

Automotive eFuse Protects Software-Defined Vehicles

[Infineon Technologies](#) has expanded its automotive power distribution portfolio with the SPOC Wire Guard BTS80009 SWPx 1ES, a highly integrated 12-V automotive eFuse with SPI interface. As the first member of a new smart power switch family, it combines a protected high-side switch with integrated I²t wire protection, software configurability, and advanced diagnosis. It is designed for new E/E architectures that support software-defined vehicle (SDV) concepts with over-the-air updates (see the figure).

The SPOC Wire Guard BTS80009 SWPx 1ES automotive eFuse provides ultrafast failure isolation in microseconds as well as precise current sensing, avoiding overdimensioning of the wire diameter compared with traditional melting fuses. At the same time, it ensures high availability of the power supply with freedom of interference.

For permanently powered loads, the product features a dedicated idle mode with very low power consumption of only a few microamps while maintaining full protection. To mitigate a limited amount of microcontroller I/O ports, its 24-bit SPI interface is daisy-chain-capable.

To support platform reuse across vehicle variants, configuration and protection parameters can be adjusted in software for each variant. In addition, SPOC Wire Guard devices provide real-time status, pre-warning indicators, and other diagnostics to improve vehicle availability and enable optimization throughout the vehicle's lifecycle.

SPOC Wire Guard also addresses growing needs for features supporting Advanced Driver Assistance Systems (ADASs) and enables fail-operational capabilities for L2++ to L5. It is offered as a Safety Element out of Context (SEooC) for use in systems up to ASIL-D in accordance with ISO 26262, with an integrated non-volatile memory (NVM) to configure an application-specific safe state.

The eFuse can autonomously react to supply-voltage drops caused by load faults to protect the supply. The single-channel architecture helps prevent fault propagation to other outputs.

The first family member, SPOC Wire Guard BTS80009 SWPx 1ES, is available in four variants with a scalable feature set (A, I, P, and F) and supports currents up to 34.5 A, making it suitable for replacing gate-driver ICs plus MOSFET and shunt solutions while delivering significant PCB savings.

The BTS80009 SWPx 1ES is now in production, with three further R_{DS(ON)} variants planned to follow by the end of 2026. For more information, see the SPOC Wire Guard 12 V Automotive eFuse with SPI [page](#).

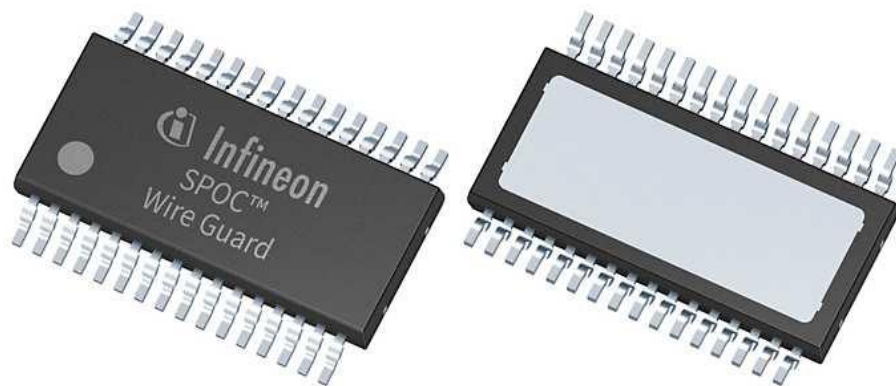


Figure. The SPOC Wire Guard offers high-side switches with integrated I²t wire protection and current limitation configurable by SPI interface. In low-power idle mode, the device offers full protection during parking. Additional features like NVM and digital diagnosis are predestined for use in software-defined vehicles. The BTS80009 SWPx 1ES 12-V automotive eFuse is the first member of this new family.