TPS3890 Low Quiescent Current, 1% Accurate Supervisor with Programmable Delay

1 Features

- Power-On Reset Generator with Adjustable Delay Time: 40 µs to 30 s
- Very Low Quiescent Current: 2.1 µA (Typical)
- High Threshold Accuracy: 0.5% (Typical)
- Fixed Threshold Voltages:
  - Standard Voltage Rails From 1.2 V to 3.3 V
  - Adjustable Voltage Down to 1.15 V
- Manual Reset ($\overline{MR}$) Input
- Open-Drain $\overline{RESET}$ Output
- Temperature Range: –40°C to +125°C
- Package: Very Small 1.5-mm × 1.5-mm WSON

2 Applications

- DSP or Microcontroller Applications
- Notebook, Desktop Computers
- Smartphones, Hand-Held Products
- FPGA, ASIC Applications
- Portable, Battery-Powered Products

3 Description

The TPS3890 is a low-quiescent voltage supervisor that monitors system voltages from 1.2 V to 3.3 V, asserting an open-drain $\overline{RESET}$ signal when the SENSE voltage drops below a preset threshold or when the manual reset ($\overline{MR}$) pin drops to a logic low. The $\overline{RESET}$ output remains low for the user-adjustable delay time after the SENSE voltage and manual reset ($\overline{MR}$) return above the respective thresholds. The TPS3890 device uses a precision reference to achieve 0.5% threshold accuracy. The reset delay time can be user-adjusted between 40 µs and 30 s by connecting the CT pin to an external capacitor. The TPS3890 has a very low typical quiescent current of 2.1 µA, making the device well-suited to battery-powered applications. The device is fully specified over a temperature range of –40°C to +125°C (T_J).

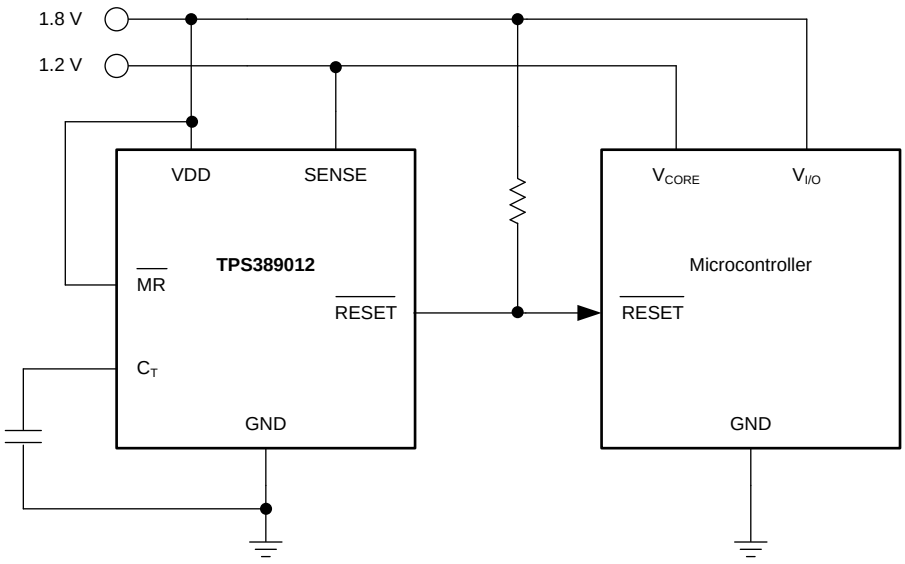
Device Information[1]

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS3890	WSON (6)	1.50 mm × 1.50 mm

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

PRODUCT PREVIEW

Typical Application Circuit



4 Device and Documentation Support

4.1 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.

4.2 Trademarks

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4.3 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.

