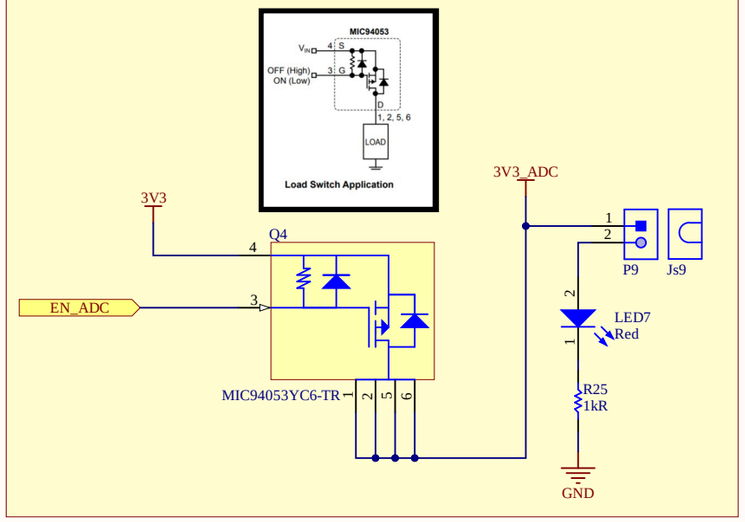
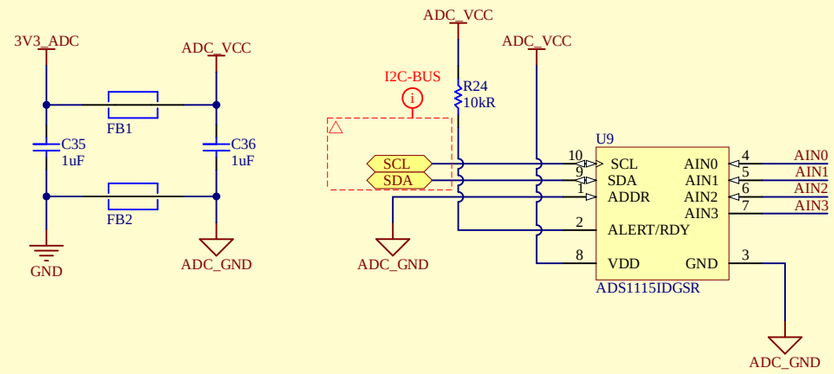
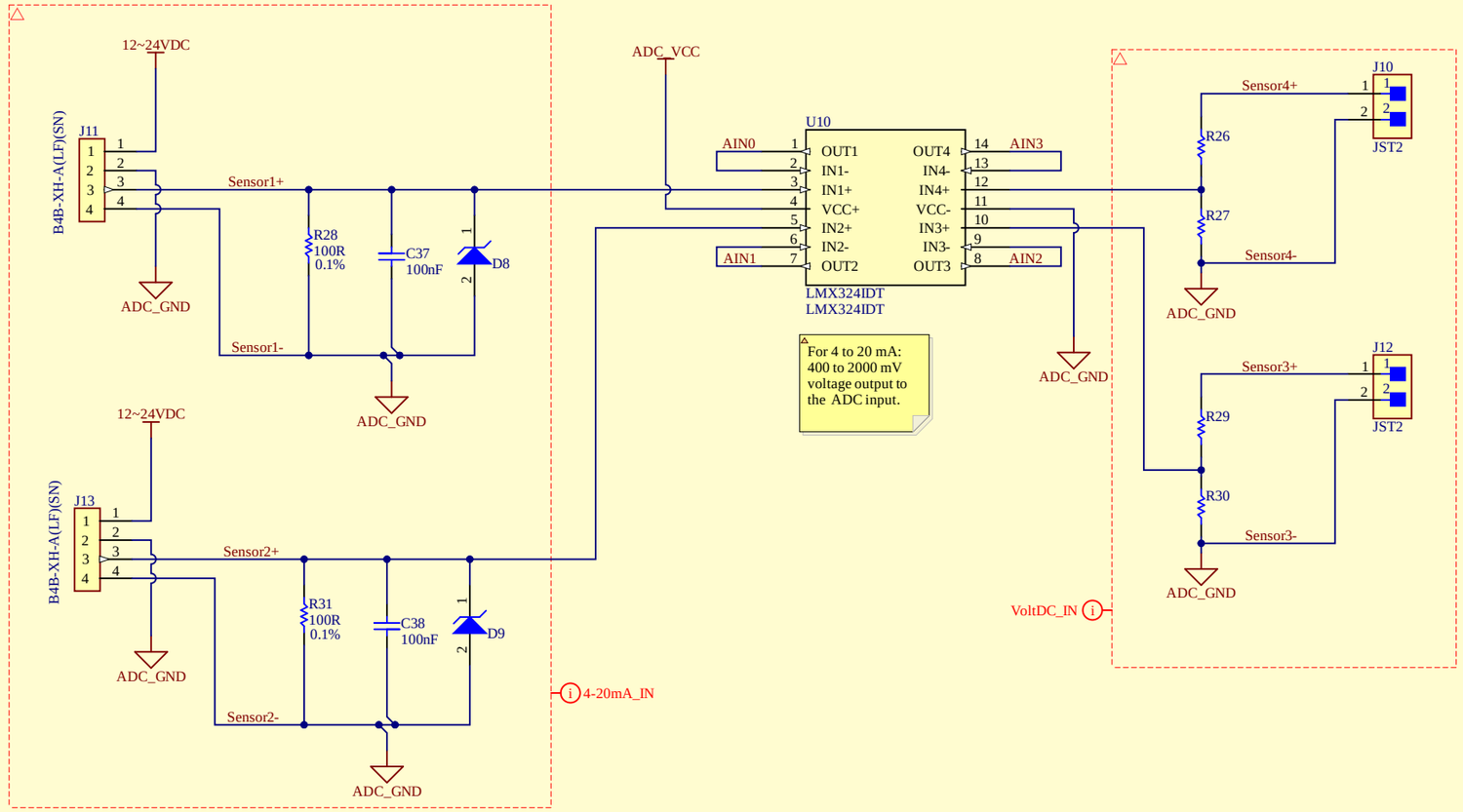
MOSFET ON/OFF ADC



