Sheet: External Input

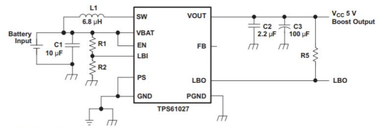
Estimated BOM cost: $0.03

Alt Power Input

File: ExternalInput.sch

Sheet: Boost Converters

Estimated BOM cost: $0.60



List of Components:
U1 = TPS61027DRC
L1 = EPCOS B82462-G4682
C1, C2 = X7R,X5R Ceramic
C3 = Low ESR Tantalum

Figure 24. Power Supply Solution for Maximum Output Power Operating From a Single Alkaline Cell

Power Conversion

File: Boost.sch

Sheet: USB Input

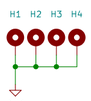
Estimated BOM cost: $1.00
($0.02 without serial to usb)

USB Input (Power/serial)

File: USB_Input.sch

Sheet: Sensors

File: Sensors.sch



Sheet: User Input/Output

Estimated BOM cost: $0.05

User I/O

File: UserInputOutput.sch

Sheet: Programming

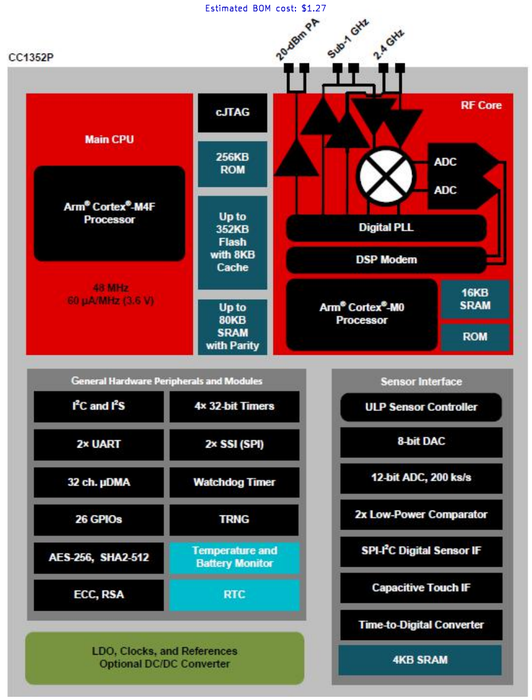
Estimated BOM cost: $0.00

Programming

File: Programming.sch

Sheet: RF

Estimated BOM cost: $1.27

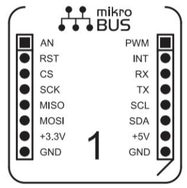


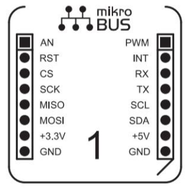
RF and Processor

File: RF.sch

Sheet: MikroBus Click

Estimated BOM cost: $0.15





MikroBus Headers

File: MikroBusClick.sch

Sheet: Sheet5D099F01

Estimated BOM cost: $0.03

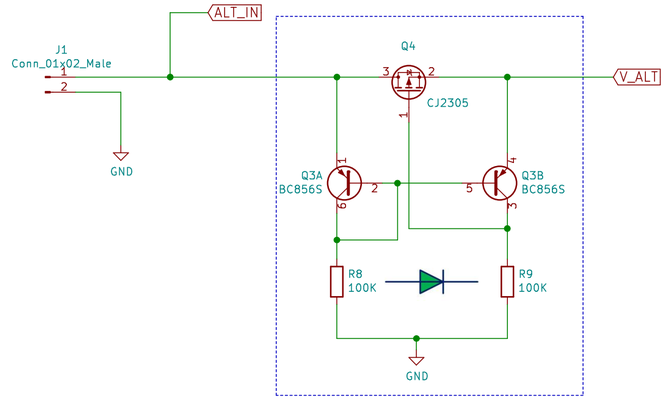
Indicators

File: Indicators.sch

Schematic originally designed by Analog Life, LLC
Beagleboard.org
Sheet: /
File: BeagleConnect Freedom.sch

