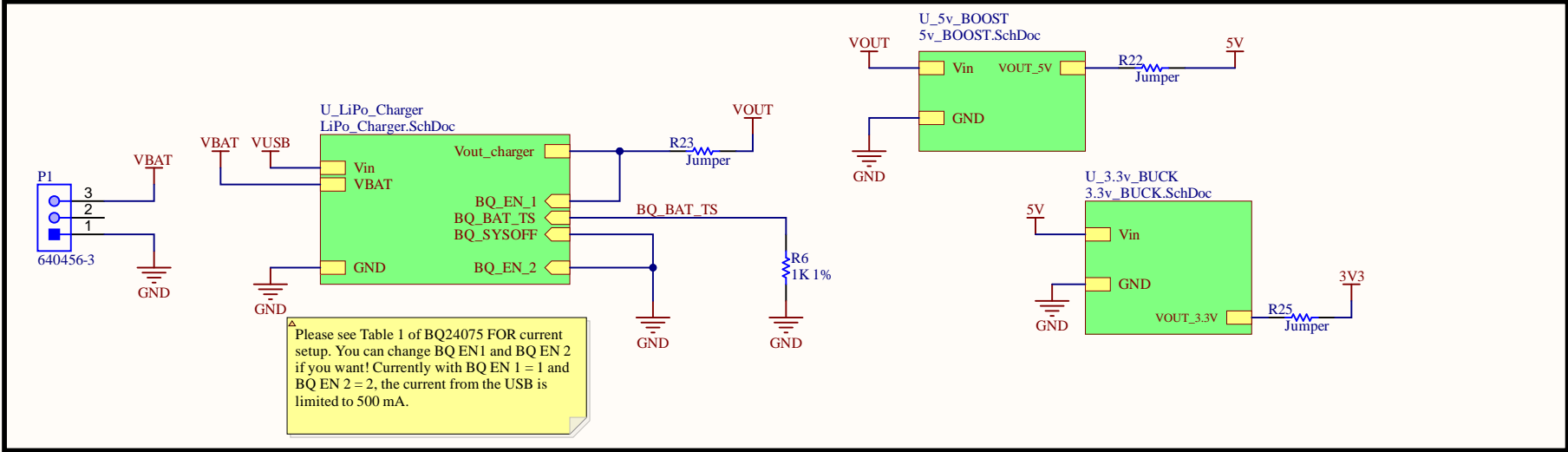


REVISION	DESCRIPTION	DATE	APPROVED

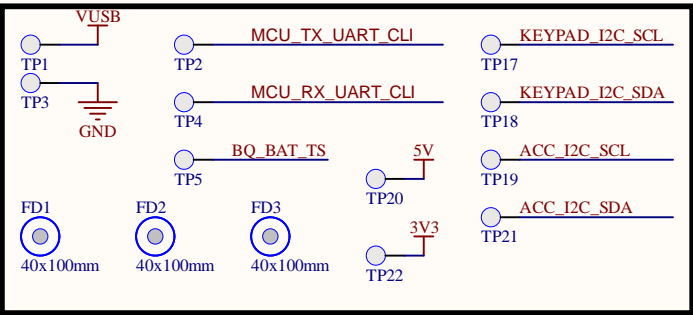
POWER SUPPLY



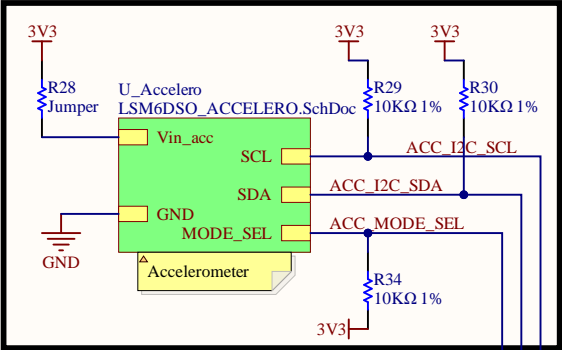
NOTES

Section to add version notes or any other general information

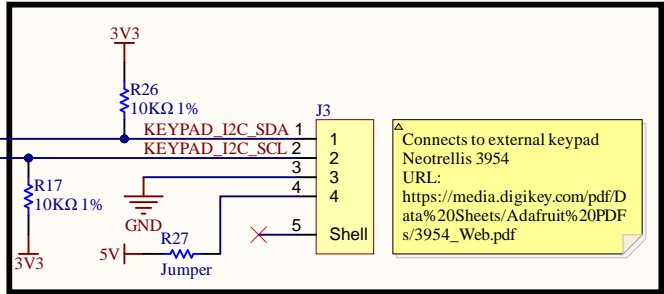
TEST POINTS AND FIDUCIALS



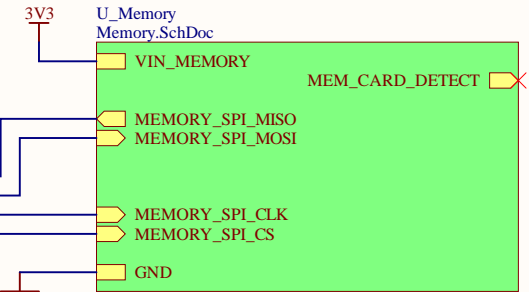
ACCELEROMETER



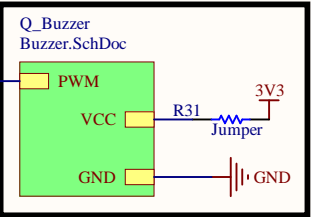
KEYPAD



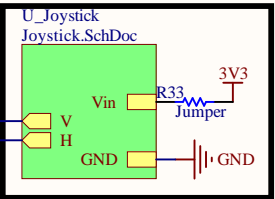
SD CARD MEMORY



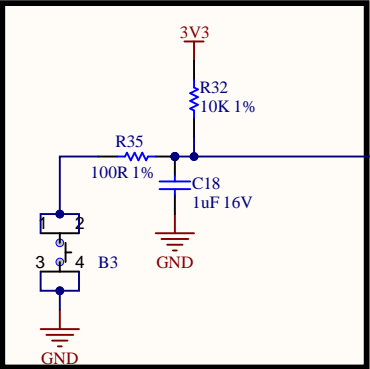
BUZZER



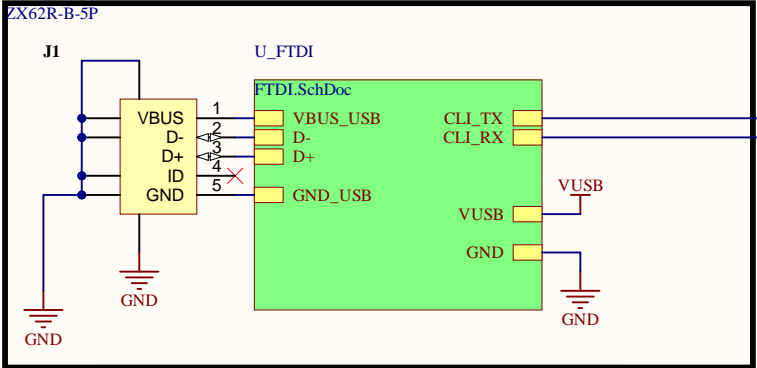
JOYSTICK



ON/OFF BUTTON



USB CONNECTOR + FTDI



NOTE:
The FTDI Chip is an useful chip that allows us to convert USART cmessages 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.

