

# Amulet Motion Controller Fabrication Document

A

A

B

B

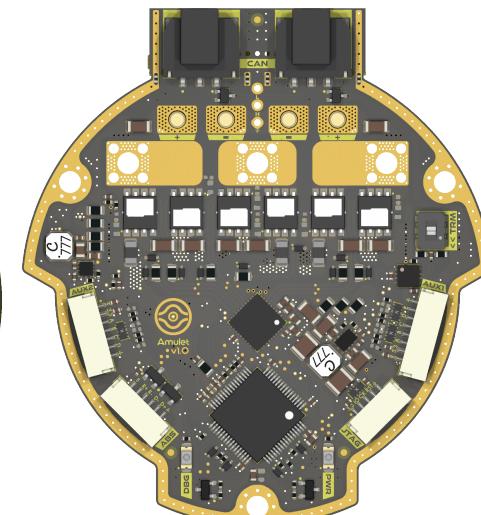
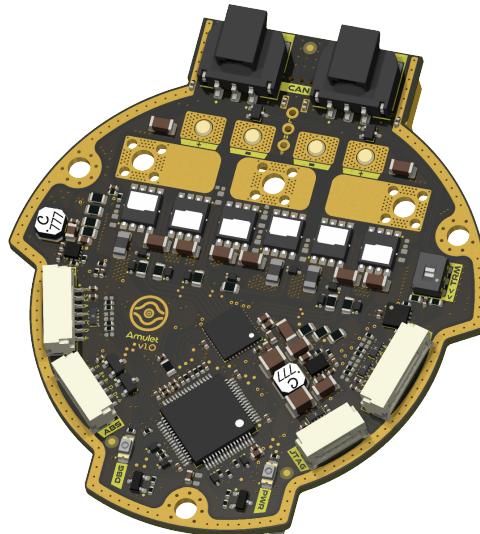
C

C

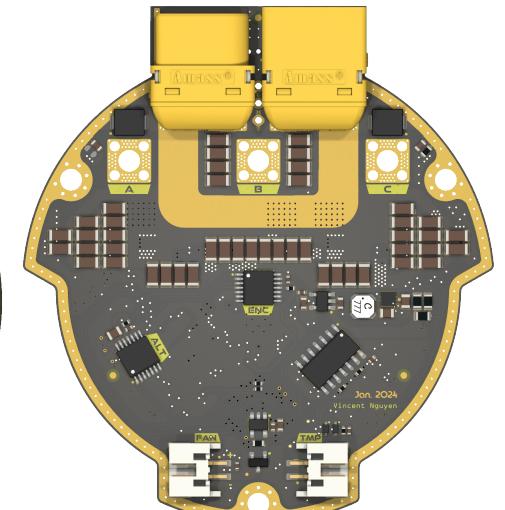
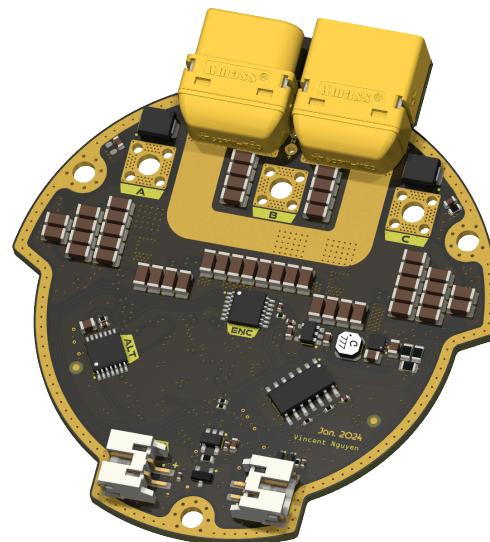
D

