USB/Power (USB-Power.sch)

Left	Right
nPG	FTDI_RST → FTDI_RST
STAT1	SDA → SDA
STAT2	SCL → CBUS0
	CBUS1 → CBUS1
	CBUS2 → CBUS2
	CBUS4 → CBUS4
Boost-En	CBUS3

LCD/Sensors (LCD-Sensors.sch)

Left	Right
FX_RST	RES → RES
INT1	CS → CS
INT2	D/C → D/C
SDA	R/W → R/W
SCL	E → E
	D7 → D7
	D6 → D6
	D5 → D5
	D4 → D4
	D3 → D3
	D2 → D2
	D1 → D1
	D0 → D0

U6 — PIC32MX370F512H

Pin	Left signal
57	VDD
38	VDD
26	VDD
19	AVDD
10	VDD
65	Ex_Pad
41	Vss
25	Vss
20	AVss
9	Vss
56	VCAP
7	MCLR
15	PGEC1/VREF−/CVREF−/AN1/RPB1/CTED12/RB1
16	PGED1/VREF+/CVREF+/AN0/RPB0/PMA6/RB0
35	INT1 — RPF6/SCK1/INT0/RF6
32	INT2 — RPF5/SCL2/PMA8/RF5
31	FX_RST — RPF4/SDA2/PMA9/RF4
33	Boost_En — RPF3/RF3
34	nPG — RPF2/RF2
59	STAT1 — RPF1/RF1
58	STAT2 — RPF0/RF0
8	SW1 — AN19/C2INC/RPG9/PMA2/RG9
6	SW2 — AN18/C2IND/RPG8/PMA3/RG8
5	SW3 — AN17/C1INC/RPG7/PMA4/RG7
4	SW4 — AN16/C1IND/RPG6/SCK2/PMA5/RG6
36	SDA — SDA1/RG3
37	SCL — SCL1/RG2

Pin	Right signal
30	AN15/RPB15/OCFB/CTED6/PMA0/RB15 — D/C
29	AN14/RPB14/CTED5/PMA1/RB14 — FTDI_RST
28	TDI/AN13/PMA10/RB13
27	TCK/AN12/PMA11/RB12
24	TDO/AN11/PMA12/RB11 — CBUS2
23	TMS/CVREFOUT/AN10/RPB10/CTED11//PMA13/RB10 — CBUS4
22	AN9/RPB9/CTED4/PMA7/RB9
21	AN8/RPB8/CTED10//RB8
18	PGED2/AN7/RPB7/CTED3//RB7 — MOTOR
17	PGEC2/AN6/RPB6/RB6 — BAT/2
11	AN5/C1INA/RPB5/RB5
12	AN4/C1INB/RB4
13	PGED3/AN3/C2INA/RPB3/RB3
14	PGEC3/AN2/C2INB/RPB2/CTED13/RB2
45	RPD11/PMCS1/RD11
44	RPD10/PMCS2/RD10 — CS
43	RPD9/RD9 — RES
42	RPD8/RTCC/RD8 — RTCC
55	RD7
54	RD6
53	RPD5/PMRD/RD5 — R/W
52	RPD4/PMWR/RD4 — E
51	AN26/RPD3/RD3
50	AN25/RPD2/RD2
49	AN24/RPD1/RD1
46	RPD0/RD0
3	AN27/PMD7/RE7 — D7
2	AN23/PMD6/RE6 — D6
1	AN22/RPE5/PMD5/RE5 — D5
64	AN21/PMD4/RE4 — D4
63	RPE3/CTPLS/PMD3/RE3 — D3
62	AN20/PMD2/RE2 — D2
61	PMD1/RE1 — D1
60	PMD0/RE0 — D0
39	OSC1/CLKI/RC12
40	OSC2/CLKO/RC15
48	SOSCO/RPC14/T1CK/RC14
47	SOSCI/RPC13/RC13

TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8

C27 100n, C28 100n, C29 100n, C30 100n, C31 100n

C32 10u, C33 100n

R13 10K, R14 1K, R20 4.7K, R21 4.7K

R22 10K, R23 10K (BAT/2)

