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ON SCREEN PRESENTATION

***Industrial AC-DC USB Type-C Power Delivery (PD)
NCP1342 QR + FUSB3307***

Public Information



NCP1342+FUSB3307 Quasi Resonant 60 W USB-C/PD Demo Board

Value Proposition

The [NCP1342PD65WGEVB](#) showcases the NCP1342 Quasi-Resonant Flyback Controller and NCP1622 PFC Controller in a USB-C Power Delivery (PD) application. The board is capable of delivering 60W of power. The NCP1342 is suitable for designing high-performance power converters and USB/PD adapters, featuring Rapid Frequency Foldback (RFF) for improved efficiency over the load range. An integrated active X2 capacitor discharge feature eliminates discharge resistors which enables low no-load power consumption.

Specifications and Features

- Input voltage: 90Vac to 265Vac
- PD Output spec: 5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/4.5A
- Standby power: 40mW @ 5V output, 230Vac
- Avg. efficiency: >91% at 115Vac&230Vac
- Compact board size (around 43mm x 43mm)
- VCONN Supply feature
- Control Loop for constant voltage (CV)
- Control Loop for constant current limit (CL)
- Complete series of diagnostics & protections like OVP, UV, OVC, TEMP
- Integrated active X2 capacitor discharge

Market & Applications

- Notebook adapters, displays, Tablets, Industrial Equipment

Demo Board Photo



Available

NCP1342 High Frequency QR Controller

Value Proposition

The NCP1342 is a highly integrated quasi-resonant flyback controller capable of controlling rugged and high-performance off-line power supplies as required by adapter applications. With an integrated active X2 capacitor discharge feature, the NCP1342 can enable no-load power consumption below 30 mW for USB PD Notebook Adapters from 45W to 100W.

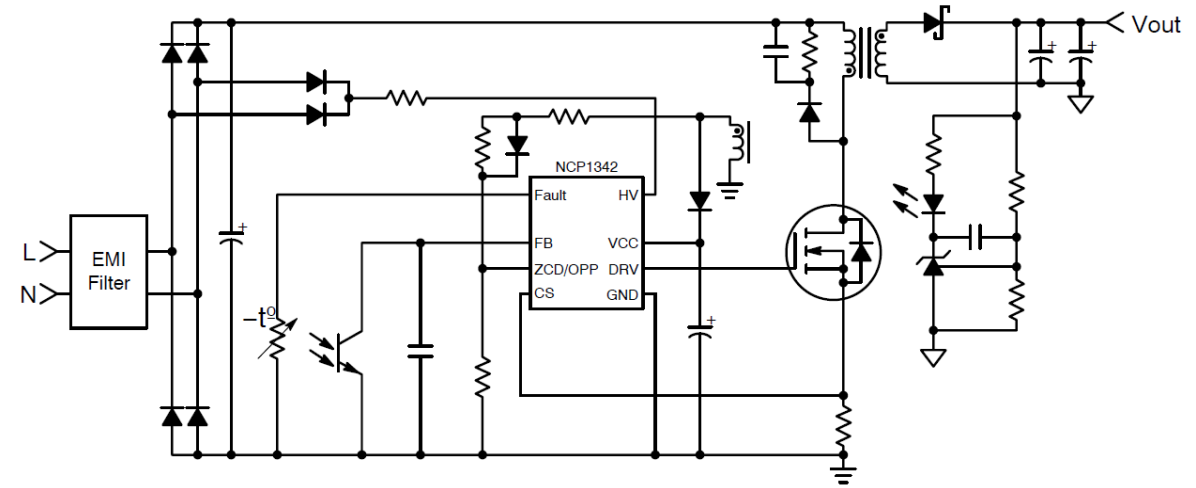
Features

- Wide VCC range from 9V to 28V
- Overvoltage protection for VCC
- QR Frequency jittering
- New Quite-Skip technology
- Maximum peak current Modulation
- Rapid frequency foldback (RFF)
- Integrated X2 capacitor Discharge
- NTC compatible Fault Pin
- High Drive capability
- Latch input for OVP and OTP implementation
- High Drive capability -500mA/800mA

Benefits

- Reduced EMI signature
- Ensures Operation Outside Audible range
- Enhanced Light Load efficiency
- Eliminates the need for an X2 resistor
- Simple implementation of required protection functions
- Maximizes the efficiency over the entire power range
- Extra protection against high temperature or other faults

