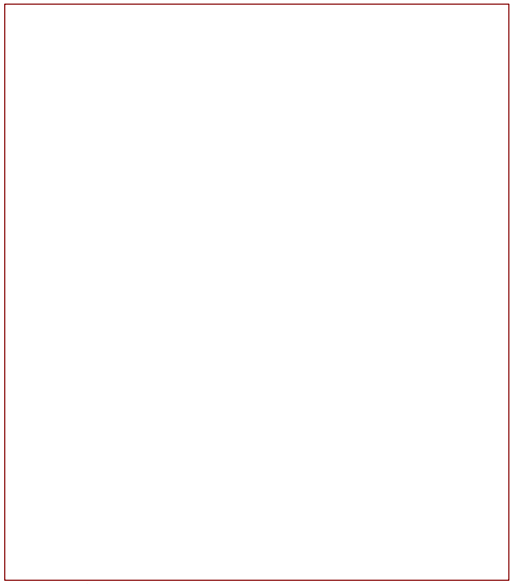
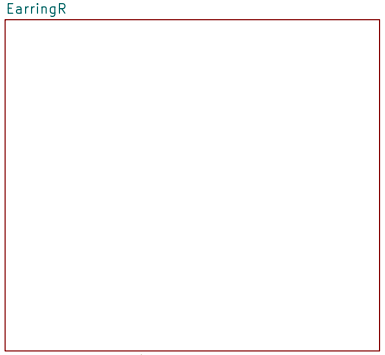
Dock



