

# Amulet Motion Controller Fabrication Document

A

## Layer Stack Legend

Material	Layer	Thickness	Dielectric	Type	Gerber
	F.Paste			Paste Mask	
	F.Silkscreen		Direct Printing	Legend	GBR
	F.Mask	0.02mm	Solder Resist	Solder Mask	GBR
Copper	L1 (Sig. PWR)	0.07mm (2oz)		Signal	GBR
Prepreg	L2 (GND)	0.18mm	FR4_7628	Dielectric	
Copper	L3 (Sig. PWR)	0.035mm (1oz)		Plane	GBR
Core		0.4mm	FR4	Dielectric	
Copper	L4 (Sig. PWR)	0.035mm (1oz)		Signal	GBR
Core		0.4mm	FR4	Dielectric	
Copper	L5 (GND)	0.035mm (1oz)		Signal	GBR
Prepreg	L6 (Sig. PWR)	0.07mm (2oz)	FR4_7628	Dielectric	
Copper	B.Mask	0.02mm	Solder Resist	Plane	GBR
	B.Silkscreen		Direct Printing	Legend	GBR
	B.Paste			Paste Mask	

Total thickness: 1.66mm

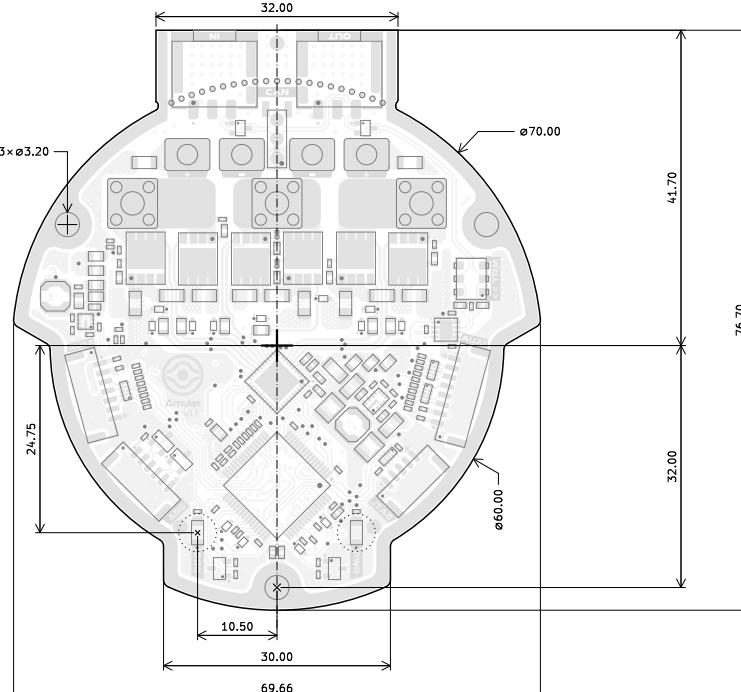
Note: external layer thicknesses are specified after plating

## FABRICATION NOTES (UNLESS OTHERWISE SPECIFIED)

- OUTLINE DEFINED IN SEPARATE GERBER FILE WITH "Edge\_Cuts.GBR" SUFFIX.  
DIMENSIONS OF CIRCUMSIZEZED RECTANGLE SHOWN ON THIS DWG FOR REF ONLY.
- SEE SEPARATE DRILL FILES WITH ".DRL" SUFFIX FOR HOLE LOCATIONS.  
SELECTED HOLE LOCATIONS SHOWN ON THIS DWG FOR REF ONLY.
- IMPEDANCE CONTROL REQUIRED.  
Microstrip 100-Ohm Differential (L1 ref. L2)  
0.2032mm width, 0.28mm spacing
- CONFIRM TRACE WIDTHS AND SPACINGS.
- DESIGN GEOMETRY MINIMUM FEATURE SIZES:  

TRACE WIDTH	0.20 mm
TRACE TO TRACE	0.20 mm
MIN. HOLE (PTH)	0.25 mm
MIN. HOLE (NPTH)	0.70 mm
ANNULLAR RING	0.15 mm
COPPER TO HOLE	0.254 mm
COPPER TO EDGE	0.25 mm
HOLE TO HOLE	0.254 mm

## Top Fabrication (Scale 1:1)



All dimensions are in millimeters unless otherwise specified.

