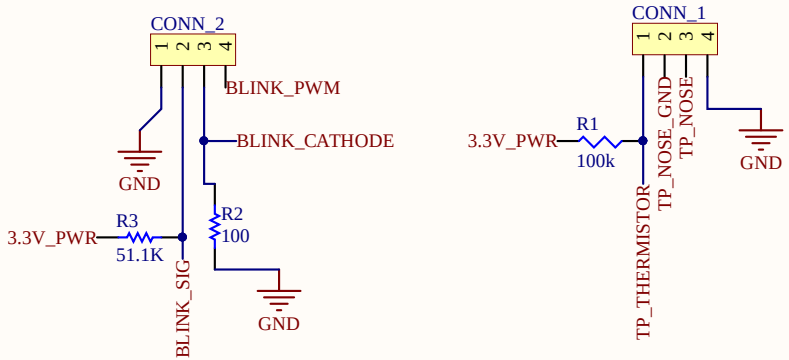
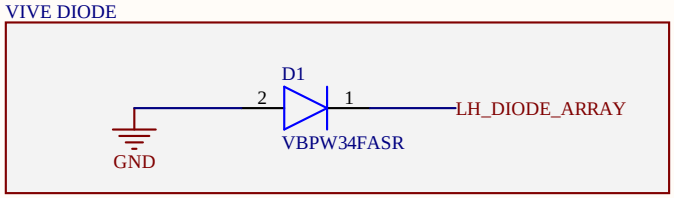
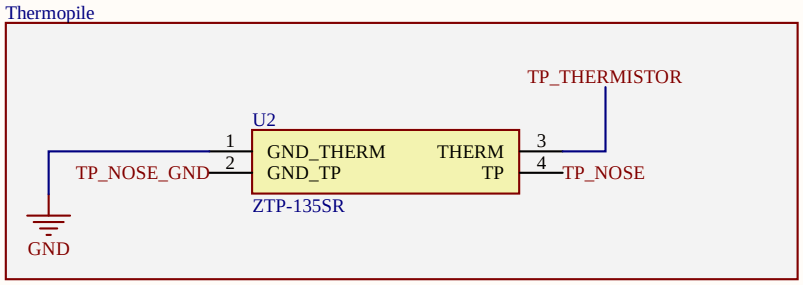
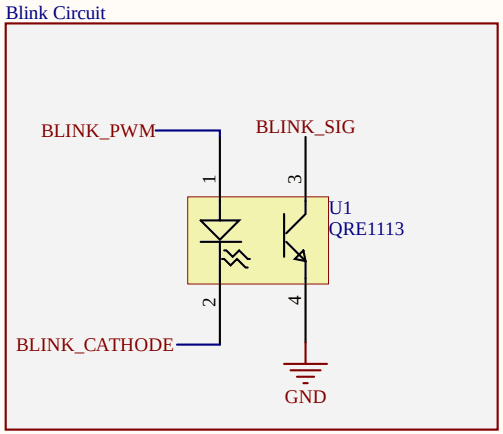




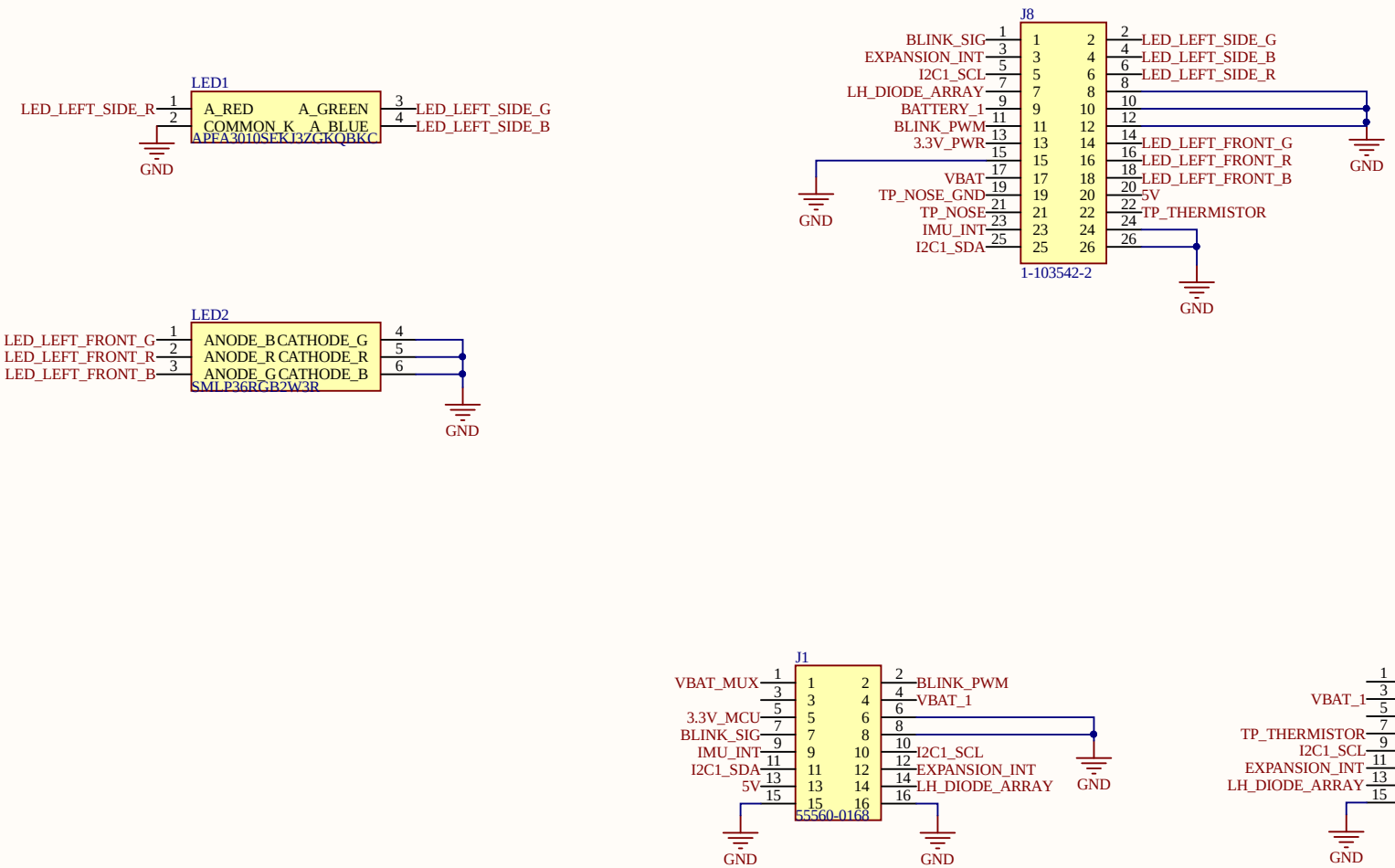


- need to check power at eye (harmful levels)
 - check gain circuit necessary, part variability, placements

