

# USB Power

## USB Standart

<https://en.wikipedia.org/wiki/USB>

When connected and transferring data

| USB           | max voltage | max current | data transfer     |                       |                      |
|---------------|-------------|-------------|-------------------|-----------------------|----------------------|
| USB 1.1       | 5v          | 0.5A        | 1.5Mbps, 12 Mbps  | Low Speed, Full Speed |                      |
| USB 2.0       | 5v          | 0.5A        | 12 Mbps, 480 Mbps | HighSpeed             | <a href="#">spec</a> |
| USB 3.1 Gen 1 | 5v          | 0.9A        | 5 Gbit/s          | SuperSpeed            | AKA USB 3.0          |
| USB 3.1 Gen 2 | 5v          | 0.9A        | 10 Gbit/s         | SuperSpeed+           |                      |
| USB 3.2       | 5v          | 1.5A        | 20 Gbit/s         | SuperSpeed+           | <a href="#">spec</a> |

### Battery Charging Specification

[https://www.usb.org/documents?search=Battery+Charging&category%5B%5D=49&type%5B%5D=55&items\\_per\\_page=50](https://www.usb.org/documents?search=Battery+Charging&category%5B%5D=49&type%5B%5D=55&items_per_page=50)

### USB-PD Power Delivery

spec: <https://www.usb.org/sites/default/files/USB%20Power%20Delivery%2020181203.zip>

| Spec         | V          | A max |                   |
|--------------|------------|-------|-------------------|
| BC1.2        | 5v         | 1.5A  | Battery Charging  |
| Type-C       | 5v         | 3A    |                   |
| PD 2.0       | 5,9,15,20v | 5A    | Power Delivery    |
| PD 2.0 micro | 5,9,15,20v | 3A    |                   |
| PD 3.0       | 5,9,15,20v | 5A    | Auth, Type-C only |

## Proprietary specs

[https://en.wikipedia.org/wiki/Quick\\_Charge](https://en.wikipedia.org/wiki/Quick_Charge)

| Spec       | V         | A    | Full Name, feature                         |
|------------|-----------|------|--------------------------------------------|
| MTK-PE+    | 5,7,9,12v | 3A   | 18W, <a href="#">Mediatek PumpExpress+</a> |
| MTK-PE2    | 5-20v     | 3A   |                                            |
| MTK-PE3    | 3-6v      | 5A+  | USB PD                                     |
| MTK-PE4    |           |      | USB PD 3.0                                 |
| QC         | 5v        | 2A   | <a href="#">Qualcomm Quick Charge</a>      |
| QC2        | 5,9,12v   | 3A   | 18W                                        |
| QC3        | 3.6v-20v  | 4.6A | 18W                                        |
| QC4        | 3.6v-20v  |      | 27W, USB PD + QC3                          |
| QC4+       | 0v-11v    | 3A   | 27W, USB PD 3.0                            |
| VOOC       | 5v        | 4A   | 20W                                        |
| Super VOOC | 10v       | 5A   |                                            |
| AFC        | 5v,9v     | 2A   | 15W <a href="#">Samsung AFC</a> (QC2?)     |

|             |          |           |                          |
|-------------|----------|-----------|--------------------------|
| Apple 5W    | 5v       | 1A        | 5W                       |
| Apple 10W   | 5.1v     | 2.1A      | 10W                      |
| Apple 12W   | 5.2v     | 2.4A      | 12W                      |
| Apple 29W   | 5v,14.5v | 2.4A      | 29W <b>USB-PD</b>        |
| Supercharge | 4.5-5v   | <b>5A</b> | 22.5W Huawei Supercharge |

#### Links

[https://en.wikipedia.org/wiki/American\\_wire\\_gauge](https://en.wikipedia.org/wiki/American_wire_gauge)

<https://lygte-info.dk/info/USBinfo%20UK.html>