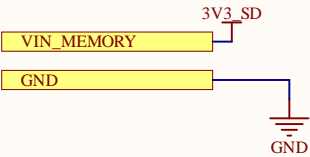
APPROVALS	DATE	PROJECT	260 S 33rd Street Detkin Lab Philadelphia PA 19104	
ENG: SP, PS		Shipwars		
DSN: SP, PS		PROJECT REVISION:	DOCUMENT REVISION:	DESIGN ITEM:
CHK: SP, PS		TITLE		
REFERENCE DOCUMENTS				
BOM:				
ASSY DWG:				
FAB DWG:				
PCB DWG:				
SIZE		CAGE CODE	DWG NO.	REV
B				.1.0.0
SCALE:		FILE NAME	SHEET 1 OF 10	
		MAIN.SchDoc		

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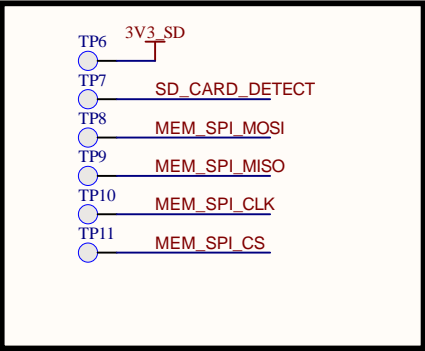
DWG. NO. 1.020
REV. SMT

REVISION	DESCRIPTION	DATE	APPROVED

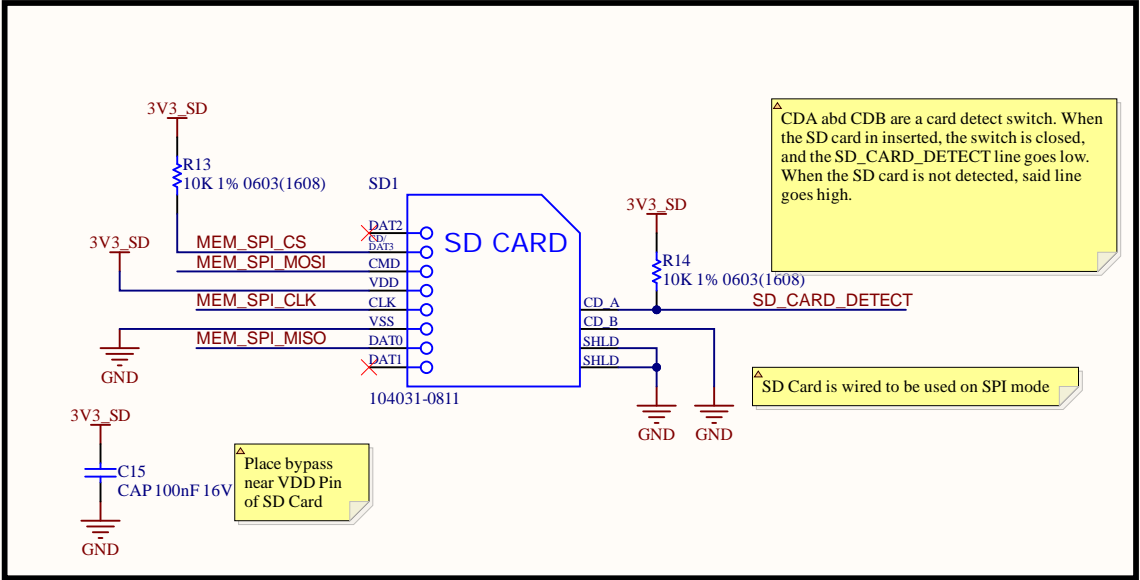
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MEMORY_SPI_MISO	MEM_SPI_MISO
MEMORY_SPI_CLK	MEM_SPI_CLK
MEMORY_SPI_CS	MEM_SPI_CS
MEM_CARD_DETECT	SD_CARD_DETECT




TESTPOINTS

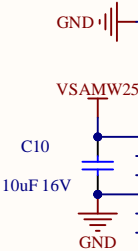
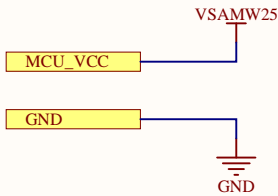


SD CARD

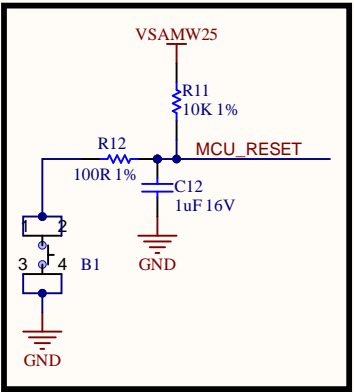


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DSN:	SP, PS		PROJECT REVISION:		DOCUMENT REVISION:		DESIGN ITEM:	
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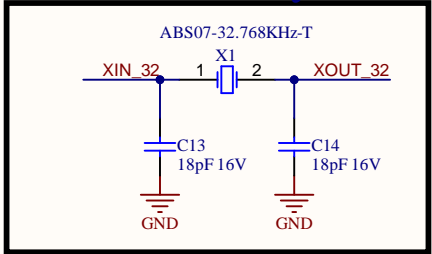
REVISION	DESCRIPTION	DATE	APPROVED