LED Circuit :
-The LEDs will be powered via VBAT where the shift registers will either pull the cathode to VBAT or GND.
-Even though powering with VBAT, the comms at 3.3V are still within spec and should work

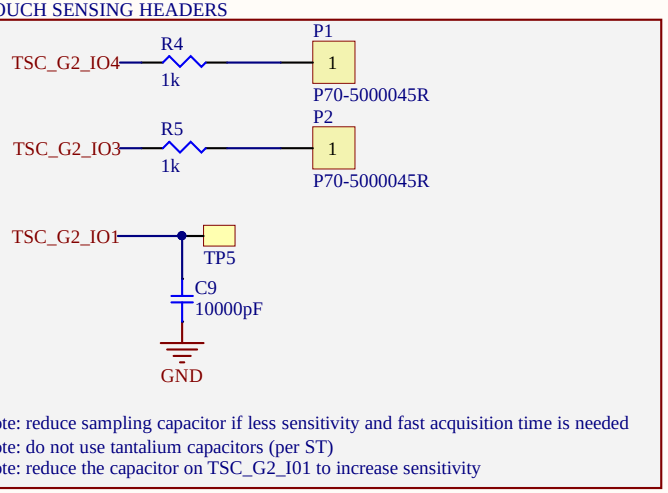


Title: FRONT BOARD		
Size: A	Number:	Revision:
Date: 8/29/2019		Sheet of
File: C:\Users\..\Sch_front.SchDoc		Drawn By: PATRICK CHWALEK

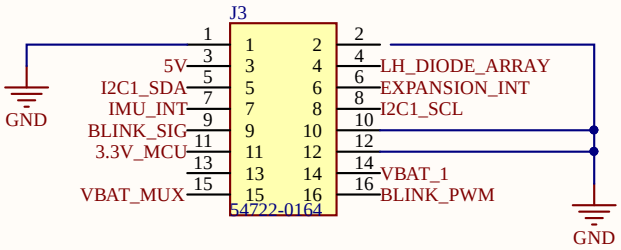


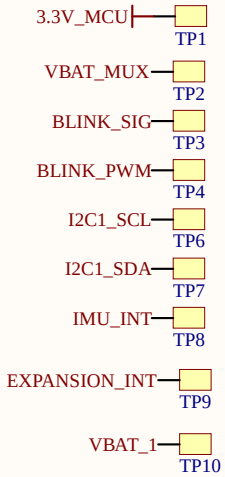
Title		
Size: Letter	Number	Revision
Date: 8/29/2019		Sheet of
File: C:\Users\..\Sch_front_led.SchDoc		Drawn By: PATRICK CHWALEK

TOUCH SENSING HEADERS

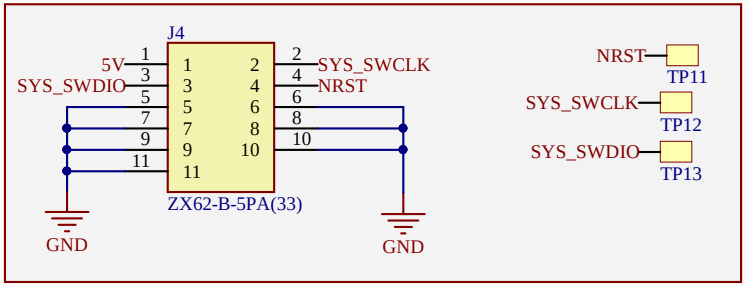


Note: reduce sampling capacitor if less sensitivity and fast acquisition time is needed
Note: do not use tantalium capacitors (per ST)
Note: reduce the capacitor on TSC_G2_I01 to increase sensitivity

