MPQ4214

40V, USB Type-C PD Synchronous Buck-Boost Controller with I²C AEC-Q100 Qualification in Progress

PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

DESCRIPTION

The MPQ4214 is a full-feature, buck-boost controller to support USB PD3.0 power solutions for automotive USB power designs. The MPQ4214 is a synchronous, four-switch, buck-boost controller capable of regulating different output voltages with a wide input voltage range and high efficiency. The MPQ4214 provides an I²C interface, which supports V_{OUT} voltage programmability, V_{OUT} slew-rate control and constant output current limit programmability, making the MPQ4214 suitable for USB power delivery (PD) design in USB Type-C power supplies.

The MPQ4214 uses valley-current control in buck mode and peak-current control in boost mode, providing fast load transient response and smooth buck-boost mode transient. The MPQ4214 provides forced continuous conduction mode (FCCM) and programmable average current limit, which supports flexible designs for different applications.

The MPQ4214 also features hiccup over-current protection (OCP), hiccup over-voltage protection (OVP), programmable soft start, and programmable under-voltage lockout (UVLO).

The MPQ4214 is available in a QFN-27 (5mmx5mm) package.

FEATURES

- 6V to 40V Startup Input Voltage Range
- 4V to 40V Operation Input Voltage Range
- Flexible I²C Interface Control for:
  - 3V to 20V Output with 10mV Steps
  - Selectable V_{OUT} Slew Rate
  - Programmable Constant Current Limit
- <50mA Steps Current Limit Adjusting through IPWM Pin
- Frequency Dithering Function for EMI Optimization
- Integrated V_{OUT} Discharge Function
- Selectable 200kHz, 300kHz, 400kHz, and 600kHz Switching Frequency
- Fixed Frequency over Full Load Range with FCCM Mode
- OCP, SCP, and OVP
- Interrupt Indicator for OCP, OVP and OTP
- Available in a QFN-27(5mmx5mm) Package
- AEC-Q100 Qualification in Progress

APPLICATIONS

- USB Power Delivery
- Industrial PC Power Supplies
- Automotive Start-Stop Systems
- Super-Capacitor Charging

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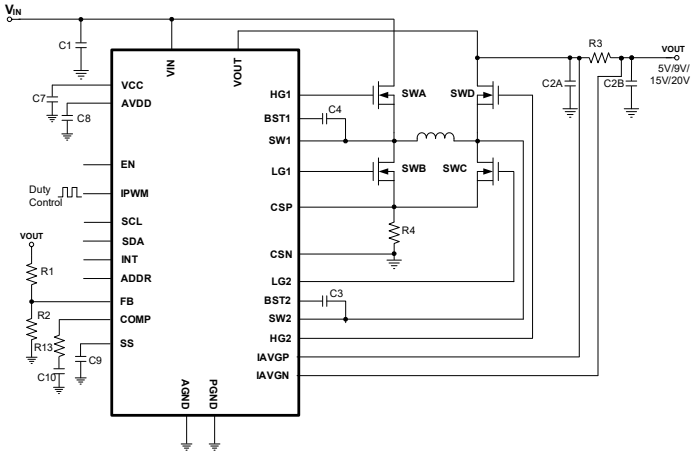
TYPICAL APPLICATION



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