

# USB Type-C™ USB Power Delivery

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# Agenda 2

USB Type-C and USB Power Delivery Benefits

USB Type-C Technical Details

ST Offer

Evaluation Tools



# The Re-evolution of USB

3

USB has evolved from a data interface capable of supplying limited power to a primary provider of power with a data interface



USB  
Type-C



Power  
Delivery



USB  
Data



Alternate  
Mode

## A smart and green technology

- More **flexibility** with a new reversible & thinner connector, more robust
- More **power** with USB Power Delivery (up to 100W)
- More **speed** with USB 3.1 (5/10Gbps), USB 3.2 (20Gbps), USB4 (40Gbps)
- More **protocols** (Display Port, HDMI, Thunderbolt 3, ...)



# Power, Data & Display: All-in-One interface

Power management  
100W max

High Speed Data  
USB 2.0  
USB 3.x

Display Connection  
Video + Audio  
(DisplayPort™ or HDMI™)



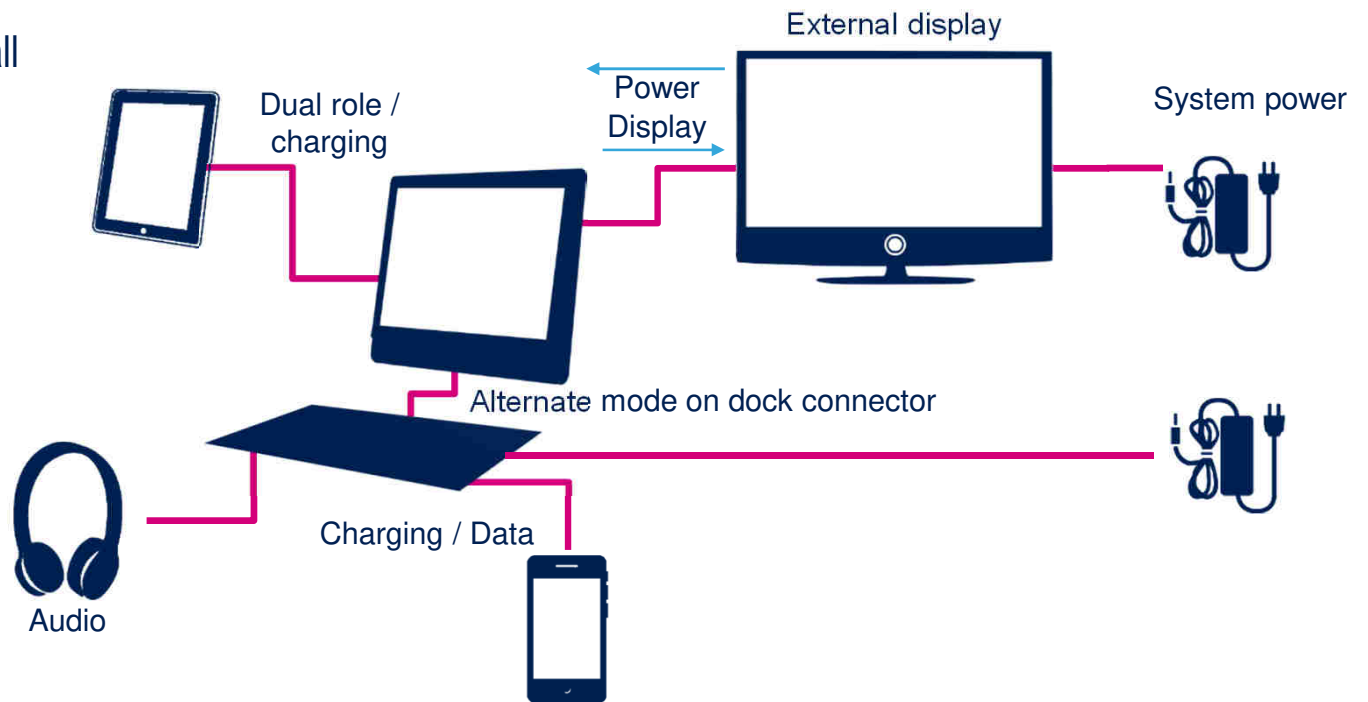
USB Type-C™  
USB-C™



# USB Type-C and USB Power Delivery

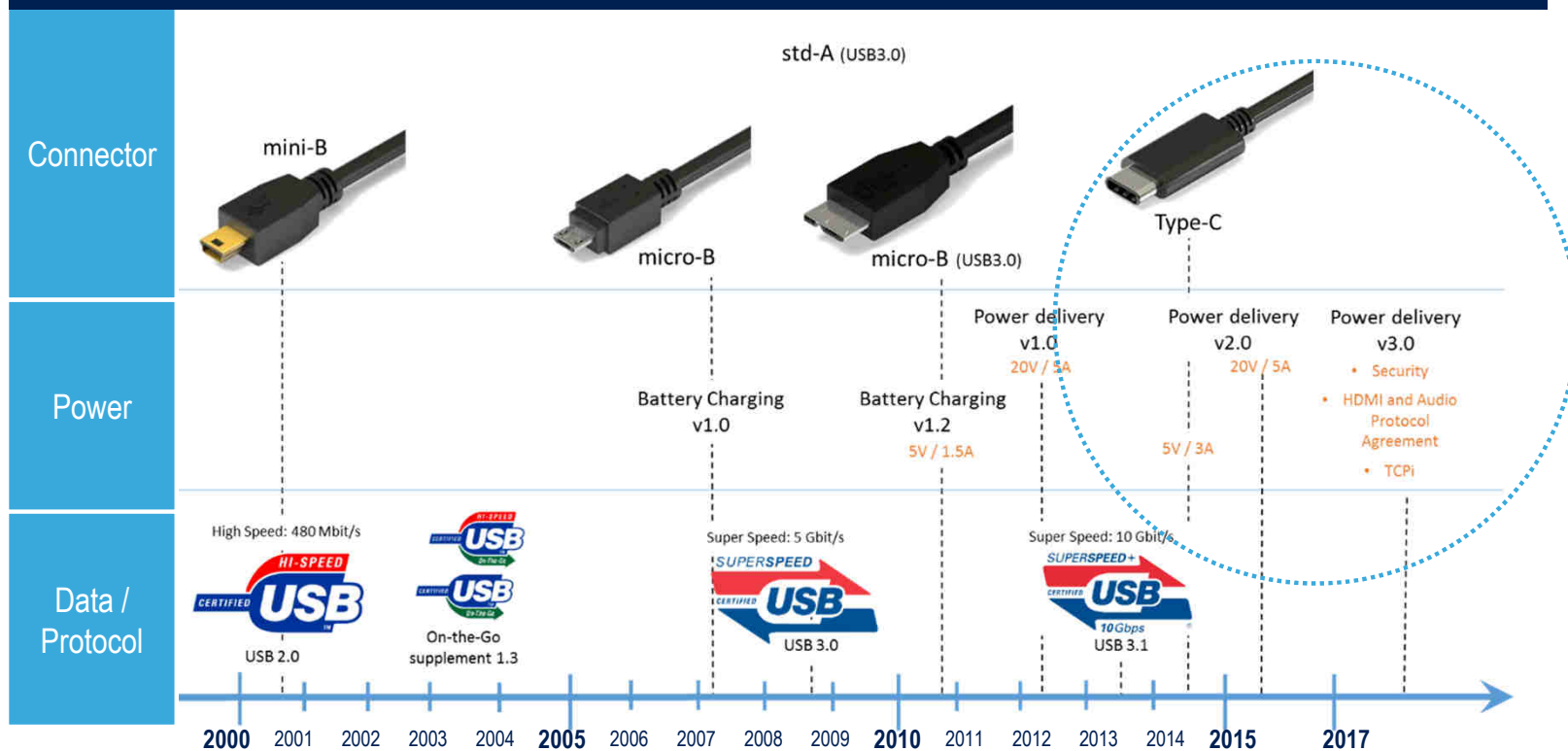
Modifying the ecosystem.....enabling new scenarios!

