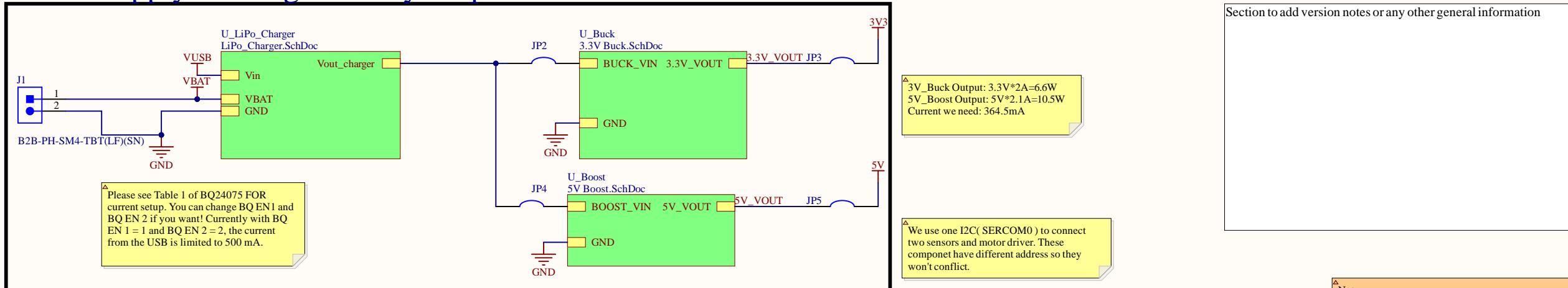
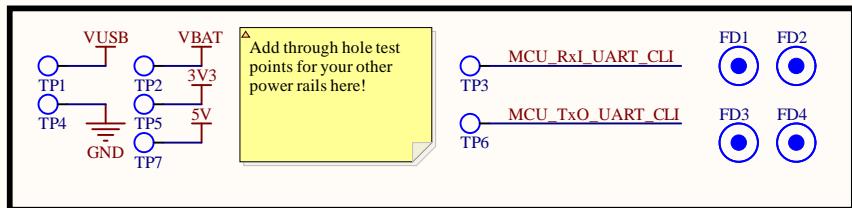


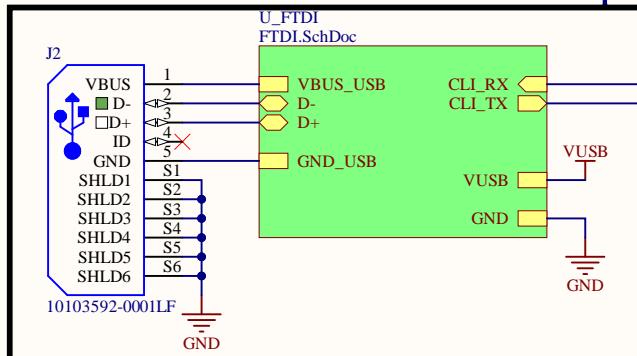
Power Supply - Change me to your power architecture



Test Points + Fiducials

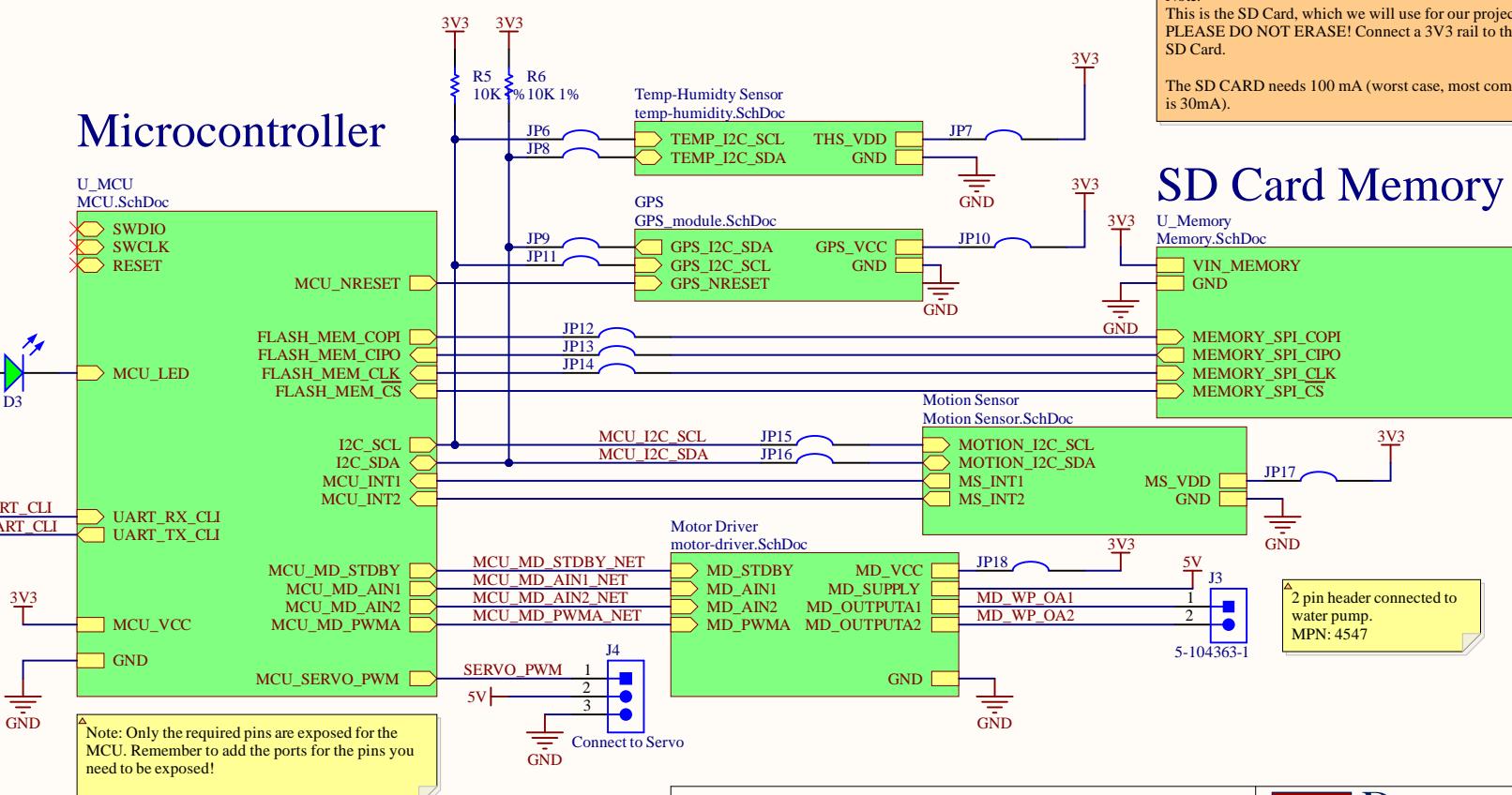


USB Connector + FTDI Chip



NOTE:
The FTDI Chip is an useful chip that allows us to convert USART messages into USB signals. It allows us to connect the MCU directly to the USB port of a computer and use the serial terminal (it is the same bridge used on the SAMW25 Xplained Board).The FTDI device also contains protection circuitry for the USB.

Microcontroller



Title: **Main.SchDoc**

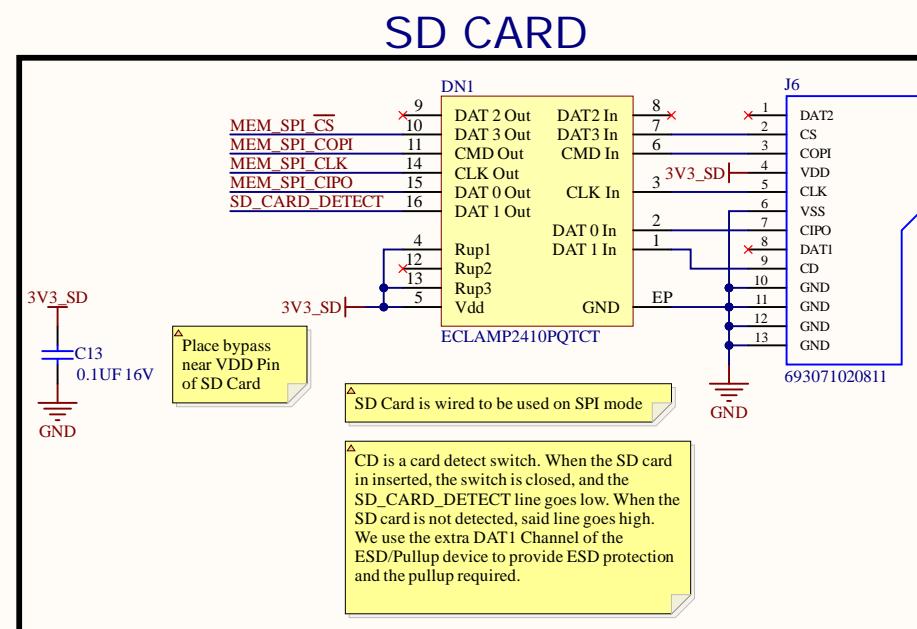
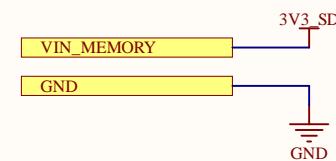
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Date: 10/19/2023 12:04:49 AM	AD Ver. 23.8.1.32	Doc. * Sheet 1 of 7
File: C:\Users\Public\Documents\Altium\ESE5160_ExampleLayoutProject - Copy_1\Main.SchDoc		Electrical and Systems Engineering



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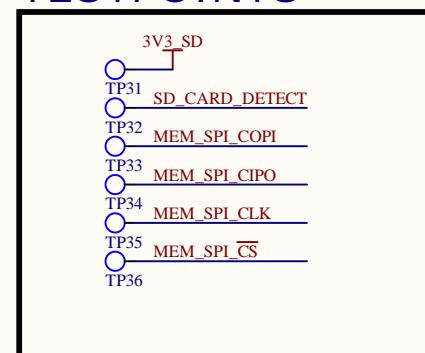
A



B

B

TESTPOINTS



C

C

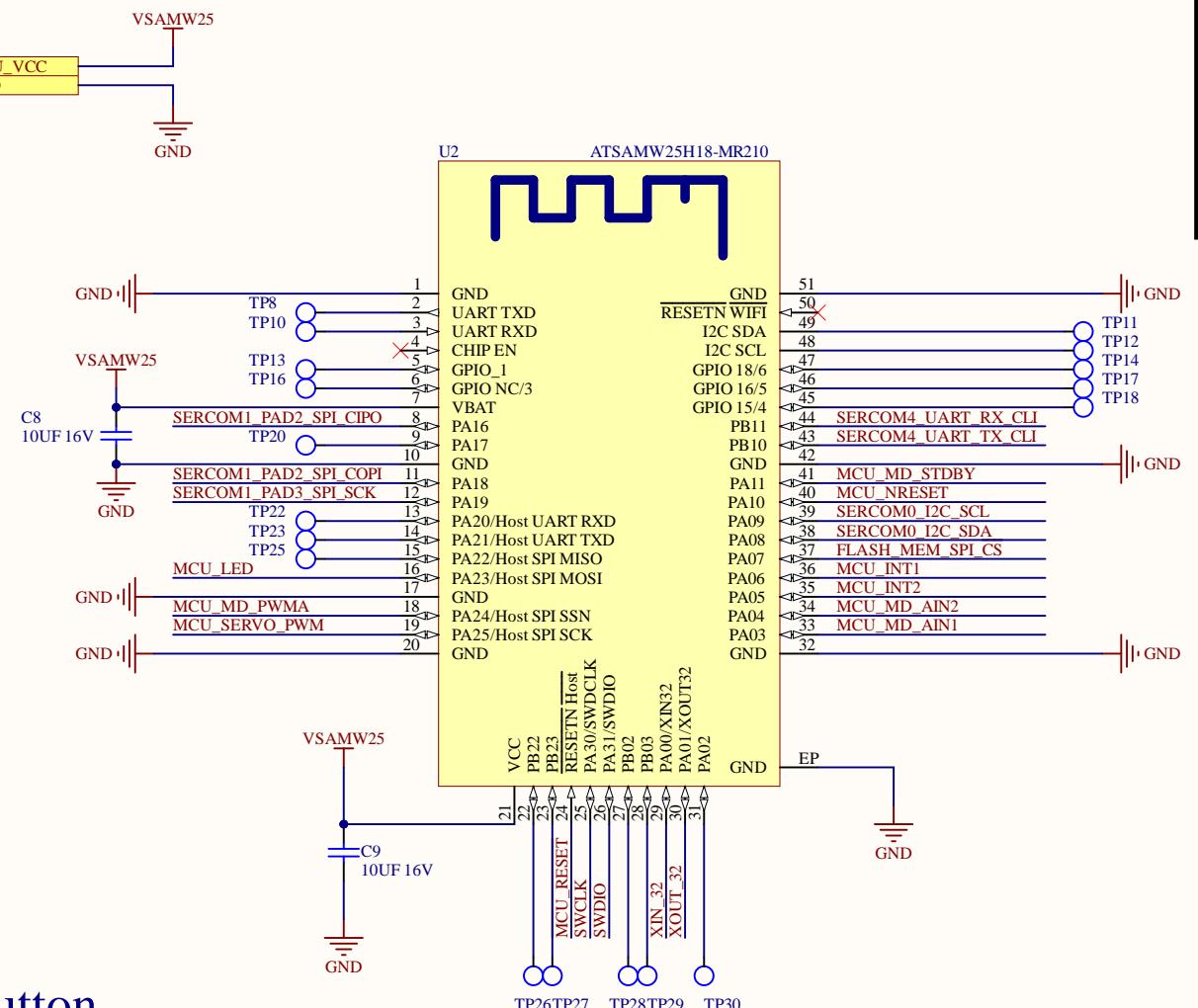
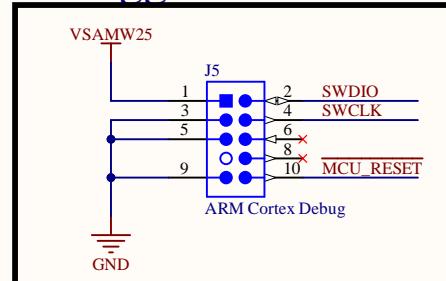
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Desc:

