TPS22969 5.5-V, 6-A, 4.4-mΩ On-Resistance Load Switch

1 Features

- Integrated Single Channel Load Switch
- VBIAS Voltage Range: 2.5V to 5.5V
- VIN Voltage Range: 0.8V to 5.5V
- Ultra low R_{ON} Resistance
  - R_{ON} = 4.4mΩ at V_{IN} = 1.05V (V_{BIAS} = 5V)
- 6A Maximum Continuous Switch Current
- Low Quiescent Current (20µA (typ) for V_{BIAS} = 5V)
- Low Shutdown Current (1µA (typ) for V_{BIAS} = 5V)
- Low Control Input Threshold Enables use of 1.2V or Higher Logic
- Controlled and Fixed Slew Rate Across V_{BIAS}
  - t_R = 599µs at V_{IN} = 1.05V (V_{BIAS} = 5V)
- Quick Output Discharge (QOD)
- SON 8-terminal Package with Thermal Pad
- ESD Performance Tested per JESD 22
  - 2kV HBM and 1kV CDM

2 Applications

- Ultrabook™/Notebooks
- Desktops
- Servers
- Set-top Boxes
- Telecom Systems
- Tablet PC

3 Description

The TPS22969 is a small, ultra-low R_{ON}, single channel load switch with controlled turn on. The device contains an N-channel MOSFET that can operate over an input voltage range of 0.8V to 5.5V and can support a maximum continuous current of 6A.

The combination of ultra-low R_{ON} and high current capability of the device makes it ideal for driving processor rails with very tight voltage dropout tolerances. The controlled rise time of the device greatly reduces inrush current caused by large bulk load capacitances, thereby reducing or eliminating power supply droop. The switch can be independently controlled via the ON terminal, which is capable of interfacing directly with low-voltage control signals originating from microcontrollers or low voltage discrete logic. The device further reduces the total solution size by integrating a 260Ω pull-down transistor for quick output discharge (QOD) when the switch is turned off.

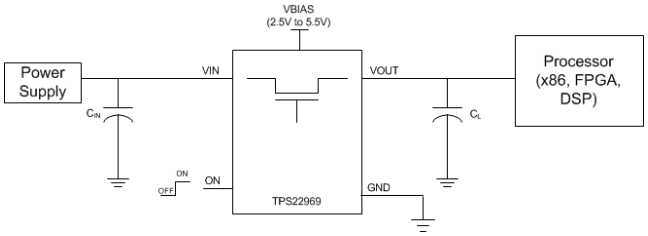
The TPS22969 is available in a small 3mm x 3mm 8-SON package (DNY). The DNY package integrates a thermal pad which allows for high power dissipation in high current and high temperature applications. The device is characterized for operation over the free-air temperature range of –40°C to 85°C.

Device Information

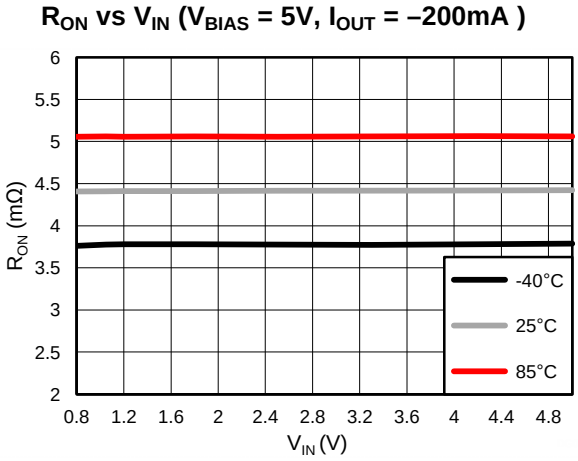
ORDER NUMBER	PACKAGE	BODY SIZE
TPS22969DNYR	WSON (8)	3mm × 3mm

PRODUCT PREVIEW

4 Simplified Schematic



Typical Application: driving high current core rails for a processor



5 Device and Documentation Support

5.1 Trademarks

Ultrabook is a trademark of Intel.

5.2 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.

5.3 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.

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
TPS22969DNYR	PREVIEW	WSON	DNY	8	3000	TBD	Call TI	Call TI			
TPS22969DNYT	PREVIEW	WSON	DNY	8	250	TBD	Call TI	Call TI			

(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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