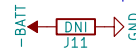
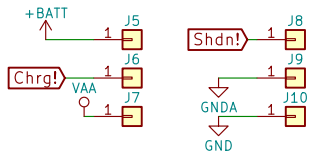
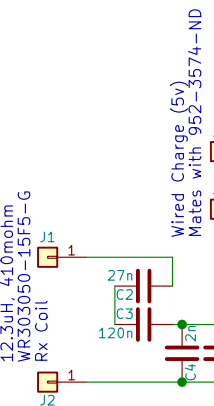


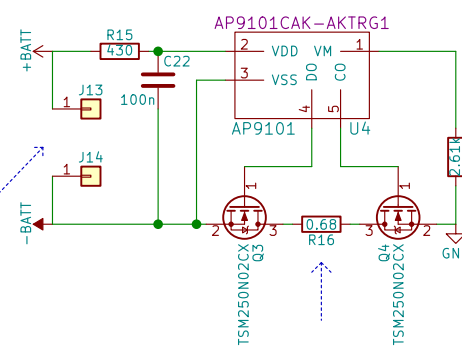
Just a bit of exposed pad between gnd and bat—so protection circuitry can be reset easily (like at first batt plug in)



Intended to be used with Part No. 445-2550-1-ND on a tiny PCB mounted to the Battery Mated with 952-3575-ND on the tiny PCB



The uController has an internal 50k pullup which we can use to read the charge! pin. Since the pulldown on the EN pin is 200k internal so 640k total we have a voltage divider that should produce like 3v minimum at the Q2 gate and register a high at the uController input. This will keep Q2 off while providing a way to passively read CHRG!



Max RdsOn for each FET is about 30mohms. Battery spec is max discharge at 220mA (2C) and AP9101 flavor is AKTRG1 with 150mV sense for both overcharge and discharge. 150mV/(680\*1.01 +60) = 200mA. That takes care of Discharge. Max charge is set at 110mA (1C) which will have to be taken care of by the charge circuitry since no suitable protection IC fits the ratios needed. Intended to be used with LiPo battery from Tenenergy model 30653-0, 3.7V 120mAh