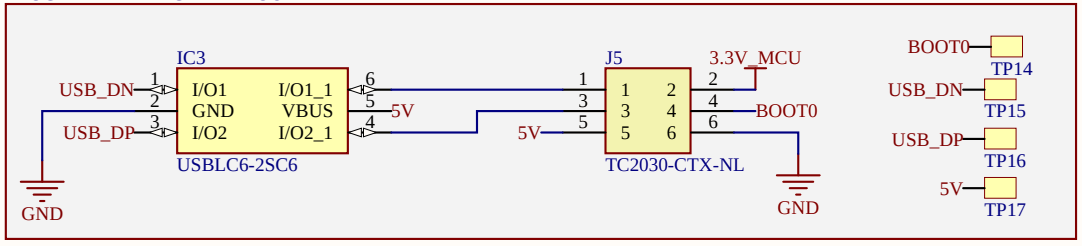




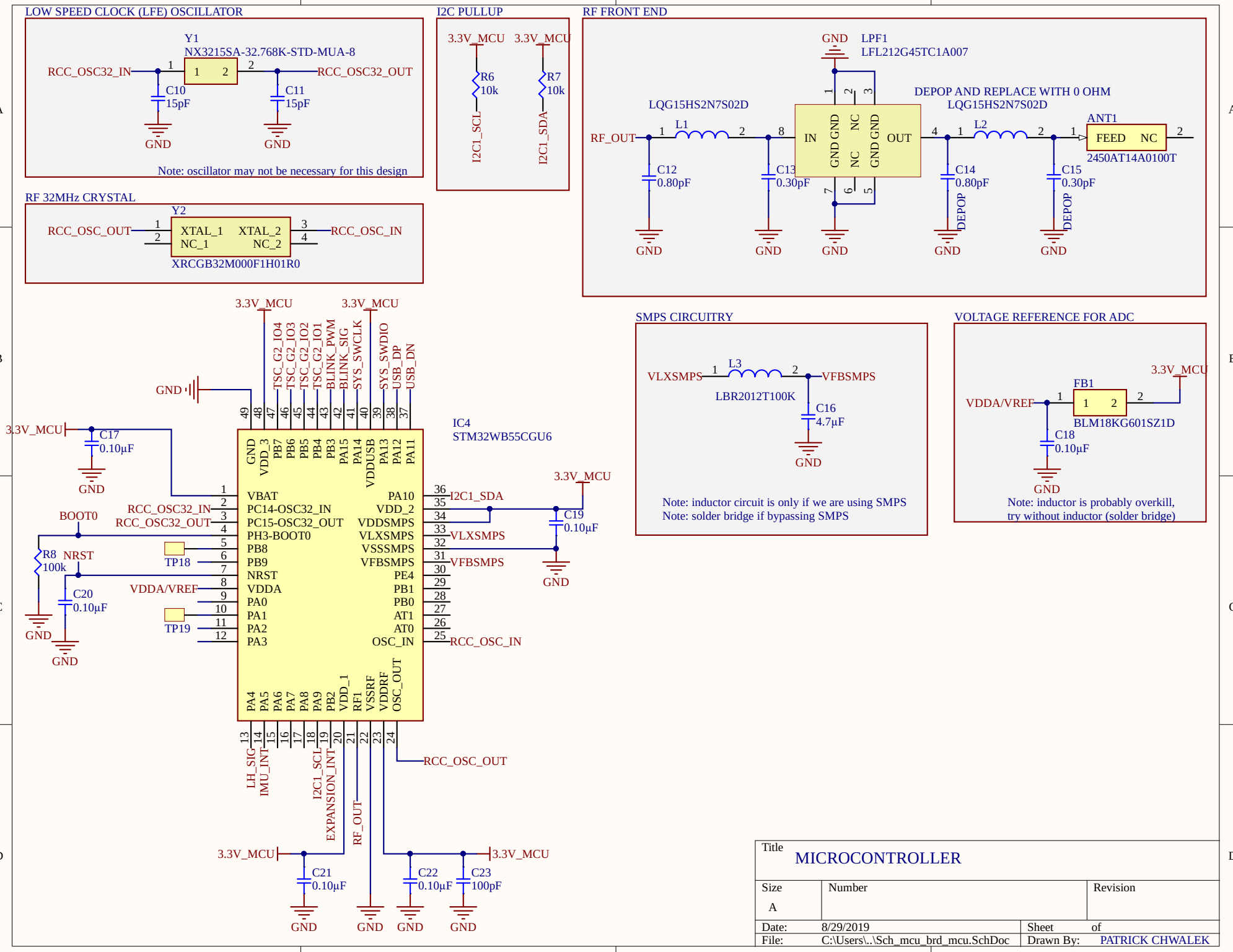
PROGRAMMER USB BREAKOUT



PROGRAMMER TAG BREAKOUT



Title: EXTERNAL CONNECTORS		
Size: A	Number:	Revision:
Date: 8/29/2019		Sheet of
File: C:\Users\..\Sch_mcu_brd_external_connectors.SchDoc		Drawn By: PATRICK CHWALEK


LOW SPEED CLOCK (LFE) OSCILLATOR
Y1
NX3215SA-32.768K-STD-MUA-8
RCC_OSC32_IN
RCC_OSC32_OUT
C10
15pF
C11
15pF
GND
Note: oscillator may not be necessary for this design
I2C PULLUP
3.3V_MCU
R6
10k
R7
10k
I2C1_SCL
I2C1_SDA
RF FRONT END
LPF1
LFL212G45TC1A007
LQG15HS2N7S02D
DEPOP AND REPLACE WITH 0 OHM
RF_OUT
L1
L2
IN
OUT
C12
0.80pF
C13
0.30pF
C14
0.80pF
C15
0.30pF
DEPOP
ANT1
FEED
NC
2450AT14A0100T
RF 32MHz CRYSTAL
Y2
RCC_OSC_OUT
RCC_OSC_IN
XTAL_1
XTAL_2
NC_1
NC_2
XRCGB32M000F1H01R0
IC4
STM32WB55CGU6
VBAT
PC14-OSC32_IN
PC15-OSC32_OUT
PH3-BOOT0
PB8
PB9
NRST
VDDA
PA0
PA1
PA2
PA3
PA10
VDD_2
VDDSMPS
VLXSMPS
VSSSMPS
VFBSMPS
PE4
PB1
PB0
AT1
AT0
OSC_IN
C17
0.10µF
C19
0.10µF
C20
0.10µF
R8
100k
BOOT0
NRST
TP18
TP19
C21
0.10µF
C22
0.10µF
C23
100pF
SMPS CIRCUITRY
L3
LBR2012T100K
C16
4.7µF
Note: inductor circuit is only if we are using SMPS
Note: solder bridge if bypassing SMPS
VOLTAGE REFERENCE FOR ADC
FB1
BLM18KG601SZ1D
C18
0.10µF
Note: inductor is probably overkill,
try without inductor (solder bridge)
Title
MICROCONTROLLER
Size
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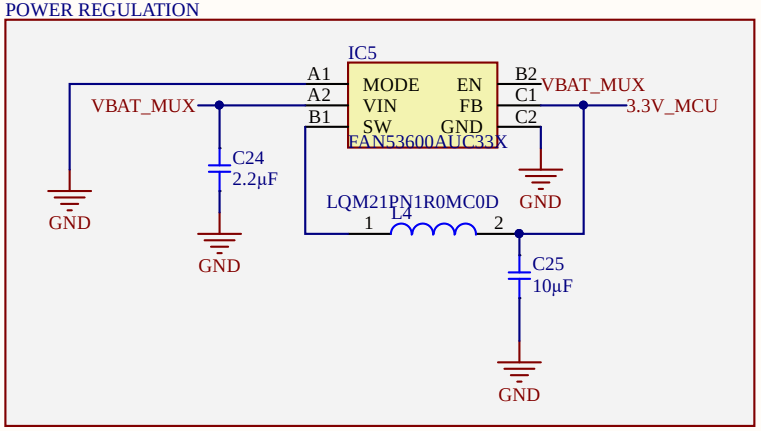
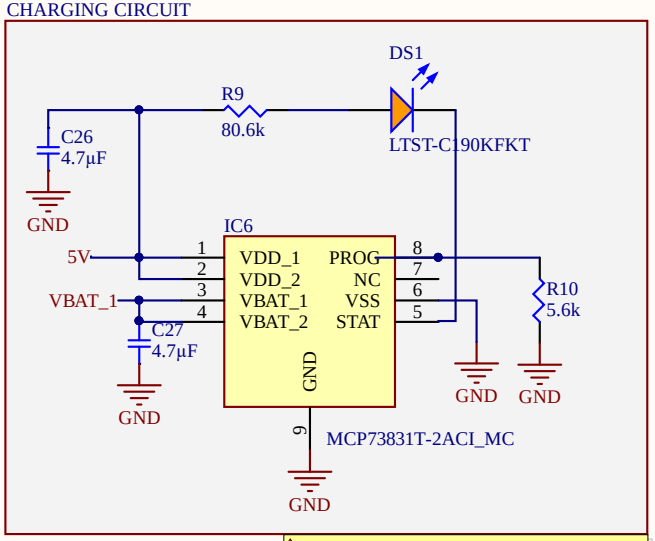
Number
Revision
Date:
8/29/2019
Sheet
of
File:
C:\Users\..\Sch_mcu_brd_mcu.SchDoc
Drawn By:
PATRICK CHWALEK

