Addendum 9/02/2017

After deploying the device and observing for three months, it was noted that the red LED on the CC3200 board would occasionally turn on at the moment the sump pump turned off. This indicated that the board went through the POR due to an active wakeup input. As expected, the EMI blast from the pump was coupling on the input wire and generating a wakeup. Since the software debouncing is relatively long, the device would ignore this event and go back to hibernation. However, this could significantly impact battery life.

In any case, it is not good practice to have the input go directly to the microcontroller pin, so it was decided to add a RC filter to the input and see if that alleviated the problem before testing other ideas (TVS, ferrites, etc.). Adding 10nF, 100nF, and 1kOhm in pi configuration to the input (see schematic below) indeed did solve the issue. This would have been an appropriate addition in the initial design.

Also, the Low Voltage threshold has been increased to 2.8V in order to ensure that there is enough charge left in the batteries to power up the radio and network core to get the message out.

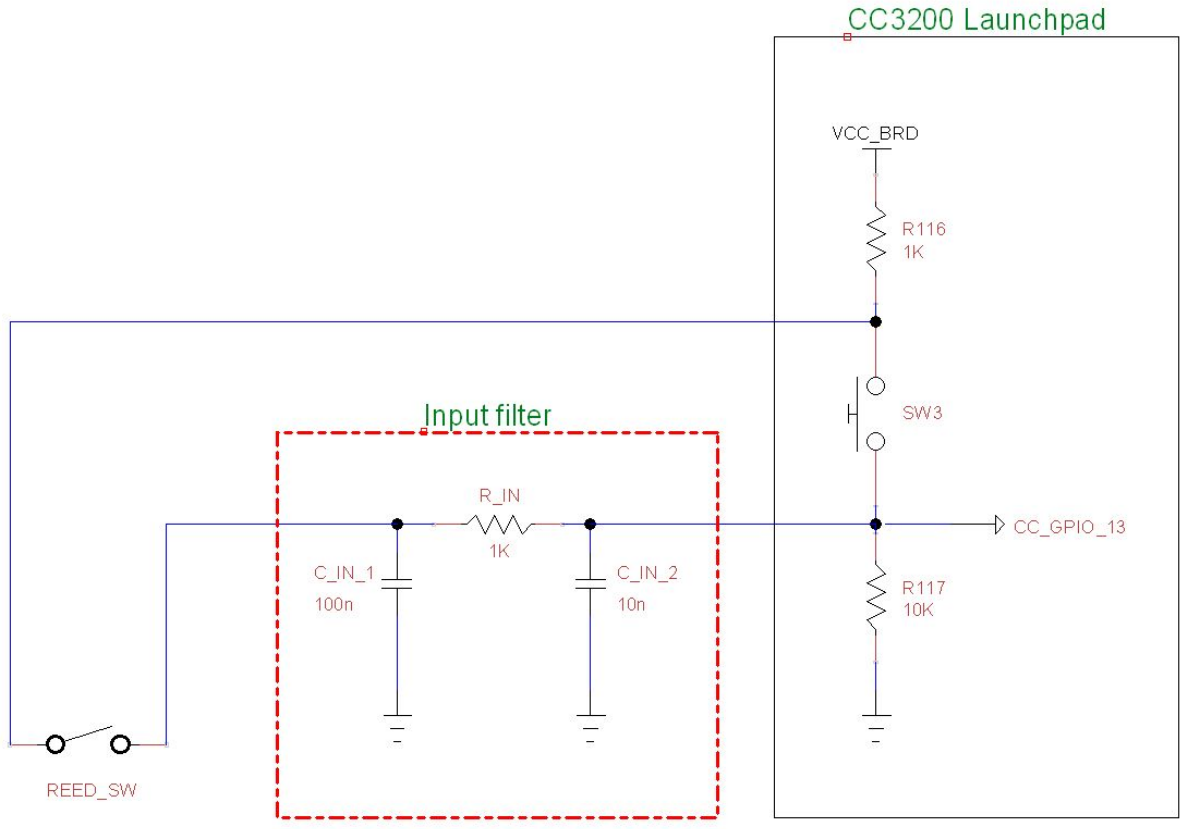

Figure 1: RC filter was added to the wake-up input.