ADC 16 bits



ANALOG INPUTS



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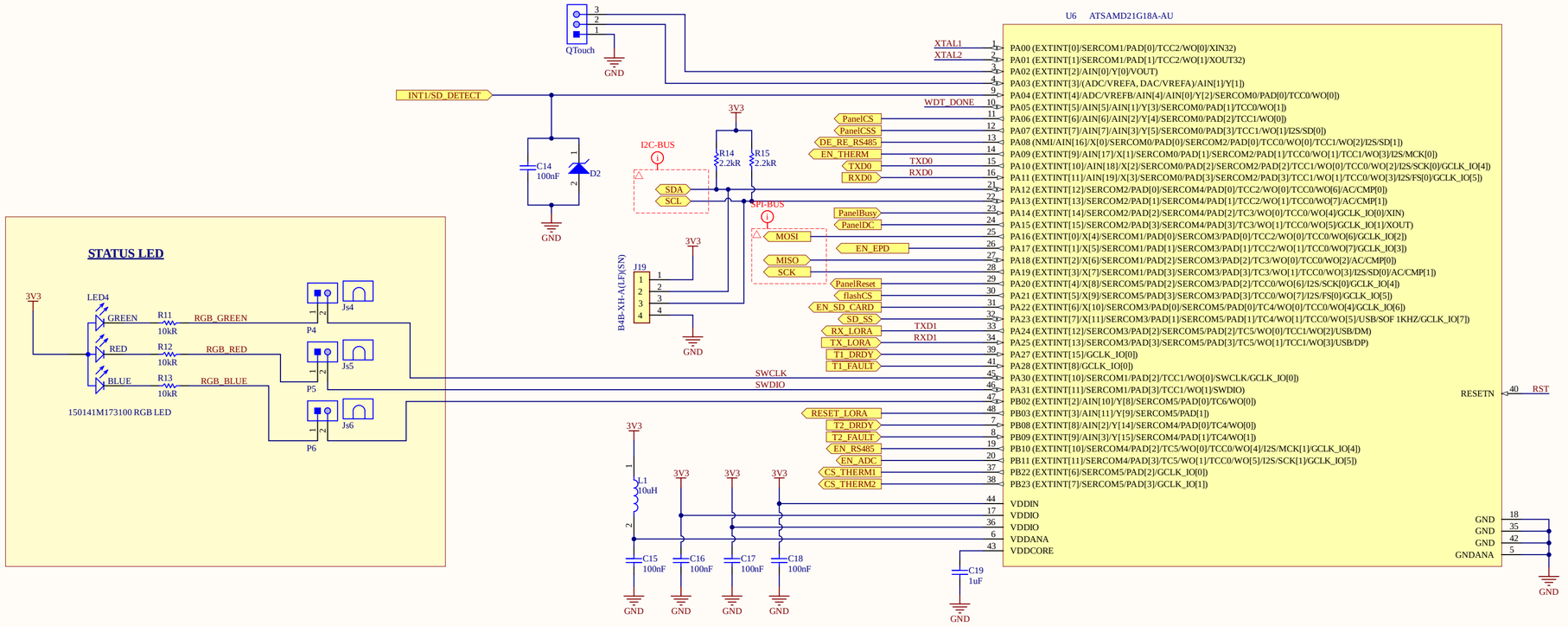