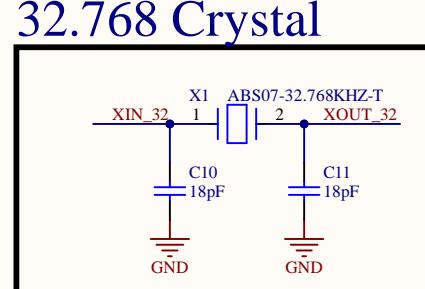
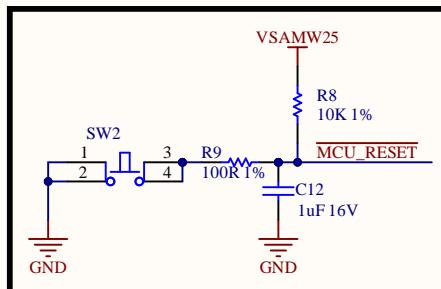
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File: C:\Users\Public\Documents\Altium\ESE5160_ExampleLayoutProject - Copy_1\Memory.SchDoc		Electrical and Systems Engineering



Debugger Port



Reset Button



△ Calculation of crystal load capacitors:

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C_{para} = 3.15 pF (from MC)

$$C_{pcb} = 0.5 \text{ pF (estimate)}$$

$$C_{ext} = 2x(12.5\text{pF} - 3.15\text{pF} - 0.5\text{pF})$$

[View Details](#) | [Edit](#) | [Delete](#)

[View all posts by admin](#)

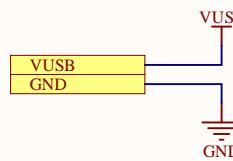
ANSWER *See page 10.*

Title: MCII SchDoc

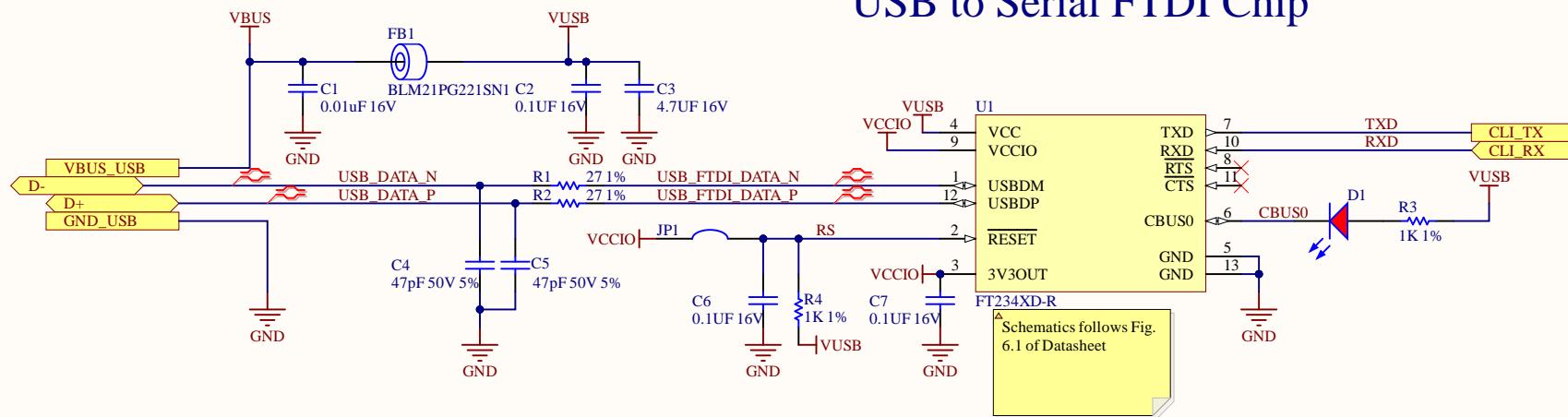
ANSWER



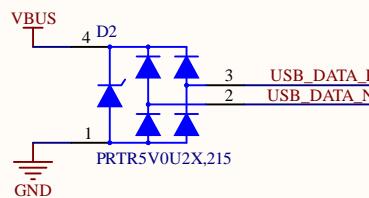
A



USB to Serial FTDI Chip



USB ESD Protection

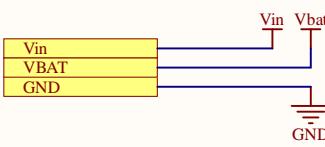


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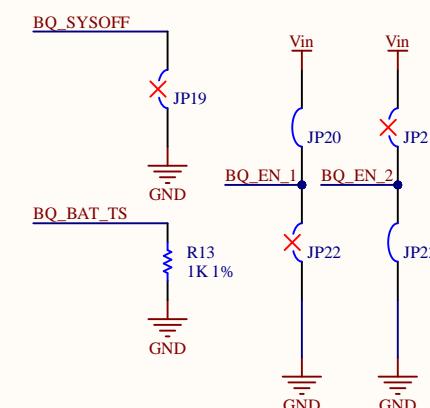
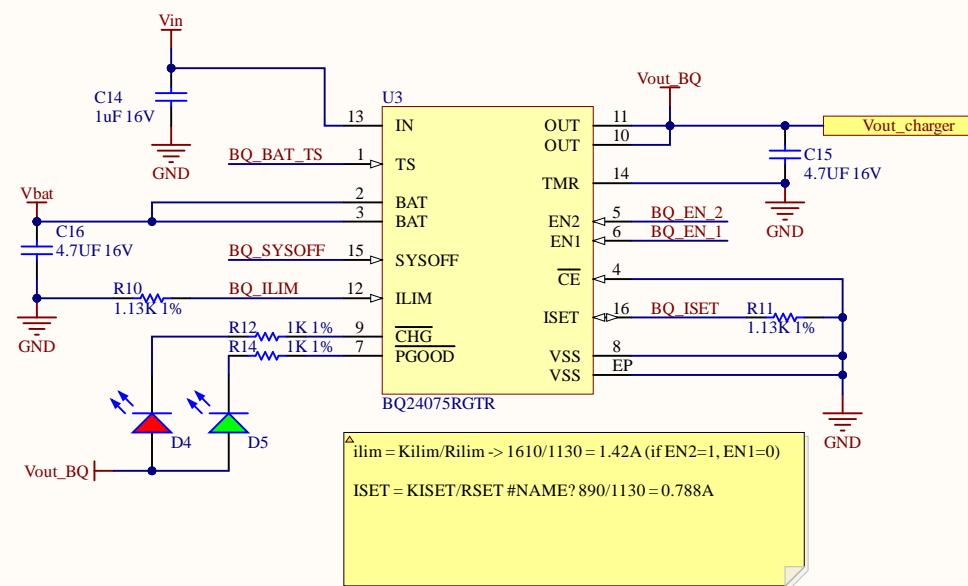
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A



B



C

D

Title: *Lipo_Charger.SchDoc*

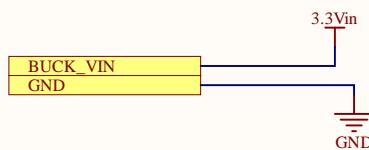
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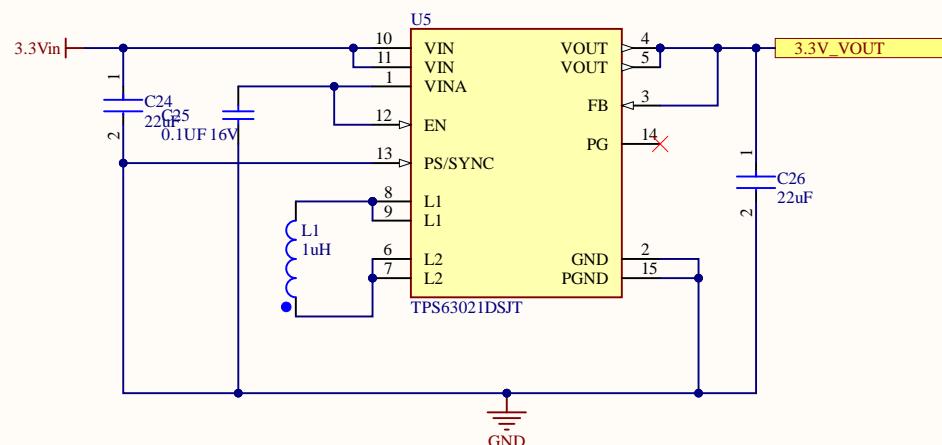
A

A



B

B



Buck LiPo output voltage to 3.3V for the system.

C

C

D

D

Title: 3.3V_Buck.SchDoc	
Desc:	
Size: Letter	Auth: Ashley Ding, Runlong Proj: ESE5160_Team3_VRSTeam_Project
VCS: 9c4ff34198308952c2fd1f82fd152d1c6cf79730 [No modification]	
Date: 10/19/2023 12:04:50 AM AD Ver. 23.8.1.32 Doc. * Sheet * of *	
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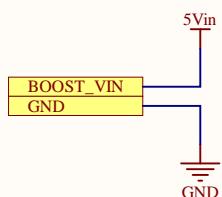
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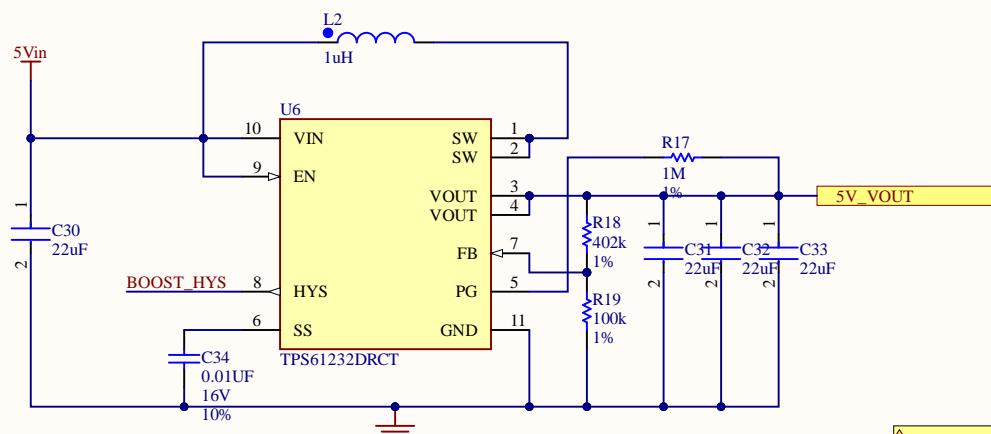
A

TESTPOINTS

BOOST_HYS
TP67



B



△ Boost LiPo output voltage to 5V for servo and motor driver.
MPN: TPS61232DRCT
<https://www.digikey.com/en/products/detail/texas-instruments/TPS61232DRCT/4924051>

C

D

Title: **5V Boost.SchDoc**

Desc:

Size: Letter

Auth: Ashley Ding, Runlong Hu Proj: ESE5160_Team3_VRSTeam_Project

VCS: 9c4ff34198308952c2fd1f82fd152d1c6cf79730 [No modification]

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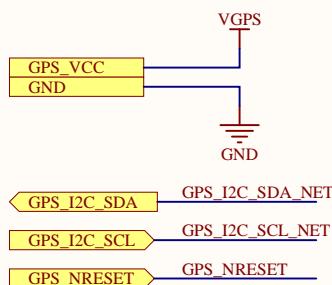


