

# Appendix A: Hardware Schematics and Component Datasheets

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1. Main board schematic

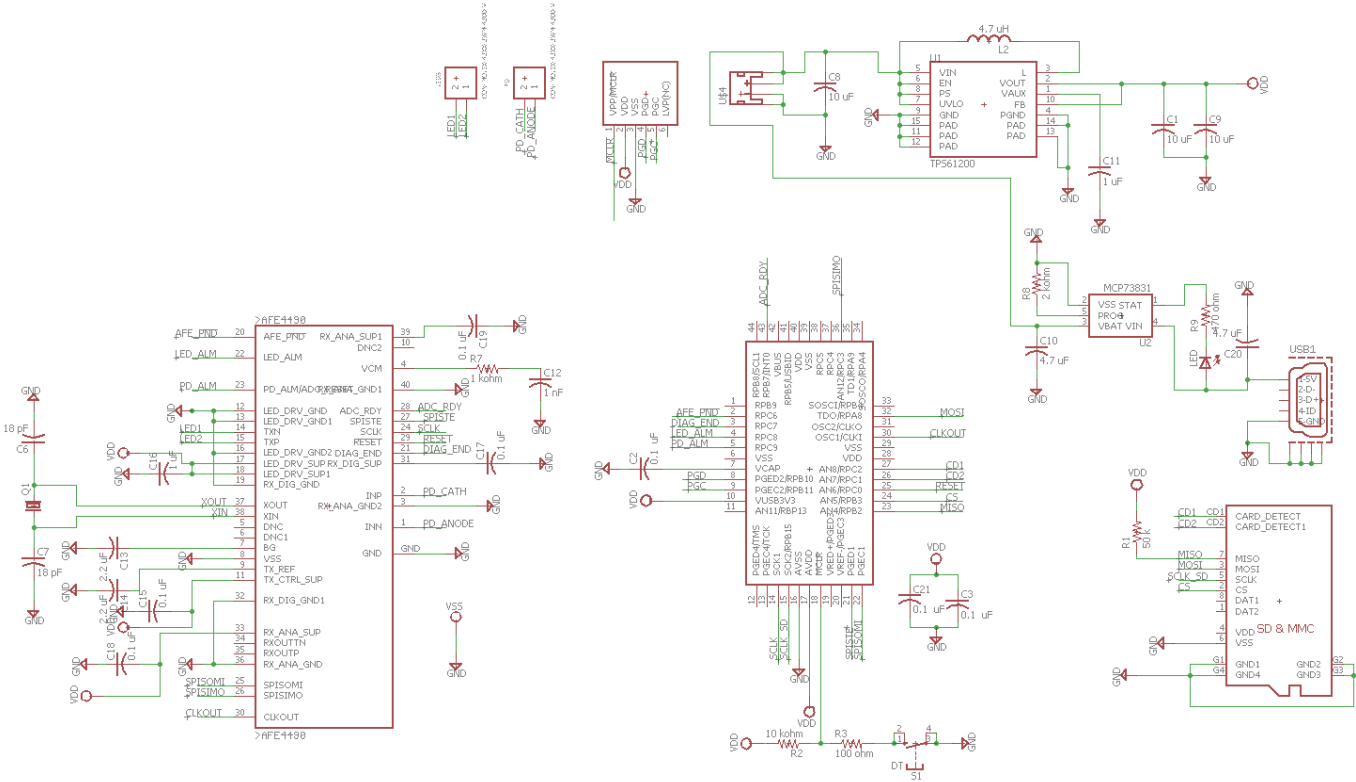


Figure 1. Main board schematic

2. Main board layout

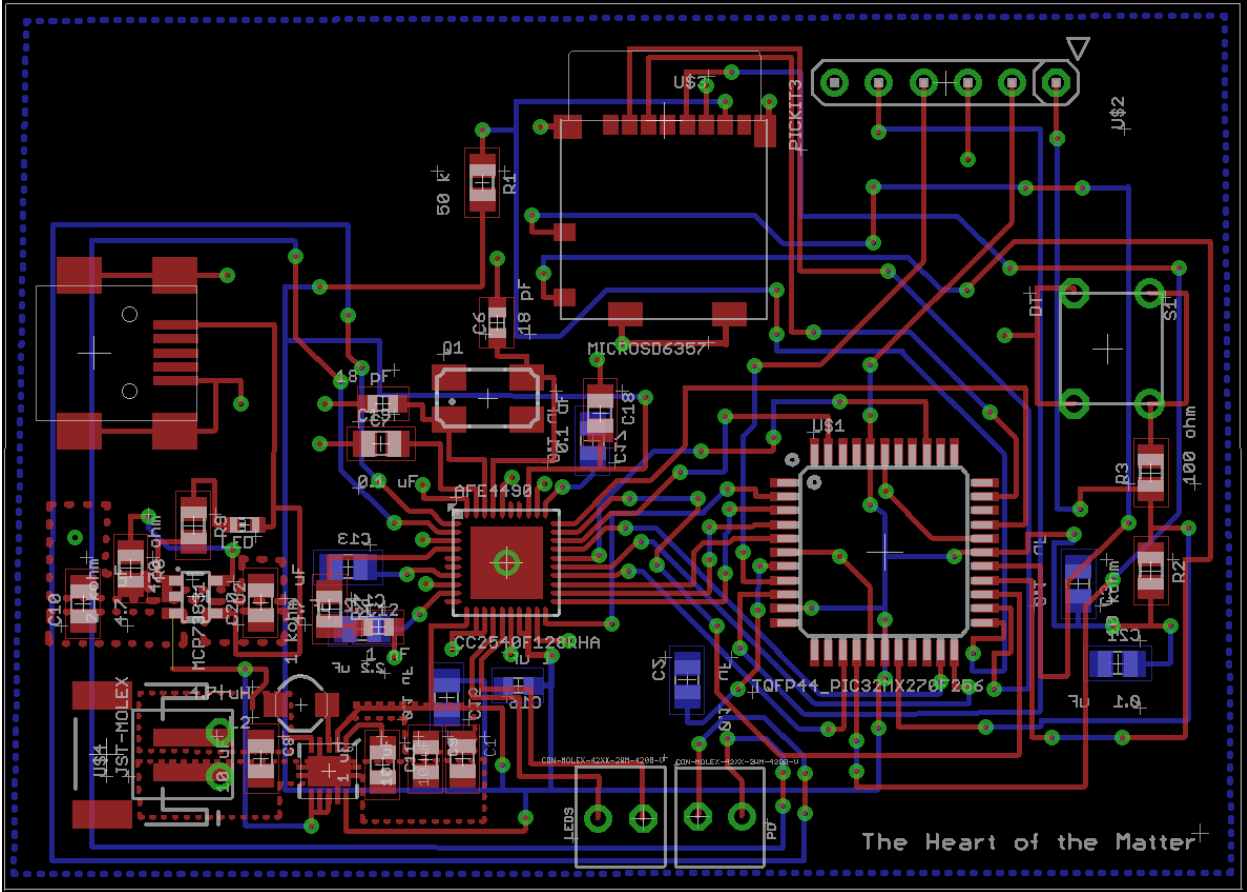


Figure 2. Main board layout

3. LEDs and photodiode board schematic

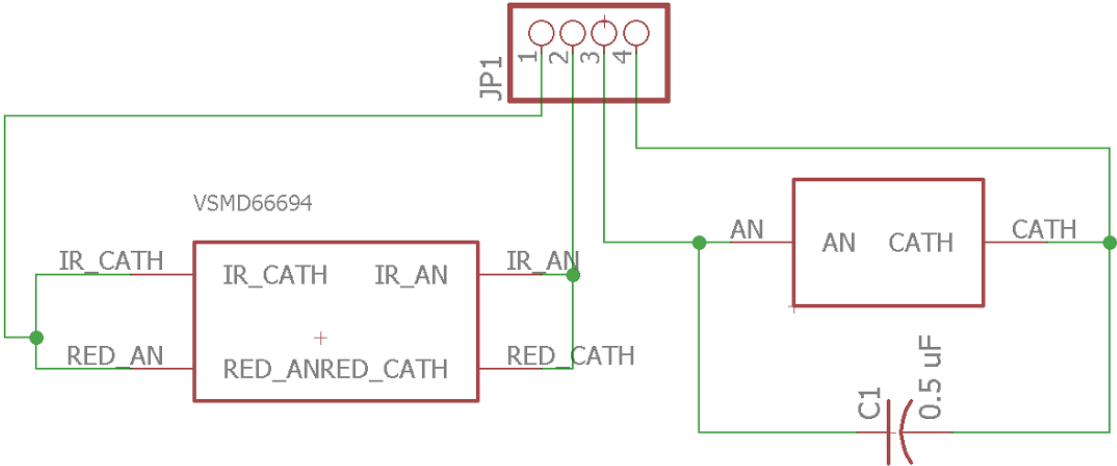


Figure 3. LEDs and photodiode board schematic

4. LEDs and photodiode board layout

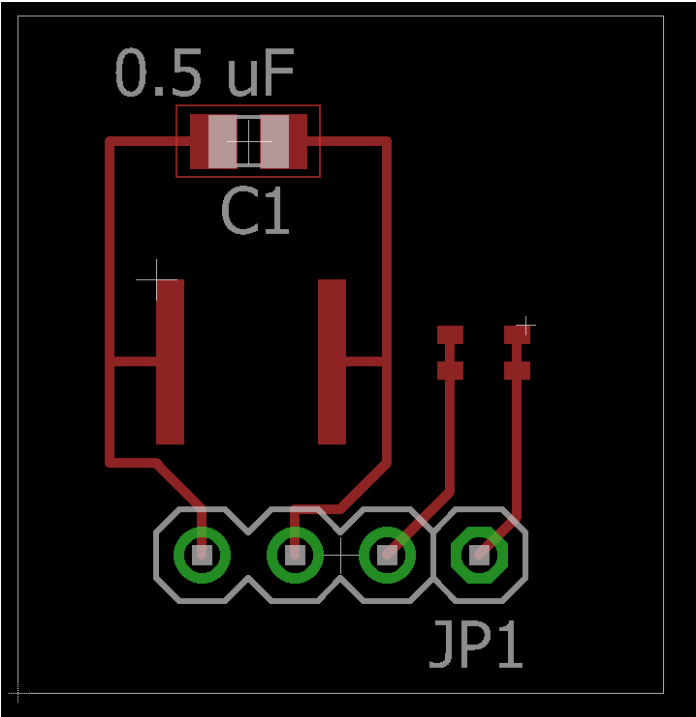


Figure 4. LEDs and photodiode board layout

## 5. List of components

**Table 1.** List of Components

<b>Part</b>	<b>Value</b>	<b>Device</b>	<b>Package</b>
<b>Main board</b>			
<b>AFE4490</b>		AFE4490	QFN40-6X6
<b>C1</b>	10 uF	C-USC0805	C0805
<b>C2</b>	0.1 uF	C-USC0805	C0805
<b>C3</b>	0.1 uF	C-USC0805	C0805
<b>C6</b>	18 pF	C-USC0805	C0805
<b>C7</b>	18 pF	C-USC0805	C0805
<b>C8</b>	10 uF	C-USC0805	C0805
<b>C9</b>	10 uF	C-USC0805	C0805
