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USB PD EPR Chipset Offers Efficiency And Safety

Renesas Electronics' RAA489118 buck-boost battery charger IC and RAA489400 USB Type-C port controller IC combine to provide an Extended Power Range (EPR) USB Power Delivery (PD) solution that is said to provide superior efficiency and safety features for power tools, portable vacuums, lawn mowers, two-wheelers, and other applications.

The RAA489118 functions as either a battery charger supporting two to seven battery cells in series or as a voltage regulator supporting 30-V input and 30-V output. It employs Renesas' R3 (Robust Ripple Regulator) technology, which combines the best features of fixed-frequency and hysteretic PWM technologies. According to the vendor, R3 modulation technology delivers acoustic noise-free operation, fast dynamic response, and best-in-class light-load efficiency for longer battery life.

The RAA489118 includes an SMBus interface that is widely employed in power tools, home appliances and light industrial products. The SMBus interface, combined with the buck-boost and bidirectional features, allows the RAA489118 to work seamlessly with the RAA489400 and other components in USB-C PD implementations. Its input and output voltage levels also match mainstream solar power voltage levels, making it well suited for solar portable power station applications.

The RAA489400 port controller supports USB-PD VBUS power up to 48 V and 5 A. It features an integrated PHY, both sink and source power path gate drivers with external NFETs, short-circuit protection, VBUS discharge, a VCONN MUX and dead battery support.

"Renesas has been a worldwide leader in battery charging for many years based on advanced technology, adaptability, and exceptional value," said Chris Allexandre, senior vice president and general manager of power at Renesas. "The RAA489118 and RAA489400 bring those strengths along with Renesas' strong legacy of safety and reliability to new applications such as power tools and light industrial products. We expect to see strong demand from customers across multiple markets."

Other features of the Renesas USB EPR PD solution include:

- Robust thermal management and protection features for safety and reliability
- Adaptable configurations to support a wide range of applications
- Built-in protection against overcharging, overheating, and voltage anomalies
- Bidirectional power flow
- USB-IF certified reference design to reduce compliance testing time and effort
- Comprehensive design support and tools.

Renesas offers a turnkey USB-PD Charger Winning Combination that minimizes the effort required for customers to integrate USB-PD and battery management system features into their products. Winning Combinations are technically vetted system architectures from mutually compatible devices that work together seamlessly to bring an optimized, low-risk design for faster time to market.

The RAA489118 comes in a 4-mm × 4-mm 32-lead TQFN package, and the RAA489400 is packaged in a 32-Ld 3-mm x 5-mm FCQFN. Both products are available now. Comprehensive design support and tools, including VIDWriter configuration tools and battery charger GUI software to configure designs, are also available. For more information, see the RAA489118 and RAA489400 pages.