

USB 2.0 Routing Guidelines

1. All USB traces must be routed as differential pairs.
2. Avoid using any stubs on these lines.
3. Use 45 degree turns to minimize impedance discontinuities.
4. Route the differential pairs over unbroken ground planes or floods.
5. Vias are not typically needed to route the USB signal pairs for Microchip devices. Minimize the number of vias used and use a balanced number and placement of them per pair if used.
6. Keep USB pairs as short as possible to reduce signal loss. Traces longer than ~15 cm (~6 in) may significantly degrade signal quality. Minimize the trace length of the differential pairs whenever possible.
7. D+ and D- signals must be matched in length to 50 mils of each other.
8. Route USB 2.0 such that they are spaced at least 3 times the trace width away from other non-USB signals. Refer to the SMSC AN 26.2 application note for additional details.
9. For the DP+ and DP- traces, Microchip recommends 90 ohms +/- 15%. Refer to the USB 2.0 specification for additional information.