

Advanced Power Management Unit

Check for Samples: [TPS658600](#)

1 INTRODUCTION

1.1 MAIN FEATURES

- **BATTERY CHARGER**
 - Complete Charge Management Solution for a Single Cell Li-Ion/Li-Pol Cell With Dynamic Power Management and Thermal Foldback.
 - Maximum 1.0A charge current
 - Programmable Adapter and USB Charge Operation
- **INTEGRATED POWER SUPPLIES**
 - 3 Programmable Step-Down converters
 - Software Controlled Enable/Forced PWM Mode
 - Automatic Power Saving Mode
 - Maximum 1.2A Outputs
 - 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
 - 11 Channel ADC With 3 Operating Modes
 - Single Conversion
 - Peak Detection
 - Averaging

1.2 APPLICATIONS

- Smart Phones
- Portable Navigation Devices
- Portable Media Players



1.3 OVERVIEW

The TPS658600 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 6x6 package. The I²C 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.



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.

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TPS658600ZQZR	NRND	BGA MICROSTAR JUNIOR	ZQZ	120		TBD	Call TI	Call TI	-40 to 85	TPS658600	
TPS658600ZQZT	NRND	BGA MICROSTAR JUNIOR	ZQZ	120		TBD	Call TI	Call TI	-40 to 85	TPS658600	

⁽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.

⁽⁴⁾ There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

⁽⁵⁾ Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

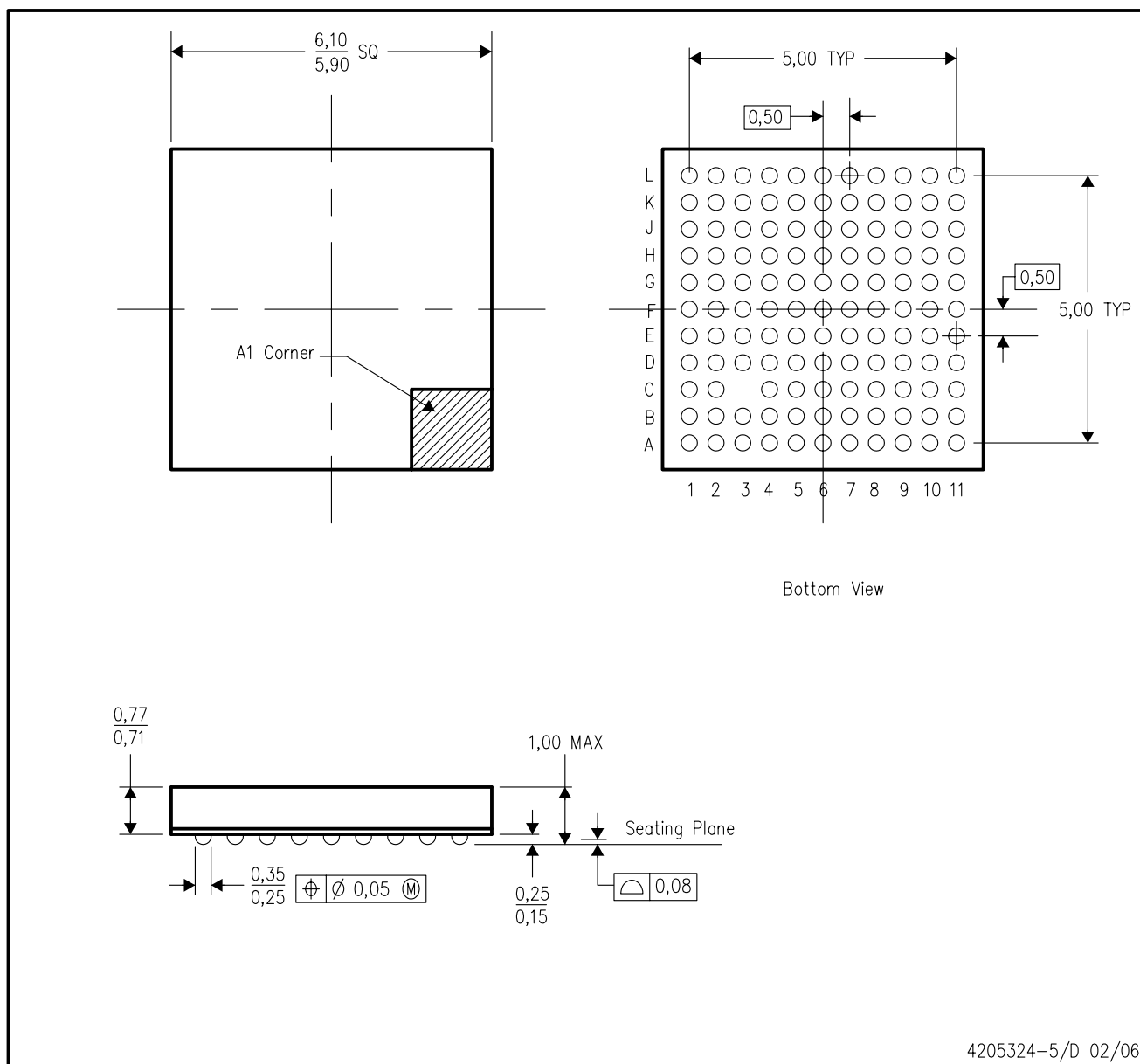
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ZQZ (S-PBGA-N120)

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.

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