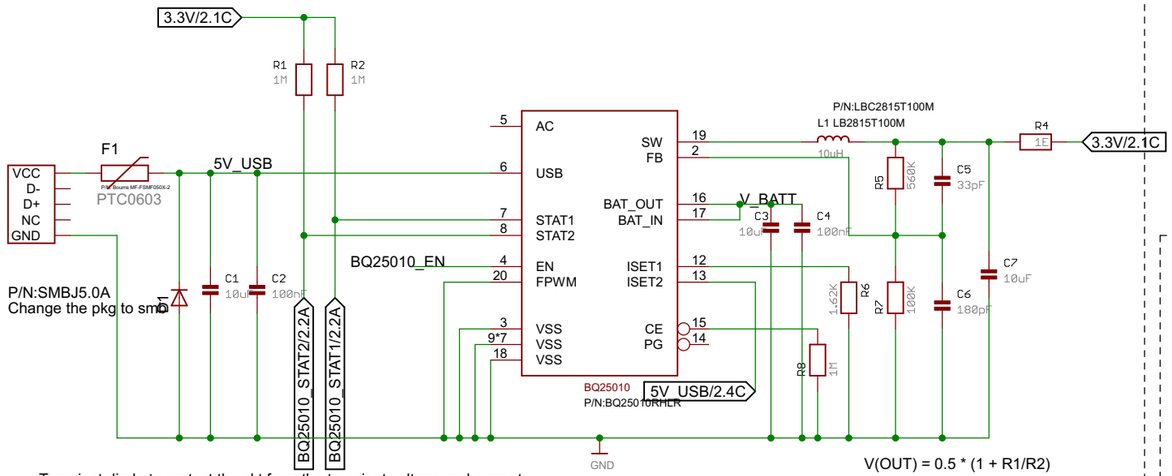
Revision

Replaced LEDS by low current one to reduce battery drainage
Added MOSFET circuitry to enable battery voltage sense only when required which will further reduce battery leakage
Integrated power supply and charging circuit in one unit BQ25010
Diabeto functionality changed such that it will on conitnously to monitor activity paramerets of user and remains in sleep mode continously and wake only when user press soft button
No need to detect USB signal status we can monitor STAT1 &2 to get the status
Voltage translator TXS0108ERGYR
AP7361-18FGE-7 1.8v/1A LDO, QUIESCENT CURRENT 70uA, 150MV DROPOUT AT 300mA LOAD

Power Supply+Charging unit



Transient diode to protect the ckt from the transient voltage and current
Need to power down the load during charging condition to get charge done indication(tested @ 600uA)

Note
I(out) = 500 mA
I(precharge) = 50 mA
V(out) = 3.3 V
Need to figure out whether STAT1 &2 pin required pullups or not,since AVR device have internal pullups
DC-DC coverter gets shutdown when VBAT <= 2.6 V(UVLO)
EN pin permanently tied to battery to on power supply continously
FPWM pin tied to ground to allow the converter to enter in power save mode
Place the i/p and o/p capacitor as close as possible to IC
inductor current rating should be greater than converter max current plus inductor ripple current
I/P and O/P capacitor for the converter should be ceramic since they have low ESR values
I/P capcitor must have to handle the charging and ripple current (more than 500 mA)

V(OUT) = 0.5 * (1 + R1/R2)

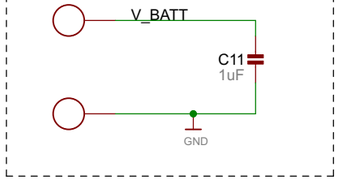
For low quiescent current
R1+R2 <= 1M
560K+100k <= 1M

C1 = 1/2*PI*10KHZ*R1
=28.43pF

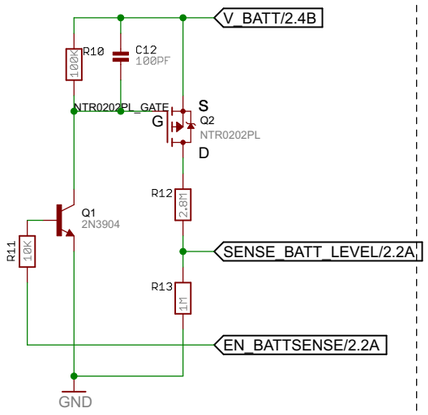
C2 = (R1/R2) * C1
=159.208pF

For higher quiescent current
R1+R2 < 100K , omit capacitors

LIPO 3.7V/55mAH BATTERY



Battery Voltage Monitor



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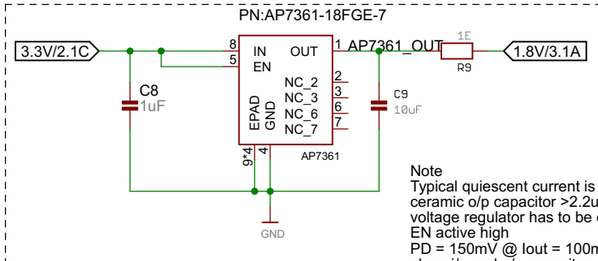

Note
Typical quiescent current is 70uA
ceramic o/p capacitor >2.2uF 10mohm < ESR<300mohm
voltage regulator has to be operate continously to operate pedometer application
EN active high
PD = 150mV @ Iout = 100mA = (VIN - VOUT)XIOUT
place i/p and o/p capacitor very close to IC
Use polygons for power trace
Less startup time <200uS

open hardware

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