Typical Application Diagram



Available

Market & Applications

- Medium or High Power AC-DC Adapters
- Ultra High Density AC-DC
- USB-C/PD Compliant applications
- Industrial supplies

Ordering information and packaging



SOIC-8 NB
D SUFFIX
CASE 751



SOIC-9 NB
D SUFFIX
CASE 751BP

Part Number	Operating Temp	Package
NCP1342AMDCCDR2G	(-40 ; 105) [°C]	SOIC-8 NB
NCP1342xxx (several)	(-40 ; 105) [°C]	SOIC-9 NB



FUSB3307 – USB-C Power Delivery (PD) 3.0 Adaptive Source Charging Controller

Value Proposition

FUSB3307 is a highly integrated USB Type-C 1.4 and Power Delivery (PD) 3.0 fully autonomous source (DFP) controller that can control a DCDC port power regulator or the opto-coupler in the secondary side of an ACDC adapter. It features Programmable Power Supplies (PPS) thus supporting a min 3.3V and max 21V output voltage control. It includes Constant Voltage (CV) & Constant Current Limit (CL) control blocks.

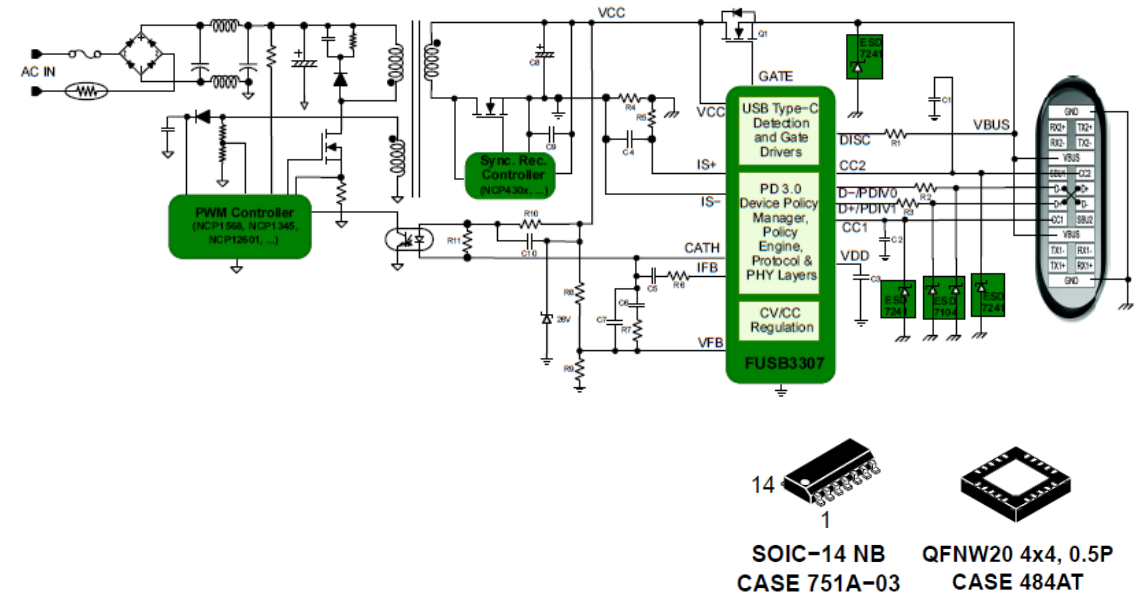
Features

- PD 3.0 v1.2 & Type-C r1.4 Compliant
- Very Low Active Power
- VBUS 3V to 21V (20mV Steps);
- Current control up to 5A (50mA Steps)
- Up to 7 Fixed & Programmable PDOs
- Internal VDD and VCONN Supplies
- Constant Voltage (CV) & Constant Current Limit (CL) Regulation
- CC1/CC2 Pin Protection up to 26 V
- Built-in Cable-Drop Compensation
- Selectable Resistor Divider or Battery Charging (BC1.2) Modes
- Built-in Output Capacitor Bleeding Function for Fast Discharge
- Programmable PD power 16W to 100W

