TPS82085 3A, High Efficiency Step Down Converter Module with Integrated Inductor

1 Features

- 3 A, 1.3 mm Profile Power Module
- Up to 95% Efficiency
- DCS-Control™ Topology
- 17 µA Operating Quiescent Current
- Hiccup Short Circuit Protection
- 2.5 V to 6 V Input Voltage Range
- Power Save Mode for Light Load Efficiency
- 100% Duty Cycle for Lowest Dropout
- 0.8 V to V_{IN} Adjustable Output Voltage
- Output Discharge Function
- Power Good Output
- 3 mm x 2.8 mm x 1.3 mm 8-Pin µSiP Package

2 Applications

- Battery Powered Applications
- Solid State Drives
- Processor Supply
- Mobile Phones

3 Description

The TPS82085 device is a 3 A step down converter power module optimized for small solution size and high efficiency. The power module integrates a synchronous step down converter and an inductor. The low profile and compact solution (3.0 mm x 2.8 mm x 1.3 mm) is suitable for automated assembly by standard surface mount equipment.

To maximize efficiency, the converter operates in PWM mode with a nominal switching frequency of 2.4 MHz and automatically enters Power Save Mode operation at light load currents. In Power Save Mode, the device operates with typically 17 µA quiescent current. Using the DCS-Control™ topology, the device achieves excellent load transient performance and accurate output voltage regulation.

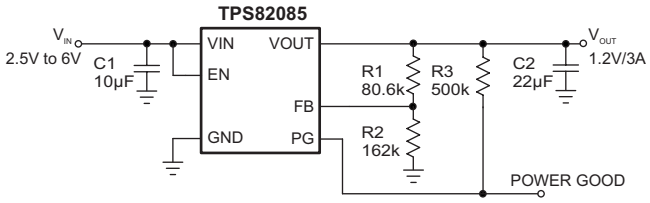
Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS82085	µSiP (8)	3.00 mm x 2.80 mm

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

4 Simplified Schematic

5 1.2 V Output Application



PRODUCT PREVIEW

6 Revision History

DATE	REVISION	NOTES
October 2014	*	Initial Release

7 Device and Documentation Support

7.1 Device Support

7.2 Trademarks

DCS-Control is a trademark of Texas Instruments.
All other trademarks are the property of their respective owners.

7.3 Electrostatic Discharge Caution

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

7.4 Glossary

SLYZ022 — *TI Glossary*.

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

8 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.

PRODUCT PREVIEW

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
TPS82085SILR	PREVIEW	uSiP	SIL	8	3000	TBD	Call TI	Call TI	-40 to 85		
TPS82085SILT	PREVIEW	uSiP	SIL	8	250	TBD	Call TI	Call TI	-40 to 85		

(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.