Reset Button



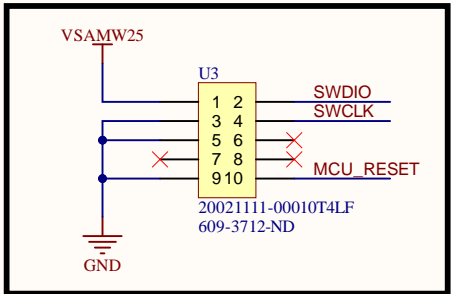
32.768 Crystal



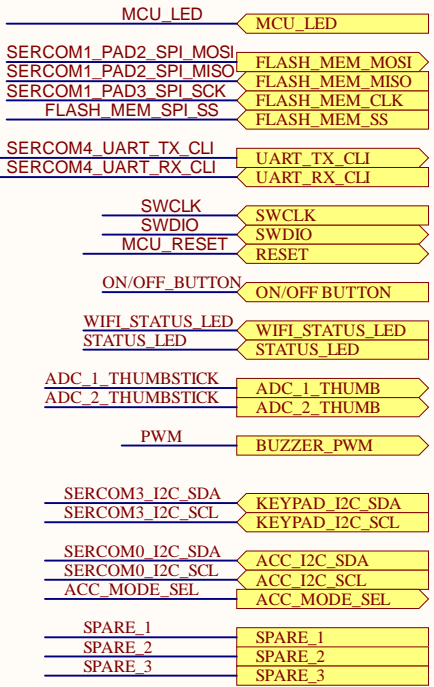
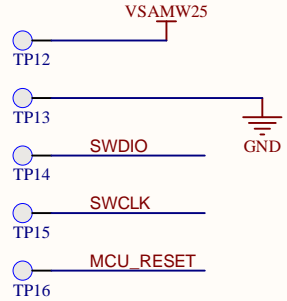
^a Calculation of crystal load capacitors:
 $C_{ext} = 2 \times (C_{crystal} - C_{para} - C_{pcb})$

Crystal = 12.5pF (from crystal datasheet)
Cpara = 3.15pF (from MCU datasheet)
Cpcb = 0.5pF (estimate)

 $C_{ext} = 2 \times (12.5pF - 3.15pF - 0.5pF) = 17.7pF$



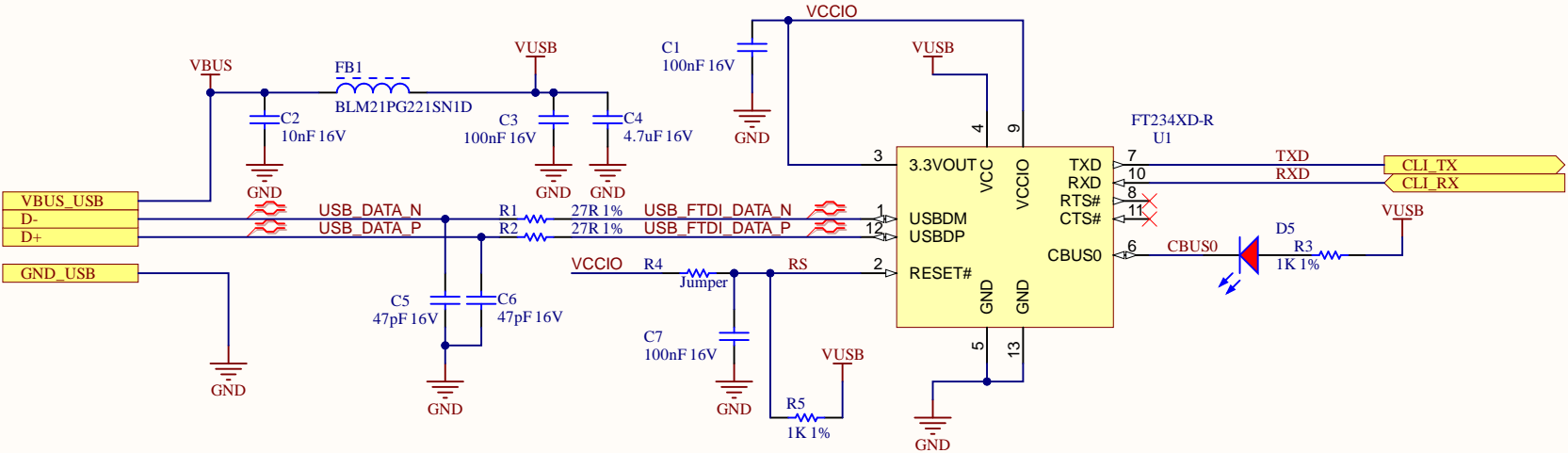
DEBUGGER PORT



APPROVALS	DATE	PROJECT	200 S 33rd Street Detkin Lab Philadelphia PA 19104	
ENG: SP, PS		Shipwars	Penn Engineering	
DSN: SP, PS		PROJECT REVISION:	DOCUMENT REVISION:	DESIGN ITEM:
CHK: SP, PS		TITLE		
REFERENCE DOCUMENTS		Shipwars MCU Schematic		
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FAB DWG:		SCALE:	FILE NAME	SHEET 3 OF 10
PCB DWG:			MCU.SchDoc	

