PRODUCT BRIEF

XDP711-001

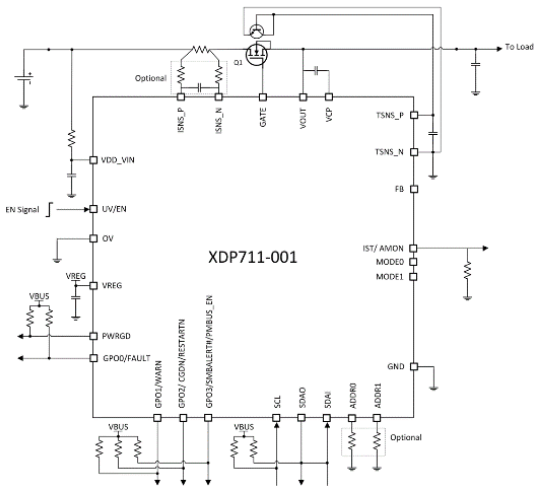
7 V to 80 V hot-swap controller and system monitoring IC with programmable digital SOA control

Infineon's XDP™ XDP711-001 is the new member of Infineon Technologies' wide input voltage range digital hot-swap and system monitoring controller IC with programmable digital SOA control and added features over XDP710-002 which include enhanced input voltage surge immunity, IMON and extended 40-bit energy readings optimized for AI server applications. The input voltage surge immunity of XDP711-001 increases system availability and enables a smooth operation. In addition, it drives a single or multiple parallel N-channel MOSFETs, thus allows for system scalability. The pulsed SOA current control technology feature allows safer turn-on of field-effect transistors (FETs) in systems with non-optimal SOA for a lower system BOM cost where multiple MOSFETs in parallel are used supporting high-power designs, which is becoming a key requirement for AI servers. Besides a controlled turn ON, XDP711-001 provides continuous system health monitoring and reporting to the main MCU via PMBus 1.3 interface. The high-speed communication through PMBus allows system designers to monitor the system more reliably and disable the downstream sub-systems fully or partially before the fault event can occur.

XDP711-001 incorporates an extensive variety of system protections for a safe operation and generates various protection responses depending on the severity of the incident. Latch-off and auto-retry are some examples of response types. All of which guarantee a robust and reliable design. Moreover, its SOA protection effectively ensures that the system FET always operates under safe condition. A detailed list of features is provided in the datasheet.

Potential applications

- Server and datacenter
- 24 V - 48 V industrial systems
- Power distribution systems
- Intelligent e-fuse
- Network router and switches



Key features

Improvements and enhancements over XDP710-002 include:

- Wide input voltage range: 7 V to 80 V
- Analog current & power monitor (AMON)
- Surge immunity protection
- FET fault (VDS) detection before FET's start-up
- Extended adjustable power averaging period up to 1 s
- Precision input and output voltage monitoring and reporting: ≤0.4%
- Precision FET's current monitoring and reporting: ≤ 0.75% at full ADC range
- Precision input power monitoring and reporting: ≤ 1.15%
- Energy monitoring and reporting
- PMBus 1.3 interface at 1 MHz
- 29-lead 6 x 6 mm² VQFN package

Key benefits

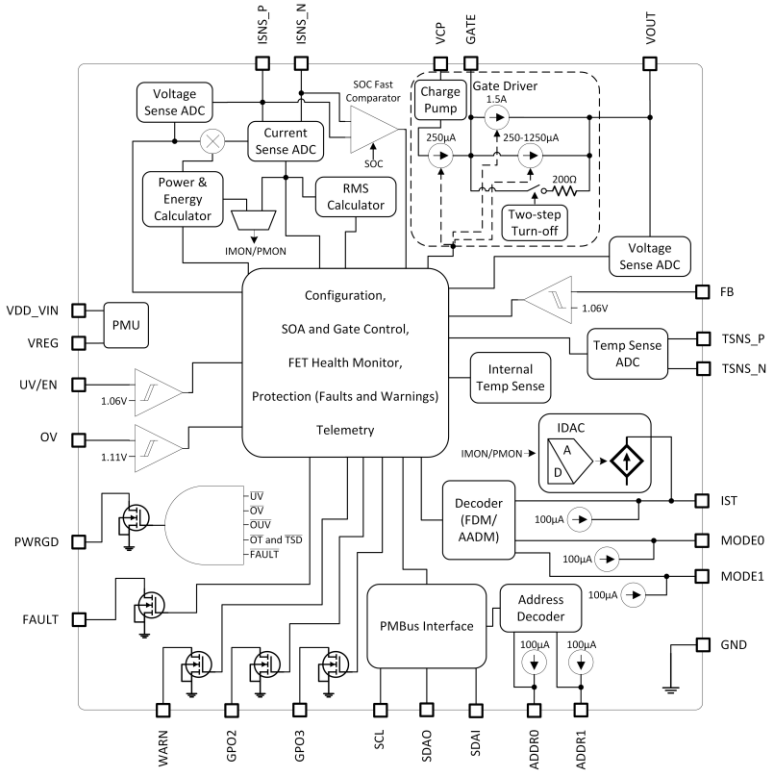
- Increases system reliability and a smooth operation
- Small footprint, reduced BOM and lower system costs
- Optimized system performance due to < 1% telemetry accuracy
- Reduces design time and flexibility in design
- Allows for system scalability
- Detection to isolation of short circuit in <1µs
- Robust design

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Beyond its enhanced features, XDP711-001 provides a multitude of core features that make it highly functional, reliable and robust. For instance, it is supporting an extended range of FETs, with SOA profiles pre-defined in the chip, which can be selected using resistor strapping or with digital settings. This not only streamlines configuration and facilitates rapid time-to-market solutions but provides greater flexibility in configuration. The analog-assisted digital mode of XDP711-001 further ensures compatibility with legacy systems and guarantees a seamless integration with older equipment. The device also features programmable input and output overvoltage (OV) and undervoltage (UV) protections, safeguarding against damage caused by, for instance, voltage fluctuations. Fast overcurrent (OC) detection protects the system from severe faults, such as short circuits. The unique boost mode feature allows the FETs with reduced SOA capability to be used for hot-swap applications, providing preferable second sourcing and reduced overall system cost. Lastly, the sequential turn-on capability allows for a controlled startup sequence, reducing stress on the device and connected equipment, making it a versatile choice for diverse applications.

Block diagram



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