MP2760

I²C-Controlled, 1-Cell to 4-Cells In Series Buck-Boost Charger with NVDC Power Path Control

PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

DESCRIPTION

The MP2760 is a Buck-boost charger IC designed for battery pack with 1 to 4 cells in series. It can accept a wide range (4V to 22V) of input operation voltage to charge the battery. The battery voltage can be either lower or higher than input voltage due to the buck-boost topology.

When the input is present, the MP2760 operates in charge mode. It measures the battery voltage and charges the battery with four phases: constant current trickle charge, constant current pre-charge, constant current fast charge and constant voltage charge. Other features include charge termination and auto-recharge.

The MP2760 also integrates the input current limit and input voltage limit to avoid overloading the input power source. This is compliant to the USB and PD specification.

The MP2760 provides a narrow voltage DC (NVDC) power path management. A battery FET (BATFET) driver is designed to control an external N-channel MOSFET to realize system minimum voltage regulation and battery supplement function.

The MP2760 can also supply a wide range (3V to 21V) of voltage at IN pin when the source mode is enabled. It also has output current limit up to 6A in source mode. These allows MP2760 to be compliant to the USB PD.

With I²C/SMBus interface, the charge and discharge parameters of MP2760 can be flexibly programmed, such as input current limit, input voltage limit, charging current, battery full regulation voltage, output voltage and output current in source mode and so on. It can also provide the status and faults in operation through registers.

To guarantee safe operation, the IC limits the die temperature to a programmable threshold. Other safety features include input over-voltage protection, battery over-voltage protection, system over-voltage protection, thermal shutdown, and a programmable timer to prevent prolonged charging of a dead battery.

The MP2760 is available in TQFN-30 (4mmx5mm) package.

FEATURES

- Buck-boost Charger for 1 to 4 Cells in Series Battery Pack
- 4V to 22V Input Operation Voltage
- Up to 26V Sustainable Voltage
- Up to 28V Sustainable Voltage by Using External MOSFET
- Supports USB2.0, USB3.0, USB3.1, USB3.2, Type-C and USB PD 3.0 Settings
- Seamless and Smooth Transition Between Buck and Boost Operation
- Configurable Input Maximum Current Limit and Input Minimum Voltage Limit
- Up to 6A Configurable Charge Current
- Configurable Battery-Full Voltage Up to 4.68V/Cell with 0.5% Accuracy
- Configurable 3V to 21V Output Voltage with 20mV/Step to Be Compatible with USB PD 3.0
- Up to 6A Output Current with 50mA/Step to Be Compatible with USB PD 3.0
- 500kHz to 1.2MHz Configurable Switching Frequency
- I²C or SMBus Host Control Interface to Support Flexible Parameter Setting
- Input Power Source Status Indication Pin
- Integrated 10bit ADC for Voltage, Current and Temperature Monitoring
- Analog Output Pin to Monitor Battery Current in charge mode and source mode
- Input Over-Voltage-Protection (OVP)
- System Over-Voltage-Protection (OVP)
- Battery Over-Voltage-Protection (OVP)
- System Short-Circuit-Protection (SCP) in Charge Mode
- Output Short-Circuit-Protection (SCP) in USB PD Source Mode

- Battery Missing Detection
- NTC Pin Floating Detection
- Integrated N-Channel MOSFET Driver for Input Power Pass Through or Over Voltage Protection
- Integrated N-Channel MOSFET Driver for Narrow Voltage DC (NVDC) Power Path Control
- Configurable Battery Temperature Protection Threshold and Behavior to Be Compliant to JEITA Standard
- Thermal Regulation and Thermal Shutdown
- TQFN-30 (4mm x 5mm) package

APPLICATIONS

- Ultra-book, Notebooks, Tablet
- USB PD Device
- General Multiple Cells Application