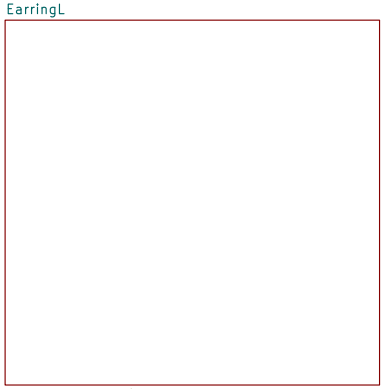
File: Dock/Dock.kicad_sch

EarringR



File: EarringRight/BLEEarrings.kicad_sch

EarringL

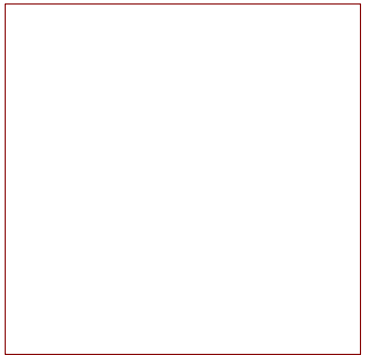


File: EarringLeft/BLEEarrings.kicad_sch

Pendant1

File: Pendant/Earring.kicad_sch

Pendant2



File: Pendant/Earring.kicad_sch

DK

Sheet: /
File: Combine.kicad_sch

Title: BLEarrings V1

Size: A4	Date: 2024-12-27	**Rev: 00.00**
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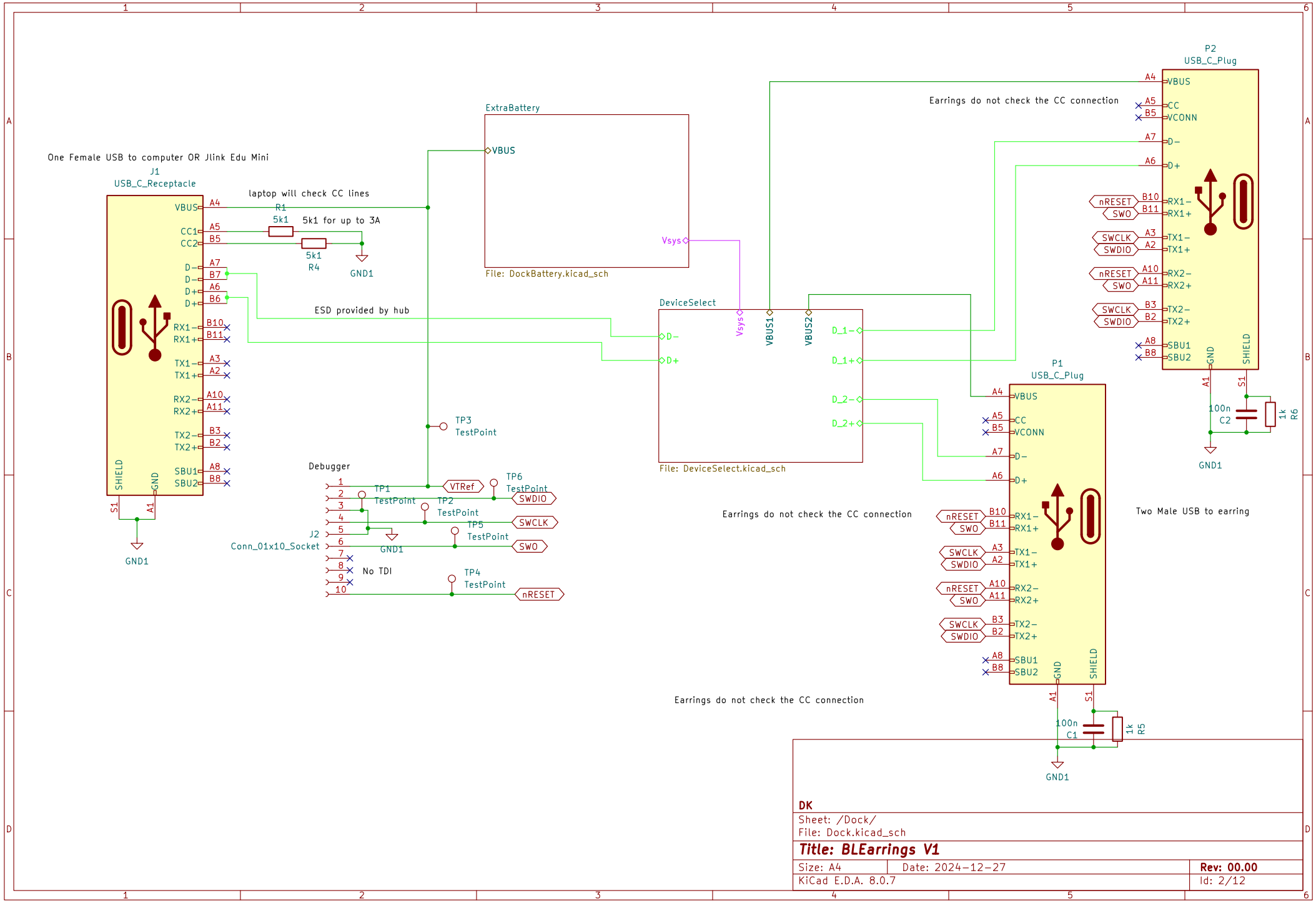
One Female USB to computer OR Jlink Edu Mini
J1
USB_C_Receptacle
laptop will check CC lines
R1
5k1
5k1 for up to 3A
5k1
R4
GND1
ESD provided by hub
ExtraBattery
VBUS
File: DockBattery.kicad_sch
Vsys
DeviceSelect
D−
D+
VBUS1
VBUS2
D_1−
D_1+
D_2−
D_2+
File: DeviceSelect.kicad_sch
TP3
TestPoint
Debugger
J2
Conn_01x10_Socket
TP1
TestPoint
TP2
TestPoint
TP5
TestPoint
TP6
TestPoint
TP4
TestPoint
VTRef
SWDIO
SWCLK
SWO
nRESET
No TDI
Earrings do not check the CC connection
P2
USB_C_Plug
P1
USB_C_Plug
Two Male USB to earring
100n
C2
1k
R6
100n
C1
1k
R5
DK
Sheet: /Dock/
File: Dock.kicad_sch
Title: BLEarrings V1
Size: A4
Date: 2024-12-27
Rev: 00.00
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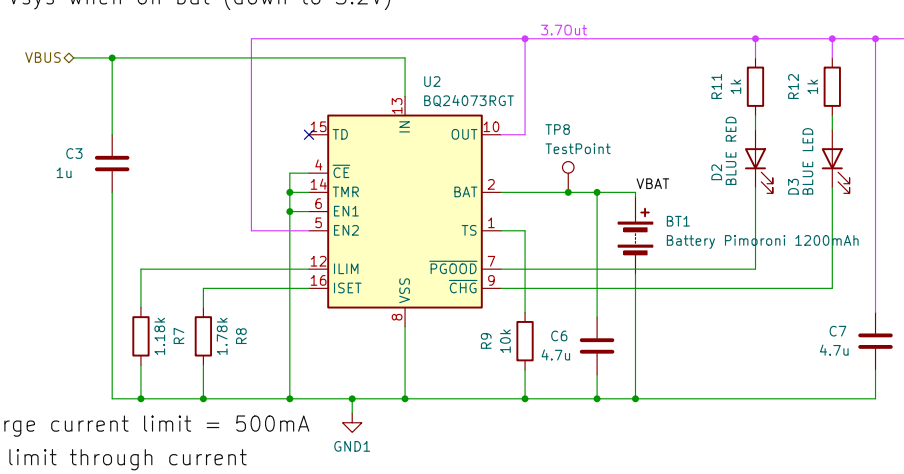
Id: 2/12