USB Type-C:  
One port to rule them all

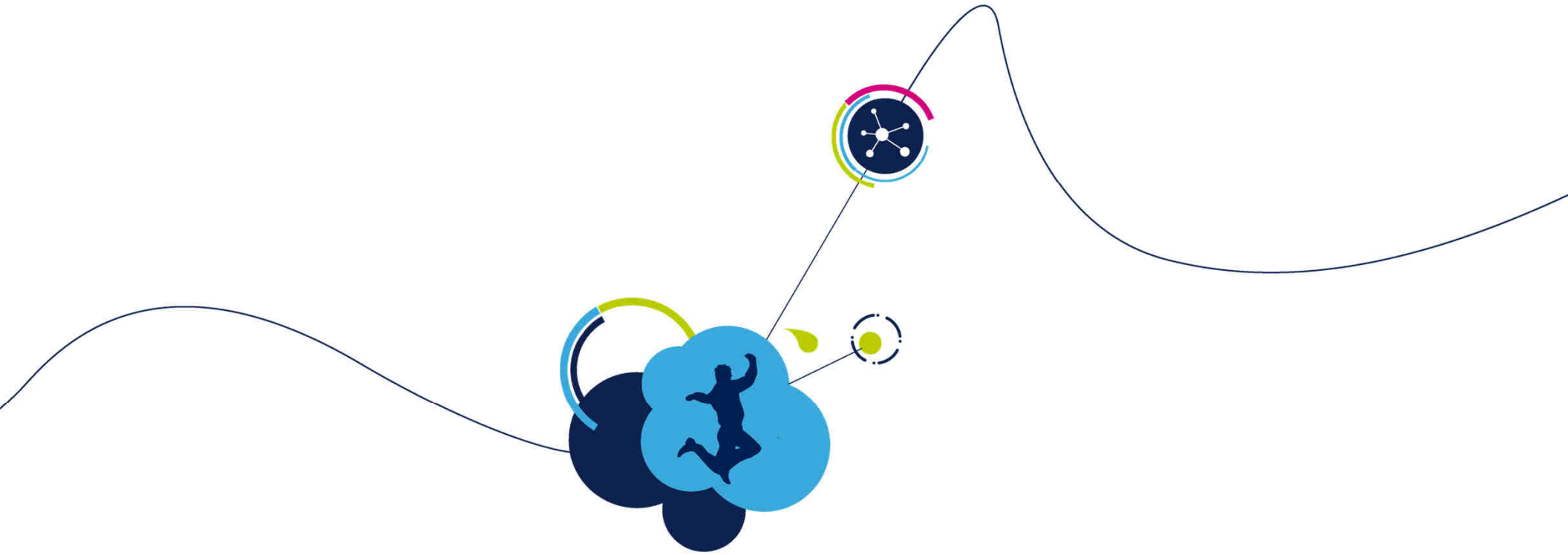


# USB Global Evolution

STMicroelectronics is a board member of USB-IF and USB 2.0 & USB 3.0 promoter



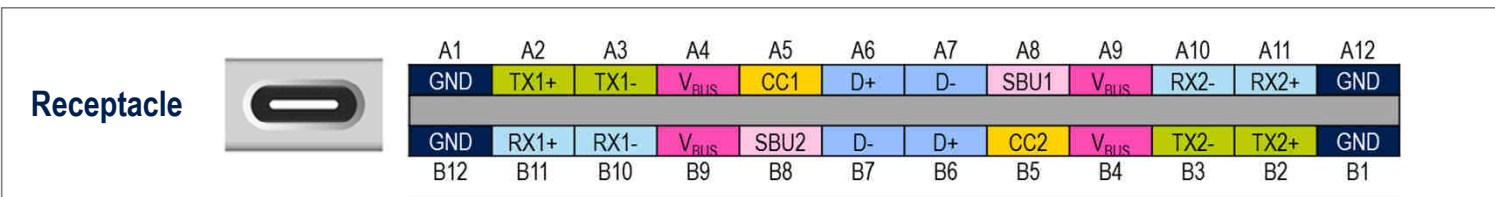
<http://www.usb.org/developers/powerdelivery/>



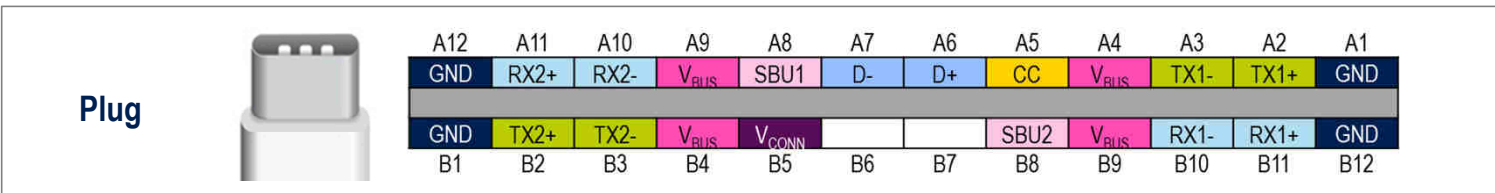
# USB Type-C Technical Details

# USB Type-C Pinout Functions

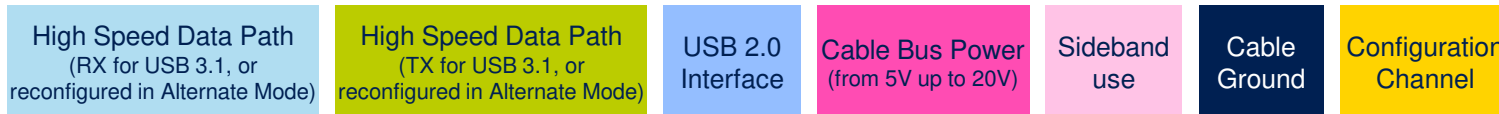
Enhance ease of use



Two pins on the USB Type-C receptacle, CC1 and CC2, are used in the discovery, configuration and management of connections across the USB Type-C cable

