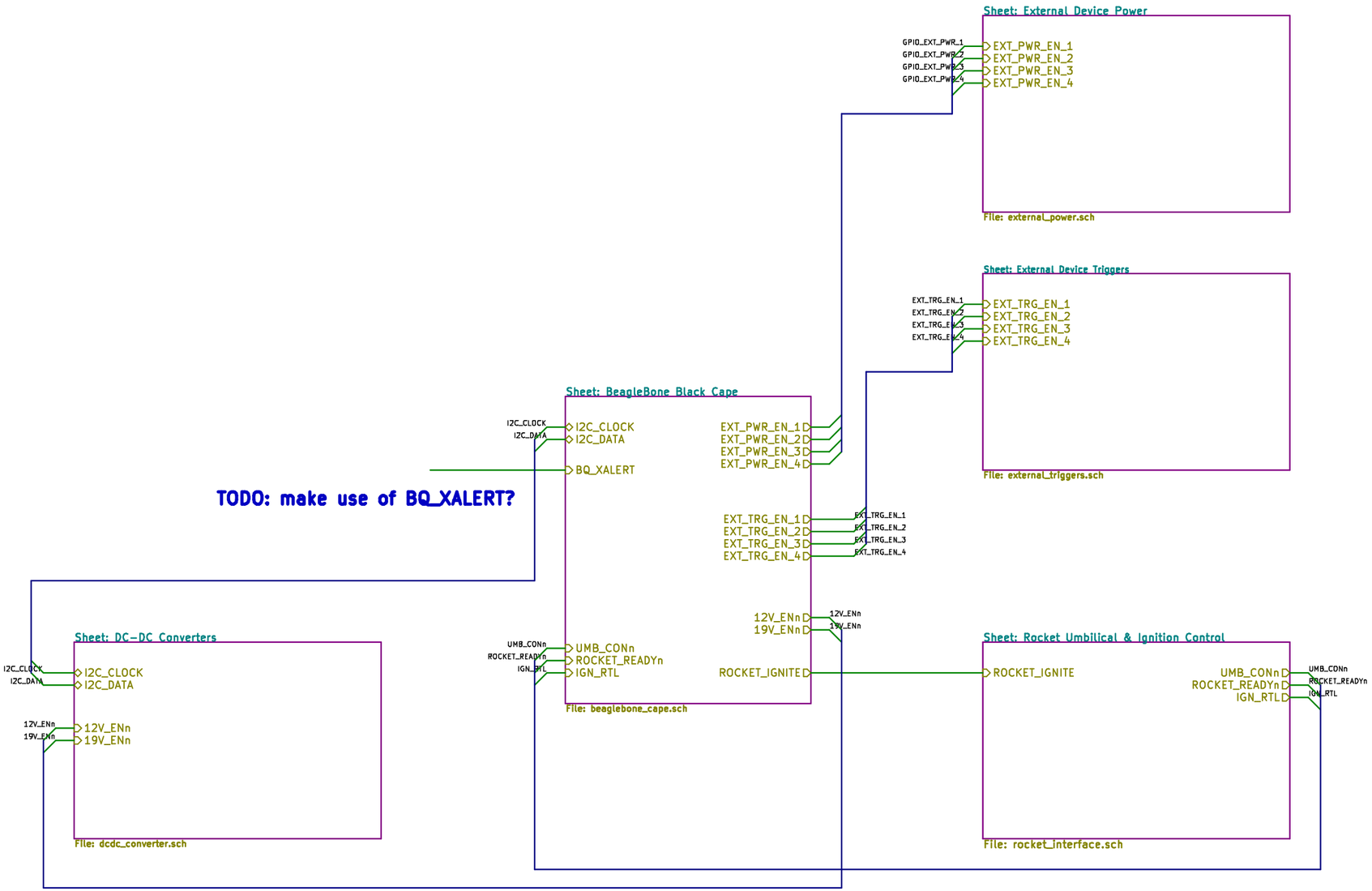

2019-02-10: Converted from KiCad v4 to v5.

