

POWER Protector



PowerProtector

Version 1.0

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PowerProtector

Introduction

The unstable power conditions of outdoor applications such as transportation, telecommunications/networking and embedded systems run the risk of data loss and drive corruption during a sudden power failure. Power failures result in downtime as embedded systems are reformatted and operating systems are reinstalled. Furthermore, the overall productivity decreases as the cost of ownership increases for industrial grade memory solutions, which are specifically designed for high performance mission critical applications.

Industrial Grade storage such as CF, embedded modules and SSD's require superior performance and reliability that surpass what is currently offered by existing SuperCap designs. ATP's patented Power Protector Technology ensures data integrity during a sudden power down in all conditions.

PowerProtector Technology and Features

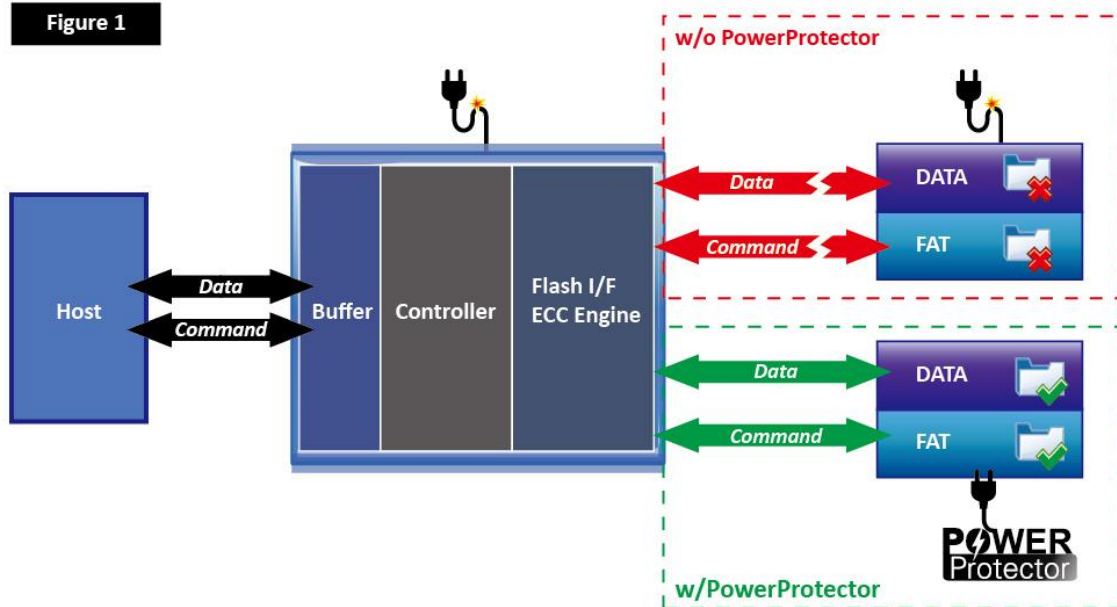
ATP PowerProtector's stand alone hardware design ensures a sufficient amount of reserve power during any power abnormalities such as unstable voltages and power outages. A back up power circuit ensures reliable controller and NAND flash operation during a power failure.

During a sudden power failure, the abnormality is discovered by a power loss detection circuit that is integrated into the drive, activating PowerProtector. The drive then draws power from PowerProtector's solid state capacitors for reserve power, which guarantee reliable drive operations. The solid state capacitors allow the flash to finish processing the last command or data.



PowerProtector

An illustration of the working concept behind PowerProtector is shown below.



Unlike SuperCap, the common backup power solution on the market, PowerProtector is a stand alone hardware design that does not require specific controllers or customized firmware. This feature provides greater flexibility during the design of a new product or a customized form factor. PowerProtector's unique configuration supports multiple form factors (eUSB, CF, SSD), wide temperature ranges and longer life spans.

The solid state capacitor is a critical component that allows PowerProtector to surpass the natural limitations of existing SuperCap designs. SuperCap is well known for its sensitivity to temperature change and has a tendency of losing its capacitance and functionality at extreme temperatures that are found in mission critical and industrial environments. The solid state capacitor's low series resistance and its minimal sensitivity to temperature and humidity make it the ideal solution for extreme situations.

The lifespan of an industrial grade product is a critical feature to consider, given that most products last more than five years. The average life span of SuperCap is less than two years; the capacitance will degrade over time and eventually fail to perform. In contrast, the solid state capacitor of PowerProtector has an average life span of over five years and no capacitance degradation.