<b>C10</b>	4.7 uF	C-USC0805	C0805
<b>C11</b>	1 uF	C-USC0805	C0805
<b>C12</b>	1 nF	C-USC0603	C0603
<b>C13</b>	2.2 uF	C-USC0805	C0805
<b>C14</b>	2.2 uF	C-USC0805	C0805
<b>C15</b>	0.1 uF	C-USC0805	C0805
<b>C16</b>	1 uF	C-USC0603	C0603
<b>C17</b>	0.1 uF	C-USC0805	C0805
<b>C18</b>	0.1 uF	C-USC0805	C0805
<b>C19</b>	0.1 uF	C-USC0805	C0805
<b>C20</b>	4.7 uF	C-USC0805	C0805
<b>C21</b>	0.1 uF	C-USC0805	C0805
<b>L2</b>	4.7 uH	INDUCTORCDRH	CDRH
<b>LED</b>	red	LEDCHIP-LED0603	CHIP-LED-0603
<b>Q1 crystal oscillator</b>		CRYSTALCTS406	CTS406
<b>R1</b>	50 kohm	R-US_R0805	R0805
<b>R2</b>	10 kohm	R-US_R0805	R0805
<b>R3</b>	100 ohm	R-US_R0805	R0805
<b>R7</b>	1 kohm	R-US_R0805	R0805
<b>R8</b>	2 kohm	R-US_R0805	R0805
<b>R9</b>	470 ohm	R-US_R0805	R0805
<b>S1 switch</b>		DT	PBSWITCH
<b>PIC32MX270F256D microcontroller</b>		TQFP44_PIC32MX270F2 56	TQFP44
<b>PICKIT3</b>		PICKIT3	PICKIT3
<b>MICROSD</b>		MICROSD6357	MICROSD6357
<b>JST-Molex battery connector</b>		JST-MOLEX	JST-MOLEX
