Vcore

C1 100nF   C2 100nF
GND   GND

U1

VCC (4)
AVCC (18)

PD2 — 12 — PB0(PCINT0/CLKO/ICP1)
PD1 — 13 — PB1(PCINT1/OC1A)
uC:ACC — 14 — PB2(PCINT2/OC1B/SS0)
uC:D- — 15 — PB3(PCINT3/OC2A/MOSI0/TXD1)
uC:D+ — 16 — PB4(PCINT4/MISO0/RXD1)

uC:ID — 3 — NC   COM — 4
VcoreSW — 1 — NO   IN — 6
U2.1
TS5A3159

uC:RESET

17 — PB5(PCINT5/SCK0/XCK0?)
7 — PB6(PCINT6/XTAL1/TOSC1)
8 — PB7(PCINT7/XTAL2/TOSC2)

Y1 32.768kHz

PE0(PCINT24/ICP4/SDA1/ACO) — 3 — I2C:SDA
PE1(PCINT25/TC4/SCL1) — 6 — I2C:SCL
PE2(PCINT26/ADC6/ICP3) — 19 — uC:ID
PE3(PCINT27/ADC7/T3/MOSI1) — 22 — BAT:NFO

Vcore

R1 10k

decrease if spontanious resets occur

Vcore   U2
5 — VCC
2 — GND
GND
TS5A3159

PD6 — 30 — PD0(PCINT16/OC3A/RXD0)
PD15 — 31 — PD1(PCINT17/OC4A/TXD0)
PD16 — 32 — PD2(PCINT18/INT0/OC3B/OC4B)
PD7 — 1 — PD3(PCINT19/INT1/OC2B)
PD8 — 2 — PD4(PCINT20/XCK0?/T0)
PD5 — 9 — PD5(PCINT21/OC0B/T1)
PD4 — 10 — PD6(PCINT22/OC0A/AN0)
PD3 — 11 — PD7(PCINT23/AN1)

PC0(PCINT8/ADC0/MISO1) — 23 — PD9
PC1(PCINT9/ADC1/SCK1) — 24 — PD10
PC2(PCINT10/ADC2) — 25 — PD11
PC3(PCINT11/ADC3) — 26 — PD12
PC4(PCINT12/ADC4/SDA0) — 27 — PD13
PC5(PCINT13/ADC5/SCL0) — 28 — PD14

PC6(PCINT14/RESET) — 29 — uC:RESET

GND   GND (PAD)   AGND   AREF
5   33   21   20

C3 10nF
GND

atmega328PB_MLF

adjust pull-up values with scope

Vcore

high GS leakage desired!

