency and Duty Cycle
  - Dual RGB LED Drivers
  - Constant Current WLED Driver
    - 26.5V (max) at 25mA
    - Over-Voltage Protection
    - Programmable Current Level and Brightness Control
- **HOST INTERFACE**
  - Interrupt Controller With Maskable Interrupts
  - External ADC Triggering and Step-Down Converter Mode Control
- **SYSTEM MANAGEMENT**
  - Dual Input Power Path
    - USB Current Limiting
    - Max 18V Over-Voltage Protection
  - Power Good Monitoring on all Supply Outputs
  - Software Reset Function
  - Hardware On/Off and Reboot Control
  - Momentary Power Loss (MPL) support
  - AUTOBOOT support
  - 11 Channel ADC With 3 Operating Modes
    - Single Conversion
    - Peak Detection
    - Averaging

#### 1.2 APPLICATIONS

- Netbooks
- Portable Navigation Devices
- Portable Media Players



#### 1.3 DESCRIPTION

The TPS658621D provides an easy to use, fully integrated solution for handheld devices, integrating charge management, multiple regulated power supplies, system management and display functions in a small package. The I<sup>2</sup>C™ interface enables control of a wide range of subsystem parameters. Internal registers have a complete set of status information, enabling easy diagnostics and host-controlled handling of fault conditions.



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I<sup>2</sup>C is a trademark of NXP B. V Corporation.

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**PACKAGING INFORMATION**

| Orderable Device | Status <sup>(1)</sup> | Package Type               | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup>    | Lead/<br>Ball Finish | MSL Peak Temp <sup>(3)</sup> | Samples<br>(Requires Login)          |
|------------------|-----------------------|----------------------------|-----------------|------|-------------|----------------------------|----------------------|------------------------------|--------------------------------------|
| TPS658621DZGUR   | ACTIVE                | BGA<br>MICROSTAR           | ZGU             | 169  | 1000        | Green (RoHS<br>& no Sb/Br) | SNAGCU               | Level-3-260C-168 HR          | <a href="#">Purchase Samples</a>     |
| TPS658621DZGUT   | ACTIVE                | BGA<br>MICROSTAR           | ZGU             | 169  | 250         | Green (RoHS<br>& no Sb/Br) | SNAGCU               | Level-3-260C-168 HR          | <a href="#">Request Free Samples</a> |
| TPS658621DZQZR   | ACTIVE                | BGA<br>MICROSTAR<br>JUNIOR | ZQZ             | 120  | 2500        | Green (RoHS<br>& no Sb/Br) | SNAGCU               | Level-3-260C-168 HR          | <a href="#">Purchase Samples</a>     |
| TPS658621DZQZT   | ACTIVE                | BGA<br>MICROSTAR<br>JUNIOR | ZQZ             | 120  | 250         | Green (RoHS<br>& no Sb/Br) | SNAGCU               | Level-3-260C-168 HR          | <a href="#">Request Free Samples</a> |

<sup>(1)</sup> 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.

<sup>(2)</sup> 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.

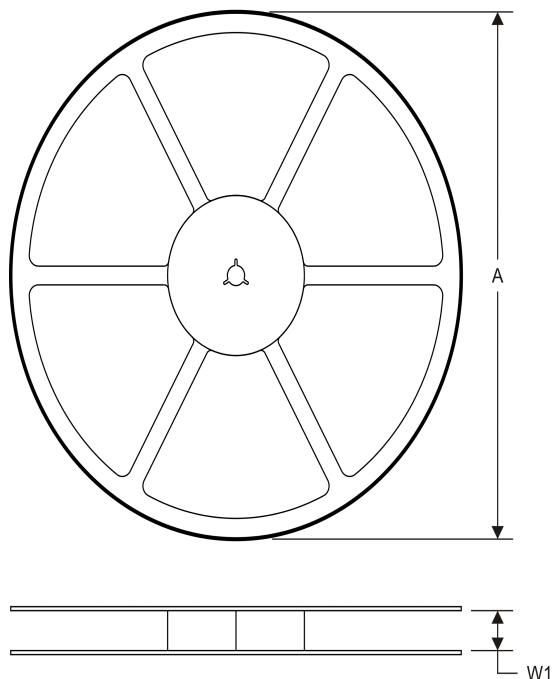
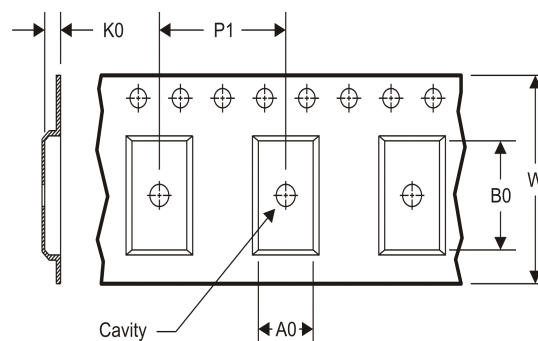
**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**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)

