

**SOC**

U2  
ESP32-PICO-D4

VDDA 46  
VDDA3P3 8  
VDD3P3\_RTC 19  
VDD3P3\_CPU 37  
VDD\_SDIO 26

Input only:  
IO34, IP35, IO36,  
IO37, IO38, IO39  
IO, 11, 5, 6, 7, 8

SENSOR\_CAPD IO37  
SENSOR\_CAPN IO38  
SENSOR\_VP IO36  
SENSOR\_VN IO39  
EN  
IO34  
IO35  
IO0  
IO2  
IO4  
IO5  
IO12  
IO13  
IO14  
IO15  
IO16  
IO17  
IO18  
IO19  
IO21  
I2S2\_Data  
EN  
SPARE  
TOUCH1  
SDA  
RGB  
SCL  
ALERT

U0TXD TX\_ESP  
U0RXD RX\_ESP  
SD0  
SD1  
SD2  
SD3  
CLK  
CMD  
LNA\_IN  
IO22  
IO23  
IO25  
IO26  
IO27  
IO32  
IO33  
CAP1\_NC  
CAP2\_NC  
XTAL\_P\_NC  
XTAL\_N\_NC  
GND

AE1  
ANT3216LL00R2400A

i2S2\_CLK  
i2S1\_Data  
i2S2\_WS  
i2S1\_CLK

Strapping Pins:  
GPIO0, IO2, IO5, IO12, IO15

ESP32-PICO-D4 Datasheet:  
"Pins IO16, IO17, CMD, CLK, SD0, SD1 and SD13  
(25, 26, 30, 31, 32, 33, 29)  
are used to connect the embedded flash,  
and can not be used for other purposes."  
For details, please see Section 6 Schematics."

**Programming**

U3

VDD5 7  
VBUS 8  
UD- 4  
USB+ 3  
GND 2  
CH9102F

C9 1uF  
C10 0.1uF  
C11 0.1uF

TP13 Tx  
TP14 Rx

RX\_ESP  
TX\_ESP

TXD 21  
RXD 20  
RTS 19  
CTS 23  
DSR 23  
DTR 23  
DCD 24  
RI 1

SUSPEND 17  
SUSPEND 15  
ACT 10

RST 9  
TNOW/GPIO.2  
WAKEUP/GPIO.3  
GPIO.4  
TXS/GPIO.0  
RXS/GPIO.1

**Visual Feedback RGB LEDs**

D1 +5V  
WS2812C-2020  
J2  
Ext RGB

GPI014 RGB  
Din  
Dout  
GND

**Reset**

+3.3V  
R1 10K  
C1 1uF  
EN

**User Switch**

+3.3V  
R4 10K  
SW1 SW\_SPST  
C4 100nF  
GND

**ADC + Breakouts**

+5V  
TP2  
5V  
TP8  
3V3  
TP9  
GND  
TP1  
IO35 SPARE GPI035

**Programming Transistors**

Q1 2SC4617R BR  
Q2 2SC4617R BR  
R5 10K  
R6 10K  
DTR  
RTS  
EN\_TP  
TP5 EN  
TP12 IO0

**Microphone**

U1  
MP23DB01HPTR  
GPI033 OR\*  
OR\*  
OR\*  
GPI025 i2S2\_CLK  
GPI039 i2S2\_Data  
GPI032 i2S2\_WS  
J1

Ext. I2S Microphones

+3.3V  
C3 200pF  
C2 100nF  
GND

CLK VDD  
L/R  
GND DOUT

i2S1\_Data GPI026

\*Fit one resistor  
to select Left  
or Right Channel

Compatible PDM Microphones:  
\* MP23DB01HPCT Digkey: 497-MP23BD01HPCT-ND AS2.75/10  
\* MP23DB01HPTR Mouser: 511-MP23DB01HPTR AS2.62/10  
\* GMA3526H10-B26 LCSC: C498192 AS1.33/10

Compatible I2S Microphones:  
\* SPH0645  
\* ICS-43434

**Breakout**

Power

File: Power.kicad\_sch

MIT License  
2P Battery Version  
**Team Open Smart Glasses**  
Sheet: /  
File: OSSG\_v0p4.kicad\_sch  
**Title: Team OpenSource Smartglasses**  
Size: A3 Date: 2022-09-17 Rev: V0.4b3  
KiCad E.D.A. kicad 6.0.7-f9a2dced07-116-ubuntu22.04.1 Id: 1/2

