

I²C-Controlled 2A Battery Charger with ADC, Power Path, Load Switch, and Boost Operation

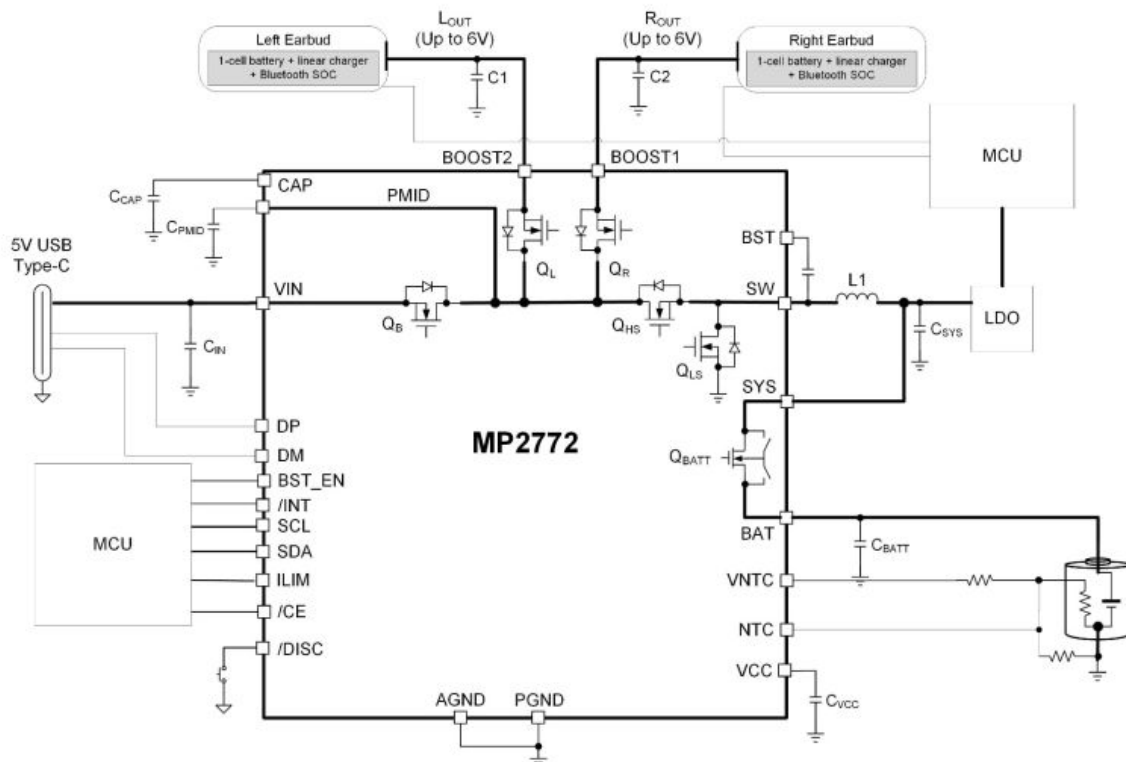
The MP2772 is a highly integrated switching battery charger that provides a complete solution for wearable and portable devices. The device provides an 8-bit successive approximation register (SAR) analog-to-digital converter (ADC) for battery and system monitoring, smart power-path management, narrow-voltage DC (NVDC) charging, push-button control, integrated load switches with an individual enable function, and an autonomous battery charging profile.

It integrates a battery charger, boost converter, and two embedded load switches into a single device. Only one inductor is required to charge a battery or boost the battery voltage to charge the device through load switches. The device achieves a low quiescent current (I_Q) down to $5\mu\text{A}$ in shipping mode and provides a low I_Q for battery self-life extension in light-load boost operation. The integrated ADC monitors battery charging parameters and load parameters during boost operation.

The MP2772 provides various safety features for battery charging and system operations, including the charge safety timer, battery and junction temperature (T_J) monitoring, over-voltage protection (OVP), and over-current protection (OCP). If a fault condition occurs, the device asserts an interrupt signal to the microcontroller unit (MCU) host.

The device also provides battery MOSFET disable control to enter shipping mode and reset the system via the /DISC pin.

The MP2772 is available in a WLCSP-30 (2.5mmx2.85mm) package.



Features & Benefits

- High-Performance Buck Charger:
 - Up to 6.5V Operating Input Voltage (V_{IN}) 26V Sustainable V_{IN}
 - Charge Efficiency is >95% at 0.5A and >94% at 1A ($V_{IN} = 5V$)
 - $\pm 0.5\%$ Charge Voltage Regulation Accuracy
 - 100mA to 3.2A I²C-Configurable Input Current Limit Compatible with BC1.2
 - 20mA to 2A I²C-Configurable Charge Current with 20mA/Step Resolution
 - Down to 10mA Termination Current
- Boost Operation:
 - Low Quiescent Current (I_Q), Light-Load Boost Operation
 - Automatic Transition from Buck to Boost
 - Up to 6V I²C-Configurable Boost Output with 0.1V/Step Resolution
 - Up to 1.5A of Output Current (I_{OUT}) in On-The-Go (OTG) Mode
- Safety:
 - Safety Timers for Fast Charge, Pre-Charge, and Watchdog
 - I²C-Configurable JEITA Profile for Safety Operation
 - Adjustable Thermal Regulation Loop and Thermal Shutdown Protection
 - Input, Battery, and System Over-Voltage Protection (OVP)
- Dual, Integrated Load Switches with Over-Current Protection (OCP) and Short-Circuit Protection (SCP)
- Integrated Analog-to-Digital Converter (ADC) for Charge and Discharge Parameters
- Narrow-Voltage DC (NVDC) Power Path Enabling System Instant Start-Up with Deeply Discharged Battery
- Battery Supplement Mode Provides Battery Current to Support Heavy System Loads
- Below 5 μ A Battery Discharge Current in Shipping Mode
- Integrated, 30m Ω , Low On Resistance ($R_{DS(ON)}$) Battery MOSFET (BATFET) with Shipping Mode and System Power Reset Function
- Available in a Small WLCSP-30 (2.5mmx2.85mm) Package