Charger  
H - Charge Complete/not charging  
L - Charging

Receiver  
H - Not Charging  
L - Charging

TS/CTRL  
H - Charge Complete  
L - Fault Condition  
Z - TS, normal op

EN  
11 - Stop all charging  
00 - Green for charging

Sheet: 1/1

File: PowerBoard.sch

Title: Nixie Power Board

Engineer: Emin Vartanians

Size: A4

Date: 8/8/2018

Rev: 2

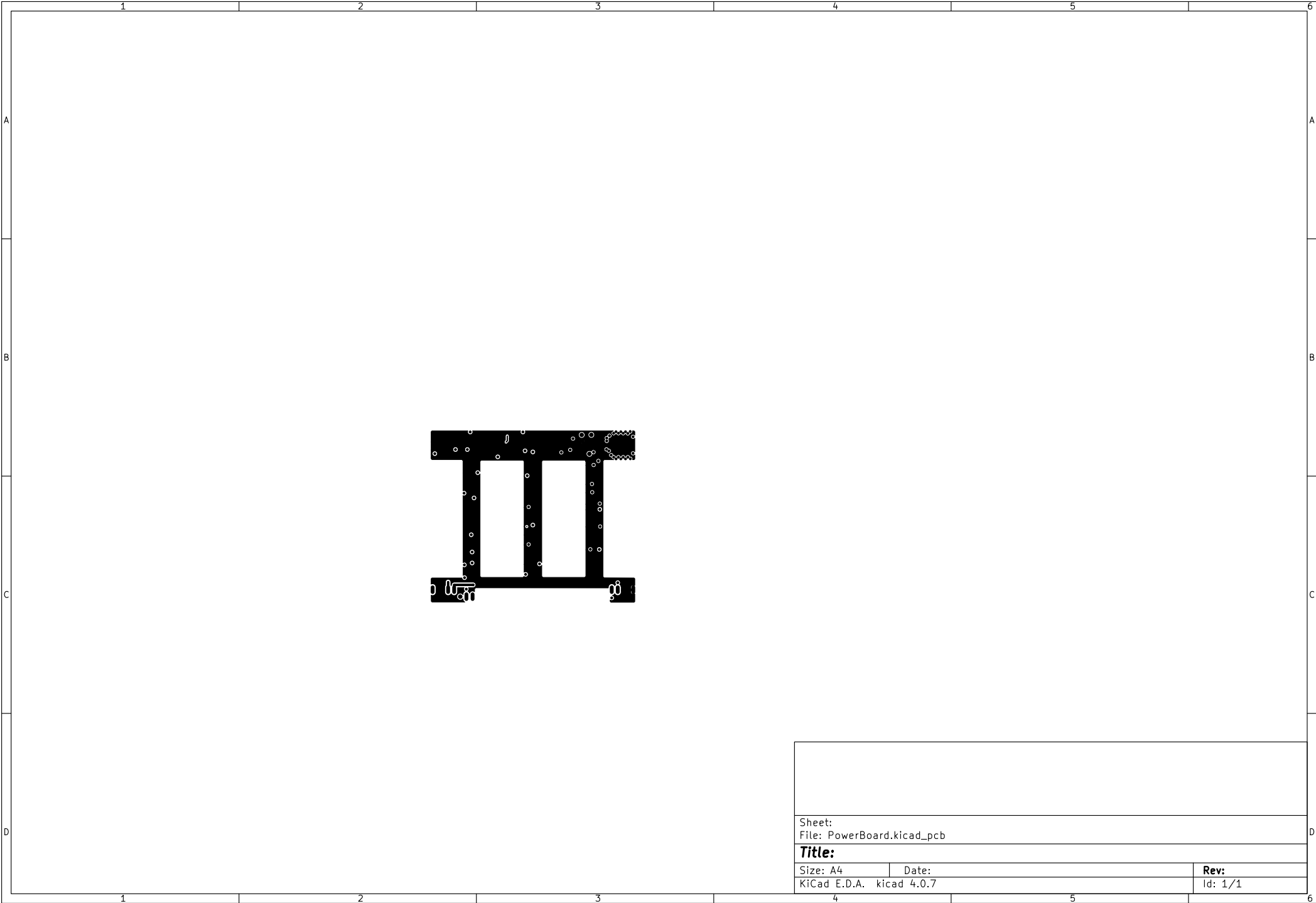
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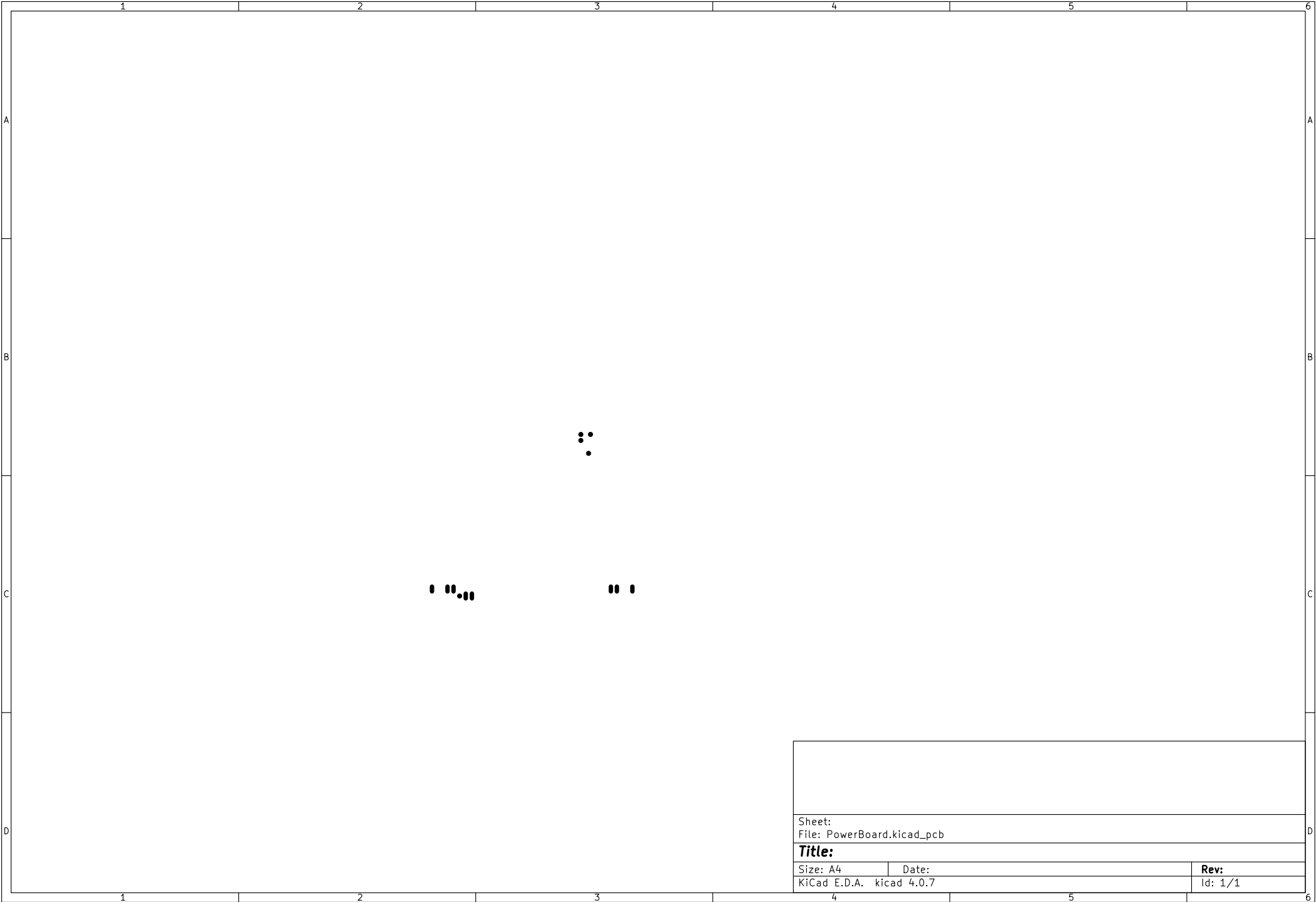
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Component Count:,"75"

