

## PWM Controller for Programmable Power Converter (USBPD)

### General Description

The RT7791P series is specifically designed to work with controllers, such as the RT7202, so as to provide a total solution for the USB PD or a programmable power adapter. The RT7791P can achieve high efficiency, meet safety standards, and consume less than 50mW of power in a 5V standby condition.

The RT7791P possesses several innovations in system control, by which the RT7791P can therefore allow one to design a power a solution with a wide range of output voltage. One of the innovations is by using the DMAG pin, the RT7791P senses output voltage to adjust loop gain for system stability, to adjust output over-voltage protection threshold voltage for external devices protection, and to adjust current limit for Limited Power Source (LPS) safety requirements.

The RT7791P 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). In case 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. Moreover the RT7791P moreover provides various features to protect against failures occurring at the secondary-side component, such as the RT7202 or a shunt regulator.

In applications, the RT7791P is suggested to use with a Secondary controller RT7202 to realize a robust and safe design, especially to prevent the potential fault scenarios, due to the mis-connection of various devices, cables, plugs and receptacles.

### Features

- **Optimized for Adaptive Output Power**
  - ▶ **Integrated Low-Dropout Regulator (LDO)**
  - ▶ **Wide VDD Range : 10V to 40V**
  - ▶ **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

