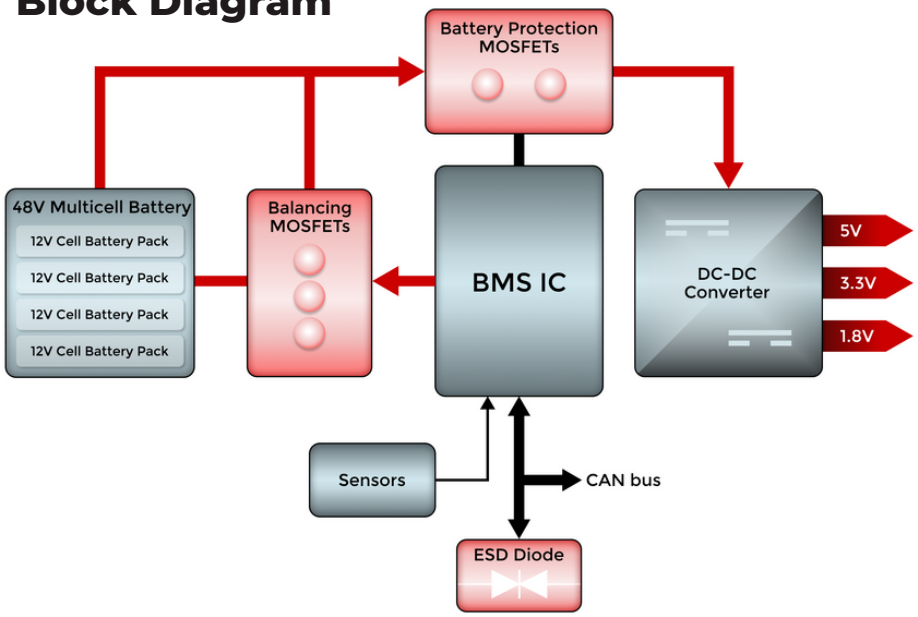
Optimizing E-bike Battery Management Systems (BMS)

Extending Battery Life, Enhancing Efficiency

Effective Power Management Begins with Effective BMS Design

E-bikes are growing in popularity worldwide due to their convenience and minimal carbon footprint. The BMS is key to enabling proper safety by overseeing a range of functions. With features including voltage monitoring, cell balancing, and safety alarms, the BMS maintains constant communication with the operator and has the power to enhance the overall longevity and experience of the e-bike.

Block Diagram



Design Objectives

With limited space for the BMS due to the e-bike's compact design, the balancing MOSFET ensures even power distribution and utilization across all battery cells to:

- **Enhance performance**
- **Extend battery life**
- **Maximize power delivery**

The battery protection MOSFET and ESD protection device help safeguard the sensitive circuitry and battery from spikes in current or temperature.

Recommended AEC-Q101 Qualified Products

Balancing MOSFET
N-Channel
40V

- MCACL320N04YQ

ESD Protection
VRWM = 24V

- ESD1524D3BHE3A
- ESD24VD3BHE3

Battery Reverse Protection MOSFET
40V - 80V

- MCG53N06AHE3