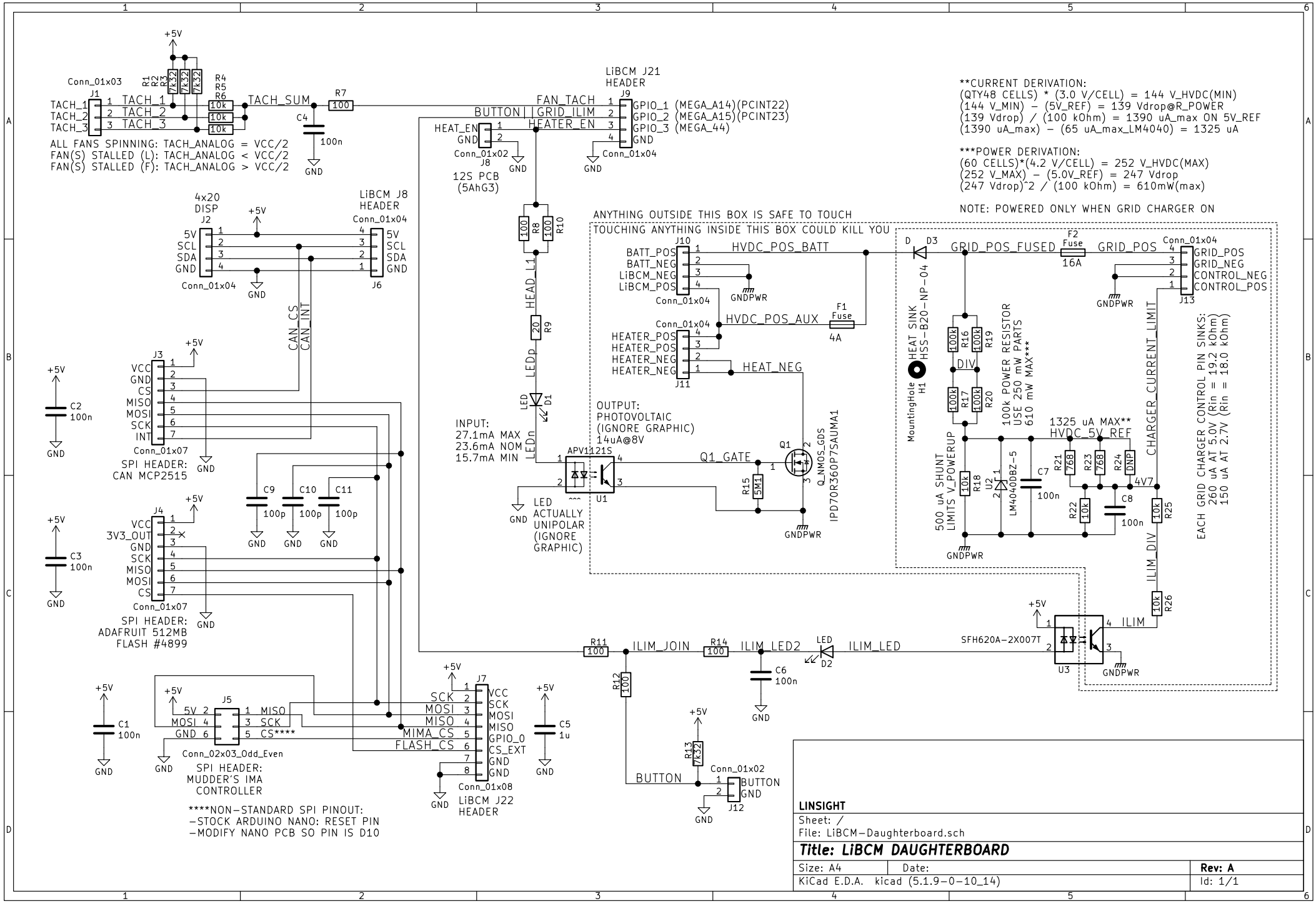
Conn_01x03
J1
TACH_1
TACH_2
TACH_3
R1 R2 R3 7k32
R4 R5 R6 10k
TACH_SUM
R7 100
C4 100n
ALL FANS SPINNING: TACH_ANALOG = VCC/2
FAN(S) STALLED (L): TACH_ANALOG < VCC/2
FAN(S) STALLED (F): TACH_ANALOG > VCC/2
LiBCM J21 HEADER
J9
FAN_TACH
BUTTON||GRID_ILIM
HEATER_EN
GPIO_1 (MEGA_A14)(PCINT22)
GPIO_2 (MEGA_A15)(PCINT23)
GPIO_3 (MEGA_44)
GND
Conn_01x04
HEAT_EN
GND
Conn_01x02
J8
12S PCB (5AhG3)
**CURRENT DERIVATION:
(QTY48 CELLS) * (3.0 V/CELL) = 144 V_HVDC(MIN)
(144 V_MIN) - (5V_REF) = 139 Vdrop@R_POWER
(139 Vdrop) / (100 kOhm) = 1390 uA_max ON 5V_REF
(1390 uA_max) - (65 uA_max_LM4040) = 1325 uA
***POWER DERIVATION:
(60 CELLS)*(4.2 V/CELL) = 252 V_HVDC(MAX)
(252 V_MAX) - (5.0V_REF) = 247 Vdrop
(247 Vdrop)^2 / (100 kOhm) = 610mW(max)
NOTE: POWERED ONLY WHEN GRID CHARGER ON
4x20 DISP
J2
5V
SCL
SDA
GND
Conn_01x04
LiBCM J8 HEADER
J6
R8 100
R10 100
HEAD_L1
R9 20
LEDp
LEDn
LED D1
INPUT:
27.1mA MAX
23.6mA NOM
15.7mA MIN
ANYTHING OUTSIDE THIS BOX IS SAFE TO TOUCH
TOUCHING ANYTHING INSIDE THIS BOX COULD KILL YOU
J10
BATT_POS
BATT_NEG
LiBCM_NEG
LiBCM_POS
HVDC_POS_BATT
GNDPWR
HVDC_POS_AUX
F1 Fuse 4A
J11
HEATER_POS
HEATER_POS
HEATER_NEG
HEATER_NEG
HEAT_NEG
OUTPUT:
PHOTOVOLTAIC
(IGNORE GRAPHIC)
14uA@8V
APV1121S
U1
Q1_GATE
Q1
R15 5M1
Q_NMOS_GDS
IPD70R360P7SAUMA1
