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THE NEW USB POWER DELIVERY CAR CHARGING SOLUTION
The RT7880 device is designed to fulfill the requirements of current and future car chargers

The RT7880 is the world's first integrated IC device that combines a USB Type-C power delivery (PD) and a Buck-Boost controller. Featuring high power, high efficiency, high power density and comprehensive protection functions, the RT7880 device is designed to fulfill the requirements of current and future car chargers.

In the past, most car chargers were only designed for charging mobile phones. A simple Buck controller is sufficient to support a single-port output below 18 watts, or an output below 9 or 12 volts in a car charging system. However, the demand for charging high power portable devices, such as tablets and laptops through car chargers is growing, driving the increased demand for USB PD car charging system.

Adding the power delivery function brings new challenges to existing car charger designs. The required power and power density increase dramatically. The car charging system requires a wider output voltage range between 3V and 21V. Additionally, higher resolution must be achieved in constant voltage (20mV per step) and constant current (50mA per step), while the constant current accuracy must be within +/-150mA in order to meet the Programmable Power Supply (PPS) specification. The USB PD 3.0 PPS is designed to unify the fast charging technology specifications, incorporated both MediaTek's PE4.0 and Qualcomm's QC4.0. The RT7880 provides solutions to all challenges above and meets all requirements of power delivery function.
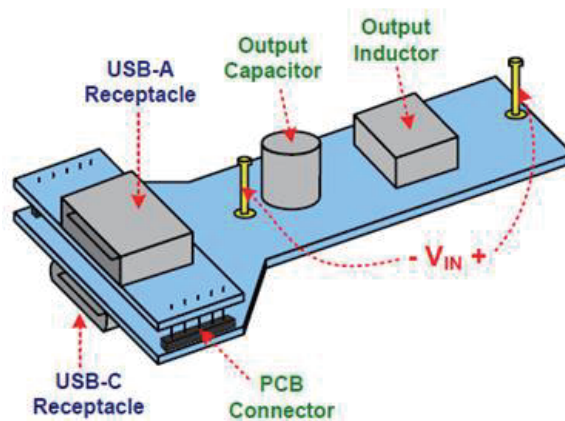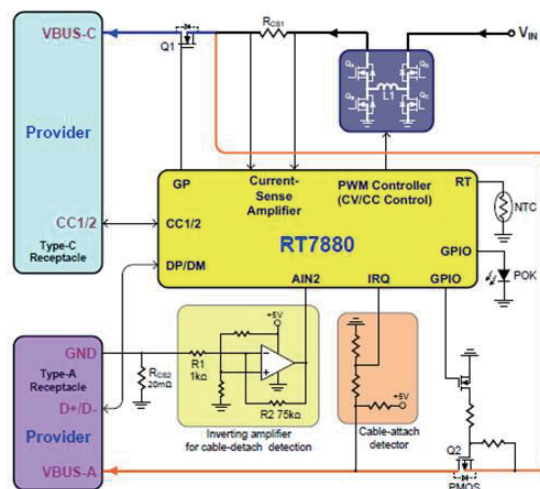
▲ 1C1A the car charging power source

RT7880 KEY FEATURES

- Built-in ARM Cortex™ M0 MCU
- Support USB PD 3.0 PPS and various mainstream fast charging and direct charging communication protocols

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- Integrated PWM Buck-Boost controller with programmable switching frequency (200kHz to 600kHz)
- Built-in constant voltage and constant current control circuit for high resolution (20mV/step; 50mA/step), and for highly accurate constant voltage (+/-5%) and constant current (+/-150mA) control 4V-36V wide input voltage range and 3V-21V output voltage range
- Built-in Charge Pump for driving cost-effective N-MOSFETs as the power channel control
- Support power up to 100 watts (20V/5A)
- Built-in VBUS fast discharge circuit
- Support CC1, CC2, D+,D- I²C(Master),and I²C(Slave) interfaces
- Support up to 10 GPIOs
- Comprehensive and programmable protection settings including over-voltage, over-current, over-temperature, under-voltage, and short-circuit protections which can be set to automatic recovery, latch-up, or hysteresis mode
- The embedded MTP memory allows the RT7880's firmware to be updated by an EC (Embedded Controller) or AP (Application Processor) through the I²C slave interface
- Available in WQFN-40L 5x5 Package

TOOLS AND SUPPORT

We also provide RT7880 design tools and documents to accelerate your design process, and support any quality-related requirements. Please contact us for more information.

AVAILABILITY, PACKAGING AND PRICING

Offered in a 5-mm-by-5-mm, 40-pin WQFN package, the RT7880 products are now available through the Richtek and authorized distributors. Please contact us for pricing.

FIND OUT MORE ABOUT RICHTEK USB PD SOLUTIONS

Richtek is continuously expanding the power management solutions for various USB Type-C with Power Delivery applications, from Type-C power adapter, Car charger, Display, Power Bank, Cable ID to full function Dual Role Power applications such as Smart Phones.

For more information, please see the application note ''Introduction to Richtek USB Type-C Power Delivery Solutions''. You can also find other Richtek USB PD solution on the application page and the list of USB PD products on the product page. If you would like to have more information on the USB Type-C PD samples and design kits, please contact your nearest Richtek sales office.

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