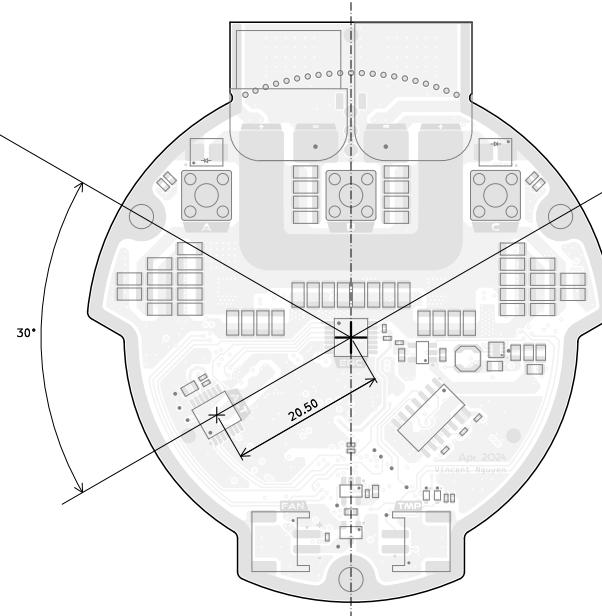
C

D

	Comments:	Company: EPFL Xplore Research	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>			Project Name: <b>Chienpanzé</b>
	Sheet Title: Top Fabrication (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13    Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>1</b> of <b>11</b>

# Amulet Motion Controller Fabrication Document

**Bottom Fabrication (Scale 1:1)**



All dimensions are in millimeters unless otherwise specified.

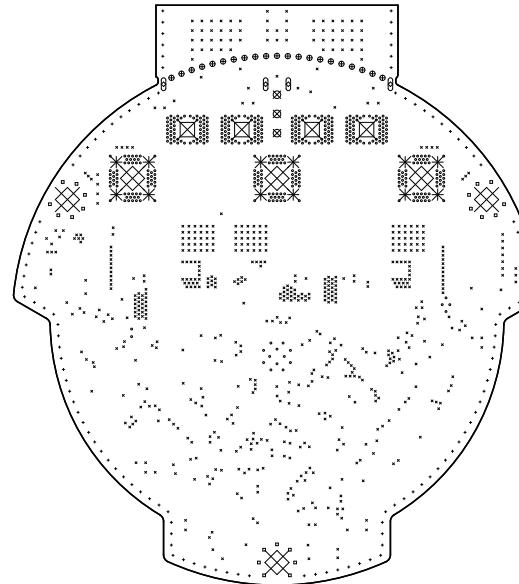
	Comments:	Company: EPFL Xplore Research	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>			Project Name: <b>Chienpanzé</b>
	Sheet Title: Bottom Fabrication (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
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# Amulet Motion Controller Fabrication Document

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Symbol	Count	Hole Size	Plated
•	674	0.25mm	Plated
•	438	0.25mm	Plated
•	120	0.30mm	Plated
▫	21	0.50mm	Plated
◊	4 (slot)	0.60mm	Plated
☒	3	1.00mm	Plated
✳	12	1.50mm	Plated
☒	4	2.70mm	Plated
☒	6	3.20mm	Plated
●	21	0.70mm	Unplated

**Drill Drawing Top View (Scale 1:1)**



B

C

D

A

B

C

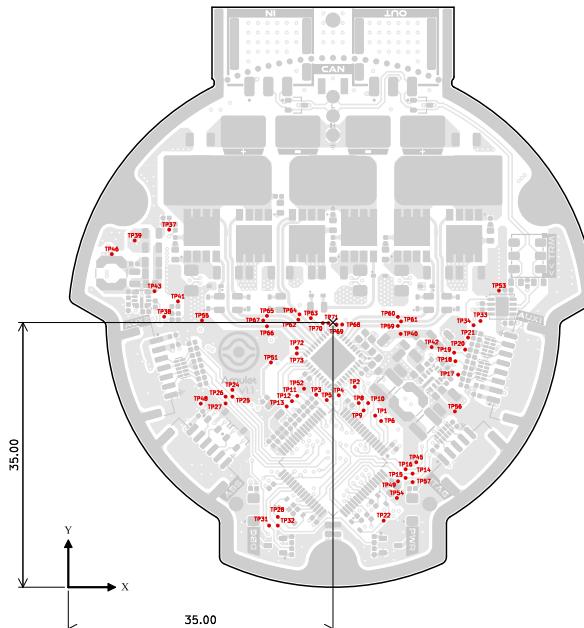
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	Comments:	Company: EPFL Xplore Research 	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>			Project Name: <b>Chienpanzé</b>
	Sheet Title: Drill Drawing Top View (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>3</b> of <b>11</b>

