



# **bq25882 I<sup>2</sup>C Controlled, 2-Cell, 2-A Boost-Mode Battery Charger for USB Input**

## **1 Features**

- High-Efficiency 2-A, 1.5-MHz Switch Mode Boost Charger
  - 91.5% (TBD) Charge Efficiency at 7.6-V Battery, 1-A Charge
  - Optimized for USB Input and 2-Cell Li-Ion Output
  - Selectable Low Power PFM Mode for Light Load Operation
- USB On-the-Go (OTG) with Adjustable Output from 4.5 V to 5.5 V
  - Buck Converter with up-to 2-A Output
  - 94% (TBD) Efficiency at 5.1-V, 1-A Output
  - Accurate Constant Current (CC) Limit
  - Output Short Protection
  - Selectable Low Power PFM Mode for Light Load Operation
- Single Input to Support USB Input Adapters
  - Supports 3.9-V to 6.2-V Input Voltage Range with 20-V Absolute Maximum Input Voltage Rating
  - Input Current Limit (500 mA to 3.3 A with 100-mA resolution) to Support USB2.0, USB3.0 Standard Adapters
  - Maximum Power Tracking by Input Voltage Limit up-to 5.5 V
  - Auto-Detect USB SDP, CDP, DCP, and Non-Standard Adapters
- Input Current Optimizer (ICO) to Maximize Input Power without Overloading Adapters
- Highest Battery Discharge Efficiency with low resistance Battery Discharge MOSFET
- Narrow VDC (NVDC) Power Path Management
  - Instant-on Works with No Battery or Deeply Discharged Battery
  - Ideal Diode Operation in Battery Supplement Mode
- Flexible Autonomous and I<sup>2</sup>C Mode for Optimal System Performance

- High Integration includes all MOSFETs, Current Sensing and Loop Compensation
- Safety
  - Battery Temperature Sensing in Charge and OTG Buck Mode
  - Thermal Regulation and Thermal Shutdown

## **2 Applications**

- Wireless Speaker
- Digital Camera (DSC, DVC)
- Mobile Printer
- Tablet
- Electronic Point of Sales (ePOS)
- Portable Electronic Devices

## **3 Description**

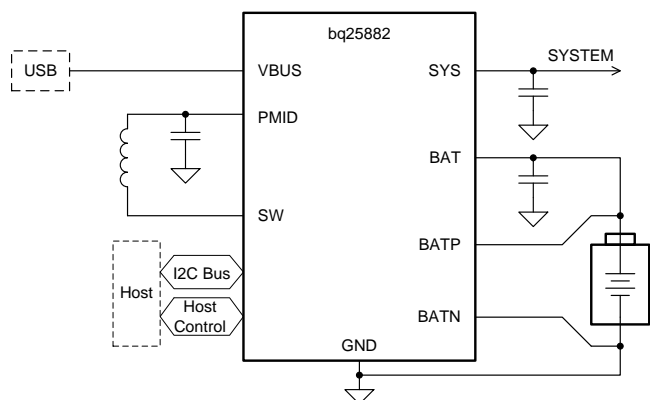
The bq25882 is a highly-integrated 2-A switch-mode battery charge management and system power path management device for dual-cell Li-Ion and Li-polymer batteries. The I<sup>2</sup>C Serial interface with charging and system settings makes the device a truly flexible solution.

### **Device Information<sup>(1)</sup>**

PART NUMBER	PACKAGE	BODY SIZE (NOM)
bq25882	DSBGA (25)	2.10 mm x 2.10 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

### **Simplified Schematic**



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## 4 Device and Documentation Support

### 4.1 Documentation Support

#### 4.1.1 Related Documentation

For related documentation see the following:

- bq2588x Boosting Battery Chargers Evaluation Module User's Guide ([SLUUBP2](#))

### 4.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

### 4.3 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

**TI E2E™ Online Community** *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

**Design Support** *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

### 4.4 Trademarks

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All other trademarks are the property of their respective owners.