POWER REGULATION

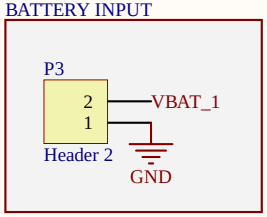


CHARGING CIRCUIT



Charge Current : 1000V / 5.6k = 178mA

BATTERY INPUT



Title	POWER		
Size	Number		Revision
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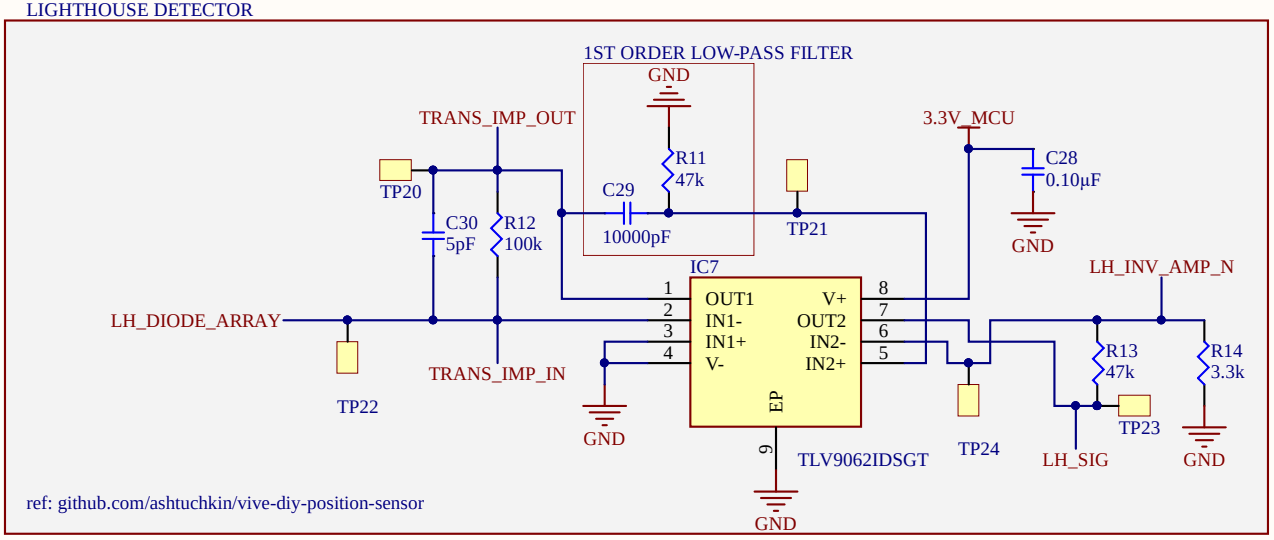
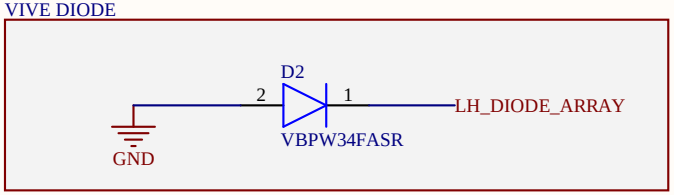
Date:	8/29/2019	Sheet	of
File:	C:\Users\..\Sch_mcu_brd_pwr.SchDoc	Drawn By:	PATRICK CHWALEK

