1. **News Release**

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**Renesas Electronics Introduces True Bidirectional Synchronous Buck-Boost Controllers for Industrial Battery-Powered Applications**

*High Efficiency ISL81601 and ISL81401 Leverage Proprietary Buck-Boost Algorithm for Reliable Bidirectional Operation and Smooth Mode Transitions*

Düsseldorf, October 3, 2018 – Renesas Electronics Corporation (TSE:6723), a premier supplier of advanced semiconductor solutions, today announced an innovative new family of bidirectional four-switch synchronous buck-boost controllers. The ISL81601 and ISL81401 are the industry’s only true bidirectional controllers that sense peak current at both ends and provide cycle-by-cycle current limit in both directions while in buck or boost mode. The controllers generate point-of-load (POL) and voltage rail conversions with peak efficiency up to 99 percent. The ISL81601 has a wide input range of 4.5V to 60V and produces a 0.8V to 60V output to support most industrial batteries: 12V, 24V, 36V and 48V. Also available is the ISL81401, a 4.5V to 40V input and 0.8V to 40V output version, and its unidirectional counterpart, the ISL81401A. The new controllers are well suited for DC power backup and battery-powered medical, industrial and telecommunication systems.

The ISL81601 and ISL81401’s bidirectional peak current sensing capability eliminates complex external circuitry required for charging and discharging a battery to supply power to the loads. Their proprietary algorithm provides smooth mode transitions between buck, boost and buck-boost, while reducing low frequency ripple at Vout, ensuring minimal disturbances during line or load transients. The algorithm also ensures predictable ripple voltage under all conditions. The addition of multilayer overcurrent protection and a precision control algorithm delivers constant current down to 0.1V at Vout for reliable operation. Designers can easily expand system power by paralleling an unlimited number of controllers. The ISL81601 and ISL81401 operate two switches at a time to minimize power loss and achieve higher efficiency.

“Our new bidirectional buck-boost controllers eliminate extra sensing circuitry and offer customers a robust feature-set that maintains battery health and superior power utilization,” said Philip Chesley, Vice President of Industrial Analog and Power Business Division, Renesas Electronics Corporation. “Leveraging Renesas’ proprietary modulation scheme and algorithms allows the highly integrated ISL81601, ISL81401 and ISL81401A to achieve the high reliability performance required for battery-powered equipment.”

**Key Features of ISL81601, ISL81401 and ISL81401A**

* Single inductor 4-switch buck-boost controllers
* Bidirectional operation (ISL81601 & ISL81401) with four feedback control loops
  + Independent voltage and current feedback loop control
  + Constant current/constant voltage profile for input and output
  + Supports on-the-fly changes in parametric settings using microcontroller
* Programmable frequency: 100kHz to 600kHz
* MOSFET drivers with adaptive shoot-through protection
* 8V drive (ISL81601), and 5V drive (ISL81401/A) for optimized efficiency
* Light load efficiency mode and 2.7µA shutdown current extends battery life
* Frequency dithering for lower EMI (ISL81601 & ISL81401)
* Extensive multilayer protection for overvoltage, undervoltage, overcurrent, overtemperature, and short circuit

The ISL81601 and ISL81401/A can be combined with a Renesas [RL78 microcontroller (MCU)](https://www.renesas.com/products/microcontrollers-microprocessors/rl78.html), or other MCUs, to program the voltages, battery charge/discharge function, and on-the-fly bidirectional power flow. Designers can also use the [PowerCompass](https://www.renesas.com/powercompass)™ tool to help them quickly identify other power supply parts that match their specific system requirements. Multiple power rails can be set up and designers can perform high-level system analysis and generate custom reference design files in minutes.

**Pricing and Availability**

All three controllers and evaluation boards are available now from Renesas Electronics’ worldwide distributors. The ISL81601 bidirectional 60V synchronous buck-boost controller is available in a 38-lead HTSSOP package priced at $3.99 USD, and a 32-lead QFN package priced at $3.69 USD, both in 1k quantities. For more information, please visit: [www.renesas.com/products/isl81601](https://www.renesas.com/products/isl81601).

The ISL81401 bidirectional and ISL81401A unidirectional synchronous 40V buck-boost controllers are available in 32-lead QFN packages. The ISL81401 is priced at $2.79 USD, and the ISL81401A is priced at $2.29 USD, both in 1k quantities. For more information, please visit: [www.renesas.com/products/isl81401](https://www.renesas.com/products/isl81401) and [www.renesas.com/products/isl81401A](https://www.renesas.com/products/isl81401A).

**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/en-hq/about/company/profile/global.html) leader in microcontrollers, analog, power and 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/en-us/).

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