Battery Charge Management and DPPM

Vsys out when Vin>Vout = 4.4V when VDPPM (when charging current reduced) = 4.3V

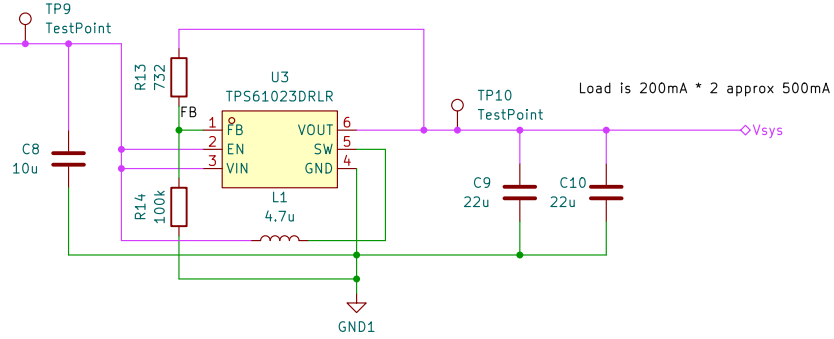
Vsys when on bat (down to 3.2V)



FastCharge current limit = 500mA

Doesn't limit through current

Boost



IL = ((5 volts) × (500 milliamperes))/((3.7 volts) × 0.9) = 750mA

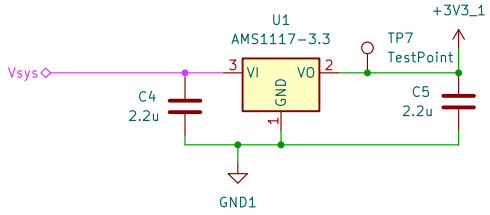
D = 1−((3.7V)×0.9)/5V) = 0.33

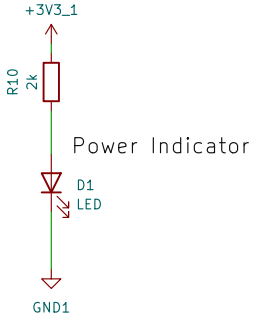
4uH chosen to keep ripple less than 40% of average inductor current