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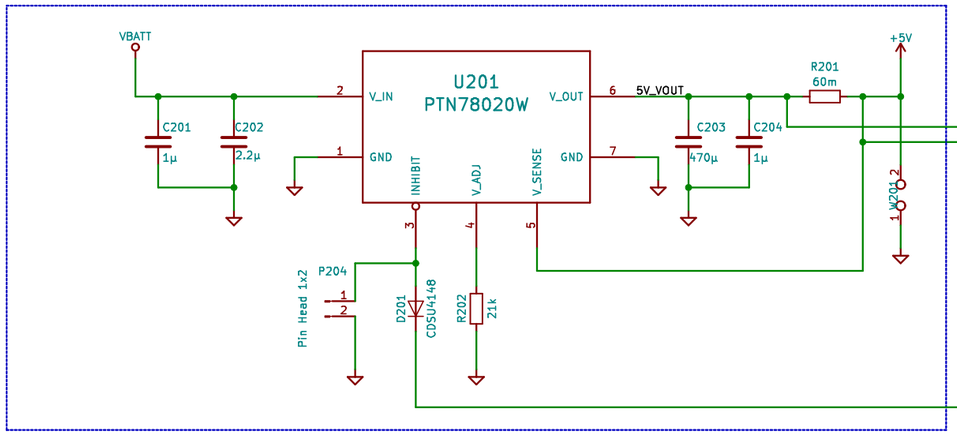
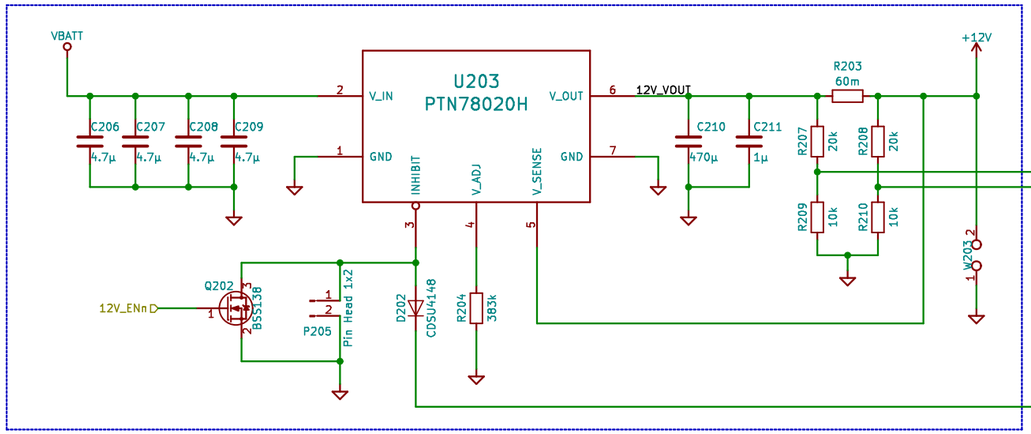
Sheet: /
File: LTC3.sch

Title: Launch Tower Computer 3 (LTC3)

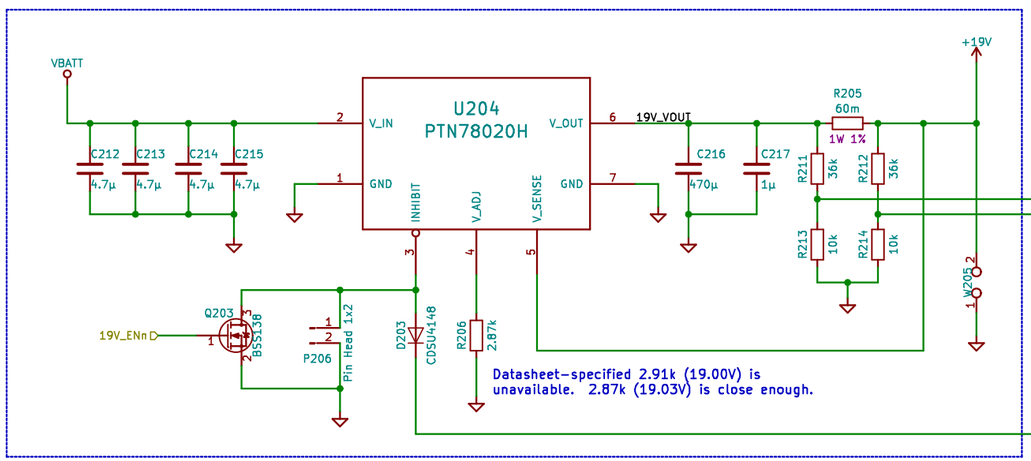
Size: B	Date: 2016-09-13	**Rev: A**
KiCad E.D.A. kicad 5.0.2+dfsg1-1		Id: 1/6