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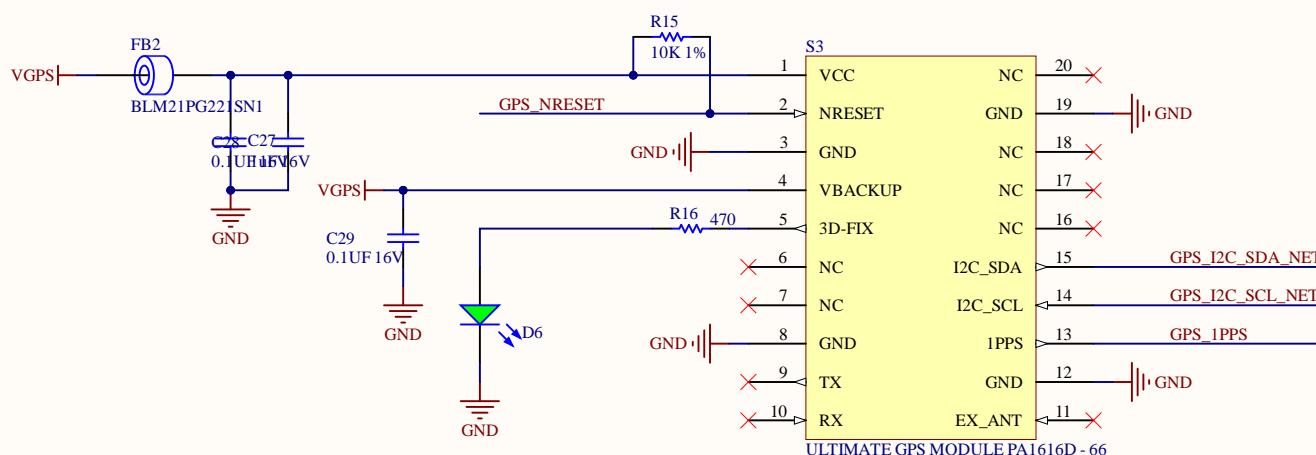
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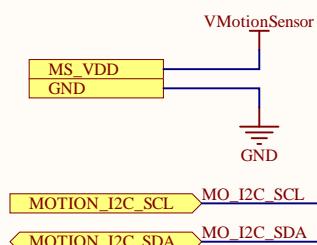
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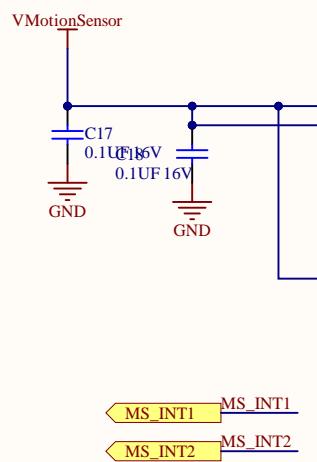
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A



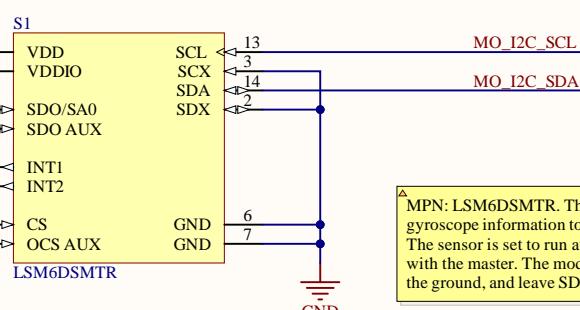
B

B



C

C



MPN: LSM6DSMTR. This sensor transmit accelerometer and gyroscope information to MCU with I2C.
The sensor is set to run at mode 1, where it only communicates with the master. The mode is set by connecting SCX and SDX to the ground, and leave SDO AUX and OCS AUX unconnected.

D

D

Title: Motion Sensor.SchDoc

Desc:

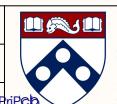
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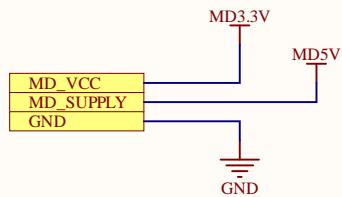


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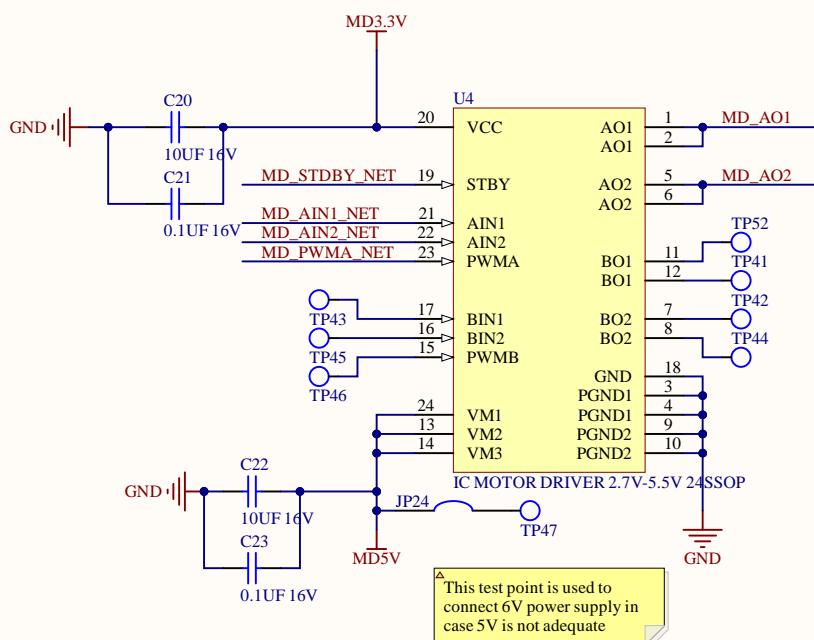
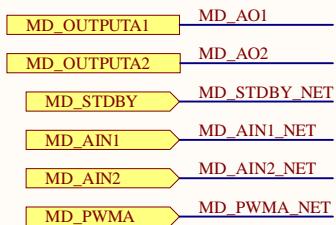
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A



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C

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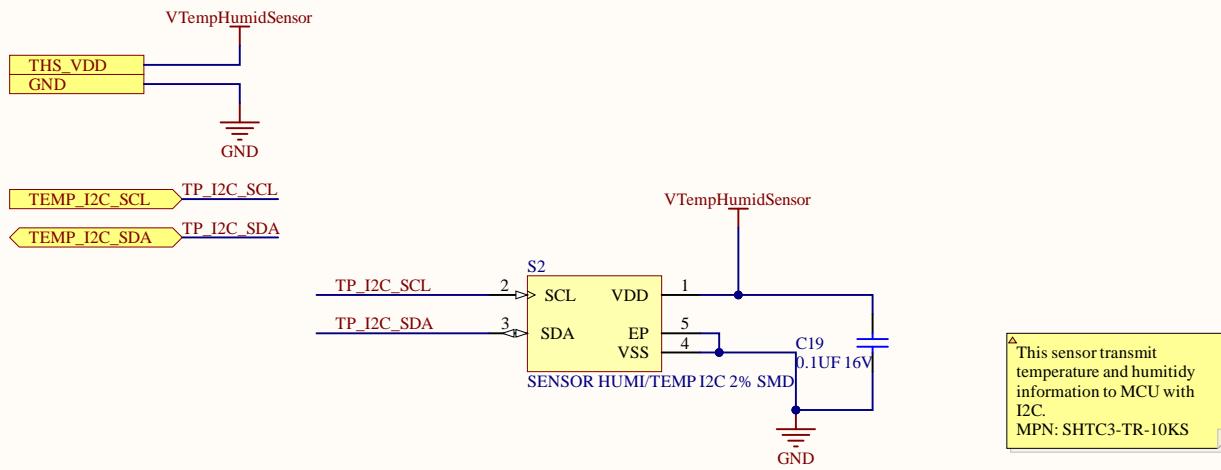
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Desc:			
Size: Letter	Auth: Ashley Ding, Runlong	Proj: ESE5160_Team3_VRSTeam_Project	File: C:\Users\Public\Documents\Altium\ESE5160_ExampleLayoutProject - Copy_1\Motor-driver.SchDoc
VCS: 9c4ff34198308952c2fd1f82fd152d1c6cf79730 [No modification]	Date: 10/19/2023 12:04:50 AM	AD Ver. 23.8.1.32	Doc. * of *
		Electrical and Systems Engineering	

A

A

B

B



C

C

D

D

Title: Temp-humidity.SchDoc	
Desc:	
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VCS: 9c4ff34198308952c2fd1f82fd152d1c6cf79730 [No modification]	
Date: 10/19/2023 12:04:50 AM AD Ver. 23.8.1.32 Doc. * Sheet * of *	
File: C:\Users\Public\Documents\Altium\ESE5160_ExampleLayoutProject - Copy_1\Temp-humidity.SchDoc	



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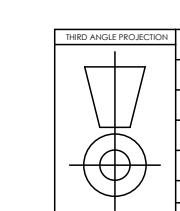
Four (4) Layers
Dimensions: _____
Thickness: 1.53mm
Material: PP-006; Core-009
All layers are unmirrored - should be able to "see straight thru"
Scoring: Yes

Finished Thickness: 1.53mm
Surface Finish: ENIG
Gold Fingers: Yes
Outer Layer Finish Copper: 1oz
Inner Copper: 0.5oz
Number of Holes Per Board: _____
Minimum Hole size: 0.20mm
Minimum Trace (Outer layer): 6mil
Minimum Space (Outer layer): 6mil
Minimum Trace (Inner layer): None (no Trace)
Minimum Space (Inner layer): None (no Trace)
Solder Mask: Yes
Solder Mask Sides: Top and Bottom
Solder Mask Color: Green
Solder Mask Type: LPI
Solder Mask Finish: Standard (Semi-Gloss)
Silk Screen: Yes
Logo Allowed: Silk Screen
Silk Screen Sides: Top and bottom
Silk Screen Color: N/A
Internal Slots: No
Counter Sink: No
Counter Bore: No
Edge Plating: No
Route and Retain: N/A
Scoring: N/A
Controlled Impedance: No
Controlled Dielectric: No
Thru-Hole Via in Pad: No
Thickness Tolerance: +/-10%
UL Marking Required: No
Rohs Marking: No
ITAR?: No

Layer Stack Legend

Material	Layer	Thickness	Dielectric Material	Type	Gerber
Surface Material	Top Overlay			Legend	GTO
Copper	Top Solder	0.03mm	Solder Resist	Solder Mask	GTS
Copper	Top Layer	0.04mm		Signal	GTL
Prepreg		0.33mm	PP-006	Dielectric	
CF-004	GroundPlane	0.02mm		Signal	G1
Core		0.71mm	Core-009	Dielectric	
CF-004	PowerPlane	0.02mm		Signal	G2
Prepreg		0.33mm	PP-006	Dielectric	
Copper	Bottom Layer	0.04mm		Signal	GBL
Surface Material	Bottom Solder	0.03mm	Solder Resist	Solder Mask	GBS

Total thickness: 1.5



PART NO: =PCB_PART_NUMBER			
APPROVALS	DATE		
ENGINEER: =PCB_ENGINEER	=PCB_ENGINEE	ADDRESS 1	
DESIGNER: =PCB_DESIGNER	=PCB_DESIGNE	ADDRESS 2	
CHECKER: =PCB_CHECKER	=PCB_CHECKE	ADDRESS 3	
Reference Documents		ADDRESS 4	
BOM DOC: =DOC_NO_BOM	DESIGN ITEM: .Item DESIGN ITEM REVISION: .ItemRevision		
ASSY DOC: =DOC_NO_FAB_DWG	TITLE: =PCB_TITLE_1 =PCB_TITLE_2		
SCH DOC: =DOC_NO_SCH_DWG	SIZE: B	CAGE CODE: =CAGE_CO	DWG NO: REV:
PCB DOC: =PCB_DWG_NO	SCALE: 1	FILE NAME: Start-to-BoardFinalization_PCBDesign.dwg	SHEET: 1 OF 10