Individual Components:

Item	Qty	Reference(s)	Value	Digikey PN	PN
1	1	C1	10nF	399-10040-1-ND	C0603C103J2RACTU
2	1	C2	27n	311-3360-1-ND	CC0603JRX7R8BB273
3	1	C3	120n	1276-2455-1-ND	CL21B124JACNNNC
4	1	C4	2n	478-10122-1-ND	04025C202JAT2A
5	1	C5	47u	478-8644-1-ND	F980J476MMA
6	1	C6	DNI		
7	4	C7, C17, C20, C21	4.7u	1276-6836-1-ND	CL05A475MO5NUNC
8	3	C8, C9, C22	100n	1276-1022-1-ND	CL05A104KP5NNNC
9	2	C10, C11	470n	490-16354-1-ND	GRM155R61H474KE11D
10	2	C12, C13	10n	399-10040-1-ND	C0603C103J2RACTU
11	2	C14, C15	22n	490-3884-1-ND	GRM155R71H223KA12D
12	3	C16, C18, C19	10nF	399-10040-1-ND	C0603C103J2RACTU
13	1	C23	220u	478-6612-1-ND	TLNT227M010R1300
14	1	D1	D_Schottky	MBR0540CT-ND	MBR0540
15	3	D2, D3, D5	D	BAV21WSTPMSCT-ND	BAV21WS-TP
16	1	D4	Blue LED	475-3112-1-ND	LB QH9G-N100-35-1
17	2	D6, D7	Red LED	754-2123-1-ND	APHHS1005LSECK/J3-PF
18	5	J1, J2, J3, J4, J13	Conn_01x01	952-3615-ND	DNI
19	8	J5, J6, J7, J8, J9, J10, J12, J14	Conn_01x01	952-3615-ND	DNI
20	1	J11	DNI		
21	1	Q1	FDC6306P	FDC6306PCT-ND	FDC6306P
22	1	Q2	TP5335	TP5335K1-GCT-ND	TP5335K1-G
23	2	Q3, Q4	TSM250N02CX	TSM250N02CX RFGCT-ND	TSM250N02CX RFG
24	4	R1, R12, R13, R19	10k	A130054CT-ND	CRGCQ0402J10K
25	1	R2	100k	A121521CT-ND	CRG0402J100K/10
26	1	R3	7.5k	311-7.5KJRCT-ND	RC0402JR-077K5L
27	1	R4		150 311-150LRCT-ND	RC0402FR-07150RL
28	1	R5	1.1M	RHM1.1MKCT-ND	ESR10EZPJ115
29	2	R6, R15		430 RMCF0402JT430RCT-ND	RMCF0402JT430R
30	2	R7, R17	2.61k	YAG3103CT-ND	RC0402FR-072K61L
31	1	R8	20k	1276-4407-1-ND	RC1005J203CS
32	2	R9, R11		0 311-0.0LRCT-ND	RC0402FR-070RL
33	1	R10		200 311-200JRCT-ND	RC0402JR-07200RL
34	2	R14, R22		750 YAG3314CT-ND	RC0402JR-07750RL
35	1	R16		0.68 A109552CT-ND	RLP73K1ER68FTDF
36	3	R18, R20, R21	220k	A130062CT-ND	CRGCQ0402J220K
37	1	T1	PA1005	PA1005.030QNL-ND	PA1005.030QNL
38	1	U1	LT1308A	LT1308ACS8#PBF-ND	LT1308ACS8#PBF
39	1	U2	bq51013B	296-38885-1-ND	BQ51013BRHLR
40	1	U3	bq21040	296-47315-1-ND	BQ21040DBVR
41	1	U4	AP9101	AP9101CAK-AKTRG1DICT-ND	AP9101CAK-AKTRG1