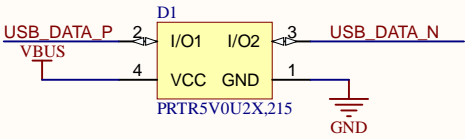
REVISION	DESCRIPTION	DATE	APPROVED


FTDI CHIP



△ Schematics follows Fig. 6.1 of Datasheet

USB ESD PROTECTION

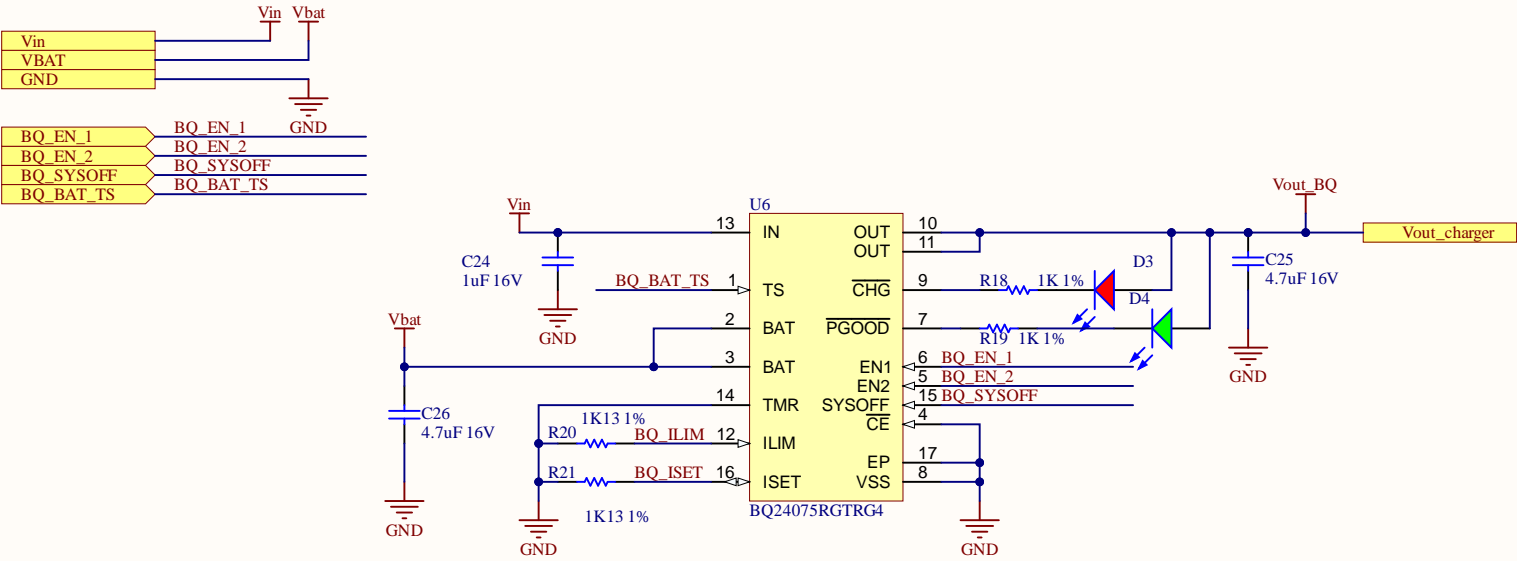



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DSN:	SP, PS			PROJECT REVISION:		DOCUMENT REVISION:	
CHK:	SP, PS					DESIGN ITEM:	
REFERENCE DOCUMENTS				TITLE			
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FAB DWG:				B			1.0.0
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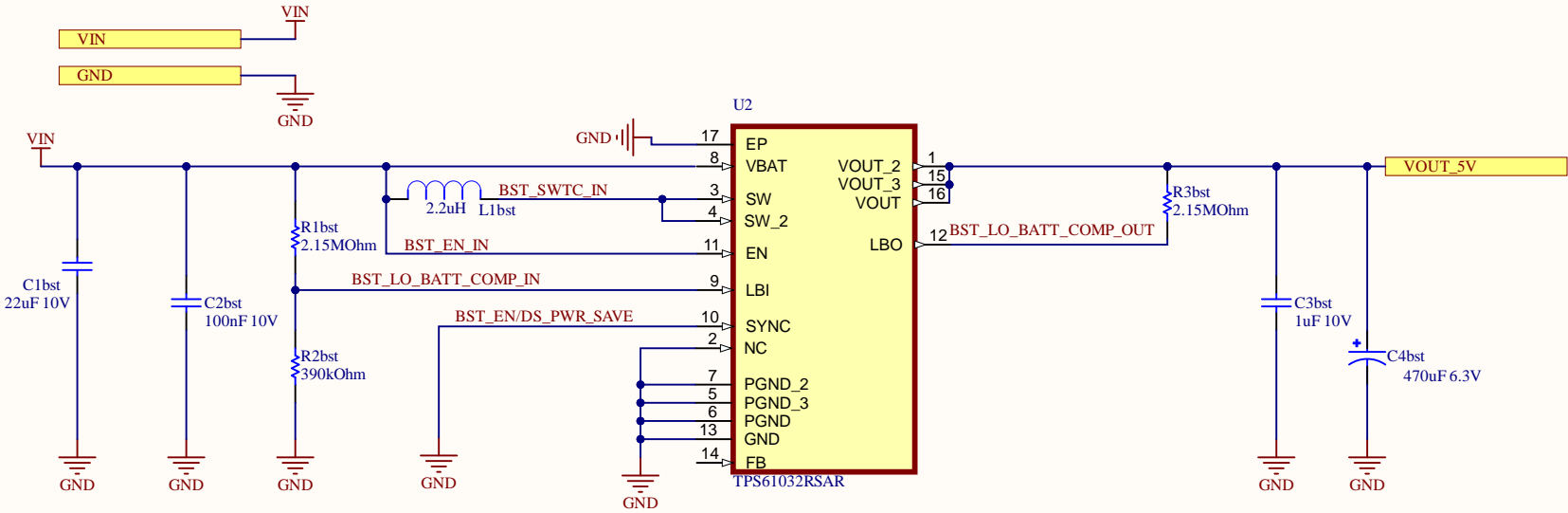


APPROVALS		DATE		PROJECT Shipwars		200 S 33rd Street Detkin Lab Philadelphia PA 19104	Penn Engineering SOLUTION PROVIDERS				
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DSN:	SP, PS										
CHK:	SP, PS										
REFERENCE DOCUMENTS				PROJECT REVISION:				DOCUMENT REVISION:		DESIGN ITEM:	
BOM:				TITLE							
ASSY DWG:				Shipwars Charger Schematic							
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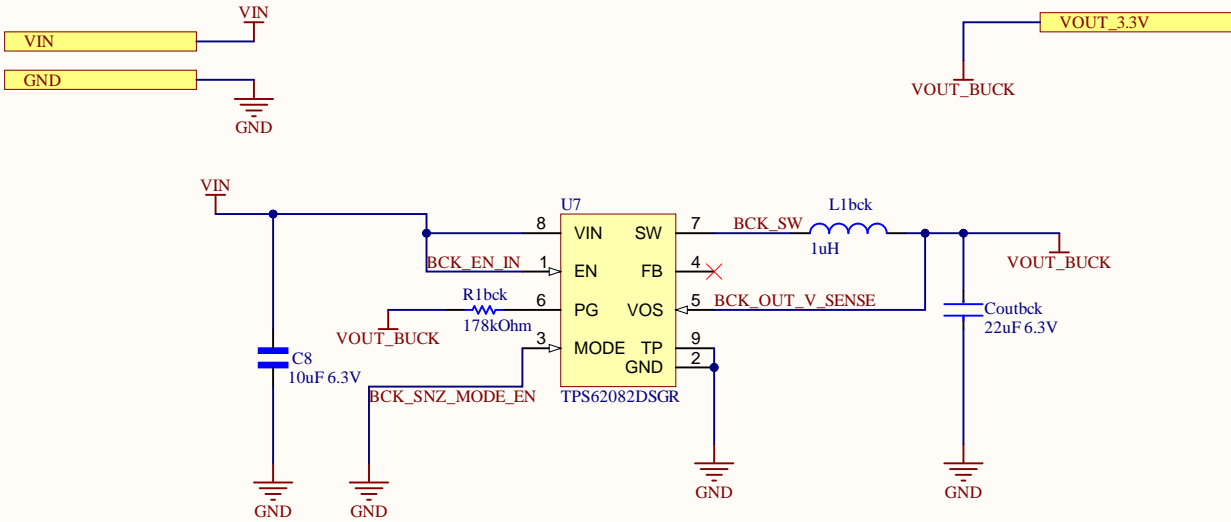


TPS61032
VIN: 3.3V to 5V
OUT: 5V up to 2A
REF: <https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=0929BF869665908F>