# Amulet Motion Controller Fabrication Document

Ref.	Net	X	Y
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	PWM_PHASEA	38.40	24.35
TP9	PWM_PHASEB	39.05	23.37
TP10	PWM_PHASEC	39.65	24.35
TP11	SOA	30.28	25.30
TP12	SOB	29.58	24.60
TP13	SOC	28.88	23.90
TP14	SWDIO	45.53	15.02
TP15	SWCLK	44.60	14.45
TP16	NRST	44.60	15.60
TP17	AUX1_A	51.55	28.11
TP18	AUX1_B	51.19	29.89
TP19	AUX1_C	51.02	31.02
TP20	AUX1_D	52.47	31.42
TP21	AUX1_E	52.86	33.02
TP22	AUX1_I2C_PULLUP	41.70	8.80
TP24	AUX2_A	21.70	26.10
TP25	AUX2_B	21.70	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	54.50	35.20
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	48.05	31.75
TP43	F_VIN_5V	11.40	39.15
TP45	+12V	46.01	16.53
TP46	+5V	5.75	44.05
TP48	+3V3	17.52	24.28
TP49	+3V3	43.60	14.00
TP51	+A3V3	26.80	29.72
TP52	GND	31.17	26.25
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	GHB	30.42	35.38
TP63	GLB	32.07	35.58
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	34.40	34.93
TP72	SC_P	30.21	31.65
TP73	SC_N	30.21	30.90

Top Test Points (Scale 1:1)



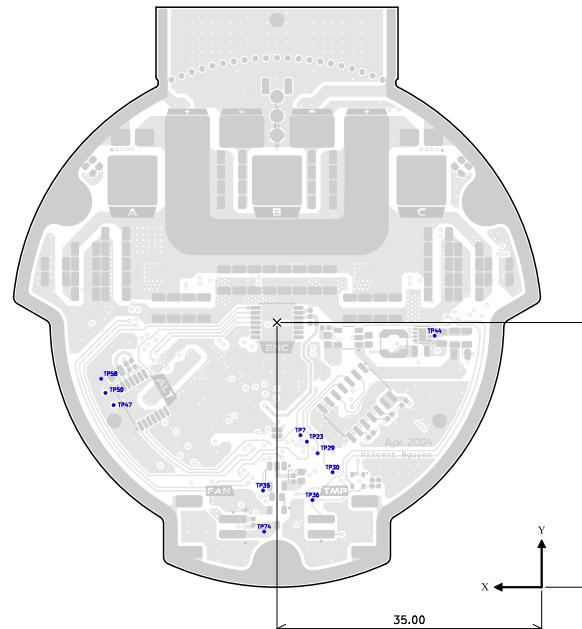
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Comments:	Company:		Variant:	Git Hash:	
	EPFL Xplore Research				
Board Name:		Project Name:			
Amulet Motion Controller		Chienpanzé			
Sheet Title:	File Name:	Designer:	Date:	Revision:	
Top Test Points (Scale 1:1)	amulet_controller.kicad_pcb	Vincent Nguyen	2024-04-13	1.1.1+ (Unreleased)	
Sheet Path:	Reviewer:	Size:	Sheet:		
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# Amulet Motion Controller Fabrication Document

Ref.	Net	X	Y
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	36.84	12.79
TP36	SENSE_TEMP_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

