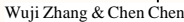
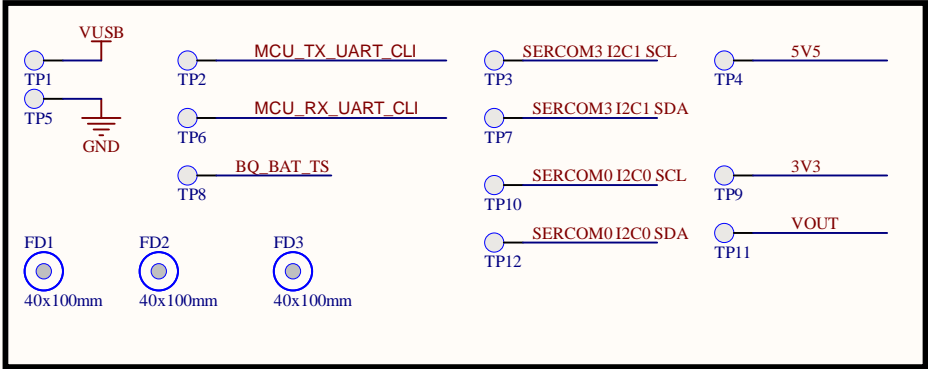
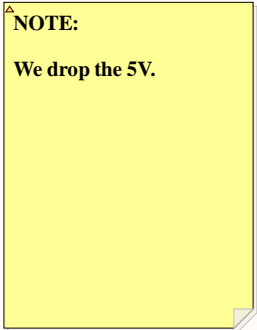
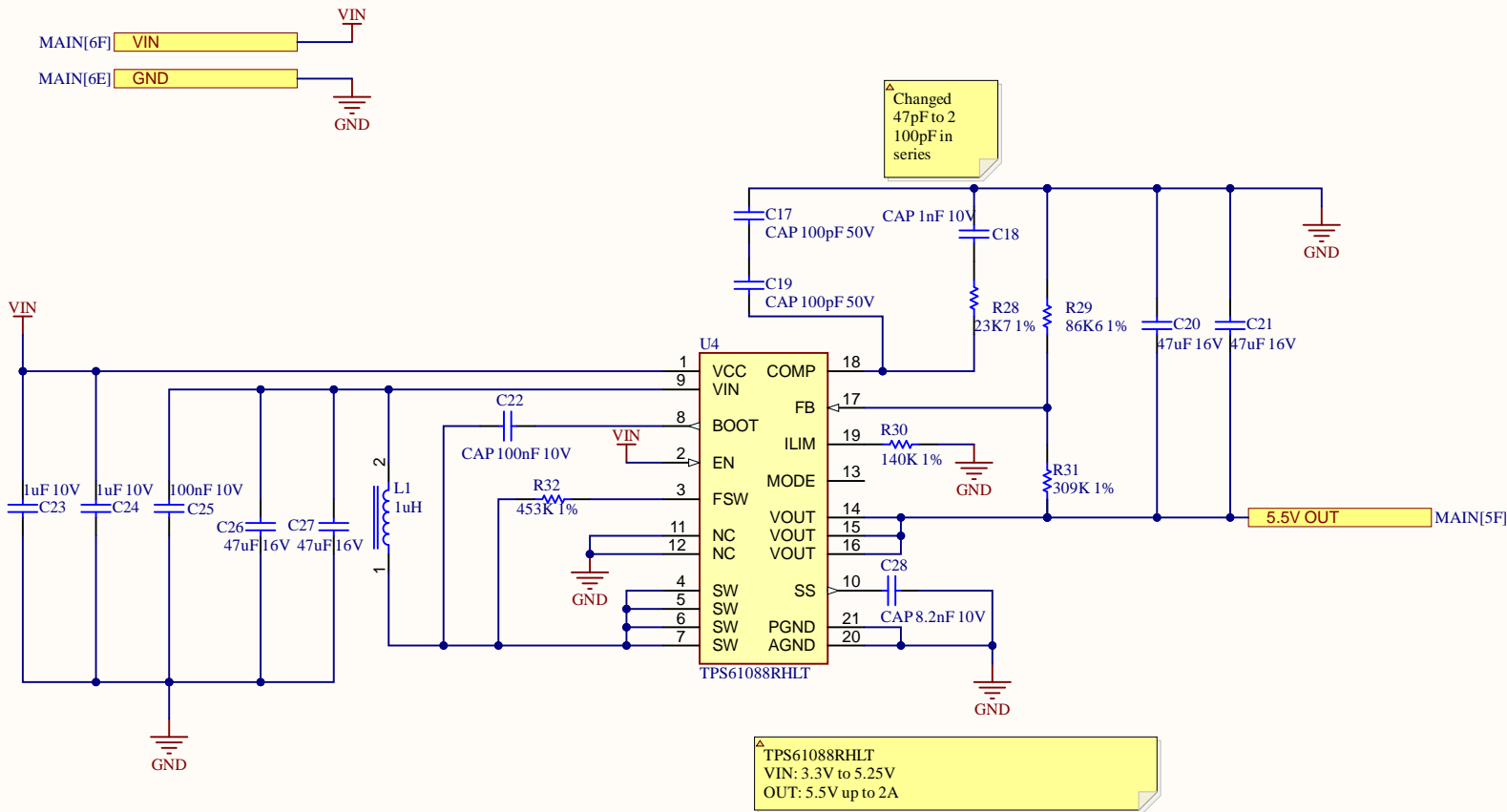


TEST POINTS AND FIDUCIALS



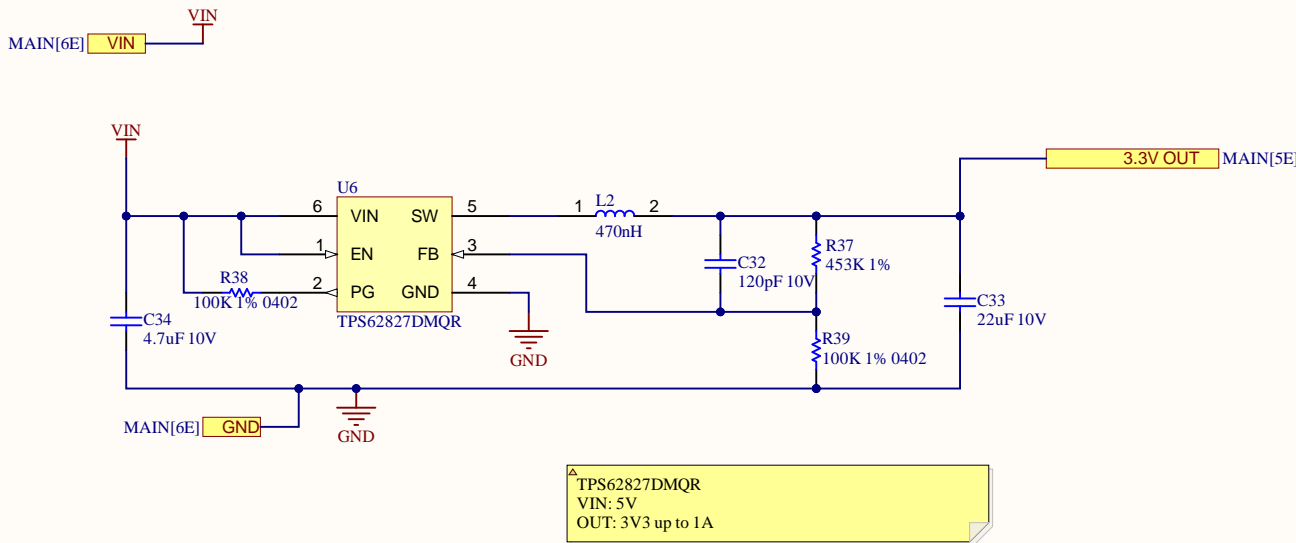
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APPROVALS		DATE	PROJECT		ADDRESS 1	
ENG:	*	--/--	*		ADDRESS 2	
DSN:	Wuji Zhang	--/--	PROJECT REVISION:		ADDRESS 3	
CHK:	Wuji Zhang	--/--	8d19d6f92247fd68b87f		ADDRESS 4	
REFERENCE DOCUMENTS			DOCUMENT REVISION:		DESIGN ITEM: *	
BOM:			TITLE			
ASSY DWG:			SIZE		CAGE CODE	
FAB DWG:			B		DWG NO.	
PCB DWG:			SCALE: *		REV	
			FILE NAME		SHEET	
			5V5_BOOST.SchDoc		2	
					OF	
					8	


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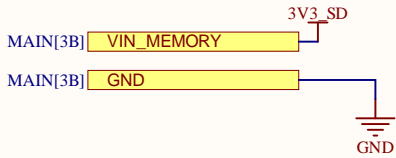
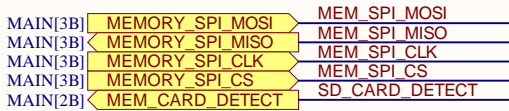
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DSN:		Wuji Zhang		--/--/--		PROJECT REVISION:		ADDRESS 3	
CHK:		Wuji Zhang		--/--/--		8d19d6f92247fd68b87f		ADDRESS 4	
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FAB DWG:				B				REV	
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PCB DWG:				SCALE: *		FILE NAME		SHEET	
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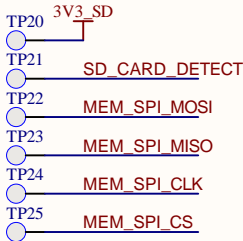
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				B					-
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				MCU.SchDoc			4 OF 8		

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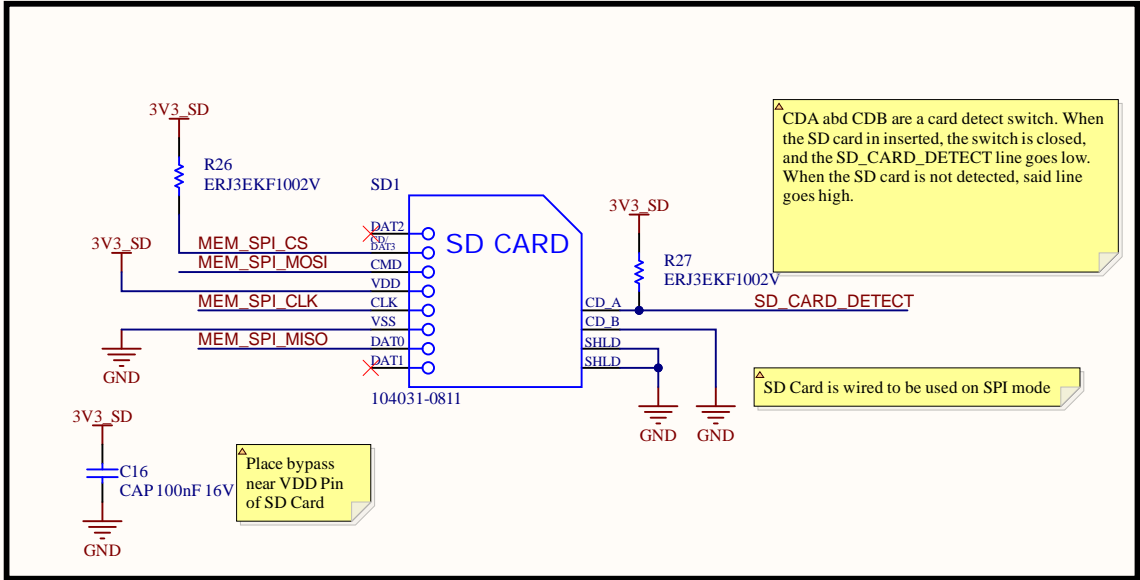
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TESTPOINTS