4.4 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
TPS389001DSER	PREVIEW	WSON	DSE	6	3000	TBD	Call TI	Call TI	-40 to 125		
TPS389001DSET	PREVIEW	WSON	DSE	6	250	TBD	Call TI	Call TI	-40 to 125		
TPS389012DSER	PREVIEW	WSON	DSE	6	3000	TBD	Call TI	Call TI	-40 to 125		
TPS389012DSET	PREVIEW	WSON	DSE	6	250	TBD	Call TI	Call TI	-40 to 125		
TPS389018DSER	PREVIEW	WSON	DSE	6	3000	TBD	Call TI	Call TI	-40 to 125		
TPS389018DSET	PREVIEW	WSON	DSE	6	250	TBD	Call TI	Call TI	-40 to 125		
TPS389025DSER	PREVIEW	WSON	DSE	6	3000	TBD	Call TI	Call TI	-40 to 125		
TPS389025DSET	PREVIEW	WSON	DSE	6	250	TBD	Call TI	Call TI	-40 to 125		
TPS389030DSER	PREVIEW	WSON	DSE	6	3000	TBD	Call TI	Call TI	-40 to 125		
TPS389030DSET	PREVIEW	WSON	DSE	6	250	TBD	Call TI	Call TI	-40 to 125		
TPS389033DSER	PREVIEW	WSON	DSE	6	3000	TBD	Call TI	Call TI	-40 to 125		
TPS389033DSET	PREVIEW	WSON	DSE	6	250	TBD	Call TI	Call TI	-40 to 125		

(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)

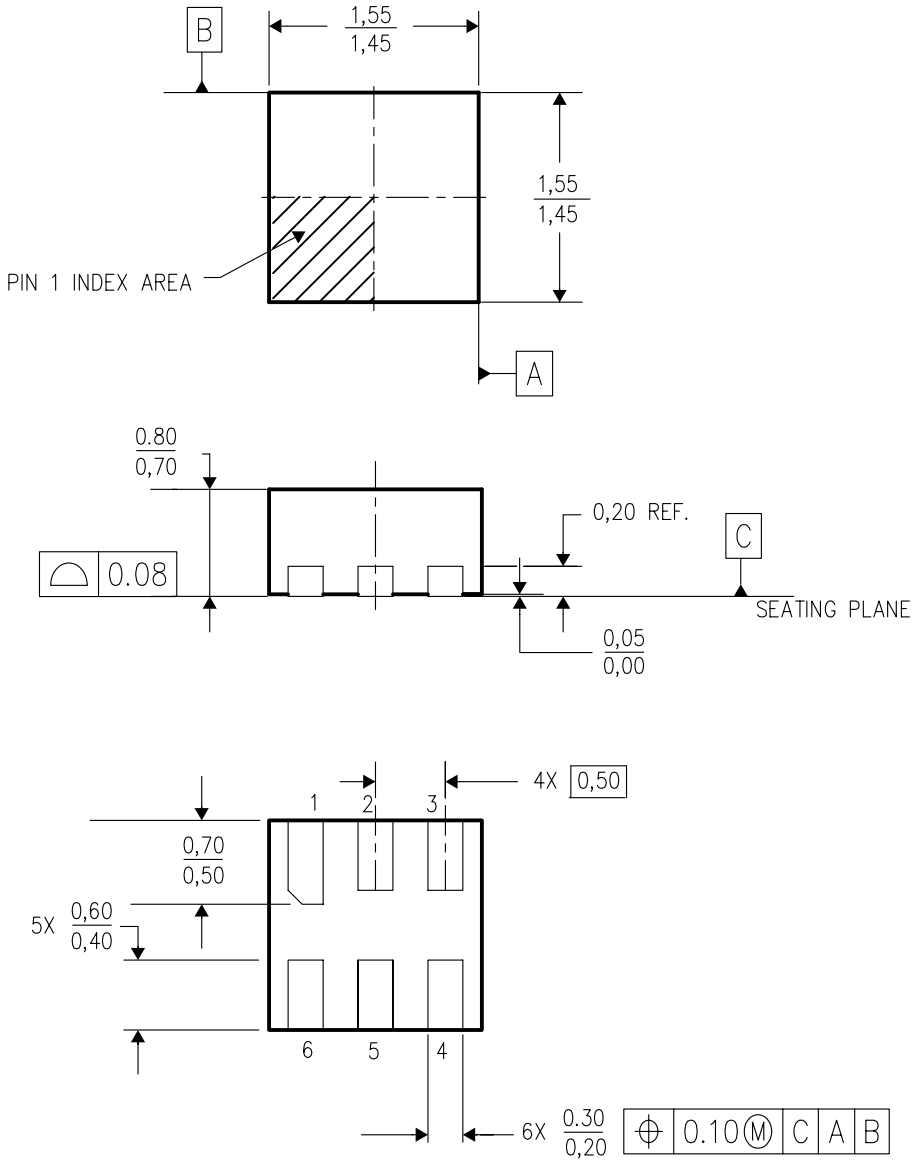
(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(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.

DSE (S–PDSO–N6) PLASTIC SMALL OUTLINE



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NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Small Outline No–Lead (SON) package configuration.
D. This package is lead–free.

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