+3.3V

SW1, SW2, SW3, SW4

R16 10K, R17 10K, R18 10K, R19 10K
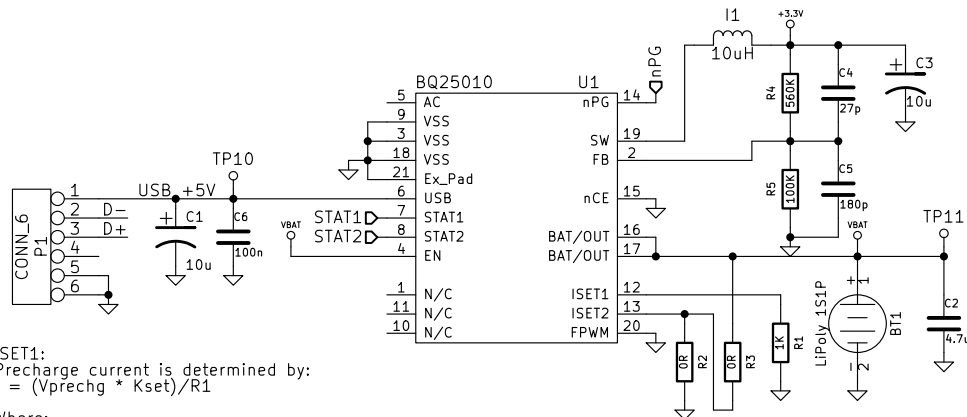
M1 MOTOR, Q1 MMBT2222A, R15 10K → MOTOR

VBAT

Oscillator Configuration:
FNOSC=PRIPLL // the defualt oscilator is Posc with PLL
POSCMOD=HS // Posc is in HS mode
FPLLIDIV=DIV_5 // divide the crystal freq. by 5 going into the PLL
FPLLMUL=MUL_20 // multiply it by 20
FPLLODIV=DIV_1 // divide the output from the PLL by one Posc will be 100MHz

X1 25MHz, C34 15p, C35 15p
X2 32.768KHz, C36 9p1, C37 9p1

File: SmartWatch.sch	
Sheet: /	
Title:	
Size: USLetter Date: 24 jun 2016	Rev:
KiCad E.D.A.	Id: 1/3

ISET1:
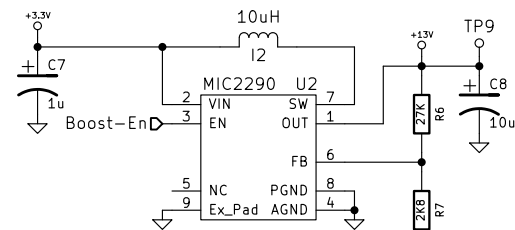Precharge current is determined by:
$I = (Vprechg * Kset)/R1$

Where:
Vprechg = 255mV (typ.)
Kset = 322 (typ.)

ISET2:
Determines the battery charge rate:
Asserted=500mA | De-asserted=100mA | High-Z=disable USB charging
(remember the battery charge current is equal to the chage rate minus the
current draw of the rest of the circuit)

STAT Pins:
PIC needs to check STAT1 and STAT2 to make sure that the precharge is not
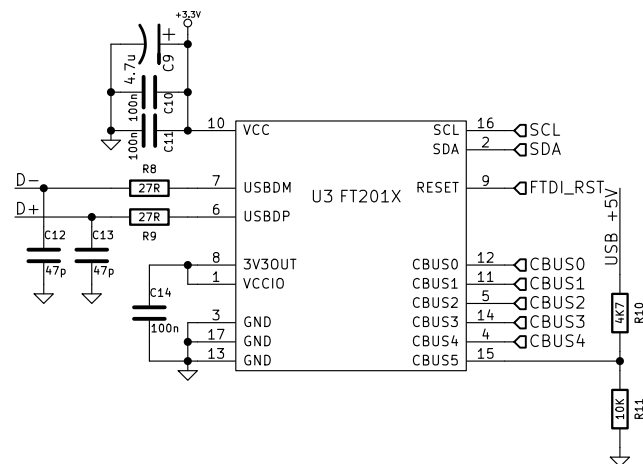going - If it is it should go into a low power state

Output Voltage:
$Vout=0.5V*(1+(R1/R2))$

Where:
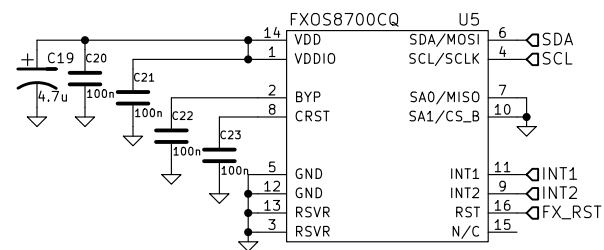$R1+R2<=1M$ ohm
Internal reference voltage Vref=0.5V (typ.)