Title: BeagleConnect Freedom

Size: C	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 1/10



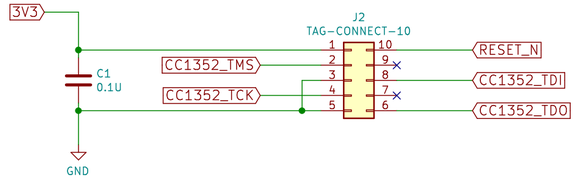
Schematic originally designed by Analog Life, LLC

Beagleboard.org

Sheet: /External Input/
File: ExternalInput.sch

Title: BeagleConnect Freedom

Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 2/10



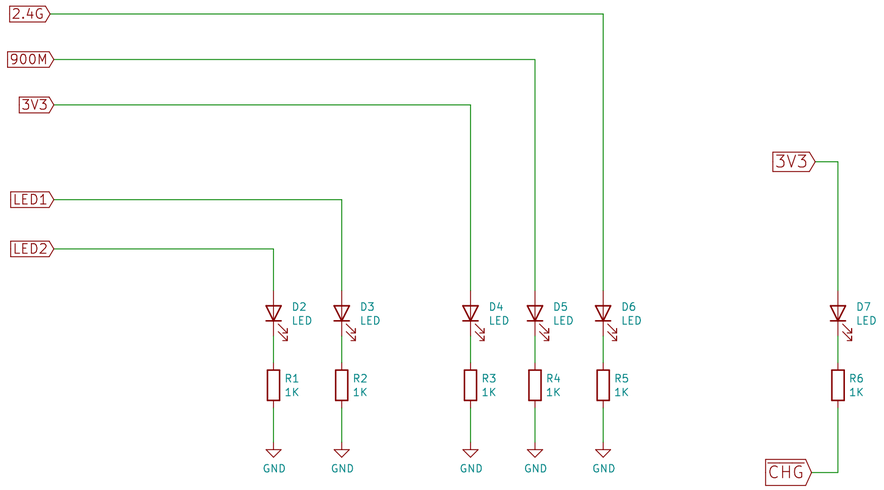
Schematic originally designed by Analog Life, LLC

Beagleboard.org

Sheet: /Programming/
File: Programming.sch

Title: BeagleConnect Freedom

Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 3/10



Schematic originally designed by Analog Life, LLC

Beagleboard.org

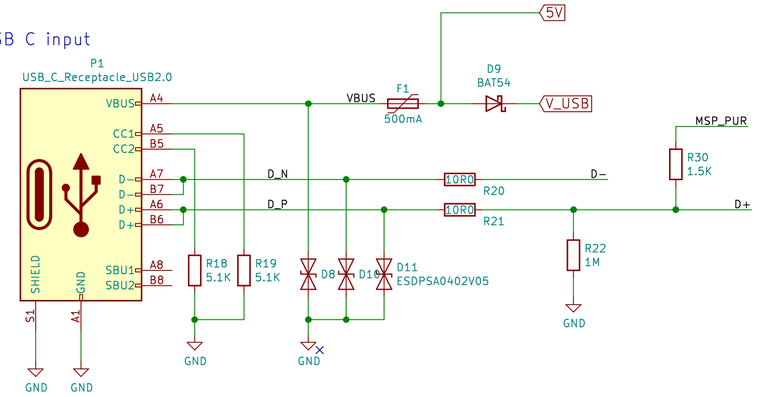
Sheet: /Sheet5D099F01/

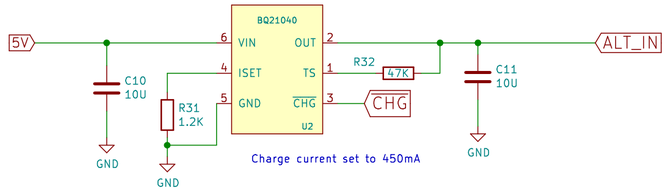
File: Indicators.sch

Title: BeagleConnect Freedom

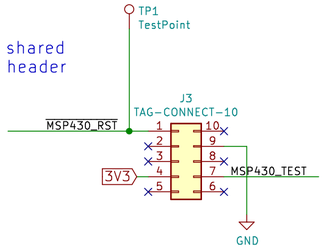
Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 4/10

