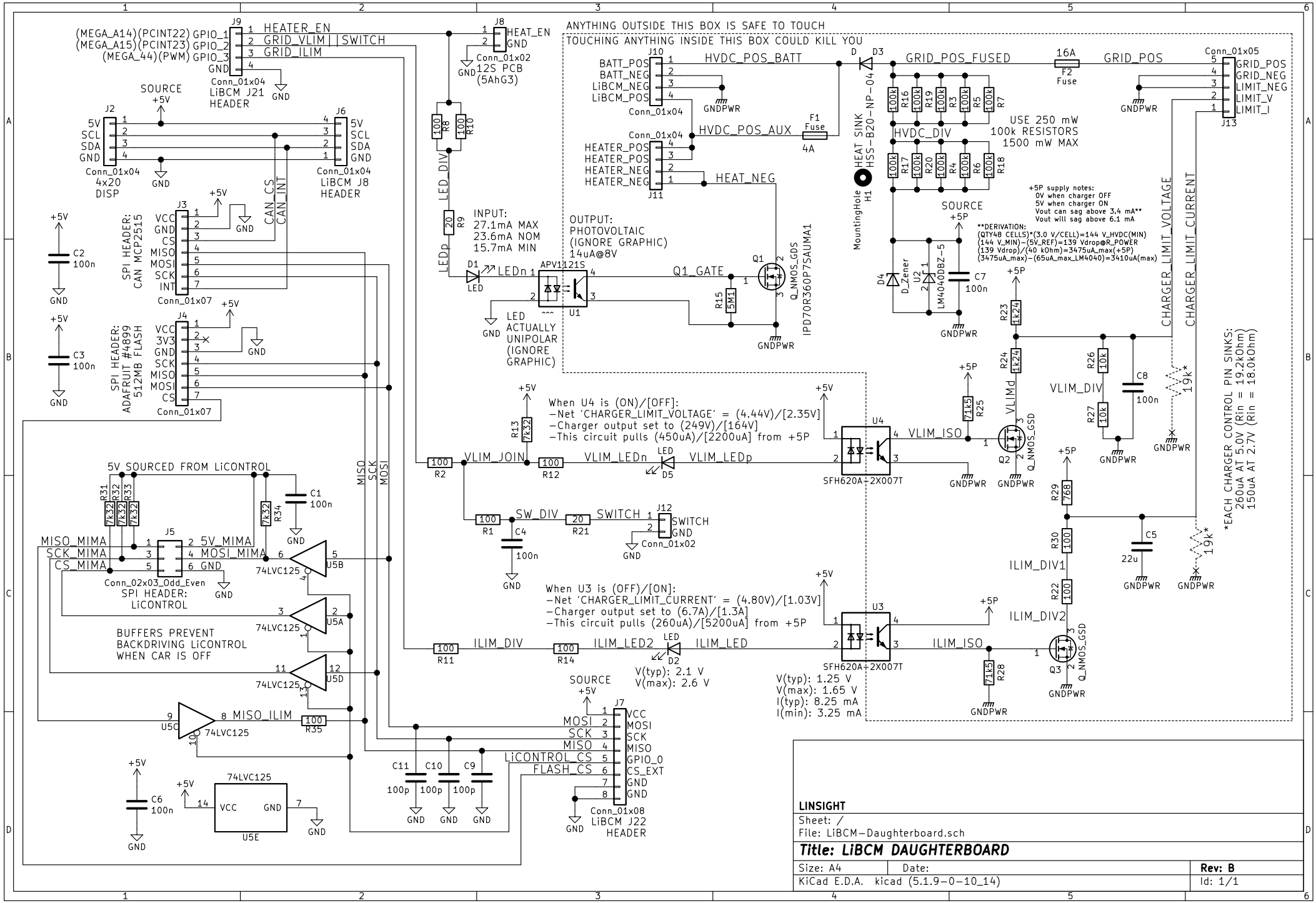
ANYTHING OUTSIDE THIS BOX IS SAFE TO TOUCH
TOUCHING ANYTHING INSIDE THIS BOX COULD KILL YOU
(MEGA_A14)(PCINT22) GPIO_1 HEATER_EN
(MEGA_A15)(PCINT23) GPIO_2 GRID_VLIM||SWITCH
(MEGA_44)(PWM) GPIO_3 GRID_ILIM
GND
J9
Conn_01x04
LiBCM J21 HEADER
J8
HEAT_EN
GND
Conn_01x02
12S PCB (5AhG3)
J10
BATT_POS
BATT_NEG
LiBCM_NEG
LiBCM_POS
HVDC_POS_BATT
GNDPWR
D
D3
HEAT SINK HSS-B20-NP-04
GRID_POS_FUSED
16A
F2 Fuse
GRID_POS
Conn_01x05
GRID_POS
GRID_NEG
LIMIT_NEG
LIMIT_V
LIMIT_I
J13
HEATER_POS
HEATER_POS
HEATER_NEG
HEATER_NEG
J11
HVDC_POS_AUX
F1 Fuse
4A
HEAT_NEG
HVDC_DIV
USE 250 mW
100k RESISTORS
1500 mW MAX
MountingHole H1
SOURCE +5V
J2
5V
SCL
SDA
GND
Conn_01x04
4x20 DISP
J6
Conn_01x04
LiBCM J8 HEADER
CAN_CS
CAN_INT
J3
VCC
GND
CS
MISO
MOSI
SCK
INT
Conn_01x07
SPI HEADER: CAN MCP2515
C2 100n
J4
VCC
3V3
GND
SCK
MISO
MOSI
CS
Conn_01x07
SPI HEADER: ADAFRUIT #4899 512MB FLASH
C3 100n
LED_DIV
R8 100
R10 100
R9 20
LEDp
LEDn
D1 LED
INPUT:
27.1mA MAX
23.6mA NOM
15.7mA MIN
OUTPUT:
PHOTOVOLTAIC
(IGNORE GRAPHIC)
14uA@8V
APV1121S
U1
LED ACTUALLY UNIPOLAR (IGNORE GRAPHIC)
Q1_GATE
R15 5M1
Q1
Q_NMOS_GDS
IPD70R360P7SAUMA1
D4 D_Zener
U2 LM4040DBZ-5
C7 100n
+5P supply notes:
0V when charger OFF
5V when charger ON
Vout can sag above 3.4 mA**
Vout will sag above 6.1 mA
**DERIVATION:
(QTY48 CELLS)*(3.0 V/CELL)=144 V_HVDC(MIN)
(144 V_MIN)-(5V_REF)=139 Vdrop@R_POWER
(139 Vdrop)/(40 kOhm)=3475uA_max(+5P)
(3475uA_max)-(65uA_max_LM4040)=3410uA(max)
R23 1k24
R24 1k24
R26 10k
