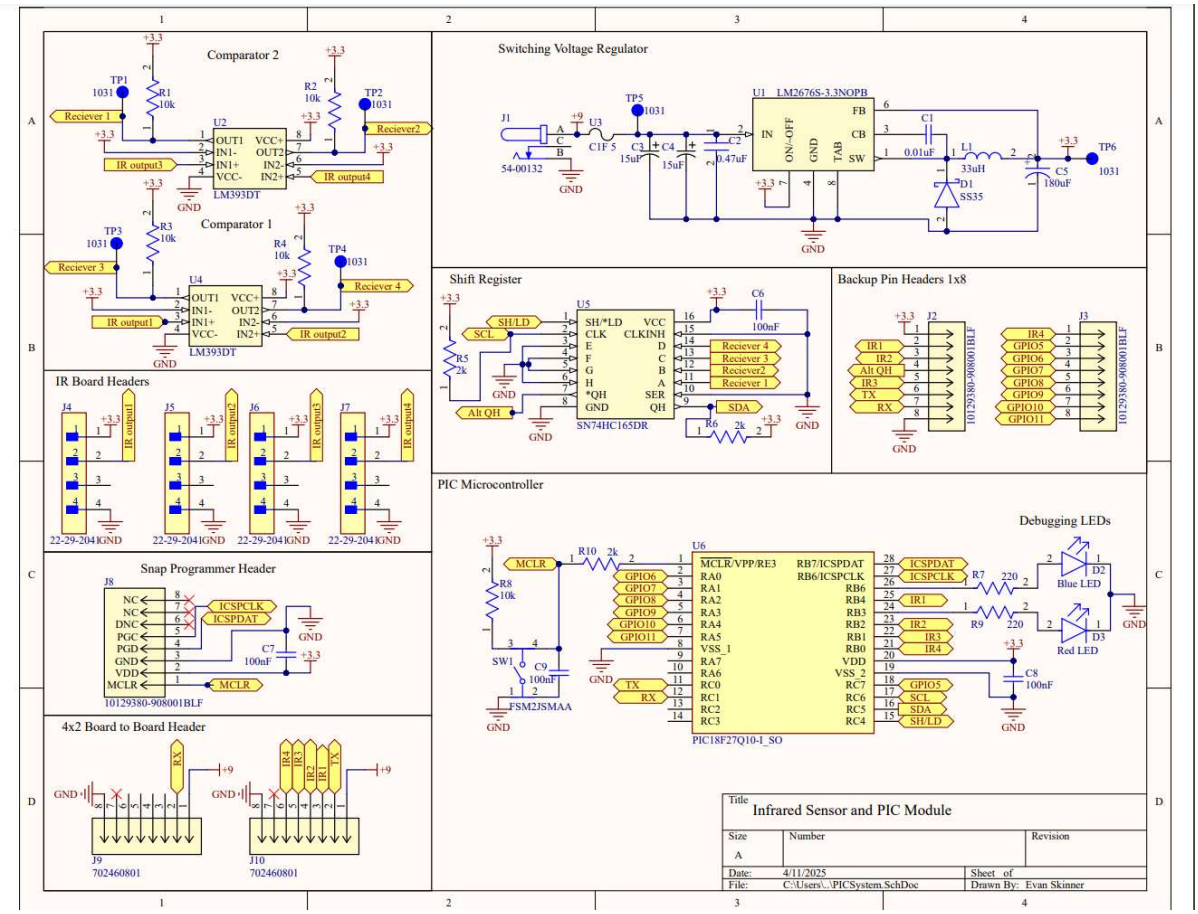
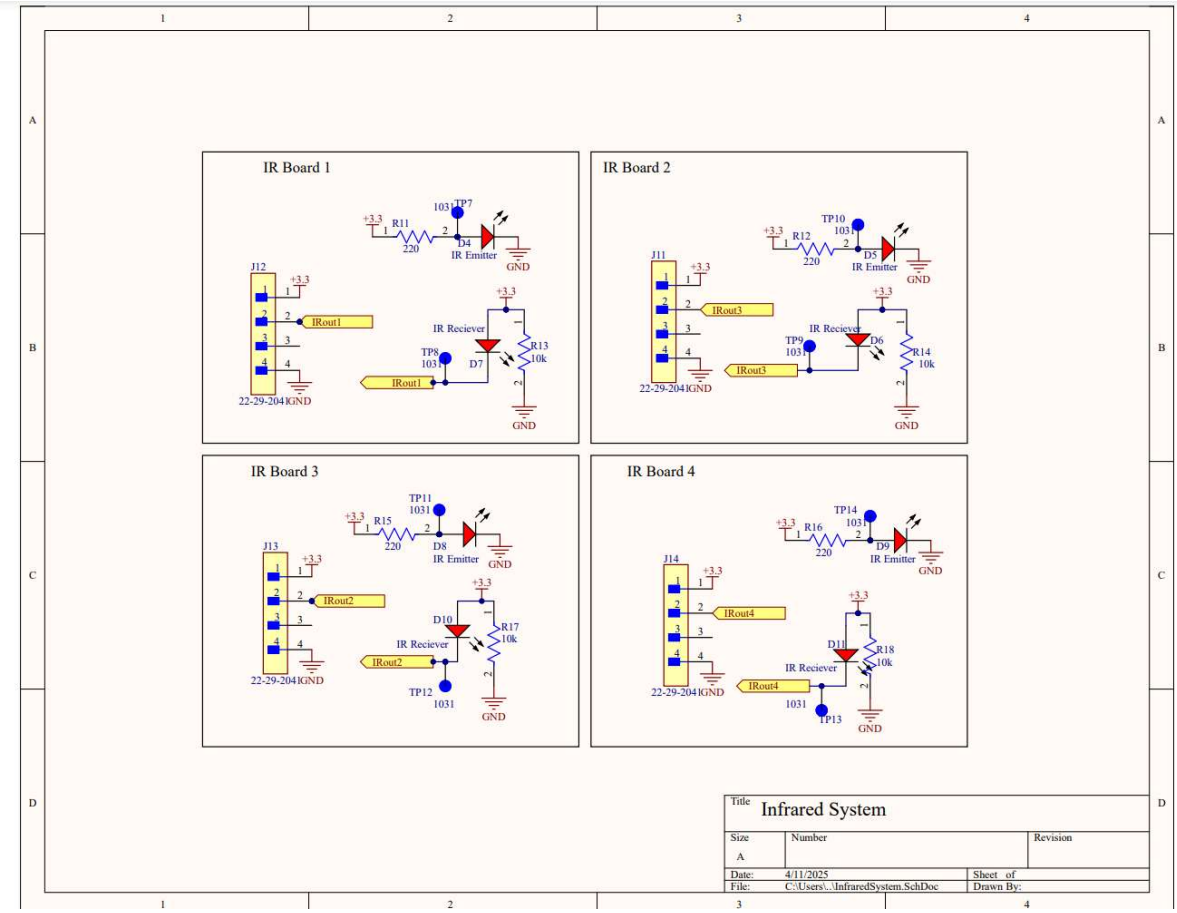
Schematic Design and Power Budget