<sup>(3)</sup> 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**
**REEL DIMENSIONS**

**TAPE DIMENSIONS**


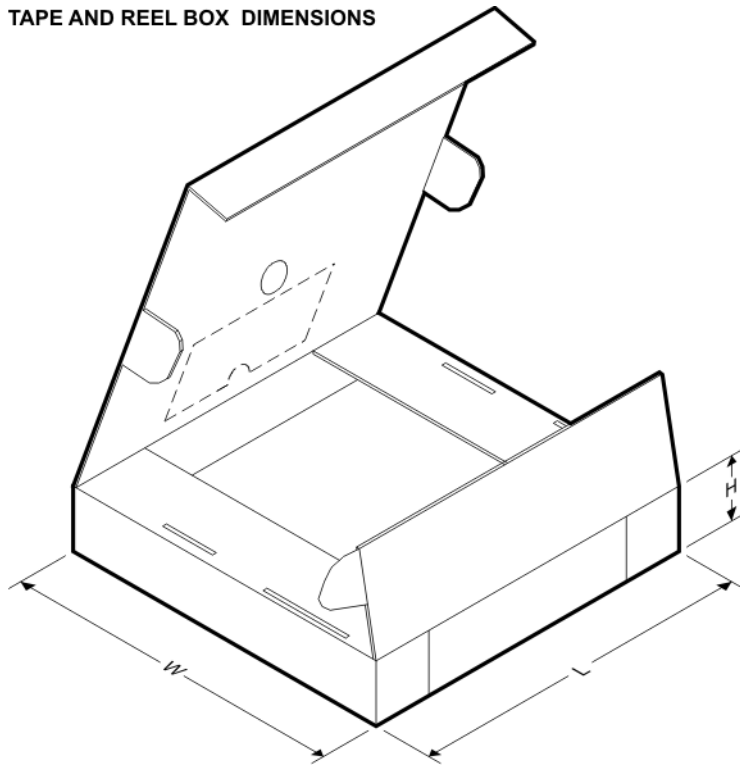
|    |                                                           |
|----|-----------------------------------------------------------|
| A0 | Dimension designed to accommodate the component width     |
| B0 | Dimension designed to accommodate the component length    |
| K0 | Dimension designed to accommodate 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 |
|----------------|----------------------|-----------------|------|-----|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| TPS658621DZQZT | BGA MICROSTAR JUNIOR | ZQZ             | 120  | 250 | 330.0              | 16.4               | 6.3     | 6.3     | 1.5     | 12.0    | 16.0   | Q1            |

