

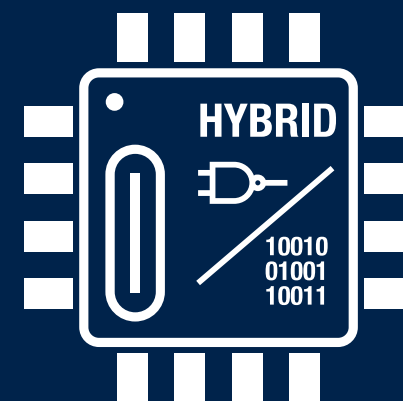


STUSB4531

The highly versatile USB PD sink controller



STUSB



January 2026



Migration to USB-C and USB PD

Facing USB standard complexity

USB-C® / PD

UFP / DFP Extended messages
Cold socket SPR / EPR
AVS / PPS Role swap
DRP Certification
Fast role swap
VCONN ALT mode
USB billboard
TCPC / TCPM
VDM



Deep technical understanding of the standards (USB-C, USB PD, cable)



Many optional features, whose usage and implementation are not obvious



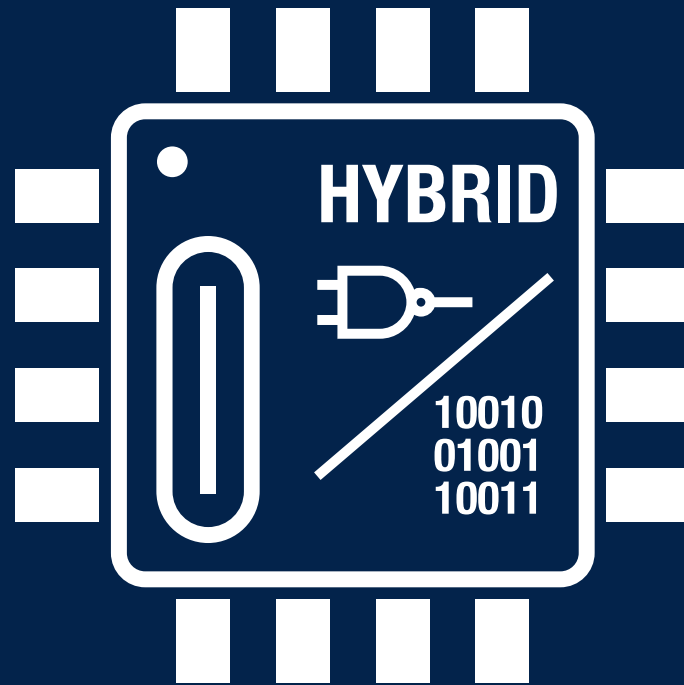
Advanced software programming skills



→ A headache for many designers

STUSB4531

Fasten design time thanks to patented
HYBRID mode





STUSB4531

the highly versatile USB PD sink controller



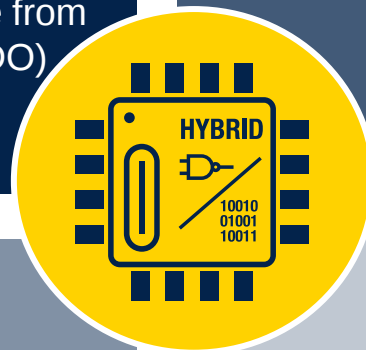
Advanced power negotiation algorithm (Autorun)

Able to negotiate best power profile from latest AC adapters (include AVS PDO)
Enhanced user experience

Latest USB PD certification

Best interoperability and user experience
+
EU conformity (IEC 62680)

USB-C® r2.4
USB PD r3.2



Unique hybrid architecture

- Autorun enables high power charging without Software (dead battery device)
- HYBRID mode enables advanced features deployment with low software effort

Combines both robustness & high flexibility

Small footprint

State-of-the-art package offer

QFN-16
(3x3)

