**News Release**

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**Renesas Electronics Announces Industry’s First USB-C™ Combo Buck-Boost Battery Charger for Mobile Computing Systems**

*Digitally Configurable ISL9241 Supports Both NVDC Charging and Higher Power HPBB Charging of Notebooks, Ultrabooks, Tablets, and Power Banks*

Düsseldorf, December 5, 2018 – Renesas Electronics Corporation (TSE:6723), a premier supplier of advanced semiconductor solutions, today introduced the industry’s first USB-C™ buck-boost battery charger to support both Narrow Voltage Direct Charging (NVDC) and Hybrid Power Buck-Boost (HPBB) charging for notebooks, ultrabooks, tablets, and power banks using the reversible USB Type-C™ connector cable. Through firmware control, the ISL9241 can switch between NVDC and HPBB modes, providing a low-cost and small solution size capable of efficiently processing a full range of power levels. It leverages Renesas’ advanced R3™ modulation technology for superior light-load efficiency and ultra-fast transient response to extend battery run-time. The charger’s reconfigurable internal registers allow the use of a smaller inductor for HPBB mode to achieve higher efficiencies across multiple power levels.

The ISL9241 delivers charging, system bus regulation, and protection features using NFETs for highest efficiency and bill of material (BOM) cost optimization. The charger can operate with only a battery, only an adapter, or both connected. It takes DC input power from conventional adapters, travel adapters, and USB Type-C power delivery (PD) ports, and safely charges battery packs with up to four-cell Li-ion series batteries. In NVDC mode, the ISL9241 automatically selects the adapter or battery as the source for system power. NVDC operation also supports turbo mode by turning on the BGATE FET to limit adapter current at the adapter’s current limit set point. NVDC is the ISL9241’s initial startup state before the system controller’s firmware changes the configuration to HPBB. In higher power HPBB mode, the ISL9241 supports bypass, bypass plus charging, reverse turbo-boost mode, and reverse turbo-boost mode plus charging.

The ISL9241 provides 5V to 20V reverse buck, boost, or buck-boost operation to the adapter port (OTG mode). This allows configurations to support USB-C PD output for fast charging Programmable Power Supply (PPS) ports. Direct charging the battery can also be enabled by bypassing the ISL9241 in PPS mode. The ISL9241’s reconfigurable charging architecture also allows designers to use the charger for multiport configurations while remaining fully compliant with the USB PD3.0 standard. Several digital telemetry, fault monitoring and protection features are provided. In addition, the ISL9241 also features a supplemental power mode that allows the input bias capacitor to store energy and release it during high power demand.

“The ISL9241 combo NVDC and HPBB battery charger gives customers the highest level of flexibility along with optimized system performance and maximum efficiency,” said Andrew Cowell, Vice President, Battery & Optical Systems Division, Renesas Electronics Corporation. “Mobile computing OEMs count on Renesas to consistently deliver power management innovations that help them differentiate their products with thinner form factors and longer battery life.”

The ISL9241 can be combined with the [ISL95338](http://www.renesas.com/products/isl95338) buck-boost voltage regulator, [R9A02G011](https://www.renesas.com/products/renesas-usb-power-delivery-family/c30-group/r9a02g011.html) USB PD controller or [R9J02G012](https://www.renesas.com/products/renesas-usb-power-delivery-family/c30-group/r9j02g012.html) USB PD controller, and [RAJ240045](https://www.renesas.com/products/power-management/battery-management-systems/battery-management/device/RAJ240045DNP.html#overviewInfo) fuel gauge IC for a complete USB-C PD3.0 and battery charger solution.

**Key Features of ISL9241**

* Buck-boost NVDC and HPBB charger for 2-, 3-, or 4-cell Li-ion batteries
* Input voltage range of 3.9V to 23.4V (no dead-zone)
* System/battery output voltage of 3.9V to 18.304V
* Bypass mode supports system connection to adapter
* Adapter current and battery current monitor (AMON/BMON)
* Supports supplemental power (Intel VMIN active protection)
* Programmable autonomous charging, and end of charge timer to stop battery charging
* Integrated 8-bit ADC enables system telemetry: temperature (PCB and junction), adapter current/voltage, battery charge/discharge current, and system bus voltage
* Compliant with Intel PROCHOT# and PSYS for protection against battery voltage drop, adapter over-current, battery over-current and overheat
* Allows trickle charging of depleted battery
* SMBus/I2C allows programming of key parameters to deliver a customized solution
* Battery ship mode keeps IC in ultra-low power state

**Pricing and Availability**

The ISL9241 USB-C combo buck-boost battery charger is available now in a 4mm x 4mm, 32-lead TQFN package and is priced at $3.90 USD in 1k quantities. For more information, please visit [www.renesas.com/products/ISL9241](http://www.renesas.com/products/power-management/battery-management-systems/multiple-cell-battery-chargers/device/ISL9241.html).

**About Renesas Electronics Corporation**

Renesas Electronics Corporation ([TSE: 6723](https://www.jpx.co.jp/english/)) delivers trusted embedded design innovation with complete semiconductor solutions that enable billions of connected, intelligent devices to enhance the way people work and live—securely and safely. A [global](https://www.renesas.com/about/company/profile/global.html) leader in microcontrollers, analog, power, SoC products and integrated platforms, Renesas provides the expertise, quality, and comprehensive solutions for a broad range of Automotive, Industrial, Home Electronics, Office Automation and Information Communication Technology applications to help shape a limitless future. Learn more at [renesas.com](https://www.renesas.com).

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