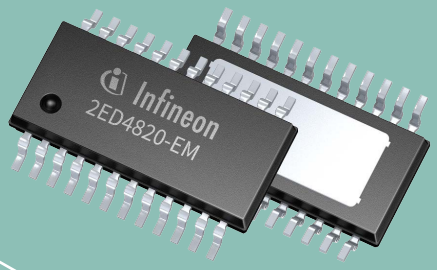


Product brief

EiceDRIVER™ APD 2ED4820-EM

48 V smart high-side MOSFET gate driver with SPI

The EiceDRIVER™ 2ED4820-EM is a smart high-side N-channel MOSFET gate driver with two outputs controlled via SPI for industry and automotive applications. The integrated powerful charge pump allows external MOSFETs to stay continuously on. Thanks to the enhanced turn-on and turn-off ability of the driver, the number of MOSFETs could be easily scaled up to manage large currents in the order of several hundred amps, while ensuring fast switch on and off. The MOSFETs could be controlled in a back to back configuration, either common drain or common source. A sophisticated high voltage technology secures that this IC could withstand V_{bat} voltages up to 105 V and V_{source} voltages versus V_{bat} of -90 V to make customer system more reliable.

The integrated current sense amplifier supports high-side and even low-side current measurement with a dedicated monitoring output. The low-side current measurement enables to re-use existing shunt in the Battery Management System (BMS) to save cost, PCB space and power losses. The current sense gain and the overcurrent thresholds can be easily configured through the SPI interface, for compatibility with a wide range of shunt values and reduced power losses.

The 2ED4820-EM comes along with several latching failure detections, to implement protections for the external MOSFETs, the load and the power source. They include overcurrent, Drain-Source overvoltage, internal overtemperature, Gate-Source and charge pump undervoltages. It also offers two non-latching failure detections, monitoring the supply voltage V_{bat} and switching off the MOSFETs when V_{bat} is in under or overvoltage condition. Other diagnostic features are also provided, for example a warning on the internal IC temperature and a monitoring of the source voltage in off state to identify open load condition before switch on.

An integrated SPI interface is used to configure the IC for the application. After successful power-up, parameters can be adjusted by SPI, monitoring data, configuration, warning and failure detection registers can be read and written.

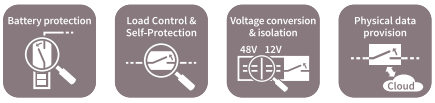
The 2ED4820-EM supports functions like a 48 V battery protection switch with and without pre-charging path or other high current load switching in the automotive sector as it comes with an AEC-Q100 qualification.

Key features

- Extended supply voltage range: 20–70 V
- Two independent high-side gate driver outputs with 1 A pull down, 0.3 A pull up for fast switch off/on
- Low supply current in sleep mode IBAT_Q < 5 µA
- Device control, configuration and diagnostic via SPI
- Versatile protection features:
  - Configurable overcurrent/ short circuit protection
  - Gate undervoltage lockout (VGS)
- Ground loss detection
- AEC-Q100 qualification

Key benefits

- Supports back-to-back MOSFET topologies (common drain or common source)
- SAFESTATEN input to trigger safe state mode in case of µC failure
- One bidirectional high- or low-side analog current sense interface with configurable gain to optimize power losses
- Robust against V_{bat} voltages up to 105 V and V_{source} voltages versus V_{bat} of -90 V