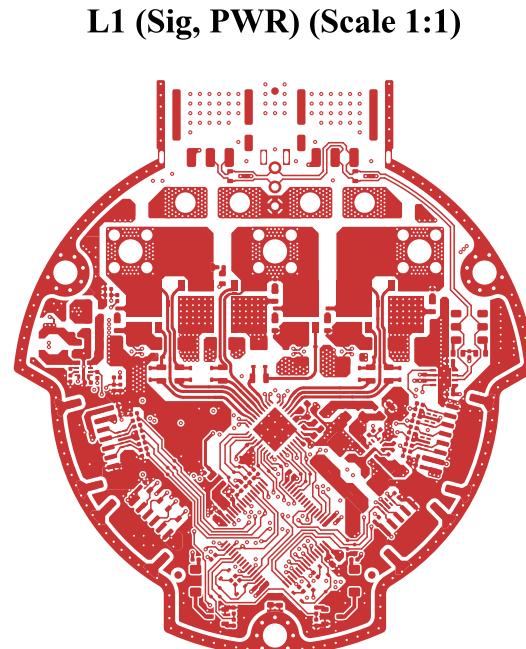
## Bottom Test Points (Scale 1:1)



All dimensions are in millimeters unless otherwise specified.

	Comments:	Company: EPFL Xplore Research 	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>			Project Name: <b>Chienpanzé</b>
	Sheet Title: Bottom Test Points (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13    Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>5</b> of <b>11</b>

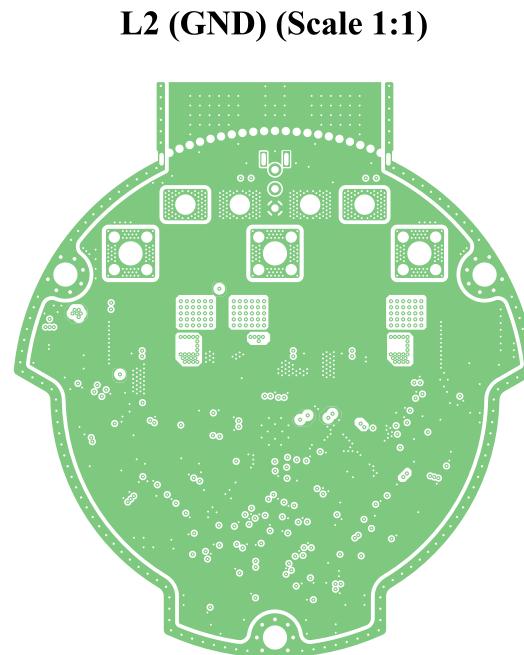
# Amulet Motion Controller Fabrication Document



**L1 (Sig, PWR) (Scale 1:1)**

	Comments:	Company: EPFL Xplore Research 	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>		
	Sheet Title: L1 (Sig, PWR) (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
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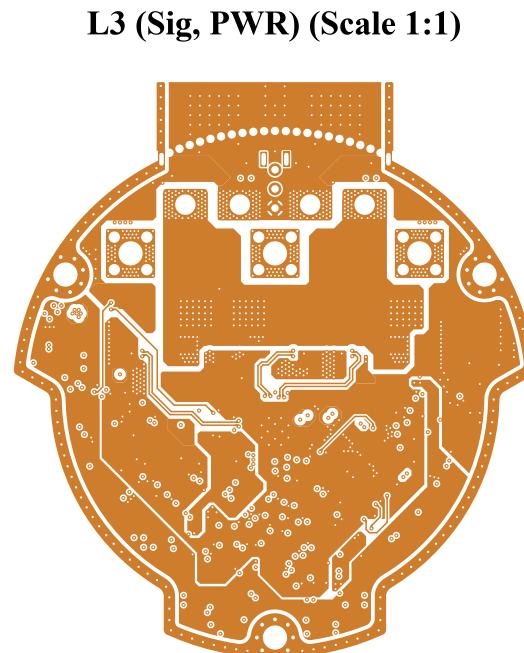
# Amulet Motion Controller Fabrication Document



**L2 (GND) (Scale 1:1)**

	Comments:	Company: EPFL Xplore Research 	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>		
	Sheet Title: L2 (GND) (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>7</b> of <b>11</b>