U3 XC6206P302MR

Vcore — IN   OUT
GND
C4 1uF 10V   C5 4.7uF 10V
GND

U4
VS   CS
RES (VS)   INT1
VDD I/O   INT2
RES (GND)
GND   SCL/SCLK
GND   SDA/SDI/SDIO
GND   SDO/ALT ADDRESS
ADXL345
GND

G1
S1 — D1
AO7800-1
Q1.1

G2
S2 — D2
AO7800-1
Q1.2

R2 10k   R3 10k

I2C:SCL

I2C:SDA

uC:ACC

R4 1MEG

B2   C2
Q4.2
BC847BS-1
E2

GND

VcoreSW

C6 100nF
GND
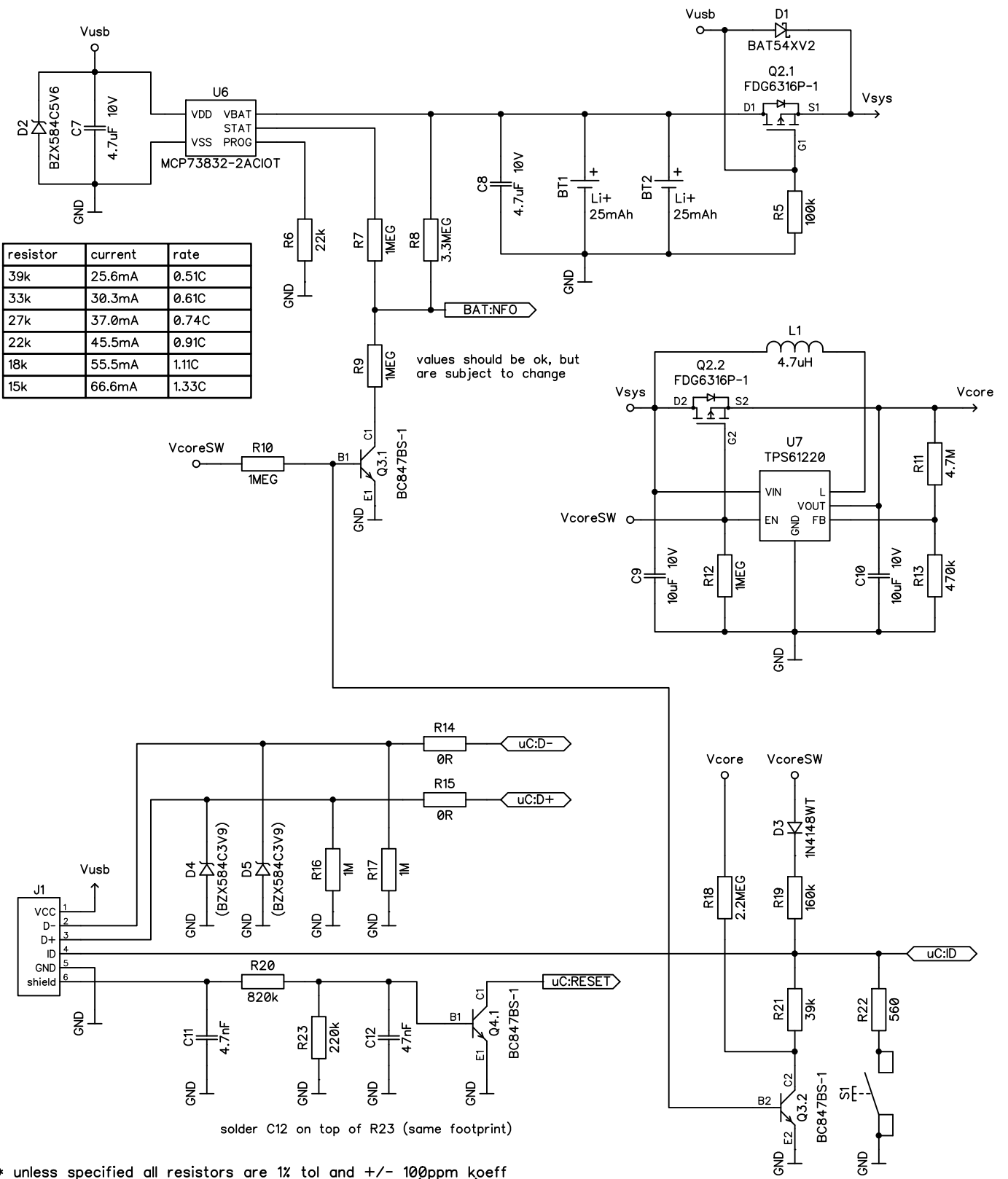
U5
VCC   SCL — I2C:SCL
VSS   SDA — I2C:SDA
M24M01-A125+

* unless specified all resistors are 1% tol and +/- 100ppm koeff
* unless specified all capacitors are at X7R or X5R (>100nF) and 10% tol.

Title	Revision	Changes	Date
Logic			
Author			
instructables.com/member/nqtronix			
Description			
Contains the main controller, the accelerometer (with it's own 3V LDO and I2C level shifter) and 1Mibt of memory.			