SD CARD



APPROVALS		DATE		<div>PROJECT</div> <div>*</div> <div><div>Penn Engineering</div><div>UNIVERSITY OF PENNSYLVANIA</div></div> <div>ADDRESS 1</div> <div>ADDRESS 2</div> <div>ADDRESS 3</div> <div>ADDRESS 4</div>				
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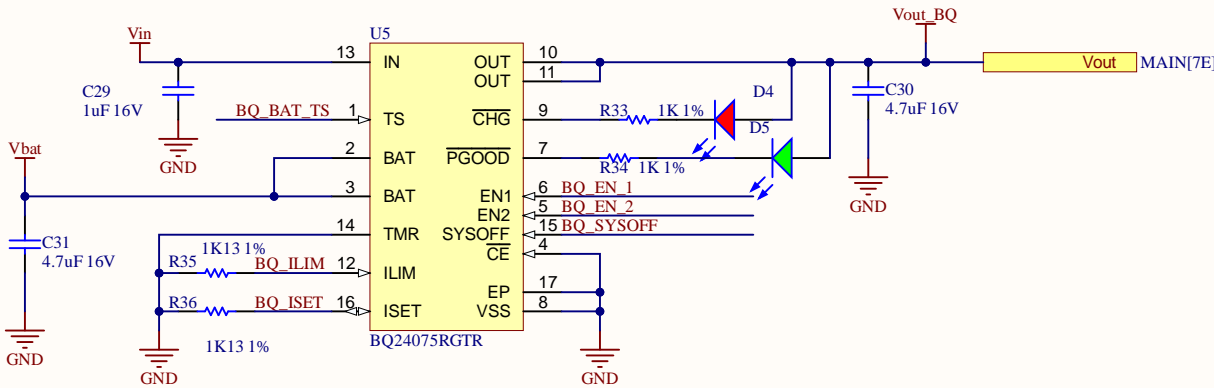
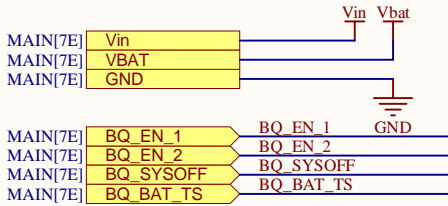


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FAB DWG:		B						-	
PCB DWG:		SCALE: *		FILE NAME		FTDI.SchDoc		SHEET 6 OF 8	

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DWG. NO. - REV. SHT

REVISION	DESCRIPTION	DATE	APPROVED



ilim = Kilim/Rilim => 1610/1130 = 1.42A
(if EN2=1, EN1=0)

ISET = KISSET/RSET => 890/1130 = 0.788A

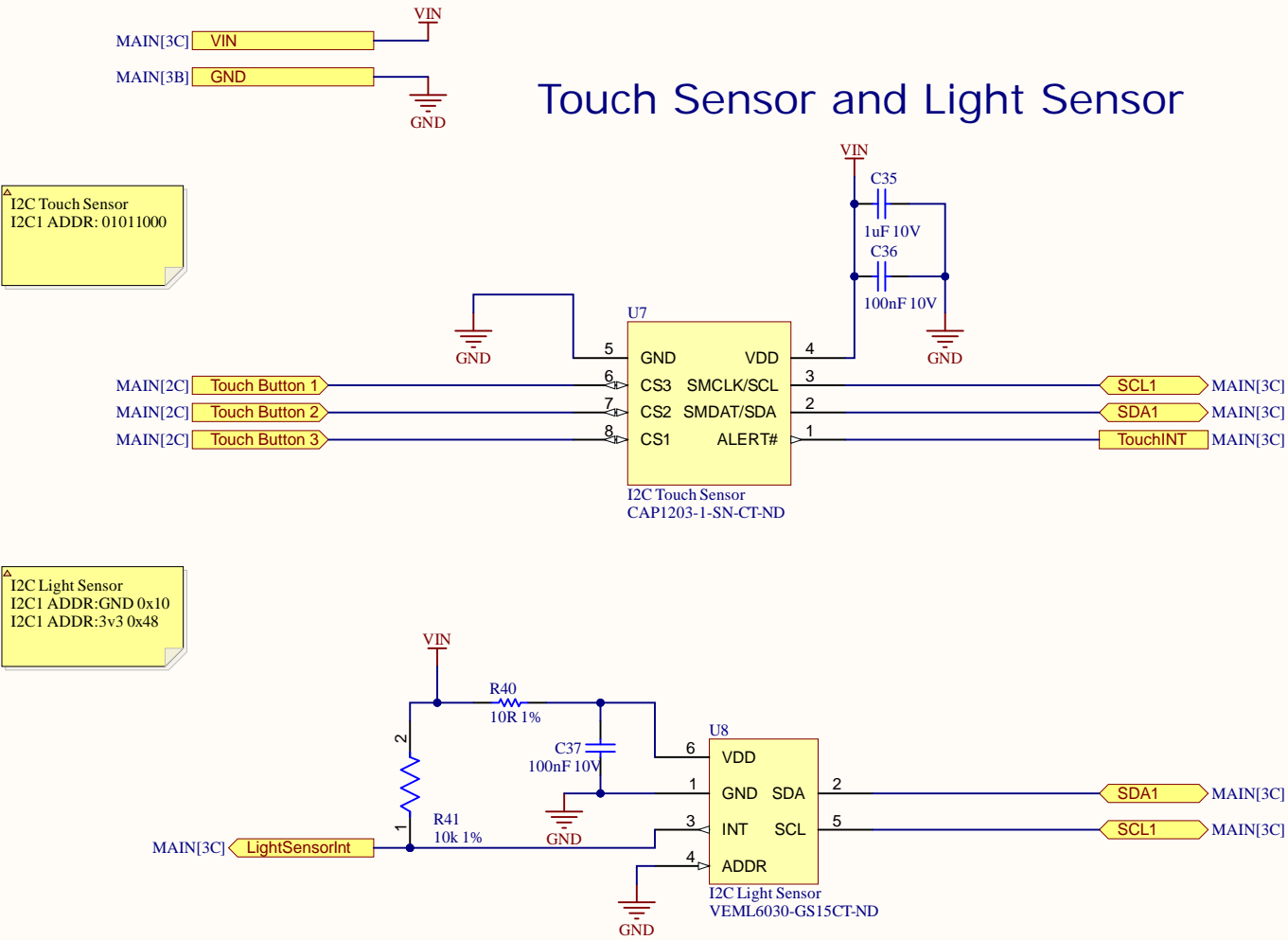
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BOM:		TITLE		
ASSY DWG:		LiPo Charger		
FAB DWG:		SIZE B	CAGE CODE	REV -
PCB DWG:		SCALE: *	FILE NAME LiPo_Charger.SchDoc	SHEET 7 OF 8

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DWG. NO. - REV. 8

REVISION	DESCRIPTION	DATE	APPROVED

Touch Sensor and Light Sensor



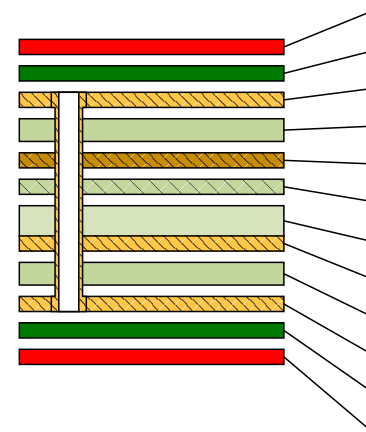
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ASSY DWG:				
FAB DWG:				
PCB DWG:				
SIZE B		CAGE CODE	DWG NO.	REV -
SCALE: *		FILE NAME Sensors.SchDoc		SHEET 8 OF 8

Manufacturing Notes:

Four (4) Layers
Dimensions: 60mm x 60mm
Thickness: 1.85mm
Number of Boards: 1
Material of Dielectric: FR4/ PP-006/ Core-009
Surface Finish: ENEPIG
Number of Holes: 229
Minimum Hole Diameter: 0.20 mm
Minimum Trace: 0.20 mm
Minimum Distance between Copper Features: 0.1524 mm
Solder Mask Color: Red
No special manufacturing

All layers are unmirrored - should be able to "see straight through"
Scoring: none

Finished Thickness : 1.85mm
 Surface Finish : ENIG
 Gold Fingers : No
 Outer Layer Finish Copper : 1 Oz
 Inner Copper : 0.5 oz Inners
 Number of Holes Per Board: 229
 Minimum Hole Size : 0.008 Inches or more
 Minimum Trace (Outer layer) : 0.008 Inches
 Minimum Space (Outer layer) : 0.008 Inches
 Minimum Trace (Inner layer) : 0.006 Inches
 Minimum Space (Inner layer) : 0.006 Inches
 Solder Mask : Yes, Solder Mask Sides : Top and Bottom
 Solder Mask Color : Red
 Solder Mask Type : LPI
 Solder Mask Finish : Standard (Semi-Gloss)
 Silk Screen : Yes
 Silk Screen Sides : Both
 Silk Screen Color : White
 Internal Slots : None
 Counter Sink : No
 Counter Bore : No
 Edge Plating : No
 Route and Retain : Yes
 Scoring : Yes
 Controlled Impedance : None