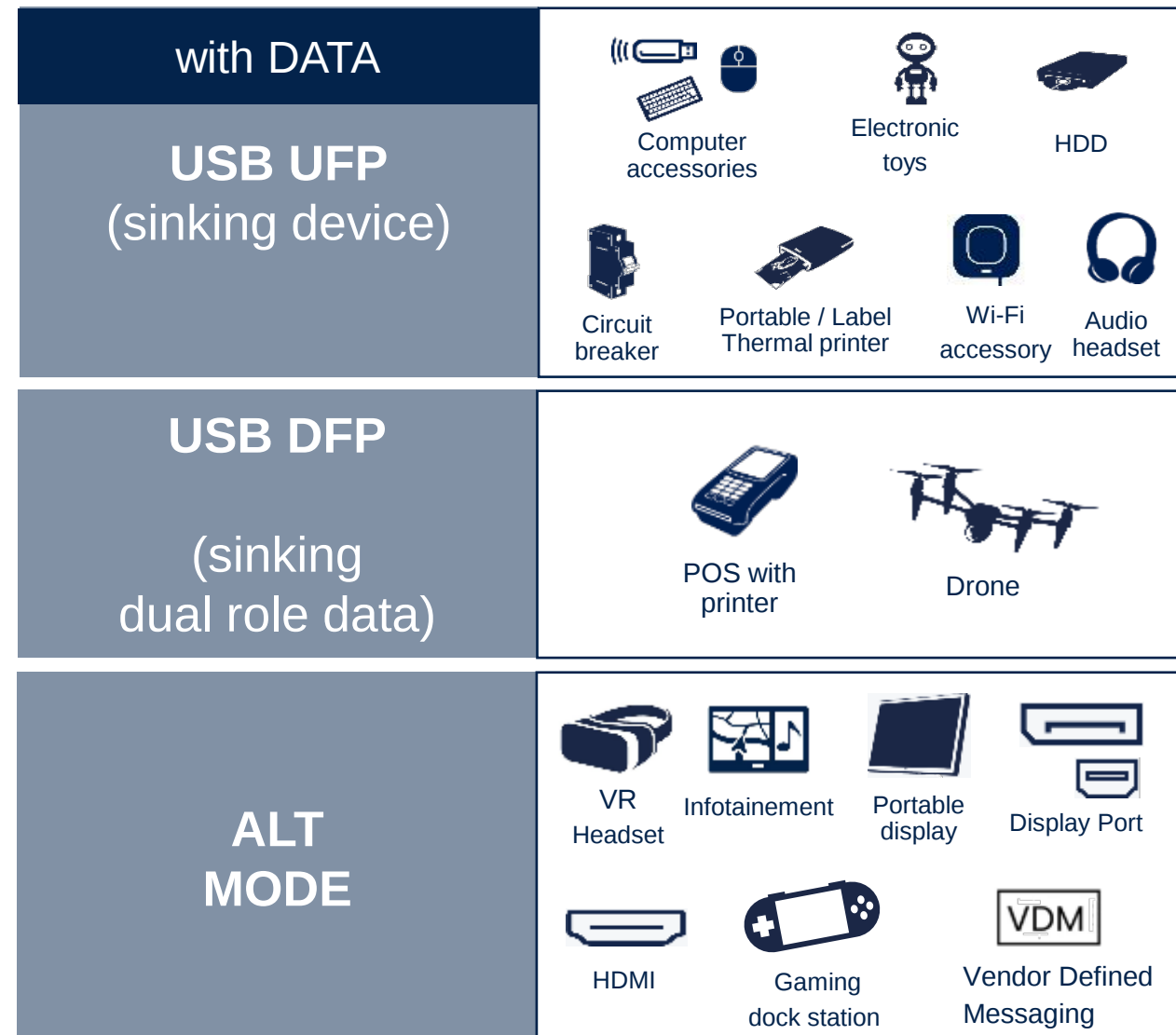
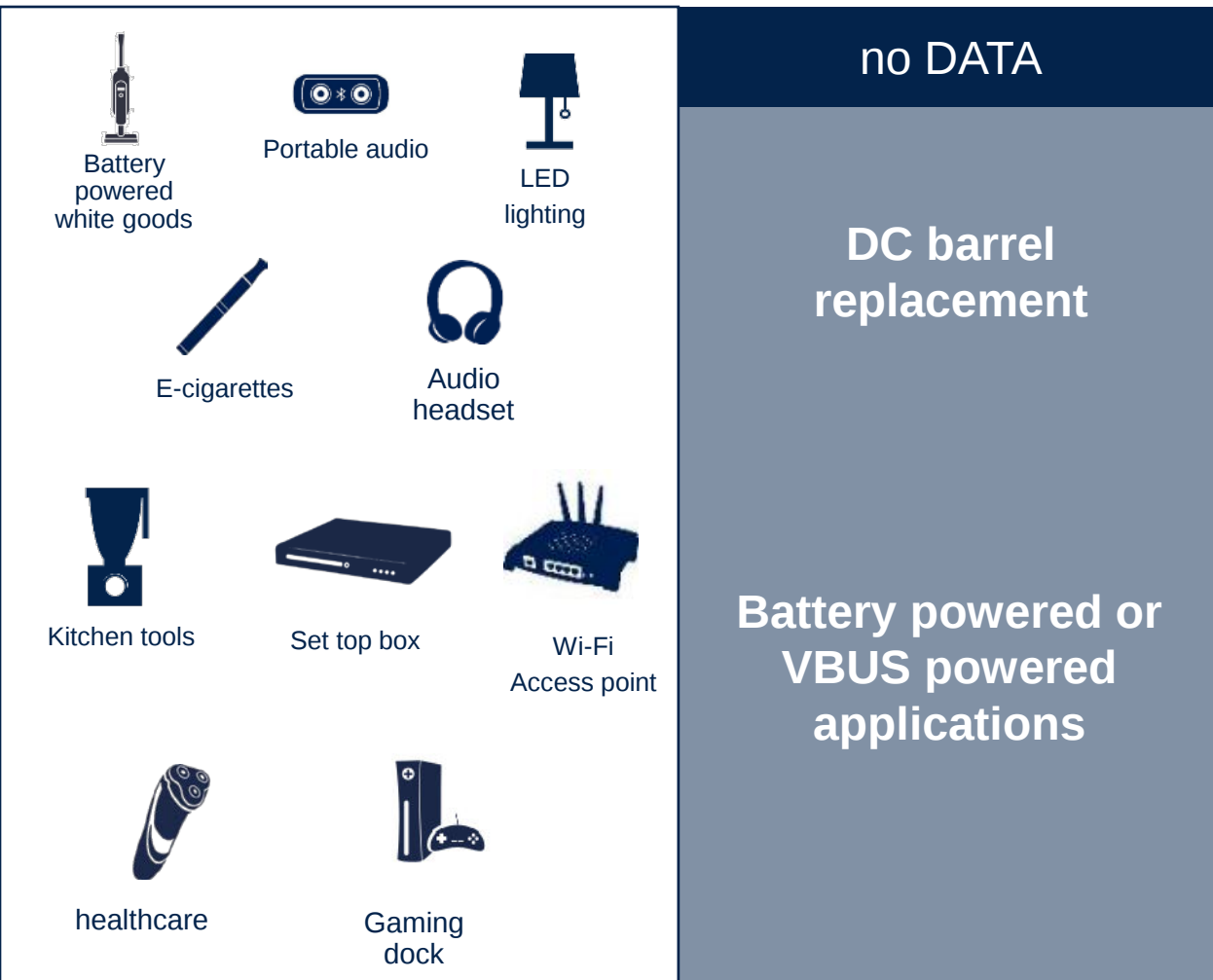