**SOC**

U2  
ESP32-PICO-D4

VDDA 46  
VDDA3P3 8  
VDD3P3\_RTC 19  
VDD3P3\_CPU 37  
VDD\_SDIO 26

Input only:  
IO34, IP35, IO36,  
IO37, IO38, IO39  
IO, 11, 5, 6, 7, 8

SENSOR\_CAPD IO37  
SENSOR\_CAPN IO38  
SENSOR\_VP IO36  
SENSOR\_VN IO39  
EN  
IO34  
IO35  
IO0  
IO2  
IO4  
IO5  
IO12  
IO13  
IO14  
IO15  
IO16  
IO17  
IO18  
IO19  
IO21

SWITCH I2S2\_Data  
EN  
SPARE  
I00  
TOUCH1  
SDA  
RGB  
SCL  
ALERT

U0TXD TX\_ESP  
U0RXD RX\_ESP  
SD0  
SD1  
SD2  
SD3  
CLK CLK  
CMD  
LNA\_IN  
IO22  
IO23  
IO25  
IO26  
IO27  
IO32  
IO33  
CAP1\_NC  
CAP2\_NC  
XTAL\_P\_NC  
XTAL\_N\_NC  
GND

C5 10uF  
C6 0.1uF  
AE1 ANT3216LL00R2400A

i2S2\_CLK  
i2S1\_Data  
i2S2\_WS  
i2S1\_CLK

Strapping Pins:  
GPIO0, IO2, IO5, IO12, IO15

ESP32-PICO-D4 Datasheet:  
"Pins IO16, IO17, CMD, CLK, SD0, SD1 and SD13  
(25, 26, 30, 31, 32, 33, 29)  
are used to connect the embedded flash,  
and can not be used for other purposes."  
For details, please see Section 6 Schematics."

**Programming**

U3

VDD5 7  
VBUS 8  
UD- 4  
USB+ 3  
UD+ 3  
TXD 21  
RXD 20  
RTS 19  
CTS 23  
DSR 23  
DTR 23  
DCD 24  
RI 1  
SUSPEND 17  
SUSPEND 15  
ACT 10  
RST 9  
TNOW/GPIO.2  
WAKEUP/GPIO.3  
GPIO.4  
TXS/GPIO.0  
RXS/GPIO.1

C9 1uF  
C10 0.1uF  
C11 0.1uF  
TP13 Tx  
TP14 Rx

RX\_ESP  
TX\_ESP

**Touch**

GPIO2 TOUCH1 2 J4  
1  
GND Touch

**Reset**

+3.3V  
R1 10K  
C1 1uF  
EN

**User Switch**

+3.3V  
R4 10K  
C4 100nF  
SW1 SW\_SPST  
GND

**ADC + Breakouts**

+5V TP2  
5V  
+3.3V TP8  
3V3  
GND TP9  
GND  
TP1 SPARE GPIO35

**Programming Transistors**

EN\_TP TP5 EN  
Q1 2SC4617R BR  
Q2 2SC4617R BR  
DTR R5 10K  
RTS R6 10K  
TP12 IO0

**Breakout**

**Microphone**

+3.3V  
GPIO33 OR\*  
i2S1\_CLK 4  
CLK VDD 5  
L/R 2  
GND DOUT 1  
i2S1\_Data GPIO26  
MP23DB01HPTTR U1  
C3 200pF  
C2 100nF  
GND

\*Fit one resistor to select Left or Right Channel

Compatible PDM Microphones:  
\* MP23DB01HPCT Digkey: 497-MP23BD01HPCT-ND AS2.75/10  
\* MP23DB01HPTR Mouser: 511-MP23DB01HPTR AS2.62/10  
\* GMA3526H10-B26 LCSC: C498192 AS1.33/10

Ext. i2S Microphones

+3.3V  
GND  
VCC  
GND  
CLK  
Data  
WS

GPIO25 i2S2\_CLK  
GPIO39 i2S2\_Data  
GPIO32 i2S2\_WS

J1 WS

Compatible i2S Microphones:  
\* SPH0645  
\* ICS-43434

**Visual Feedback RGB LEDs**

+5V  
1uF C20  
WS2812C-2020 D1 +5V  
GPIO14 RGB 3 Din  
VDD 4  
GND 2  
Dout 1  
5V J2  
Dout 2  
GND 1  
Ext RGB

**Power**

File: Power.kicad\_sch

MIT License 2P Battery Version <b>Team Open Smart Glasses</b> Sheet: / File: OSSG_v0p4.kicad_sch		
<b>Title: Team OpenSmart Glasses</b>		
Size: A3	Date: 2022-09-17	Rev: V0.4b3
KiCad E.D.A. kicad 6.0.7-f9a2dced07-116-ubuntu22.04.1 Id: 1/2		