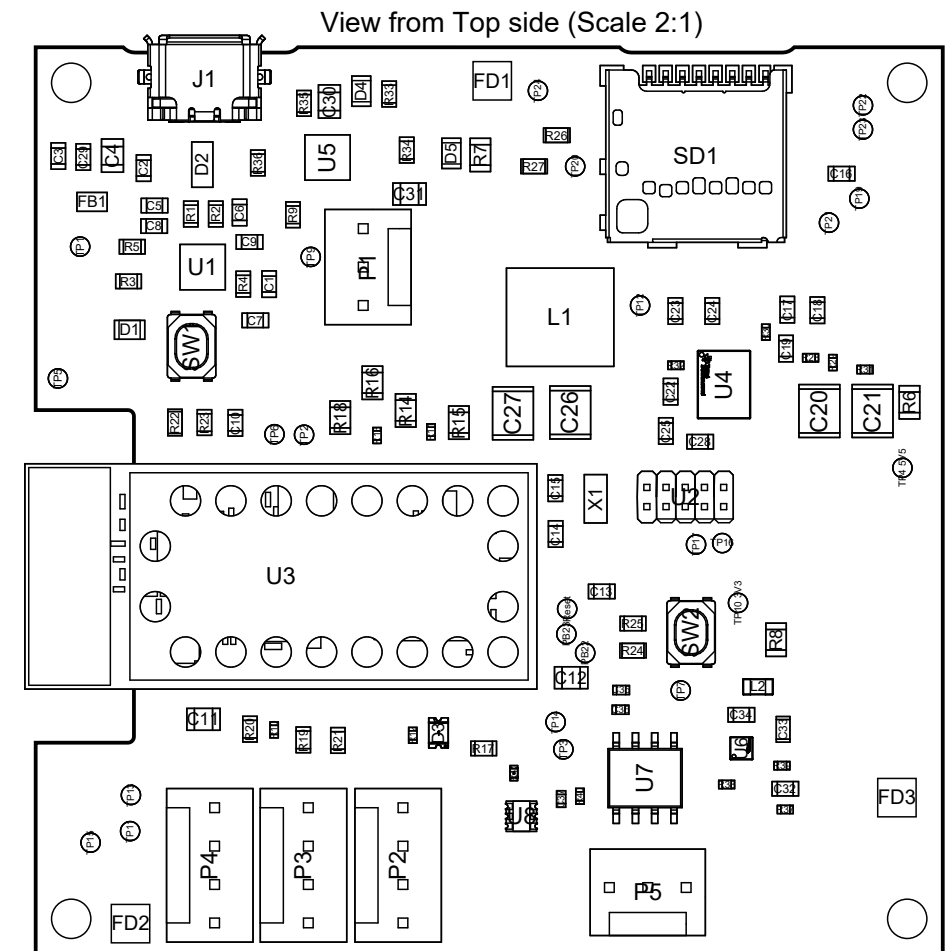


Material	Layer	Thickness	Dielectric Material	Type	Gerber
	Top Overlay			Legend	GTO
Surface Material	Top Solder	0.03mm	Solder Resist	Solder Mask	GTS
Copper	Top Layer	0.04mm		Signal	GTL
Prepreg		0.33mm	PP-006	Dielectric	
Copper	GroundPlane	0.02mm		Internal Plane	GP1
		0.32mm	FR-4	Dielectric	
Core		0.71mm	Core-009	Dielectric	
CF-004	PowerPlane	0.02mm		Signal	G1
Prepreg		0.33mm	PP-006	Dielectric	
Copper	Bottom Layer	0.04mm		Signal	GBL
Surface Material	Bottom Solder	0.03mm	Solder Resist	Solder Mask	GBS
	Bottom Overlay			Legend	GBO

Total thickness: 1.85mm

ss: 1.85mm

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			DIMENSIONS ARE IN INCHES	DRAWN	Chen Chen & Wuji Zhang				
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			FRACTIONAL ±	ENG APPR.	Chen Chen & Wuji Zhang				
			ANGULAR: MACH ± BEND ±	MFG APPR.					
			TWO PLACE DECIMAL ±	Q.A.	Chen Chen & Wuji Zhang				
			THREE PLACE DECIMAL ±	COMMENTS:			SIZE	DWG. NO.	
			INTERPRET GEOMETRIC TOLERANCING PER:						
			MATERIAL						
	NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:1	WEIGHT:	SHEET 1 OF 12	



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B

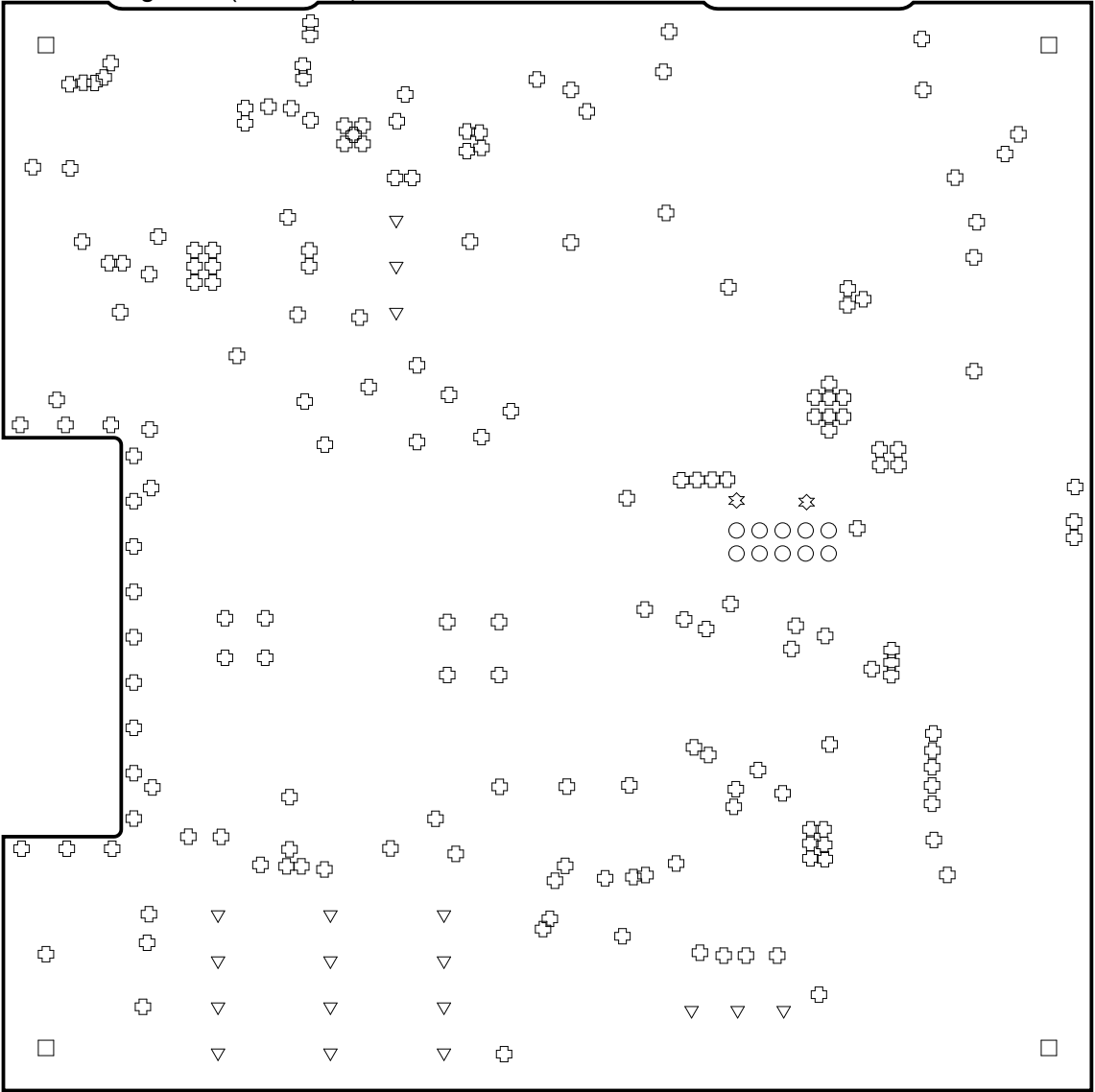
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D

Drill Table

Symbol	Count	Hole Size	Plated	Hole Tolerance
⊕	187	0.20mm	Plated	
☆	2	0.25mm	Plated	
○	10	0.65mm	Plated	
▽	18	1.27mm	Plated	
□	4	2.70mm	Plated	
221 Total				

Drill Drawing View (Scale 5:2)



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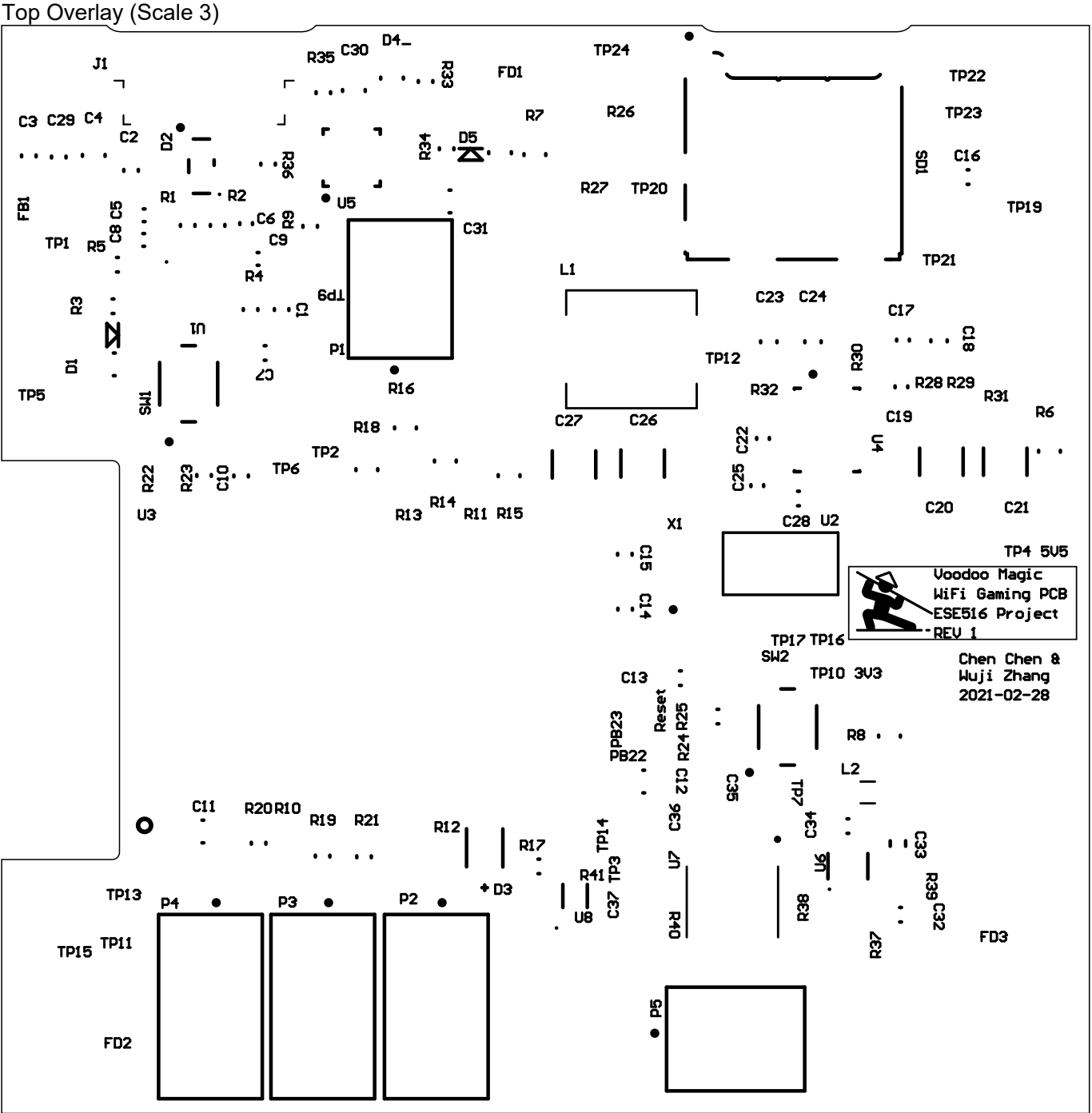
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NEXT ASSY	USED ON	FINISH														
APPLICATION		DO NOT SCALE DRAWING														
					SCALE: 1:1	WEIGHT:	SHEET 2 OF 12									

