

USB Switch

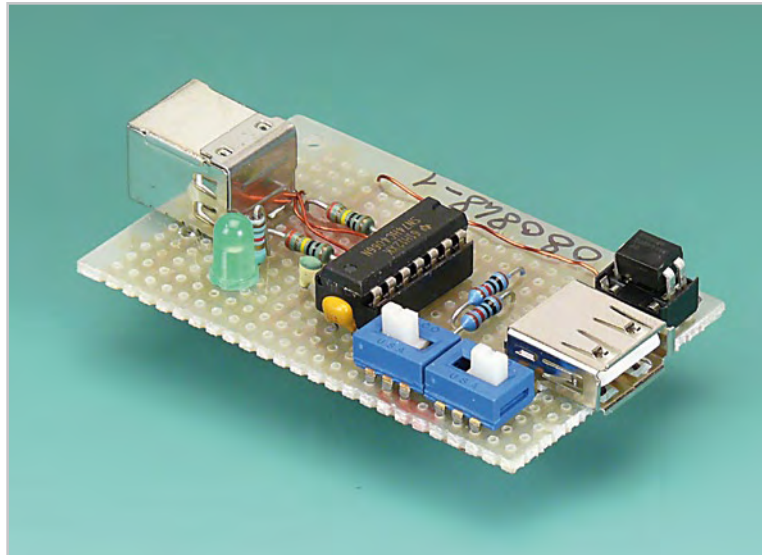


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Anyone experimenting or developing USB ported peripheral hardware soon becomes irritated by the need to disconnect and connect the plug in order to re-establish communication with the PC. This process is necessary for example each time the peripheral equipment is reset or a new version of the firmware is installed. As well as tiresome it eventually leads to excessive contact wear in the USB connector. The answer is to build this electronic isolator

which disconnects the peripheral device at the touch of a button. This is guaranteed to reduce any physical wear and tear and restore calm once again to the workplace.

The circuit uses a quad analogue switch type 74HC4066. Two of the switches in the package are used to isolate the data path. The remaining two are used in a classic bistable flip-flop configuration which is normally built using transistors. A power MOSFET switches the power supply current to the USB device. Capacitor C2 ensures that the flip flop always powers-up in a defined state when plugged into the USB socket ('B' in the diagram). The peripheral device connected to USB socket 'A' will therefore always be 'not connected' until pushbutton S2 is pressed. This flips the bistable, turning on both analogue gates in the



before the data signals are connected. The electronic switch does not suffer from the same contact problems as the physical connector so these measures are not required in the circuit. The simple circuit can quite easily be constructed on a small square of perforated strip-board. The design uses the 74HC(T)4066 type analogue switch, these have better characteristics compared to the standard 4066 device. The USB switch is suitable for both low-speed (1.5 MBit/s) and full-speed (12 MBit/s) USB ports applications but the properties of the ana-

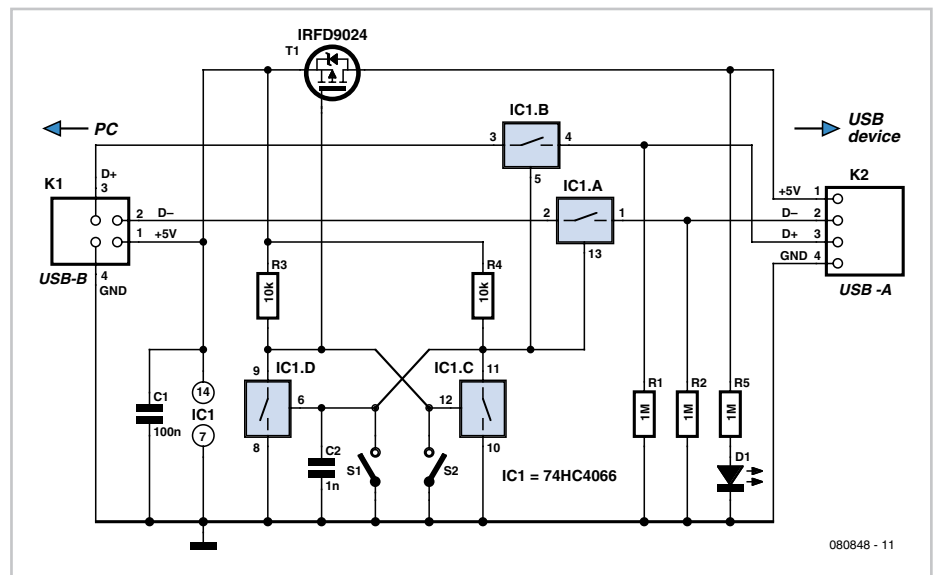
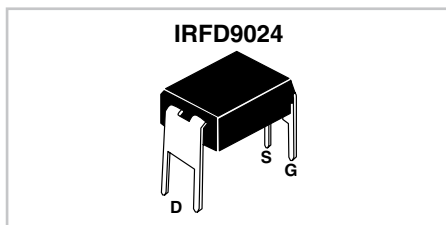
logue switches and perf-board construction will not support hi-speed (480 MBit/s) USB operation.

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