

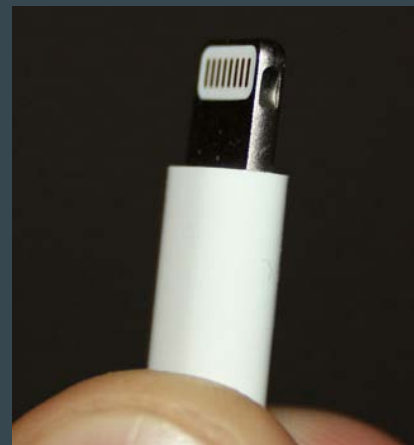
MicroUSB

vs.

Apple's Lightning Cable

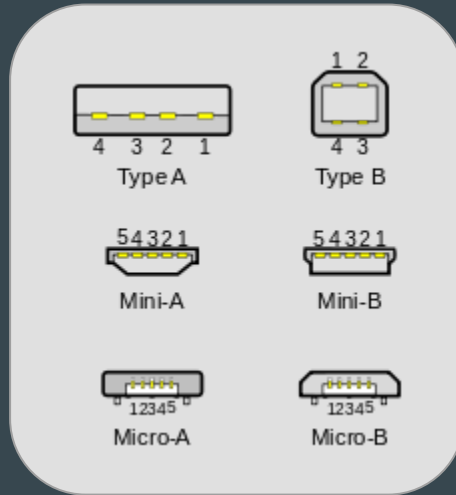
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Marisa Langlois



Overview of USB Connectors

Type A connectors
connect to the host
(e.g., computers)

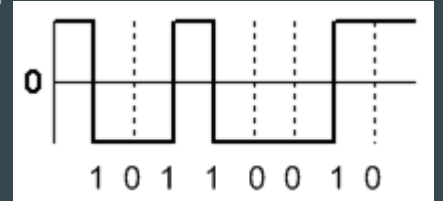


Type B connectors
connect to peripheral devices
(e.g., cell phones)

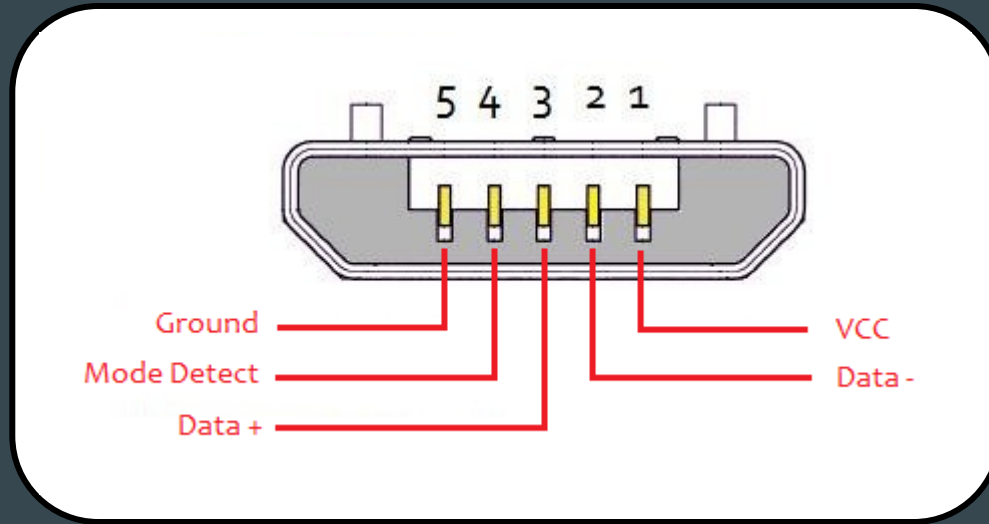
Mini-B used to be the standard, but was deprecated in 2007 in favor of Micro-B, which was mechanically stronger and thinner.

Overview of USB Data Transmission

- Half-duplex differential signaling
 - Each bit uses two wires instead of one
 - Logic state is signified by one wire being more positive than the other
 - Reduces common-mode noise
- NRZI encoding
 - “Non-Return-to-Zero Inverted”
 - Logical ‘1’ is represented by a transition at the clock edge
 - Logical ‘0’ is represented by no transition at the clock edge



