

STUSB4531

USB PD sink controller



Patented STANDALONE / HYBRID architecture for simplified integration



Compact USB-PD controller with automated power negotiation and full-feature support

The STUSB4531 combines hardware robustness and software flexibility in a patented hybrid architecture to simplify integration of full-feature USB-C sink ports. This enables faster design cycles and enhanced interoperability. By autonomously handling USB PD power negotiation and protocol management, it allows designers to focus on their application, reducing firmware complexity and memory footprint thus accelerating development and time-to-market.

KEY FEATURES & BENEFITS

- **USB PD 3.2:** compliant with the latest USB PD standard for high interoperability
- **Advanced power negotiation:** supports 5 power profiles including AVS and PPS for optimized and fast battery charging
- **Patented Hybrid mode:** supports implementation of advanced features with minimal software effort. No need for deep technical understanding of the standards (USB-C, USB PD, cables) or advanced software skills
- **EU market ready:** USB-IF certification and documentation for EU ecodesign and common charger directive compliance

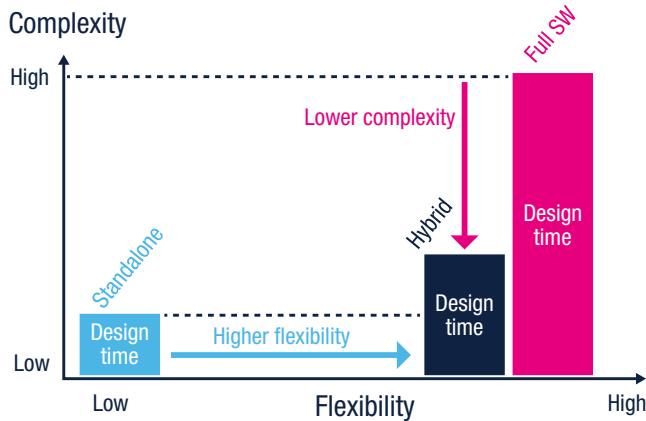
KEY APPLICATIONS

- **Battery charging only and VBUS powered electronics**
Portable audio, wearables, set top box, wi-fi access point, healthcare, lighting
- **Charging with USB data**
HDD, POS, printers, drones, industrial devices
- **Charging with ALT MODE**
VR headset, infotainment, portable displays, gaming
- **Charging with vendor defined messages (VDM)**
Consumer and OEM accessories, medical

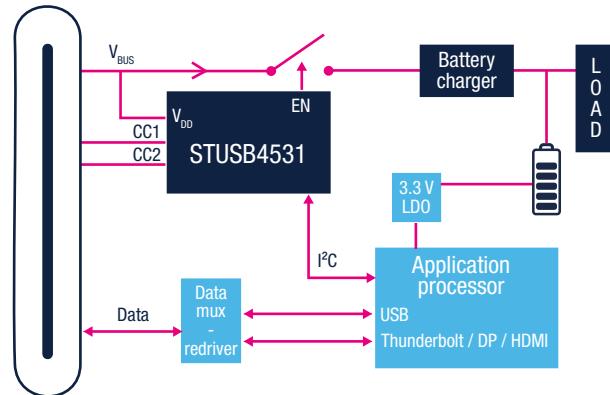
Hybrid architecture: what sets STUSB4531 apart

The patented hybrid architecture balances hardware robustness with software adaptability, addressing common design challenges in USB-C sink applications. By offloading the application processor from handling power negotiation and protocol management to dedicated hardware, the STUSB4531 ensures fast and effective USB PD communication with minimal MCU intervention. Meanwhile, its flexible and light software layer enables customization and feature expansion without compromising system stability. This results in reduced development effort, lower risk of bugs, and faster time-to-market for complex applications, even with low software expertise and standard know-how.

Competitive advantages



Typical schematic



Key development tools



STSW-STUSB020:

user-friendly GUI for easy device configuration



STSW-STUSB021:

software utility for fast non-volatile memory customization

Evaluation boards



EVAL-SCS006V1



EVAL-SCS007V1



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