STMicroelectronics’ hybrid controller simplifies full-feature implementation of USB-C sink premium applications

New ST-patented hybrid mode relieves software development for USB PD advanced features; Updated ST-proprietary AUTORUN algorithms for sw-free basic operation

STUSB4531 USB PD controller

GENEVA, SWITZERLAND, January 22, 2026 /EINPresswire.com/ -- STMicroelectronics’ STUSB4531 USB Power Delivery (PD) sink controller introduces a new, patented hybrid mode that simplifies implementing optional USB PD features for added value in USB-powered and USB-chargeable devices.

The STUSB4531 contains a certified, hardwired USB PD stack that works with ST-proprietary AUTORUN algorithms to enable software-free power negotiation, supervision, and management. These AUTORUN algorithms simplify developing battery-charging and VBUS-powered electronics in equipment such as portable audio devices, wearables, set-top boxes, Wi-Fi access points, healthcare devices, and lighting. The latest updated algorithms can negotiate with AC adapters to ensure the optimum power profile, including adjustable voltage supply (AVS) and high-power charging in dead-battery mode for faster device reactivation.

The new hybrid mode now added to the STUSB4531 lets an external application processor interact with the stack to leverage the protocol layers for USB PD communication. This gives engineers extra flexibility to implement functions such as battery messaging, data role swapping, Alternate modes, and vendor-defined messages (VDM) while also easing software development and accelerating time to market.

Typical applications for charging with USB data include hard disk drives, point-of-sale (POS) terminals, printers, drones, and portable industrial devices. While VR headsets, infotainment devices, portable displays, and gaming consoles often combine USB power with Alternate modes for DisplayPort or Thunderbolt protocols, VDM enhances consumer accessories and medical

devices.

By combining hardwired speed and simplicity with software-enabled flexibility, the STUSB4531 facilitates adoption of USB-C for charging and powering devices, mandated by ecodesign norms worldwide conceived to reduce electronic waste. The IC is certified according to the latest USB-C® 2.4 and USB PD 3.2 standards, as well as IEC 62680 confirming EU-conformity.

An extensive ecosystem supports developers using the STUSB4531, including an evaluation board (EVAL-SCS007V1), certified minimalistic reference design (EVAL-SCS006V1), graphical user interface (STSW-STUSB020), and NVM flasher (STSW-STUSB021). An open-source software library (STSW-STUSB022) will be available soon.

The STUSB4531 is in production now in a 3mm x 3mm QFN16 and 2.3mm x 2.3mm CSP16 chip-scale package, priced from $1.17 for orders of 1000 pieces.

For further information please visit https://www.st.com/stusb4531

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