((3.7 volts) × 0.334)/((4.7 microhenrys) × (1 megahertz)) = 263mA

IL(P) = 750.7507508mA + 263mA/2 = 882mA

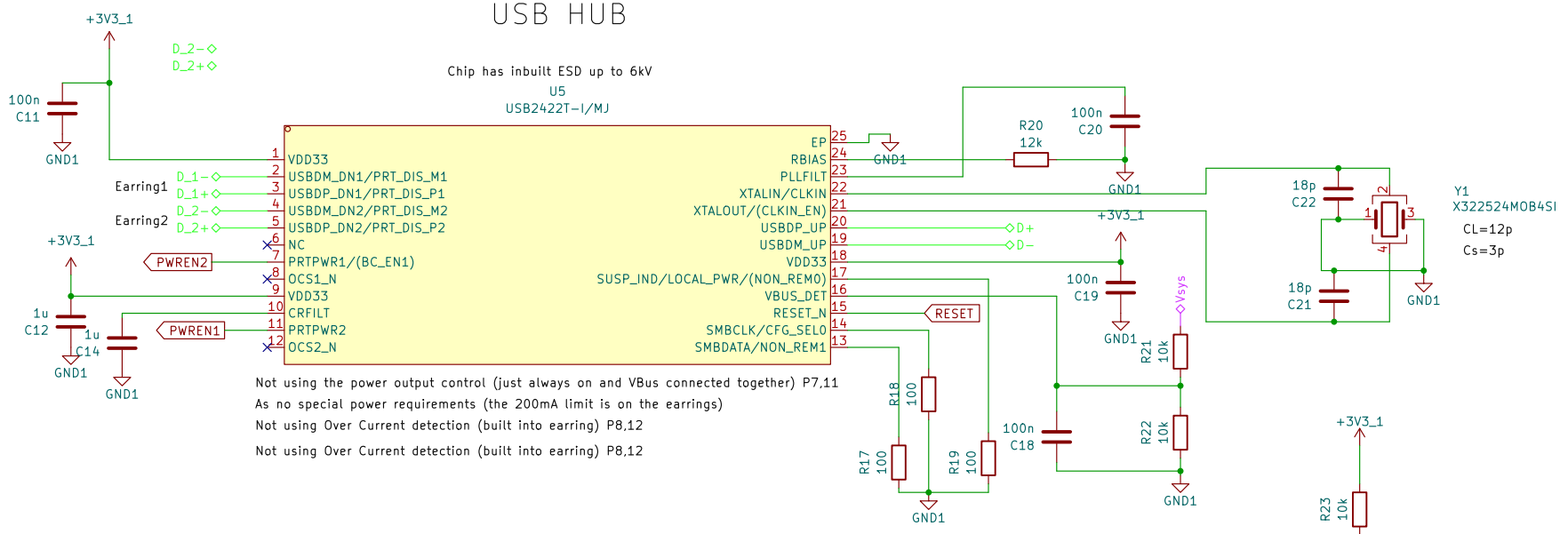
5V to 3.3V Lin Reg



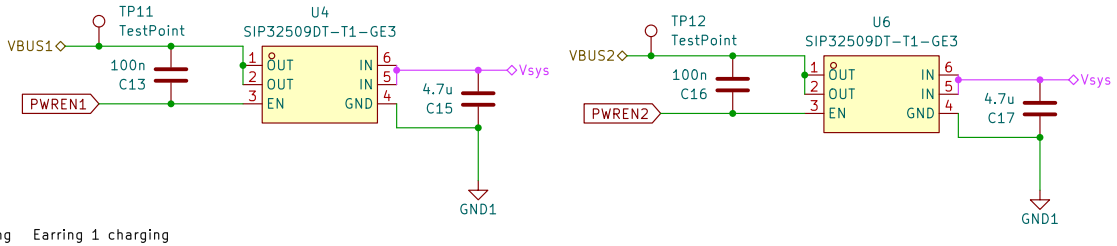


DK		
Sheet: /Dock/ExtraBattery/		
File: DockBattery.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 3/12