The output voltage is determined by:
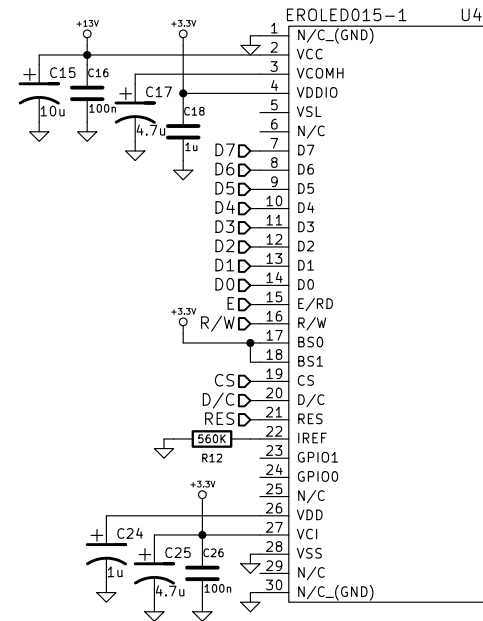$Vout=Vref*((R1/R2)+1)$

Where:
Vref=1.24V
R1=R6
R2=R7

U1 BQ25010

Pin	Name
5	AC
9	VSS
3	VSS
18	VSS
21	Ex_Pad
6	USB
7	STAT1
8	STAT2
4	EN
1	N/C
11	N/C
10	N/C
14	nPG
19	SW
2	FB
15	nCE
16	BAT/OUT
17	BAT/OUT
12	ISET1
13	ISET2
20	FPWM

U2 MIC2290

U3 FT201X

CONN_6 P1

D-
D+

USB +5V
TP10
TP11
TP9

I1 10uH
I2 10uH

R4 560K
R5 100K
R1 1K
R2 0R
R3 0R
R6 27K
R7 2K8
R8 27R
R9 27R
R10 4K7
R11 10K

C1 10u
C6 100n
C2 4.7u
C3 10u
C4 27p
C5 180p
C7 1u
C8 10u
C9 4.7u
C10 100n
C11 100n
C12 47p
C13 47p
C14 100n

BT1 LiPoly 1S1P

+3.3V
+13V

SCL
SDA
FTDI_RST
CBUS0
CBUS1
CBUS2
CBUS3
CBUS4

Boost-En

File: USB-Power.sch
Sheet: /USB/Power/
Title:
Size: A4   Date: 24 jun 2016   Rev:
KiCad E.D.A.   Id: 2/3

U5 — FXOS8700CQ

Pin	Name		Name	Pin
14	VDD	SDA/MOSI	6	SDA
1	VDDIO	SCL/SCLK	4	SCL
2	BYP	SA0/MISO	7	
8	CRST	SA1/CS_B	10	
5	GND	INT1	11	INT1
12	GND	INT2	9	INT2
13	RSVR	RST	16	FX_RST
3	RSVR	N/C	15	

C19 4.7u C20 100n C21 100n C22 100n C23 100n

SA0 and SA1 select the address for the chip on the I2C bus as follows:
SA0=0 | SA1=0 | address=0x1E
SA0=0 | SA1=1 | address=0x1D
SA0=1 | SA1=0 | address=0x1C
SA0=1 | SA1=1 | address=0x1F

U4 — EROLED015-1

+13V   +3.3V
C15 10u C16 100n C17 4.7u C18 1u

Pin	Name
1	N/C_(GND)
2	VCC
3	VCOMH
4	VDDIO
5	VSL
6	N/C
7	D7
8	D6
9	D5
10	D4
11	D3
12	D2
13	D1
14	D0
15	E/RD
16	R/W
17	BS0
18	BS1
19	CS
20	D/C
21	RES
22	IREF
23	GPIO1
24	GPIO0
25	N/C
26	VDD
27	VCI
28	VSS
29	N/C
30	N/C_(GND)

D7 D6 D5 D4 D3 D2 D1 D0 E
R/W +3.3V
CS D/C RES
R12 560K
+3.3V
C24 1u C25 4.7u C26 100n

BS0 and BS1 set the communication protocol:
BS0=1 | BS1=0 | CP=3-wire SPI
BS0=0 | BS1=0 | CP=4-wire SPI
BS0=1 | BS1=1 | CP=68XX-parallel (8-bit)
BS0=0 | BS1=1 | CP=80XX-parallel (8-bit)