APPROVALS		DATE	PROJECT		 200 S 33rd Street Detkin Lab Philadelphia PA 19104	
ENG:	SP, PS		Shipwars			
DSN:	SP, PS		PROJECT REVISION:		DOCUMENT REVISION:	DESIGN ITEM:
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PCB DWG:			SCALE:	FILE NAME	5v BOOST.SchDoc	SHEET 6 OF 10


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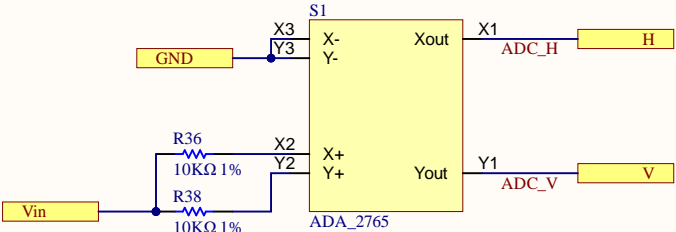


TPS62082
VIN: 4.5V to 5.5V
OUT: 3.3V up to 1.2A
REF: <https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=769E7FCD3E8DDF5A>

TP = thermal pad -> connect to GND according to Datasheet

APPROVALS		DATE		PROJECT		 <div> <div>290 S 33rd Street</div> <div>Detkin Lab</div> <div>Philadelphia</div> <div>PA 19104</div> </div>	
ENG:	SP, PS			Shipwars			
DSN:	SP, PS			PROJECT REVISION:		DOCUMENT REVISION:	
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△ Sparkfun COM-09032 Thumb Joystick
REF:
<http://cdn.sparkfun.com/datasheets/BreakoutBoards/Joystick-Breakout-v12b.pdf>
pin reference in :

DWG. NO. 1.0.0
REV. SHEET

REVISION	DESCRIPTION	DATE	APPROVED

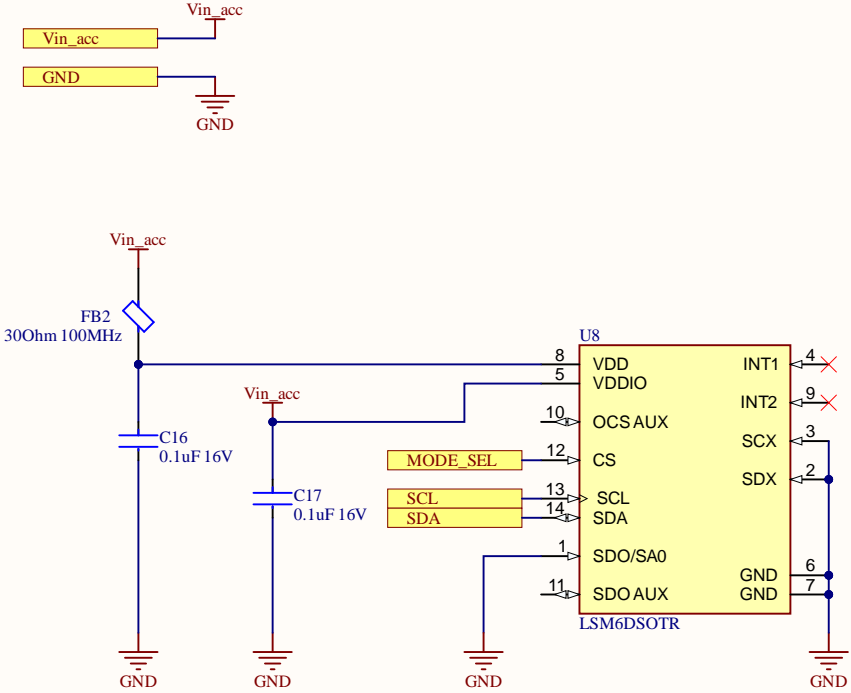
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REV. SHEET

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Text



SLM6DSOTR ACCELEROMETER

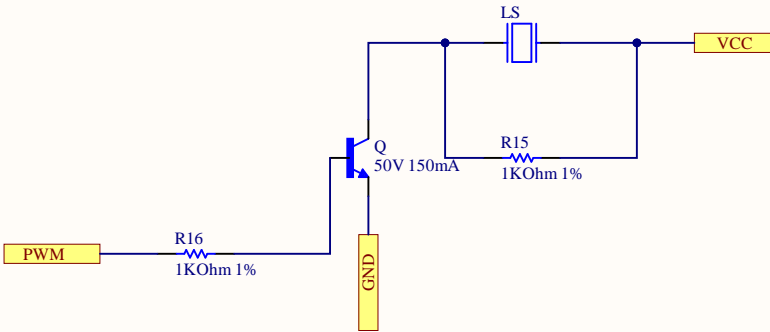
REF: https://cdn.sparkfun.com/assets/3/1/6/b/c/SparkFun_Qwiic_6DoF_LSM6DSO_Schematic.pdf

OR

REF: <https://www.st.com/resource/en/datasheet/lsm6dso.pdf> (Page35)

APPROVALS		DATE		<div>PROJECT</div> <div>Shipwars</div> <div><div><div><div><div></div><div></div><div></div></div><div></div></div><div>Penn Engineering</div><div>200 S 33rd Street Detkin Lab Philadelphia PA 19104</div></div></div>
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PS1240P02BT 3V 4kHz buzzer

REF:
<https://www.snapeda.com/parts/PS1240P02BT/TDK%20Corporation/datasheet/> (page 2)