LED ACTUALLY UNIPOLAR (IGNORE GRAPHIC)
D D3
GRID_POS_FUSED
F2 Fuse 16A
GRID_POS
Conn_01x04
J13
GRID_POS
GRID_NEG
CONTROL_NEG
CONTROL_POS
HEAT SINK HSS-B20-NP-04
MountingHole H1
R16 100k
R19 100k
DIV
R17 100k
R20 100k
100k POWER RESISTOR USE 250 mW PARTS 610 mW MAX***
1325 uA MAX**
HVDC_5V_REF
CHARGER_CURRENT_LIMIT
EACH GRID CHARGER CONTROL PIN SINKS:
260 uA AT 5.0V (Rin = 19.2 kOhm)
150 uA AT 2.7V (Rin = 18.0 kOhm)
500 uA SHUNT LIMITS V_POWERUP
R18 10k
U2 LM4040DBZ-5
C7 100n
R21 768
R23 768
R24 DNP
R22 10k
C8 100n
4V7
R25 10k
ILIM_DIV
R26 10k
ILIM
SFH620A-2X007T
U3
CAN_CS
CAN_INT
J3
VCC
GND
CS
MISO
MOSI
SCK
INT
Conn_01x07
SPI HEADER: CAN MCP2515
C2 100n
C9 100p
C10 100p
C11 100p
J4
VCC
3V3_OUT
GND
SCK
MISO
MOSI
CS
Conn_01x07
SPI HEADER: ADAFRUIT 512MB FLASH #4899
C3 100n
R11 100
ILIM_JOIN
R14 100
ILIM_LED2
LED D2
ILIM_LED
C6 100n
R12 100
J7
SCK
MOSI
MISO
MIMA_CS
FLASH_CS
VCC
SCK
MOSI
MISO
GPIO_0
CS_EXT
GND
GND
Conn_01x08
LiBCM J22 HEADER
C5 1u
C1 100n
J5
5V
MOSI
GND
MISO
SCK
CS****
Conn_02x03_Odd_Even
SPI HEADER: MUDDER'S IMA CONTROLLER
****NON-STANDARD SPI PINOUT:
-STOCK ARDUINO NANO: RESET PIN
-MODIFY NANO PCB SO PIN IS D10
R13 7k32
BUTTON
Conn_01x02
J12
BUTTON
GND
LINSIGHT
Sheet: /
File: LiBCM-Daughterboard.sch
Title: LiBCM DAUGHTERBOARD
Size: A4
Date:
Rev: A
KiCad E.D.A. kicad (5.1.9-0-10_14)
Id: 1/1