LIGHTHOUSE DETECTOR

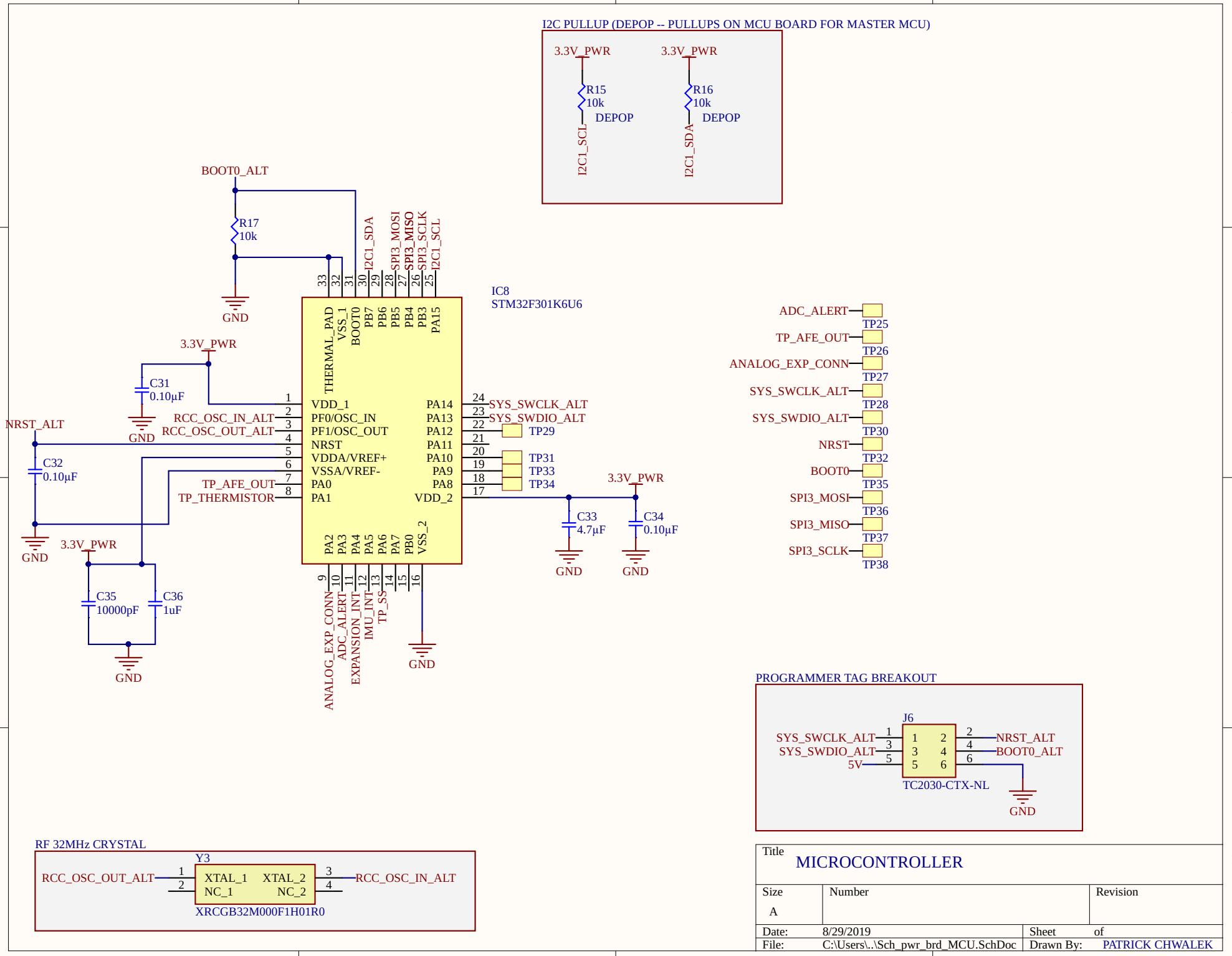


TLV9062IDSGT is an alternative (Smaller)

VIVE DIODE



Title: SENSORS		
Size: A	Number:	Revision:
Date: 8/29/2019	Sheet of	
File: C:\Users\..\Sch_mcu_brd_sensors.SchDoc	Drawn By: PATRICK CHWALEK	


I2C PULLUP (DEPOP -- PULLUPS ON MCU BOARD FOR MASTER MCU)
3.3V_PWR
R15
10k
DEPOP
I2C1_SCL
3.3V_PWR
R16
10k
DEPOP
I2C1_SDA
BOOT0_ALT
R17
10k
GND
IC8
STM32F301K6U6
THERMAL_PAD
VSS_1
BOOT0
PB7
PB6
PB5
PB4
PB3
PA15
I2C1_SDA
SPI3_MOSI
SPI3_MISO
SPI3_SCLK
I2C1_SCL
3.3V_PWR
C31
0.10µF
GND
NRST_ALT
C32
0.10µF
GND
VDD_1
PF0/OSC_IN
PF1/OSC_OUT
NRST
VDDA/VREF+
VSSA/VREF-
PA0
PA1
RCC_OSC_IN_ALT
RCC_OSC_OUT_ALT
TP_AFE_OUT
TP_THERMISTOR
PA14
PA13
PA12
PA11
PA10
PA9
PA8
VDD_2
SYS_SWCLK_ALT
SYS_SWDIO_ALT
TP29
TP31
TP33
TP34
3.3V_PWR
C33
4.7µF
GND
C34
0.10µF
GND
3.3V_PWR
C35
10000pF
C36
1uF
GND
PA2
PA3
PA4
PA5
PA6
PA7
PB0
VSS_2
ANALOG_EXP_CONN
ADC_ALERT
EXPANSION_INT
IMU_INT
TP_SS
GND
ADC_ALERT
TP_AFE_OUT
ANALOG_EXP_CONN
SYS_SWCLK_ALT
SYS_SWDIO_ALT
NRST
BOOT0
SPI3_MOSI
SPI3_MISO
SPI3_SCLK
TP25
TP26
TP27
TP28
TP30
TP32
TP35
TP36
TP37
TP38
PROGRAMMER TAG BREAKOUT
J6
SYS_SWCLK_ALT
SYS_SWDIO_ALT
5V
NRST_ALT
BOOT0_ALT
TC2030-CTX-NL
GND
RF 32MHz CRYSTAL
Y3
RCC_OSC_OUT_ALT
XTAL_1
XTAL_2
NC_1
NC_2
RCC_OSC_IN_ALT
XRCGB32M000F1H01R0
Title
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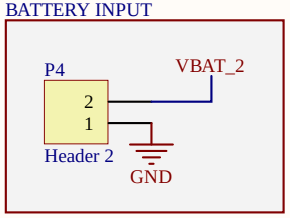
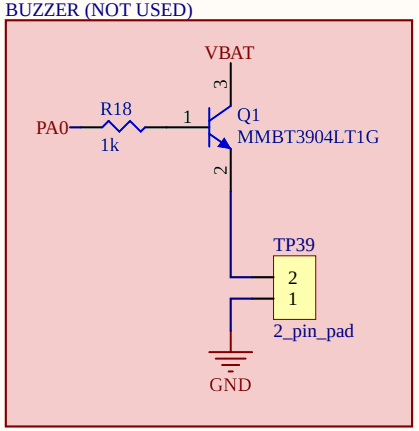
Number
Revision
Date: 8/29/2019
Sheet of
File: C:\Users\..\Sch_pwr_brd_MCU.SchDoc
Drawn By: PATRICK CHWALEK

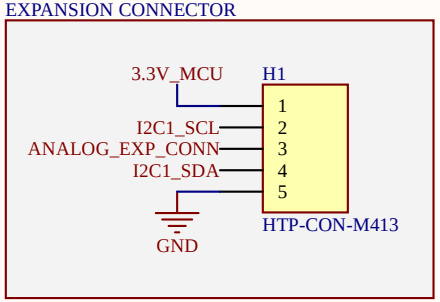
BATTERY INPUT



BUZZER (NOT USED)