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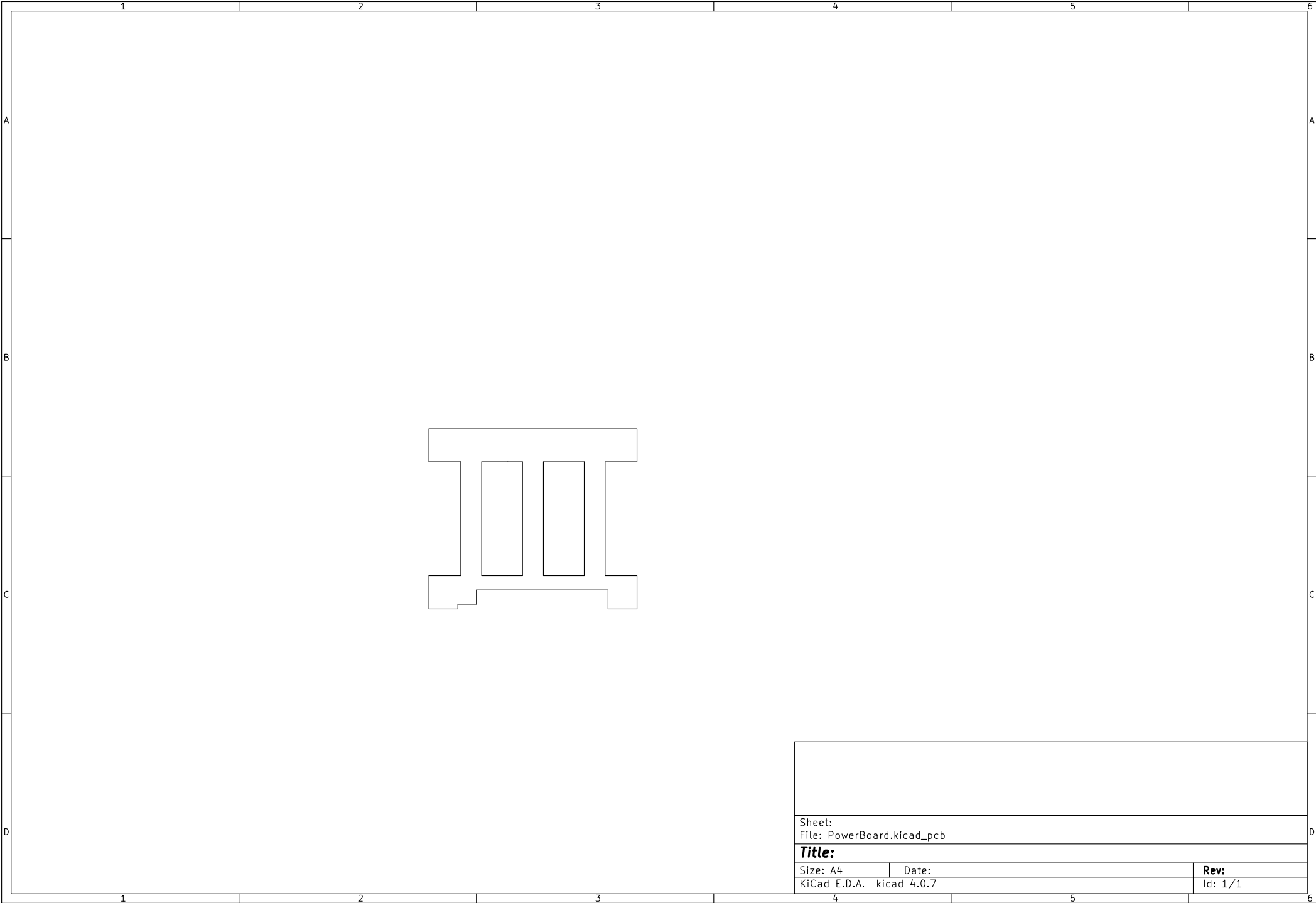