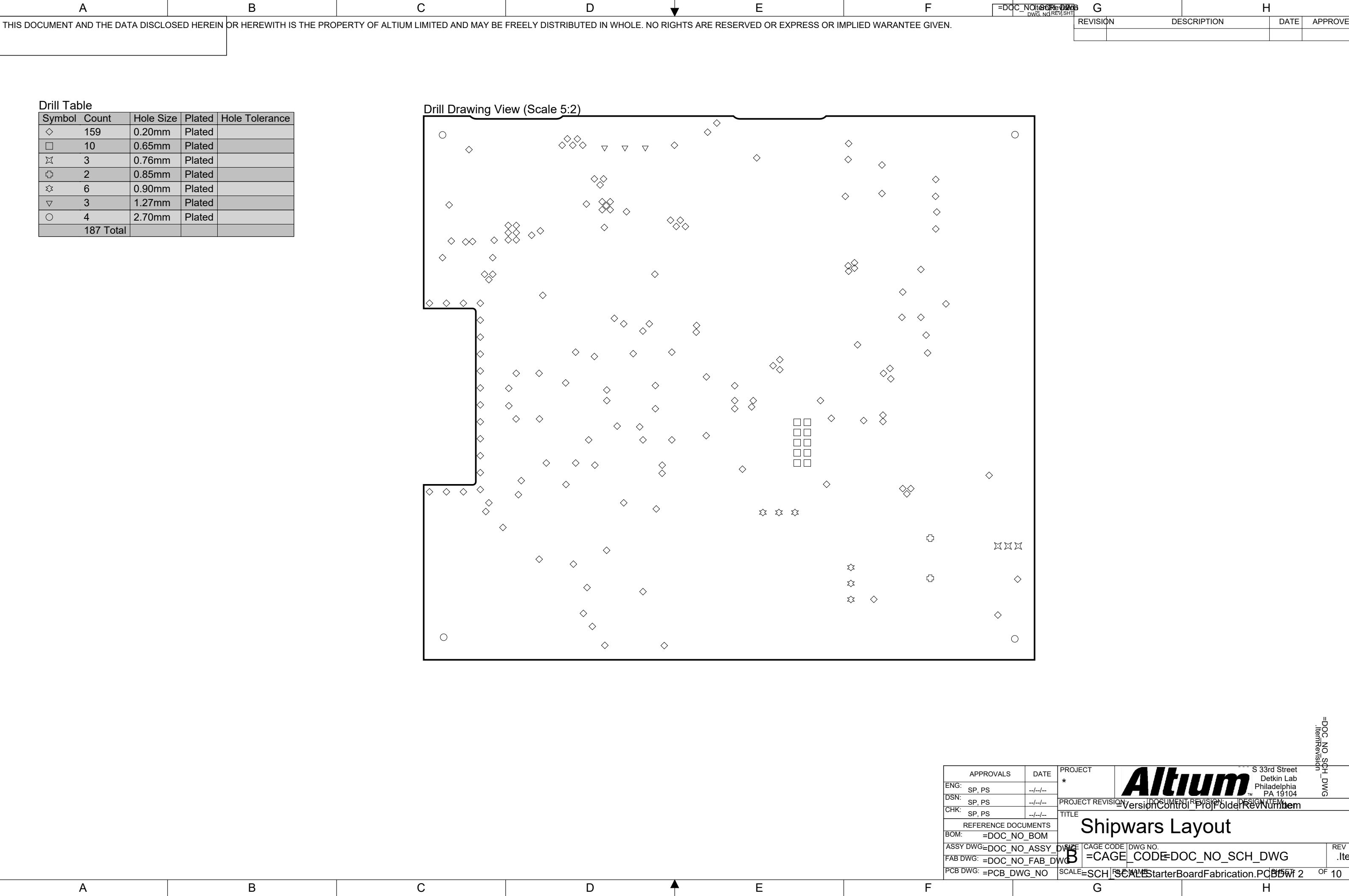
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Shipwars Layout



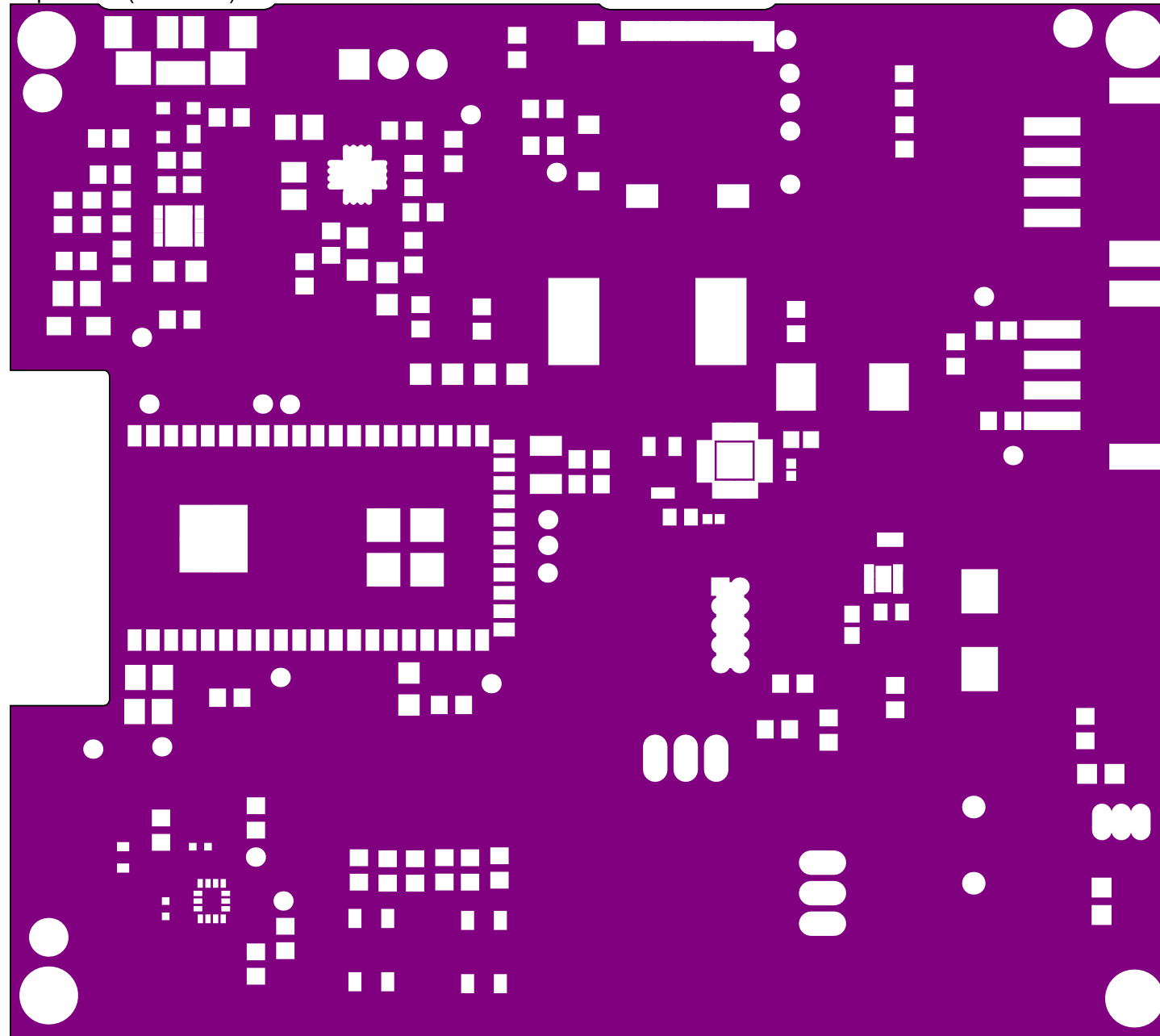



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Top Solder (Scale 5:2)