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		THREE PLACE DECIMAL ±	Q.A.	Chen Chen & Wuji Zhang					
PROPRIETARY AND CONFIDENTIAL			INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:					
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	APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:1	WEIGHT:	SHEET 3 OF 12

A

B

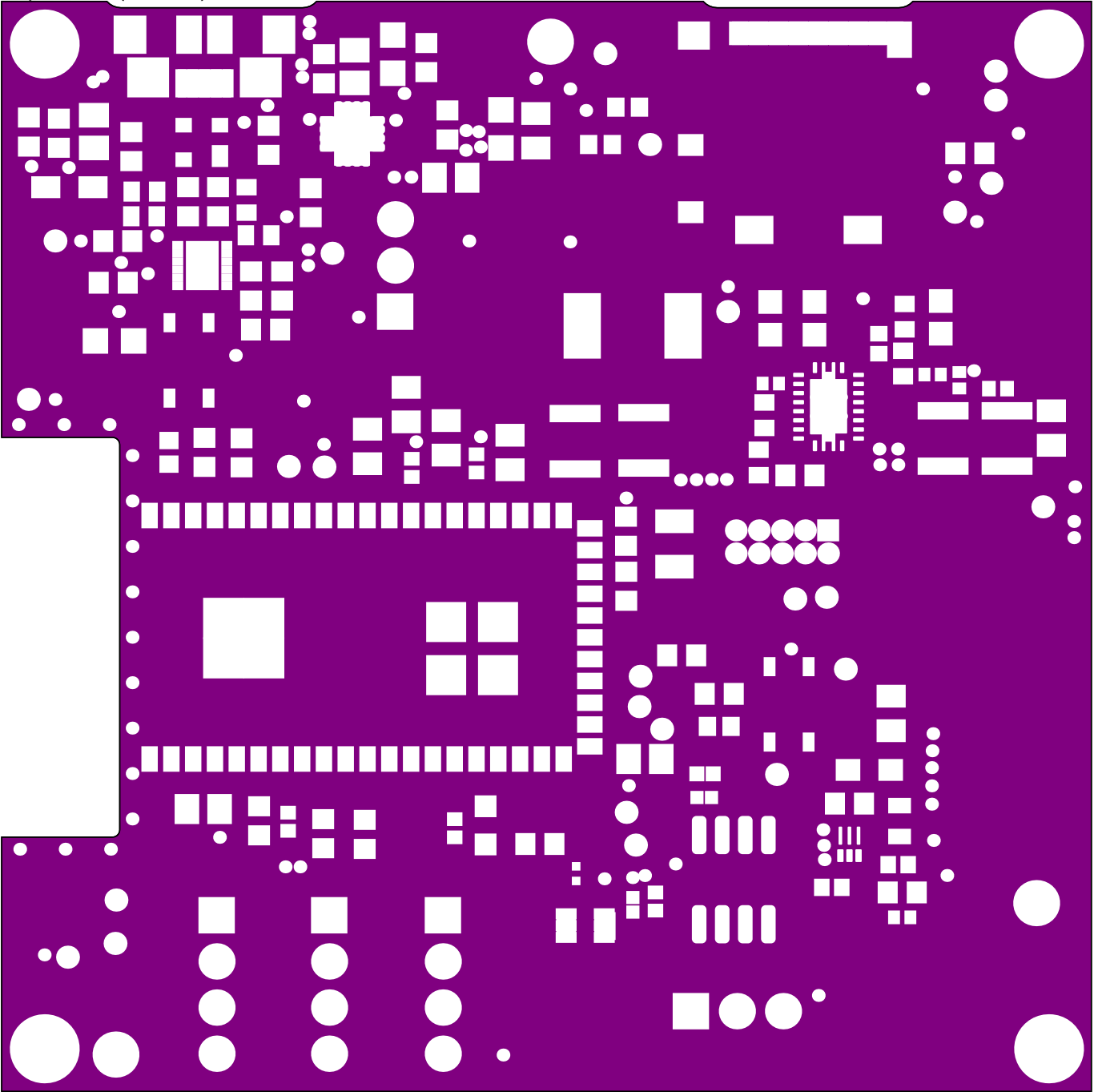
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1

1

Top Solder (Scale 3)



2

2

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		DIMENSIONS ARE IN INCHES	DRAWN	Chen Chen & Wuji Zhang	2021/03/10	WiFi Gaming Board		
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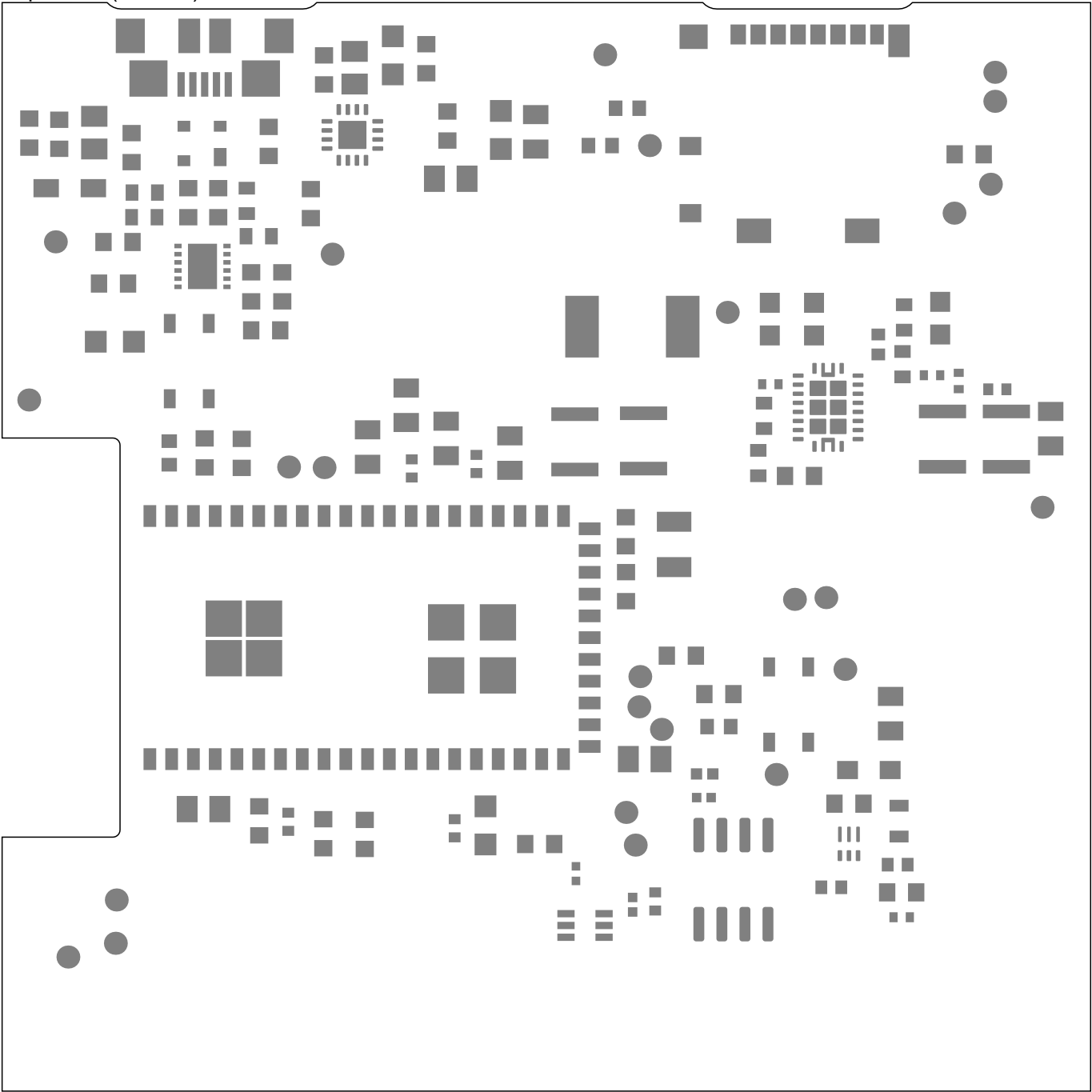
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1

1

Top Paste (Scale 3)



2

2

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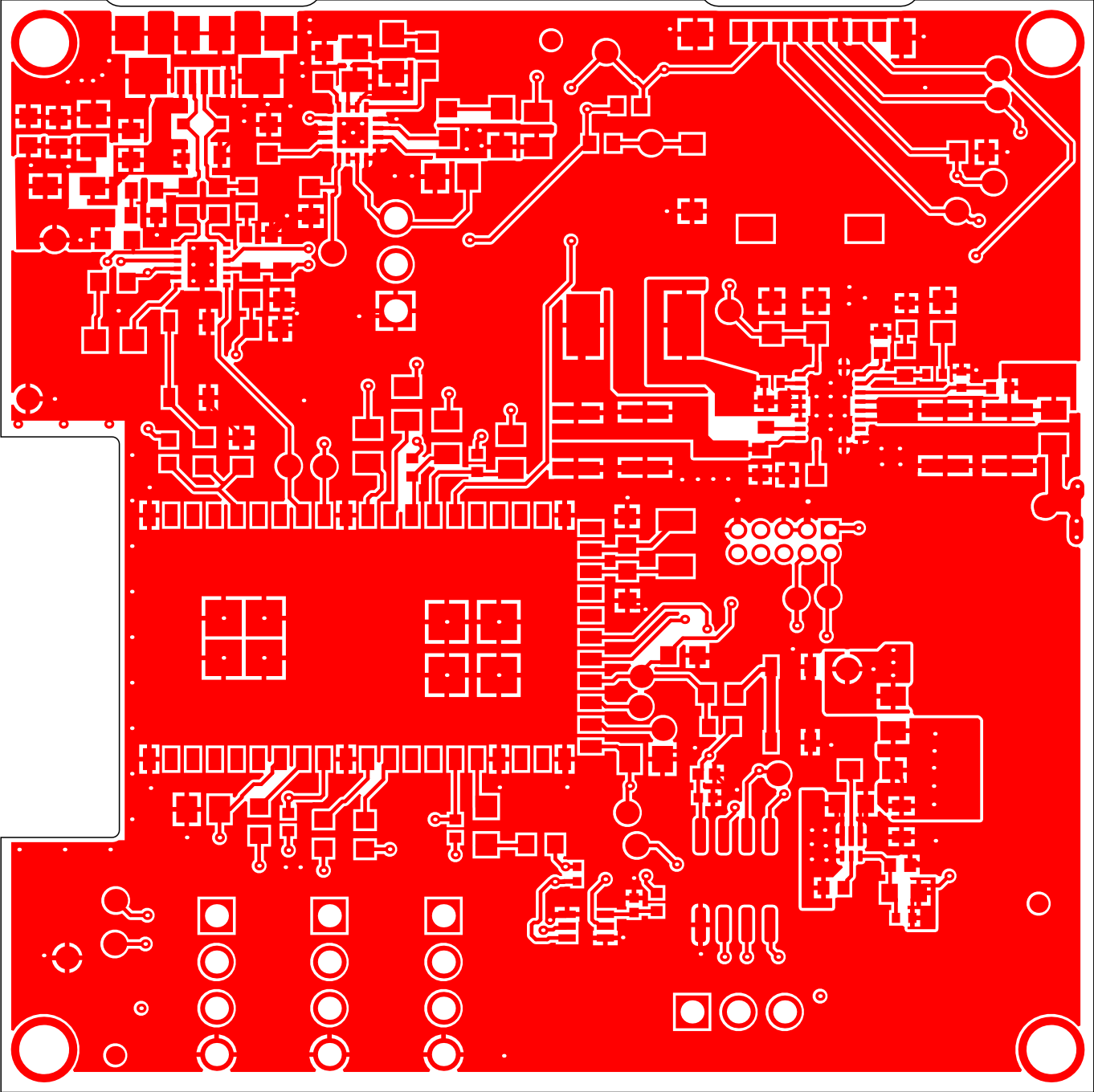
A