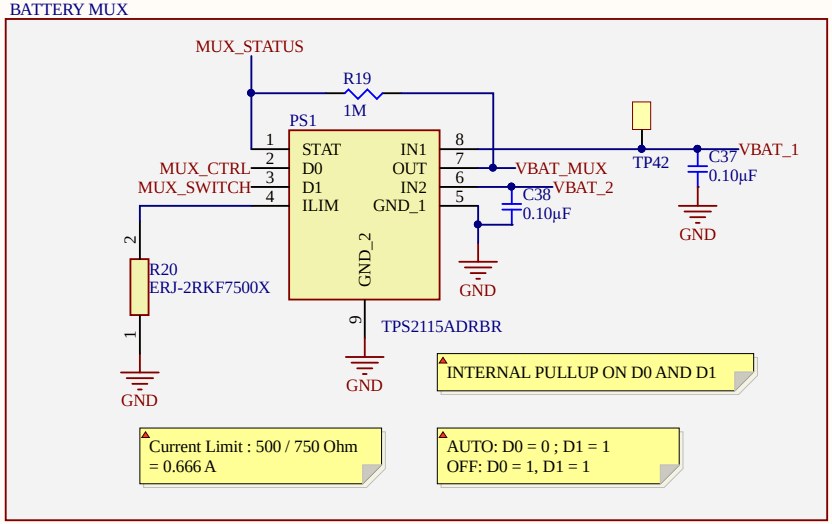


EXPANSION CONNECTOR

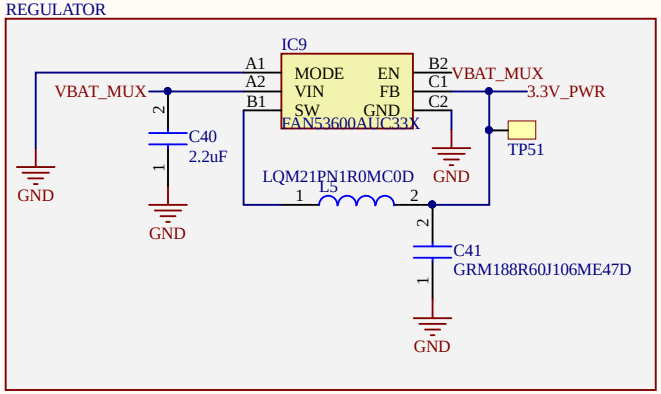


Title	POWER		
Size	Number		Revision
A			
Date:	8/29/2019	Sheet	of
File:	C:\Users\..\Sch_pwr_brd_pwr.SchDoc	Drawn By:	PATRICK CHWALEK

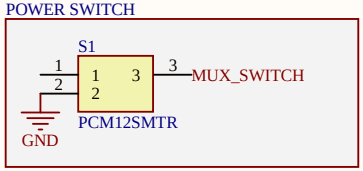
BATTERY MUX



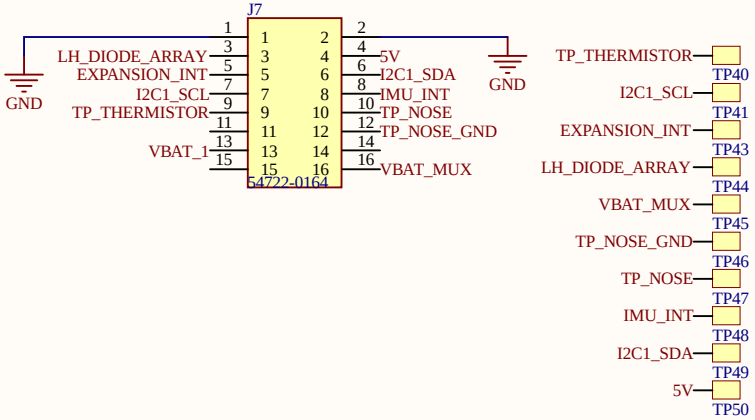
REGULATOR



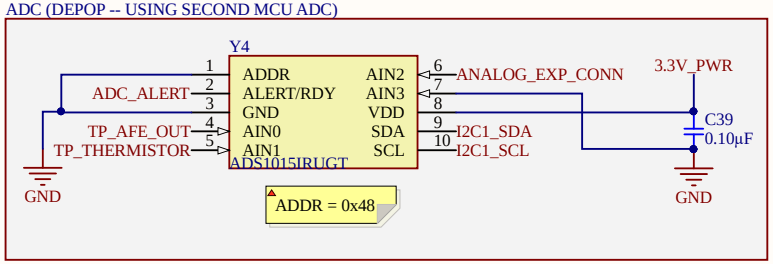
POWER SWITCH



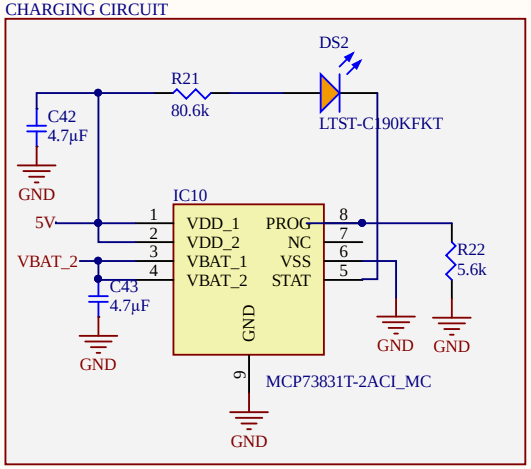
J7



ADC (DEPOP -- USING SECOND MCU ADC)