APPROVALS		DATE		PROJECT		S 33rd Street		SCH DWG
ENG: SP, PS		--/--/--		*		 Detkin Lab Philadelphia PA 19104		
DSN: SP, PS		--/--/--		PROJECT REVISION:		DOCUMENT REVISION:		
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				PCB DWG 4		OF 10		

PROJECT	Altium		S 33rd Street Detkin Lab Philadelphia PA 19104	CH_DWG
PROJECT REVISION	DOCUMENT REVISION	DESIGN REVISION	Version Control Proj Folder Rev Number Item	
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GroundPlane (Scale 5:2)

REVISION	DESCRIPTION	DATE	APPROVED

APPROVALS	DATE	PROJECT	Altium		S 33rd Street Detkin Lab Philadelphia PA 19104
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DSN: SP, PS	--/--/--	PROJECT REVISION	DOCUMENT REVISION	DESIGN ITEM	
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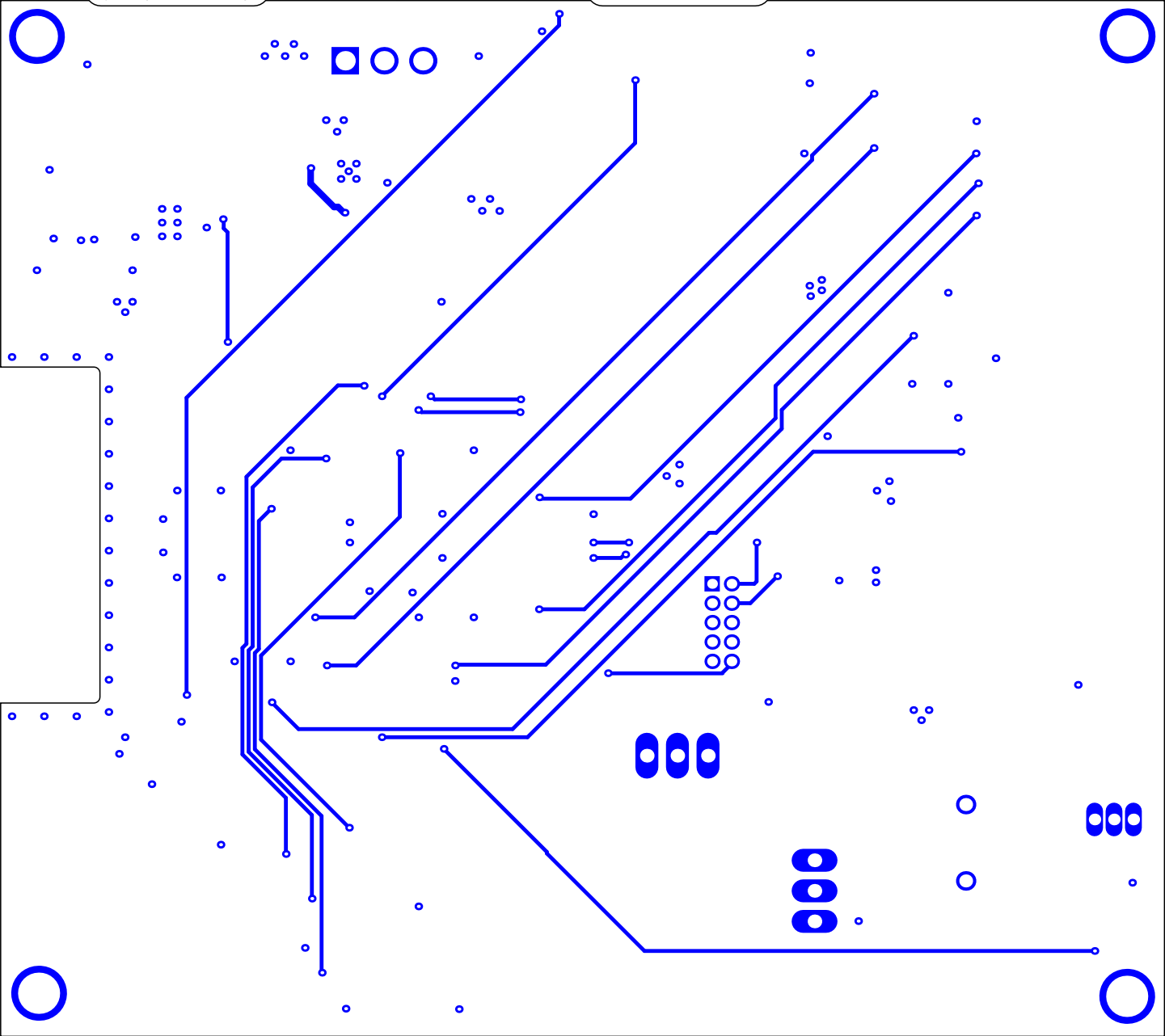
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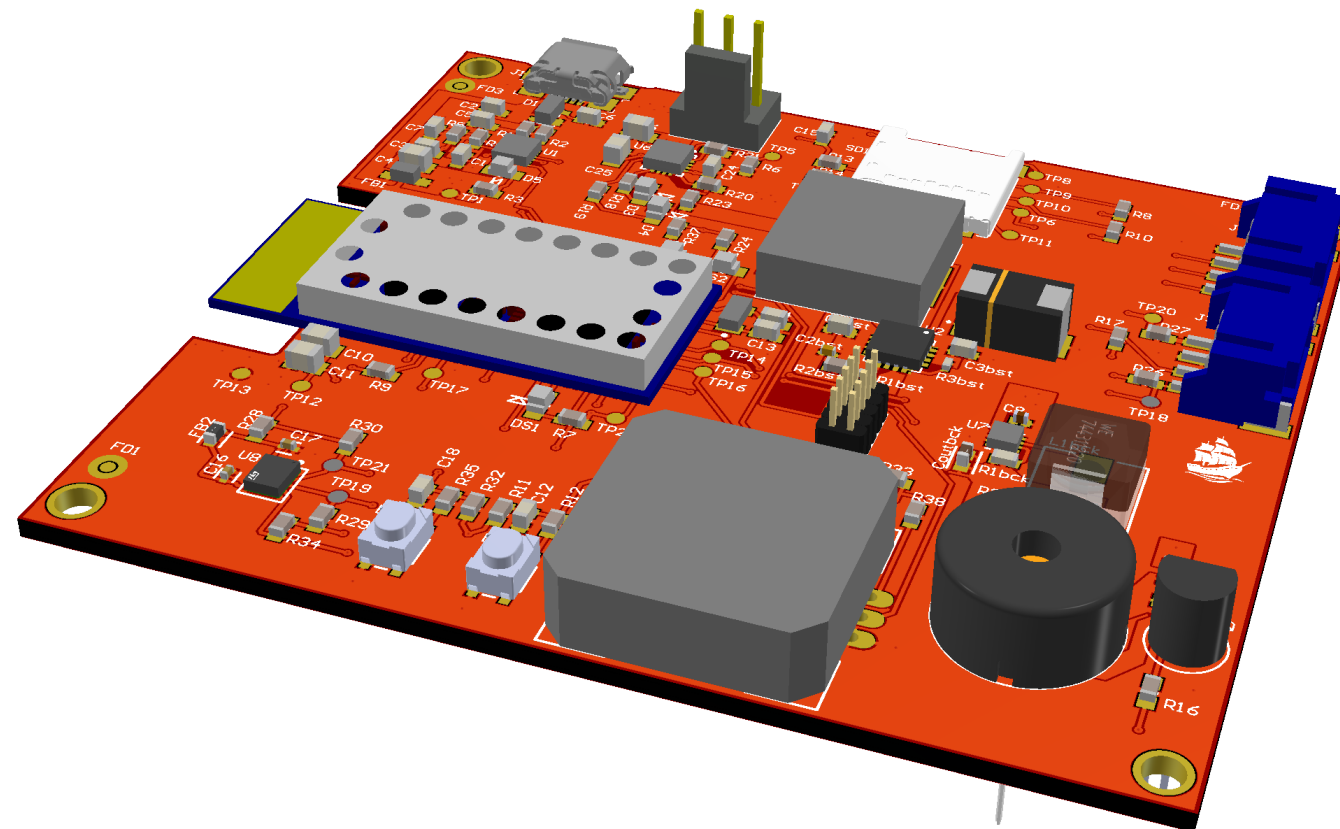
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Bottom Layer (Scale 5:2)