Benefits

- D/A converters for internal references
- Various protections and diagnostics such as Adaptive UVP, Adaptive OVP, OTP and VBUS Fault Detection
- 10bit A/D converter to monitor output voltage, output current, IC internal temperature and external temperature (via an NTC resistor).
- VCONN Over Current Protection (VCONN_OCP and internal and external Over Temperature protection
- Capable of controlling a single or back-to-back N-MOSFETs as a load switch, for a low cost and easier design.
- Small Current Sensing Resistor (5mΩ) for High Efficiency

Typical Application Diagram



RTM June 2020

Market & Applications

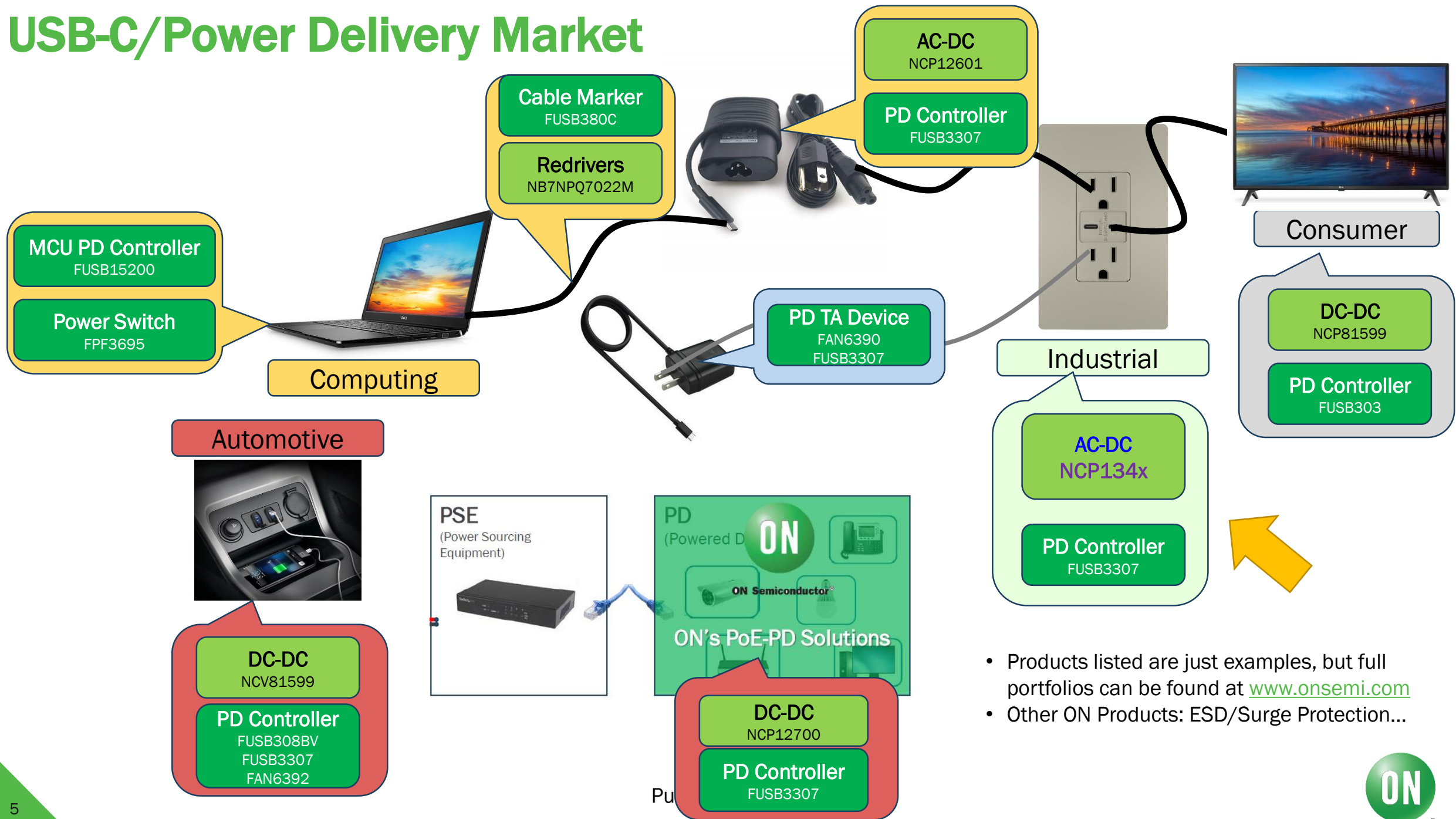
- Battery Wall Chargers for Tablet PCs and Laptops
- AC-DC Type-C/PD Compliant Adapters
- DC-DC Car Chargers for individual Port Control