MicroUSB Pinout

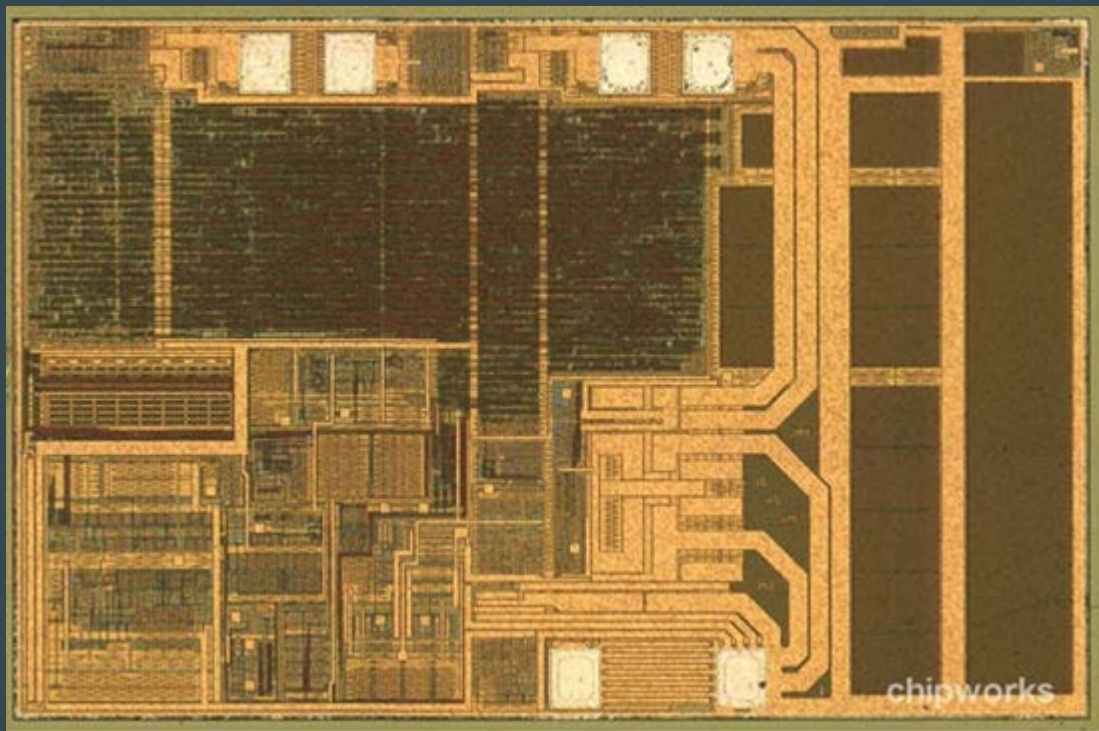


The Mode Detect (or ID) pin is part of the USB On-The-Go (OTG) specification. It determines which connected device is the host and which is the slave.