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**SOC**

U2  
ESP32-PICO-D4

VDDA 46  
VDDA3P3 8  
VDD3P3\_RTC 19  
VDD3P3\_CPU 37  
VDD\_SDIO 26

Input only:  
IO34, IP35, IO36,  
IO37, IO38, IO39  
IO, 11, 5, 6, 7, 8

SENSOR\_CAPD IO37  
SENSOR\_CAPN IO38  
SENSOR\_VP IO36  
SENSOR\_VN IO39  
EN  
IO34  
IO35  
IO0  
IO2  
IO4  
IO5  
IO12  
IO13  
IO14  
IO15  
IO16  
IO17  
IO18  
IO19  
IO21

SWITCH I2S2\_Data  
EN  
SPARE  
I00  
TOUCH1  
SDA  
RGB  
SCL  
ALERT

U0TXD TX\_ESP  
U0RXD RX\_ESP  
SD0  
SD1  
SD2  
SD3  
CLK CLK  
CMD  
LNA\_IN  
IO22  
IO23  
IO25  
IO26  
IO27  
IO32  
IO33  
CAP1\_NC  
CAP2\_NC  
XTAL\_P\_NC  
XTAL\_N\_NC  
GND

C5 10uF  
C6 0.1uF  
AE1 ANT3216LL00R2400A

i2S2\_CLK  
i2S1\_Data  
i2S2\_WS  
i2S1\_CLK

Strapping Pins:  
GPIO0, IO2, IO5, IO12, IO15

ESP32-PICO-D4 Datasheet:  
"Pins IO16, IO17, CMD, CLK, SD0, SD1 and SD13  
(25, 26, 30, 31, 32, 33, 29)  
are used to connect the embedded flash,  
and can not be used for other purposes."  
For details, please see Section 6 Schematics."

**Programming**

U3

VDD5 7  
VBUS 8  
UD- 4  
USB+ 3  
UD+ 3  
TXD 21  
RXD 20  
RTS 19  
CTS 23  
DSR 23  
DTR 23  
DCD 24  
RI 1  
SUSPEND 17  
SUSPEND 15  
ACT 10  
RST 9  
TNOW/GPIO.2  
WAKEUP/GPIO.3  
GPIO.4  
TXS/GPIO.0  
RXS/GPIO.1

C9 1uF  
C10 0.1uF  
C11 0.1uF  
TP13 Tx  
TP14 Rx

RX\_ESP  
TX\_ESP

**Touch**

GPIO2 TOUCH1 2 J4  
1 Touch  
GND

**Reset**

+3.3V  
R1 10K  
C1 1uF  
EN

**User Switch**

+3.3V  
R4 10K  
C4 100nF  
SW1 SW\_SPST  
GND

**ADC + Breakouts**

+5V TP2  
5V  
+3.3V TP8  
3V3  
GND TP9  
GND  
TP1 SPARE GPIO35

**Programming Transistors**

EN\_TP TP5 EN  
Q1 2SC4617R BR  
Q2 2SC4617R BR  
DTR R5 10K  
RTS R6 10K  
TP12 IO0

**Breakout**

**Microphone**

+3.3V  
GPIO33 OR\*  
R2  
OR\* R3  
I2S1\_CLK 4  
I2S1\_WS 5  
I2S1\_Data GPIO26  
MP23DB01HPTR U1  
CLK VDD 5  
L/R 2  
GND DOUT 1  
C3 200pF  
C2 100nF  
GND

Ext. I2S Microphones

I2S2\_CLK 1  
I2S2\_Data 2  
I2S2\_WS 3  
WS 4  
VCC 5  
GND 6

Compatible PDM Microphones:  
\* MP23DB01HPCT Digkey: 497-MP23BD01HPCT-ND AS2.75/10  
\* MP23DB01HPTR Mouser: 511-MP23BD01HPTR AS2.62/10  
\* GMA3526H10-B26 LCSC: C498192 AS1.33/10

Compatible I2S Microphones:  
\* SPH0645  
\* ICS-43434

**Visual Feedback RGB LEDs**

+5V  
1uF C20  
WS2812C-2020 D1 +5V  
GPIO14 RGB 3 Din  
VDD 4  
GND 1  
Dout 2  
Ext RGB 1  
GND