<b>TPS61200</b>		TPS61200	QFN-10_PAD
<b>MCP73831</b>		MCP73831	SOT23-5
<b>USB connector</b>		USB-MINI-MICRO-	USB-MINI-

		BMINI	FCI10033527
<b>Lithium Ion Battery</b>	3.7 V		
LEDs/photodiode board			
<b>C1</b>	0.1 uF	C-USC0805	C0805
<b>VSMD66694 red/infrared LEDs</b>	red/infrared	VSMD66694	VSMD66694
<b>TEMD5080X01 photodiode</b>		TEMD5080X01	TEMD5080X01

## 6. Component datasheet links

AFE4490: Integrated Analog Front-End for Pulse Oximeters

<http://www.ti.com/lit/ds/symlink/afe4490.pdf>

MCP73831: Battery Charge Management Controller

<http://ww1.microchip.com/downloads/en/DeviceDoc/20001984g.pdf>

PIC32MX270F256D: Microcontroller

<http://ww1.microchip.com/downloads/en/DeviceDoc/60001168F.pdf>

TEMD5080X01: Silicon PIN Photodiode

<http://www.vishay.com/docs/81643/temd5080.pdf>

TPS61200: Synchronous Boost Converter

<http://www.ti.com/lit/ds/symlink/tps61200.pdf>

VSMD66694: Dual Color Emitting Diodes

<http://www.vishay.com/docs/84324/vsmd66694.pdf>