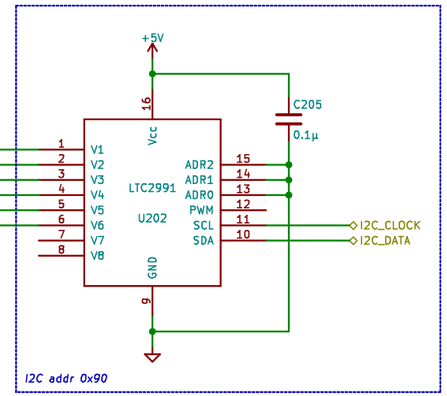
+5V DC Supply



+12V DC Supply



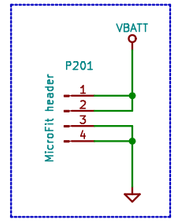
+19V DC Supply



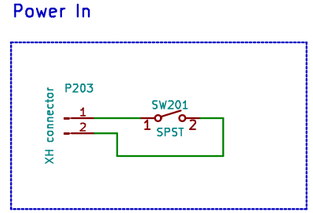
Voltage, Current, & Temp Sense

Current Sense Resistors
full-scale voltage = 0.300 V
R_sense_max = 0.300/Imax
5 A = 60mΩ

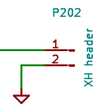
TODO: add MicroFit housing contacts to BOM



Power In



Main Power Switch, Front Panel



NOTES
1. V_sense should connect as close as possible to the largest load on the given power rail.
2. Place Rset resistors as close to package pins as possible.
3. Ceramic (Cin) capacitors should be located within 0.5 in of the input pins.
4. We may need heat sinks on the converters. The datasheet indicates a range of 2W to 5W of power dissipation given our specs.
5. Pay attention to the datasheet's recommendations regarding capacitor selection.

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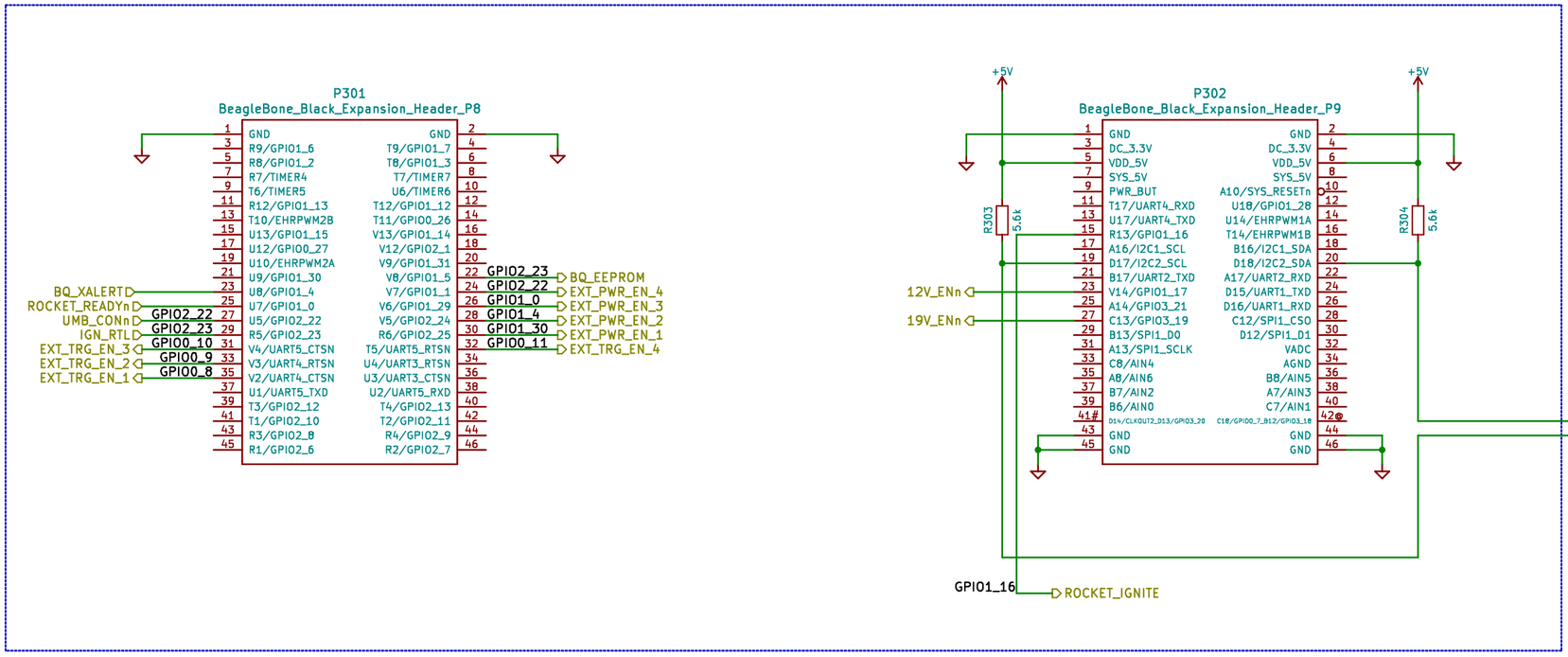
Sheet: /DC-DC Converters/
File: dcdc_converter.sch

