



USPs

- ✓ **Installation space**
Significantly smaller dimensions compared to a standard USB charging module with integrated electronics
→ **up to 90% space savings in the dashboard**
- ✓ **Temperature**
Despite of high charging power only marginal heating in the dashboard
→ **up to 95% less waste heat at customer interface**
- ✓ **Additional features possible**
e.g. lighting, temperature monitoring, real time monitoring V_{drop}



Customer requirement / application

- ✓ Power Delivery (100 W)
- ✓ SuperSpeed (5 Gbps)
- ✓ Additional features possible
e.g. Alternate Modes
- ✓ High Speed Data Transmission >10 Gbps



Use Case I - Charging



- **Data transmission:**
USB2.0 High speed (480 Mbit)
- **V_{bus}**
Power delivery specification (5 V – 20 V / max. 5 A)
- **Transmission length:** 80 mV ground drop at 5 A with one meter cable (similar to HSD application with 1.5 A / one meter cable)
- **Additional functions:** e.g. lighting, temperature monitoring, Real Time Monitoring V_{drop} etc.

Use Case II - Data



- Variant 1**
 - **Data transmission:** USB 2.0 High speed (480 Mbit) or USB3.1 Superspeed (Gen1 / 5 Gbit)
 - **Transmission length:** max. 3 meters
 - **Additional functions:** Power supply, Alternate Modes
- Variant 2 (active with Redriver)**
 - **Data transmission:** USB2.0 High speed (480 Mbit) or USB3.1 Superspeed (Gen1 / 5 Gbit)
 - **Transmission length:** max. 6 meters
 - **Additional functions:** Power supply, Alternate Modes

Use Case III – High Speed Data Transmission



- Possible variant**
 - **Data transmission:** 4 differential lines
 - **Transmission length:** 3 meters
 - **Additional functions:** Power supply (max. 1 A), 2 additional control lines

- Possible variant**
 - **Customer specific applications**