## TAPE AND REEL BOX DIMENSIONS

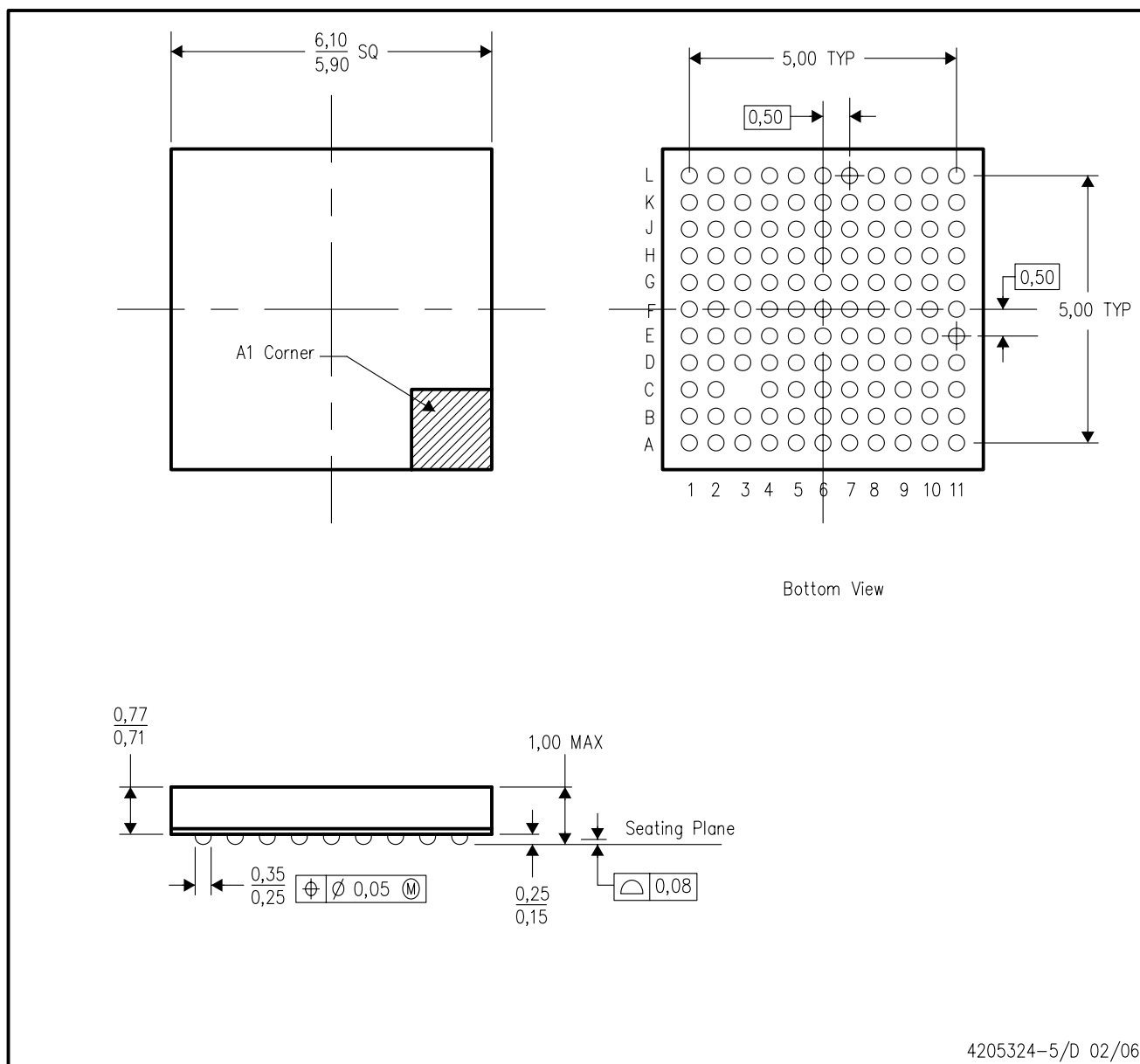


\*All dimensions are nominal

| Device         | Package Type         | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|----------------|----------------------|-----------------|------|-----|-------------|------------|-------------|
| TPS658621DZQZT | BGA MICROSTAR JUNIOR | ZQZ             | 120  | 250 | 336.6       | 336.6      | 28.6        |