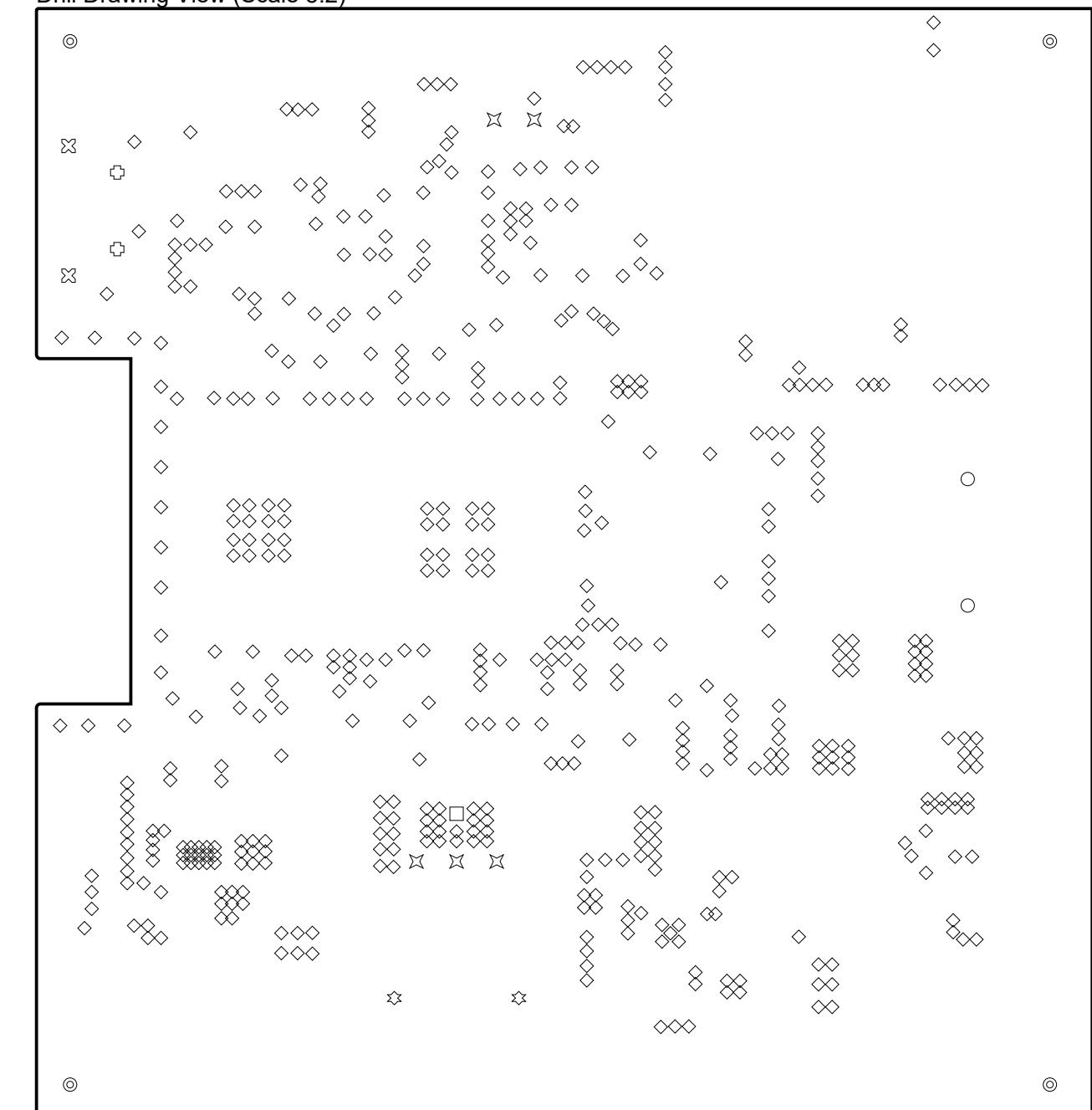
REV STATUS OF SHEETS		REV							
SHEET									
=DOC_NO_ASSY_DWG									

REVISIONS		DESCRIPTION	DATE	APPROVED

Drill Table

Symbol	Count	Hole Size	Plated	Hole Tolerance
◇	495	0.20mm	Plated	
+	2	0.65mm	Plated	
□	1	0.69mm	Plated	
☒	2	0.70mm	Plated	
☒	5	0.89mm	Plated	
○	2	0.90mm	Non-Plated	
◎	4	2.40mm	Plated	
☒	2	3.40mm	Non-Plated	
513 Total				

Drill Drawing View (Scale 5:2)



PART NO: =PCB_PART_NUMBER

APPROVALS DATE

ENGINEER: =PCB_ENGINEER =PCB_ENGINEER

DESIGNER: =PCB_DESIGNER =PCB_DESIGNER

CHECKER: =PCB_CHECKER =PCB_CHECKER

Reference Documents

BOM DOC: =DOC_NO_BOM

ASSY DOC: =DOC_NO_FAB_DWG

SCH DOC: =DOC_NO_SCH_DWG

NEXT ASSY USED ON PCB DOC: =PCB_DWG_NO

APPLICATION

DESIGN ITEM: .Item

DESIGN ITEM REVISION: .ItemRevision

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=PCB_TITLE_2

SIZE: CAGE CODE: DWG NO:

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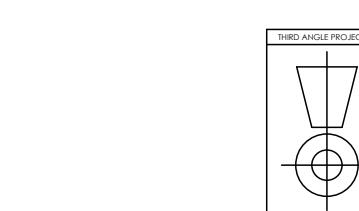
REV:

SCALE: FILE NAME: StarterBoardFabrication.PCDBdwf

HEET: 2 OF 12

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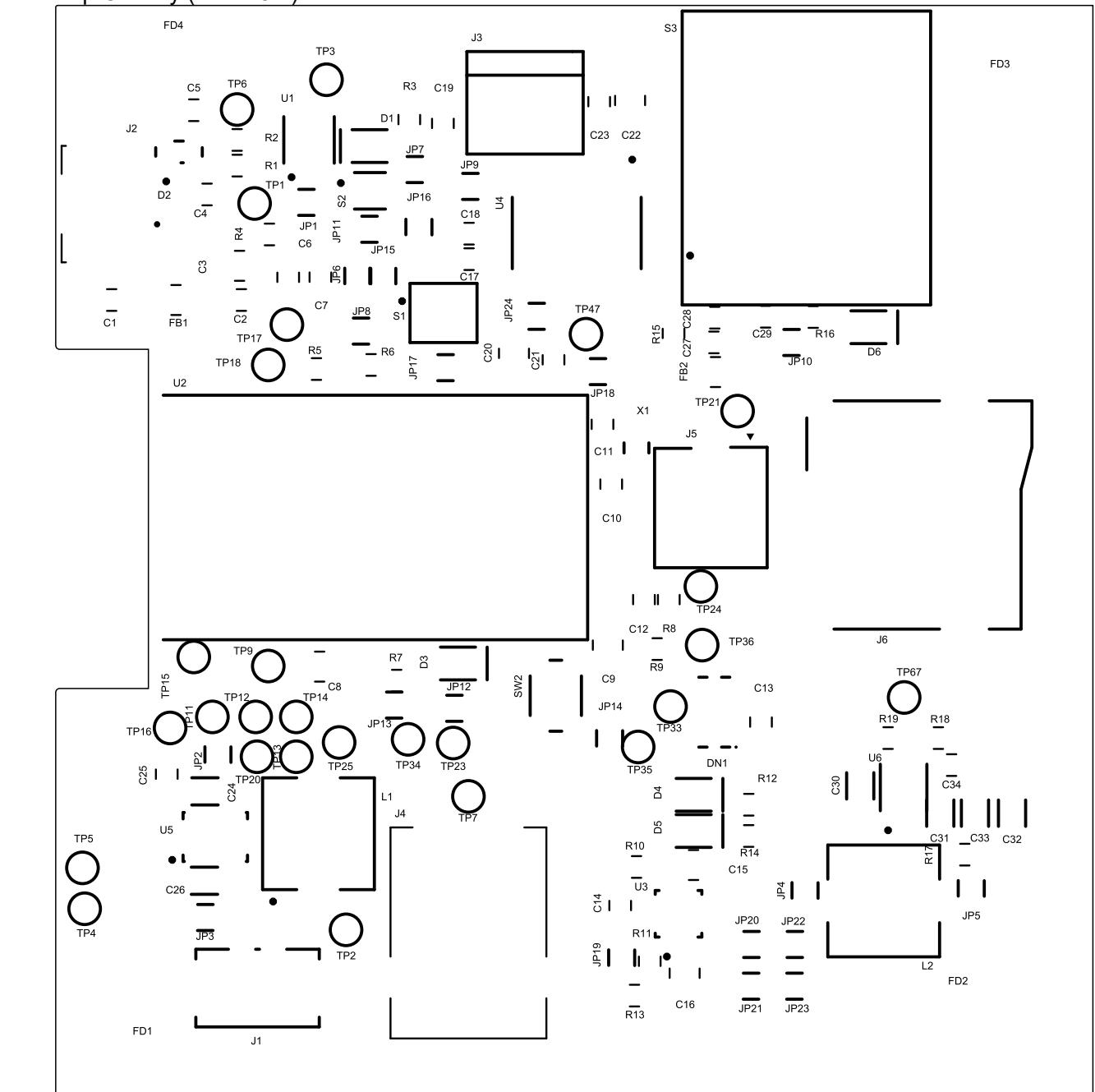
ADDRESS 1
ADDRESS 2
ADDRESS 3
ADDRESS 4



REV STATUS OF SHEETS		REV						
DWG NO.: =DOC_NO_ASSY_DWG		REV:						
ZONE	REV							

REVISIONS		
DESCRIPTION	DATE	APPROVED

Top Overlay (Scale 5:2)



PART NO: =PCB_PART_NUMBER

APPROVALS DATE

ENGINEER: =PCB_ENGINEER =PCB_ENGINEER

DESIGNER: =PCB_DESIGNER =PCB_DESIGNER

CHECKER: =PCB_CHECKER =PCB_CHECKER

Reference Documents

BOM DOC: =DOC_NO_BOM

ASSY DOC: =DOC_NO_FAB_DWG

SCH DOC: =DOC_NO_SCH_DWG

NEXT ASSY USED ON

PCB DOC: =PCB_DWG_NO

APPLICATION

ADDRESS 1
ADDRESS 2
ADDRESS 3
ADDRESS 4

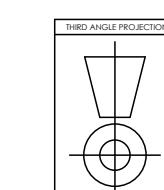
Altium
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=PCB_TITLE_2

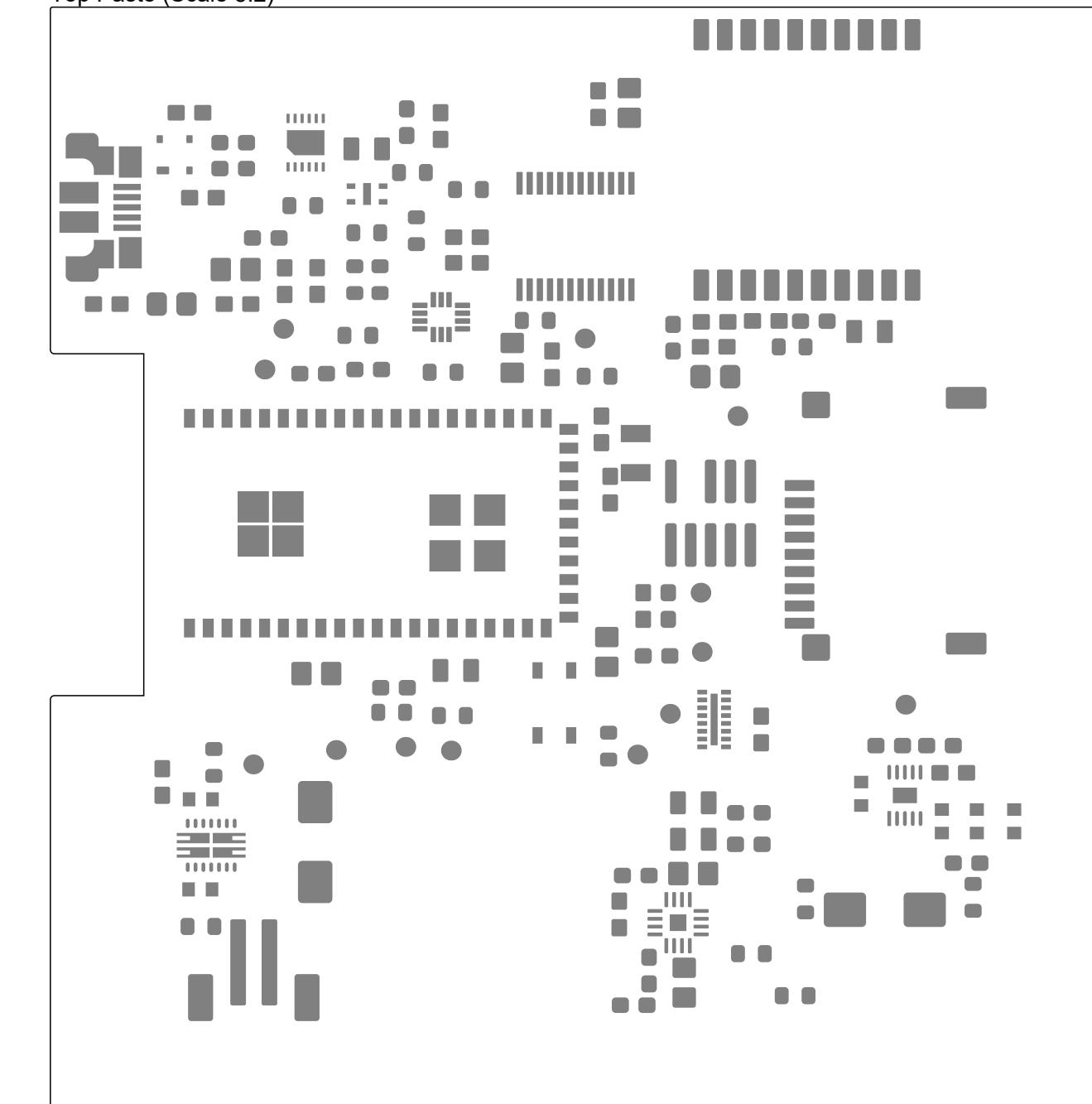
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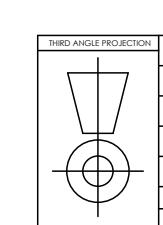


Top Paste (Scale 5:2)



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APPROVALS	DATE			ADDRESS 2
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DESIGNER:	=PCB_DESIGNER			ADDRESS 4
CHECKER:	=PCB_CHECKER	DESIGN ITEM:	.Item	DESIGN ITEM REVISION:
				.ItemRevision
Reference Documents		TITLE: =PCB_TITLE_1 =PCB_TITLE_2		
BOM DOC:	=DOC_NO_BOM	SIZE:	CAGE CODE:	DWG NO:
ASSY DOC:	=DOC_NO_FAB_DWG	B =CAGE_CO		REV:
SCH DOC:	=DOC_NO_SCH_DWG	SCALE:	FILE NAME:	StarterBoardFabrication PCBdWf
PCB DOC:	=PCB_DWG_NO			SHEET: 5 OF 12