Schematic

PIC Microcontroller Schematic

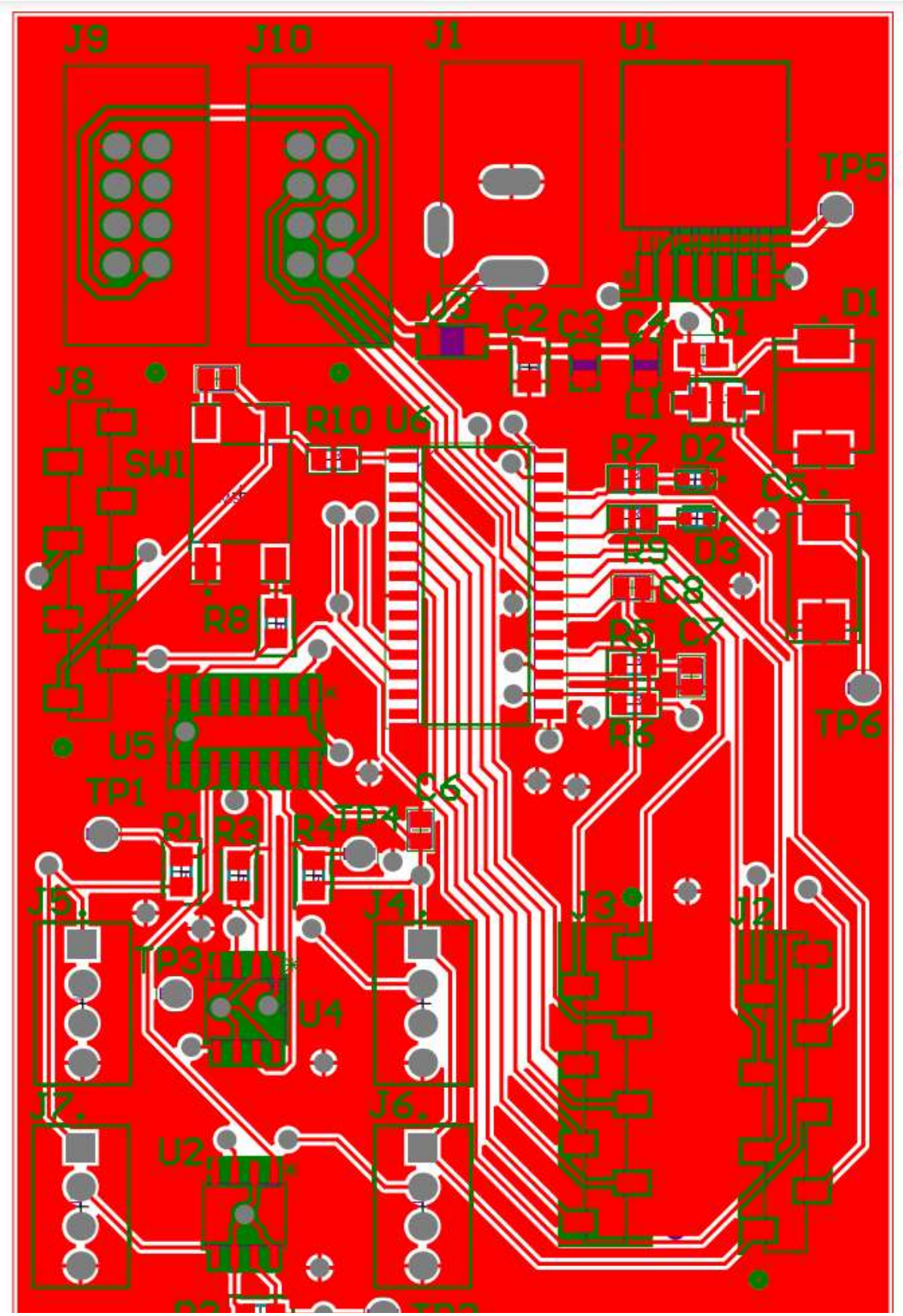


Infrared Sensor Schematic



PCB Design

PIC Microcontroller PCB Layout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TP5
J8
SW1
R10
U6
C2
C3
C4
C1
D1