Title: LTC3 DC-DC Converters

Size: B	Date: 2016-09-13	Rev: A
KiCad E.D.A. kicad 5.0.2+dfsg1-1		Id: 2/6



BeagleBone Expansion Headers

I2C Devices			
ADDR	Part	Type	Location
0x10	U203	BQ77PL900	B/PM
0x54	U501	EEPROM	BBB
0x90	U402	LTC2991	DC-DC
0x98	U203	LTC2990	Power In
0x9A	U301	LTC2990	B/PM

NOTES:
* Do NOT change ROCKET_IGNITE, pin default reset state is High-Z w/ pulldown resistor. Other pins can be configured in EEPROM at boot time.
* All I2C devices on LTC3 are slaves. The BBB is the only master so the LTC will not need arbitration.

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Sheet: /BeagleBone Black Cape/
File: beaglebone_cape.sch

Title: LTC3 BeagleBone Black Cape Interface

Size: B	Date: 2016-09-13	Rev: A
KiCad E.D.A. kicad 5.0.2+dfsg1-1		Id: 3/6

Circuit keeps ignition battery pack disconnected until
flight computer has asserted ROCKET_READY and
19 VDC rail (shore power) has been shut off.

ROCKET_READYn
+3.1V
+5V
R402 10k
U401A
CD74HC14
R401 62k
R403 100k
U401B
CD74HC14
R404 120
U404
TLP3542
R405 10k
W402 TEST
U402
SN65220DBV
SOT-23
U403
SN74AHC1G08
Shore Power Check
+19V
R410 5.6k
R413 1.5k
C403 0.1µ
W403 TEST
U401F
CD74HC14
R414 10k
W404 TEST
W405 TEST

Input Logic

D402 CDSU4148
R406 100
R407 500k
R408 NP
C401 10µ
C402 NP
W406 TEST

Delay (5s)

IGN_BATT_P
W401 TEST
GND_IGN
P401
MicroFit header to ignition batt
+5V
CDSU4148 D401
K401
RELAY_1C
U401C
CD74HC14
U401D
CD74HC14
Q401 PMV45EN
U401E
CD74HC14
R409 10k
R411 62k
R412 240
IGN_RTL
+3.1V
R415 100k
D403 RED Ready-To-Launch

Ignition Battery Relay

J401 RJ45
SH
ROCKET_READY_5V
+19V
P408
MicroFit header
ROCKET_ETH_1
ROCKET_ETH_2
ROCKET_ETH_3
ROCKET_ETH_4
UMB_CONN_FROM_RKT
UMB_CONN_TO_LTC
R422 5.1k
R419 5.1k
UMB_CONn
D406 3.3V
C404 1µ

TODO: conn. to umbilical conn. on front panel

Rocket Umbilical

Rocket-to-BeagleBone Ethernet

+5V
Q402 PMV45EN
Q403 PMV45EN
Q404 PMV45EN
R416 10k
R417 10k
R418 10k
R423 0
R424 0
R425 0
XH header
P406

BAKERCON Hazard Gauge

(super-bright LEDs, exterior panel)

P407
XH connector
OFF-BOARD, Batt. Relay Closed
OFF-BOARD, Ign. Relay Closed
OFF-BOARD, Ignition HOT
D407 Yellow, Lg.
D408 Yellow, Lg.
D409 Red, Lg.