CSP-16
(2.3x2.3)



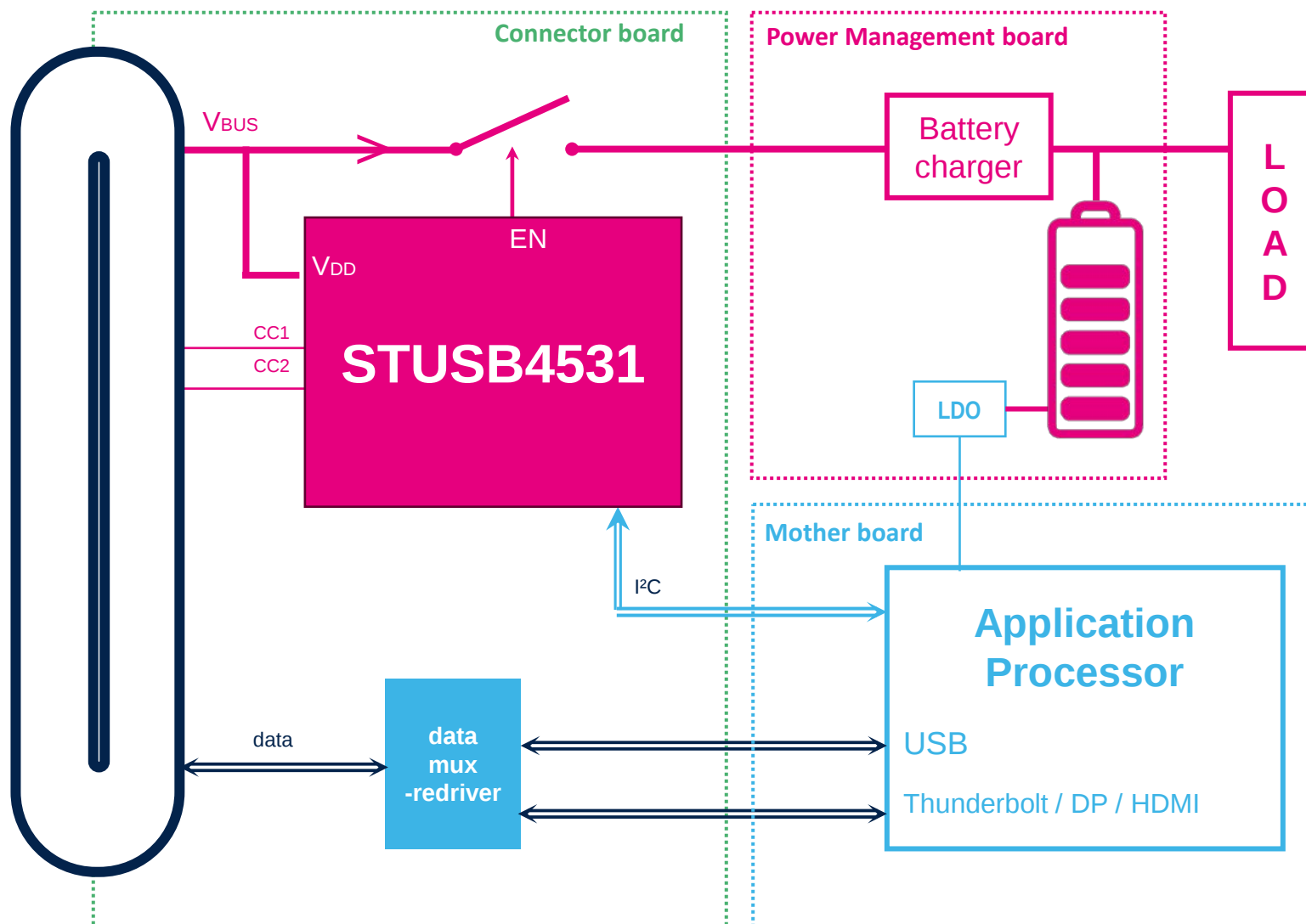


Application coverage





Typical schematic



NB:
I²C connection to MCU
is optional for charging
only and UFP applications



STUSB4531 key features

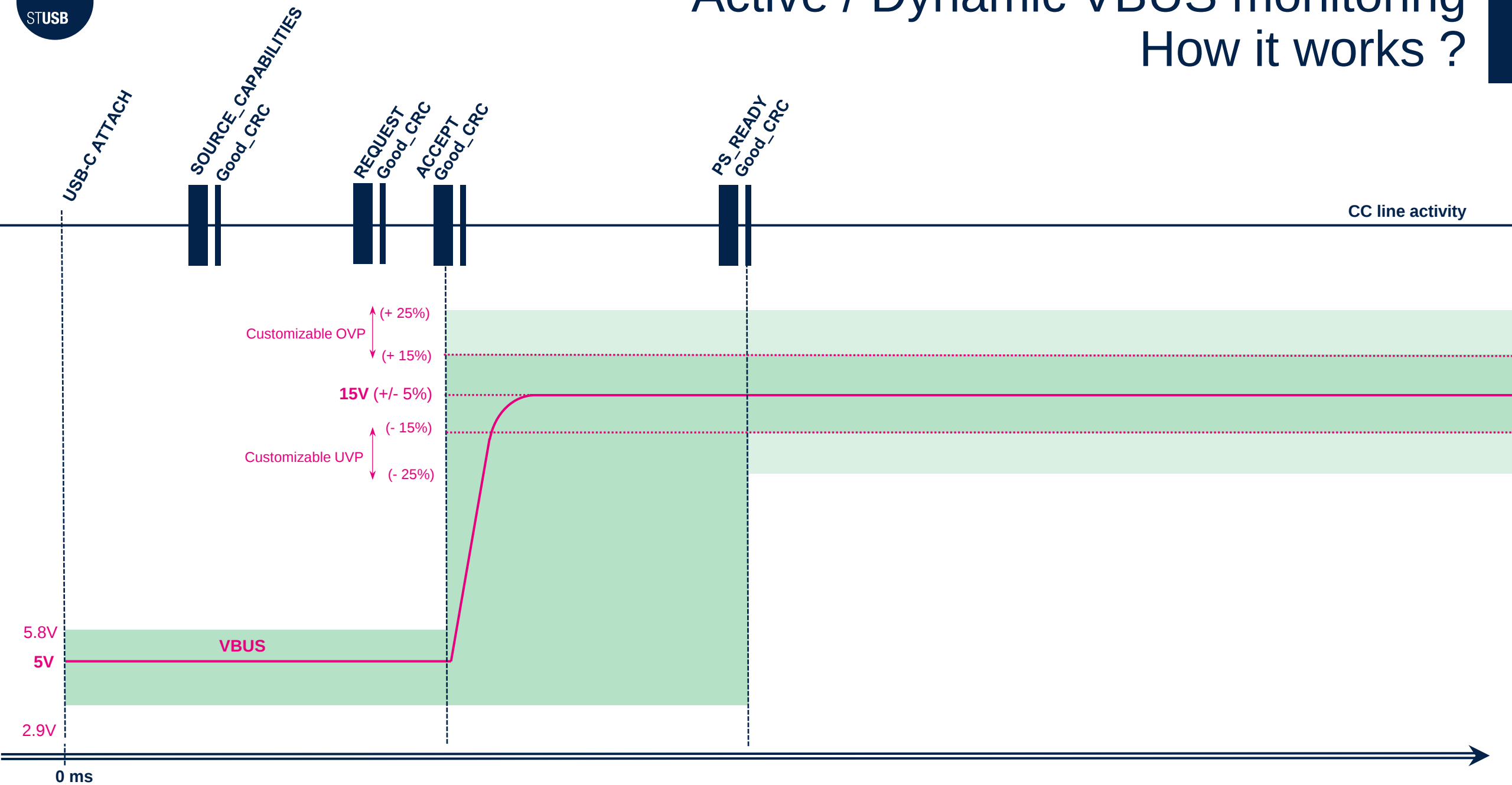
Certification	• USB type-C r2.4 • USB PD r3.2 • IEC 62680-1-3:2024 / IEC 62680-1-2:2024 (CE market)
PDO	• 3 x FIXED (native) • 1 x VARIABLE (native) • 1 x PPS (native + SW) • + EPR Mode (SW only) • accept SOURCE AVS PDO
Autorun	• YES
SW modes	• BASIC • HYBRID
Others	• External VCONN support (cable feature identification) • DATA ROLE SWAP • ALT MODE / VDM support
Standby current	• 40 µA (if powered from battery) • 0 µA (if powered from VBUS)
Package	• QFN-16 3x3 mm² • CSP-16 2.3x2.3 mm²
BENEFITS	• Standalone for Power Management (all profiles) • USB PD full feature (extended functionality thru SW) • USB PD EPR-ready (SPR standalone / EPR by SW) • Good product for users without USB PD or SW skills • Smallest on the market