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C5
R9
D3
C8
R8
R5
C7
R6
TP6
U5
TP1
C6
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R3
R4
J5
J4
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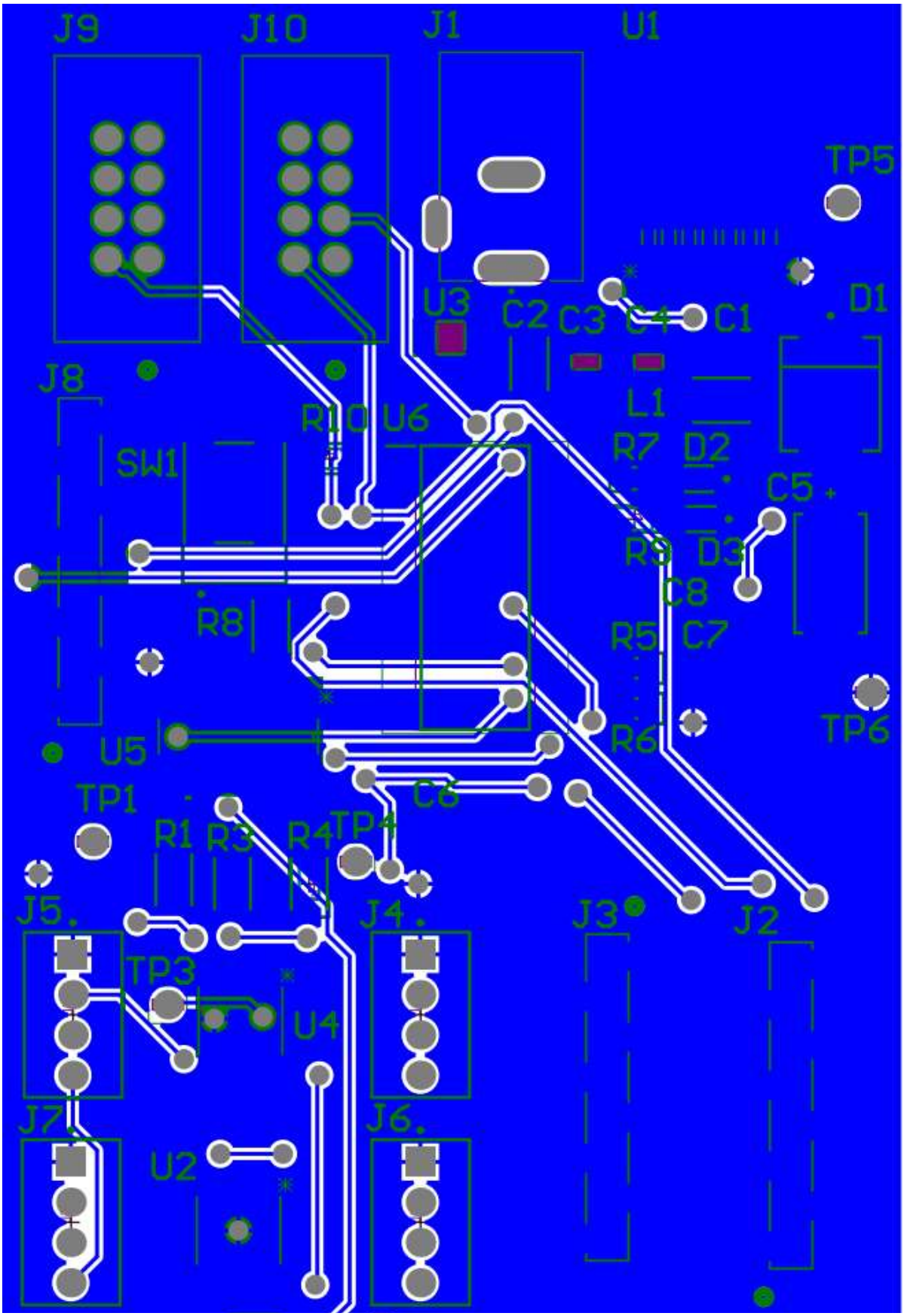