+5V
D404 CDSU4148
K402
RELAY_1C
P402
MicroFit header
ROCKET_IGNITE
Q405 PMV45EN
R420 240
Rocket_Ignite
D405
W407 TEST
R421 10k
P404
MicroFit header
GND_IGN

Rocket Ignition Relay

TODO: add MicroFit housing contacts to BOM

P403
MicroFit connector
M401 10A
SW401 SPST
JP401 Shorting Bar
P405
P409
CONN_01x02
To Away Box

Breaker, Arm Switch, Shorting Bar, & Ignition Connector

(front panel)

+5V
VCC

VCC for CD74HC14

+5V
C405 0.1µ
C406 0.1µ

Bypass Capacitors (one per IC VCC)

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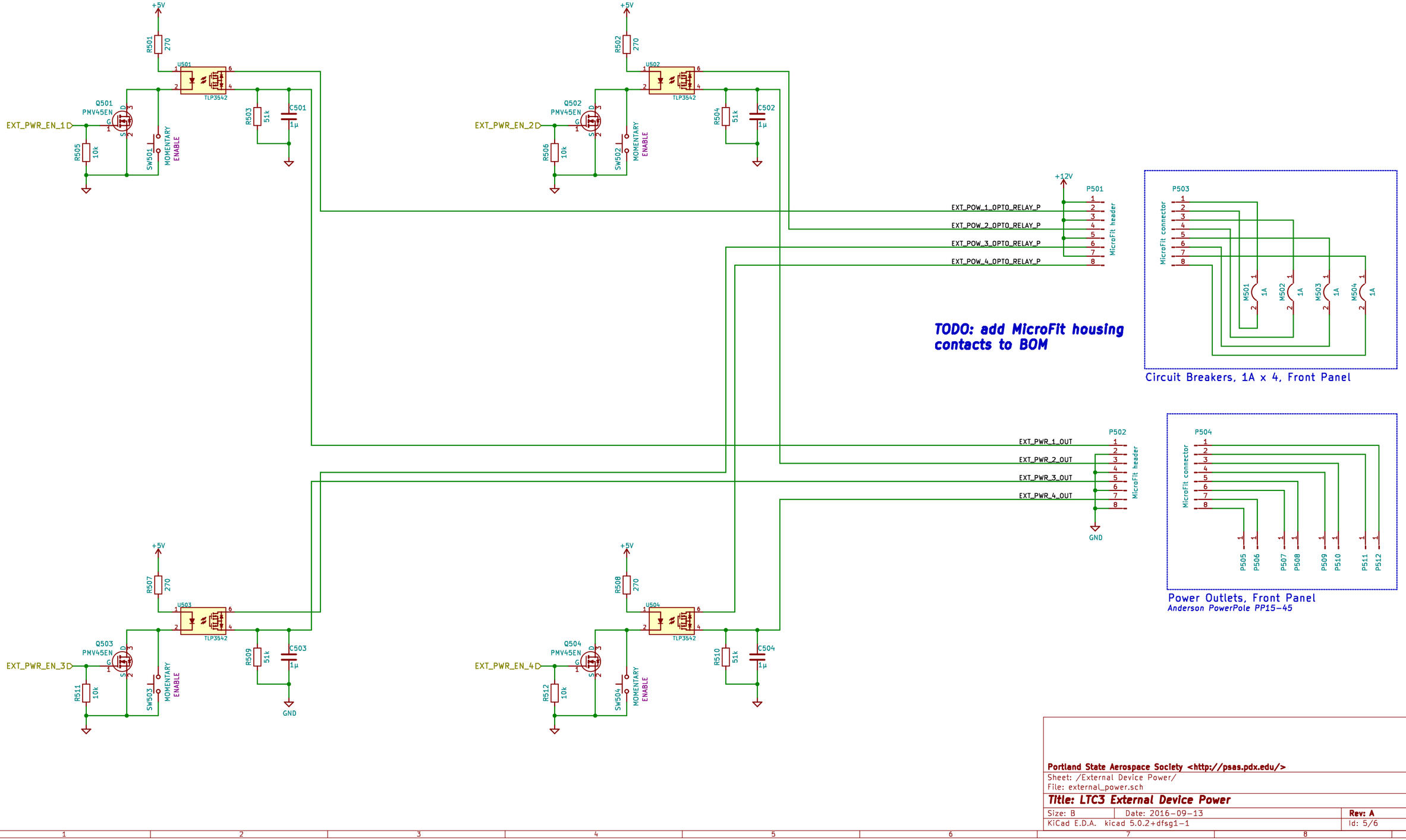
Sheet: /Rocket Umbilical & Ignition Control/
File: rocket_interface.sch