R27 10k
C8 100n
VLIMd
VLIM_DIV
CHARGER_LIMIT_VOLTAGE
CHARGER_LIMIT_CURRENT
19k*
19k*
*EACH CHARGER CONTROL PIN SINKS:
260uA AT 5.0V (Rin = 19.2kOhm)
150uA AT 2.7V (Rin = 18.0kOhm)
R13 7k32
When U4 is (ON)/[OFF]:
-Net 'CHARGER_LIMIT_VOLTAGE' = (4.44V)/[2.35V]
-Charger output set to (249V)/[164V]
-This circuit pulls (450uA)/[2200uA] from +5P
U4
SFH620A-2X007T
VLIM_ISO
R25 71k5
Q2 Q_NMOS_GSD
R2 100
VLIM_JOIN
R12 100
VLIM_LEDn
D5 LED
VLIM_LEDp
5V SOURCED FROM LiCONTROL
R31 7k32
R32 7k32
R33 7k32
R34 7k32
C1 100n
MISO
SCK
MOSI
MISO_MIMA
SCK_MIMA
CS_MIMA
J5
5V_MIMA
MOSI_MIMA
GND
Conn_02x03_Odd_Even
SPI HEADER: LiCONTROL
U5B 74LVC125
U5A 74LVC125
U5D 74LVC125
BUFFERS PREVENT BACKDRIVING LiCONTROL WHEN CAR IS OFF
R1 100
SW_DIV
C4 100n
R21 20
SWITCH
J12
SWITCH
GND
Conn_01x02
R29 768
R30 100
C5 22u
ILIM_DIV1
R22 100
ILIM_DIV2
When U3 is (OFF)/[ON]:
-Net 'CHARGER_LIMIT_CURRENT' = (4.80V)/[1.03V]
-Charger output set to (6.7A)/[1.3A]
-This circuit pulls (260uA)/[5200uA] from +5P
U3
SFH620A-2X007T
ILIM_ISO
R28 71k5
Q3 Q_NMOS_GSD
R11 100
ILIM_DIV
R14 100
ILIM_LED2
D2 LED
ILIM_LED
V(typ): 2.1 V
V(max): 2.6 V
V(typ): 1.25 V
V(max): 1.65 V
I(typ): 8.25 mA
I(min): 3.25 mA
U5C 74LVC125
8 MISO_ILIM
R35 100
C6 100n
74LVC125
U5E
VCC
GND
C11 100p
C10 100p
C9 100p
SOURCE +5V
J7
VCC
MOSI
SCK
MISO
GPIO_0
CS_EXT
GND
GND
LiCONTROL_CS
FLASH_CS
Conn_01x08
LiBCM J22 HEADER
LINSIGHT
Sheet: /
File: LiBCM-Daughterboard.sch
Title: LiBCM DAUGHTERBOARD
Size: A4
Date:
Rev: B
KiCad E.D.A. kicad (5.1.9-0-10_14)
Id: 1/1