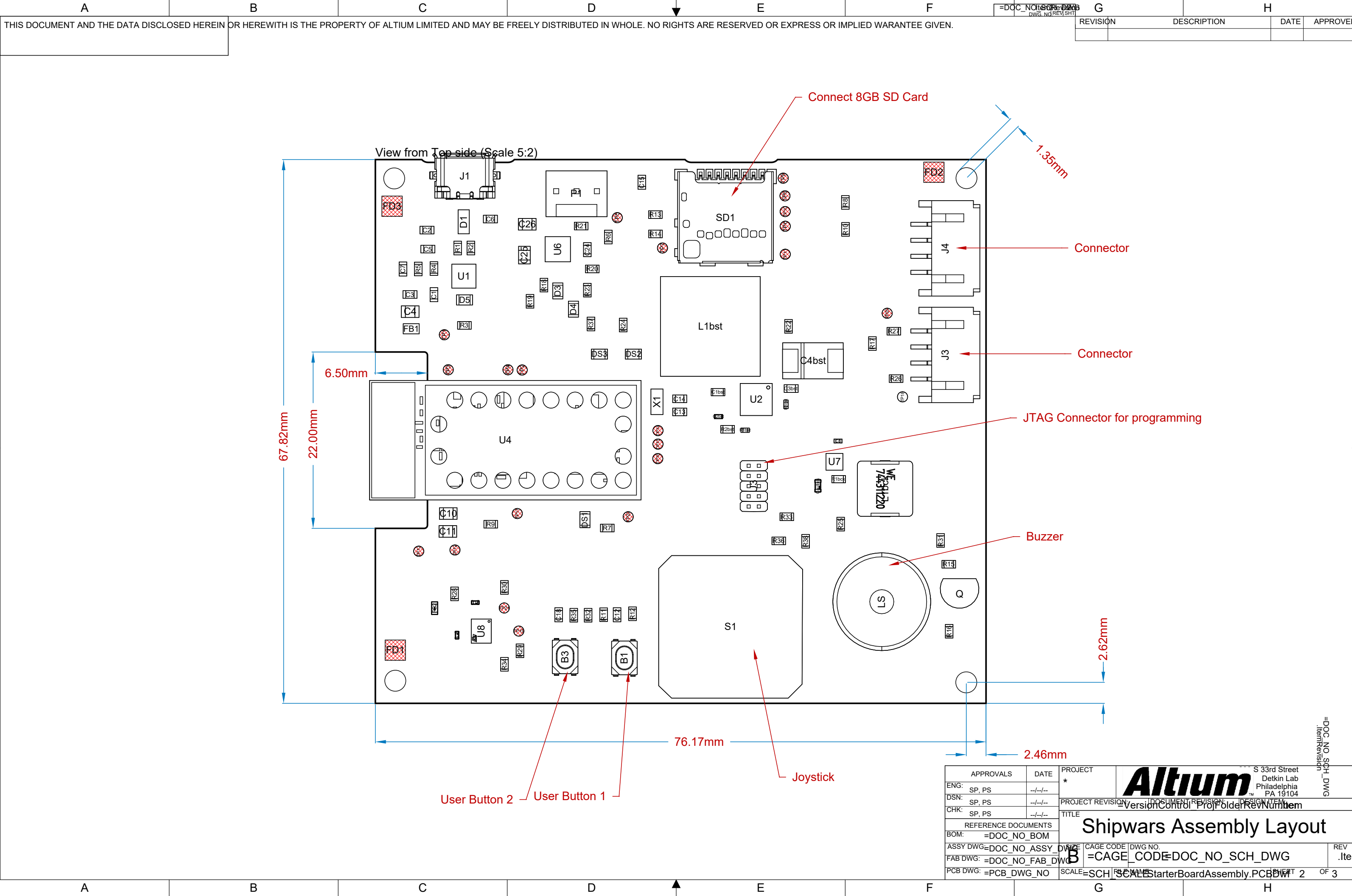
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NOTES:
1. THIS ITEM IS ELECTROSTATIC SENSITIVE
AND SHALL BE HANDLED ACCORDINGLY



The diagram illustrates a top-down view of a rectangular object. Four circular markers are positioned at the corners of the rectangle. A small inset on the right side shows a side view of the object, which is a rectangular prism with a grid pattern on its side face.

APPROVALS		DATE		PROJECT		S 33rd Street		SCH DWG 1
ENG:	SP, PS	--/--/--		*				
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View from Bottom side (Scale 5:2)

APPROVALS

DATE

PROJECT

ENG: SP, PS

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DSN: SP, PS

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PROJECT REVISION

CHK: SP, PS

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DOCUMENT REVISION

REFERENCE DOCUMENTS

TITLE

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REV

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SCALE

=SCH_SCALE

STARTERBOARDASSEMBLY.PCB.DWG

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OF 3

Altium

S 33rd Street
Detkin Lab
Philadelphia
PA 19104

=DOC_NO_SCH_DWG

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REVISION

DESCRIPTION

DATE

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