STUSB1600

USB Type-C™ interface

Features
- Power role: provider, consumer, dual role
- Configurable startup profiles
- $V_{\text{CONN}}$ support
  - Adjustable current limit (600 mA max)
  - OVP, OCP, UVP protections
- Direct interface to MCU through I²C + interrupt
- Integrated voltage monitoring
- Dead-battery support
- Dual power supply: $V_{\text{BUS}}$ or system $V_{\text{DD}}$
- Nominal operating supply [4.6 V - 22 V]
- Temperature range: -40 °C up to 85 °C

Applications
- AC adapters, power supplies
- Smart plugs, wall adapters
- Power hubs, docking stations
- Smartphones, tablets
- Gaming, PNDs
- Displays
- Wearables, Internet of Things (IoT)
- Cameras, camcorders, MP3 players
- Any provider device (source role)
- Any consumer device (sink role)

Description
The STUSB1600 is a generic IC designed in 20 V technology, addressing USB Type-C™ port management both on host and/or device sides and is suited for a broad range of applications. It is fully compatible with the USB Type-C cable and connector specifications (rev 1.1).

The STUSB1600 is able to handle all functions from Type-C attach detection, plug orientation detection, host-to-device connection, $V_{\text{CONN}}$ support, $V_{\text{BUS}}$ configuration and so on.

Additionally, the STUSB1600 provides support for dead-battery operation and is fully customizable (thanks to an integrated non-volatile memory).

Table 1. Device summary

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
<th>Package</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUSB1600QTR</td>
<td>Dual-role Type-C™ interface</td>
<td>QFN-24 EP</td>
<td>USB0X</td>
</tr>
<tr>
<td></td>
<td>(4 x 4 mm²)</td>
<td>(4 x 4 mm²)</td>
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</table>
1 General description

The STUSB1600’s major role is:
1. Detect the connection between two USB ports (attach detection)
2. Resolve cable orientation and twist connections to establish USB data routing (mux control)
3. Establish a valid host-to-device connection
4. Discover and configure $V_{\text{BUS}}$: Type-C Medium or High current mode
5. Configure $V_{\text{CONN}}$

Additional features:
- I$^2$C interface
- Dead-battery support
- Non-volatile default startup configuration (user-defined parameters)
- $V_{\text{BUS}}$ voltage monitoring
- High-voltage protection on interface pins
- $V_{\text{CONN}}$ protections:
  - Soft-start to limit inrush current
  - Constant current mode overcurrent protection
  - Adjustable current limit
  - Thermal protection
  - Undervoltage and overvoltage protections
  - Reverse-current and reverse-voltage protections
  - Fault blanking
2 Revision history

Table 2. Document revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Changes</th>
</tr>
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<tbody>
<tr>
<td>11-Dec-2015</td>
<td>1</td>
<td>Initial release.</td>
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</table>
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