

TPS82130 17-V Input 3-A Step-Down Converter MicroSiP™ with Integrated Inductor

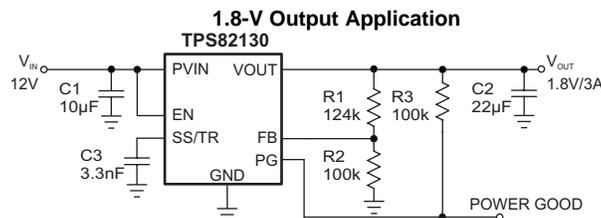
1 Features

- 3.0-mm x 2.8-mm x 1.5-mm MicroSiP™ Package
- 3.0-V to 17-V Input Range
- 3-A Continuous Output Current
- DCS-Control™ Topology
- Power Save Mode for Light Load Efficiency
- 20- μ A Operating Quiescent Current
- 0.9-V to 5-V Adjustable Output Voltage
- 100% Duty Cycle for Lowest Dropout
- Power Good Output
- Programmable Soft Startup with Tracking
- Thermal Shutdown Protection
- -40°C to 125°C Operating Temperature Range

2 Applications

- Industrial Applications
- Telecom and Networking Applications
- Solid State Drives

4 Simplified Schematic



3 Description

The TPS82130 is a 17-V input 3-A step-down converter MicroSiP™ power module optimized for small solution size and high efficiency. The module integrates a synchronous step-down converter and an inductor to simplify design, reduce external components and save PCB area. The low profile and compact solution 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 2.0MHz and automatically enters Power Save Mode operation at light load currents. In Power Save Mode, the device operates with typically 20- μ A quiescent current. Using the DCS-Control™ topology, the device achieves excellent load transient performance and accurate output voltage regulation.

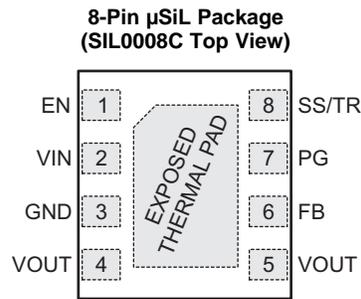
Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS82130SIL	μ SiL (8)	3.0 mm x 2.8 mm x 1.5 mm

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



5 Pin Configuration and Functions



Pin Functions

PIN		I/O	DESCRIPTION
NAME	NO.		
EN	1	I	Enable pin. Pull High to enable the device. Pull Low to disable the device. This pin has an internal pull-down resistor of typically 400k Ω when the device is disabled.
VIN	2	PWR	Input pin.
GND	3		Ground pin.
VOUT	4,5	PWR	Output pin.
FB	6	I	Feedback reference pin. An external resistor divider connected to this pin programs the output voltage.
PG	7	O	Power good open drain output pin. A pull-up resistor can be connected to any voltage less than 6V. Leave it open if it is not used.
SS/TR	8	I	Soft startup and voltage tracking pin. An external capacitor connected to this pin sets the internal reference voltage rising time.
Exposed Thermal Pad			The exposed thermal pad must be connected to the GND pin. Must be soldered to achieve appropriate power dissipation and mechanical reliability.

6 Device and Documentation Support

6.1 Device Support

6.2 Trademarks

MicroSiP, DCS-Control are trademarks of Texas Instruments.

6.3 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.

6.4 Glossary

[SLYZ022](#) — *TI Glossary*.

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

7 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
TPS82130SILR	PREVIEW	uSiP	SIL	8	3000	TBD	Call TI	Call TI	-40 to 125	H6 TXI1300EC	
TPS82130SILT	PREVIEW	uSiP	SIL	8	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.

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