

Power Failure Protection for Solid State Drives

Reduce Hold Up Capacitor Size, Eliminate Boost Converter, Increase Reliability

Lattice power management solutions greatly simplify and increase the reliability of power failure protection circuitry in Solid State Drives (SSD). The power failure protection circuitry prevents data loss in the event of input power failure by using the on-board hold-up capacitor to provide supplemental power during that critical period when the data is fully saved into the Flash memory. These circuits traditionally use either a super capacitor or a tantalum capacitor bank along with a boost converter to store the energy.

The innovative Lattice Power Manager II device simplifies and reduces the cost of power failure protection circuitry by integrating the charging and power switch over circuit of the hold-up capacitor. In the case of tantalum hold-up capacitor applications, it eliminates the need for a voltage boost converter.

Power Manager II Family

The programmable Power Manager II family consists of six devices that can monitor and control up to 12 power supplies. The low power POWR607 is ideal for portable SSD applications, controlling up to six supplies and incorporating two high voltage MOSFET drivers. The POWR1014 and POWR1220 devices are well suited for enterprise or PCIe SSD applications. The POWR1220 can manage up to 12 voltages and drive 4 N-Channel MOSFETs for the most demanding SSD applications. It consists of a programmable threshold, precision differential input comparator block with an accuracy of 0.7%, a 48-macrocell CPLD, programmable hardware timers, a 10-bit analog to digital converter and a trim block for the trimming and margining of supplies.

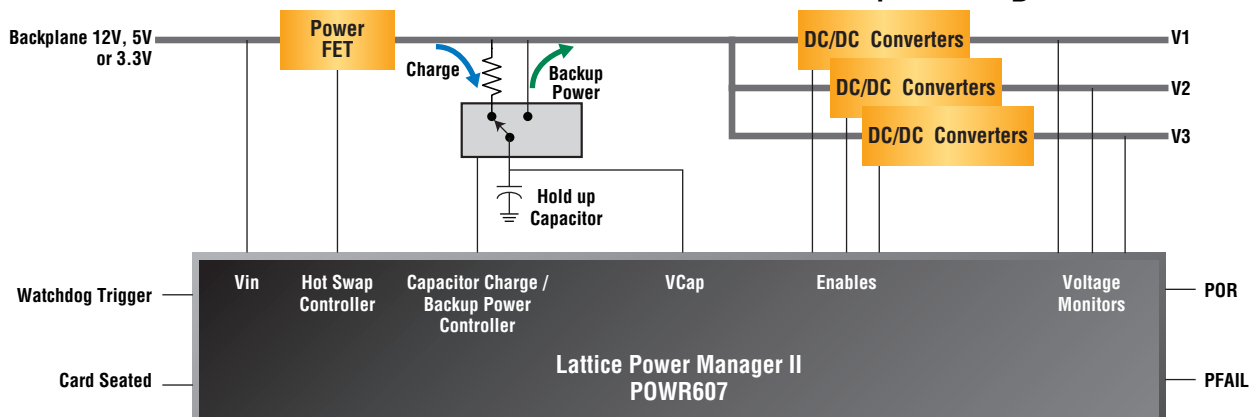
Lattice mixed-signal product families are supported by development kits, reference designs and design software that enable fast, easy product development. For more information about Power Manager devices, visit <http://www.latticesemi.com/products/powermanager>.



Key Features and Benefits

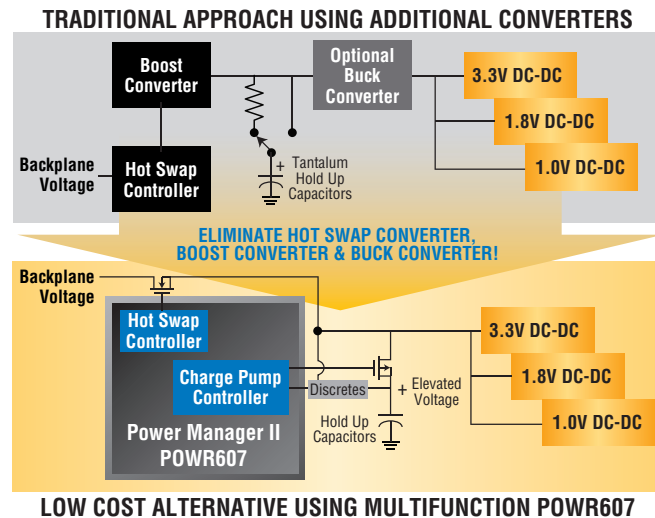
- **Low Cost Solution – Integrates:**
 - Power failure protection
 - Hot swap controller
 - Sequencing controller
 - Reset generator
 - Voltage monitor
 - Hold up capacitor controller
- **Increase System Reliability**
 - Supervise up to 12 supplies
 - Respond to events in <math><65\mu\text{s}</math>
 - Reduced component count
 - Controlled charging of hold up capacitor
- **32-Pin QFN, 48-Pin TQFP, 100-Pin TQFP Industrial Temperature**
- **In-System Re-programmability Reduces Risk**
 - On-chip configuration memory
 - JTAG programming interface