Ordering information and packaging

Part Number	Operating Temp	Package
FUSB3307D6MX	(-40 ; 85) [°C]	14-Lead Small Outline Integrated circuit (SOIC)
Other trip or package	(-40 ; 105) [°C]	Contact Sales office



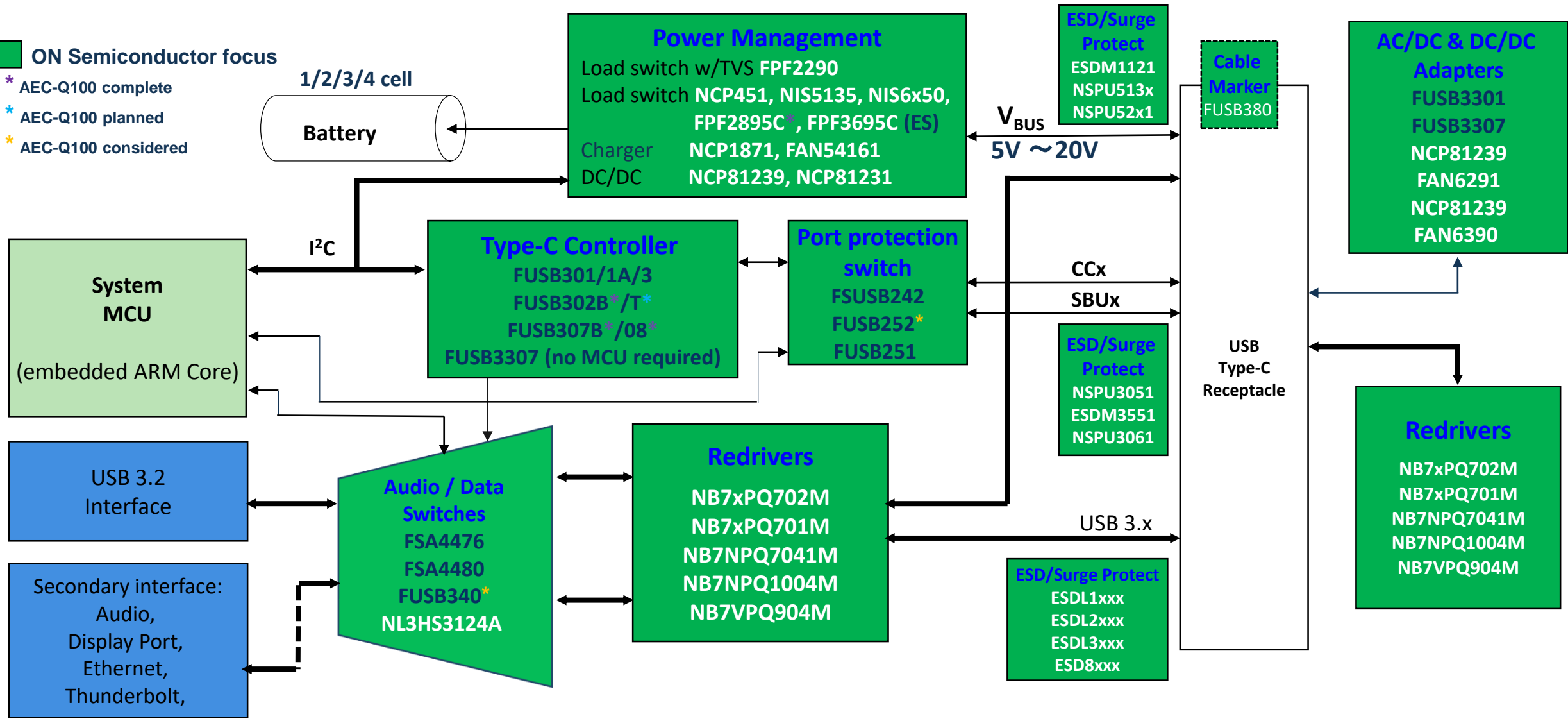
USB-C/Power Delivery Market



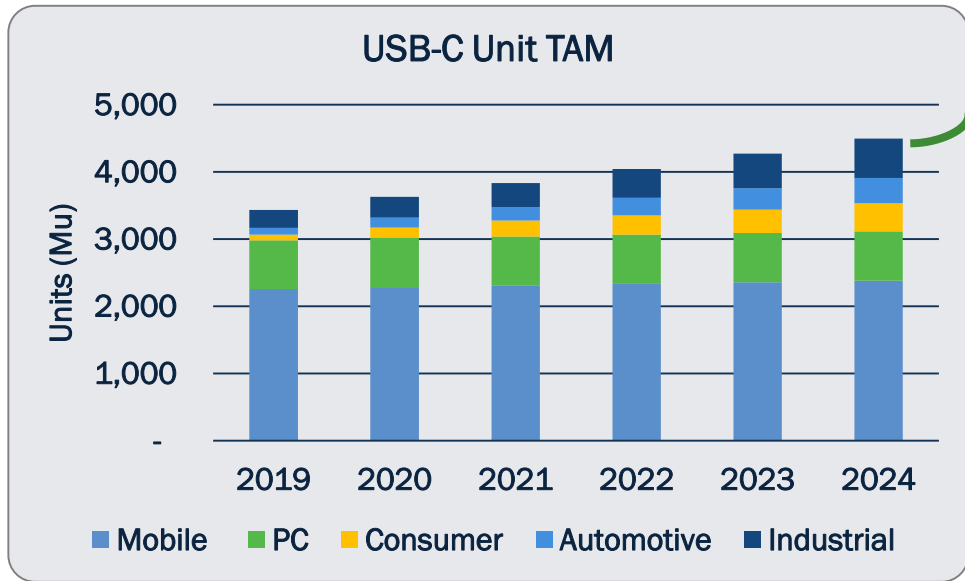
ON Semi USB-C/PD Block Diagram: Ecosystem & Product Selector

ON Semiconductor focus

- * AEC-Q100 complete
- * AEC-Q100 planned
- * AEC-Q100 considered



ON Semiconductor's Leadership in USB-C/PD

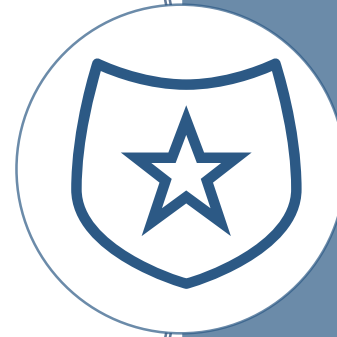


4.5B units by 2024!



Solutions for all applications

- Programmable solutions for flexibility
- Fully integrated solutions for ease of implementation
- Switches for HV protection and audio performance