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Top Layer (Scale 3)



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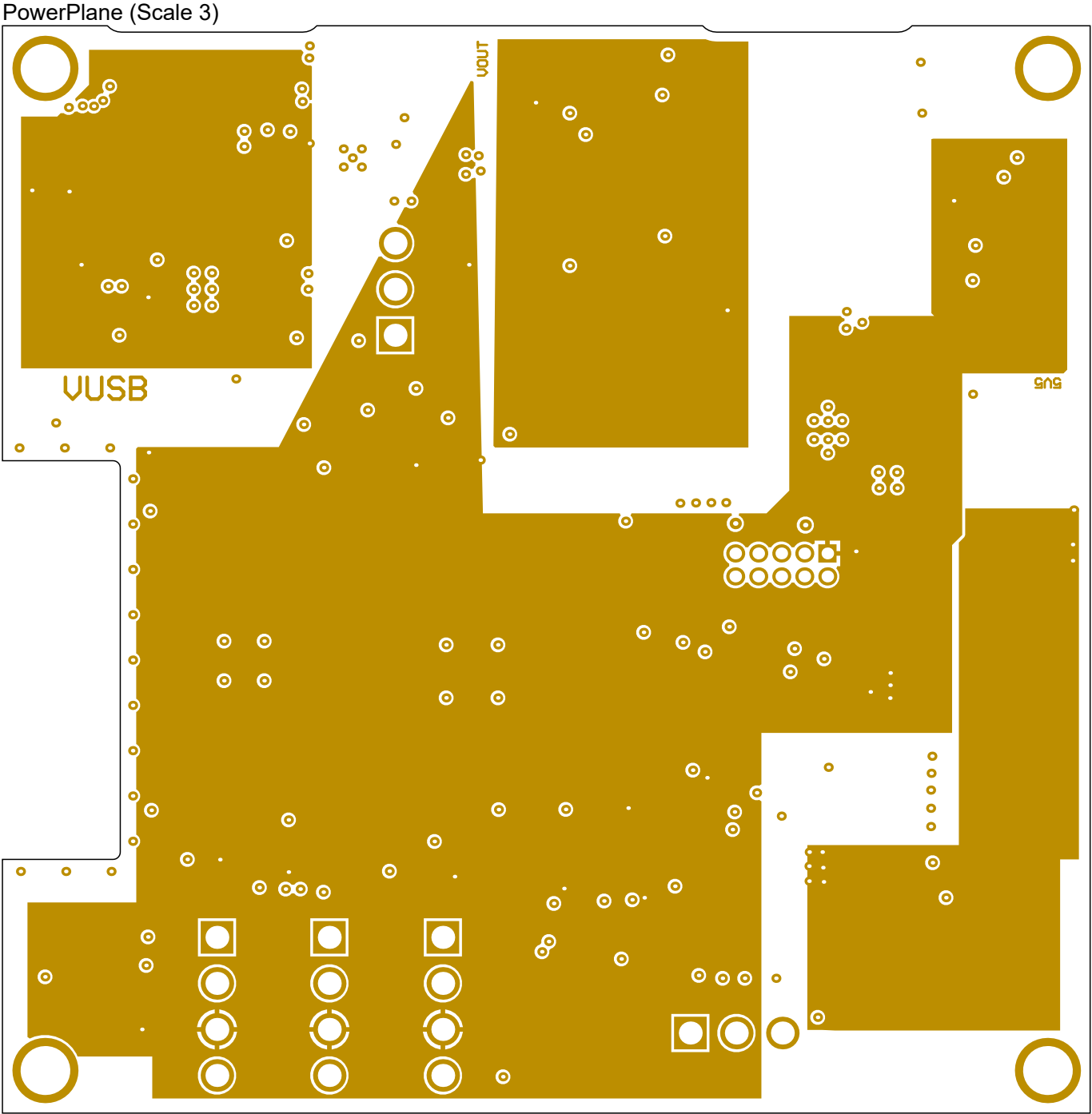
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1

1



2

2

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		TOLERANCES:
		FRACTIONAL ±
		ANGULAR: MACH ± BEND ±
		TWO PLACE DECIMAL ±
		THREE PLACE DECIMAL ±
		INTERPRET GEOMETRIC TOLERANCING PER:
		MATERIAL
NEXT ASSY	USED ON	FINISH
APPLICATION		DO NOT SCALE DRAWING

ED:	NAME	DATE	Voodoo Magic		
DRAWN	Chen Chen & Wuji Zhang	2021/03/20	WiFi Gaming Board		
CHECKED	Chen Chen & Wuji Zhang	2021/03/20			
ENG APPR.	Chen Chen & Wuji Zhang				
MFG APPR.					
Q.A.	Chen Chen & Wuji Zhang		COMMENTS:		
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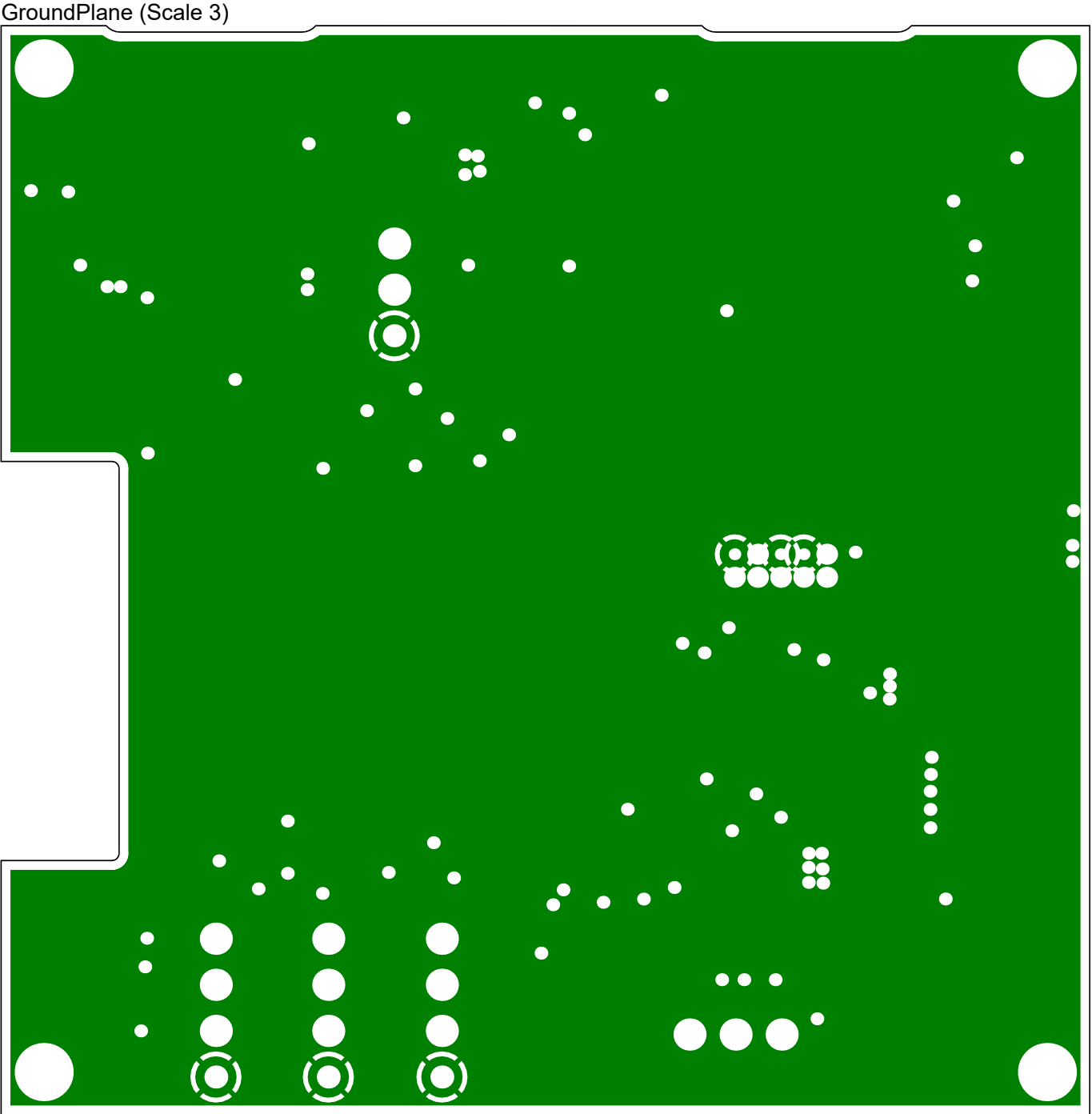
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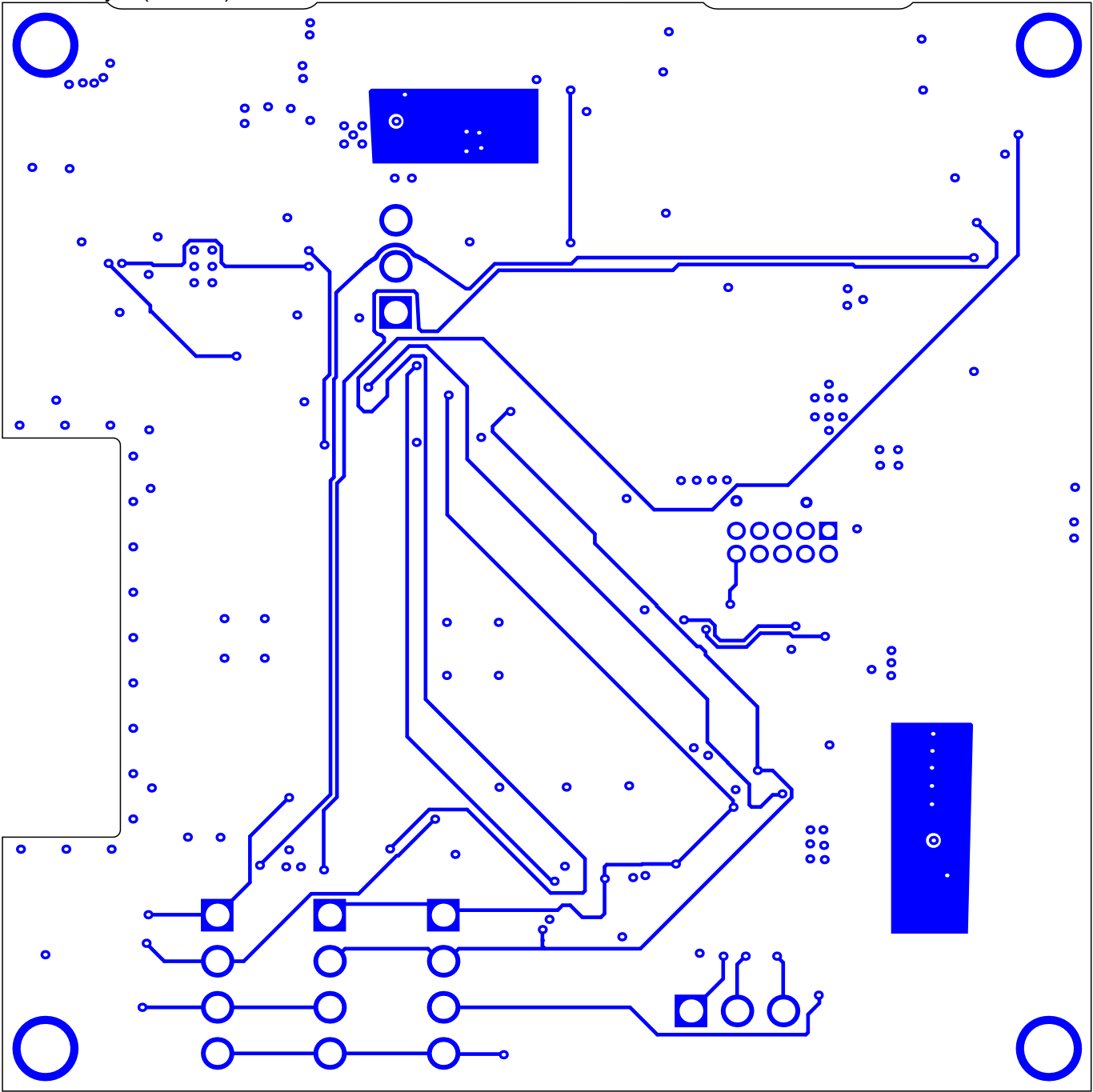
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1