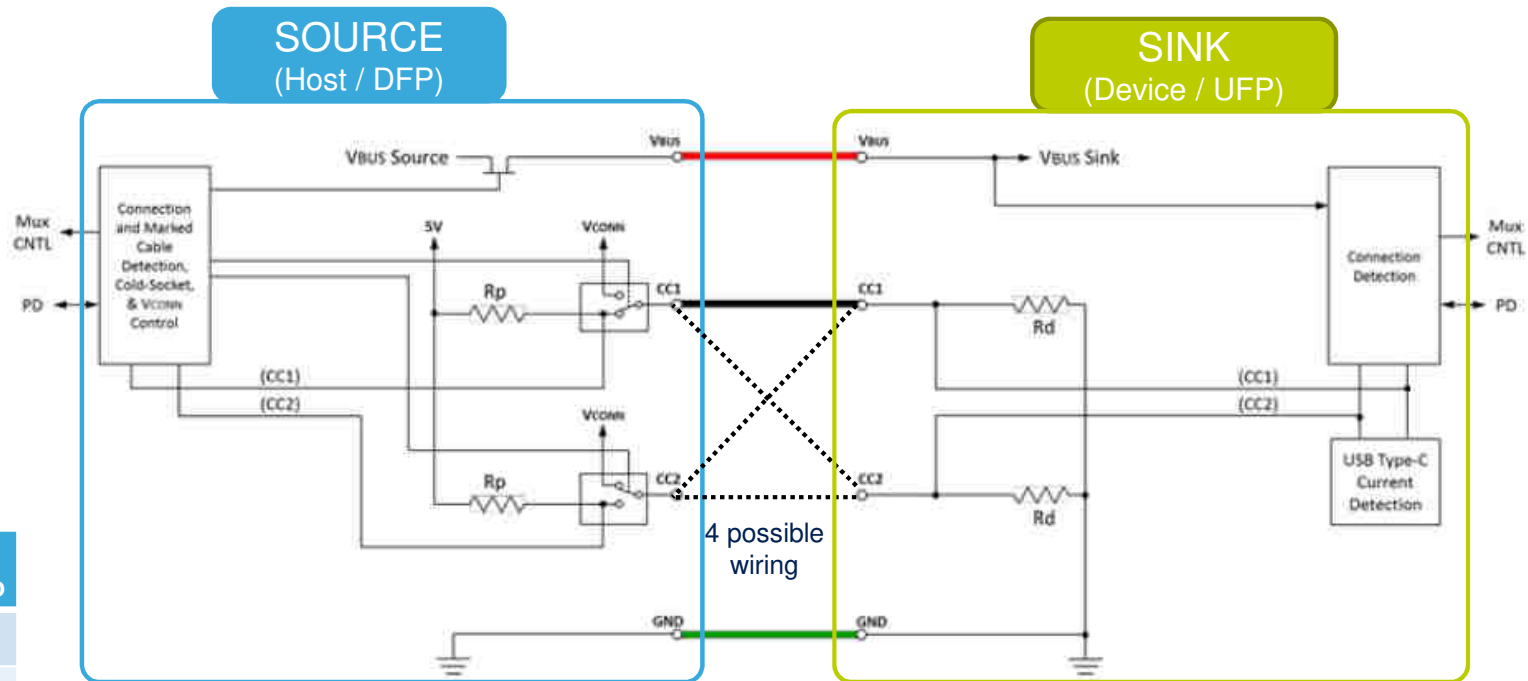


On a standard USB Type-C cable, only a single CC wire within each plug is connected through the cable to establish signal orientation. The other CC pin is repurposed as V<sub>CONN</sub> for powering electronics  
Also, only one set of USB 2.0 D+/D- wires are implemented





# USB-C: Host-to-device Connection



Source Power	Rp pull-up
Legacy current	56 kΩ
1.5A @ 5V	22 kΩ
3A @ 5V	10 kΩ

Sink	Rd pull-dw
CC pin	5.1 kΩ

1. By default: **VBUS is not powered** (cold socket)
2. At insertion detect, the Configuration Channel (**CC pin**) is used to solve plug orientation (**CC1 or CC2**)
  - HOST identified by Pull-up resistor / current source on its CC pin
  - Device identified by Pull-Down resistor on CC pin
3. After correct Host to Device connection, VBUS is supplied as well as Vconn on the unconnected CC pin
4. Optionally, USB PD, Alternate or Accessory Mode can be supported