USB C input

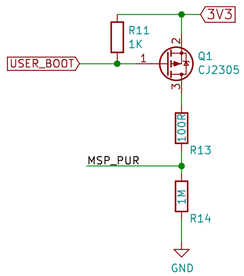




Decoupling cap shared
with other prog header

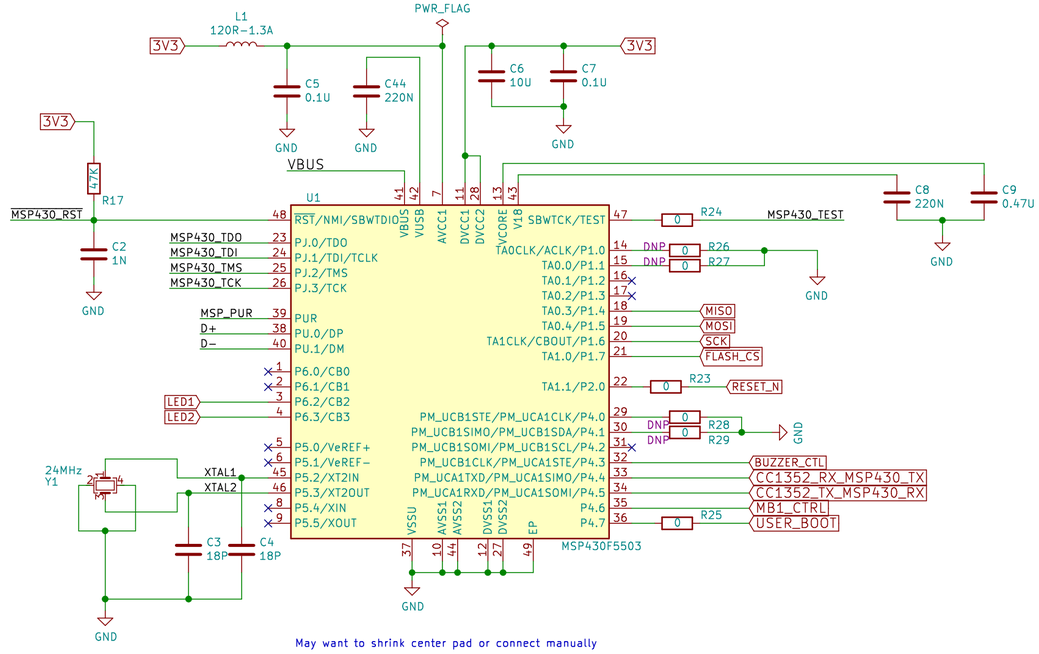


Verify all connections with Erik Larson



When USER_BOOT button is pressed during USB power up,
it pulls MSP_PUR high. This puts the MSP430 into programming mode.

The USER_BOOT button is also used as an input to the
CC1352R for it's programming, but is active low



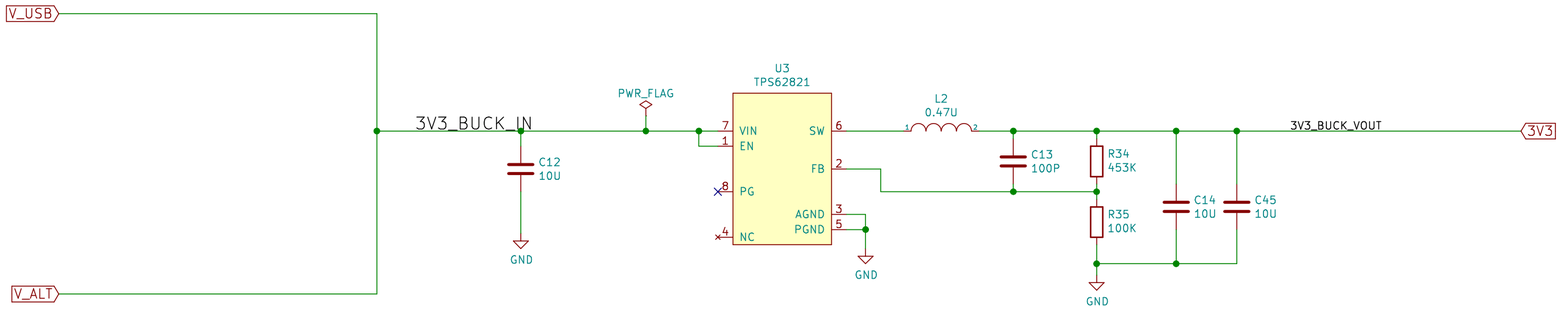
May want to shrink center pad or connect manually