Active / Dynamic VBUS monitoring

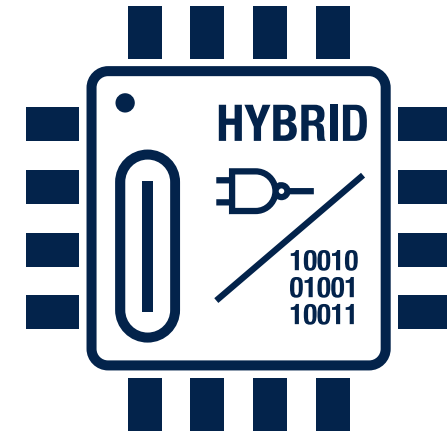
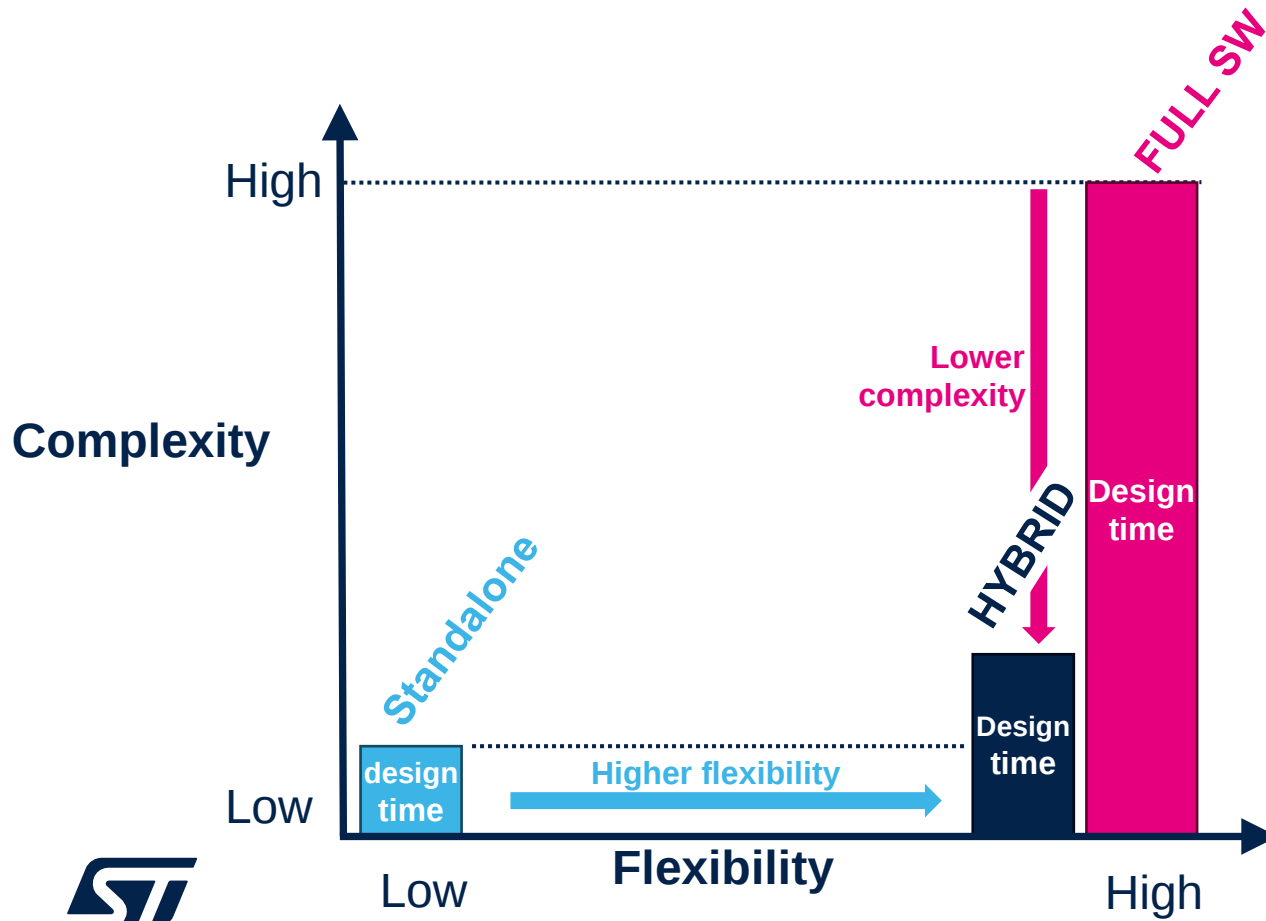
How it works ?