**Power**

File: Power.kicad\_sch

MIT License 2P Battery Version <b>Team Open Smart Glasses</b> Sheet: / File: OSSG_v0p4.kicad_sch <b>Title: Team OpenSource Smartglasses</b>		
Size: A3	Date: 2022-09-17	Rev: V0.4b3
KiCad E.D.A. kicad 6.0.7-f9a2dced07-116-ubuntu22.04.1 Id: 1/2		

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**SOC**

U2  
ESP32-PICO-D4

VDDA 46  
VDDA3P3 8  
VDD3P3\_RTC 19  
VDD3P3\_CPU 37  
VDD\_SDIO 26

Input only:  
IO34, IP35, IO36,  
IO37, IO38, IO39  
IO, 11, 5, 6, 7, 8

SENSOR\_CAPD IO37  
SENSOR\_CAPN IO38  
SENSOR\_VP IO36  
SENSOR\_VN IO39  
EN  
IO34  
IO35  
IO0  
IO2  
IO4  
IO5  
IO12  
IO13  
IO14  
IO15  
IO16  
IO17  
IO18  
IO19  
IO21

SWITCH I2S2\_Data  
EN  
SPARE  
I00  
TOUCH1  
SDA  
RGB  
SCL  
ALERT

U0TXD TX\_ESP  
U0RXD RX\_ESP  
SD0  
SD1  
SD2  
SD3  
CLK CLK  
CMD  
LNA\_IN  
IO22  
IO23  
IO25  
IO26  
IO27  
IO32  
IO33  
CAP1\_NC  
CAP2\_NC  
XTAL\_P\_NC  
XTAL\_N\_NC  
GND

C5 10uF  
C6 0.1uF  
AE1 ANT3216LL00R2400A

i2S2\_CLK  
i2S1\_Data  
i2S2\_WS  
i2S1\_CLK

Strapping Pins:  
GPIO0, IO2, IO5, IO12, IO15

ESP32-PICO-D4 Datasheet:  
"Pins IO16, IO17, CMD, CLK, SD0, SD1 and SD13  
(25, 26, 30, 31, 32, 33, 29)  
are used to connect the embedded flash,  
and can not be used for other purposes."  
For details, please see Section 6 Schematics."

**Programming**

U3

VDD5 7  
VBUS 8  
UD- 4  
USB+ 3  
UD+ 3  
TXD 21  
RXD 20  
RTS 19  
CTS 23  
DSR 23  
DTR 23  
DCD 24  
RI 1  
SUSPEND 17  
SUSPEND 15  
ACT 10  
RST 9  
TNOW/GPIO.2  
WAKEUP/GPIO.3  
GPIO.4  
TXS/GPIO.0  
RXS/GPIO.1

C9 1uF  
C10 0.1uF  
C11 0.1uF  
TP13 Tx  
TP14 Rx

RX\_ESP  
TX\_ESP

**Touch**

GPIO2 TOUCH1 2 J4  
1  
GND Touch

**Reset**

+3.3V  
R1 10K  
C1 1uF  
EN

**User Switch**

+3.3V  
R4 10K  
C4 100nF  
SW1 SW\_SPST  
GND

**ADC + Breakouts**

+5V TP2  
5V  
+3.3V TP8  
3V3  
GND TP9  
GND  
TP1 SPARE GPIO35

**Programming Transistors**

EN\_TP TP5 EN  
Q1 2SC4617R BR  
R5 10K  
DTR  
Q2 2SC4617R BR  
R6 10K  
RTS  
TP12 IO0

**Breakout**

**Microphone**

+3.3V  
GPIO33 OR\*  
R2  
OR\* R3  
MP23DB01HPTR U1  
CLK L/R VDD  
GND DOUT  
C3 200pF  
C2 100nF  
GND  
i2S1\_Data GPIO26

Ext. i2S Microphones

GPIO25 i2S2\_CLK  
GPIO39 i2S2\_Data  
GPIO32 i2S2\_WS  
J1 WS

\*Fit one resistor to select Left or Right Channel

Compatible PDM Microphones:  
\* MP23DB01HPCT Digkey: 497-MP23BD01HPCT-ND AS2.75/10  
\* MP23DB01HPTR Mouser: 511-MP23DB01HPTR AS2.62/10  
\* GMA3526H10-B26 LCSC: C498192 AS1.33/10

Compatible i2S Microphones:  
\* SPH0645  
\* ICS-43434

**Visual Feedback RGB LEDs**

+5V  
1uF C20 WS2812C-2020 D1 +5V  
GND  
GPIO14 RGB 3 Din VDD 4  
Dout 2  
GND Ext RGB 1  
5V J2  
Dout 2  
GND