D

**Top View**



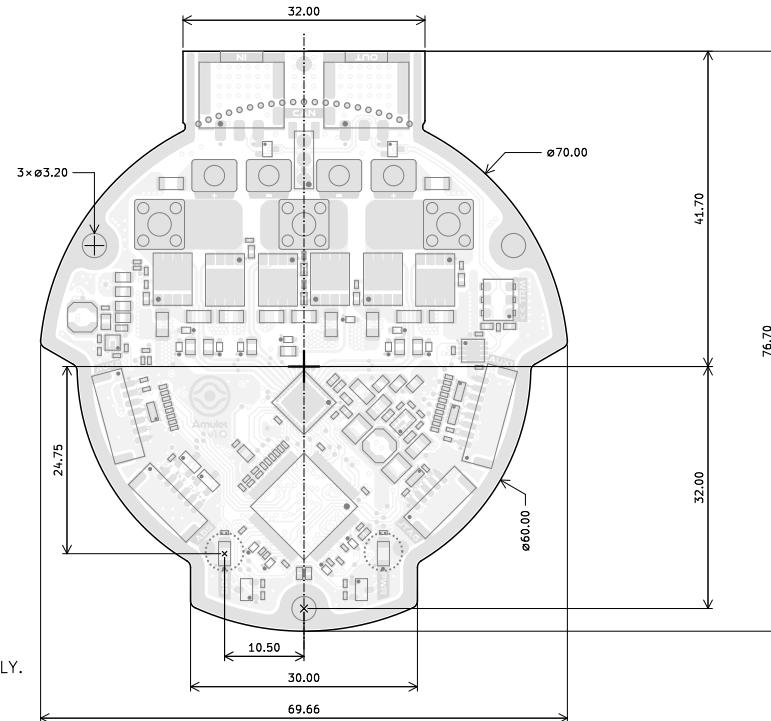
**Bottom View**



	Comments:	Company: EPFL Xplore Research	Variant: Checked
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>	
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Date: 2024-01-25 Revision: 1.0
			Size: A4 Sheet: 1 of 1

# Amulet Motion Controller Fabrication Document

## Top Dimensions



### FABRICATION NOTES (UNLESS OTHERWISE SPECIFIED)

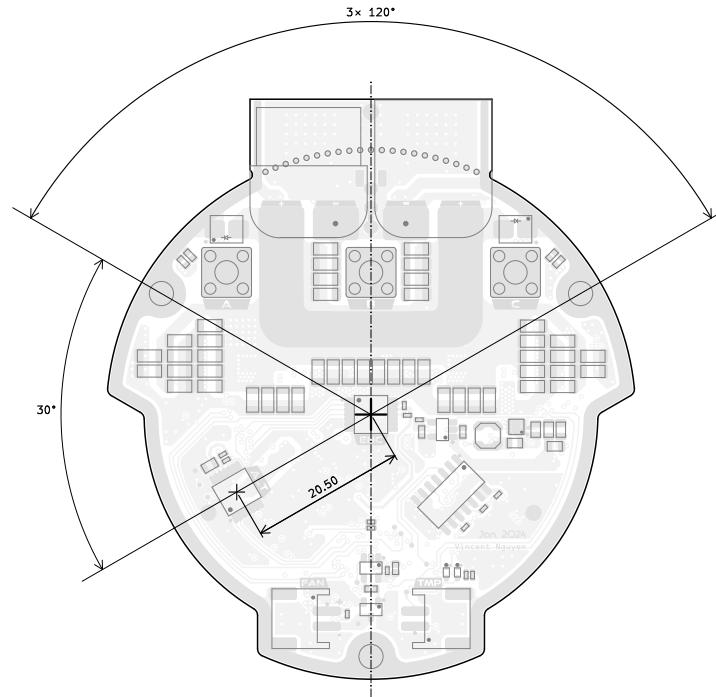
- 1) OUTLINE DEFINED IN SEPARATE GERBER FILE WITH "Edge\_Cuts.GBR" SUFFIX. DIMENSIONS OF CIRCUMSIZED RECTANGLE SHOWN ON THIS DWG FOR REF ONLY.
- 2) SEE SEPARATE DRILL FILES WITH ".DRL" SUFFIX FOR HOLE LOCATIONS. SELECTED HOLE LOCATIONS SHOWN ON THIS DWG FOR REF ONLY.