HYBRID USB PD stack: why?

Design time vs. flexibility

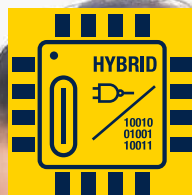
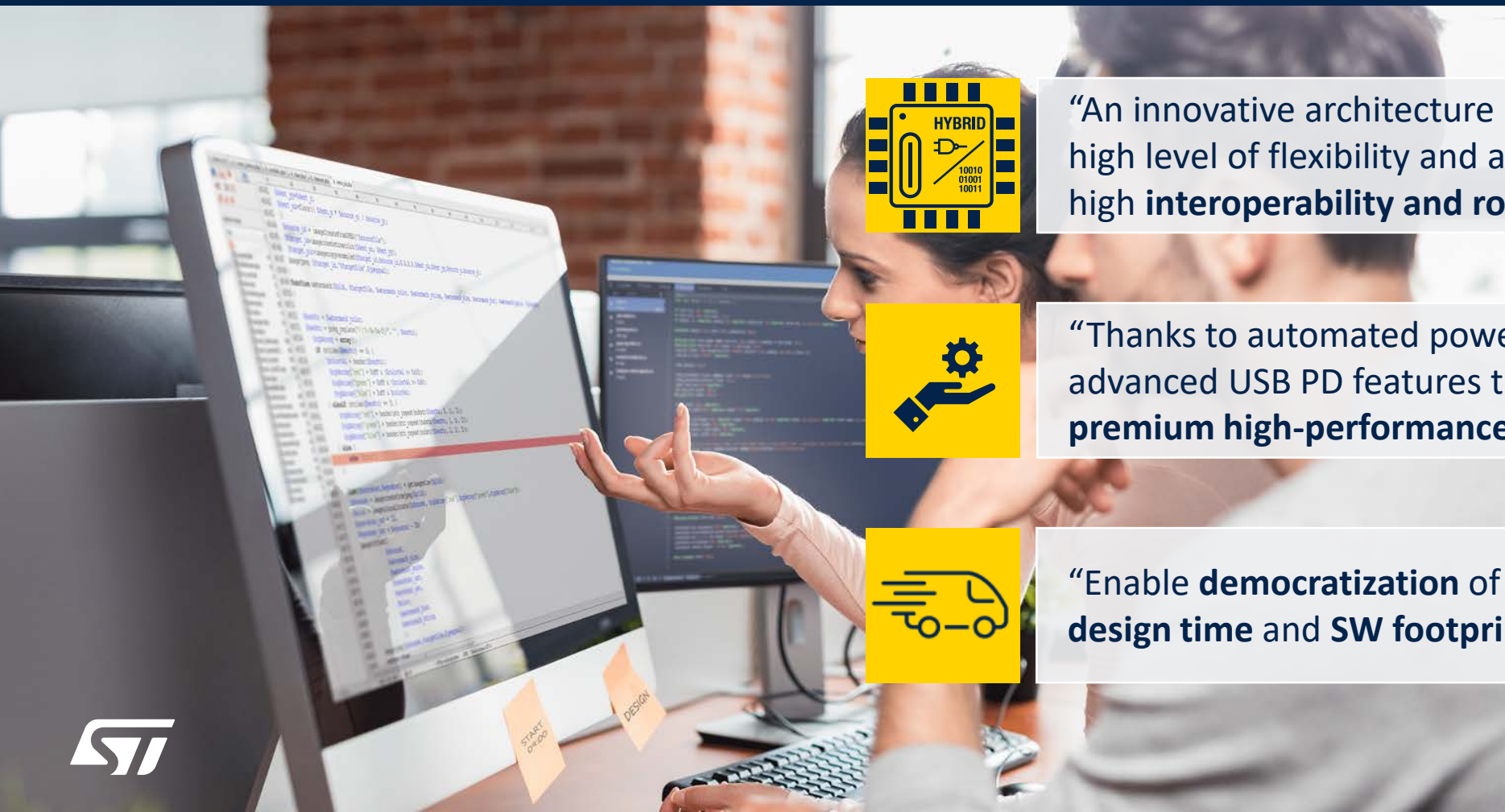