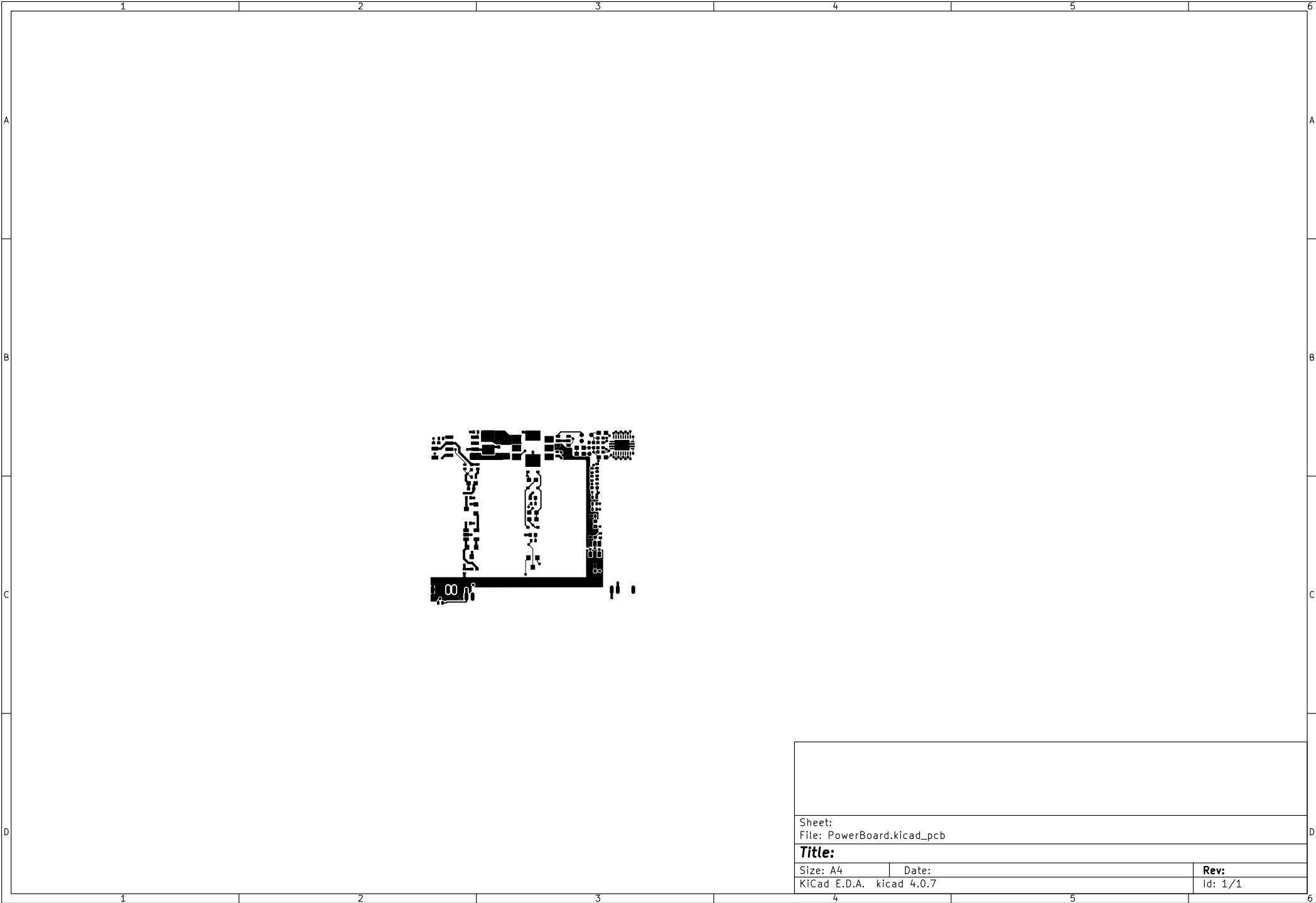
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D					D
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D					D
