PRODUCT BRIEF

PROFET™ +2 BTG70xx-y -EPL types

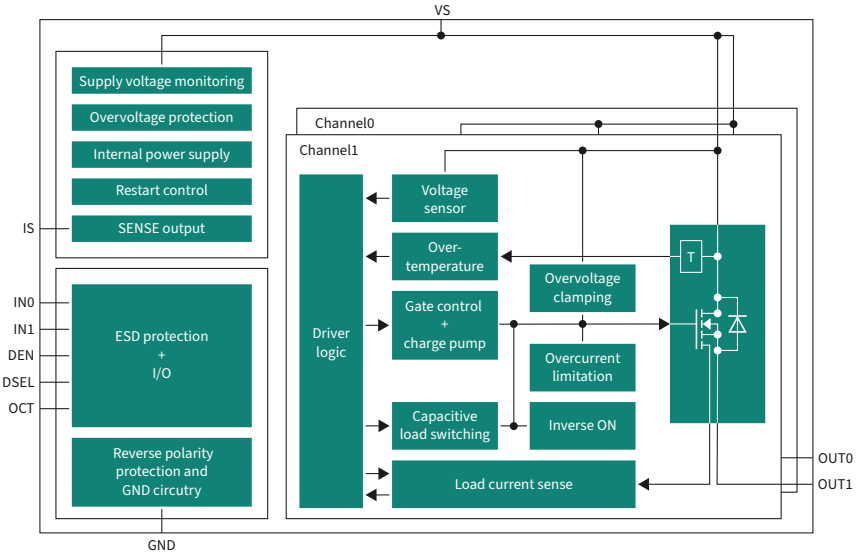
First ever 12 V PROFET™ high-side switch with adjustable overcurrent limitation and capacitive load switching mode

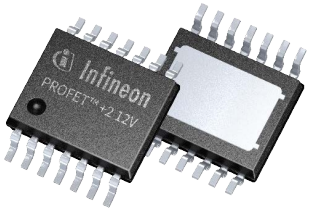
The PROFET™ +2 BTG7 -EPL types portfolio is characterized by the highest design flexibility, provided by the possibility to adjust the overcurrent limitation of each device, according to the load requirements. This minimizes design-in efforts by setting up only one design, as the current limit can be adapted on demand if load-driving requirements change, e.g.for variant handling.

Exchanging devices within the PROFET™ +2 BTG7 -EPL types family is simple, as the single and dual-channel devices in the established TSDSO-14 exposed pad package are pin and function compatible. With the integrated capacitive load switching mode, a broad range of capacitive loads can be charged in the safe operating area. Furthermore, the family offers to perform precise module diagnosis with best in class current sense accuracy in smart switches in low current regions (k_{ILIS}) and ISO 26262-ready documentation supports the use in safety-related applications.

All in all, the PROFET™ +2 BTG7 -EPL types is a flexible device to fulfill the needs of upcoming automotive power distribution generations. Especially autonomous driving and advanced driver assistance systems benefit from the adjustable current limitation by protecting sensitive input and output filters of sensors.

Block diagram





Key features

- Adjustable overcurrent limitation via external resistor
- Capacitive load switching mode to switch loads with big capacitive share in the safe operating area, extending system robustness
- Best in class current sense accuracy for lower current areas
- Overtemperature, overvoltage, load dump, reverse polarity and short-circuit protection
- State of the art intelligent restart strategy for a dependable power supply

Key benefits

- Highest design flexibility thanks to adjustable overcurrent limitation, pin-to-pin compatibility within the family and compatibility to PROFET™ +2 12V products
- Extended operation voltage range from 3 to 28 V and cranking capability down to 2.7 V
- Precise module diagnostics
- Switching of big capacitive loads within safe operating area
- ISO 26262-readiness supports functional safety applications

PRO SIL ISO 26262 ready

Load control & self protection

Load supply protection

Power supply protection

Wire protection

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PROFET™ +2 BTG7 -EPL types protects both the load supply infrastructure towards loads and to the power side with adjustable overcurrent limitation and capacitive load switching mode.

When switching loads with capacitive share, high peak currents occur, endangering the sensible data separation filters of both the load and the local DC-DC supply, for example in power over coax applications. In addition, when a load causes a current failure event, the current consumption could potentially rise above the maximum DC-DC output current, causing the power supply to switch off, decoupling the power supply for fail-operational loads.