Similar flexibility as full software implementation
+
lower complexity and higher robustness
=
Faster design time



STUSB4531 value proposition

Designers can focus on their application



"An innovative architecture on the market combining both high level of flexibility and automation, while guaranteeing high **interoperability and robustness**"



"Thanks to automated power negotiation, unlock advanced USB PD features through hybrid MCU control for **premium high-performance USB Type-C sink applications.**"



"Enable **democratization** of full feature applications, **faster design time** and **SW footprint reduction.**"



conformity to USB-IF Specifications IEC 62680 | USB-IF

EUROPE Ecodesign and Common Charger Directive

According to EU legislation, OEMs must provide documentation that demonstrates their Portable Battery Powered devices and External Power Supplies (EPS) conform to the basic EU requirements in term of Interoperability.

**STUSB4531 comes with the required documentation to pass
end product certification on EU market.**

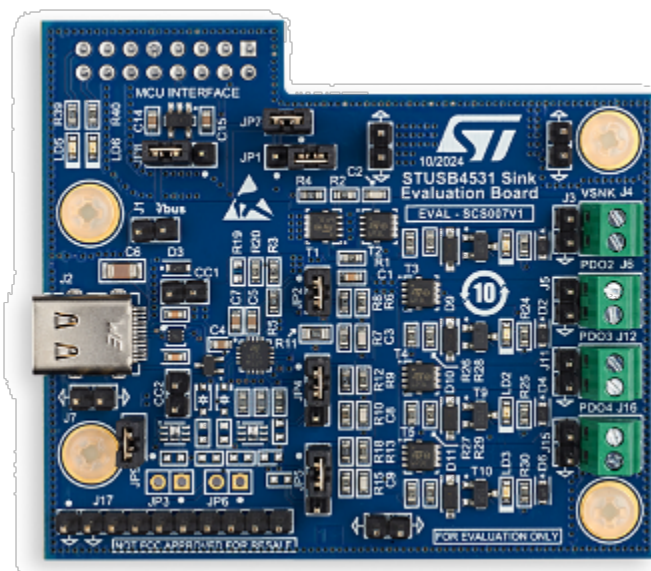
More details at: <https://www.usb.org/euconformity>

The EU Conformity to the USB-IF Specifications program is a new program from the USB-IF that provides OEMs/ODMs an avenue to acquire documentation that shows their product(s) conform to the EU mandatory requirements to the USB Specifications and/or the related IEC 62680 (USB) categories referenced in the EU legislation.

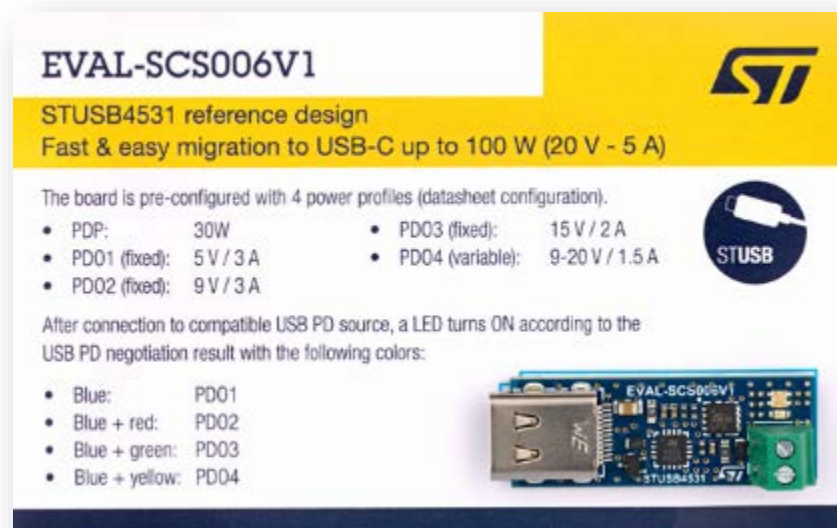


Key development tools

EVALUATION BOARD ([EVAL-SCS007V1](#))