1

Bottom Layer (Scale 3)



2

2

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		MATERIAL						
		FINISH				WEIGHT:		
NEXT ASSY	USED ON							
APPLICATION		DO NOT SCALE DRAWING				SHEET 9 OF 12		

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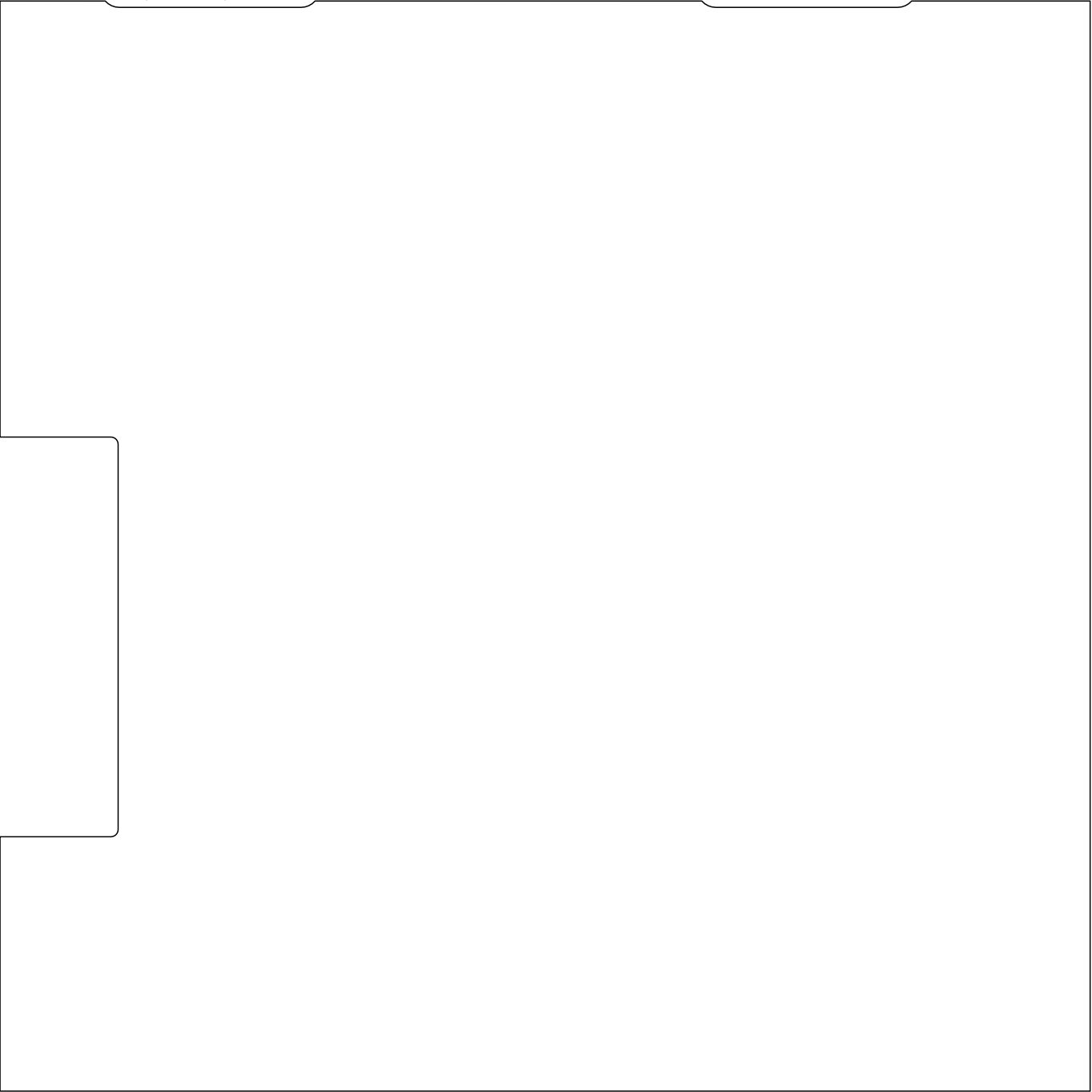
1

1

2

2

Bottom Paste (Scale 3)



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		MATERIAL	COMMENTS:					
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING	SCALE: 1:1			WEIGHT:	SHEET 10 OF 12	

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B

C

D

A

B

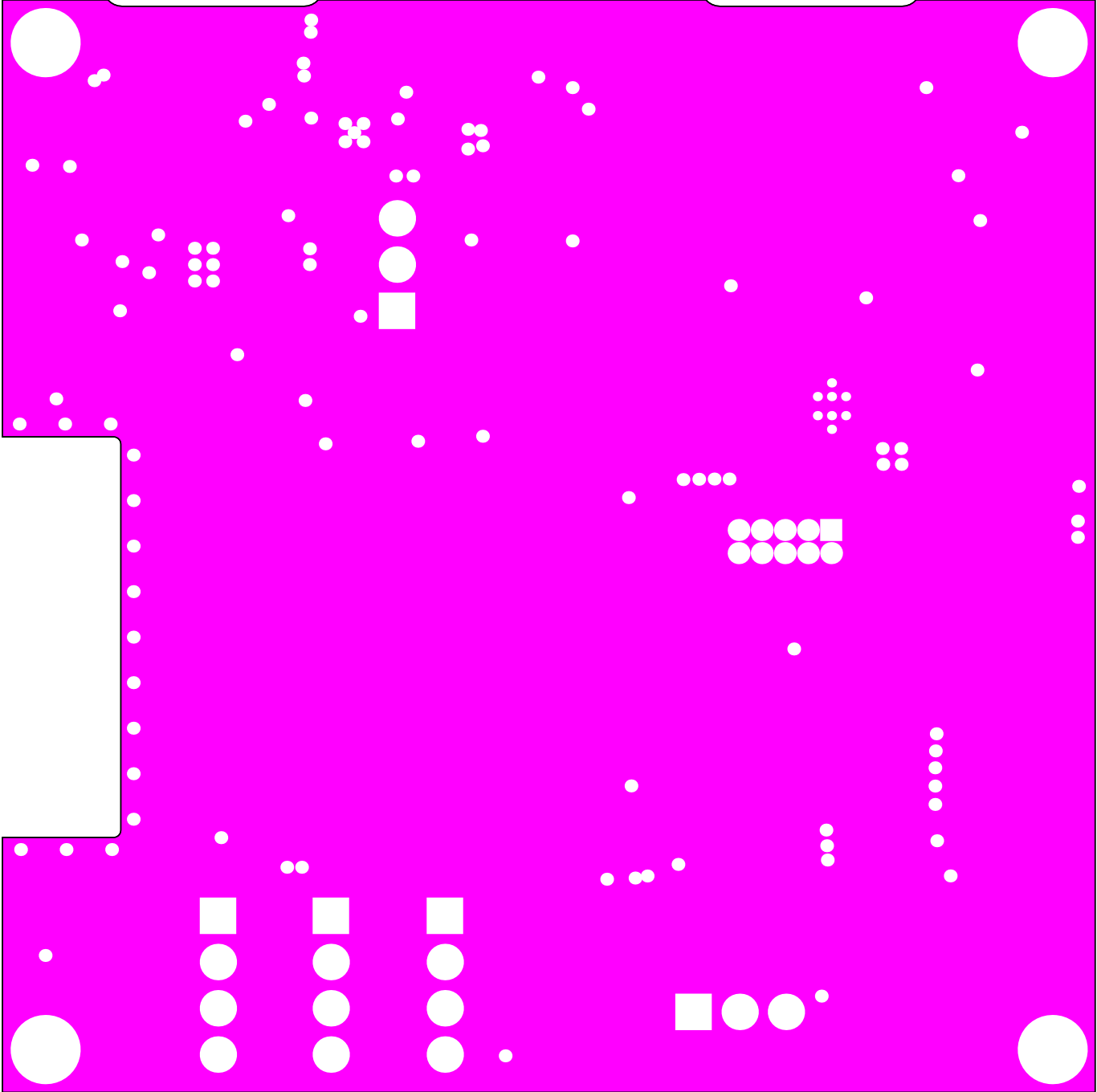
C

D

1

1

Bottom Solder (Scale 3)



2

2

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	Voodoo Magic			
		DIMENSIONS ARE IN INCHES	DRAWN	Chen Chen & Wuji Zhang	2021/03/10	WiFi Gaming Board		
		TOLERANCES:	CHECKED	Chen Chen & Wuji Zhang				
		FRACTIONAL ±	ENG APPR.	Chen Chen & Wuji Zhang				
		ANGULAR: MACH ± BEND ±	MFG APPR.					
		TWO PLACE DECIMAL ±	Q.A.	Chen Chen & Wuji Zhang		SIZE DWG. NO.		
		THREE PLACE DECIMAL ±	COMMENTS:					
		INTERPRET GEOMETRIC TOLERANCING PER:						
		MATERIAL						
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:1	WEIGHT:	SHEET 11 OF 12