J2
TP3
U4
J7
J6
U2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U1
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C2
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C1
D1
J8
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R10
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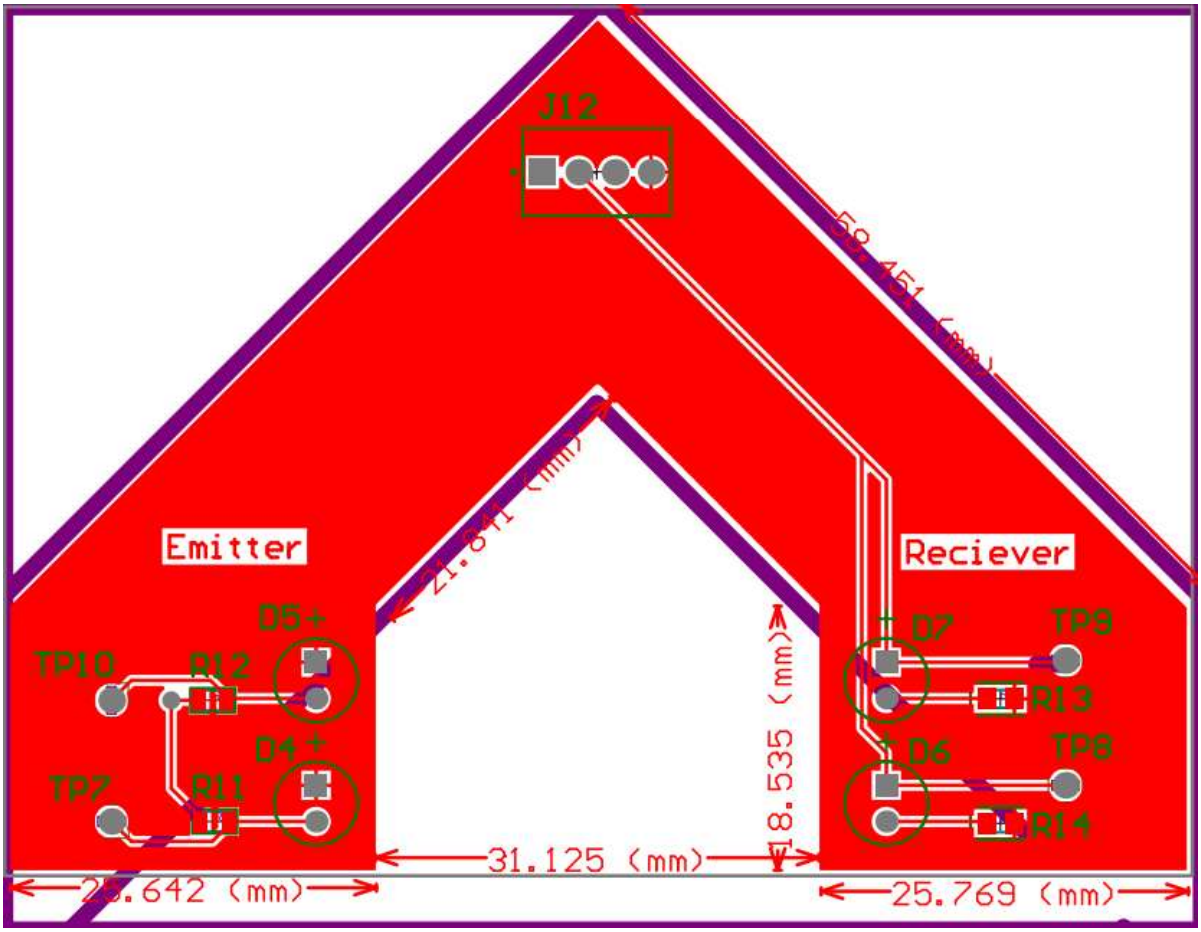
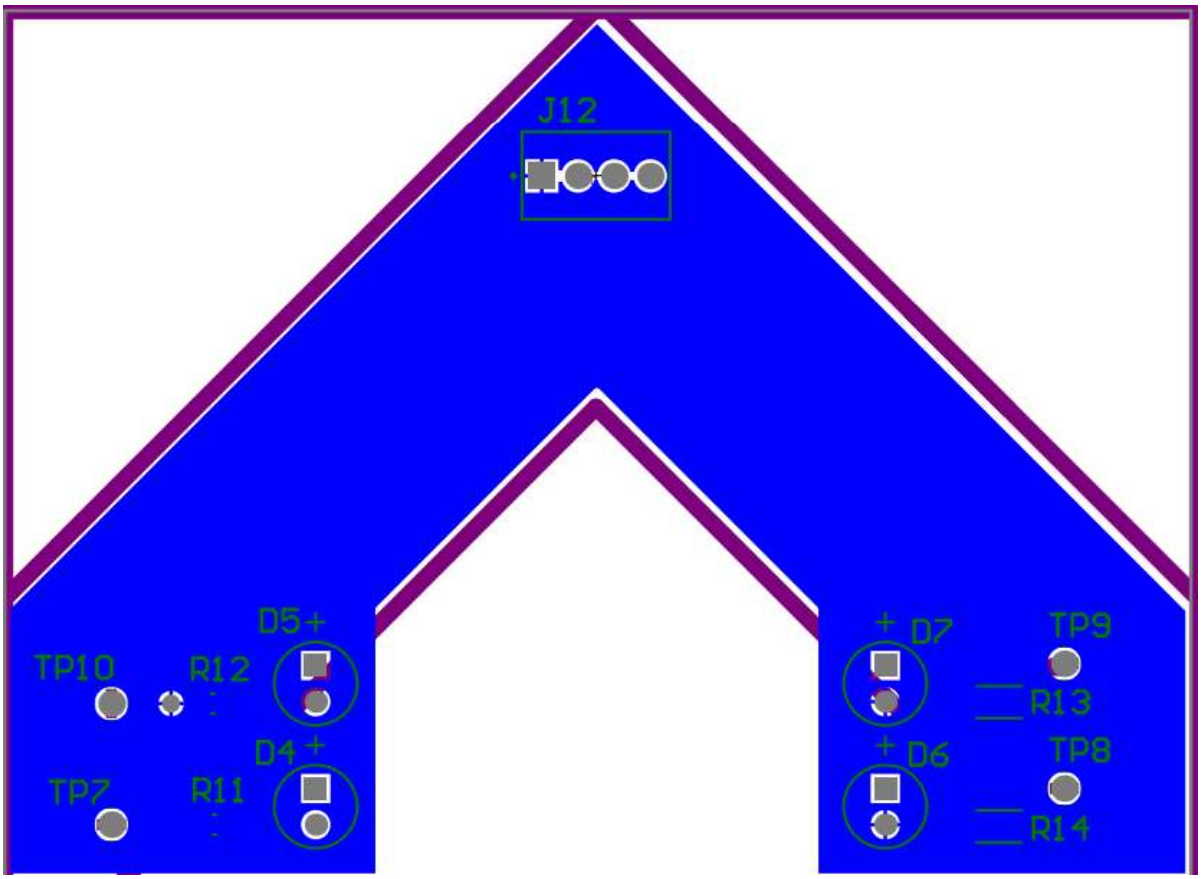
D2
SW1
C5
R9
D3
C8
R8
R5
C7
TP6
U5
R6
TP1
C6
R1
R3
R4
TP4
J5
J4
J3
J2
TP3
U4
J7
J6
U2