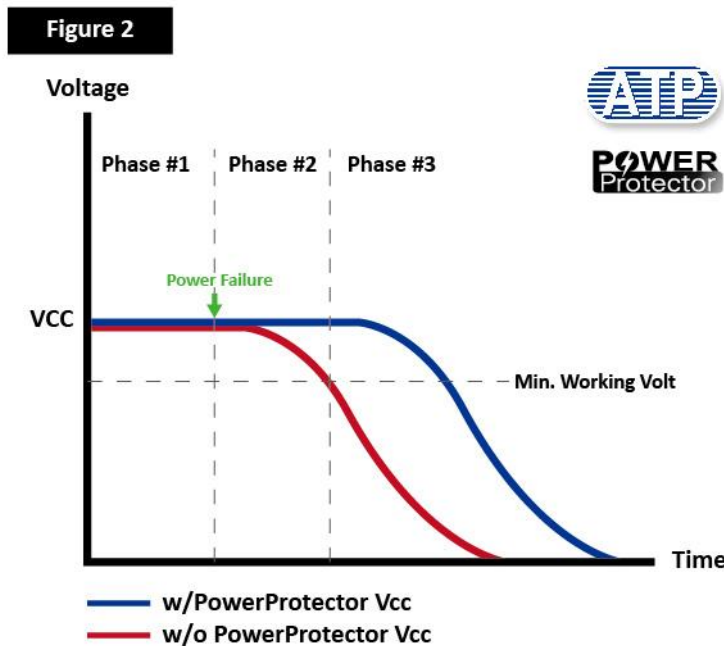
PowerProtector

Below is a comparison table summarizing the innovative PowerProtector and other commonly seen solutions on the market:

Solution	Design	Effectiveness	Risk	Life Span	Wide Temp.
PowerProtector	Standalone HW design	Good	Low	> 5 yrs	Yes
SuperCap	Specific controller + Firmware	Good	Degradation	< 2 yrs	No
Battery	Size is a concern	Good	Frequent replacement	< 3 yrs	No

Three actions that a drive typically performs are “read”, “write”, and “erase”. Under a sudden power failure, the data integrity is usually not harmed if the drive is in the “read” process. However, this is not the case if the drive is in “write” or “erase” mode and this is where PowerProtector can be advantageous in keeping the critical data protected

The below diagram illustrates how PowerProtector prolongs the functionality of NAND flash, essentially allowing the completion of the last command or data given by the controller.





PowerProtector

Phase#1

This is where power input is normal, so both controller and flash are functioning normally.

Phase #2

This is when the drive experiences sudden power failure. The Vcc of a drive without PowerProtector would begin to drop and eventually falls below the minimum working voltage. Consequently, causing the controller and flash to malfunction and compromising the integrity of existing data.

Phase #3

In contrast, a drive with PowerProtector would prolong and maintain the functionality of the controller and flash for an extended period. During this time, the PowerProtector would manage and allocate the reserve power/data to controller and flash intelligently to ensure the last command or data given to the flash finishes processing before the Vcc falls below the minimum working voltage. This will in turn prevent putting the existing data into risk of data corruption caused by incomplete data processing. Furthermore, this would also ensure the integrity of file allocation table.

Conclusion

PowerProtector offers an advanced level of protection ensuring that data integrity is not compromised during a power failure scenario, and preserves critical data in mission critical applications. PowerProtector is the next generation of data protection technology, the stand alone design, solid state capacitor and longer life span exceeds the performance and reliability offered by existing SuperCap designs.



About ATP

Established in 1991, ATP has accumulated many years of experience in the design, manufacturing, and support of high performance, highest quality DRAM modules and NAND flash storage products. ATP focuses in mission critical applications such as industrial/automation, telecom, medical, and enterprise computing where high levels of technical support, performance consistency and wide operating temperature ranges are required. A certified Eco/Green partner of tier one OEMs, all ATP products are fully RoHS and China RoHS compliant.

As a true manufacturer, ATP offers in house design, testing and product tuning, with extensive supply chain support with controlled/fixed BOMs's and longer product life cycles.

ATP System-In-Packaging (SIP) flash product manufacturing process is the backbone to our superior build quality and durability. The industry leading SIP process involves advanced wire bonding, stacking, and encapsulation stages which make ATP products more consistently durable and reliable with waterproof, extreme temperature durability.

The ATP brand continues to grow through both consumer and industrial OEM sales channels. With multiple offices in the United States, Asia, and Europe, ATP offers worldwide support in both engineering and sales. ATP adheres to the strict ISO9001 QA standards for quality and compatibility. All ATP memory products are RoHs, CE, and FCC approved.

For more information, please visit <http://www.atpinc.com/>