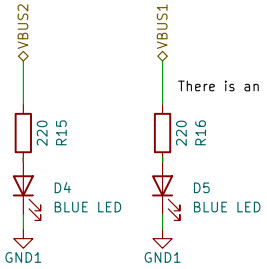
USB HUB



Power Switch IC for VBUS path

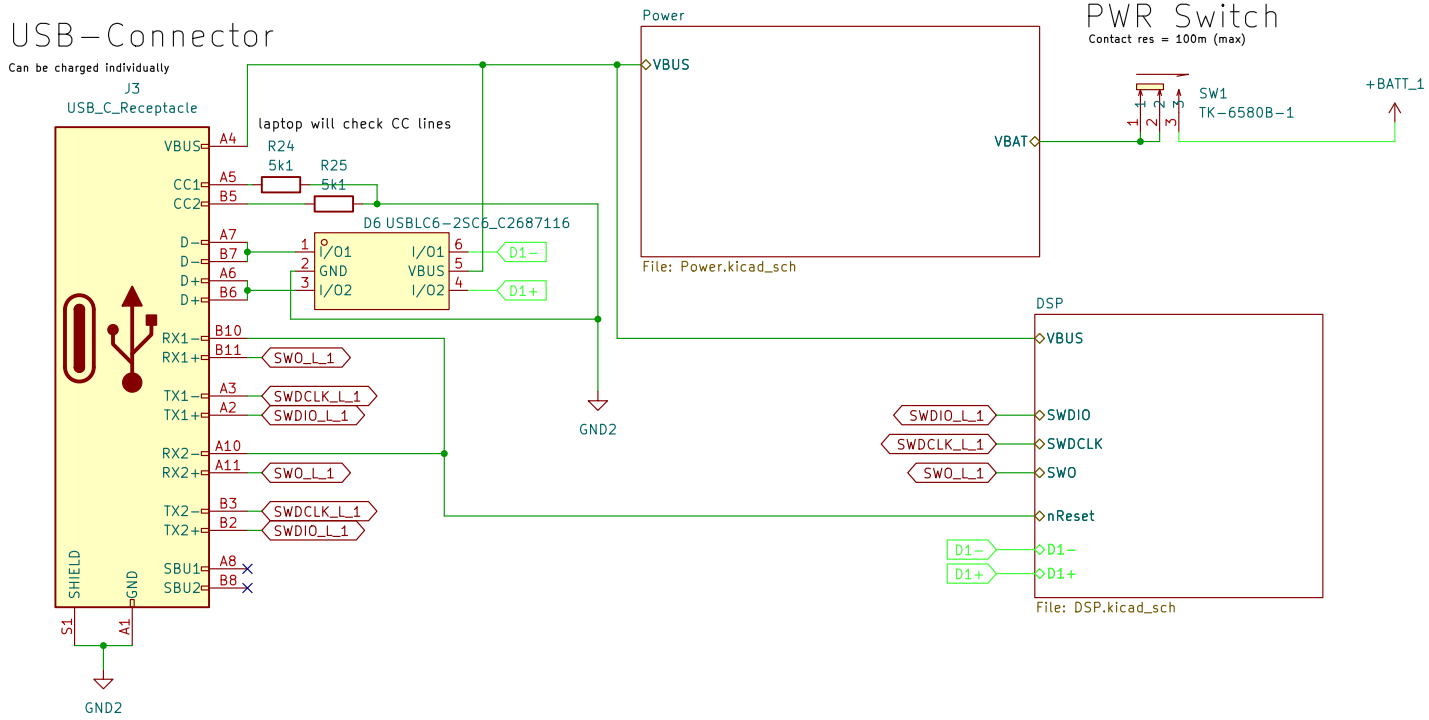


Earring 2 charging Earring 1 charging

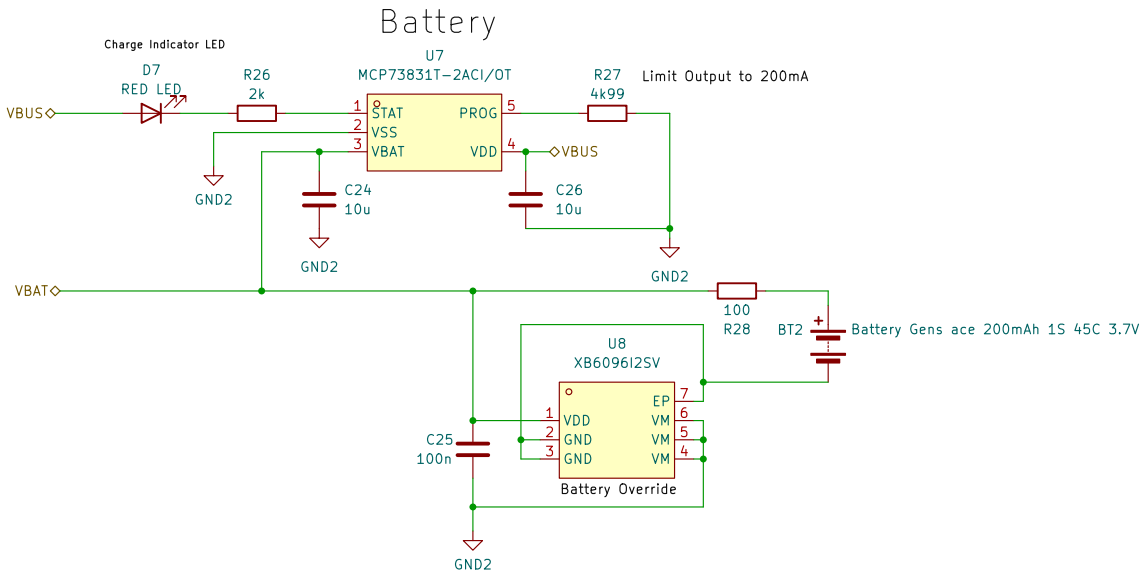