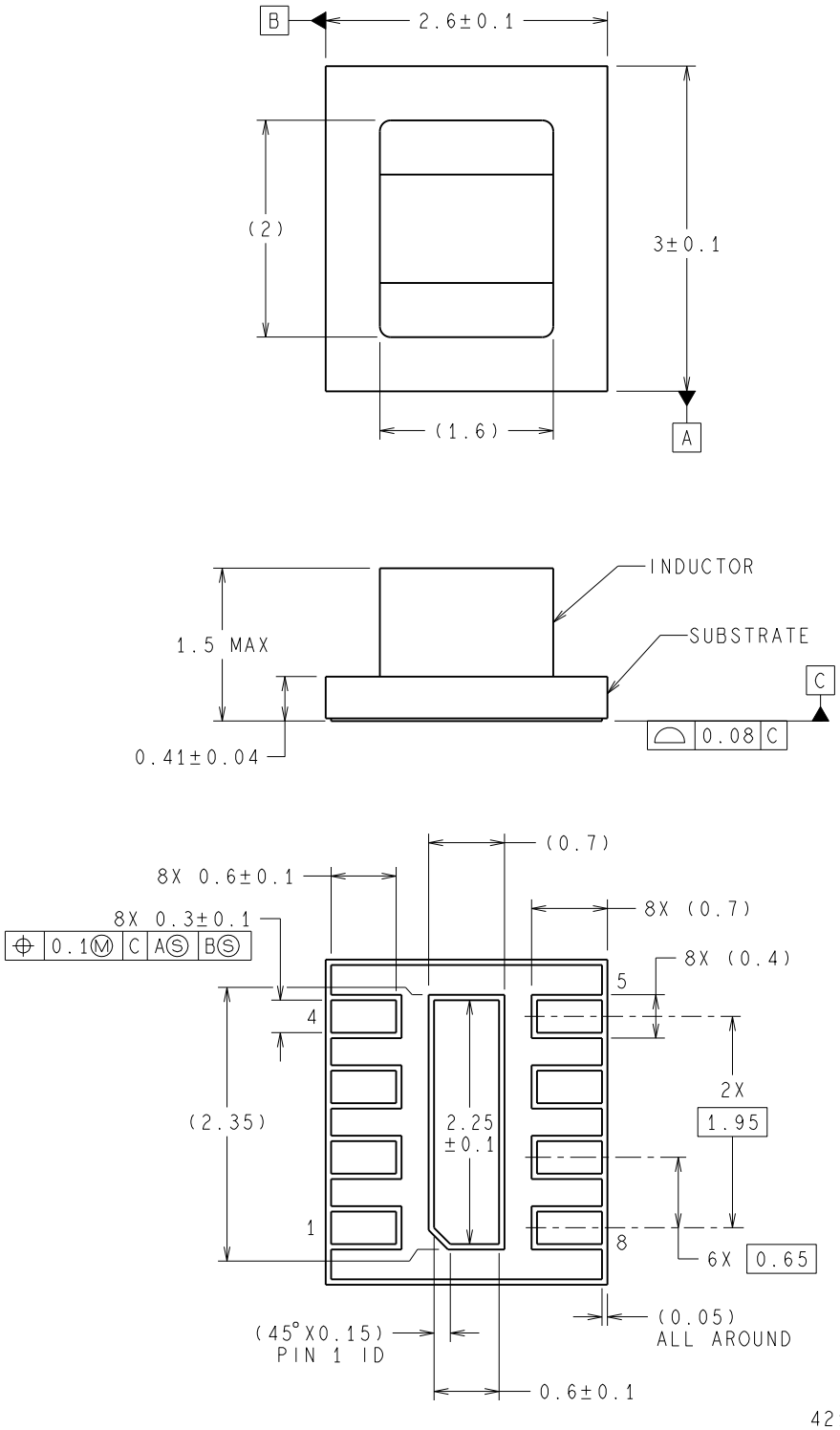
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(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.