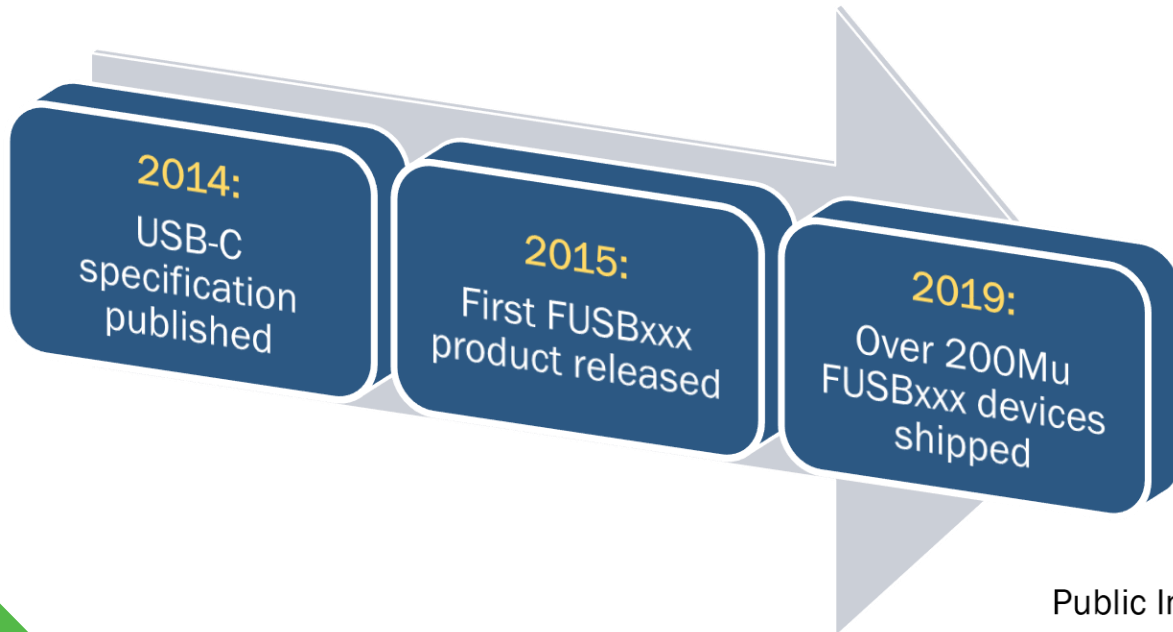
World class performance

- Lowest controller standby power
- Programmability through I2C to reduce MCU redundancy
- State machine based solutions to minimize power consumption



USB-C Standards Experts

- Early adopter of USB-C and seats on initial committees
- Current seats on multiple committees across key application areas
- Knowledge to anticipate spec changes



Public Information



USB Type-C Connector Pin out details



• USB 3.1 Super Speed (SSTX, SSRX):

- Gen 1: 5 Gbps (200ps UI, or bit width)
- Gen 2: 10 Gbps (100ps UI, or bit width)



• USB 2.0 (Dp, Dn):

- 480Mbps (Legacy)



• Configuration (CC):

- Plug orientation.
- Attach/detach Detection.
- Initial Power/Host to Device relationship
- Current Level Detection (default/1.5A/3A).
- PD Communication (BMC).
- Discovery and configuration of functional extensions.



• Auxiliary Side Band Use (SBU)



• Power: (GND, VBUS)

- $\leq 100W$ (20V@5A)



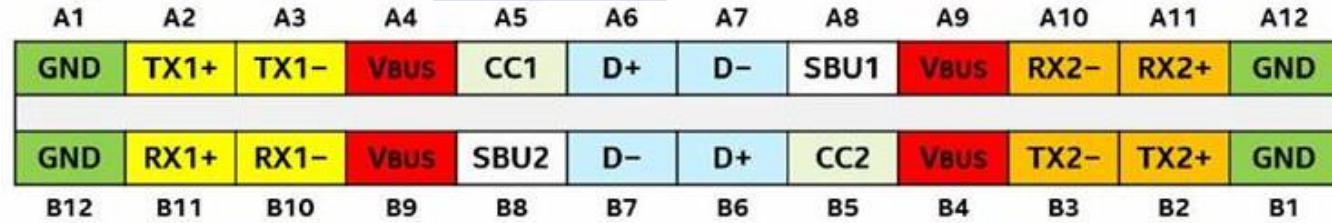
• VCONN

- 3V – 5.5V, 1W emarker supply (w/SS)
- 3V – 5.5V, 100mW emarker supply (w/o SS)



Type-C

Looking into the product **receptacle:**



Looking into the cable or product **plug:**

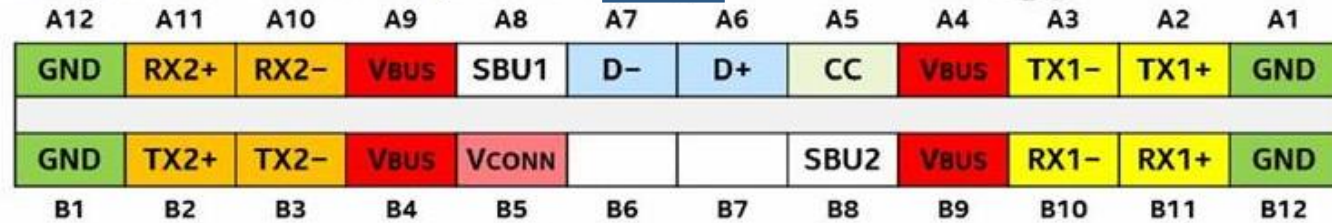


Figure 3-23 USB Full-Featured Type-C Standard Cable Assembly