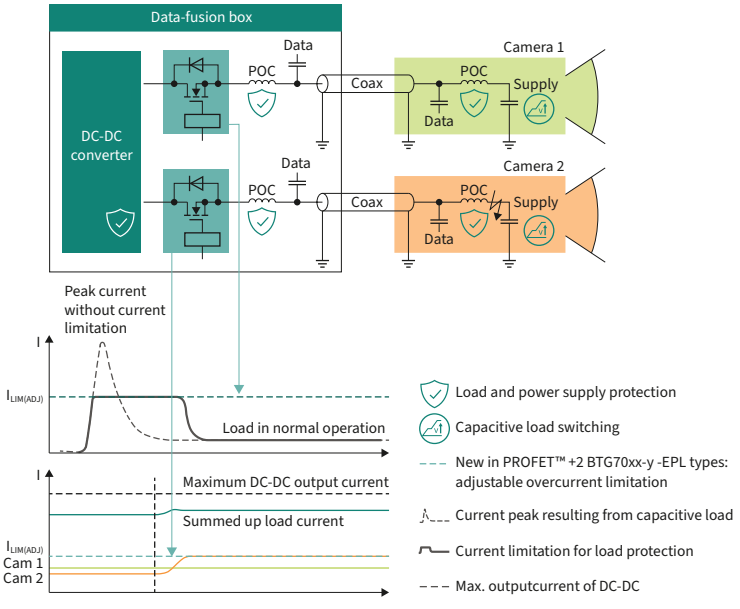
With the adjustable overcurrent limitation of the PROFET™ +2 BTG7 -EPL types , the current will be limited to the value adjusted to the system requirements. This way, I/O filters in PoC implementations are protected from peak currents and the power supply is protected from a voltage drop to 0 V. Furthermore, the capacitive load switching mode enables switching of big capacitors within the safe operating are, which increases system robustness.

PROFET™ +2 BTG7 -EPL types supports wire protection with adjustable overcurrent limitation and capacitive load switching mode.

Due to decentralized power distribution networks and growing requirements for dependable electronics, fuses do not fulfill the requirements for overtemperature protection of wires anymore.

With the adjustable overcurrent limitation of the PROFET™ +2 BTG7 -EPL types, the current will be limited to the value adjusted to the load requirements via an external pull-down resistor and does not cause any temperature threat to the wire, as the feature will prevent the current to exceed the maximum current capability of the wire. In addition, the capacitive load switching mode enables switching big capacitors in the safe operating area, while wire protection still can be guaranteed.

Both power supply and load supply will be protected by PROFET™ +2 BTG70xx-y -EPL types



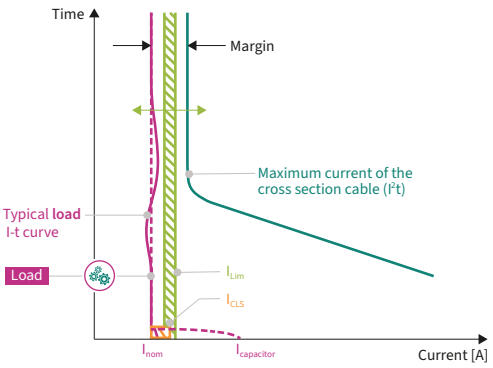
Key benefits of PROFET™ +2 BTG70xx-y -EPL types for load supply and power supply protection

- Simplified power-over-coax implementation
- Protection of the local DC-DC power supply against overload
- Stabilized, dependable power supply for loads in normal operation mode, fulfilling ASIL requirements
- Capacitor charging capability of up to several mF