All dimensions are in millimeters unless otherwise specified.

	Comments:	Company: EPFL Xplore Research	Variant: Checked
	Board Name: <b>Amulet Motion Controller</b>		
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Date: 2024-01-25 Revision: 1.0
			Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

# Amulet Motion Controller Fabrication Document

## Bottom Dimensions



All dimensions are in millimeters unless otherwise specified.

	Comments:	Company: EPFL Xplore Research	 Variant: Checked
	Board Name: <b>Amulet Motion Controller</b>		Project Name: <b>Chienpanzé</b>
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:		Reviewers: Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

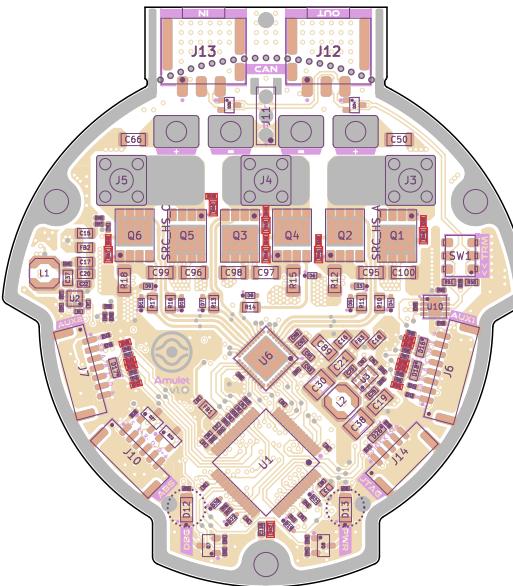
# Amulet Motion Controller Fabrication Document

## Top Assembly

### Layer Stack Legend

Material	Layer	Thickness	Dielectric Material	Type	Gerber
	F.Paste			Paste Mask	GBR
	F.Silkscreen			Legend	GBR
	F.Mask			Solder Mask	GBR
Copper	L1 (Sig. PWR)	0.07mm (2oz)		Signal	GBR
Prepreg	L2 (GND)	0.18mm	FR-4	Dielectric	
Copper	L3 (GND)	0.035mm (1oz)		Internal Plane	GBR
Core		0.4mm	FR-4	Dielectric	
Copper	L4 (Sig. PWR)	0.035mm (1oz)		Signal	GBR
Prepreg	L5 (GND)	0.18mm	FR-4	Dielectric	
Copper	L6 (Sig. PWR)	0.035mm (1oz)		Signal	GBR
Core		0.4mm	FR-4	Dielectric	
Copper	L7 (GND)	0.035mm (1oz)		Internal Plane	GBR
Prepreg	L8 (Sig. PWR)	0.18mm	FR-4	Dielectric	
Copper	L9 (GND)	0.07mm (2oz)		Signal	GBR
	B.Mask			Solder Mask	GBR
	B.Silkscreen			Legend	GBR
	B.Paste			Paste Mask	GBR

Total thickness: 1.62mm  
Note: external layer thicknesses are specified after plating.



### FABRICATION NOTES (CONT.)

- 3) IMPEDANCE CONTROL REQUIRED.  
Microstrip 100-Ohm Differential (L1 ref. L2, L6 ref. L5)  
0.2032mm width, 0.28mm spacing

- 4) CONFIRM TRACE WIDTHS AND SPACINGS.

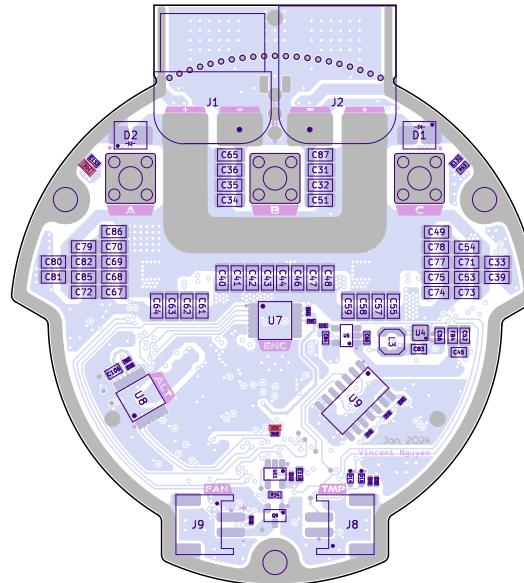
- 5) DESIGN GEOMETRY MINIMUM FEATURE SIZES:

TRACE WIDTH	0.20 mm	TRACE TO TRACE	0.20 mm
MIN. HOLE (plated)	0.25 mm	MIN. HOLE (unplated)	0.70 mm
ANNULAR RING	0.15 mm	COPPER TO HOLE	0.254 mm
COPPER TO EDGE	0.25 mm	HOLE TO HOLE	0.254 mm

			Comments:	Company: <b>EPFL Xplore Research</b>	Variant:  Checked
			Board Name: <b>Amulet Motion Controller</b>		
			Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
			Sheet Path:		Reviewers: Size: <b>A4</b>
				Sheet: <b>1</b> of <b>1</b>	

# Amulet Motion Controller Fabrication Document

## Bottom Assembly

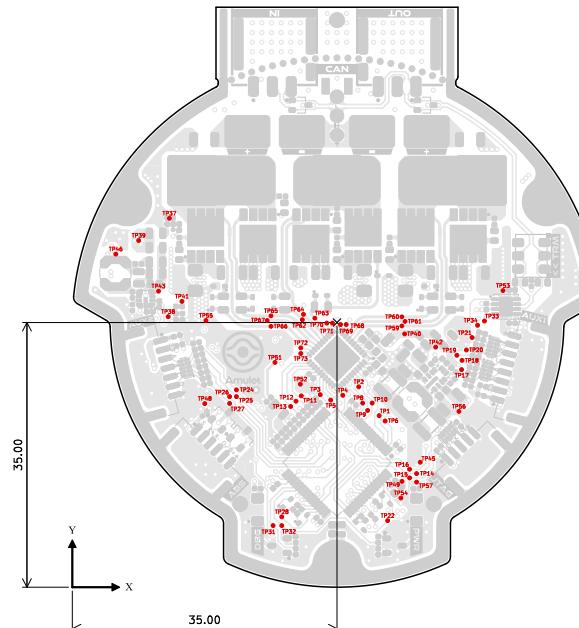


	Comments:	Company: EPFL Xplore Research	 Variant: Checked
		Board Name: <b>Amulet Motion Controller</b>	
D	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Date: 2024-01-25 Revision: 1.0
			Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