There is an indicator on the earrings that will show through the casing for this

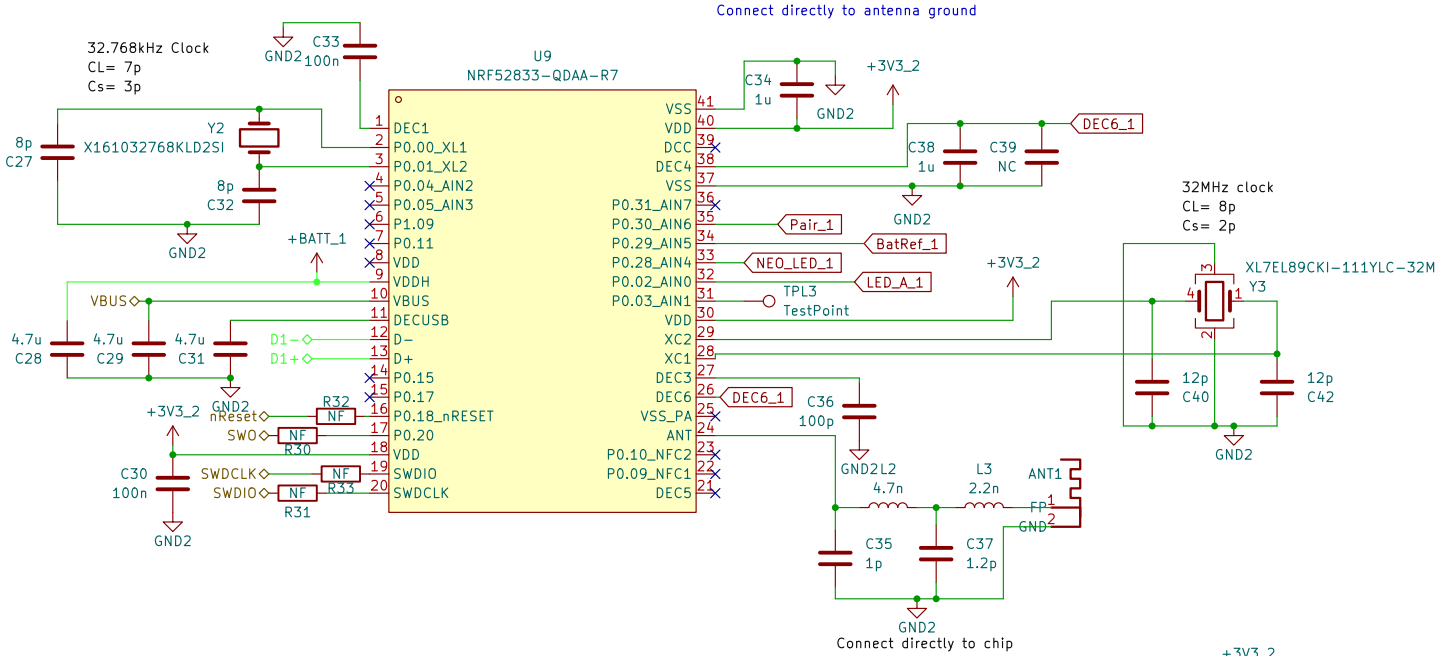
DK		
Sheet: /Dock/DeviceSelect/		
File: DeviceSelect.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 4/12



