129.3

82.4

15.9

31.8

78.7

Battery bypass

github.com
/rnph2s3-2025-team5/
robot-motherboard-pcb

open source
hardware

PIN STRAPPING:
GPIO0 -> PULL-UP
GPIO2 -> PULL-DOWN
MDTI(GPIO13) -> PULL-DOWN
MDTO(GPIO15) -> PULL-UP
GPIO5 -> PULL-UP

Designed by
George Sleen

BOARD CHARACTERISTICS

Copper Layer Count:	2	Board Thickness:	1.6000 mm
Board overall dimensions:	129.2860 mm x 78.7400 mm		
Min track/spacing:	0.1000 mm / 0.1000 mm	Min hole diameter:	0.3000 mm
Copper Finish:	None	Impedance Control:	No
Castellated pads:	No	Plated Board Edge:	No
Edge card connectors:	No		

Layer Name	Type	Material	Thickness (mm)	Color	Epsilon R	Loss Tangent
F.Silkscreen	Top Silk Screen	Not specified	0 mm	Not specified	1	0
F.Paste	Top Solder Paste		0 mm		1	0
F.Mask	Top Solder Mask	Not specified	0.01 mm	Not specified	3.3	0
F.Cu	copper		0.035 mm		1	0
Dielectric	core	FR4	1.51 mm	Not specified	4.5	0.02
B.Cu	copper		0.035 mm		1	0
B.Mask	Bottom Solder Mask	Not specified	0.01 mm	Not specified	3.3	0
B.Paste	Bottom Solder Paste		0 mm		1	0
B.Silkscreen	Bottom Silk Screen	Not specified	0 mm	Not specified	1	0

George Sleen
Team 5
Sheet:
File: robot-motherboard.kicad_pcb
Title: Robot Motherboard

Size: A4	Date: 2025-07-04	**Rev: v1.0.0**
KiCad E.D.A. 9.0.2		Id: 1/4

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Team 5
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Title: Robot Motherboard

Size: A4	Date: 2025-07-04	**Rev: v1.0.0**
KiCad E.D.A. 9.0.2		Id: 2/4

T5 ROBOT MOTHERBOARD

Wing1_SW — IN GND
Wing1_S — OUT GND
Wing0_SW — IN GND
Wing0_S — OUT GND
I2C1 — 3V3 SDA SCL
I2C0 — 3V3 SDA SCL

BATT
9V
PW_OUT — 5V 3V3 GND

R1 470R
R2 10K
U1
H1
MCT6
Q1 IRFZ44
R6 4k7
R5 4k7
R4 4k7
R3 4k7
C9
C13

Reflectance — 3V3 IN1 IN2 GND
C12
U5 BNO085
C8
C2

U2 — VIN+ VOUT+ VIN− VOUT−

U3 CD4051B
C1
C5
C4
C7

Arm_M — S.P S.D I.P I.D GND
Arm_M — S.P S.D I.P I.D GND

Antenna
U4 ESP32_PICO-1
USB

User.Input — IN8 IN7 IN6 IN5
C10
G1 SSD1306_OLED

POT1 RV1
POT2 RV2
POT3 RV3
POT4 RV4

Drivetrain_M — GND 1.D 1.P 0.D 0.P
Extra — GND 12 2 RX0 TX0
C11
C3 C6

Dimensions: 129.3 · 82.4 · 15.9 · 31.8 · 78.7

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BATT

J3

J5 J4 J2 J1 J16 J14

J6

J17

H1
M3_PTH

H5
100nF
M3_PTH
C13

J19 J12 J11

J10

U5

C8
100nF

R1 R2

R6 R4
R5 R3

U1

Q1

C12
100nF

H4
M3_PTH

C2
100nF

C9
100nF

LM2596_Breakout
U2

C1
100nF

C5
47uF

C4
47uF

U3

J9

J8

U4

J13

C7
100nF

C10 100nF

G1

RV1 RV2 RV3 RV4

H2
M3_PTH

J7

J15

100nF 100nF 100nF
C11 C3 C6

H3
M3_PTH

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