

PWM Controller for Programmable Power Converter (USBPD)

General Description

The RT7791 series is specifically designed to work with controllers, such as the RT7202, to provide a total solution for USB PD or a programmable power adapter. The RT7791 can achieve high efficiency, meet safety standards, and consume less than 50mW of power in a 5V standby condition.

The RT7791 includes several innovations in order to provide a solution with a wide range of output voltage. By way of DMAG pin, the RT7791 senses output voltage to adjust loop gain for system stability, to adjust output over-voltage protection threshold voltage to protect external devices, and to adjust current limit to meet Limited Power Source (LPS) safety requirements.

The RT7791 is also equipped with comprehensive protection features, including Bulk-Capacitor brown-in /brown-out protection, VDD over-voltage protection (VDD OVP), output over-voltage/under-voltage protection (Output OVP/UVP), secondary rectifier short-circuit protection (SRSP), and external over-temperature protection (External OTP). For constant output power regulation, a resistor connected to CS pin can be used to achieve accurate line compensation across the universal input voltage range. The RT7791 also provides various features to protect against any failures occurring at the secondary-side component, such as the RT7202 or a shunt regulator.

The RT7791 and the RT7202 work together to realize a robust and safe design to prevent all the potential fault scenarios, which may arise from versatile and unknown connections to various devices, cables, plugs and receptacles.

Features

- **Optimized for Adaptive Output Power**
 - ▶ **Integrated Low-Dropout Regulator (LDO)**
 - ▶ **Wide VDD Range : 10V to 40V**
 - ▶ **Adaptive Output Over-Voltage Protection**
 - ▶ **Adaptive Over-Current Protection**
 - ▶ **Adaptive Loop Gain Control for Loop Stability**
- **High Efficiency**
 - ▶ **Green Mode Operation at Light Load or No Load**
- **Comprehensive Protection Features**
 - ▶ **Bulk-Capacitor Brown-In and Brown-Out Protection**
 - ▶ **OTP Pin for External Over-Temperature Protection**
 - ▶ **VDD Over-Voltage Protection**
 - ▶ **Output Over-Voltage and Under-Voltage Protection**
 - ▶ **Secondary Rectifier Short-Circuit Protection**
 - ▶ **Programmable Line Compensation**
- **Others**
 - ▶ **< 50mW in 5V Standby Mode for Power Saving**
 - ▶ **Driver Capability : 300mA/–300mA**
 - ▶ **SmartJitter™ Technology**

Applications

- USB PD and Programmable Power Adapters

Simplified Application Circuit

