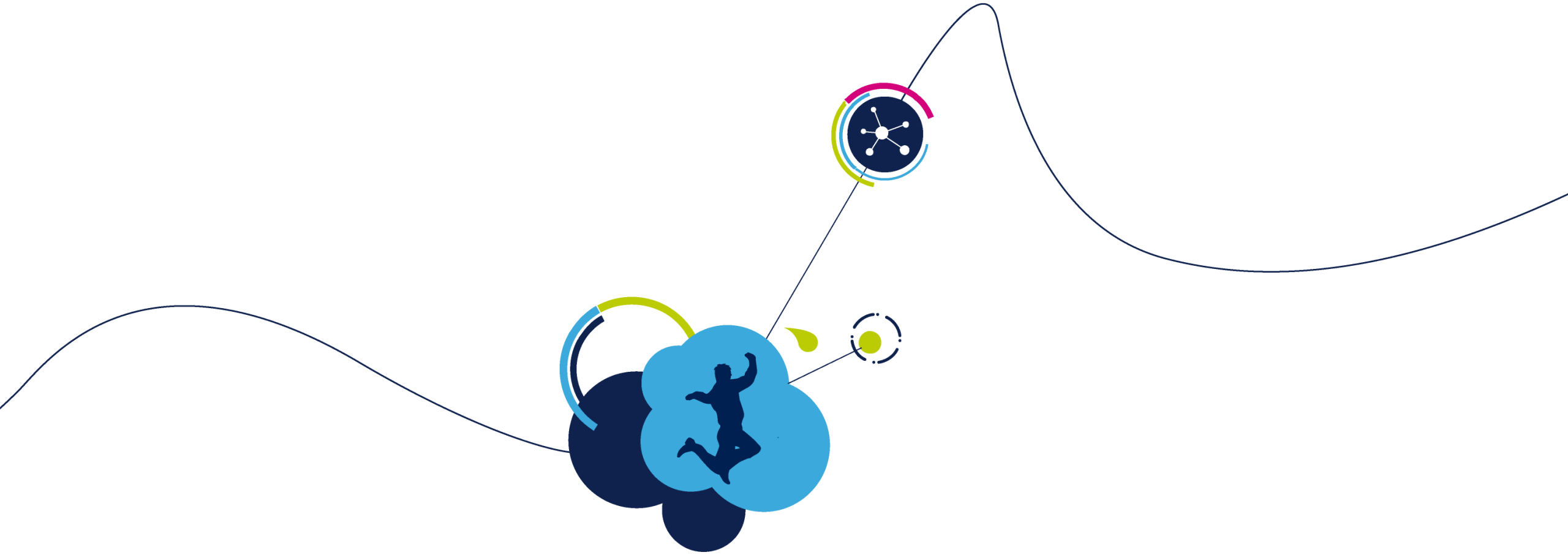


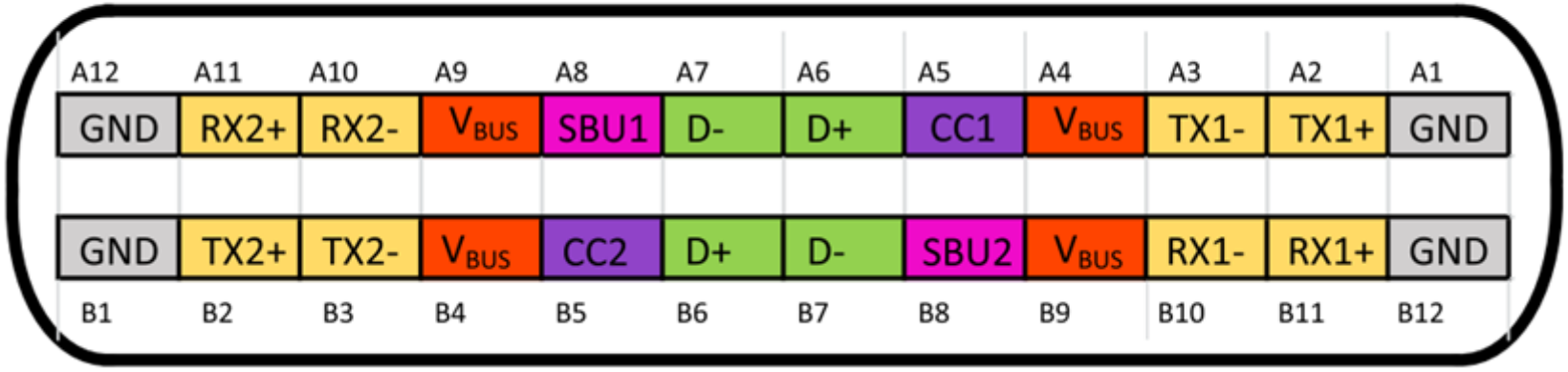
USB type-C

life.augmented

USB type-C

- Reversible slim cable and connector
- Contain high speed USB2.0 signals and two SuperSpeed lanes
- Extended power and USB Power Delivery(PD) protocol
  - Native power up to 15 W (3A @ 5V) without PD
  - Up to 100 W (5A @ 20V) with PD