SIL0008A — **MicroSiP - 1.5mm max height**

SYSTEM IN PACKAGE

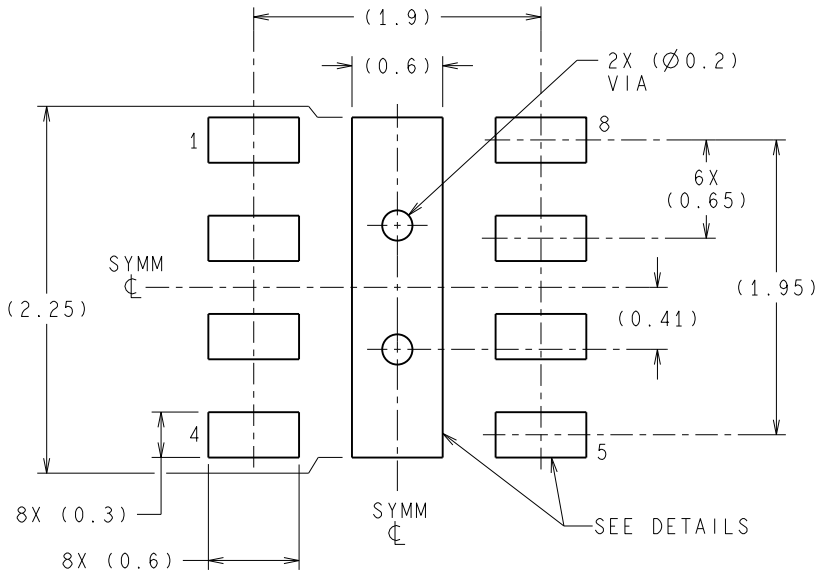


NOTES:
1. DIMENSIONS ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESIS ARE FOR REFERENCE ONLY.
2. THIS DRAWING IS SUBJECT TO CHANGE WITHOUT NOTICE.
3. NO JEDEC REFERENCE AS OF NOVEMBER 2012.
4. R-uSiP-N8.

SIL0008A

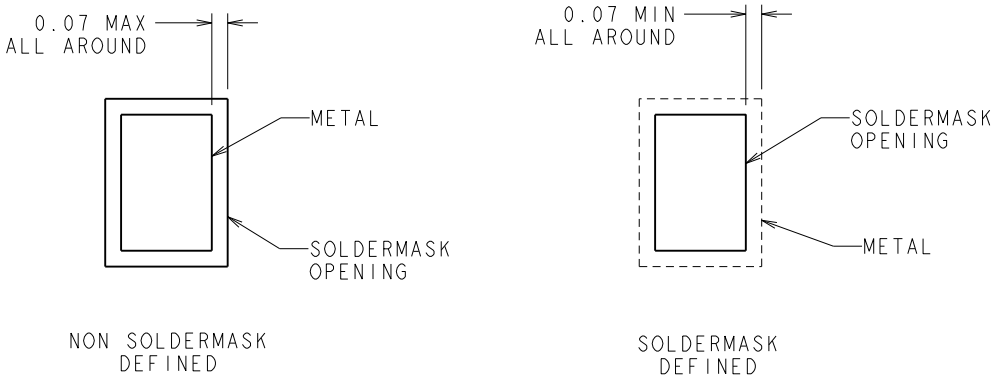
MicroSiP - 1.5mm max height

SYSTEM IN PACKAGE



RECOMMENDED LAND PATTERN

1:1 RATIO WITH PACKAGE SOLDER PADS



SOLDERMASK DETAILS

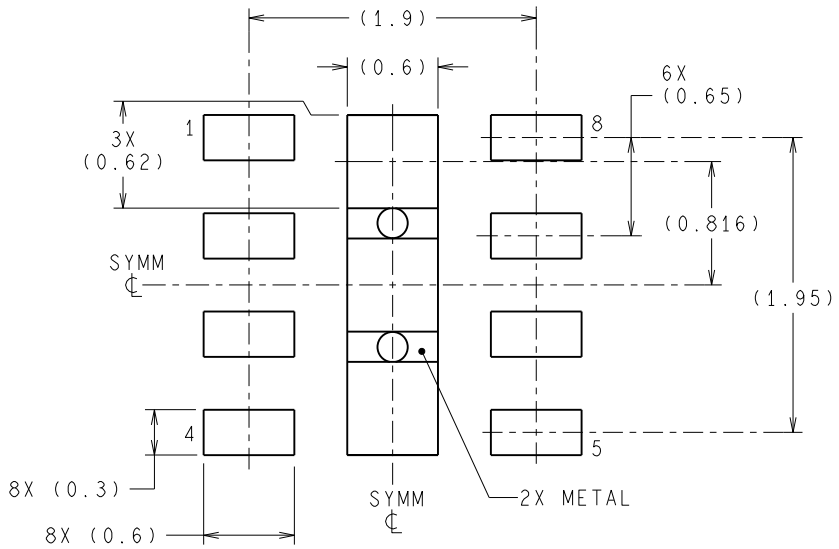
NOT TO SCALE

4218258/A 12/2012

SIL0008A

MicroSiP - 1.5mm max height

SYSTEM IN PACKAGE



RECOMMENDED SOLDERPASTE
EXPOSED PAD
82% PRINTED SOLDER COVERAGE BY AREA

4218258/A 12/2012

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