MPQ5852

36V, Smart Diode Controller with Two Voltage Monitors AEC-Q100 Qualified

PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

DESCRIPTION

The MPQ5852 is a smart diode controller that can drive an external N-MOSFET to replace a Schottky diode for reverse input protection. The device's 20mV ultra-low dropout minimizes power loss and enables a low minimum input voltage. Its 4μA standby current makes it ideal for battery-powered applications. The ultra-fast transient response ensures the part to rectify AC frequency up to 100kHz.

The MPQ5852 integrates an internal boost to provide a boost voltage that turns on the external N-MOSFET even at low input voltage (V_{IN}). With an extremely low UV threshold, the device provides a wide operation range to meet the harsh startup conditions defined in ISO16750. The device also supports cold crank voltage down to 0V.

Besides the reverse polarity protection and reverse pulse protection, the MPQ5852 also provides multiple diagnostics for automotive ECUs during fault conditions such as under voltage (UV), over voltage (OV), as well as over temperature (OT).

The MPQ5852 is available in a QFN-13 (3mm x 3mm) package.

FEATURES

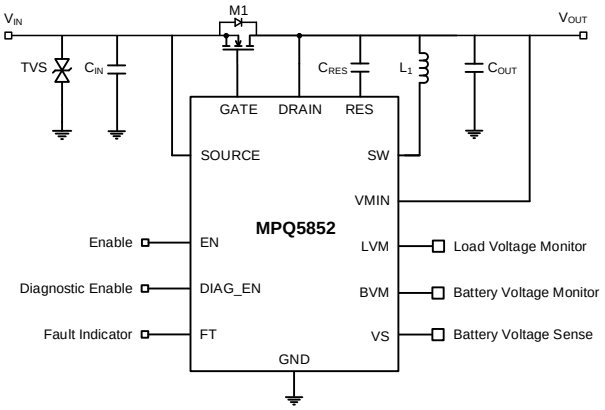
- Built to Handle Tough Automotive Transients and AEC-Q100 Requirement
  - Load Dump Up to 42V
  - -40V Reverse Polarity Voltage
  - Cold Crank Down to 0V
  - Rectifies AC Frequency Up to 100kHz
  - Available in AEC-Q100 Grade 1
- Cooler Thermals
  - Strong Gate Drive Ability and Small Switching Loss
  - 20mV Ultra-Low Dropout
- Extends Vehicle Battery Life
  - Low Quiescent Current in Standby (4μA)
  - Low Quiescent Current in Rectify Mode (30μA)
  - DIAG_EN Pin to Disable Diagnostic for Low Quiescent Current Operation
- Reduces Board Size
  - QFN-13 (3mm x 3mm) Package
  - Available in Wettable Flank
- Robust Protection and Diagnostics
  - Battery and Load Under-voltage (UV) / Overvoltage (OV) Monitoring
  - Battery Voltage Sensing
  - Over Temperature Warning
  - Fault Indication via FT pin
- Functional Safety System Design Capable
  - MPSafe™ Compatible - Functional Safety Supporting Document Available

MPSafe™ Fusa Compatible

APPLICATIONS

- Automotive System Protection
- Automotive ADAS Systems
- Automotive Infotainment Systems - Digital Cluster, Head Unit, Camera
- Industrial Equipment
- Battery Powered Systems

TYPICAL APPLICATION



Negative Pulse

V_{OUT} = 12V, I_{OUT} = 20A, TVS: SMBJ26CA