

TPS560430 4-V to 36-V, 600-mA Synchronous Step-Down Converter

TI Information — Selective Disclosure

1 Features

- Integrated Synchronous Rectification
- Input Voltage Range 4 V to 36 V
- 600-mA Continuous Output Current
- 80- μ A Operating Quiescent Current
- 1.1-MHz and 2.1-MHz Switching Frequency
- Minimum Switching-On Time: 60 ns
- High Duty Cycle Operation Supported
- Accurate Voltage Reference
- Forced PWM Options
- Fixed 3.3-V Output Options
- Internal Compensation for Ease of Use
- High Voltage-Enable Input
- Soft Start into Pre-Biased Load
- Cycle-by-Cycle Current Limiting
- Short Circuit Protection with Hiccup Mode
- Over Temperature Protection
- Small Overall Solution Size (SOT-23-6 Package)

2 Applications

- Industrial Distributed Power Systems
- Automotive
- Battery Powered Equipment
- Portable Handheld Instruments
- Portable Media Players

3 Description

The TPS560430 is an easy to use synchronous step-down DC-DC converter capable of driving up to 600 mA. With a wide input range of 4 V to 36 V, the device is suitable for a wide range of applications from industrial to automotive for power conditioning from an unregulated source.

The TPS560430 has 1.1-MHz and 2.1-MHz operating frequency versions for either high efficiency or small solution size. The TPS560430 also has FPWM (forced PWM) version to achieve constant frequency and small output voltage ripple at light load. Soft-start and compensation circuits are implemented internally which allow the device to be used with minimized external components.

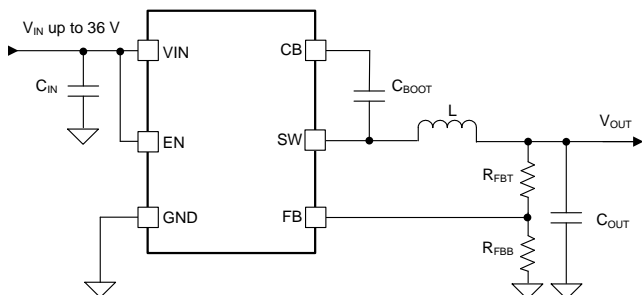
The device has built-in protection features, such as cycle-by-cycle current limit, hiccup mode short-circuit protection, and thermal shutdown in case of excessive power dissipation. The TPS560430 is available in a low profile 6-pin SOT-23-6 package.

Table 1. Device Information ⁽¹⁾

ORDERABLE PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS560430X	SOT-23-6	2.90 mm x 1.60 mm
TPS560430XF	SOT-23-6	2.90 mm x 1.60 mm
TPS560430X3F	SOT-23-6	2.90 mm x 1.60 mm
TPS560430Y	SOT-23-6	2.90 mm x 1.60 mm

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

Typical Application Schematic



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Table 2. Device Comparison Table

ORDERABLE PART NUMBER	Frequency	FPWM	Output
TPS560430X	1.1 MHz		Adjustable
TPS560430XF	1.1 MHz	√	Adjustable
TPS560430X3F	1.1 MHz	√	3.3 V
TPS560430Y	2.1 MHz		Adjustable



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4 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (September 2017) to Revision A	Page
• Added TPS560430X3F Orderable Part Number to the Device Information Table.....	1
• Added TPS560430X3F Orderable Part Number to the Device Comparison Table.	1

ADVANCE INFORMATION

5 Device and Documentation Support

5.1 Documentation Support

5.1.1 Related Documentation

For related documentation see the following:

- [AN-1149 Layout Guidelines for Switching Power Supplies](#)
-

5.2 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.

5.3 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.

5.4 Trademarks

E2E is a trademark of Texas Instruments.
All other trademarks are the property of their respective owners.

5.5 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.

5.6 Glossary

[SLYZ022](#) — *TI Glossary*.

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

6 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
XTPS560430XFBVBR	ACTIVE	SOT-23	DBV	6	3000	TBD	Call TI	Call TI	-40 to 125		Samples

(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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MECHANICAL DATA

DBV (R-PDSO-G6)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
 - Leads 1,2,3 may be wider than leads 4,5,6 for package orientation.
- Falls within JEDEC MO-178 Variation AB, except minimum lead width.

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