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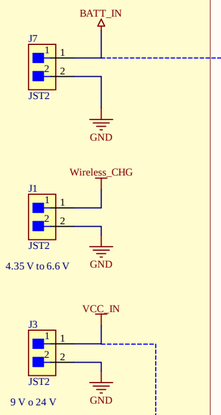
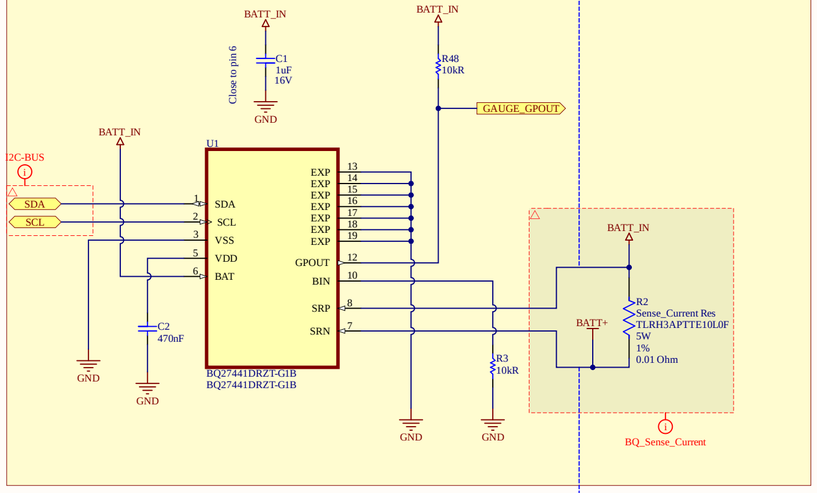
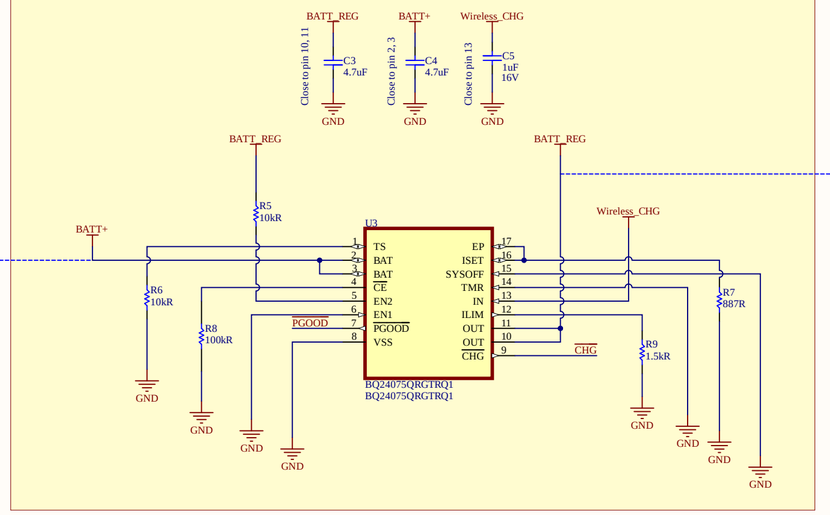
POWER INPUTS



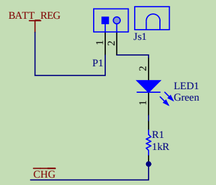
BQ27441 FUEL GAUGE



BQ24075 CHARGER

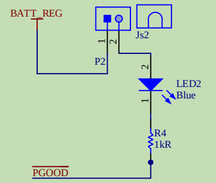


Charging Status Indication Output



CHG pulls to VSS when the battery is charging. CHG is high impedance when charging is complete and when charger is

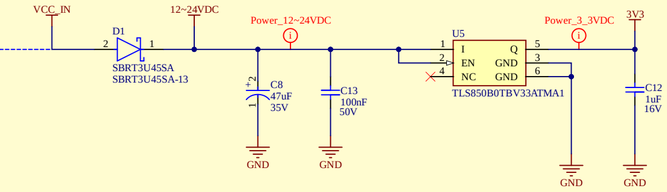
Power Good Status Indication



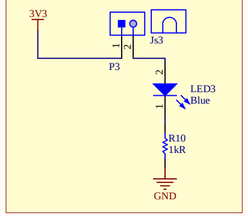
PGOOD pulls to VSS when a valid input source is detected. PGOOD is high-impedance when the input power is not within specified

3.3VDC LDO REGULATOR

24VDC (max) to 3.3VDC LDO REGULATOR



TEST LED



- Supply voltage = 5 V (Wireless charger).
- Fast charge current of approximately 1000 mA; ISET - pin 16
- Input Current Limit = 1.03 A; ILIM - pin 12
- Safety timer duration, Disable, TMR to GND
- TS – Disable

TS - External thermistor.

- Connect TS to 10k NTC thermistor inthe battery pack.
- Connect a 10k resistor to GND if not used.

TMR - Saftey timers

Sets pre-charged and fast charge saftey timers.

1) Leave unconnected to ser default (30 min precharged, 5hr charge time).

2) Connect to GND to dissable.

3)
- R_TMR: 18K72K;
- T_PRE RANGE: 1400-2160 seg
- T_PRE (s) = 0.048 * R_TMR.
- T_MAX = 10 * T_PRE.

ISET - Charge current

Sets the fast charge current.