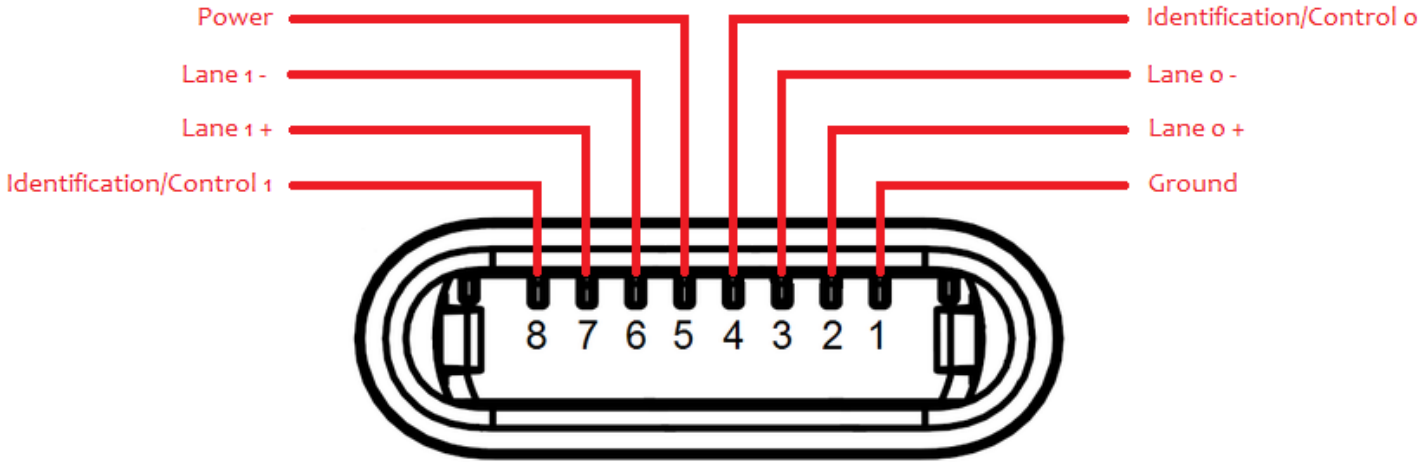
Lightning Cable



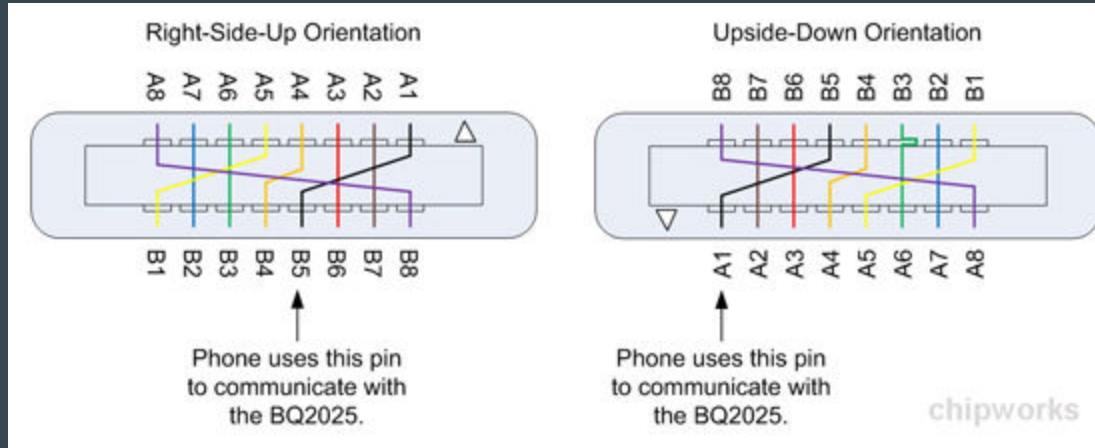
Lightning Cable BQ2025 Chip



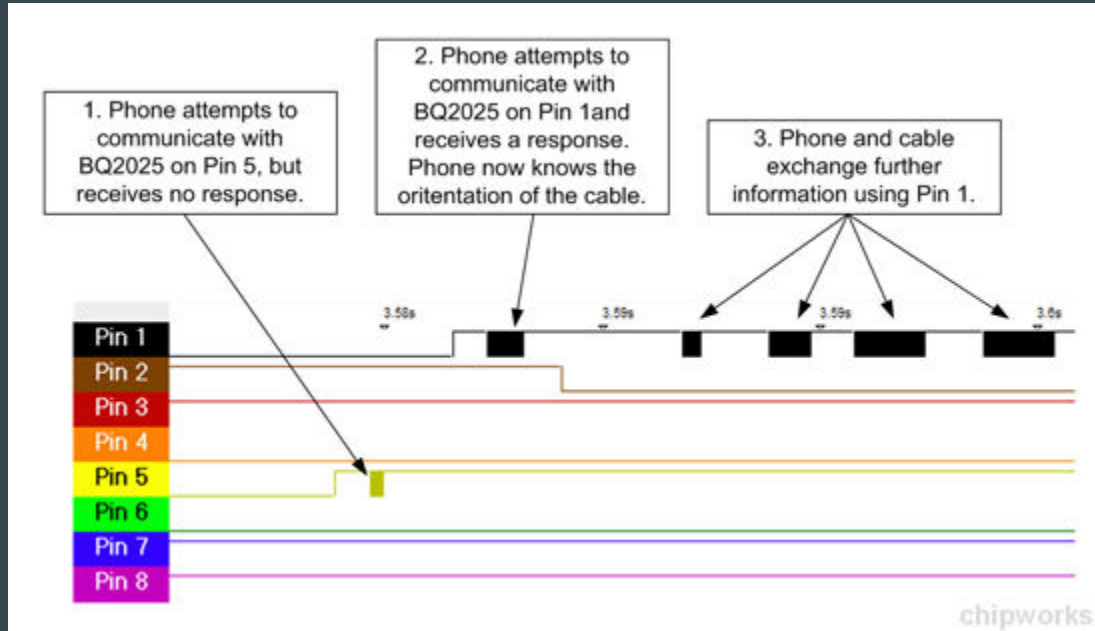
Lightning Cable Pinout



Lightning Cable Reversibility



Lightning Cable Reversibility



MicroUSB

Lightning

MicroUSB

lower power rating

1.8A at 5V, 9W

May find 2A wire

Lightning

higher power rating

2A, at least 12W

enough power to charge an iPad

MicroUSB

lower power rating

mechanically fragile

Lightning

higher power rating

durable



MicroUSB

lower power rating

mechanically fragile

cheaper

\$1 - \$7

Lightning

higher power rating

durable

more expensive

\$6 - \$15

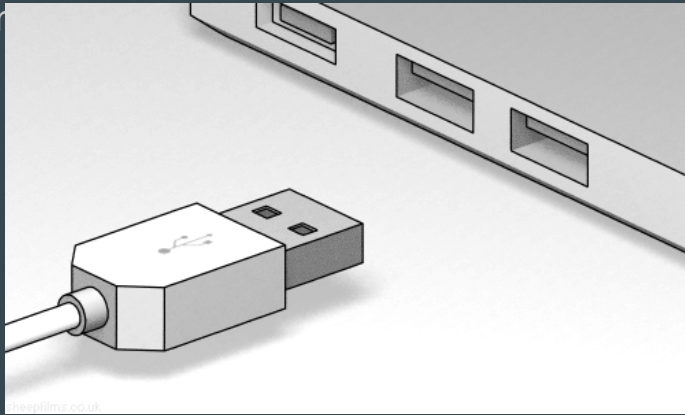
directly from Apple: \$19 - \$29

MicroUSB

lower power rating

mechanically fragile

cheaper



Lightning

higher power rating

durable

more expensive

reversible

MicroUSB

lower power rating

mechanically fragile

cheaper

not reversible

universal between Brands

Different types may be needed for tablets

Lightning

higher power rating

durable

more expensive

reversible

universal between Apple products

Not usable by other products

MicroUSB

lower power rating

mechanically fragile

cheaper

not reversible

universal between Brands

Open for Use

Lightning

higher power rating

durable

more expensive

reversible

universal between Apple products

Proprietary

Sources

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