On rev B prototype, the soldermask peeled back and many of the
pins on the edge of the QFN would short to the center pad after
attempted repair to the part (reflow, component replacement)

Schematic originally designed by Analog Life, LLC
Beagleboard.org

Sheet: /USB Input/	
File: USB_Input.sch	
Title: BeagleConnect Freedom	
Size: B	Date: 2020-11-03
KiCad E.D.A. kicad (5.1.7)-1	Id: 5/10

Rev: C2



Schematic originally designed by Analog Life, LLC
Beagleboard.org

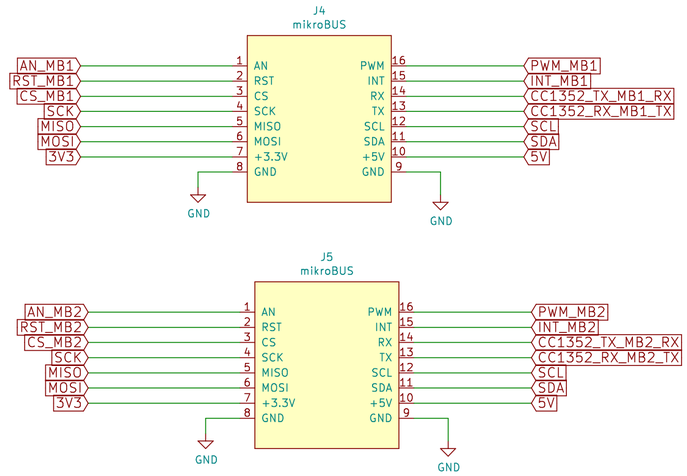
Sheet: /Boost Converters/
File: Boost.sch

Title: BeagleConnect Freedom

Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 6/10

*Footprint is component footprint plus 1 mm per side.

Part	Manufacturer	Part Number	Quantity	Total Price ($)	Attribute	Total Footprint (mm²)	Top View	Edit
Cin	TDK	C1608X7S1A475K080AC	1	0.06	Cap = 4.7 µF Total Derated Cap = 1.5 µF VDC = 10 V ESR = 3.73 mΩ Package = 0603	4.68	-	SELECT ALTERNATE PART
L1	MuRata	DFE201610E-R47M=P2	1	0.15	L = 470 nH DCR = 26 mΩ IDC = 3.6 A	7.8		SELECT ALTERNATE PART
U1	Texas Instruments	TPS62821DLCR	1	0.47		7.5		
					Cap = 22 µF			



Schematic originally designed by Analog Life, LLC

Beagleboard.org

Sheet: /MikroBus Click/

File: MikroBusClick.sch

Title: BeagleConnect Freedom

Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 7/10

PWR_FLAG
R36 0
PWR_FLAG
VDD
L3 120R-1.3A
PWR_FLAG
3V3
VDDS
VDDS
Optional sense resistor for power measurement

L4 6.8 uH
DCDC_SW
VDDR
C24 22U
GND

U4A
CC1352P-LeashPCB
Power Subsection
Y3 48MHz
C47 7P
C48 12P
GND
Y2 32.768KHz
C15 12P
C16 12P
GND
46 X48M_N
47 X48M_P
8 X32K_Q1
9 X32K_Q2
49 GND/EP
Must connect!
GND
45 VDDR
48 VDDR_RF
VDDR
C22 0.1U
C23 0.1U
GND
44 VDDS
13 VDDS2
22 VDDS3
VDDS
VDDS
VDDS
34 VDDS_DCDC
C18 0.1U
C19 0.1U
C20 0.1U
C21 0.1U
GND
33 DCDC_SW
DCDC_SW
23 DCOUPL
C17 1U
GND