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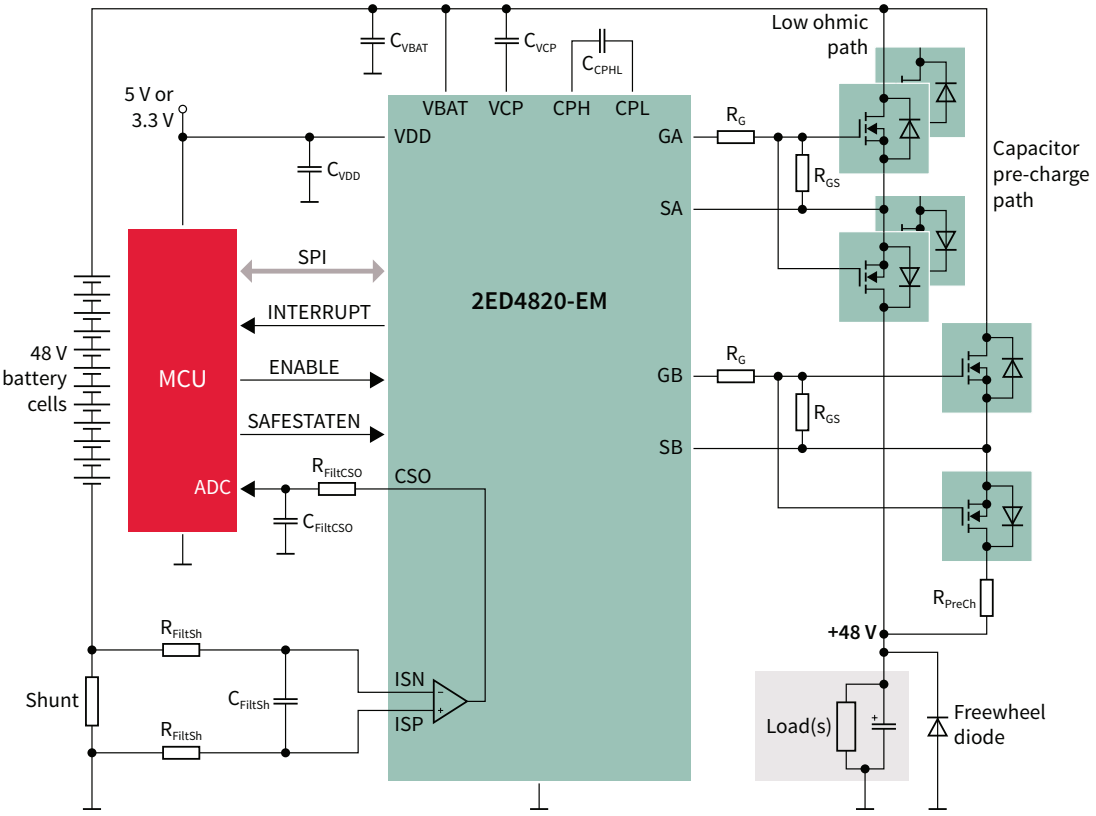
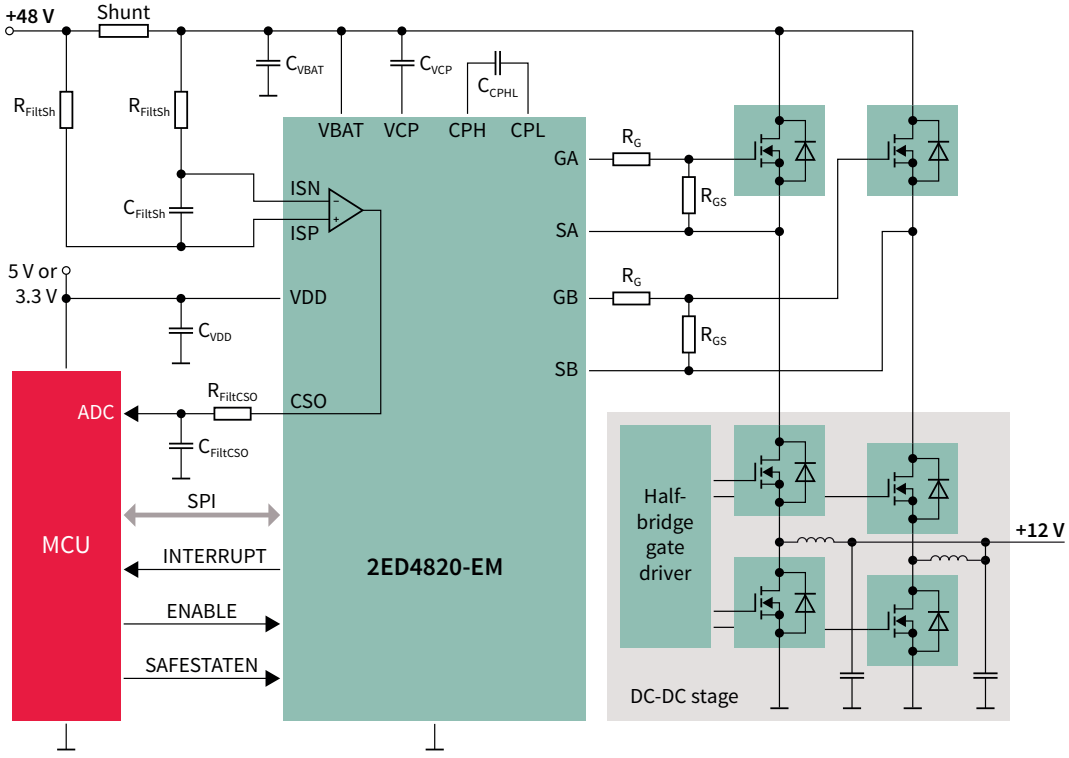
2ED4820-EM in 48 V battery protection switch application