Title: LTC3 Rocket Umbilical & Ignition Control

Size: B	Date: 2016-09-13	Rev: A
KiCad E.D.A. kicad 5.0.2+dfsg1-1		Id: 4/6



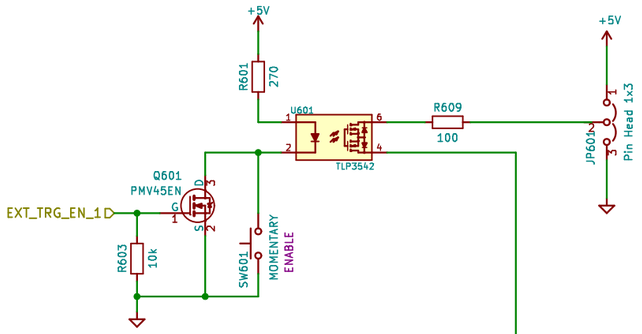
Portland State Aerospace Society <http://psas.pdx.edu/>

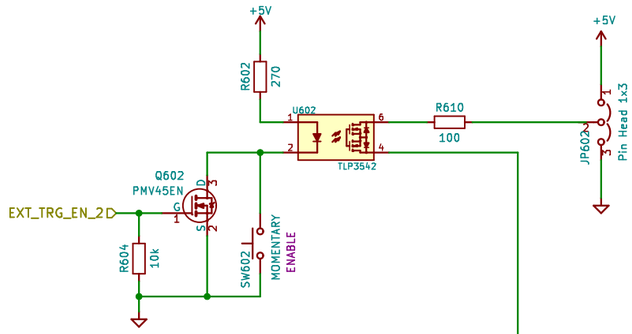
Sheet: /External Device Power/

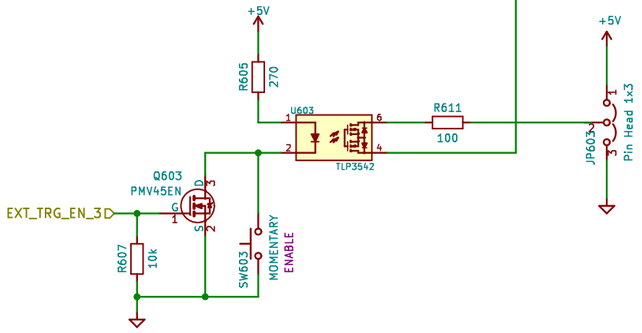
File: external_power.sch

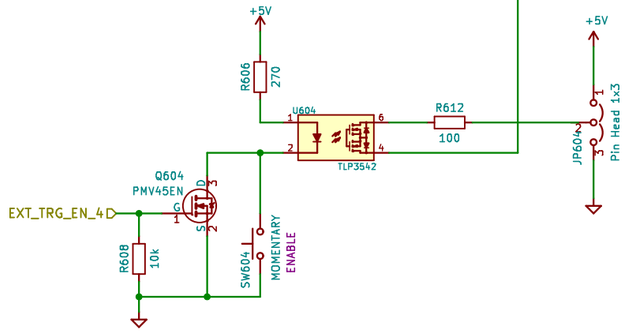
Title: LTC3 External Device Power

Size: B	Date: 2016-09-13	Rev: A
KiCad E.D.A. kicad 5.0.2+dfsg1-1		Id: 5/6

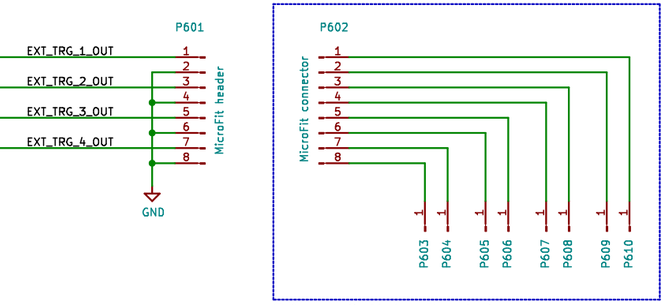








TODO: add MicroFit housing contacts to BOM



Trigger Outlets, Front Panel
Anderson PowerPole PP15-45

Portland State Aerospace Society <http://psas.pdx.edu/>

Sheet: /External Device Triggers/
File: external_triggers.sch

Title: LTC3 External Device Triggers

Size: B	Date: 2016-09-13	**Rev: A**
KiCad E.D.A. kicad 5.0.2+dfsg1-1		Id: 6/6