A

B

C

D

A

B

C

D

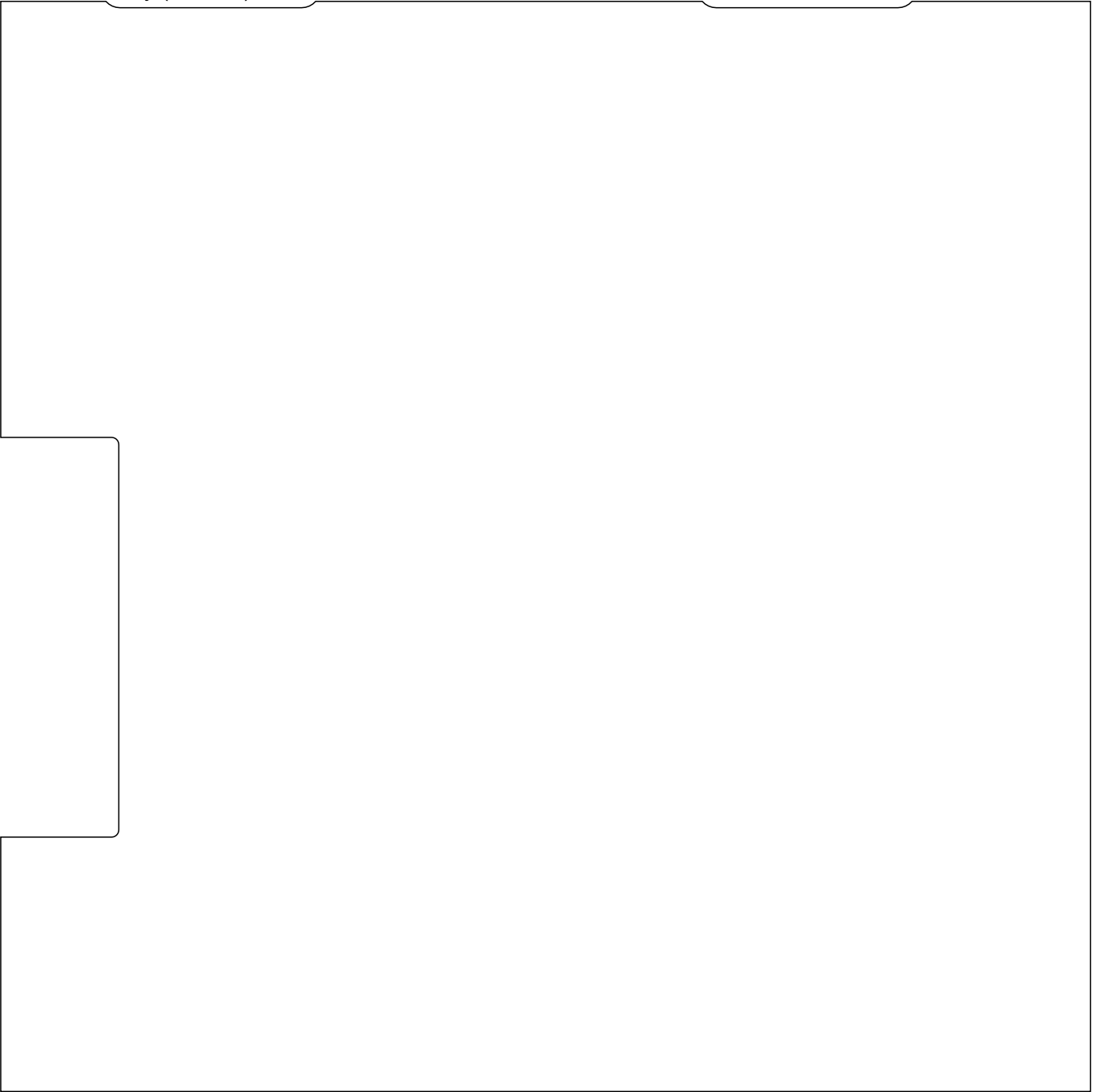
1

1

2

2

Bottom Overlay (Scale 3)



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		DIMENSIONS ARE IN INCHES	DRAWN	Chen Chen & Wuji Zhang			
		TOLERANCES:	CHECKED	Chen Chen & Wuji Zhang	WiFi Gaming Board		
		FRACTIONAL ±	ENG APPR.	Chen Chen & Wuji Zhang			
		ANGULAR: MACH ± BEND ±	MFG APPR.				
		TWO PLACE DECIMAL ±					
		THREE PLACE DECIMAL ±					
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.	Chen Chen & Wuji Zhang			
		MATERIAL	COMMENTS:		SIZE	DWG. NO.	
		FINISH					
NEXT ASSY	USED ON						
APPLICATION		DO NOT SCALE DRAWING			SCALE: 1:1	WEIGHT:	SHEET 12 OF 12

A

B

C

D

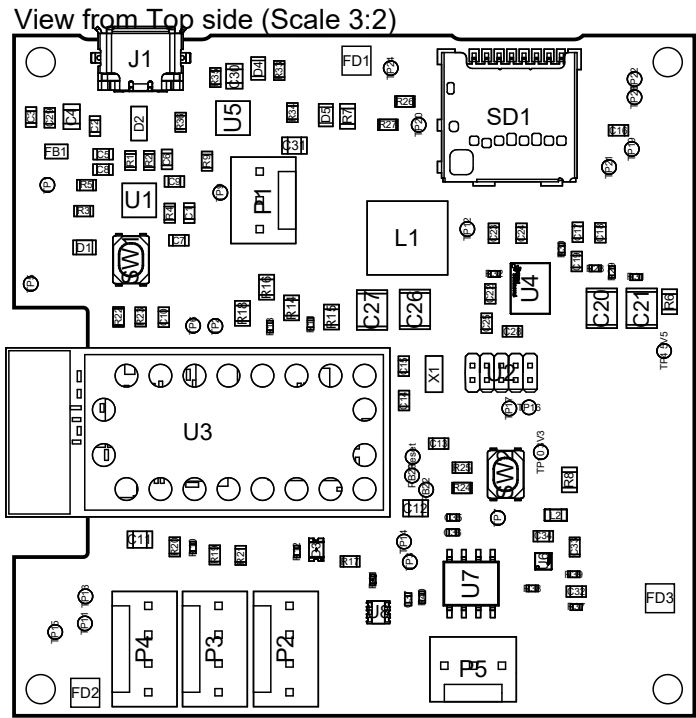
Realistic View

1. THIS ITEM IS ELECTROSTATIC SENSITIVE AND SHALL BE HANDLED ACCORDINGLY

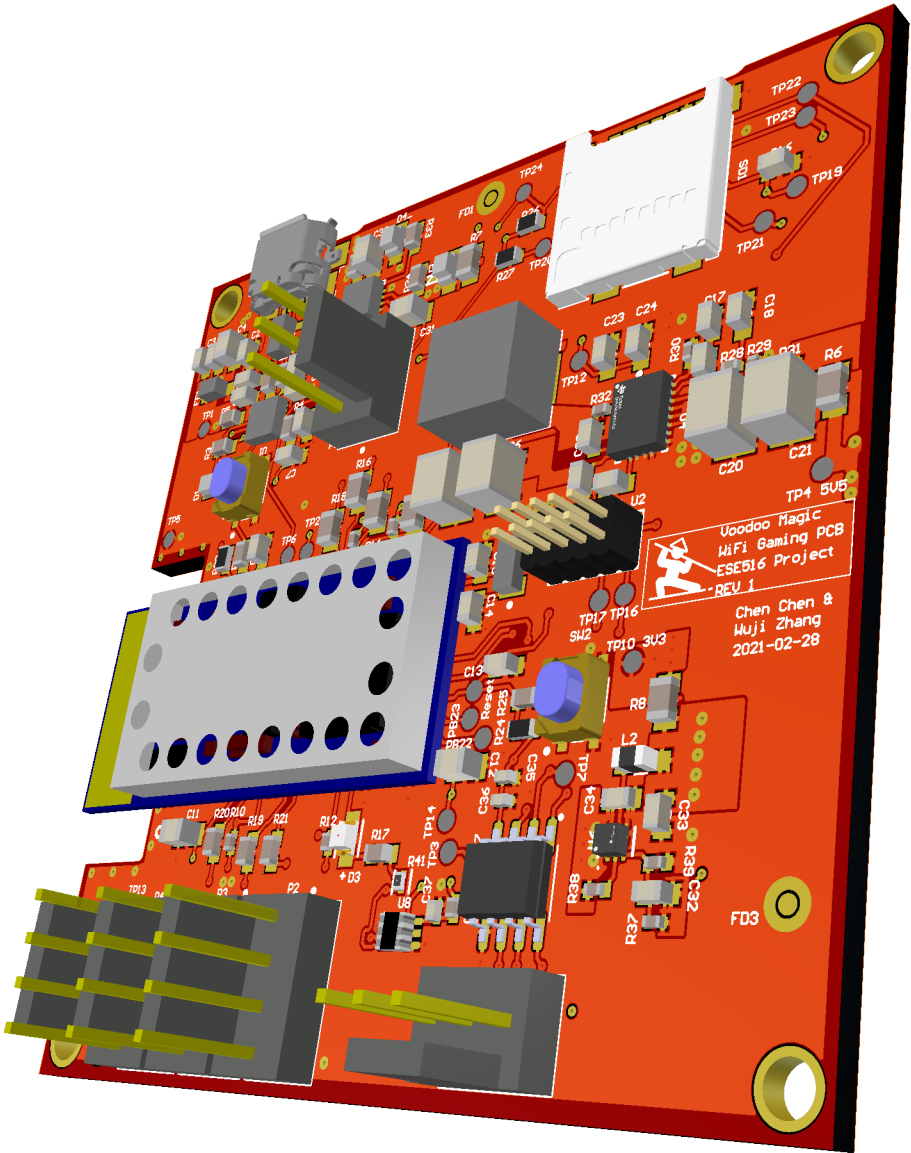
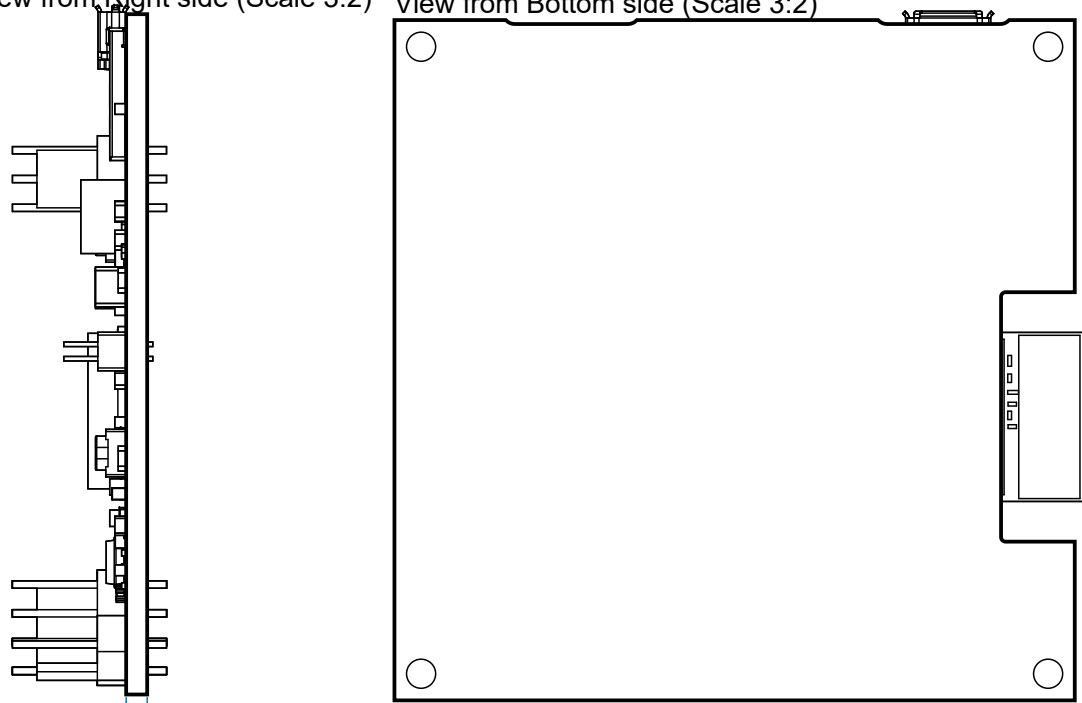
2. WORKMANSHIP WILL CONFORM TO IPC-610 CLASS 2, IPC-7711 WILL APPLY TO ALL REQUIRED REWORK OR MODIFICATION