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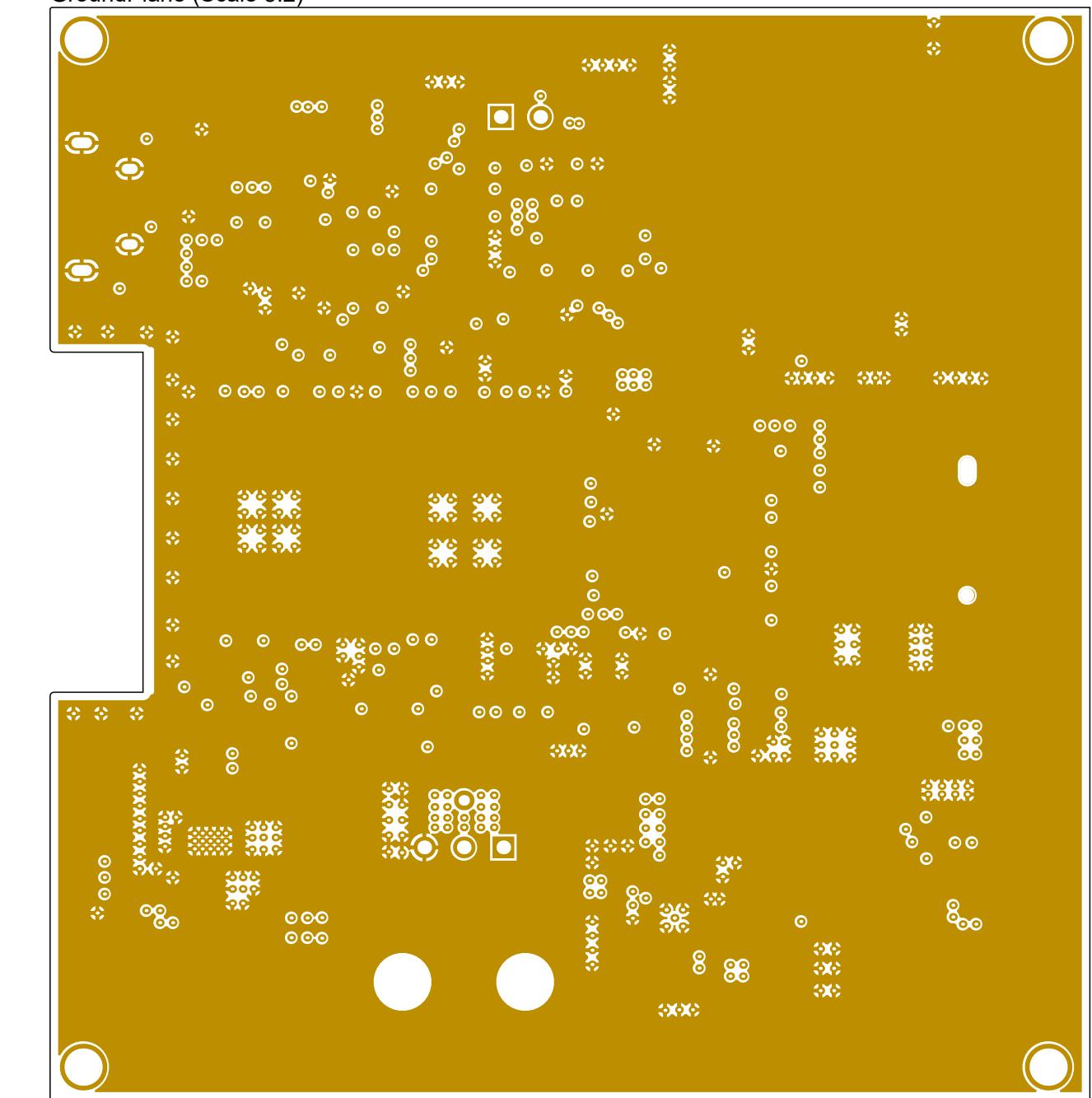
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RESERVED OR EXPRESS OR IMPLIED WARANTEE GIVEN.

REV STATUS OF SHEETS		REV						DWG NO: =DOC_NO_ASSY_DWG	REV: .lfe
SHEET									

REVISIONS		DESCRIPTION	DATE	APPROVED

GroundPlane (Scale 5:2)



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APPROVALS DATE

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DESIGNER: =PCB_DESIGNER =PCB_DESIGNER

CHECKER: =PCB_CHECKER =PCB_CHECKER

Reference Documents

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ASSY DOC: =DOC_NO_FAB_DWG

SCH DOC: =DOC_NO_SCH_DWG

NEXT ASSY USED ON PCB DOC: =PCB_DWG_NO

APPLICATION

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DESIGN ITEM REVISION: .ltemRevision

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=PCB_TITLE_2

SIZE: CAGE CODE: DWG NO:

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REV:

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SCALE: SHEET: 7 OF 12

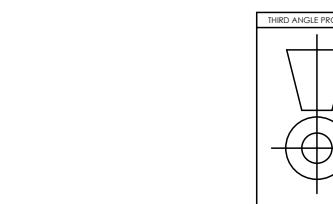
Altium™

ADDRESS 1

ADDRESS 2

ADDRESS 3

ADDRESS 4



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C

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F

1

.lt

DWG NO: =DOC_NO_ASSY_.lfe

4

4

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B

C

D

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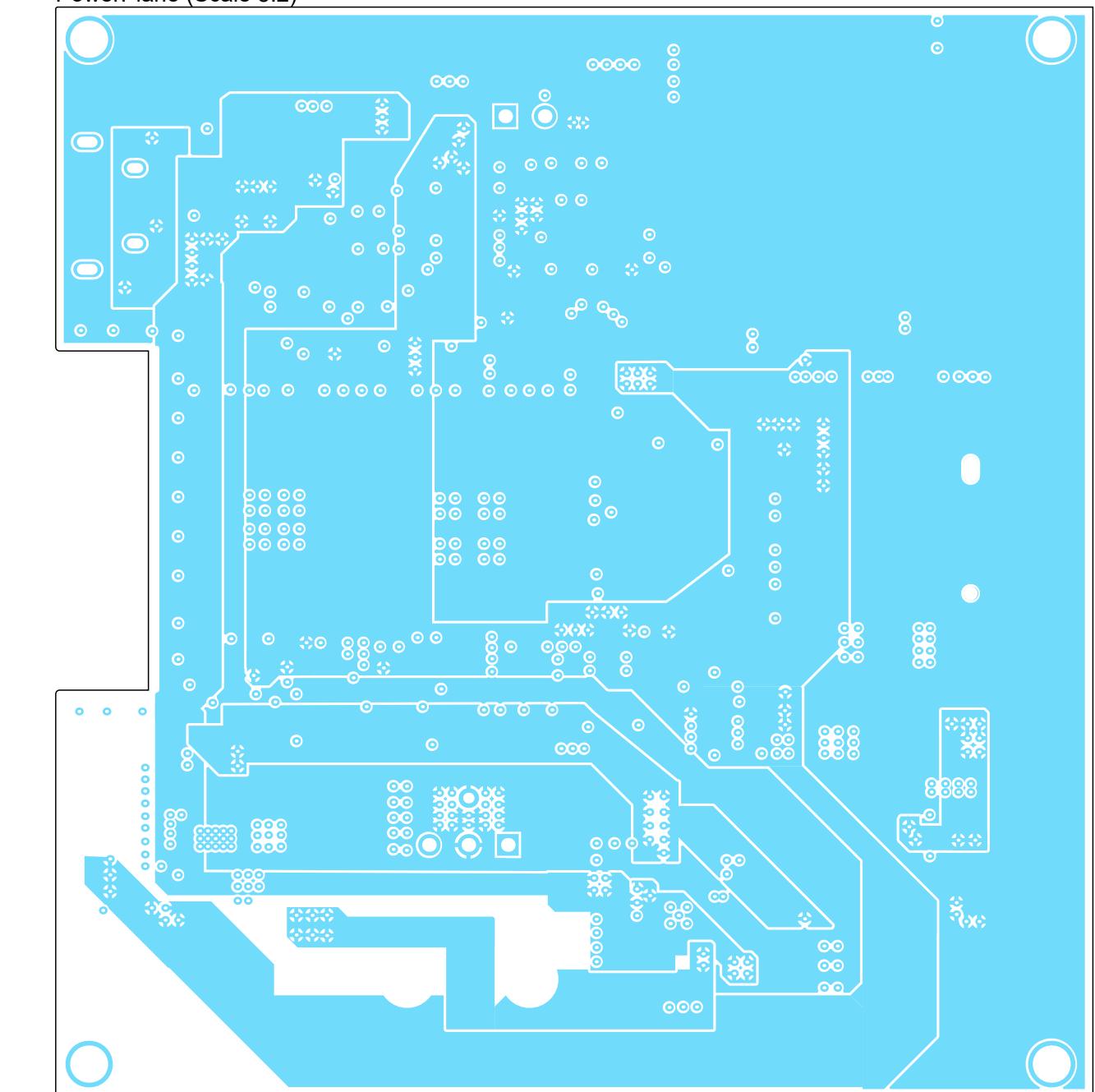
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REV STATUS OF SHEETS		REV					DWG NO: =DOC_NO_ASSY_DWG	REV: .lfe
SHEET								

REVISIONS		DESCRIPTION	DATE	APPROVED

PowerPlane (Scale 5:2)



PART NO: =PCB_PART_NUMBER

APPROVALS DATE

ENGINEER: =PCB_ENGINEER =PCB_ENGINEER

DESIGNER: =PCB_DESIGNER =PCB_DESIGNER

CHECKER: =PCB_CHECKER =PCB_CHECKER

Reference Documents

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ASSY DOC: =DOC_NO_FAB_DWG

SCH DOC: =DOC_NO_SCH_DWG

PCB DOC: =PCB_DWG_NO

ADDRESS 1
ADDRESS 2
ADDRESS 3
ADDRESS 4

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SIZE: CAGE CODE: DWG NO:

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FILE NAME: StarterBoardFabrication.PCBDwf SHEET: 8 OF 12

DWG NO: =DOC_NO_ASSY_.lfe

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DWG NO: =DOC_NO_ASSY_.lfe

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FILE NAME: StarterBoardFabrication.PCBDwf SHEET: 8 OF 12

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FILE NAME: StarterBoardFabrication.PCBDwf SHEET: 8 OF 12

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FILE NAME: StarterBoardFabrication.PCBDwf SHEET: 8 OF 12

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FILE NAME: StarterBoardFabrication.PCBDwf SHEET: 8 OF 12

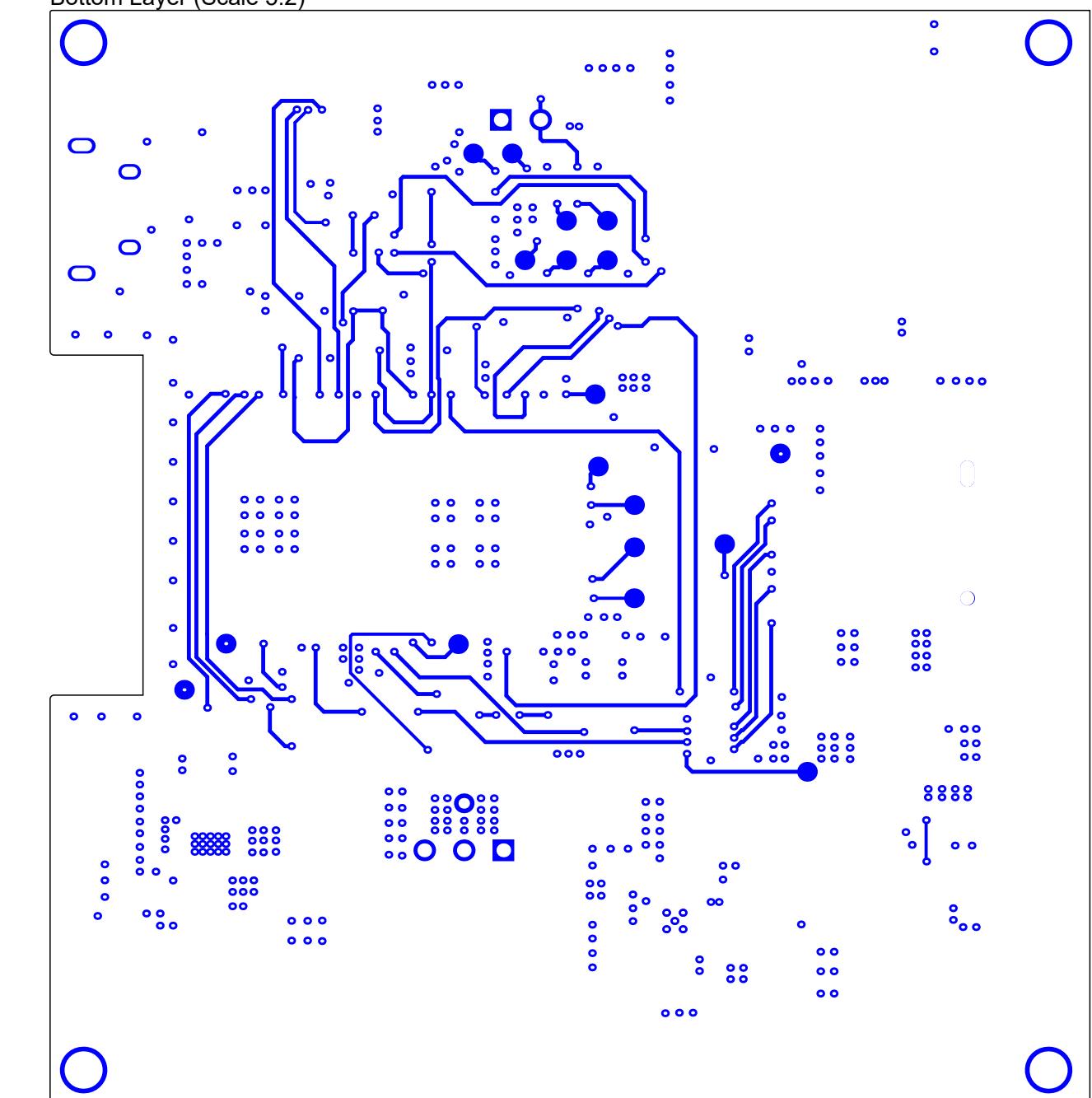
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SIZE: CAGE CODE: DWG NO:

B =CAGE_CO REV:

Bottom Layer (Scale 5:



PART NO: -PCB PART NUMBER

PART NO:	=PCB_PART_NUMBER		
APPROVALS	DATE		
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DESIGNER:	=PCB_DESIGNER	ADDRESS 2	
CHECKER:	=PCB_CHECKER	ADDRESS 3	
		ADDRESS 4	
Reference Documents		DESIGN ITEM:	.Item
BOM DOC:	=DOC_NO_BOM	DESIGN ITEM REVISION:	
ASSY DOC:	=DOC_NO_FAB_DWG	.ItemRevision	
SCH DOC:	=DOC_NO_SCH_DWG	TITLE:	
PCB DOC:	=PCB_DWG_NO	=PCB_TITLE_1 =PCB_TITLE_2	
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		B	=CAGE_CO
		DWG NO:	
		REV:	
		SCALE:	FILE NAME:
		StarterBoardFabrication.PCBdWf	
		SHEET: 9 OF 12	

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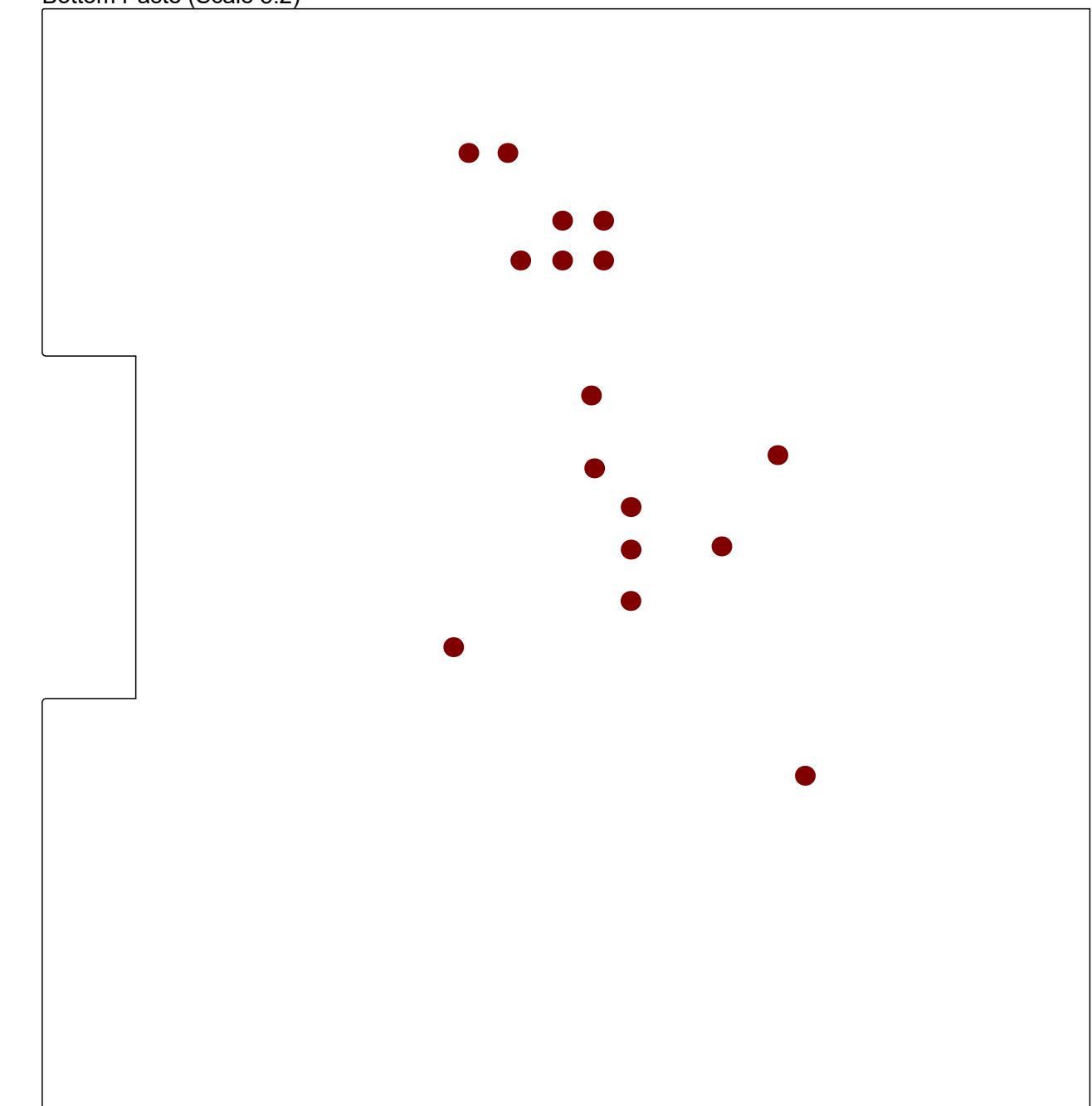
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REV STATUS OF SHEETS		REV											
SHEET		ZONE	REV	REVISIONS									
=DOC_NO_ASSY_DWG	.lfe			DESCRIPTION	DATE	APPROVED							

Bottom Paste (Scale 5:2)



PART NO: =PCB_PART_NUMBER

APPROVALS DATE

ENGINEER: =PCB_ENGINEER =PCB_ENGINEER

DESIGNER: =PCB_DESIGNER =PCB_DESIGNER

CHECKER: =PCB_CHECKER =PCB_CHECKER

Reference Documents

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ASSY DOC: =DOC_NO_FAB_DWG

SCH DOC: =DOC_NO_SCH_DWG

PCB DOC: =PCB_DWG_NO

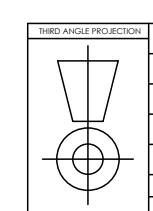
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Altium
TM
ADDRESS 1
ADDRESS 2ADDRESS 3
ADDRESS 4.lt
DWG NO:
=DOC_NO_ASSY_.lfe

DESIGN ITEM: .Item DESIGN ITEM REVISION: .ItemRevision

TITLE: =PCB_TITLE_1

=PCB_TITLE_2

SIZE: CAGE CODE: DWG NO: REV:
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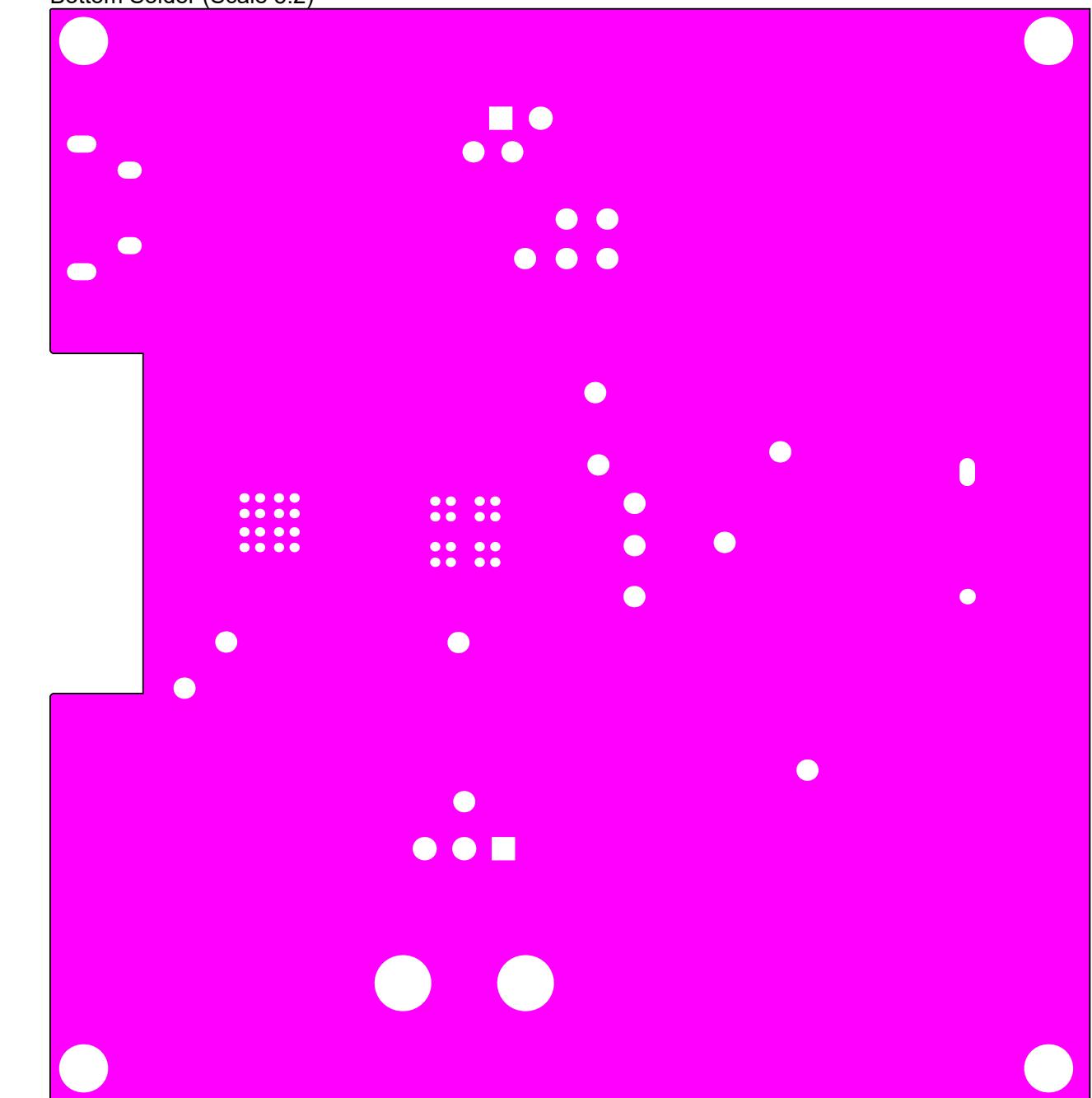
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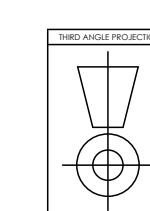
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SHEET									ZONE	REV	

REVISIONS		
DESCRIPTION	DATE	APPROVED

Bottom Solder (Scale 5:2)



PART NO: =PCB_PART_NUMBER	APPROVALS	DATE	Altium ADDRESS 1 ADDRESS 2 ADDRESS 3 ADDRESS 4
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DESIGNER: =PCB_DESIGNER	=PCB_DESIGNER		
CHECKER: =PCB_CHECKER	=PCB_CHECKER		
DESIGN ITEM: .Item		DESIGN ITEM REVISION: .ItemRevision	
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=PCB_TITLE_2			
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ASSY DOC: =DOC_NO_FAB_DWG			
SCH DOC: =DOC_NO_SCH_DWG			
PCB DOC: =PCB_DWG_NO			
SIZE: CAGE CODE: B =CAGE_CO	DWG NO:		REV:
FILE NAME: StarterBoardFabrication.PCBDwf			
SCALE: 11 OF 12			