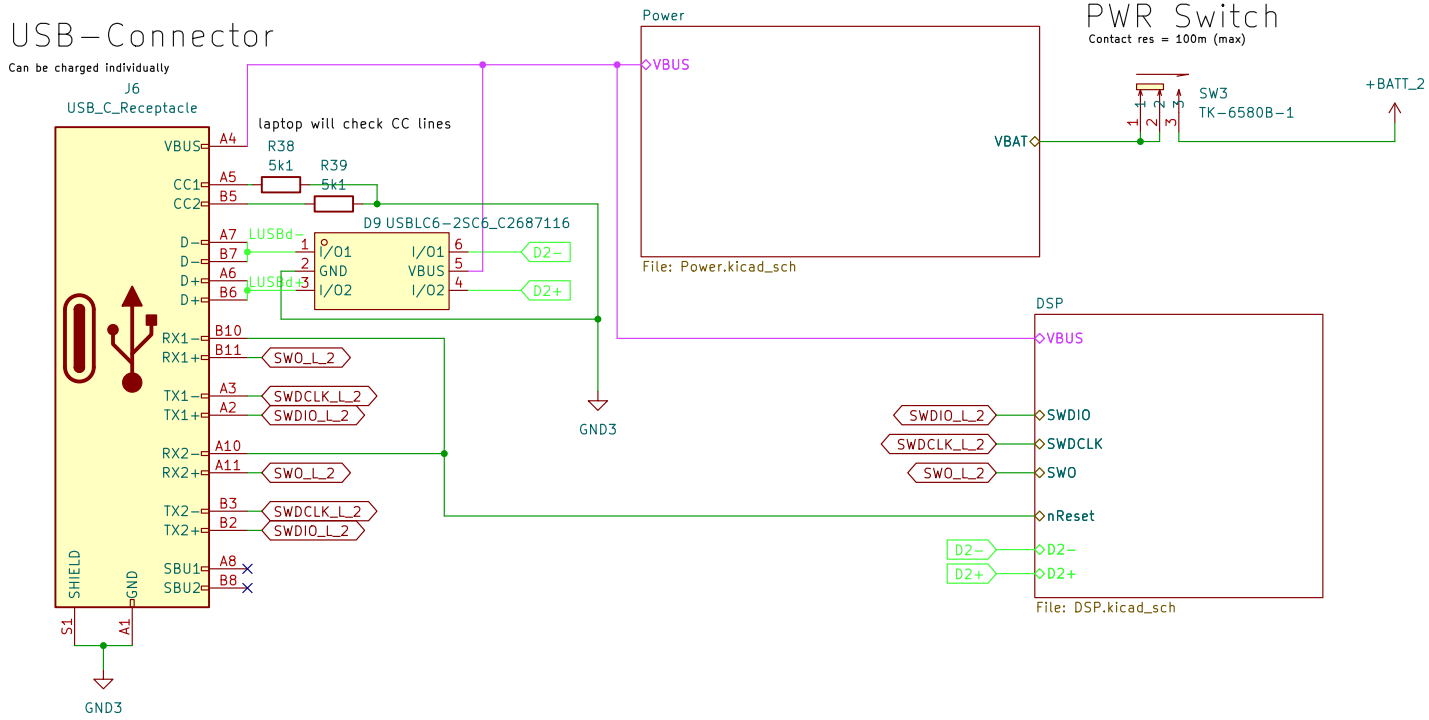
DK		
Sheet: /EarringR/		
File: BLEEarrings.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 5/12



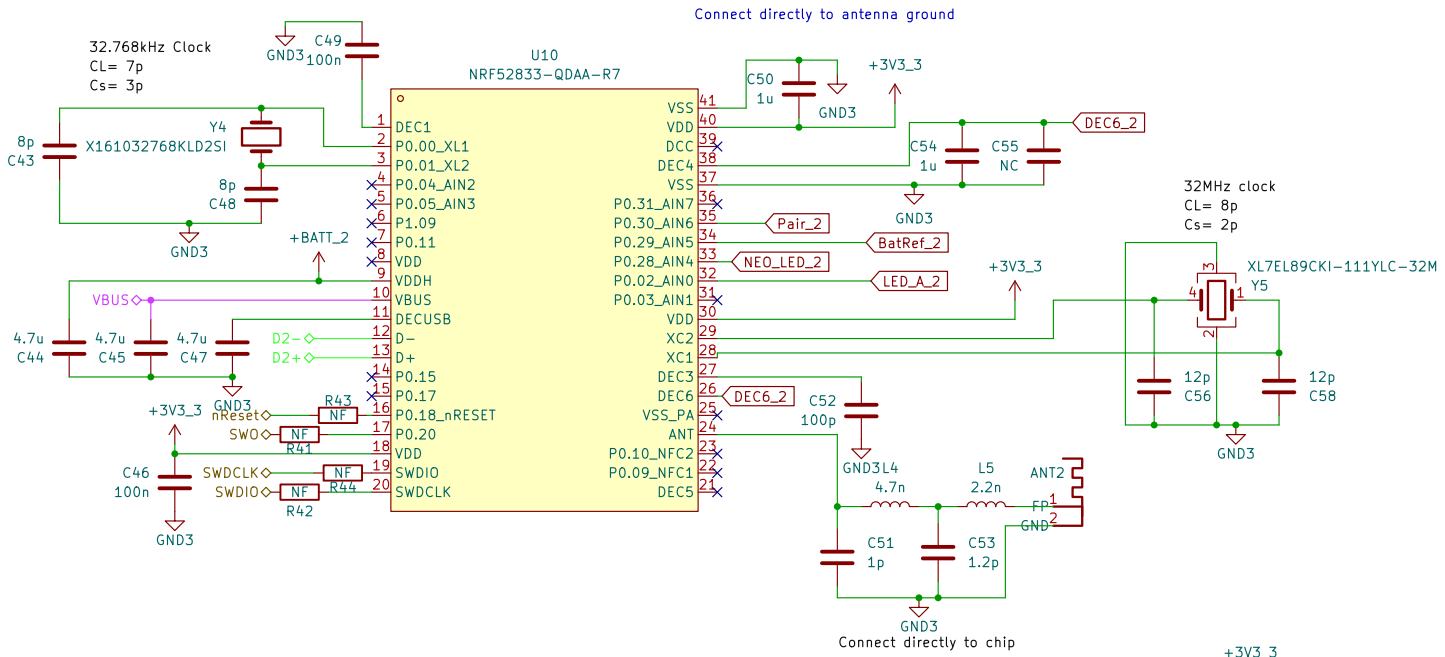
DK		
Sheet: /EarringR/Power/		
File: Power.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 5/12



