

Product brief

Power PROFET™

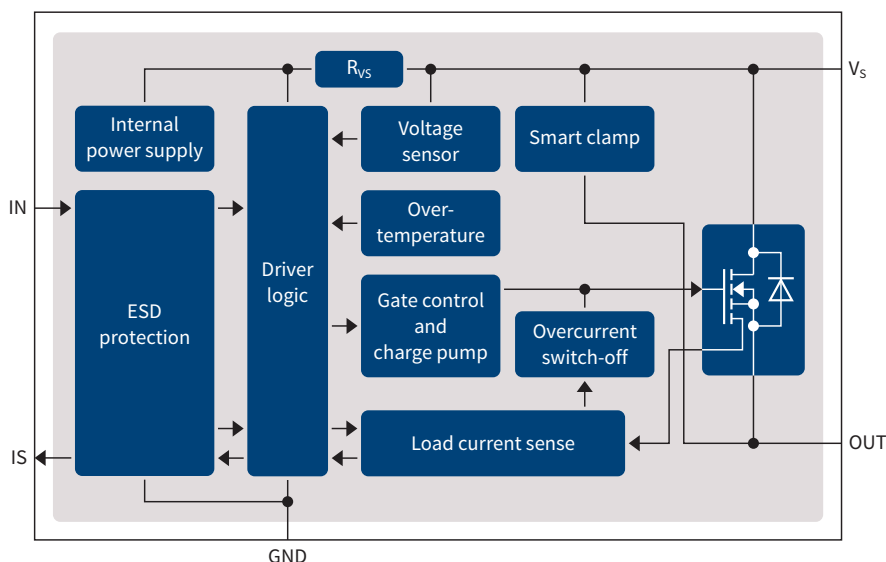
Benchmark low-ohmic smart switch with high inrush current for motor starters

Power PROFET™ BTS50010-1TAE is a smart high-side switch designed to drive currents up to 40 A DC in 12 V systems. With a $R_{DS(on)}$ as low as 1.0 m Ω , the device is packaged in a D²PAK (TO263-7). The benchmark energy robustness and inrush current capability up to 250 A supports the requirements of motor starters for motorcycle and scooter engines. BTS50010-1TAE also addresses automotive, industrial and consumer applications.

BTS50010-1TAE replaces the starter relay offering higher levels of robustness and reliability, supporting millions of switching cycles and high short circuit robustness for short cables (< 2 m). Additionally, a system of BTS50010-1TAE plus load can be used as central load dump clamping, limiting the peak voltage to < 60 V. BTS50010-1TAE includes built-in diagnostic and protection features. Therefore, there is no need of external short circuit protection nor components for load current measurement such as shunt/PTC resistors. This saves PCB area and enables faster development cycles.

Safety and energy efficiency regulations worldwide force the electrification of different functions in two wheelers (e.g. EFI – Electric Fuel Injection). This provides a great opportunity to integrate in these electrified modules additional electronics and functions such as the starter relay. BTS50010-1TAE supports the electrification of starter relay simplifying the overall system architecture and the total system cost.

Block diagram



Key features

- > High-side switch for 12 V systems
- > Ultra-low $R_{DS(on)}$ 1.0 m Ω
- > High inrush current up to 250 A
- > Benchmark energy capability
 E_{AR} 460 mJ at 40 A, E_{AS} 4000 mJ at 40 A
- > Built-in diagnostic and protection
- > Overload protection
- > Undervoltage protection
- > Short circuit protection
- > Clamp voltage $28\text{ V} < V_{DS(CL)} < 46\text{ V}$
- > Standard SMD package TO263-7 (D²PAK)

Key benefits

- > High mechanical and electrical reliability (> 1 Mio switching cycles)
- > Increased system robustness
- > Space savings due to small form factor and PCB integration

Key applications

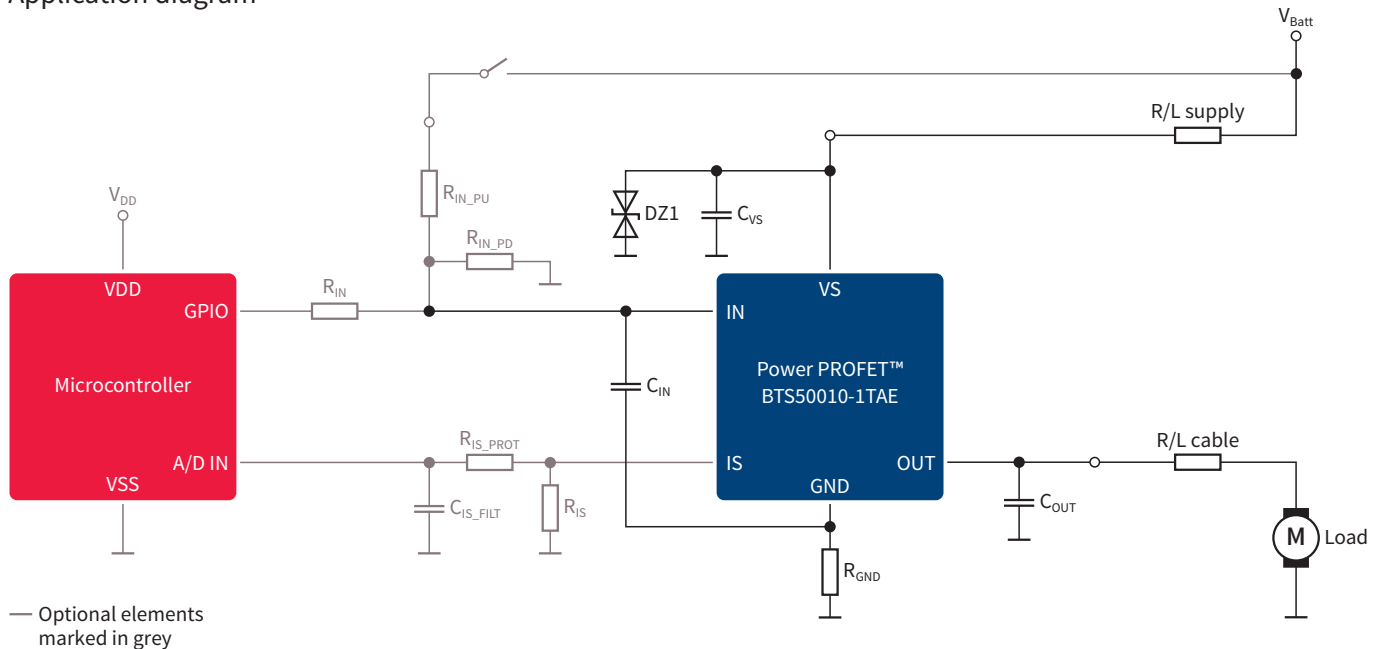
- > Motorcycle and scooter starter relay
- > Relay and fuse replacement in automotive applications with > 5.5 V and low inductance
- > Starters for small motors and engines: lawn mowers, chainsaws
- > Inductive and capacitive loads for 12 V CAV, industrial and commercial inductive and capacitive loads
- > Relay and fuse replacement



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Application diagram



Product table

Type	$R_{DS(on)}$ (typ) at $T_J = 25^\circ\text{C}$ [m Ω]	$I_{L(NOM)}$ [A]	$I_{L(SC)}$ (min) [A]	E_{AR} at $I_{L(NOM)}$ [mJ]	Nominal operating voltage [V]	Extended operating voltage [V]	Ordering code	Package	Status
BTS50010-1TAE	1.0	40	250	460	8 ... 18	5.5 ... 28	SP001666132	TO263-7 (D ² PAK)	In production

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