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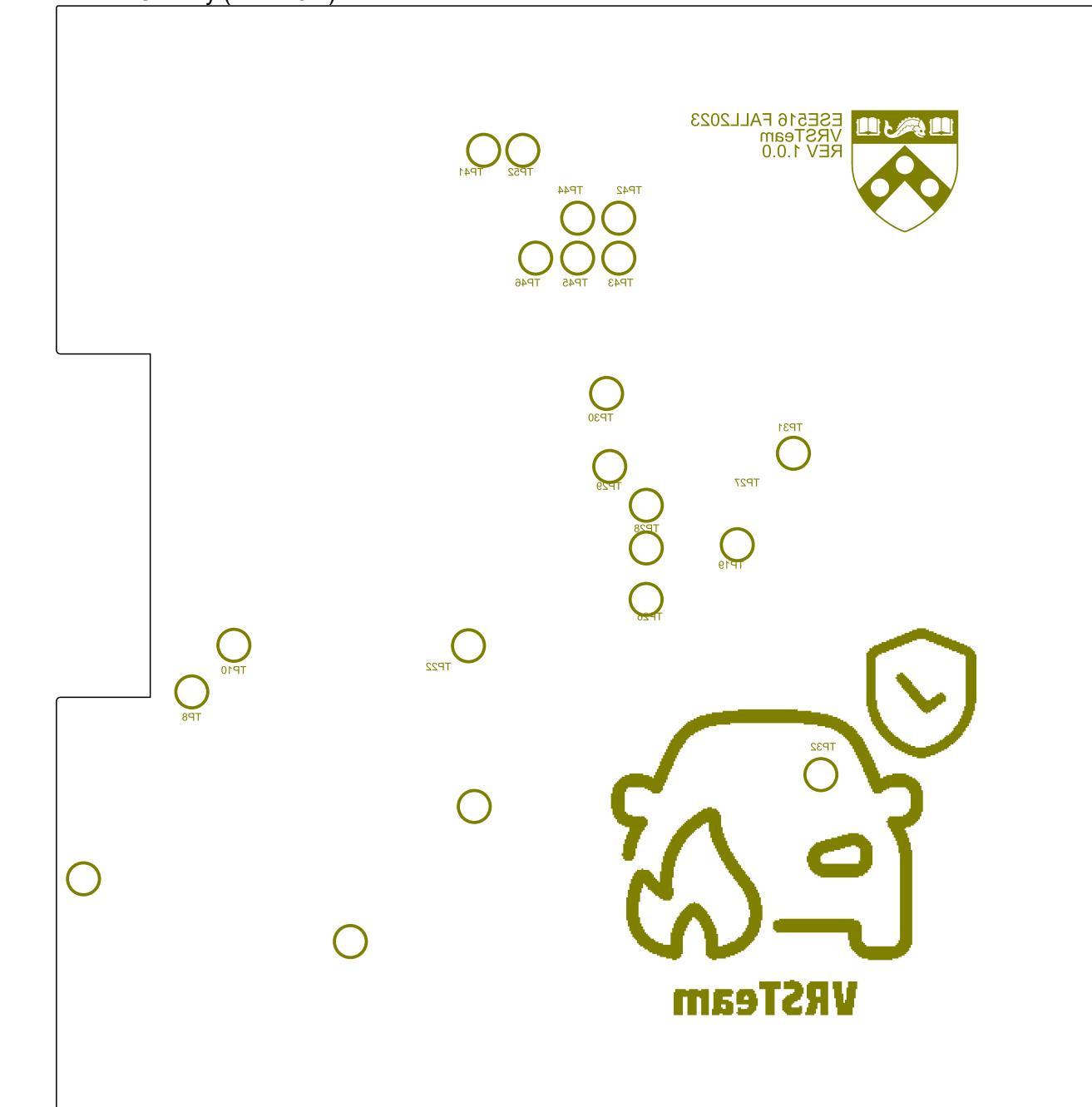
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Bottom Overlay (Scale 5:1)



PART NO: =PCB PART NUMBER

PART NO.: =PCB_PART_NUMBER		
APPROVALS		DATE
ENGINEER:	=PCB_ENGINEER	=PCB_ENGINEE
DESIGNER:	=PCB_DESIGNER	=PCB_DESIGNE
CHECKER:	=PCB_CHECKER	=PCB_CHECKE
Reference Documents		TITLE:
BOM DOC:	=DOC_NO_BOM	
ASSY DOC:	=DOC_NO_FAB_DWG	SIZE:
SCH DOC:	=DOC_NO_SCH_DWG	
PCB DOC:	=PCB_DWG_NO	SCALE:

Altium TM		ADDRESS 1 ADDRESS 2 ADDRESS 3 ADDRESS 4
ITEM: .Item		DESIGN ITEM REVISION: .ItemRevision
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=PCB_TITLE_2		
CAGE CODE: =CAGE_CO	DWG NO:	R
FILE NAME: StarterBoardFabrication.PCDBdwf	SHEET: 12	OF OF



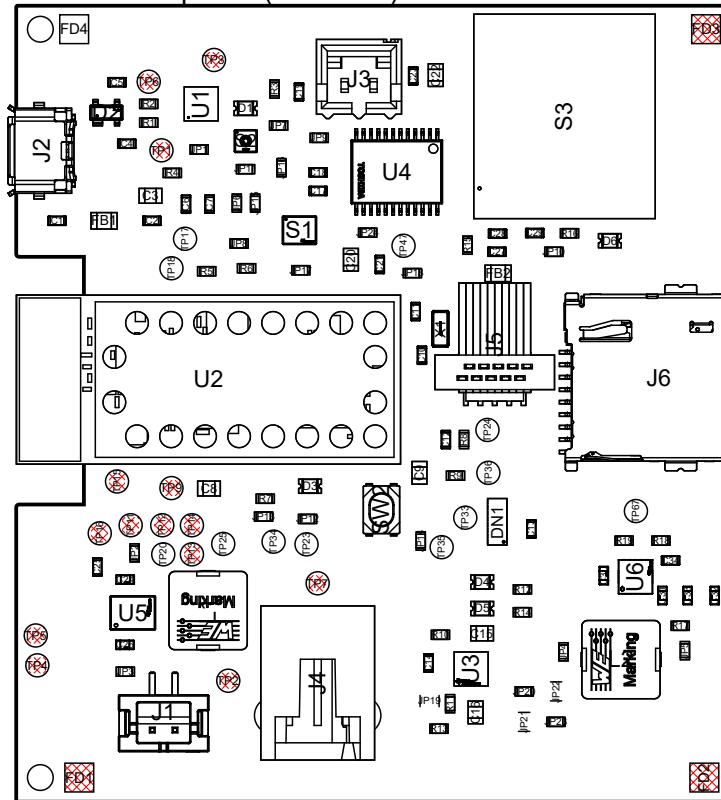
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REV STATUS OF SHEETS	SHEET	REV			ZONE	REV

REVISIONS		
DESCRIPTION	DATE	APPROVED

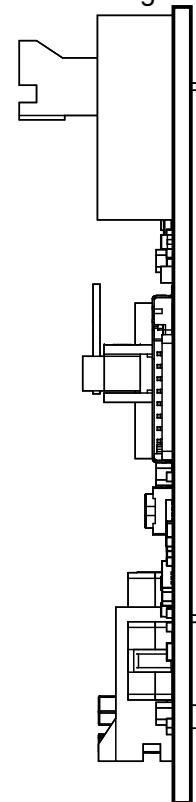
Notes:

1. This item is electrostatic sensitive and shall be handled accordingly

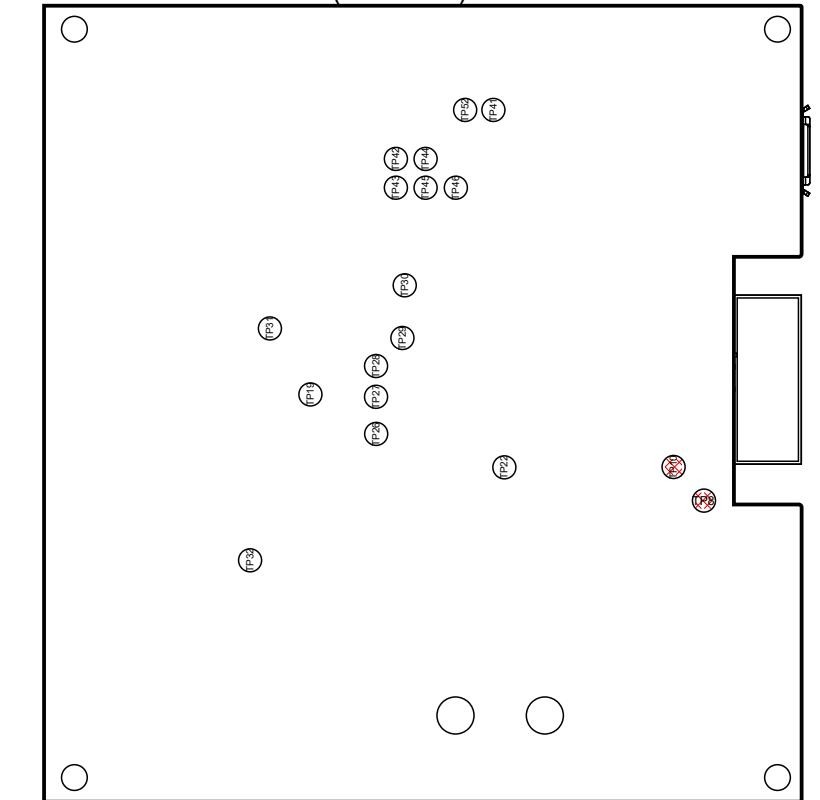
View from Top side (Scale 3:2)



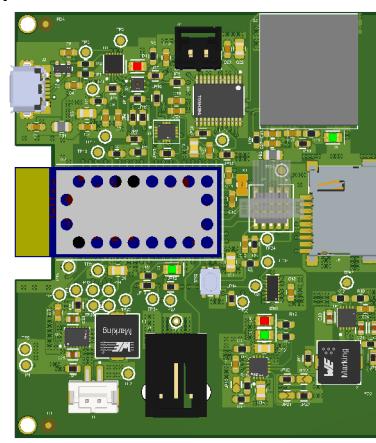
View from Right side (Scale 3:2)



View from Bottom side (Scale 3:2)



Realistic View



PART NO: =PCB_PART_NUMBER	APPROVALS	DATE	Altium =Address1 =Address2 =Address3 =Address4
ENGINEER: =PCB_ENGINEER	=PCB_ENGINEER		
DESIGNER: =PCB_DESIGNER	=PCB_DESIGNER		
CHECKER: =PCB_CHECKER	=PCB_CHECKER		
Reference Documents			
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ASSY DOC:	=DOC_NO_FAB_DWG		
SCH DOC:	=DOC_NO_SCH_DWG		
PCB DOC:	=PCB_DWG_NO		
APPLICATION			
THIRD ANGLE PROJECTION			
NEXT ASSY	USED ON		
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TITLE: =PCB_TITLE_1 =PCB_TITLE_2			
SIZE: B	CAGE CODE: =CAGE_CO	DWG NO: .lfe	
REV: 1			
SCALE: 1 OF 2	FILE NAME: StarterBoardAssembly.PCBDwf		

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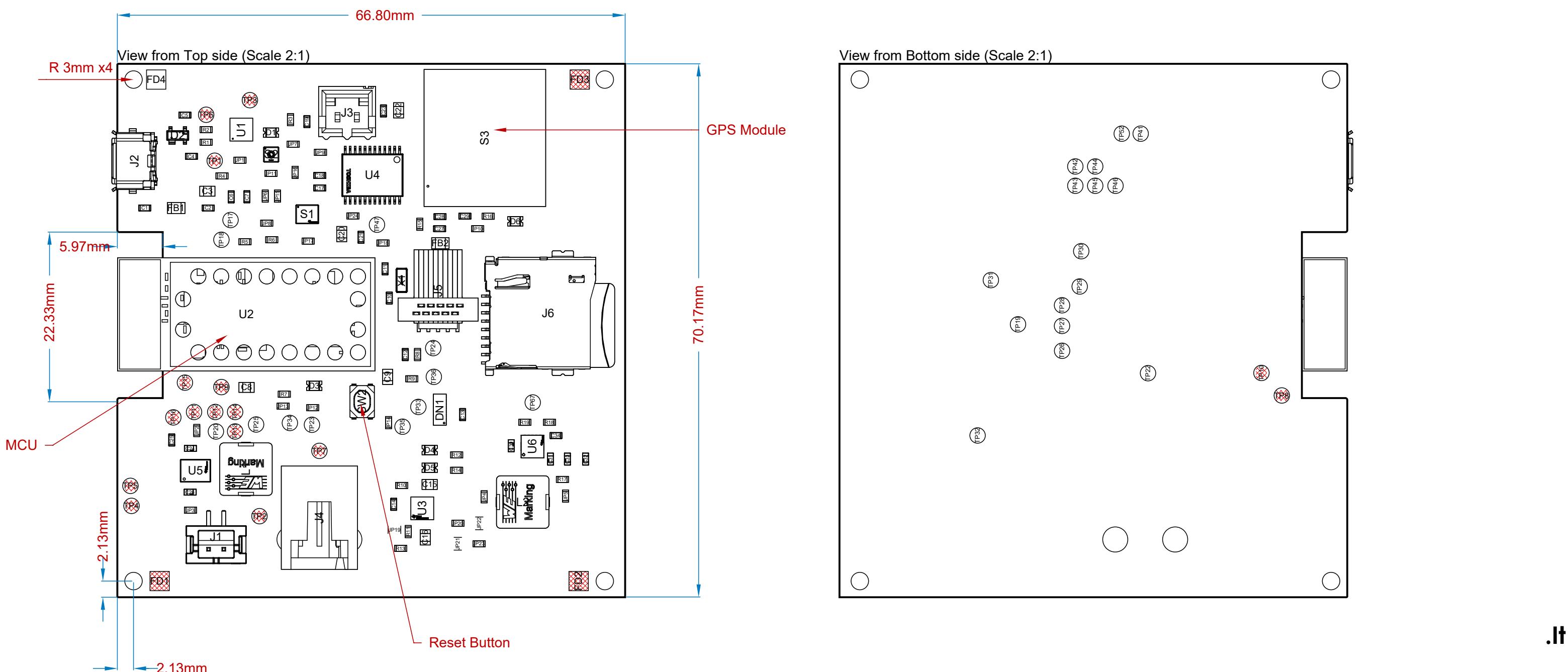
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REV STATUS OF SHEETS		REV				DWG NO.: =DOC_NO_ASSY_DWG	REV: .lfe
SHEET							