Vusb
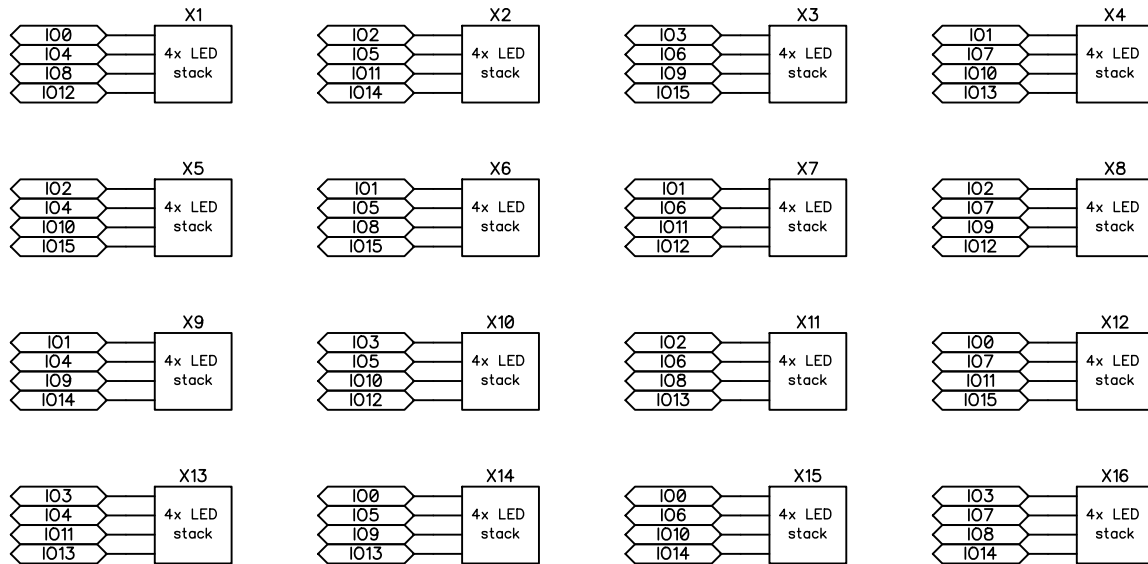
D2 BZX584C5V6
C7 4.7uF 10V
GND

U6 MCP73832-2ACI0T
VDD VBAT
STAT
VSS PROG

R6 22k
GND
R7 1MEG
R8 3.3MEG

C8 4.7uF 10V
GND

BT1 Li+ 25mAh
BT2 Li+ 25mAh

Vusb
D1 BAT54XV2
Q2.1 FDG6316P-1
D1 S1
G1
R5 100k
Vsys

resistor	current	rate
39k	25.6mA	0.51C
33k	30.3mA	0.61C
27k	37.0mA	0.74C
22k	45.5mA	0.91C
18k	55.5mA	1.11C
15k	66.6mA	1.33C

BAT:NFO

R9 1MEG

values should be ok, but
are subject to change

VcoreSW R10 1MEG
Q3.1 BC847BS-1
B1 C1
E1
GND

L1 4.7uH
Q2.2 FDG6316P-1
D2 S2
G2

Vsys

U7 TPS61220
VIN L
VOUT
EN   FB
GND

VcoreSW

C9 10uF 10V
R12 1MEG
C10 10uF 10V
R13 470k
GND

R11 4.7M
Vcore

R14 0R uC:D-
R15 0R uC:D+

J1
VCC   1
D-   2
D+   3
ID   4
GND   5
shield 6
GND

Vusb

D4 (BZX584C3V9)
D5 (BZX584C3V9)
R16 1M
R17 1M
GND

R20 820k
C11 4.7nF
R23 220k
C12 47nF
Q4.1 BC847BS-1
B1 C1
E1
GND
uC:RESET

solder C12 on top of R23 (same footprint)

Vcore VcoreSW
D3 1N4148WT
R18 2.2MEG
R19 160k
uC:ID
R21 39k
R22 560
Q3.2 BC847BS-1
B2 C2
E2
GND
S1
GND

* unless specified all resistors are 1% tol and +/- 100ppm koeff
* unless specified all capacitors are at X7R or X5R (>100nF) and 10% tol.
* do not populate parts if their part number is within (brackets)

	X1
IO0 IO4 IO8 IO12	4x LED stack

	X2
IO2 IO5 IO11 IO14	4x LED stack

	X3
IO3 IO6 IO9 IO15	4x LED stack

	X4
IO1 IO7 IO10 IO13	4x LED stack

	X5
IO2 IO4 IO10 IO15	4x LED stack

	X6
IO1 IO5 IO8 IO15	4x LED stack

	X7
IO1 IO6 IO11 IO12	4x LED stack

	X8
IO2 IO7 IO9 IO12	4x LED stack

	X9
IO1 IO4 IO9 IO14	4x LED stack

	X10
IO3 IO5 IO10 IO12	4x LED stack

	X11
IO2 IO6 IO8 IO13	4x LED stack

	X12
IO0 IO7 IO11 IO15	4x LED stack

	X13
IO3 IO4 IO11 IO13	4x LED stack

	X14
IO0 IO5 IO9 IO13	4x LED stack

	X15
IO0 IO6 IO10 IO14	4x LED stack

	X16
IO3 IO7 IO8 IO14	4x LED stack

Title	Revision	Changes	Date
LEDs			
Author			
instructables.com/member/nqtronix			
Description			
Contains the wireing information for the LED stacks. They will be connected to the "PD#" pads and assigned in software.			