Reliable, Low Cost, Solid State Drive Power Back-up Management

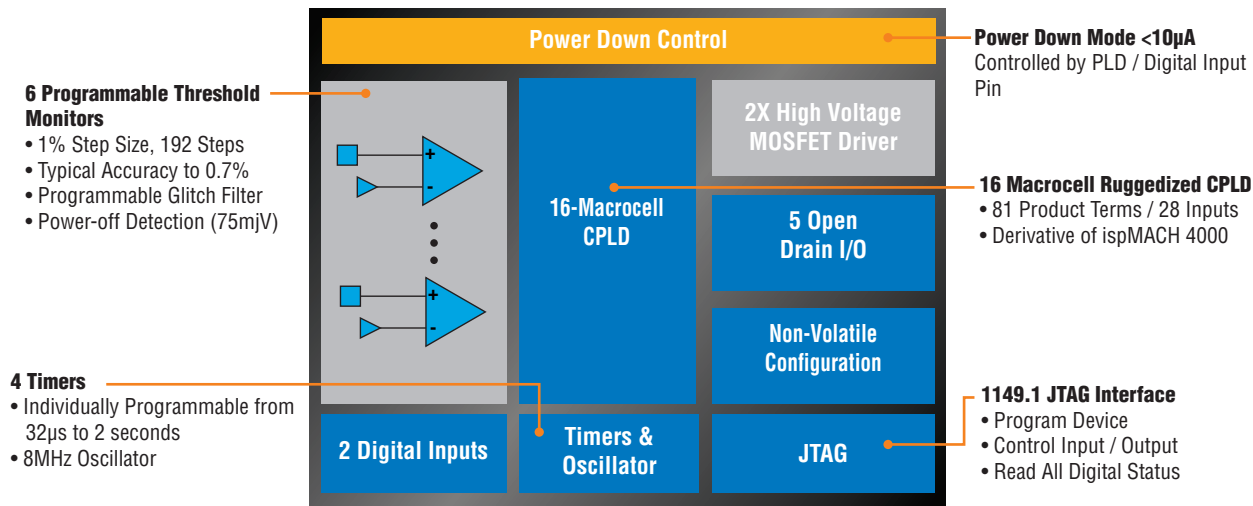


Low Cost Alternative to Boost Converters

- Traditional Solutions Implement Boost Converters to Replace Super Capacitors with Less Expensive Tantalum Capacitors. The Higher Charge Voltages allow Increased Failure Protection Time.
- POWR607 Eliminates the Need for Additional Converters by Functioning as a Charge Pump for the Hold Up Capacitor



POWR607 – “Flexible, Integrated Solid State Drive Power Manager”



Lattice’s Power Manager Family of Integrated/Programmable Voltage Monitors and FET Drivers Have a Wide Feature Set to Meet the Most Demanding Requirements of SSD Power Management.

Parameter	POWR605	POWR607	POWR1014	POWR1014A	POWR1220AT8
Number of Programmable Voltage Monitors	6	6	10	10	12
Accuracy (Typ.)	0.5%	0.5%	0.3%	0.3%	0.2%
CPLD Macrocells	16	16	24	24	48
Programmable Digital I/Os	5	7	14	14	20
FET Drivers	–	2 (fixed)	2 (programmable)	2 (programmable)	2 (programmable)
ADC Resolution	–	–	–	10 (bits)	10 (bits)
I ² C	–	–	–	Yes	Yes
Supply Current (Max.)	5	5	20	20	40

Applications Support

1-800-LATTICE (528-8423)
 503-268-8001
 techsupport@latticesemi.com