I_CHG = 885 / R_ISET

EN2	EN1	MAXIMUM INPUT CURRENT INTO IN PIN
0	0	100 mA. USB100 mode
0	1	500 mA. USB500 mode
1	0	Set by an external resistor from ILIM to VSS
1	1	Standby (USB suspend mode)

ILIM

Adjustable Current Limit Programming Input. Connect a 1100-Ω to 8-kΩ resistor from ILIM to VSS to program the maximum input current (EN2=1, EN1=0). The input current includes the system load and the battery charge current. Leaving ILIM unconnected disables all charging.

ILIM = 1550 / R_ILIM

OUT -> BATT_REG

System Supply Output. OUT provides a regulated output when the input is below the OVP threshold and above the regulation voltage. When the input is out of the operation range, OUT is connected to VBAT except when SYSOFF is high. Connect OUT to the system load. Bypass OUT to VSS with a 4.7-µF to 47-µF ceramic capacitor.

Title		
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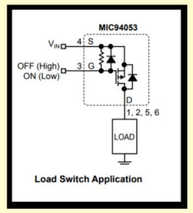
File: C:\Users\..\battery.SchDoc		Drawn By:

MOSFET ON/OFF EPD



3V3
Q3
4
EN_EPD
3
MIC94053YC6-TR
1
2
5
6
3V3_EPD
1
2
P8
Js8
LED6
Red
R23
1kR
GND

3V3_EPD
J8
1
3
2
4
L1
L2
47uH
L2
L3
10uH
C23
470nF
VGL
D6
C24
1uF
GND
D5
D7
GND
Q2
MOSFET N
R22
470mR 1%
EPD1
e-Paper Display
E2154JS0C1
J9
PanelCSS
EPD_CS_S_COG
GDR
RESE
C25
1uF
VDHR
BS
BUSY_COG
RESET_COG
D/C_COG
EPD_CS_M_COG_COG
SPI_CLK_COG
SPI_MOSI_COG
SPI-BUS
PanelBusy
PanelReset
PanelDC
PanelCS
SCK
MOSI
3V3_EPD
C26
1uF
GND
C27
470nF
GND
VDDD
VPP
VDH
VGH
VDL
VGL
VCOM
SHIELD
SHIELD
FH34SRJ-24S-0.5SH(99)
FH34SRJ-24S-0.5SH(99)
C28
1uF
C29
1uF
C30
1uF
C31
1uF
GND

3V3_EPD
C32
470nF
C33
100nF
GND

3V3_EPD
SPI-BUS
flashCS
MISO
U8
CS#
SO/SIO1
WP#
GND
VCC
HOLD#
SCLK
SI/SIO0
SPI_CLK_COG
SPI_MOSI_COG
MX25V8006EM1I-13G
GND
3V3_EPD
C34
100nF
GND

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Size A3	Number		Revision
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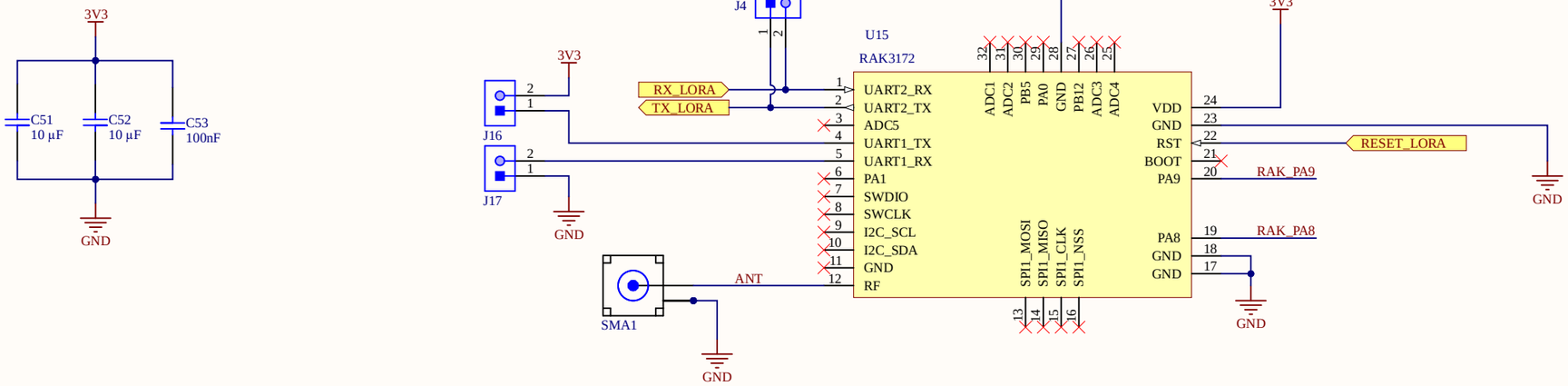