CHARGING CIRCUIT



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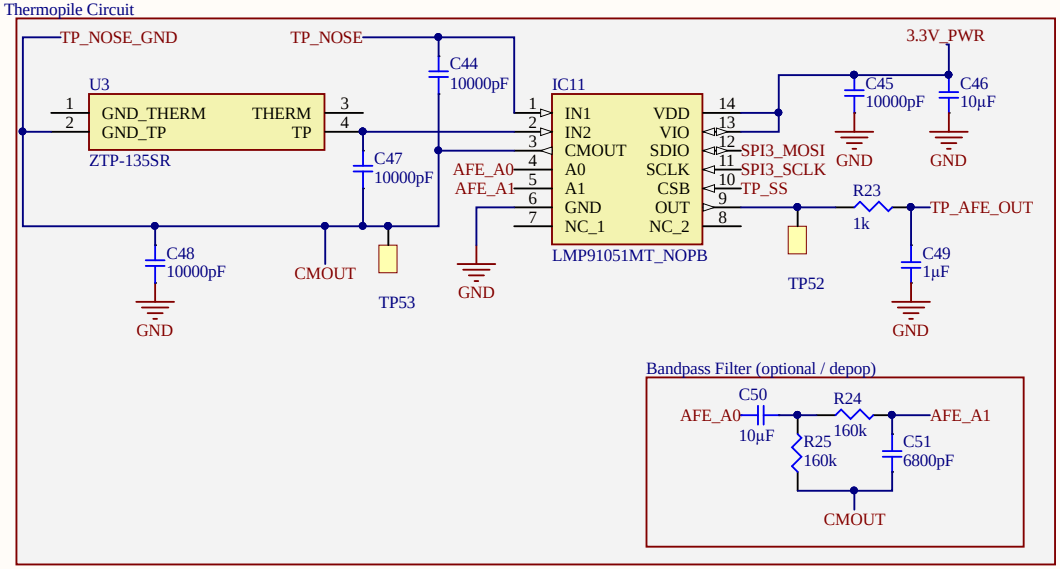
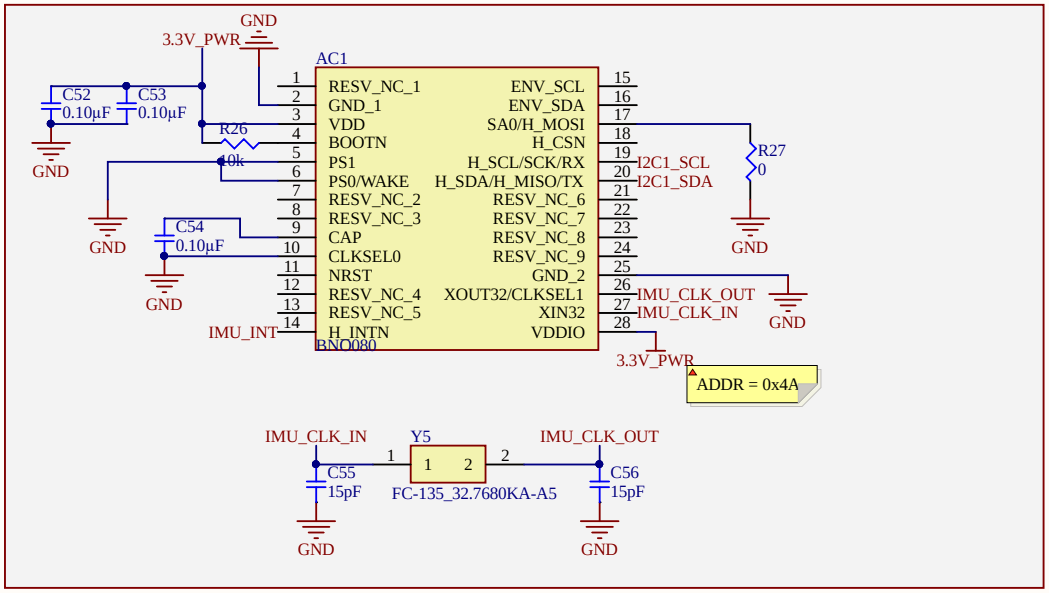
Size: Letter	Number:	Revision:
Date: 8/29/2019	Sheet: of	
File: C:\Users\..\Sch_pwr_brd_pwr_sys.SchDoc	Drawn By: PATRICK CHWALEK	