Infrared Sensor PCB Layout





Files

Click here to access PDF and Zip Files

Schematic made in Altium Designer.

Power Budget

Sensor Power Budget

Team Number:	Team 310
Project Name:	**Magnetic Ball Accelerator**
Name:	**Evan Skinner**
Version:	**1**

All Major Components	Component Name	Part Number	Supply	#	Absolute	Total	Unit
	Comparator	LM393DT	+2V to 36V	2	1	2	mA
	Microcontroller	PIC18F47Q10	+1.8V to 5.5V	1	95	95	mA
	Shift Register	SN74HC165DR	+2 to 6V	1	70	70	mA
	Infrared Emitter and Reciever	HLPT-B5D0-00000	+1.8 to 3.3V	4	350	1400	mA
+3.3V Power Rail	**Component Name**	**Part Number**	**Supply**	**#**	**Absolute**	**Total**	**Unit**
	Comparator	LM393DT	+2V to 36V	2	1	2	mA
	Microcontroller	PIC18F47Q10	+1.8V to 5.5V	1	95	95	mA
	Shift Register	SN74HC165DR	+2 to 6V	1	70	70	mA
	Infrared Emitter and Reciever	HLPT-B5D0-00000	+2V to 36V	4	350	1400	mA
					Safety Margin	25%	
					Total Current Required on +3.3V Rail	1750	mA
c4. Regulator or Source Choic	+3.3V Switching Regulator	LM2676S-3.3	+5V - 20V	1	3000	3000	mA
					Total Remaining Current Available on 3.3V Rail	1250	mA