# Amulet Motion Controller Fabrication Document

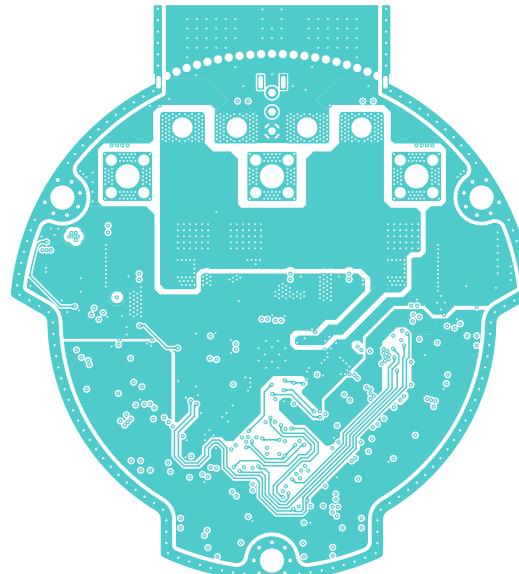


L3 (Sig, PWR) (Scale 1:1)

	Comments:	Company: EPFL Xplore Research 	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>		
	Sheet Title: L3 (Sig, PWR) (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>8</b> of <b>11</b>

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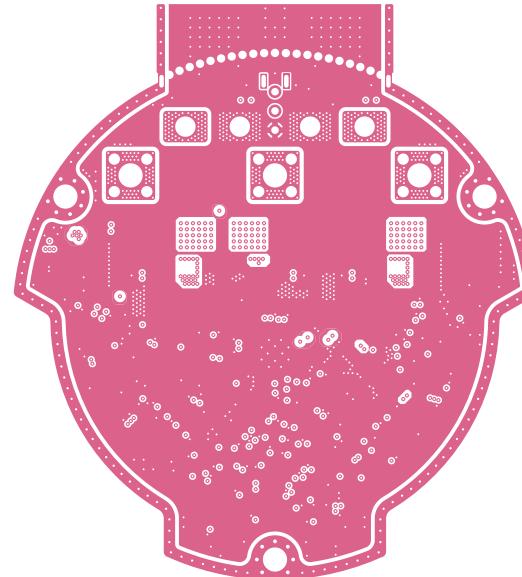
L4 (Sig, PWR) (Scale 1:1)



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	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>		
	Sheet Title: L4 (Sig, PWR) (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>9</b> of 11

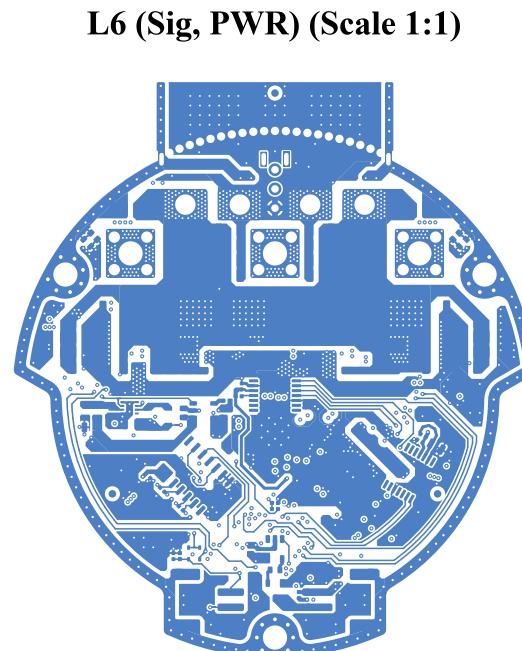
# Amulet Motion Controller Fabrication Document

L5 (GND) (Scale 1:1)



	Comments:	Company: EPFL Xplore Research 	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>		
	Sheet Title: L5 (GND) (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>10</b> of <b>11</b>

# Amulet Motion Controller Fabrication Document



**L6 (Sig, PWR) (Scale 1:1)**

	Comments:	Company: EPFL Xplore Research	Variant: CHECKED	Git Hash: 386a12d
	Board Name: <b>Amulet Motion Controller</b>	Project Name: <b>Chienpanzé</b>		
	Sheet Title: L6 (Sig, PWR) (Scale 1:1)	File Name: amulet_controller.kicad_pcb	Designer: Vincent Nguyen	Date: 2024-04-13      Revision: 1.1.1+ (Unreleased)
	Sheet Path:		Reviewer:	Size: <b>A4</b> Sheet: <b>11</b> of <b>11</b>