U4B
CC1352P-LeashPCB
RF Subsection
RF_P_2_4GHZ
RF_N_2_4GHZ
RF_2_4GHZ_P
RF_2_4GHZ_N
RF_P_SUB_1GHZ
RF_N_SUB_1GHZ
RF_SUB_1GHZ_P
RF_SUB_1GHZ_N
TX_20DBM_P
TX_20DBM_N
RX_TX
RX_TX
GND
0900PC15A0036E
10 GND
9 BP_2_4_GHZ_RF_P
8 BP_2_4_GHZ_RF_N
7 BP_SUB-1_GHZ_RF_P
6 BP_SUB-1_GHZ_RF_N
UBP_2_4_GHZ
GND
GND
UBP_SUB-1_GHZ
RX_TX
B1
GND
GND
DNP C33 DNP
J6 UFL
GND
12P C34
C43 DNP DNP
C29 DNP DNP
L5 0
C31 DNP DNP
AE1 Antenna_Dipole
1P C37
GND
GND
50 Ohm Traces for All RF
C27 100N
GND
100N C28
J7 UFL
GND
B2 1720BL15B0200E
4 RF_P
3 RF_N
2 RX/TX
UBP
GND
GND
1
100N C35
J8 UFL
GND
100N C36 DNP
C46 DNP DNP
GND
L6 0
C30 DNP DNP
C32 DNP DNP
GND
AE2 Antenna

Analog Subsection
AN_MB1 36 DIO_23
AN_MB2 37 DIO_24
SCL 38 DIO_25
SDA 39 DIO_26
CS_MB2 40 DIO_27
CS_MB1 41 DIO_28
INT_MB1 42 DIO_29
PWM_MB1 43 DIO_30
U4D
CC1352P-LeashPCB

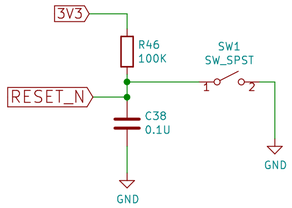
3V3
R41 2.21K
R43 2.21K
R44 2.21K
RESET_N
U6
GD25Q16CEIGR
MOSI 5 SI/SIO0
SCK 6 SCLK
FLASH_CS 1 nCS
3 nWP/SIO2
7 nRST/SIO3
4 GND
9 EP
GND
VCC 8
SO/SIO1 2 MISO
R45 0
C26 0.1U
GND

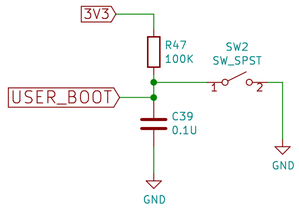
U4C
CC1352P-LeashPCB
Digital Subsection
RST_MB2 10 DIO_5
RST_MB1 11 DIO_6
INT_SENSOR 12 DIO_7
FLASH_CS 14 DIO_8
MOSI 15 DIO_9
SCK 16 DIO_10
MISO 17 DIO_11
CC1352_TDO 26 DIO_16/JTAG_TDO
CC1352_TDI 27 DIO_17/JTAG_TDI
CC1352_TMS 24 JTAG_TMSC
CC1352_TCK 25 JTAG_TCKC
RESET_N 35 RESET_N
DIO_18 28 2.4G
DIO_19 29 PWM_MB2
DIO_20 30 INT_MB2
DIO_21 31 0 R37 0 CC1352_TX_MB2_RX
DIO_22 32 0 R38 0 CC1352_RX_MB2_TX
DIO_12 18 0 R39
DIO_13 19 0 R40
DIO_14 20 900M
DIO_15 21 USER_BOOT

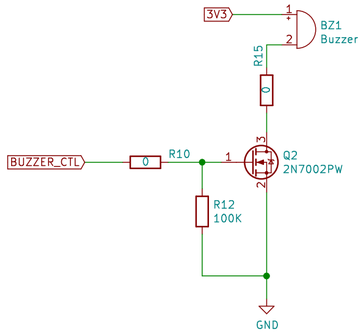
VDDS
C25 0.1U
GND
U5 TS5A23157
V+ 8
COM1 10
NC1 9
NO1 2
IN1 1
COM2 6
NC2 7
NO2 4
IN2 5
GND 3
MB1_CTRL
MB1_CTRL
CC1352_RX_MB1_TX
CC1352_RX_MSP430_TX
CC1352_TX_MB1_RX
CC1352_TX_MSP430_RX
R42 2.21K
GND
GND

Schematic originally designed by Analog Life, LLC
Beagleboard.org
Sheet: /RF/
File: RF.sch
Title: BeagleConnect Freedom

Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 8/10







Schematic originally designed by Analog Life, LLC

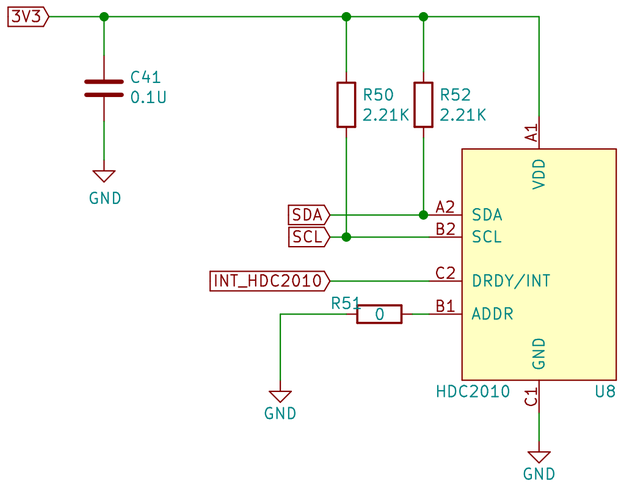
Beagleboard.org

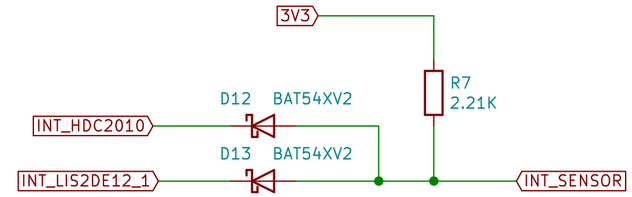
Sheet: /User Input/Output/

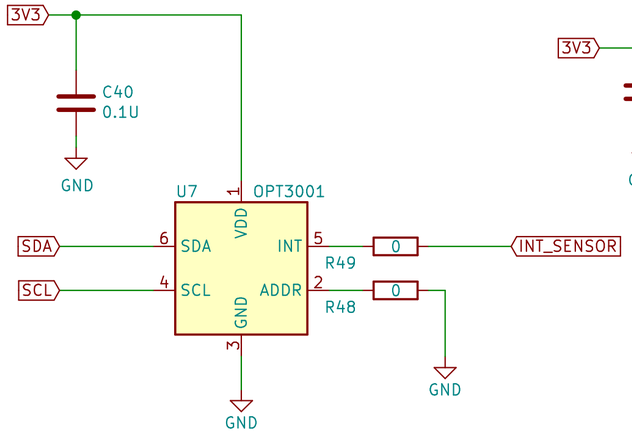
File: UserInputOutput.sch

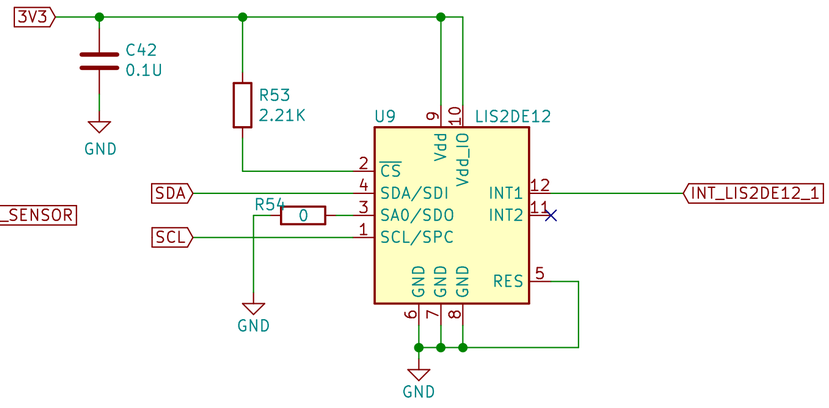
Title: BeagleConnect Freedom

Size: B	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 9/10









Schematic originally designed by Analog Life, LLC

Beagleboard.org

Sheet: /Sensors/
File: Sensors.sch

Title: BeagleConnect Freedom

Size: A4	Date: 2020-11-03	**Rev: C2**
KiCad E.D.A. kicad (5.1.7)-1		Id: 10/10