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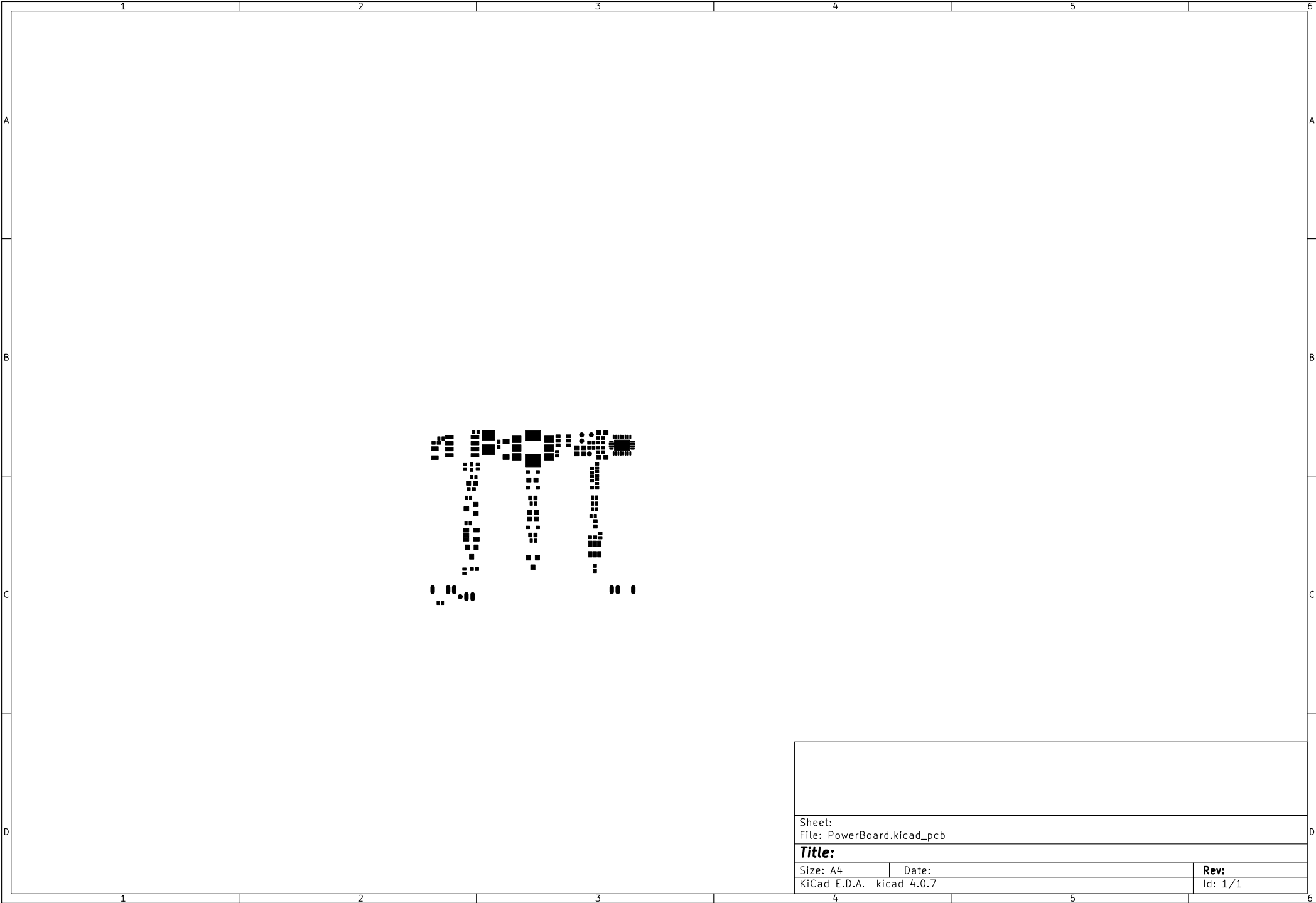
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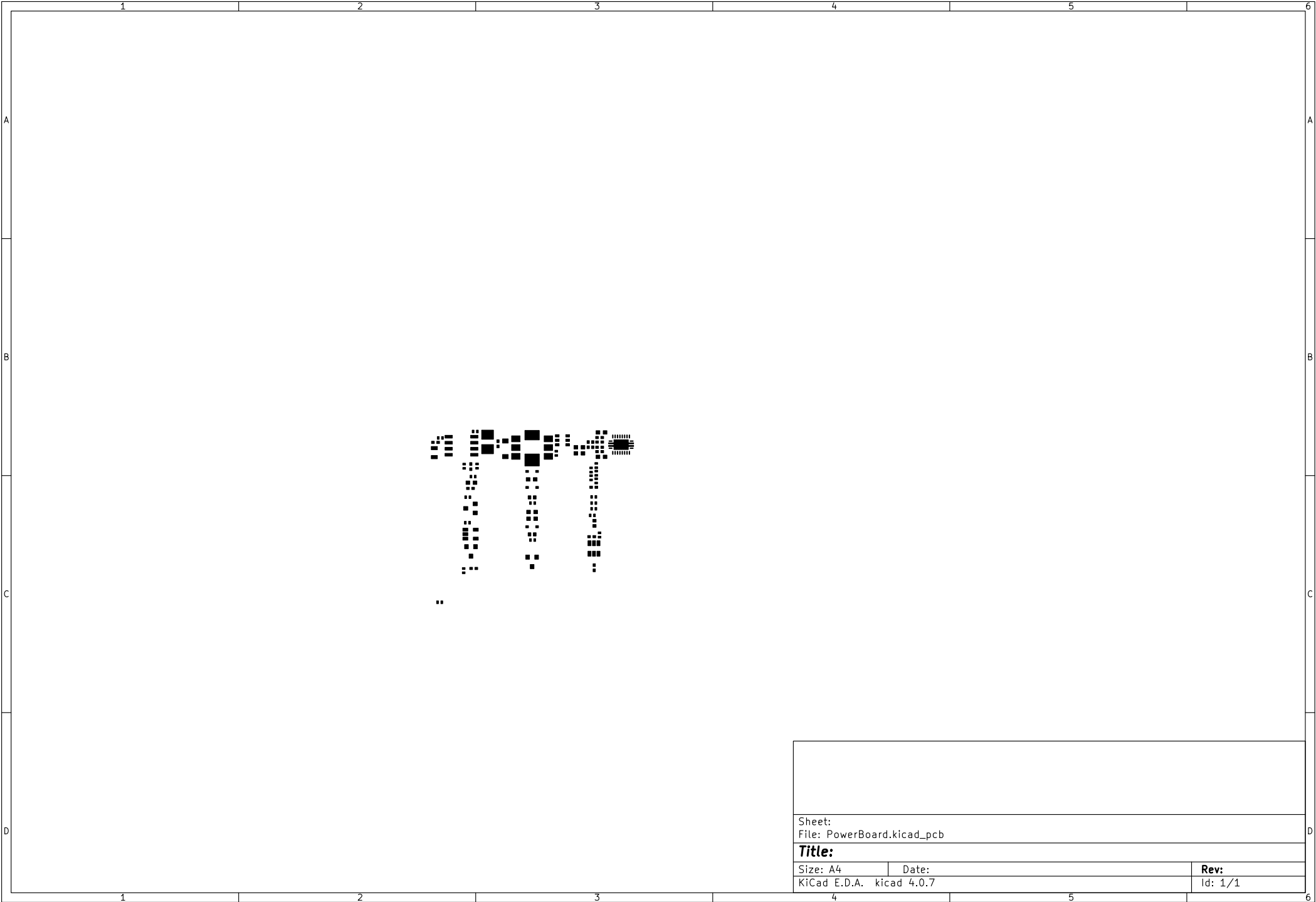