### 4.5 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 4.6 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

## 5 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

## 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
BQ25882YFFR	PREVIEW	DSBGA	YFF	25	3000	TBD	Call TI	Call TI	-40 to 85		
BQ25882YFFT	PREVIEW	DSBGA	YFF	25	250	TBD	Call TI	Call TI	-40 to 85		
PQ25882YFFR	ACTIVE	DSBGA	YFF	25	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	-40 to 85	PQ25882	<a href="#">Samples</a>

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(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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1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

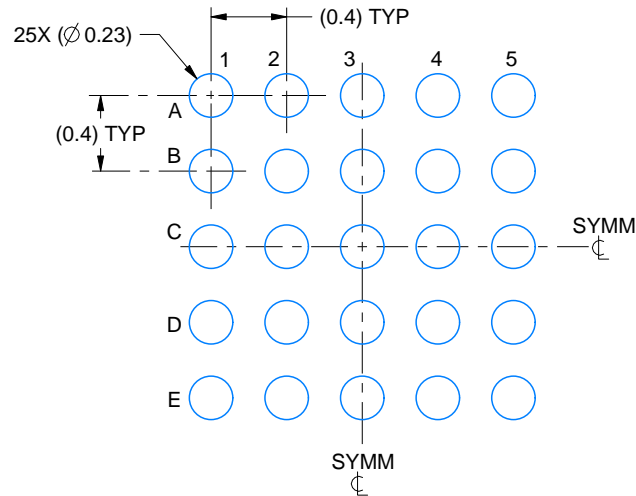
2. This drawing is subject to change without notice.

# EXAMPLE BOARD LAYOUT

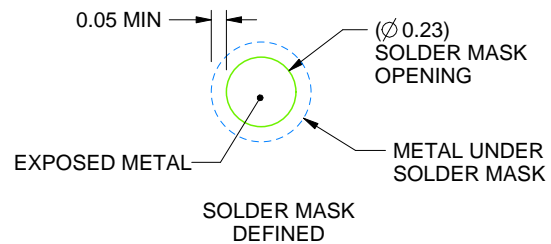
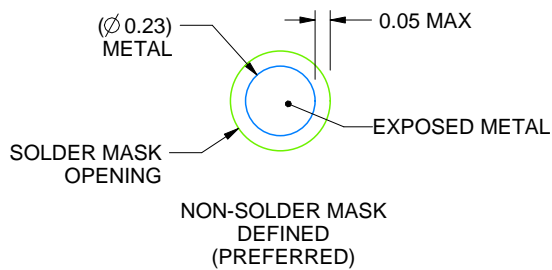
YFF0025

DSBGA - 0.625 mm max height

DIE SIZE BALL GRID ARRAY



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:25X



SOLDER MASK DETAILS  
NOT TO SCALE

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NOTES: (continued)

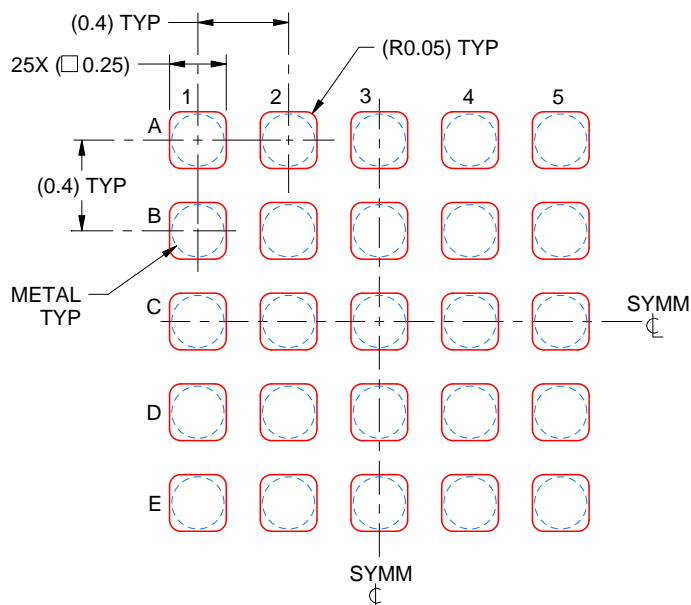
- Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For more information, see Texas Instruments literature number SNVA009 ([www.ti.com/lit/snva009](http://www.ti.com/lit/snva009)).

# EXAMPLE STENCIL DESIGN

YFF0025

DSBGA - 0.625 mm max height

DIE SIZE BALL GRID ARRAY



SOLDER PASTE EXAMPLE  
 BASED ON 0.1 mm THICK STENCIL  
 SCALE:30X

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NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.



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