# Amulet Motion Controller Fabrication Document

## Top Test Points

Ref.	Net	X [mm]	Y [mm]
TP1	MOTOR_ENABLE	40.58	22.69
TP2	MOTOR_HIZ	37.88	26.50
TP3	MOTOR_FAULT	32.78	25.46
TP4	DRV_SCLK	35.77	25.38
TP5	DRV_MISO	34.17	24.75
TP6	DRV_MOSI	41.36	21.98
TP8	PWN_PHASEA	38.40	24.35
TP9	PWN_PHASEB	39.05	23.37
TP10	PWN_PHASEC	39.65	24.35
TP11	SOA	30.28	25.30
TP12	SOB	29.58	24.60
TP13	SOC	28.88	23.90
TP14	SPIIO	45.50	19.02
TP15	SWCLK	44.60	14.45
TP16	NRST	44.60	15.60
TP17	AUX1_A	51.48	28.77
TP18	AUX1_B	51.54	30.00
TP19	AUX1_C	50.85	30.67
TP20	AUX1_D	52.11	31.37
TP21	AUX1_E	52.86	33.02
TP22	AUX1_I2C_PULLUP	41.80	28.00
TP24	AUX2_A	24.70	25.20
TP25	AUX2_B	24.70	25.20
TP26	AUX2_C	20.80	25.20
TP27	AUX2_D	20.80	24.30
TP28	AUX2_I2C_PULLUP	27.70	9.30
TP31	LED_DBG	26.55	8.15
TP32	LED_PWR	27.70	8.15
TP33	FDCAN_RX	50.50	37.20
TP34	FDCAN_TX	53.59	34.64
TP37	SENSE_TEMP_FET	13.34	47.28
TP38	SENSE_VBAT	12.67	35.77
TP39	+VBAT	8.78	45.85
TP40	+VBAT	43.95	33.50
TP41	+VBAT	14.50	37.80
TP42	F_VIN_12V	48.00	31.75
TP43	F_VIN_5V	11.40	30.25
TP46	+12V	6.01	16.53
TP48	+5V	5.75	44.05
TP49	+3V3	17.52	24.28
TP49	+3V3	43.60	14.00
TP51	+A3V3	26.80	29.72
TP52	GND	30.15	26.85
TP53	GND	56.95	39.22
TP54	GND	43.45	11.80
TP55	GND	17.68	35.27
TP56	GND	51.12	23.25
TP57	GND	45.53	13.90
TP59	GHA	43.58	34.55
TP60	GLA	43.58	35.75
TP61	SHA	44.00	35.15
TP62	GB	30.40	35.38
TP63	GLB	52.07	35.88
TP64	SHB	30.57	36.08
TP65	GHC	26.27	35.88
TP66	GLC	26.27	34.50
TP67	SHC	25.77	35.27
TP68	SA_P	36.22	34.74
TP69	SA_N	35.47	34.74
TP70	SB_P	33.65	34.93
TP71	SB_N	51.00	31.93
TP72	SC_P	30.21	31.65
TP73	SC_N	30.21	30.90



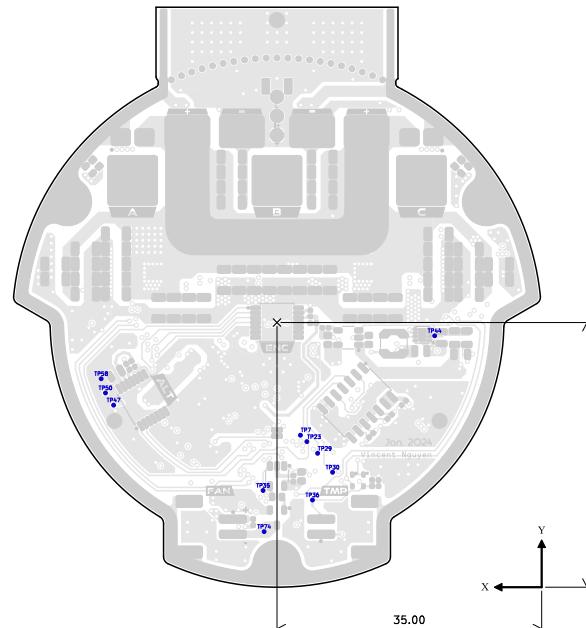
All dimensions are in millimeters unless otherwise specified.

	Comments:	Company: EPFL Xplore Research		Variant: Checked
		Board Name: <b>Amulet Motion Controller</b>		
Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-01-25	Revision: 1.0
			Sheet Path: Reviewer: Size: <b>A4</b>	
		Sheet: <b>1</b> of <b>1</b>		D

# Amulet Motion Controller Fabrication Document

## Bottom Test Points

Ref.	Net	X [mm]	Y [mm]
TP7	DRV_CS	31.90	20.10
TP23	POS_SENSOR_CS	31.05	19.25
TP29	RS422_RE	29.63	17.71
TP30	RS422_DE	27.65	15.20
TP35	FAN_CTRL	36.31	17.79
TP36	SEN_1TEMP_MOT	30.31	11.52
TP44	F_VIN_3V3	14.15	33.25
TP47	+5V	56.61	24.08
TP50	+3V3	57.68	25.69
TP58	GND	58.25	27.56
TP74	FAN_SW	36.70	7.35



All dimensions are in millimeters unless otherwise specified.