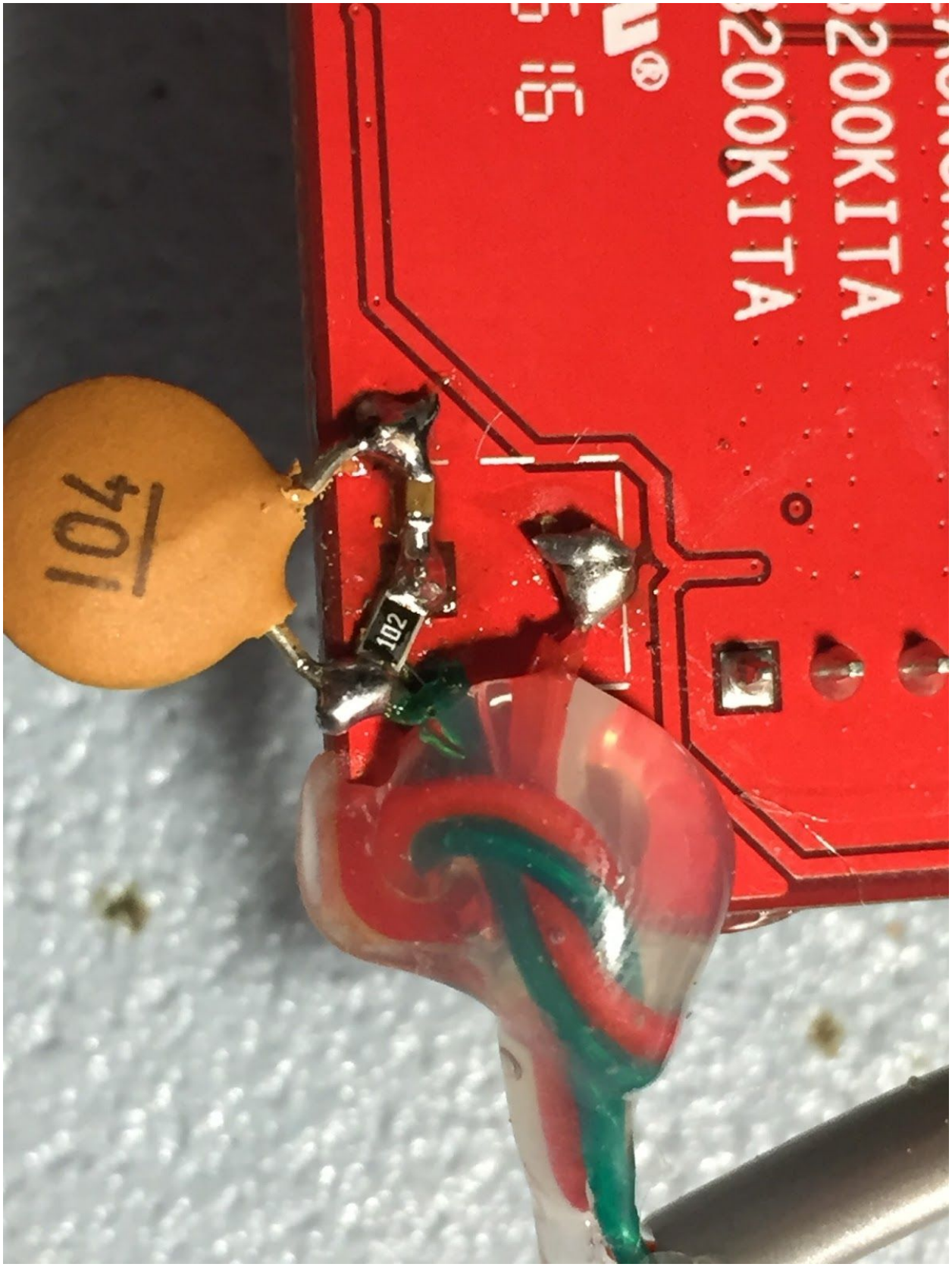

Figure 2: RC filter components were added to the bottom side of the PCB ion the SW3 area.