## ZQZ (S-PBGA-N120)

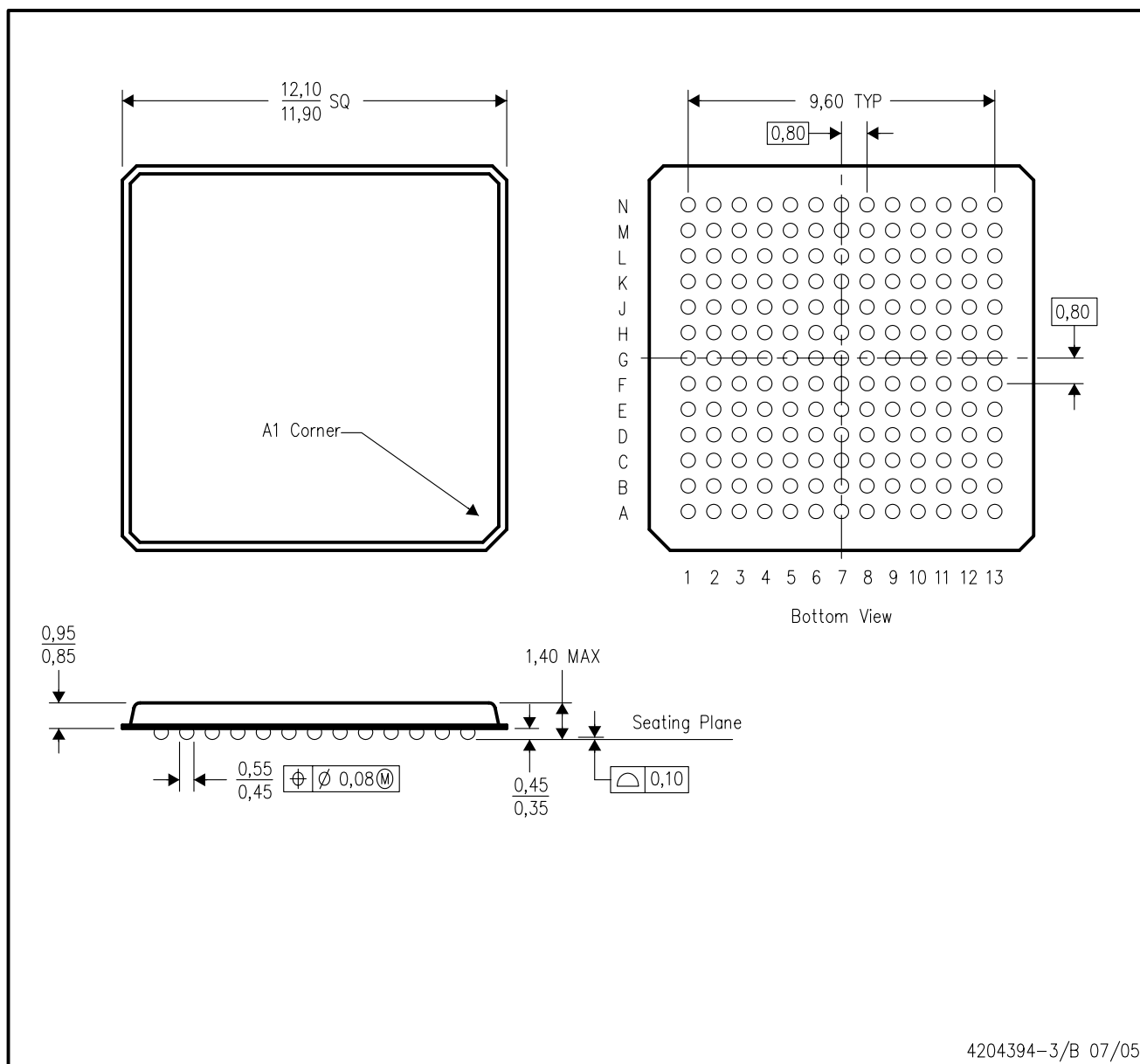
## PLASTIC BALL GRID ARRAY



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Falls within JEDEC MO-225
  - D. This package is lead-free.

ZGU (S-PBGA-N169)

## PLASTIC BALL GRID ARRAY



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Micro Star BGA configuration
  - D. This is a lead-free solder ball design.

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