REVISIONS		DESCRIPTION	DATE	APPROVED



PART NO: =PCB_PART_NUMBER

APPROVALS DATE

ENGINEER: =PCB_ENGINEER =PCB_ENGINEER

DESIGNER: =PCB_DESIGNER =PCB_DESIGNER

CHECKER: =PCB_CHECKER =PCB_CHECKER

Reference Documents

BOM DOC: =DOC_NO_BOM

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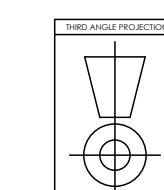
NEXT ASSY USED ON

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APPLICATION

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=Address3
=Address4

Altium
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FILE NAME: StarterBoardAssembly.PCBDwf SHEET: 2 OF 2

Line #	Name	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Manufacturer Lifecycle 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Supplier Subtotal 1
	Water Pump	DC MINI IMMERSIBLE WATER PUMP 6V	1	1	DFRobot	FIT0563	Unknown	Digi-Key	1738-1398-ND	9.2	9.2
	ULTIMATE GPS MODULE PA1616D - 66	Ultimate Gps Module Pa1616D - 99 Channel W/ 10 Hz Updates - Mtk3333 Chipset Adafruit 5186	S3	1							
	TPS63021DSJT	Switching Regulator, Current-mode, 2A, 2600kHz Switching Freq-Max, PDS014	U5	1	Texas Instruments	TPS63021DSJT	Volume Production	Digi-Key	296-37448-1-ND	4.34	4.34
	TPS61232DRCT	IC REG BOOST 5V 4A 10VSON	U6	1	Texas Instruments	TPS61232DRCT	Volume Production	Digi-Key	296-37990-1-ND	2.95	2.95
	Servo	Positional Rotation DC Motor Servomotor, RC (Hobby) 6VDC	1	1	Sparkfun	ROB-09065	Unknown	Mouser	474-ROB-09065	8.95	8.95
	SENSOR HUMI/TEMP I2C 2% SMD	SHTC3 Series 0 to 100% RH 3.6 V Humidity and Temperature Sensor IC - DFN-4	S2	1	Sensirion	SHTC3	Volume Production	Mouser	403-SHTC3	3.21	3.21
	RES 0603 470 0.1%	Resistor Surface Mount, 470 Ohms, 0603 Footprint, 0.1% Tolerance 0.1W	R16	1	Stackpole Electronics	RMCF0603FT470R	Volume Production	Digi-Key	RMCF0603FT470RCT-ND	0.1	0.1
	RES 0603 402K 1%	Resistor Surface Mount, 402K Ohms, 0603 Footprint, 1% Tolerance 0.1W	R18	1	Stackpole Electronics	RMCF0603FT402K	Volume Production	Digi-Key	RMCF0603FT402KCT-ND	0.1	0.1
	RES 0603 100K 1%	Resistor Surface Mount, 100K Ohms, 0603 Footprint, 1% Tolerance 0.1W	R19	1	Stackpole Electronics	RMCF0603FT100K	Volume Production	Digi-Key	RMCF0603FT100KCT-ND	0.1	0.1
22	RES 0603 100 1%	Resistor Surface Mount, 100 Ohms, 0603 Footprint, 1% Tolerance 0.1W	R9	1	Stackpole Electronics	RMCF0603FT100R	Volume Production	Digi-Key	RMCF0603FT100RCT-ND	0.1	0.1
18	RES 0603 27 1%	Resistor Surface Mount, 27 Ohms, 0603 Footprint, 1% Tolerance 0.1W	R1, R2	2	Stackpole Electronics	RMCF0603FT27R0	Volume Production	Digi-Key	RMCF0603FT27R0CT-ND	0.014	0.14
21	RES 0603 10K 1%	Resistor Surface Mount, 10K Ohms, 0603 Footprint, 1% Tolerance 0.1W	R5, R6, R8, R15	4	Stackpole Electronics	RMCF0603FT10K0	Volume Production	Digi-Key	RMCF0603FT10K0CT-ND	0.014	0.14
23	RES 0603 1.13K 1%	Resistor Surface Mount, 1.13K Ohms, 0603 Footprint, 1% Tolerance 0.1W	R10, R11	2	Stackpole Electronics	RMCF0603FT1K13	Volume Production	Digi-Key	RMCF0603FT1K13CT-ND	0.014	0.14
	RES 0603 1M 1%	Resistor Surface Mount, 1M Ohms, 0603 Footprint, 1% Tolerance 0.1W	R17	1	Stackpole Electronics	RMCF0603FG1M00	Volume Production	Digi-Key	RMCF0603FG1M00CT-ND	0.1	0.1
19	RES 0603 1K 1%	Resistor Surface Mount, 1K Ohms, 0603 Footprint, 1% Tolerance 0.1W	R3, R4, R7, R12, R13, R14	6	Stackpole Electronics	RMCF0603FT1K00	Volume Production	Digi-Key	RMCF0603FT1K00CT-ND	0.014	0.14
1	PTS810SK250SMTRLFS	Keypad Switch, 1 Switches, SPST, Momentary-tactile, 0.05A, 16VDC, 3.23N, Solder Terminal, Surface Mount-straight	SW2	1	ITT C&K	PTS810SK250SMTRLFS	Volume Production	Digi-Key	CKN10503CT-ND	0.34	0.34
9	PRTR5VOU2X,215	Trans Voltage Suppressor Diode, 5.5V V(RWM), Unidirectional, 1 Element, Silicon	D2	1	Nexperia	PRTR5VOU2X,215	Volume Production	Digi-Key	1727-3884-1-ND	0.5	0.5
11	LSM0805452V	Single Color LED, Green, 0805	D3, D5, D6	3	Visual Communications	LSM0805452V	Volume Production	Digi-Key	28-LSM0805452VCT-ND	0.4	1.2
10	LSM0805412V	Single Color LED, RED, 0805	D1, D4	2	Visual Communications	LSM0805412V	Volume Production	Digi-Key	28-LSM0805412VCT-ND	0.46	0.92
	LSM6DSMTR	Accelerometer, Gyroscope, Temperature, 6 Axis Sensor I ^C , SPI Output	S1	1	STMicroelectronics	LSM6DSMTR	Volume Production	Digi-Key	497-16696-1-ND	4.67	4.67
	IC MOTOR DRIVER 2.7V-5.5V 24SSOP	Brushless DC Motor Controller, 1A, BCDMOS, PDS024	U4	1	Toshiba	TB6612FNG,C,B,EL	Volume Production	Digi-Key	TB6612FNG,C,B,ELCT-ND	1.97	1.97
24	FT234XD-R	USB Bridge, USB to UART USB 2.0 UART Interface 12-DFN (3x3)	U1	1	FTDI	FT234XD-R	Volume Production	Digi-Key	768-1178-1-ND	2.26	2.26
12	ECLAMP2410POTCT	Trans Voltage Suppressor Diode, 5V V(RWM), Bidirectional, 7 Element, Silicon with EMI Filter	DN1	1	Semtech	ECLAMP2410POTCT	Volume Production	Mouser	947-ECLAMP2410POTCT	1.44	1.44
	CC0603MRX5R5BB226	CAP CER 22UF 6.3V X5R 0603	C24, C26, C30, C31, C32, C33	6	Yageo	CC0603MRX5R5BB226	Volume Production	Digi-Key	311-1815-1-ND	0.3	1.8
6	CAP 0805 10UF 16V 20% X7R	Capacitor Surface Mount 0805 Footprint 10UF 16V 20% Tolerance Ceramic X7R	C8, C9, C20, C22	4	Yageo	CC0805KKX5R7BB106	Volume Production	Jak Electronics	CC0805KKX5R7BB106	0.0419	0.1676
4	CAP 0805 4.7UF 16V 10% X7R	Capacitor Surface Mount 0805 Footprint 4.7UF 16V 10% Tolerance Ceramic X7R	C3, C15, C16	3	Yageo	CC0805KKX7R7BB475	Volume Production	Digi-Key	311-1883-1-ND	0.39	1.17
5	CAP 0603 47PF 50V 5% COG	Capacitor Surface Mount 0603 Footprint 47PF 50V 5% Tolerance Ceramic COG	C4, C5	2	Yageo	CC0603JRNPO8BN470	Volume Production	Utmel Electronic	898-CC0603JRNPO8BN470	0.0037	0.0074
8	CAP 0603 18PF 50V 5% COG	Capacitor Surface Mount 0603 Footprint 18PF 50V 5% Tolerance Ceramic COG	C10, C11	2	Yageo	CC0603JRNPO9BN180	Volume Production	Digi-Key	311-1061-1-ND	0.1	0.2
7	CAP 0603 1UF 16V 10% X7R	Capacitor Surface Mount 0603 Footprint 1UF 16V 10% Tolerance Ceramic X7R	C12, C14, C27	3	Yageo	CC0603KRX7R7BB105	Volume Production	Digi-Key	311-1446-1-ND	0.14	0.42
2	CAP 0603 0.1UF 16V 10% X7R	Capacitor Surface Mount 0603 Footprint 0.1UF 16V 10% Tolerance Ceramic X7R	C2, C6, C7, C13, C17, C18, C19, C21, C23, C25, C28, C29	12	Yageo	CC0603KRX7R7BB104	Volume Production	Mouser	603-CC603KRX7R7BB104	0.024	0.288
3	CAP 0603 0.01UF 16V 10% X7R	Capacitor Surface Mount 0603 Footprint 0.01UF 16V 10% Tolerance Ceramic X7R	C1, C34	2	Yageo	CC0603KRX7R7BB103	Volume Production	Digi-Key	311-3369-6-ND	0.1	0.2
	BQ24075RGTR	Power Supply Support Circuit, Adjustable, 1 Channel, 6.6, POCC16	U3	1	Texas Instruments	BQ24075RGTR	Volume Production	Digi-Key	296-38874-1-ND	2.35	2.35
13	BLM21PG221SN1	Ferrite Chip 2000 mAh 220 Ohms Differential Mode - Single 0805 Footprint	FB1, FB2	2	Murata	BLM21PG221SN1D	Volume Production	Digi-Key	490-1054-1-ND	0.12	0.24
	B2B-PH-SM4-TBT(LF)(SN)	Connector Header, PH Series, 2 Position, 2.00mm, 100V, Surface Mount, Solder, Pick and Place, Natural.	J1	1	JST	B2B-PH-SM4-TB	Unknown	Digi-Key	455-B2B-PH-SM4-TBCT-ND	0.55	0.55
		WiFi 802.11b/g/n Transceiver Module 2.412GHz - 2.484GHz Integrated, Trace Surface Mount, Integrated SAMD21 Cortex M0+									
25	ATSAMW25H18-MR210	10 Pin Shrouded Header, 0.050", Key Pin 7	J5	1	Samtec	FTSH-105-01-F-DV-007-K-P-TR	Volume Production	Mouser	579-ATSAMW25H18MR21	15.3	15.3
27	ABSO7-32.768KHZ-T	Crystal 32.768KHz ±20ppm (Tol) 12.5pF FUND 70kΩ 2-Pin CSMD T/R	X1	1	Abraccon	ABSO7-32.768KHZ-T	Volume Production	Newark	06X4692	0.612	0.612
16	693071020811	WR-CRD Micro SD Card Connector Push & Push	J6	1	Wurth Electronics	693071020811	Volume Production	Digi-Key	732-693071020811CT-ND	3.96	3.96
	744311100	General Purpose Inductor, 1uH, 20%, 1 Element, SMD, 2827 L1, L2		2	Wurth Electronics	744311100	Volume Production	Digi-Key	732-4177-1-ND	3.8	7.6
14	10103592-0001LF	Conn Micro USB 2.0 Type B RCP 5 POS 0.65mm Solder RA SMD 5 Terminal 1 Port T/R	J2	1	Amphenol ICC / FCI	10103592-0001LF	Unknown	Digi-Key	609-4048-1-ND	0.8	0.8
	5-104363-1	Board Connector, 2 Contact(s), 1 Row(s), Male, Straight, 0.1 Inch Pitch, Solder Terminal, Latch, Black Insulator, Plug	J3	1	TE Connectivity AMP	5-104363-1	Volume Production	Digi-Key	A33922-ND	0.96	0.96
	5-103673-2	Board Connector, 3 Contact(s), 1 Row(s), Male, Right Angle, Solder Terminal, Black Insulator	J4	1	TE Connectivity	5-103673-2	Volume Production	Mouser	571-5-103673-2	1.12	1.12