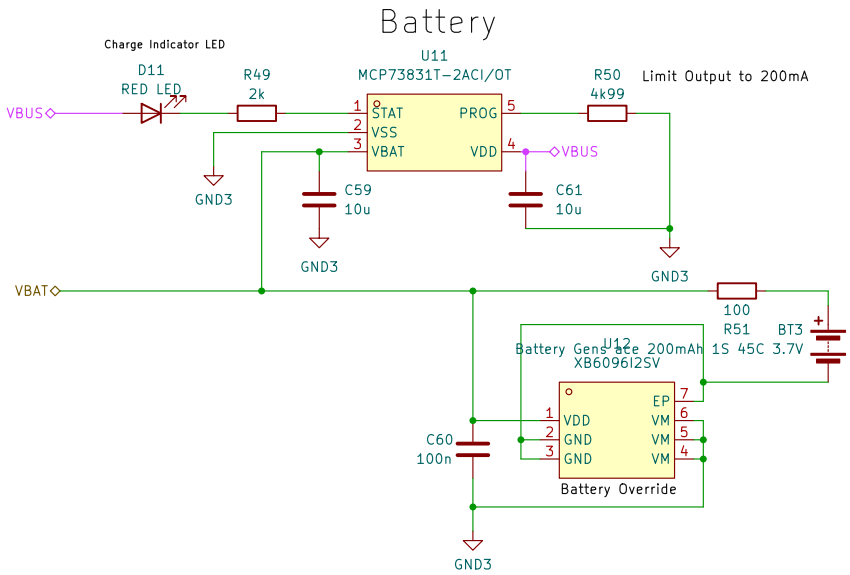
DK		
Sheet: /EarringR/DSP/		
File: DSP.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 6/12



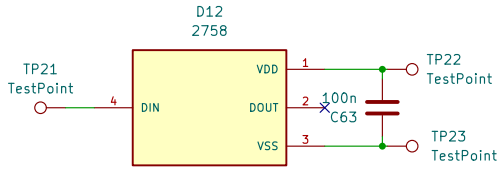
DK		
Sheet: /EarringL/		
File: BLEEarrings.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 7/12



DK		
Sheet: /EarringL/DSP/		
File: DSP.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 8/12



DK		
Sheet: /EarringL/Power/		
File: Power.kicad_sch		
Title: BLEarrings V1		
Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 9/12

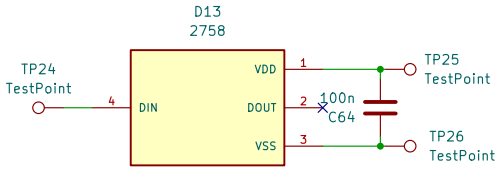


DK

Sheet: /Pendant2/
File: Earring.kicad_sch

Title: BLEarrings V1

Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 10/12



DK

Sheet: /Pendant1/
File: Earring.kicad_sch

Title: BLEarrings V1

Size: A4	Date: 2024-12-27	**Rev: 00.00**
KiCad E.D.A. 8.0.7		Id: 11/12