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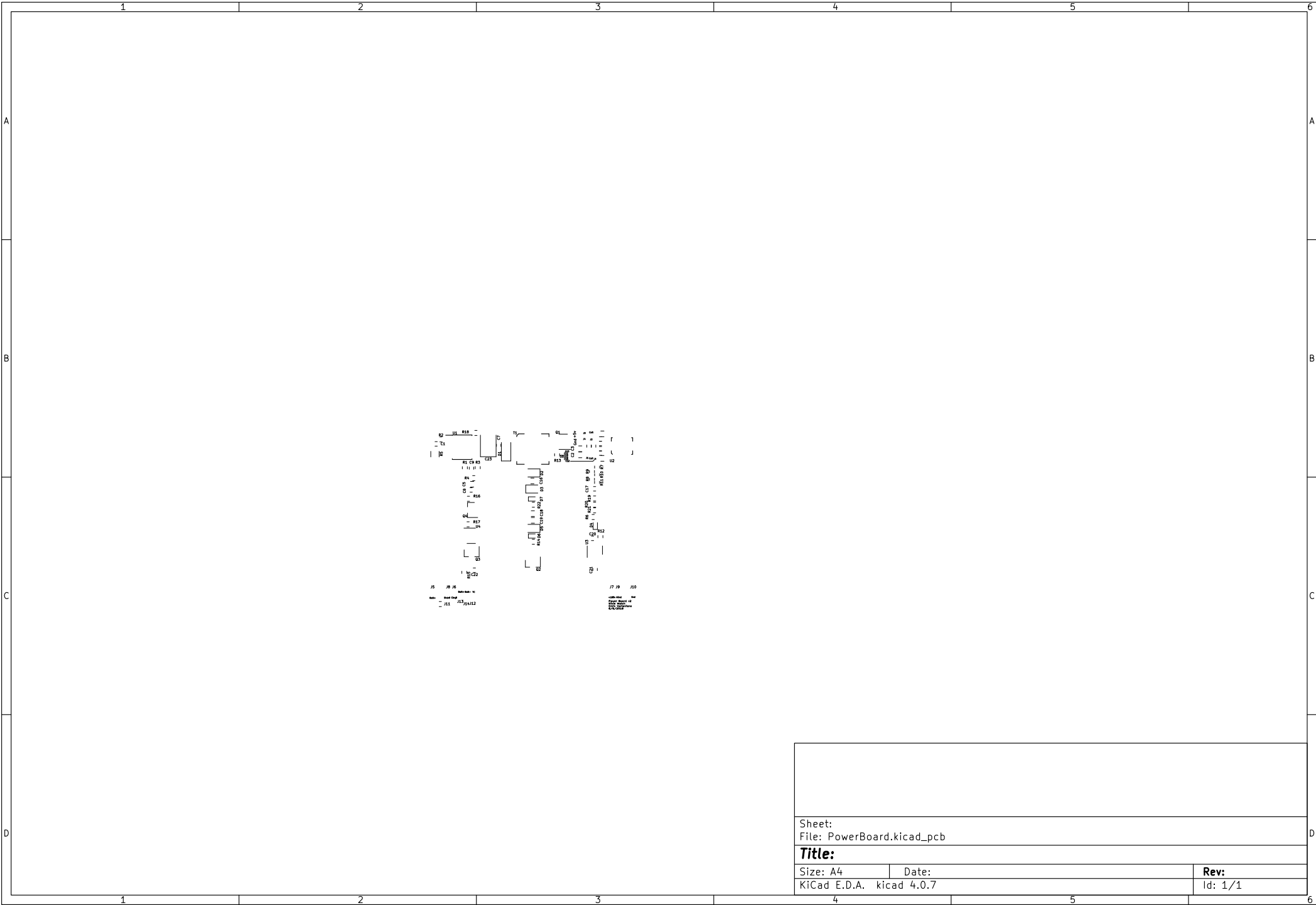