	Comments:	Company: EPFL Xplore Research		Variant: Checked
		Board Name: <b>Amulet Motion Controller</b>		Project Name: <b>Chienpanzé</b>
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-01-25
	Sheet Path:	Reviewer:		Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

## Amulet Motion Controller Fabrication Document

A

A

B

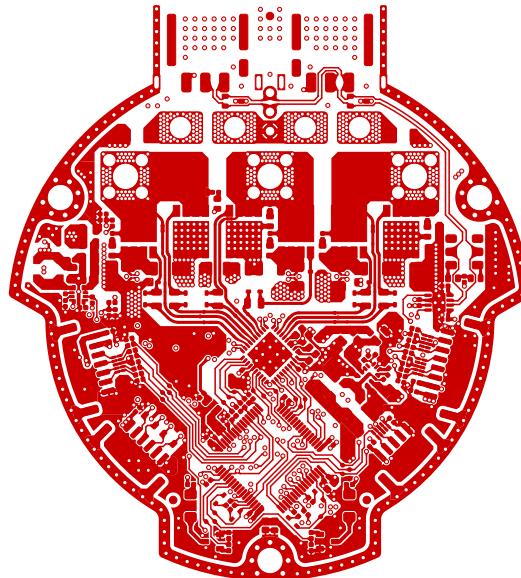
B

C

C

D

D

**L1 (SIG/PWR)**

	Comments:	Company: <b>EPFL Xplore Research</b>	Variant:  Checked
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>	
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

# Amulet Motion Controller Fabrication Document

A

A

B

B

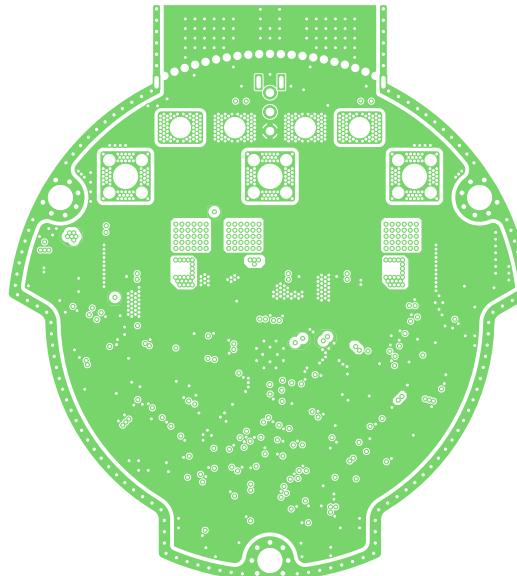
C

C

D

D

**L2 (GND)**



	Comments:	Company: EPFL Xplore Research	Variant: Checked
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>	
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

## Amulet Motion Controller Fabrication Document

A

A

B

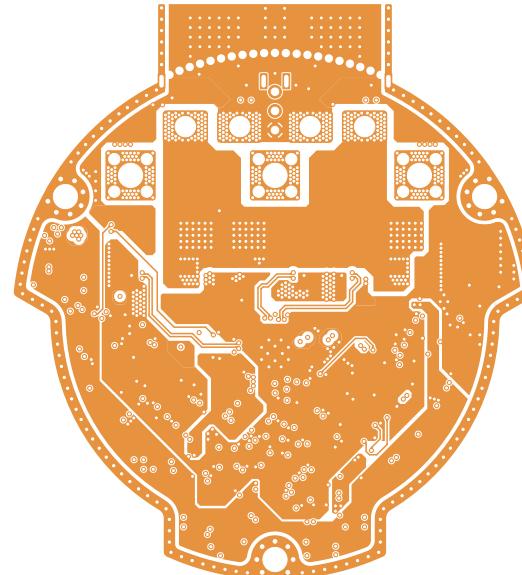
B

C

C

D

D

**L3 (SIG/PWR)**

	Comments:	Company: EPFL Xplore Research	Variant: Checked
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>	
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Date: 2024-01-25      Revision: 1.0
	Sheet Path:	Reviewer:	Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

