



The LED indicator is mounted directly on the PCB. Make sure it is oriented correctly with the anode (longer lead) inserted as shown on Fig.2. Solder its leads quickly to avoid heat damage.

The USB socket goes in last. It must be pushed right down onto the PCB before its outer mounting lugs are soldered. Its four pin connections can then be soldered.

The 5V power input can come from either a 5VDC plugpack or a USB supply (eg, a plugpack with a USB

socket). As shown, the leads from a plugpack are directly soldered to the 5V and 0V terminals after the wires have been looped through two holes at one end of the PCB. This is done to provide stress relief for the connections.

Make sure the that the plugpack's leads are connected to the correct pads. If in doubt, check the voltage between its leads before making the connections.

If you intend using a USB supply, a cable fitted with a USB type 'A' plug

Parts List

- 1 PCB, available from the *EPE PCB Service* code 14108131, 18 × 60mm
- 1 5V 1A regulated plugpack OR
- 1 5V USB charger/supply and
- 1 USB 'A' line plug with a length of light-duty figure-8 wire OR
- 1 USB type 'A' plug and cable cut from a USB extension lead
- 1 PCB-mount USB type 'A' socket
- 1 75mm-length of clear 20mm diameter heatshrink tubing
- 1 3mm LED (any colour) (LED1)

Resistors (0.25W, 1%)

1 33kΩ	2 15kΩ
2 22kΩ	1 10kΩ
1 18kΩ	1 1kΩ

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at one end will have to be wired to the PCB. Fig.3 shows the details.

Note that we do not mean using a USB supply on a computer here, since all iPods can be charged from a computer USB port. However, USB ports on a charger are different in that they supply power via pins 1 and 4 of the USB socket, but there is no communication via the D+ and D- lines.

Making the USB cable

You can obtain a suitable cable by cutting off the socket from a USB extension cable (ie, the socket at the opposite end of the cable to the type 'A' plug). That done, strip back the insulation and connect the red wire to the +5V input on the PCB and the black wire to the 0V input. The unused

Table 1: Selecting resistors R1-R4

iPod touch/iPhone/ iPod NANO 2G	iPod touch/iPhone (if product allows for 1A charge)	iPod Mini, nano 2G, Shuffle 2G	iPod Mini	iPod nano 1G and iPod Video 5G	Samsung Galaxy Tablet
D- @ 2V D+ @ 2V 500mA charge	D- @ 2.7V, D+ @ 2V 1A charge	D- @ >3V, D+ @ >3V 250mA charge (Mini and nano), 100mA (Shuffle)	D- @ 0V, D+ @ >3V 100mA charge	D- @ >3V, D+ @ 0V 500mA charge	D- @ 1.2V D+ @ 1.2V charge unknown or ≤1A
R1 = 22kΩ	R1 = 18kΩ	R1 = 22kΩ	R1 = Omit	R1 = 22kΩ	R1 = 33kΩ
R2 = 15kΩ	R2 = 22kΩ	R2 = Omit	R2 = 22kΩ	R2 = Omit	R2 = 10kΩ
R3 = 22kΩ	R3 = 22kΩ	R3 = 22kΩ	R3 = 22kΩ	R3 = Omit	R3 = 33kΩ
R4 = 15kΩ	R4 = 15kΩ	R4 = Omit	R4 = Omit	R4 = 22kΩ	R4 = 10kΩ