**Power**

File: Power.kicad\_sch

MIT License 2P Battery Version <b>Team Open Smart Glasses</b> Sheet: / File: OSSG_v0p4.kicad_sch <b>Title: Team OpenSource Smartglasses</b>		
Size: A3	Date: 2022-09-17	Rev: V0.4b3
KiCad E.D.A. kicad 6.0.7-f9a2dced07-116-ubuntu22.04.1 Id: 1/2		

[illegible][illegible][illegible]

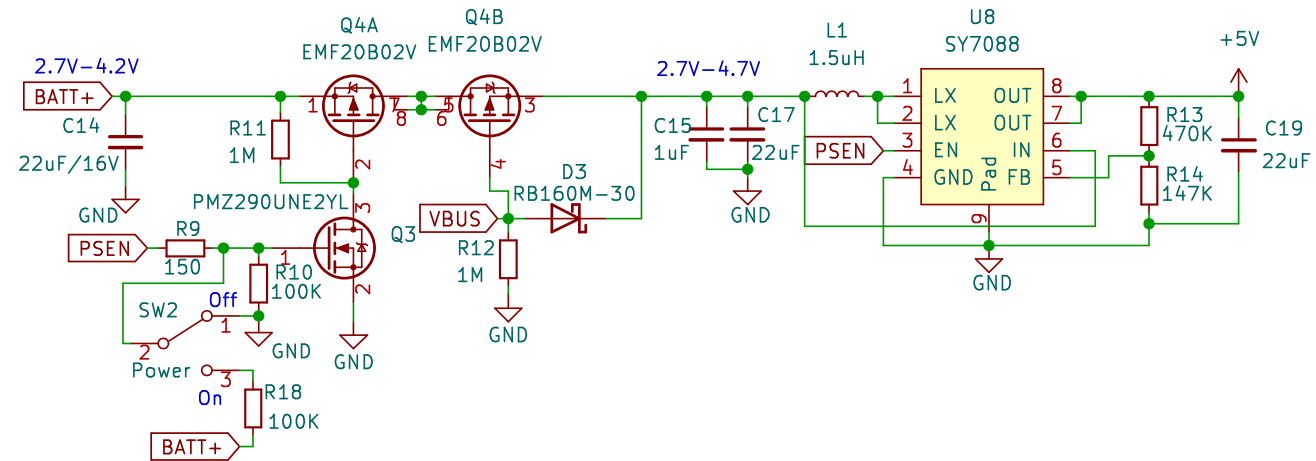
USB In



## Power On/Off + Low Battery Isolation

## Battery Bypass

## 2.7V-4.7V to 5V Boost

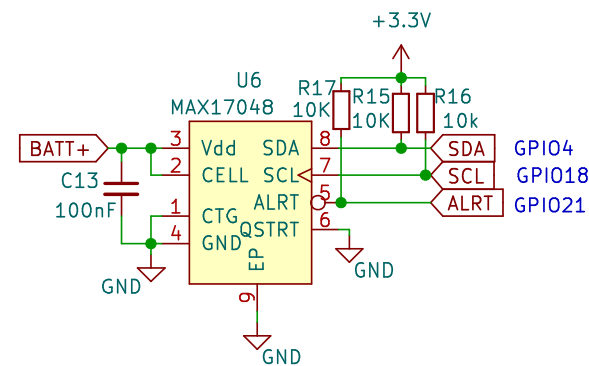


## Battery Terminals

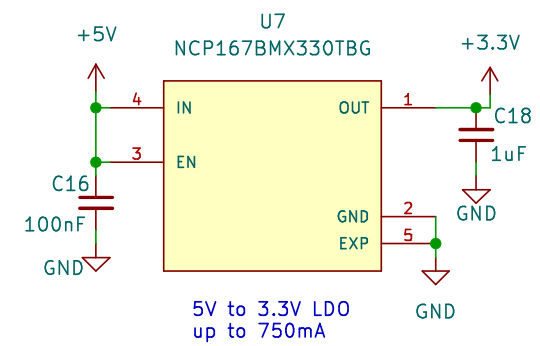


Dual LiPo  
2.7V to 4.2V  
500mA Batteries

## Battery Fuel Gauge



## 5V to 3.3V LDO



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2P Battery Version

Sheet: /Power/  
File: Power.kicad\_sch

**Title: Team OpenSource Smartglasses**

Size: A4	Date: 2022-09-17
KiCad E.D.A. kicad 6.0.7-f9a2dc07~116~ubuntu22.04.1	

Rev: V0.4b3  
Id: 2/2