## Amulet Motion Controller Fabrication Document

A

A

B

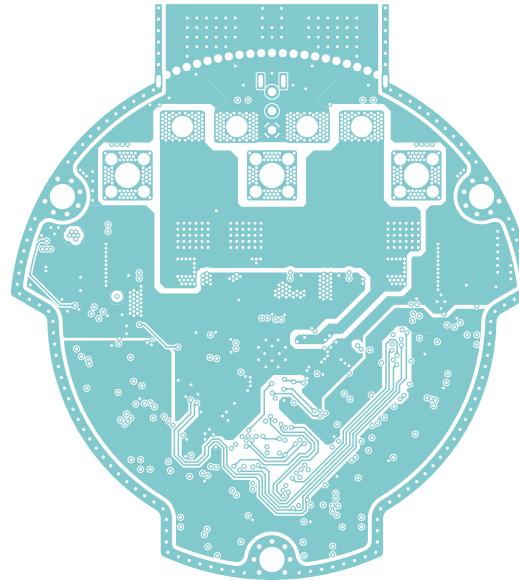
B

C

C

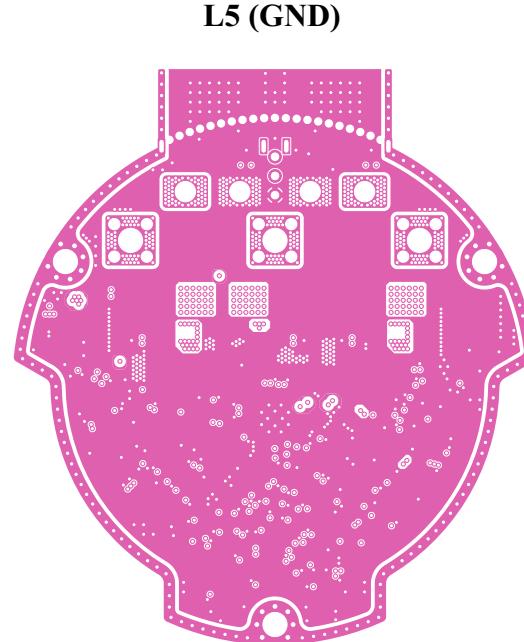
D

D

**L4 (SIG/PWR)**

	Comments:	Company: EPFL Xplore Research	Variant: Checked		
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>			
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen		
	Sheet Path:		Reviewer:  <b>A4</b> Sheet: <b>1</b> of <b>1</b>	Date: 2024-01-25	Revision: 1.0

## Amulet Motion Controller Fabrication Document



	Comments:	Company: <b>EPFL Xplore Research</b>	Variant:  Checked
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>	
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>

## Amulet Motion Controller Fabrication Document

A

A

B

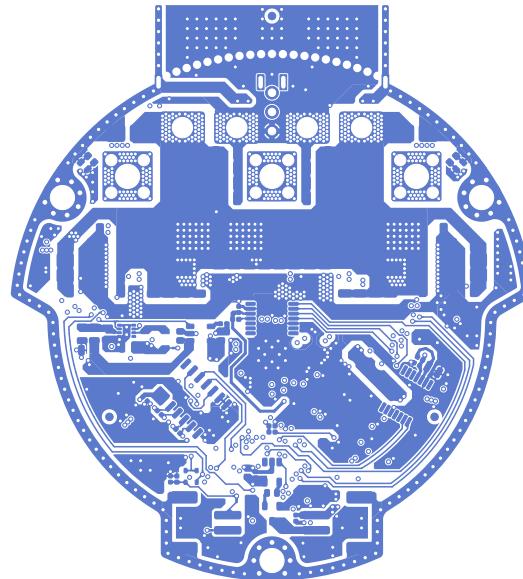
B

C

C

D

D

**L6 (SIG/PWR)**

	Comments:	Company: <b>EPFL Xplore Research</b>	Variant:  Checked
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>	
	Sheet Title: Amulet Motion Controller Assembly	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen
	Sheet Path:	Reviewer:	Size: <b>A4</b> Sheet: <b>1</b> of <b>1</b>