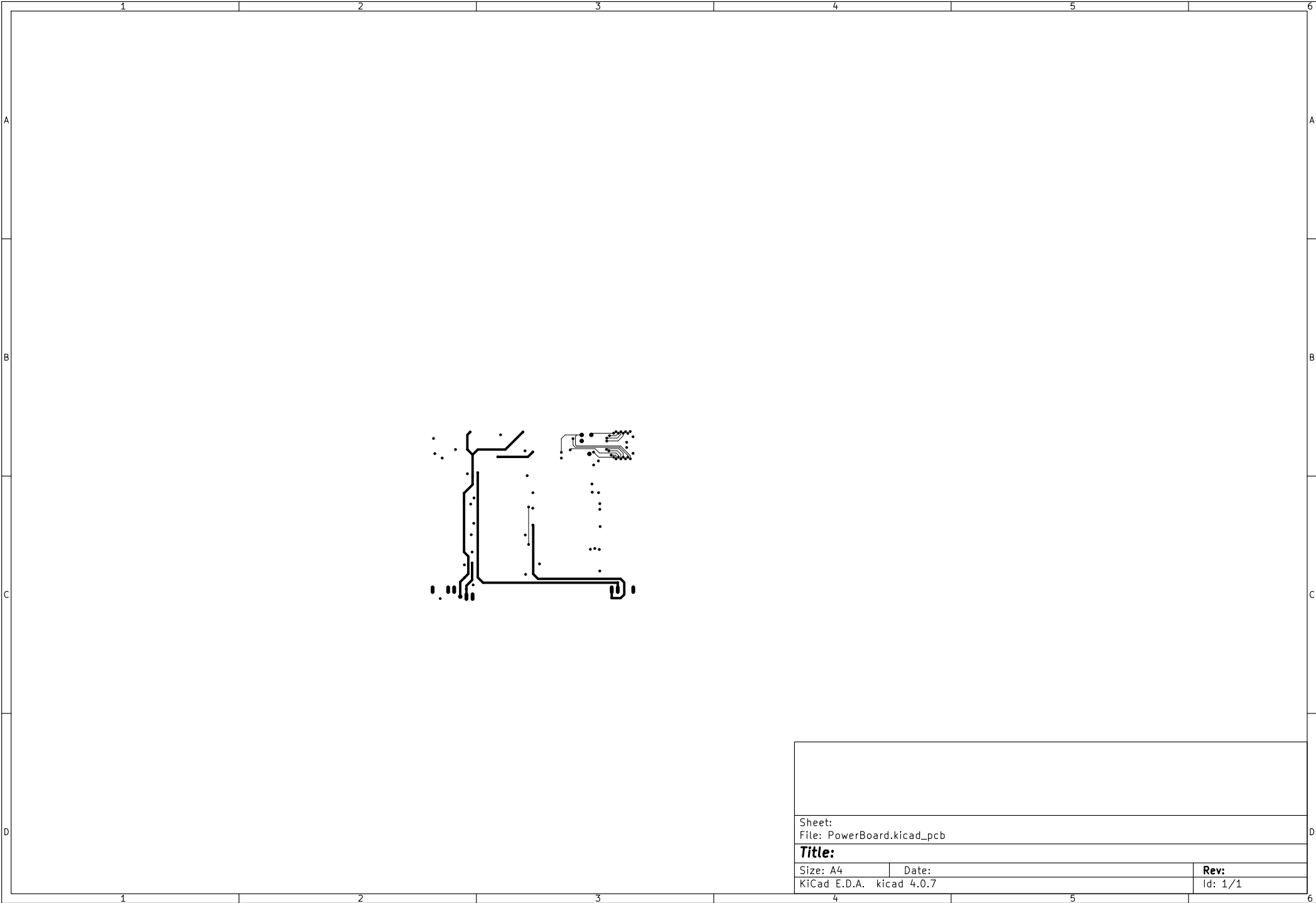
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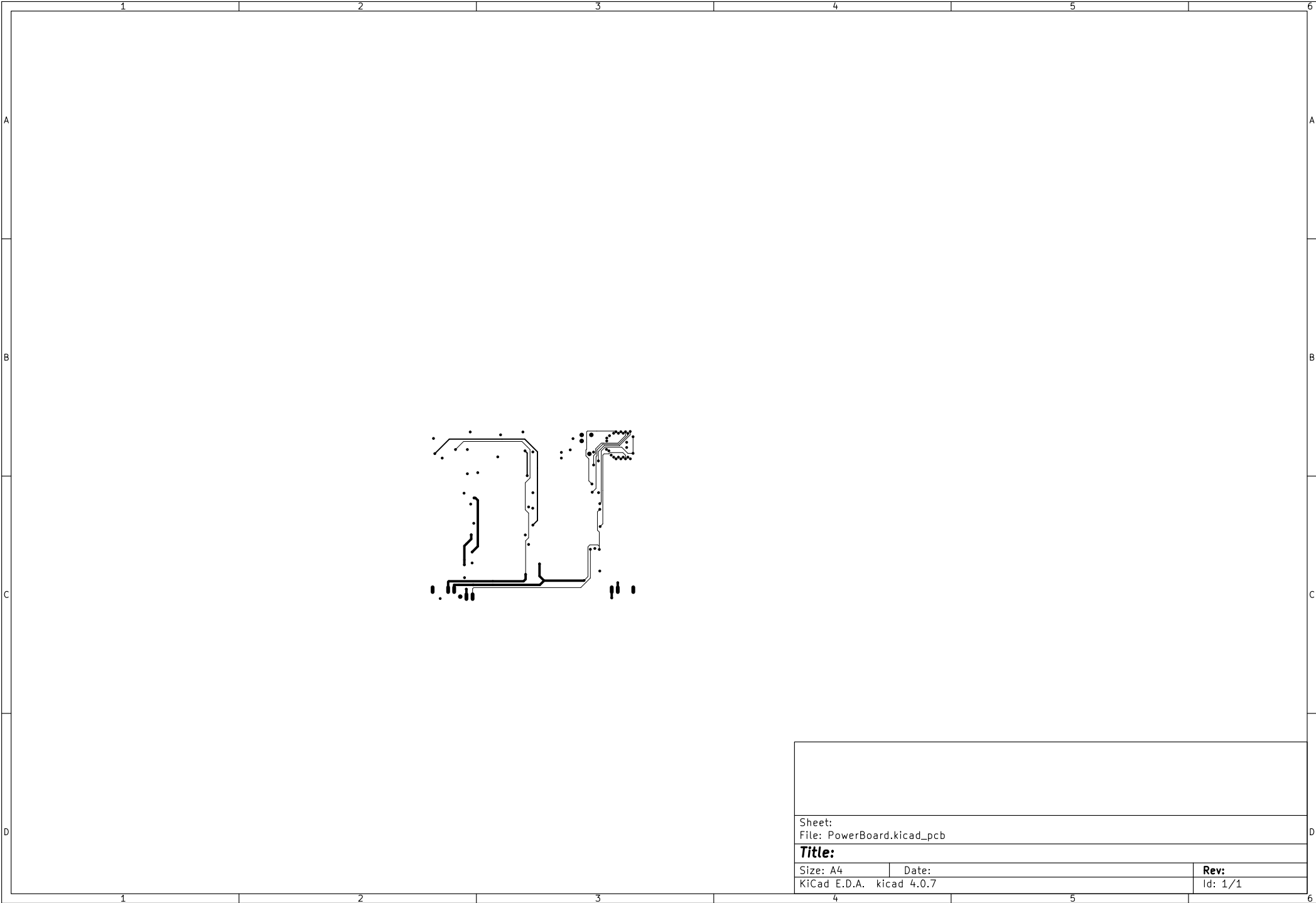
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KiCad E.D.A. kicad 4.0.7		Id: 1/1



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