Key benefits of PROFET™ +2 BTG70xx-y -EPL types for wire protection

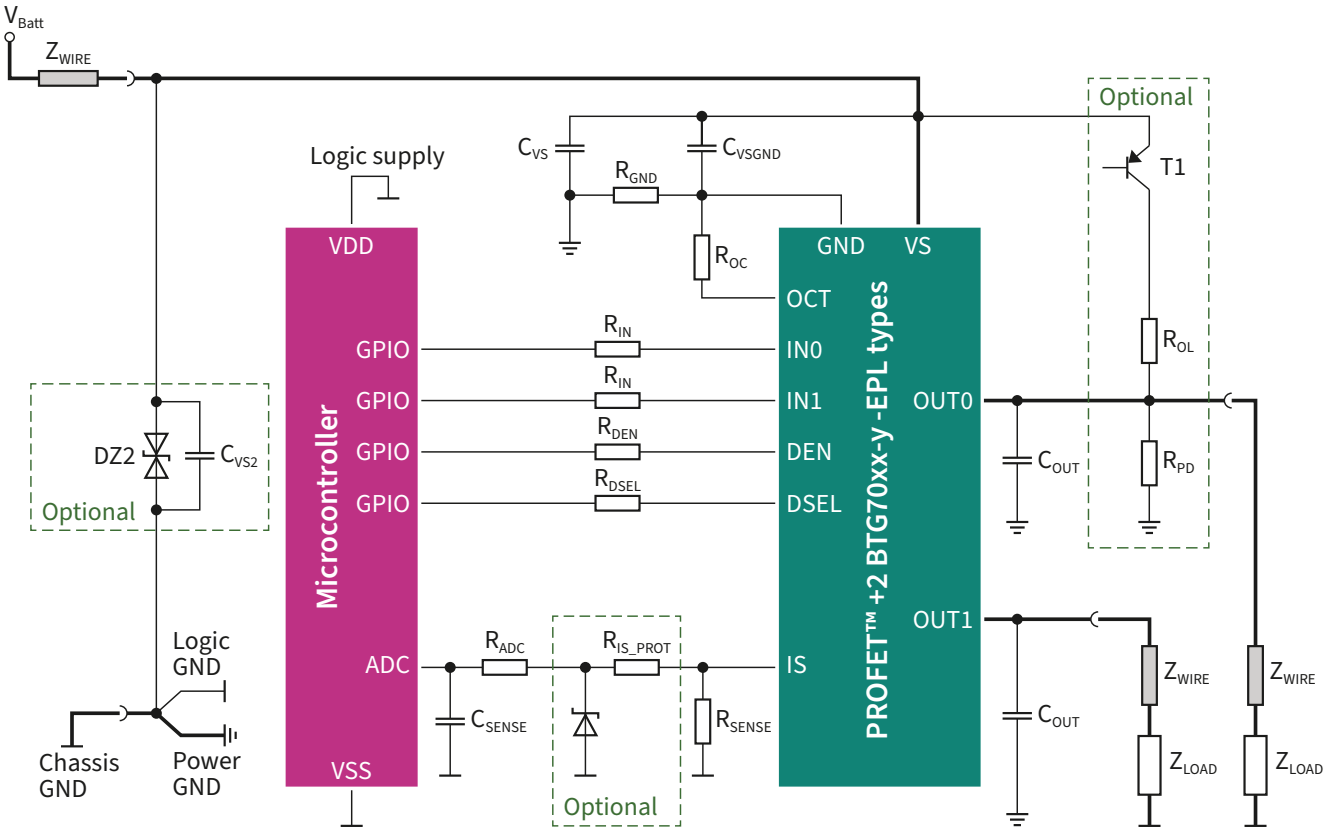
- Standalone hardware wire protection for time independent applications like heaters, or ECUs with capacitive share, available without microcontroller support
- Wire harness optimization in terms of cost and weight, due to accurate and adjustable protection behavior
- Resettable protection, without the need for accessibility for exchanging fuses
- Reduced software and processing effort for the microcontroller, as no current sampling and wire temperature calculation is necessary

Wire protection using PROFET™ +2 BTG70xx-y -EPL types enables dependable electronics and wire harness optimization in terms of cost and weight



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Application diagram



Product table

Product	$R_{DS(on)}$ (typ) [mΩ]	$R_{DS(on)}$ (max) @ T_j = 150°C [mΩ]	Nominal load current [A]	EAS [mJ]	Normal operational voltage range [V]	Extended operational voltage range [V]	Channels	Current limitation [A]	Capacitive load switching mode (CLS mode)
BTG7090-2EPL	90	180	2	6.5	4 … 20	2.7 … 28	2	0.38 – 4.34	✓
BTG7090-1EPL	90	180	2	6.5	4 … 20	2.7 … 28	1	0.38 – 4.34	✓
BTG7050-2EPL	50	100	3	12.0	4 … 20	2.7 … 28	2	0.79 – 8.86	✓
BTG7050-1EPL	50	100	3	12.0	4 … 20	2.7 … 28	1	0.79 – 8.86	✓

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