LM10692

Power Management Unit for SandForce SF3700 SSD Controllers

Texas Instruments

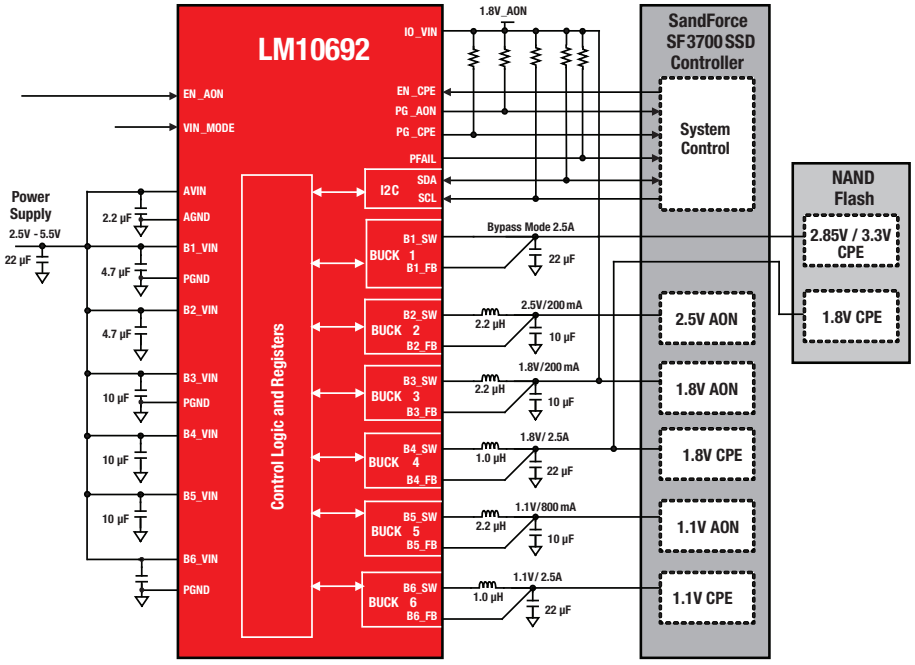
Product Bulletin

High Efficiency Solution Optimized for M.2 Solid State Drives

Overview

The LM10692 from Texas Instruments is a fully integrated power management unit (PMU) designed for SandForce SF3700 controllers. This ultra-small, reliable/flexible, and highly efficient power solution replaces up to six (6) discrete components typically used in these drives. It functions cooperatively with an SF3700 controller to optimize the supply voltage for low power conditions to obtain maximum system efficiency and provide power for NAND flash.

This design scheme delivers longer battery life for portable devices with SSDs. The chip uses I²C interface to communicate with the controller to achieve output voltage programmability. Unlike discrete solutions available today, the highly integrated, all-in-one PMU solution from TI delivers a higher performance-to-cost ratio and is specifically designed and optimized with features geared for SSD and flash drives using the SF3700 controller.



LM10692 typical application diagram

Product Highlights

- Six highly efficient SPI-programmable buck regulators
- Sleep mode saves power during idle times
- Automatic internal soft-start on each supply limits startup inrush current
- Phase-shifted buck operation reduces input current ripple and capacitor size
- Independent Enable input pins and Power Good output pins for AON (Always-On) and CPE (Core Power) rails

Key Specifications

- ±1% feedback voltage accuracy
- Up to 95% efficient buck regulators
- 2 MHz switching frequency for smaller inductor size
- 36-pin 5 x 5 mm QFN package

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Features and Benefits

Ideal Power Solution for M.2 SSDs

- Integrated all-in-one power solution saves valuable board space
- 2 MHz switching frequency for smaller inductor size
- Minimum number of external components
- High bandwidth provides fast turn-on without overshoot
- No loop compensation needed
- PFM mode for low load high efficiency operation

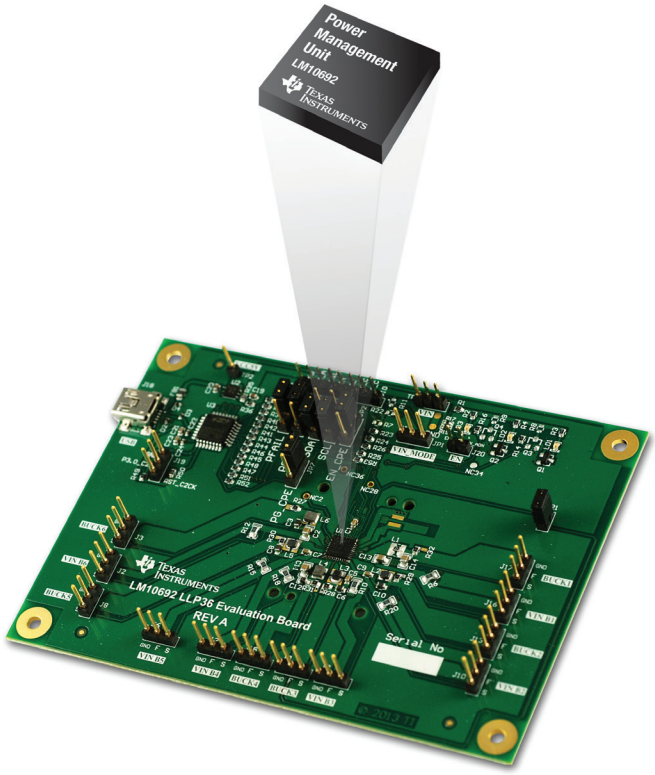
Features Optimized for SSDs

- Built-in over-current limit and thermal protection improves safety
- All six supply voltages offer user-programmable options for maximum flexibility (DVS)
- Customizable startup sequencing for greater flexibility
- Bypass mode on Buck1 eliminates inductor for 3.3V M.2 applications
- Easy-to-interface GUI for accelerated design
- Integrated solution leads to higher overall reliability of SSD
- Sleep mode via I^2C control
- Input power monitor PFAIL
- Fast active discharge
- Low quiescent current conserves battery life

Visit ti.com/LM10692 for more product information.

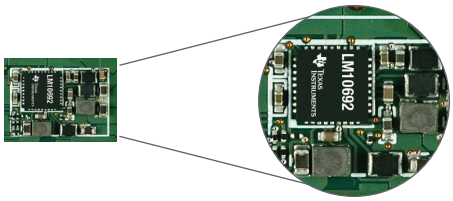
Regulator Table

Regulator	Programmable V_{OUT} (V)	Maximum I_{OUT}	Description
Buck1	1.75 to 3.3	2.5A	2.85 CPE
Buck2	1.0 to 2.55	200 mA	2.5V AON
Buck3	0.8 to 2.35	200 mA	1.8V AON
Buck4	0.8 to 2.35	2.5A	1.8V CPE
Buck5	0.8 to 1.575	0.8A	1.1V AON
Buck6	0.8 to 1.575	2.5A	1.1V CPE



LM10692 evaluation board

Complete LM10692 PMU solution size is 13.5 mm x 9.3 mm



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