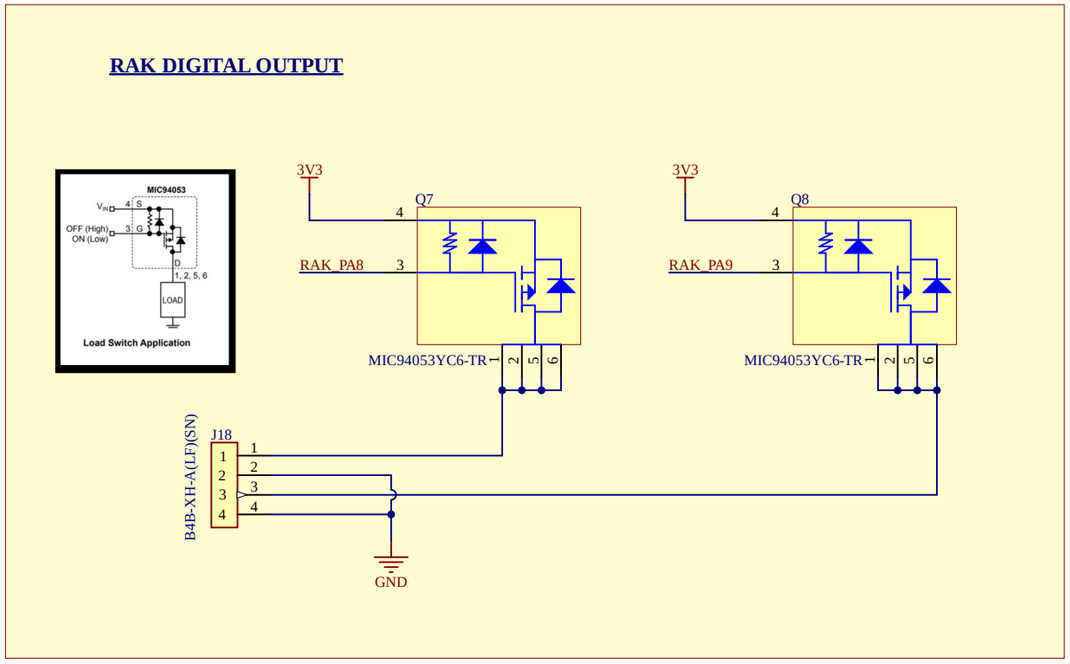

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Date: 2/07/2022	Sheet of	
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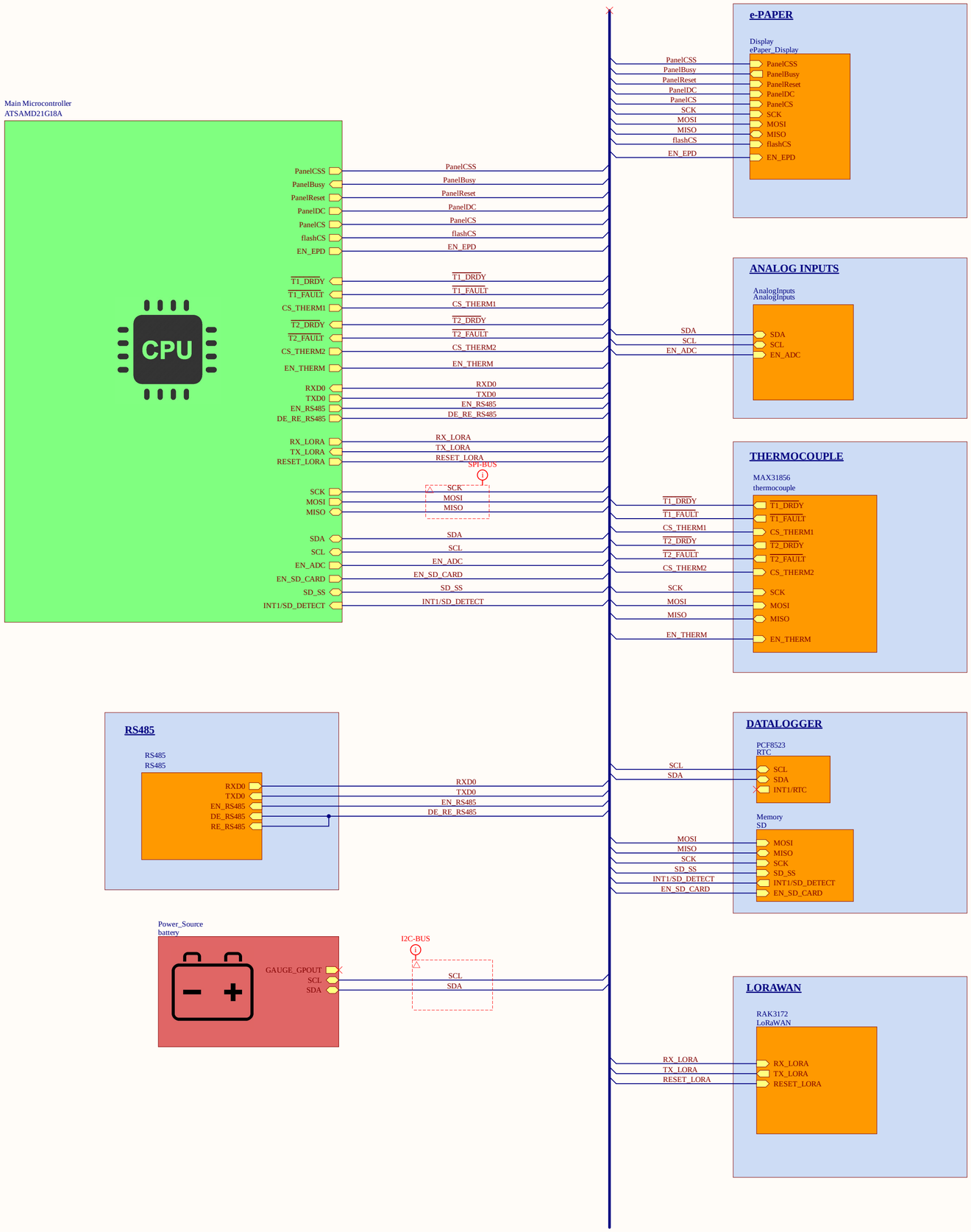