USB Type-C™ receptacle pinout

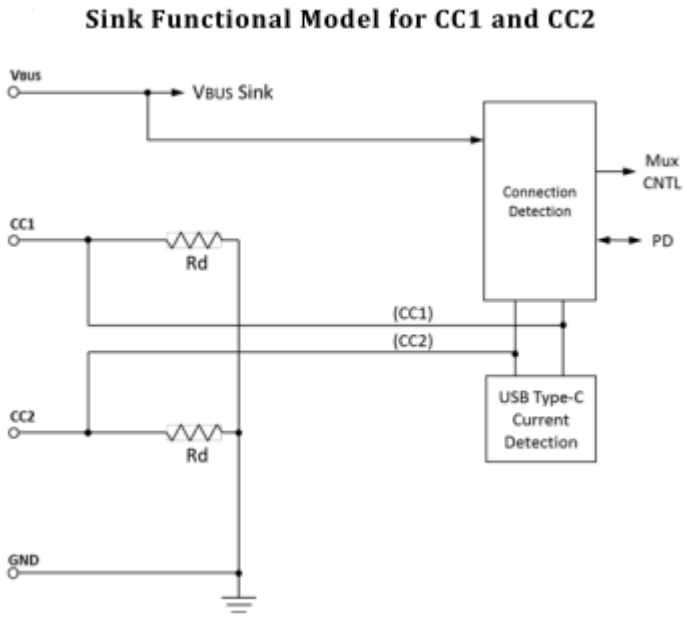


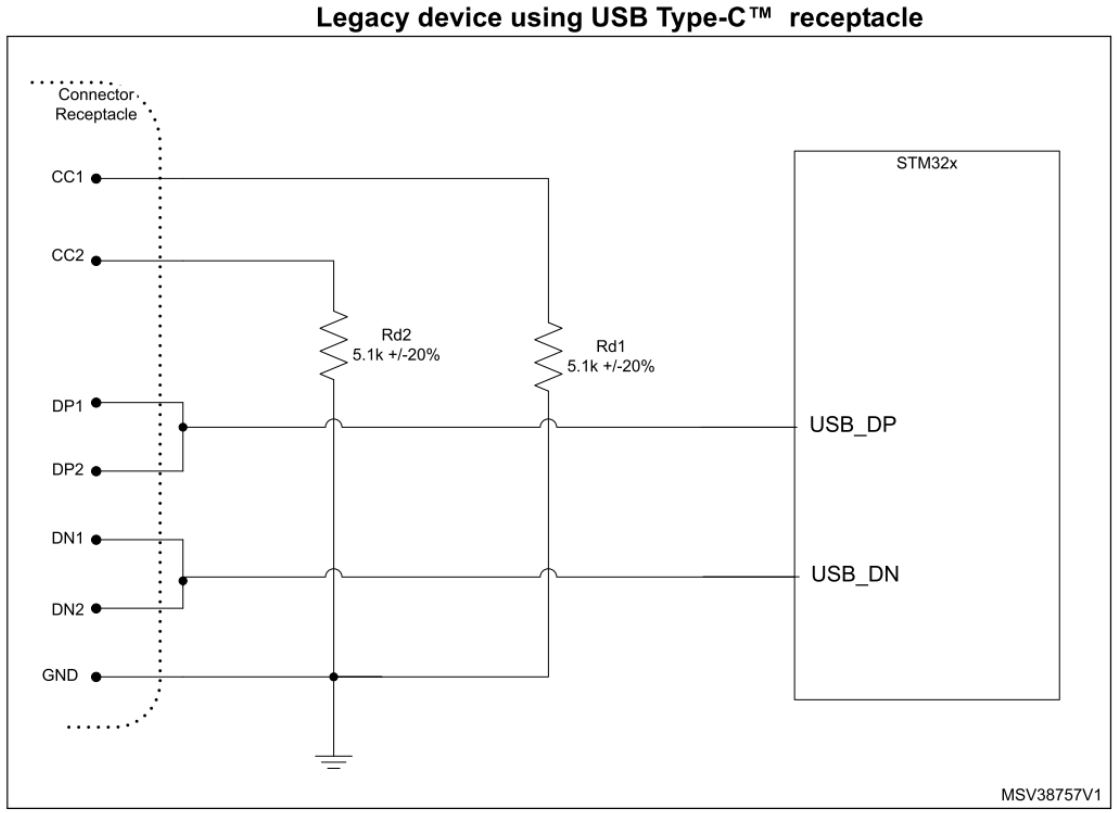
USB type-C

- USB Power Delivery – power negotiation protocol on top of USB type-C
  - USB-C cable may be used without PD, but for USB PD is mandatory to have USB-C connector
- Half duplex communication over CC lines (VBUS modulation) to negotiate used power profile and roles
  - Power swap option
- No need for USB data lines usage for PD communication
- Basic information can be found in AN4775, complete description in USB specification (divided documents for USB type-C and USB Power Delivery)

USB type-C

- Without CC lines handling only default power option may be used (0.5A @ 5V for USB2.0)
  - Basic configuration with PD option demands only 3 channels of ADC for cable orientation detection and two GPIO pins





USB type-C

- STM32 solutions for USB power delivery
  - P-NUCLEO-USB001
    - USB Type-C and Power Delivery Nucleo Pack with NUCLEO-F072RB
    - Analog front-end
  - P-NUCLEO-USB002
    - STUSB1602 USB Type-C and Power Delivery Nucleo Pack with NUCLEO-F072RB
  - ON-FUSB3-STM
    - Combination with type-C port manager from 3th party
  - X-CUBE-USB-PD
    - Certified FW stack for USB PD capable to handle source, sink and dual role power functionality
    - Contain also application examples
  - STUSB47x0 and STUSB4500
    - Standalone USB PD controller, either provider only or consumer only