3. ASSEMBLY IS TO BE IDENTIFIED BY A LABEL INDICATING-
SERIAL NUMBER
PART NUMBER and REVISION
VENDOR
DATE CODE

4. THE SUPPLIED INSERTION DATA FOR THIS PCBA IS PROVIDED TO ASSIST PROGRAMMING, COMPONENT OFFSET AND ROTATION ARE RELATIVE TO THE ENGINEERING DESIGN ENVIRONMENT AND MAY NOT MATCH REEL PACKAGING OR FEED ORIENTATION, COMPONENTS, ESPECIALLY POLARIZED PARTS, MUST BE VERIFIED AGAINST THE ACTUAL PCBA DRAWING TO INSURE PROPER INSTALLATION

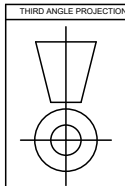
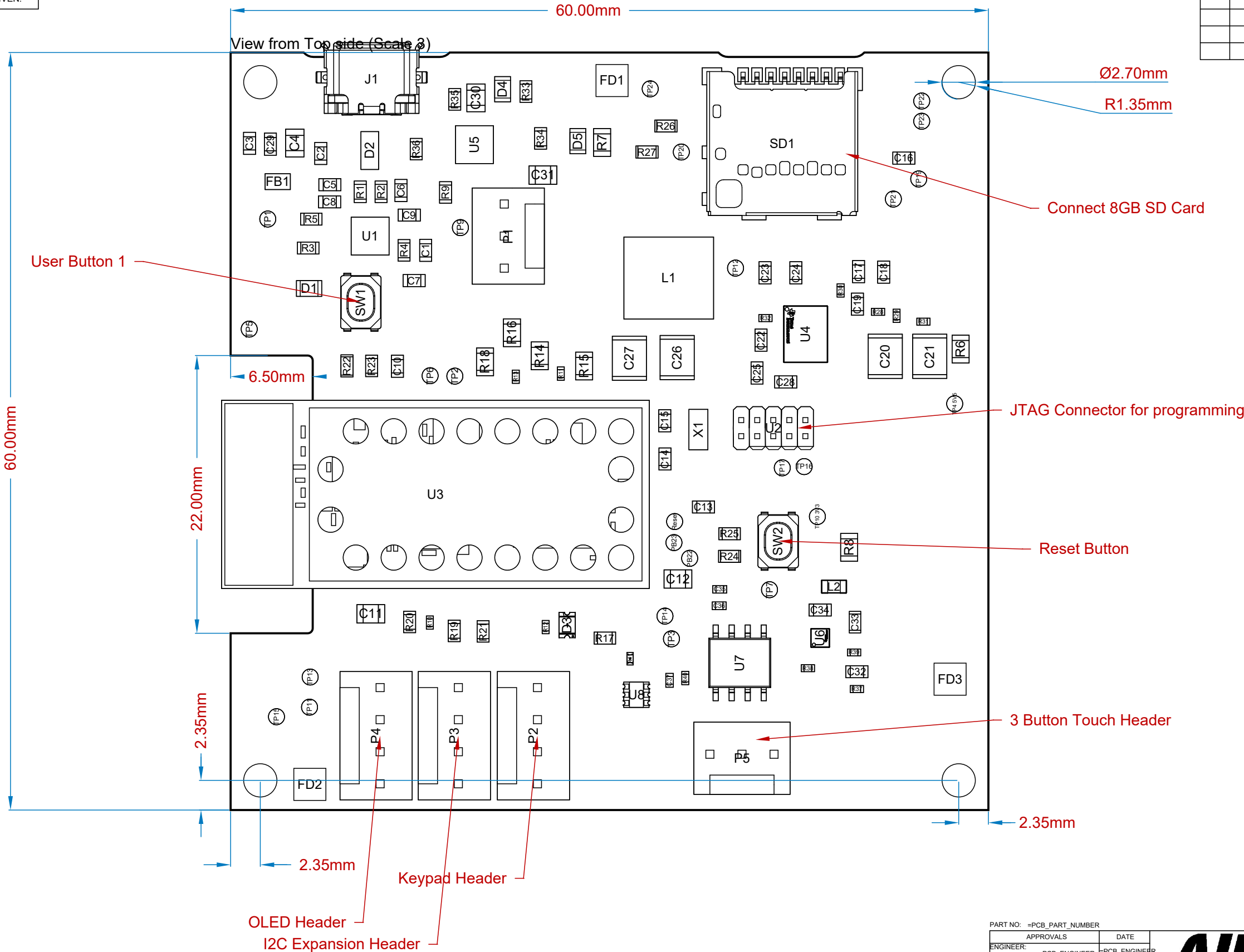



View from Right side (Scale 3:2) View from Bottom side (Scale 3:2)



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			DIMENSIONS ARE IN INCHES	DRAWN	Wuji Zhang & Chen	2023-08-06	Chen		
			TOLERANCES: FRACTIONAL ±	CHECKED	Wuji Zhang & Chen	2023-08-06	Chen		
			ANGULAR: MACH ± BEND ±	ENG APPR.	Wuji Zhang & Chen	2023-08-06	Chen		
			TWO PLACE DECIMAL ±	MFG APPR.			Chen		
			THREE PLACE DECIMAL ±	Q.A.	Wuji Zhang & Chen	2023-08-06	Chen		
			INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:			Chen		
			MATERIAL				SIZE	DWG. NO.	
	NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING					SCALE: 1:1	WEIGHT:	SHEET 1 OF 3

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[illegible]

PART NO.: =PCB_PART_NUMBER				=Address1	
				=Address2	
ENGINEER:	=PCB_ENGINEER			=Address3	
DESIGNER:	=PCB_DESIGNER			=Address4	
CHECKER:	=PCB_CHECKER	DESIGN ITEM: .Item		DESIGN ITEM REVISION: .ItemRevision	
	=PCB_CHECKER				
Reference Documents		TITLE: =PCB_TITLE_1			
BOM DOC: =DOC_NO_BOM					
ASSY DOC: =DOC_NO_FAB_DWG		SIZE: =PCB_TITLE_2			
SCH DOC: =DOC_NO_SCH_DWG					
PCB DOC: =PCB_DWG_NO		CAGE CODE: =CAGE_CODE		DWG NO: REV:	
		SCALE:		FILE NAME: StarterBoardAssembly.PCBdwf	
		SHEET: 2		OF 3	

Bill Of Materials

Line #	Designator	Name	Quantity
		Keypad	0
		OLED Screen	0
16	C1, C3, C7, C16	100nF 16V, CAP 100nF 16V 0603(1608)	4
7	C2	10nF 16V	1
5	C4, C30, C31	4.7uF 16V	3
	C5, C6, C8, C9, C17, C19	CAP 100pF 50V	6
4	C10, C13, C29	1uF 16V	3
8	C11, C12	10uF 16V, CAP 10uF 16V 0805(2012)	2
9	C14, C15	18pF 16V	2
	C18	CAP 1nF 10V	1
	C20, C21, C26, C27	47uF 16V	4
	C22, C25	CAP 100nF 10V, 100nF 10V	2
	C23, C24	1uF 10V	2
	C28	CAP 8.2nF 10V	1
	C32	120pF 10V	1
	C33	22uF 10V	1
	C34	4.7uF 10V	1
	C35	1uF 10V	1
	C36, C37	100nF 10V	2
30	D1, D4	LTST-C170CKT	2
34	D2	PRTR5V0U2X,215	1
	D3	LH R974-LP-1	1
31	D5	LTST-C170GKT	1
24	FB1	BLM21PG221SN1D	1
13	FD1, FD2, FD3	40x100mm	3
39	J1	ZX62R-B-5P	1
	L1	1uH	1
	L2	470nH	1
20	P1, P5	640456-3	2
	P2, P3, P4	640456-4	3
1	PB22, PB23, Reset, TP1, TP2, TP3, TP4 5V5, TP5, TP6, TP7, TP9, TP10 3V3, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP19, TP20, TP21, TP22, TP23, TP24	0.1" Pad	25
11	R1, R2, R19, R20, R21	27R 1%	5
3	R3, R5, R9, R17, R33, R34	1K 1%	6
28	R4	Jumper	1
29	R6, R7, R8, R14, R15, R16, R18	Jumper	7
	R10, R11, R12, R13	4K7 1%	4
	R22, R24, R26, R27	ERJ3EKF1002V	4
17	R23, R25	100R 1%	2
	R28	23K7 1%	1
	R29	86K6 1%	1
	R30	140K 1%	1
	R31	309K 1%	1
	R32, R37	453K 1%	2

Bill Of Materials

[illegible]

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		DIMENSIONS ARE IN INCHES	DRAWN	Wuji Zhang & Chen	02/08/2025	Chen		
		TOLERANCES:	CHECKED	Wuji Zhang & Chen	02/08/2025	Chen		
		FRACTIONAL ±	ENG APPR.	Wuji Zhang & Chen	02/08/2025	Chen		
		ANGULAR: MACH ± BEND ±	MFG APPR.			Chen		
		TWO PLACE DECIMAL ±				Chen		
		THREE PLACE DECIMAL ±				Chen		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.	Wuji Zhang & Chen	02/08/2025	Chen		
		MATERIAL	COMMENTS:			SIZE	DWG. NO.	
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:1	WEIGHT:	SHEET 3 OF 3