eTrace Client Mixer Client V1

Prototype for the Client in a Concrete Mixer Drum. Is integrated with a HydroMix Compact Probe HC-08.

****
TO DO:
- Finish the 3 LED Connection with a load switch
- Finish the battery gauge.
- 100 uA consuption on the SD Module. Why?

****
NOTES:

****
VERSIONS:

Jonathan

v1.0.0 Initial design.
v1.1.0 Board shape modified. Added protective diodes for battery cells and RGB Led
v1.2.0 Boost connector removed. Replaced by a BTS4142N, with the enable connected to the pin A5 in U0. the PCB now supports a 6S Cell LiPo battery

Sebastian Arboleda:

V2.0 All hardware changed, the eTrace Mixer has two microcontrollers, the main microcontroller has the accelerometer and the Hydromix connected. This microcontroller has all the sensor information. The second microcontroller has a datalogger (SD CARD and RTC chip) and also handles the lorawan communication.

LABEL1

Product number/revision
Serial number

Label PCBA with MAC64 and FCC ID

Title		
Size: A2	Number	Revision
Date: 2/07/2022		Sheet of
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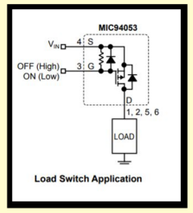
MOSFET ON/OFF RS485



3V3_RS485
3V3
Q6
EN_RS485
MIC94053YC6-TR
P11
Js11
R44
1kR
LED9
Red
GND

RS485

3V3_RS485
C49
100nF
GND
R39
10kR
R40
10kR
R41
10kR
DE_RS485
RE_RS485
TXD0
U13
VCC
DE
RE
DI
GND
RO
A
B
RXD0
R37
10kR
R38
20kR
R42
120R
R43
20kR
AB-RS485
A-RS485
B-RS485
RS485-SP3485
SP3485EN-L