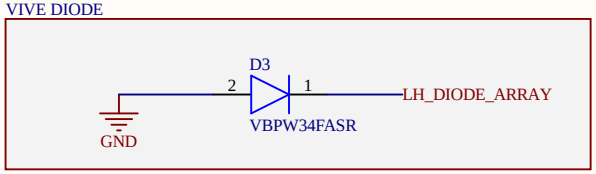
Thermopile Circuit



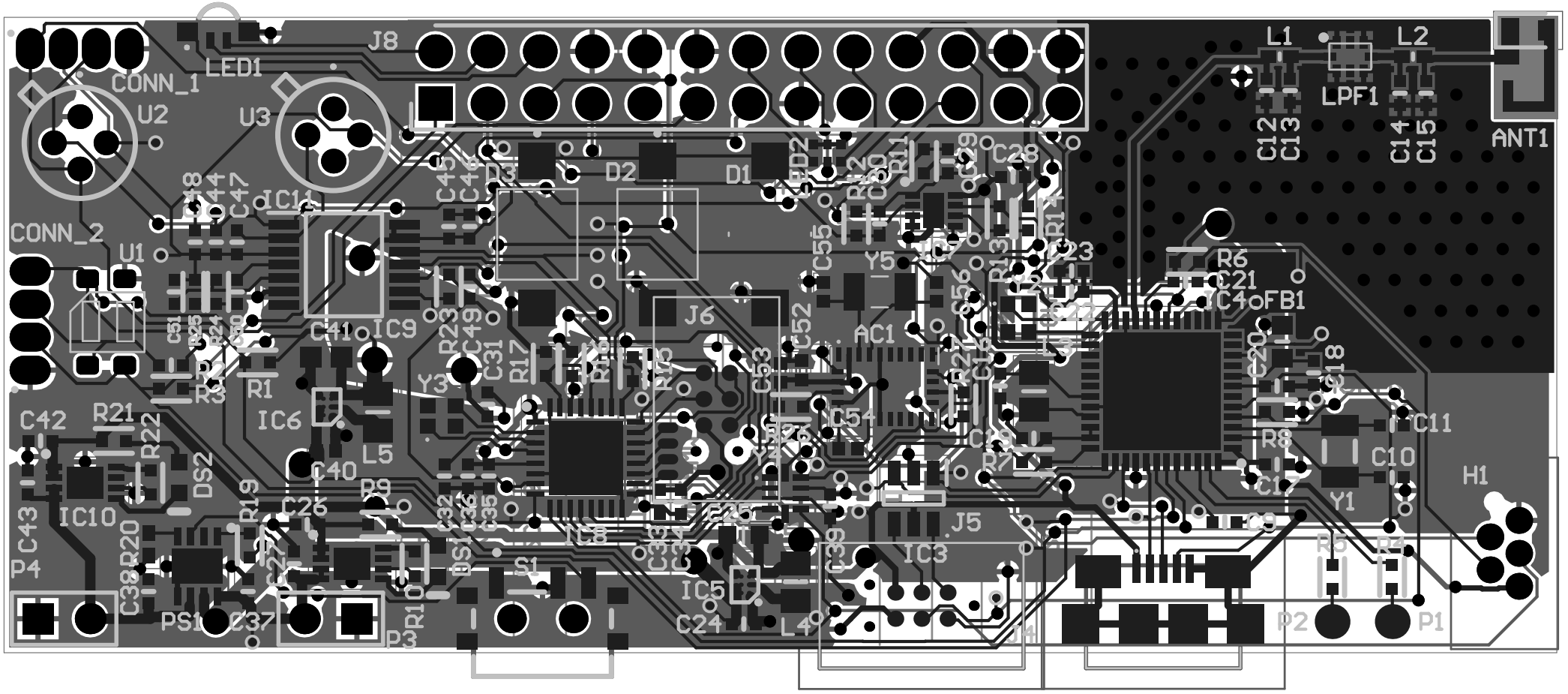
IMU



VIVE DIODE



Title	SENSORS		
Size: Letter	Number		Revision
Date:	8/29/2019	Sheet	of
File:	C:\Users\..\sch_pwr_brd_sensors.SchDoc	Drawn By:	PATRICK CHWALEK


J8
LED1
CONN_1
U2
U3
L1
L2
LPF1
ANT1
C12
C13
C14
C15
CONN_2
U1
IC11
D3
D2
D1
C28
Y5
R6
C21
IC4
FB1
J6
AC1
C41
IC9
Y3
IC6
L5
C40
C42
R21
R22
DS2
IC10
C43
P4
C38
R20
PS1
C37
P3
R10
IC8
S1
IC5
C24
L4
J5
IC3
C11
C10
H1
Y1
R8
C17
R5
R4
P2
P1
C18
C20

Line #	Name	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Num
	THERMO		CONN_1	1		
	BLINK		CONN_2	1		
	HTP-CON-M413		H1	1		
	LFL212G45TC1A007		LPF1	1	Murata	LFL212G45TC1A007
	P70-5000045R		P1, P2	2	Harwin	P70-5000045R
	100		R2	1	Vishay Dale	CRCW0402100RFKED
	51.1K		R3	1	Vishay	CRCW040251K1FKED
	TestPoint		TP1, TP2, TP	52		
	2_pin_pad		TP39	1		
	BNO080	Accelerometer	AC1	1	Hillcrest Laborato	BNO080
	2450AT14A0100T	Antenna	ANT1	1	Johanson	2450AT14A0100T
	0.10µF	CAP CER 0.1UF 16V X7R 0402	C17, C18, C1	16	Murata	GRM155R61E104KA87
	0.30pF	CAP CER 0.3PF 50V NP0 0402	C13, C15	2	Murata	GRM1555C1HR30WA0
	0.80pF	CAP CER 0.8PF 50V NP0 0402	C12, C14	2	Murata	GRM1555C1HR80BA01
	1µF	CAP CER 1UF 10V X7S 0402	C49	1	Murata	GRM155R61A105KE15
	1uF	CAP CER 1UF 0402	C36	1	Murata	GRM155R61A105KE15
	2.2µF	CAP CER 2.2UF 6.3V X5R 0402	C24	1	KEMET	C0402C225M9PACTU
	4.7µF	CAP CER 4.7UF 4V X5R 0402	C16, C26, C2	6	Murata	GRM155R60J475ME47
	5pF	CAP CER 5PF 50V NP0 0402	C30	1	Murata	GRM1555C1H5R0CA01
	10µF	CAP CER 10UF 6.3V X5R 0402	C46, C50	2	Taiyo Yuden	AMK105CBJ106MV-F
	10µF	CAP CER 10UF 6.3V X5R 0603	C25	1	Taiyo Yuden	AMK105CBJ106MV-F
	15pF	CAP CER 15PF 50V NP0 0402	C10, C11, C5	4	Kyocera AVX	04025A150JAT2A
	100pF	CAP CER 100PF 50V NP0 0402	C23	1	KEMET	C0402C101J5GACTU
	6800pF	CAP CER 6800PF 25V X7R 0402	C51	1	Kyocera AVX	04023C682KAT2A
	10000pF	CAP CER 10000PF 50V X7R 0402	C9, C29, C35	7	Vishay	VJ0402Y103KXJCW1BC
	2.2uF	Capacitor	C40	1	KEMET	C0402C225M9PACTU
	GRM188R60J106ME47D	Capacitor	C41	1	Murata	GRM188R60J106ME47
	55560-0168	Connector	J1, J2	2	Molex	55560-0168
	54722-0164	Connector	J3	1	Molex	54722-0164
	ZX62-B-5PA(33)	Connector	J4	1	Hirose	ZX62-B-5PA(33)
	TC2030-CTX-NL	Connector	J5, J6	2		
	54722-0164	Connector	J7	1	Molex	54722-0164
	1-103542-2	Connector	J8	1		
	NX3215SA-32.768K-STD-MUA-8	Crystal or Oscillator	Y1	1	NDK	NX3215SA-32.768K-S
	XRCGB32M000F1H01R0	Crystal or Oscillator	Y2, Y3	2	Murata	XRCGB32M000F1H01R
	ADS1015IRUGT	Crystal or Oscillator	Y4	1	Texas Instrument	ADS1015IRUGT
	FC-135_32.7680KA-A5	Crystal or Oscillator	Y5	1	Epson	FC-13532.7680KA-A5
	VBPW34FASR	Diode	D1, D3	2	Vishay	VBPW34FASR
	VBPW34FASR	Diode	D2	1	Vishay	VBPW34FASR
	BLM18KG601SZ1D	Ferrite Bead	FB1	1	Murata	BLM18KG601SZ1D
	MMBT3904LT1G	General Purpose Transistor, NPN Silicon, 3-Pin SO	Q1	1	ON Semiconducto	MMBT3904LT1G
	Header 2	Header, 2-Pin	P3, P4	2		
	LQG15HS2N7S02D	Inductor	L1, L2	2	Murata	LQG15HS2N7S02D
	LBR2012T100K	Inductor	L3	1	Taiyo Yuden	LBR2012T100K