

PolyZen Device Helps Protect Portable Media Player (PMP)

The growing availability of digital content and falling prices of HDDs and LCD panels are driving growth of the Portable Media Player (PMP) market. The ability to download and store music, movies, TV programs and games is expected to make PMPs the center of the mobile digital lifestyle.

Multiple interfaces and charging systems can expose the PMP to damage caused by misconnection of the 5V and 12V lines. Adequate overvoltage protection can help manufacturers meet safety requirements, provide the end-user with a reliable product, and reduce warranty costs.

Although typical computer power supplies provide regulated lines at 5V +/- 5%, and 12V +/-5%, the voltage at these lines may, under certain circumstances, exceed 5.25V, and 12.6V, resulting in damage to the system or unprotected peripherals. Voltage spikes can occur when there is inductance in the power bus, generating a rapid change in current. This change can result from a hot disconnect of a peripheral, an internal system shutdown, or other internal power fluctuations.

Inductance can be designed in with magnetics, but can also be generated by long cables and other power bus artifacts. The more inductance in the power bus the worse the voltage spike seen by the peripheral is likely to be. In short, portable consumer electronics can be exposed to voltages well in excess of the bus voltage, and may require protection to prevent premature failure.

The PolyZen micro-assembly incorporates a stable Zener diode for crisp voltage clamping and a resistively non-linear, polymeric PTC (positive temperature coefficient) layer. The advanced PTC layer responds to either diode heating or overcurrent events by transitioning from a low to high resistance state. In the event of sustained high power conditions, the tripped PTC element limits current and generates voltage drop to help protect both the Zener and the follow on electronics - effectively increasing the diode's power handling capability.

Based on its principle of operation, the PolyZen device is especially effective at helping to clamp and smooth inductive voltage spikes. Because it leverages Zener diode technology, when faced with the potential of an inductive spike, it helps shunt current to ground until the voltage is reduced to the normal operating range. In general, the Zener diode element will help clamp voltage transients and dirty power. In the case where an incorrect voltage power supply is connected, it will help clamp the voltage, shunt excess power to ground, and eventually lock out the wrong supply.

Benefits:

- Helps shield downstream electronics from overvoltage and reverse bias
- Trip events shut out overvoltage and reverse bias sources
- Analog nature of trip events minimizes upstream inductive spikes
- Helps reduce design costs with single component placement and minimal heat sinking requirements

Features:

- Overvoltage transient suppression
- Overcurrent transient suppression
- Hold currents up to 2.3A
- Time delayed, overvoltage trip
- Time delayed, reverse bias trip
- Power handling on the order of 30 watts
- Integrated device construction in a 4x4mm package
- RoHS compliant

Applications:

- Portable Media Players
- Global Positioning Systems
- Hard disk drive 5V & 12V bus protection
- Flash memory 5V bus protection
- USB 5V bus protection
- DVD drive 5V & 12V bus protection
- Zip drive 5V & 12V bus protection
- PCI card 5V & 12V bus protection
- PCI express card 5V & 12V bus protection



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