PWR SWTCH

VCC_IN
U14
GND
VBB
IN
OUT
VDD_SENSOR
ITS4141NHUMA1
C50
100nF
D10
P12
Js12
R45
10kR
R46
2.2kR
LED10
Red
R47
1kR

RS485 SENSOR

J15
B4B-XH-A(LF)(SN)
B-RS485
A-RS485

Title		
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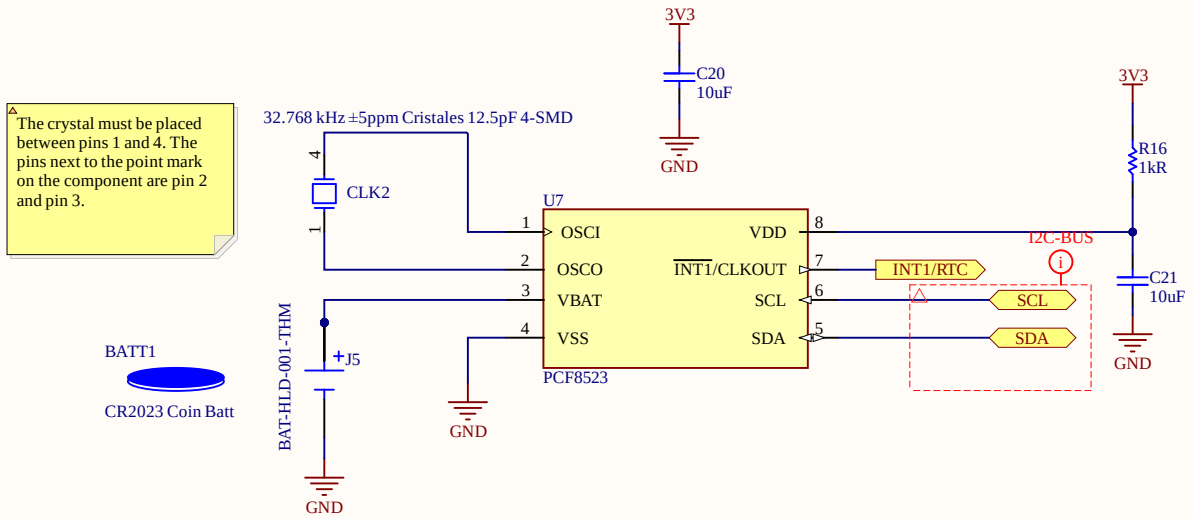
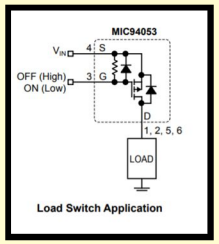
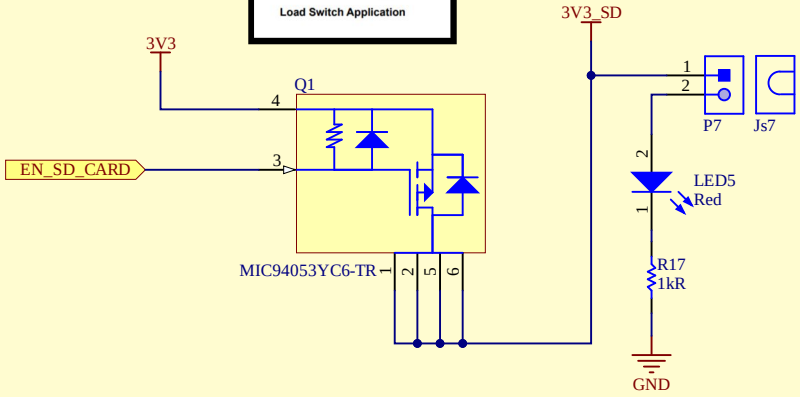
Date: 2/07/2022		Sheet of
File: C:\Users\..\RS485.SchDoc		Drawn By:



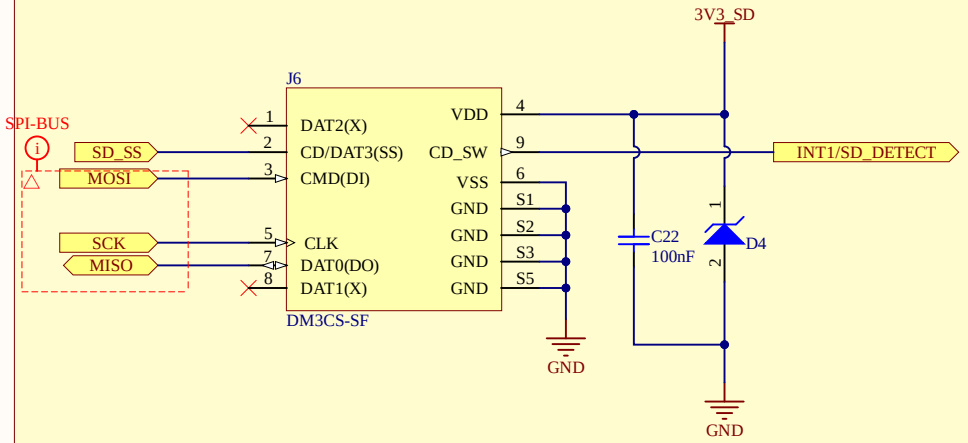
Title		
Size A4	Number	Revision
Date: 2/07/2022		Sheet of
File: C:\Users\..\RTC.SchDoc		Drawn By:

MOSFET ON/OFF SD





SD SOCKET



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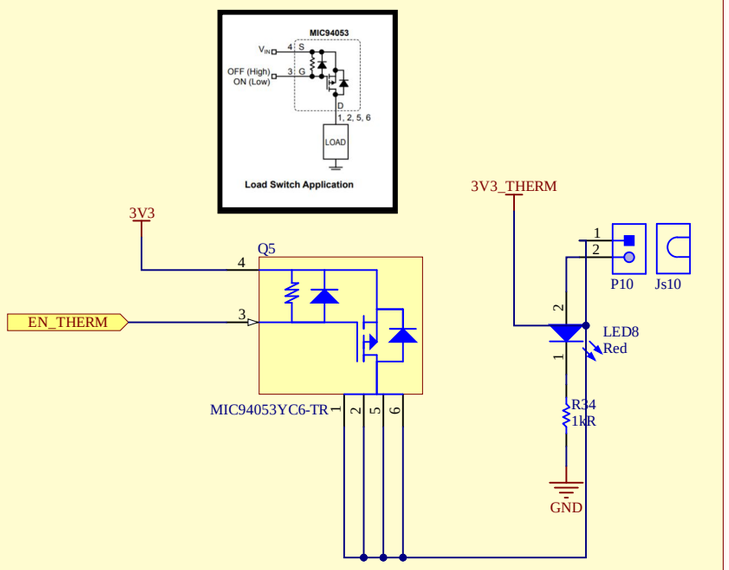
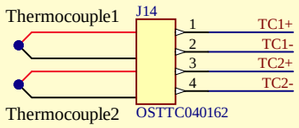
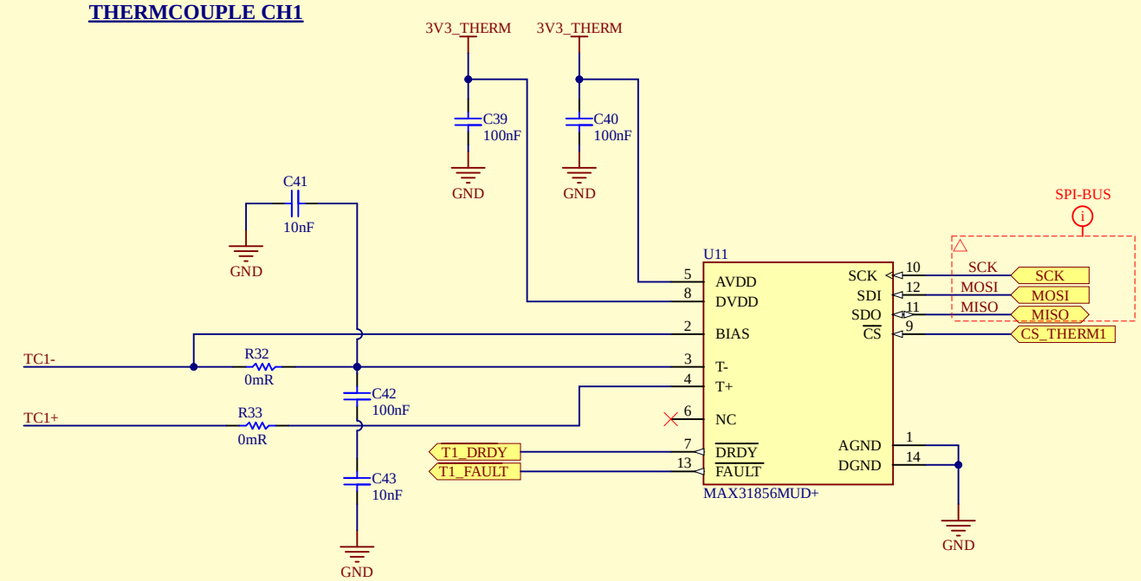
MOSFET ON/OFF EPD



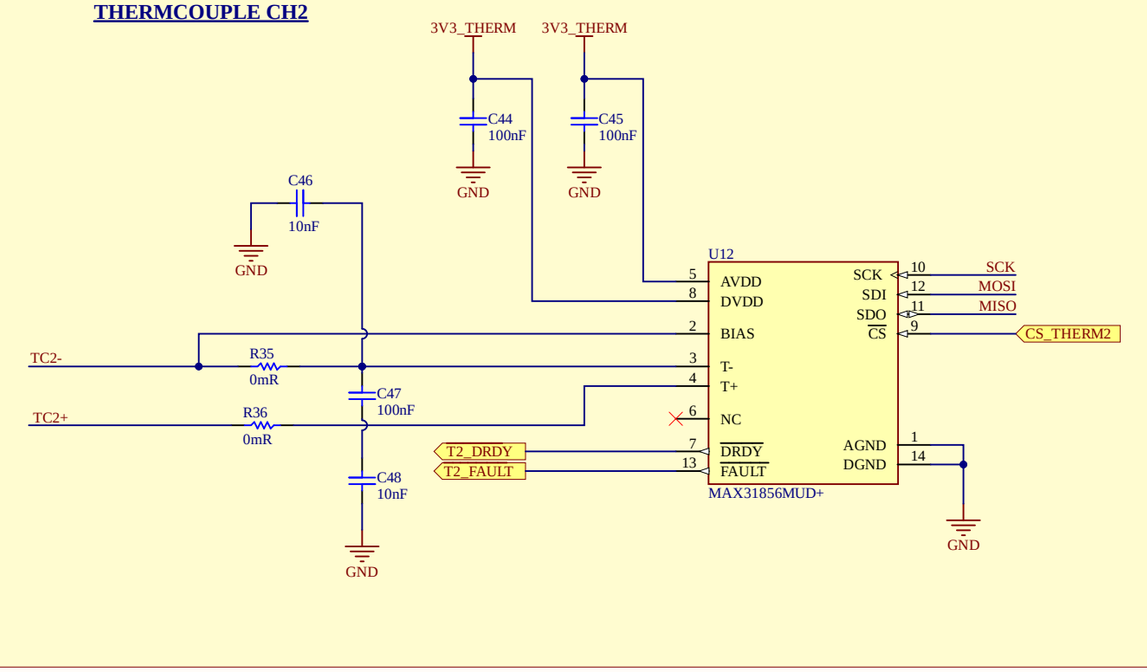
THERMCOUPLE INPUT



THERMCOUPLE CH1



THERMCOUPLE CH2



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