MINI-DONGLE ([EVAL-SCS006V1](#))



Certified reference design – TID #13956

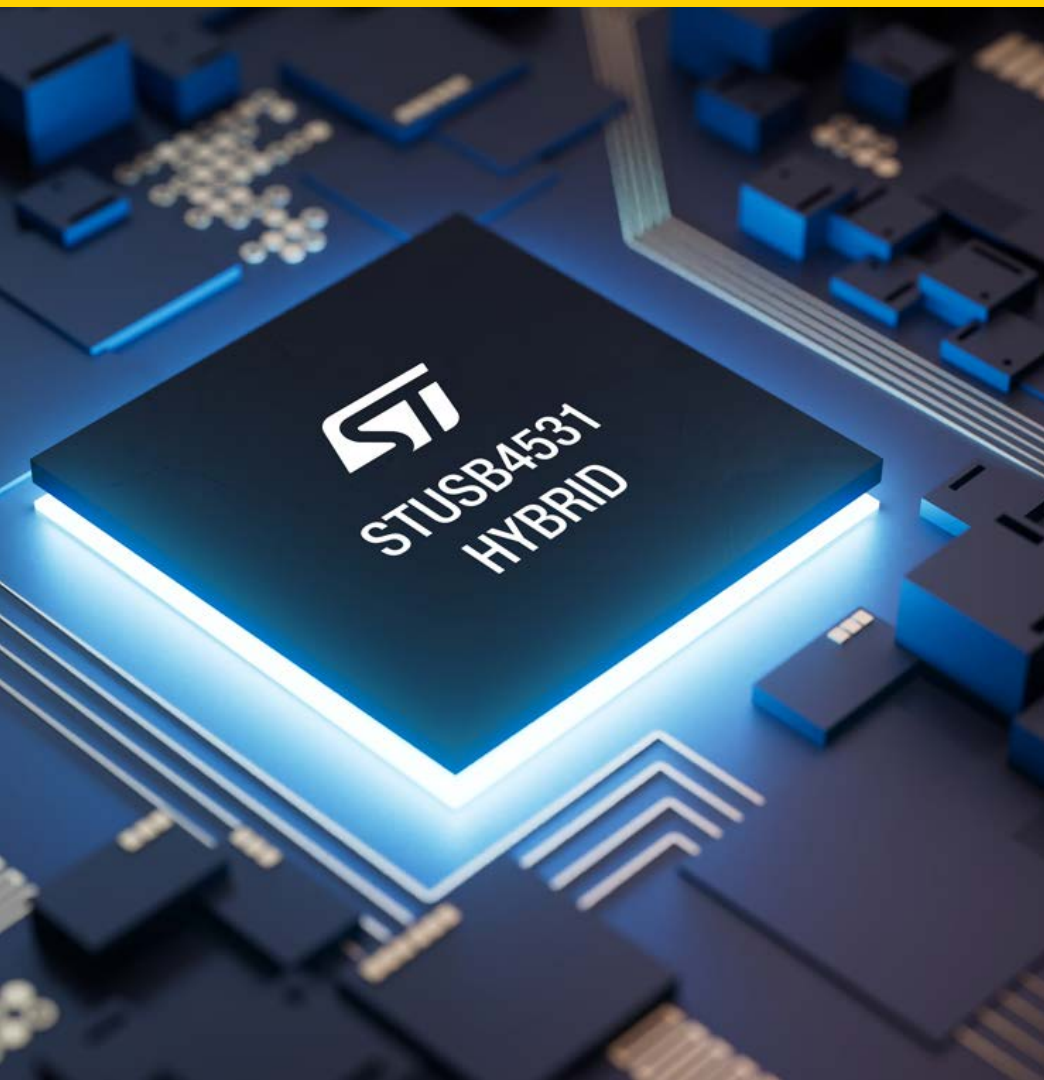
GRAPHICAL USER INTERFACE ([STSW-STUSB020](#))





STUSB4531

The highly versatile USB PD SINK controller
patented AUTORUN / HYBRID architecture



USB PD r3.2

- Certified hardwired USB PD stack, evolutive, EPR ready
- High interoperability, optimal user experience

AUTO RUN

- ZERO power consumption when unplugged
- Automated power negotiation and VBUS monitoring
- High robustness and automated fault management

HYBRID

- advanced features deployment
- low expertise, faster design time
- low SW footprint & fragmentation, MCU offloading

QFN-16 CSP-16

- small footprint

Our technology starts with You



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