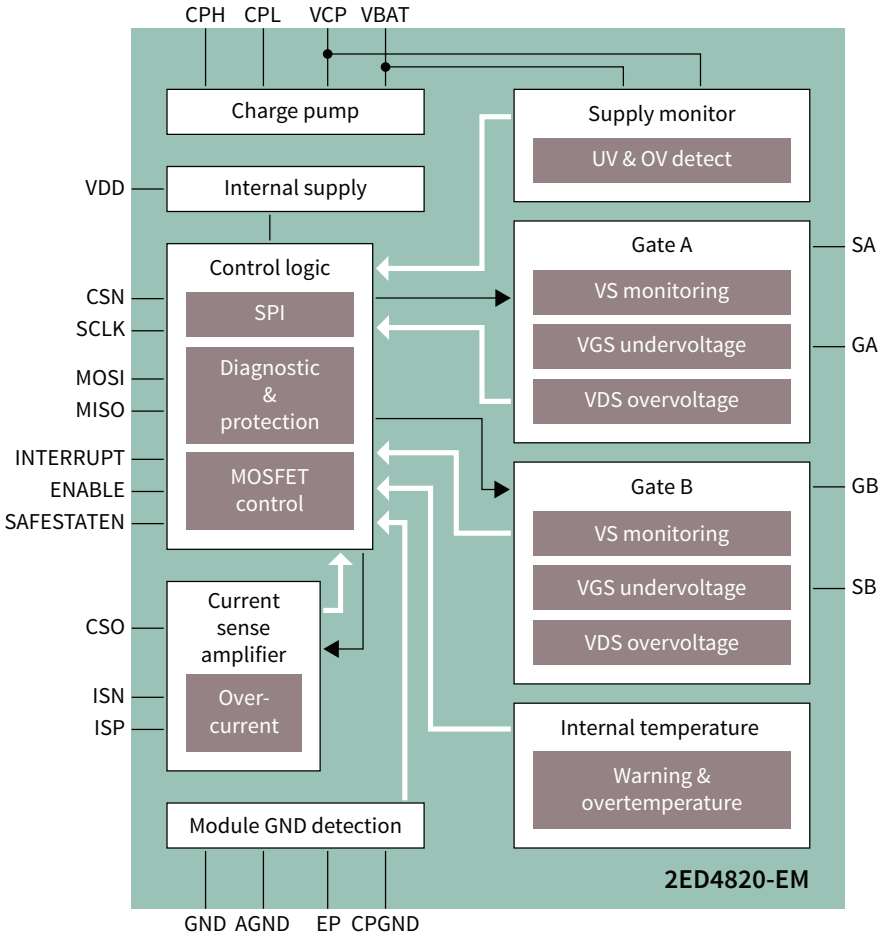
2ED4820-EM in 48 V input protection switch for a DC-DC stage



EiceDRIVER™ APD 2ED4820-EM

48 V smart high-side MOSFET gate driver with SPI

Block diagram



Product table

Type	Description	Ordering code	Package
2ED4820-EM	48 V smart high-side MOSFET gate driver with SPI	SP005629911	TSDSO-24
2ED4820 EB2 2HSV48	2ED4820 dual high-side switch – 48 V evaluation board	SP005353778 coming soon Q1/22	BOARD
R 48V BATT Switch10	48 V battery disconnect switch – reference design	SP005595834 coming soon Q1/22	BOARD

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Date: 2021-10