

## 1. Selected resistors and calculations

### Calculated values:

Birth date: 11th

$$V_{OUT1} (\text{LM317}) = 2 + 0.01 \times 11 = 2.11\text{V}$$

$$V_{OUT2} (\text{TPS79301}) = 2.11 + 0.1 = 2.21\text{V}$$

$$V_{OUT3} (\text{MIC5377}) = 2.21\text{V}$$

$$R_2 = 240\Omega$$

$$R_1 = R_2 \times (V_{OUT1}/1.25 - 1) = 240 \times (2.11/1.25 - 1) = 240 \times 0.688 = 165.12\Omega$$

$$R_7 = (V_{OUT1} - V_F) / I_F = (2.11 - 2.0) / 0.02 = 5.5\Omega$$

$$R_4 = V_{FB} / I = 1.225 / 0.00005 = 24500\Omega$$

$$R_3 = (V_{OUT2} - V_{FB}) / I = (2.21 - 1.225) / 0.00005 = 19700\Omega$$

$$R_8 = (V_{OUT2} - V_F) / I_F = (2.21 - 2.0) / 0.02 = 10.5\Omega$$

$$V_{OUT3} = V_{REF} \times (1 + R_5/R_6)$$

$$V_{REF} = 1.0\text{V}$$

$$\text{Choose } R_6 = 1\text{k}\Omega$$

$$\text{Then } R_5 = 1210\Omega$$

### Selected values:

$$R_1 = 160\Omega$$

$$R_2 = 240\Omega$$

$$R_3 = 20\text{k}\Omega$$

$$R_4 = 24\text{k}\Omega$$

$$R_5 = 1.2\text{k}\Omega$$

$$R_6 = 1\text{k}\Omega$$

$$R_7 = 5\Omega$$

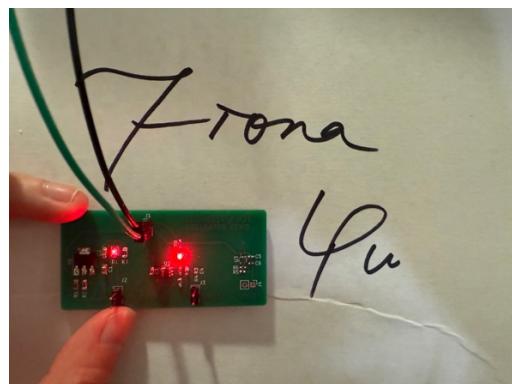
$$R_8 = 11\Omega$$

## 2. BOM spreadsheet

regulators

#	Reference	Qty	Value	Footprint	DNP
<b>1</b>	C1, C2	2	1uF	Capacitor_SMD:C_0805_2012Metric_Pad1.18x1.45mm_HandSolder	
<b>2</b>	C3, C4	2	1uF	Capacitor_SMD:C_0603_1608Metric_Pad1.08x0.95mm_HandSolder	
<b>3</b>	C5, C6	2	1uF	Capacitor_SMD:C_0402_1005Metric_Pad0.74x0.62mm_HandSolder	
<b>4</b>	D1	1	LS R976	LED_SMD:LED_0805_2012Metric_Pad1.15x1.40mm_HandSolder	
<b>5</b>	D2	1	LTST-C191KRKT	LED_SMD:LED_0603_1608Metric_Pad1.05x0.95mm_HandSolder	
<b>6</b>	J1, J2, J3, J4	4	n.m.	Connector_PinHeader_2.54mm:PinHeader_1x02_P2.54mm_Vertical	
<b>7</b>	R1	1	160Ω	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder	
<b>8</b>	R2	1	240Ω	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder	
<b>9</b>	R3	1	20kΩ	Resistor_SMD:R_0603_1608Metric_Pad0.98x0.95mm_HandSolder	
<b>10</b>	R4	1	24kΩ	Resistor_SMD:R_0603_1608Metric_Pad0.98x0.95mm_HandSolder	
<b>11</b>	R5	1	1.2kΩ	Resistor_SMD:R_0402_1005Metric_Pad0.72x0.64mm_HandSolder	
<b>12</b>	R6	1	1kΩ	Resistor_SMD:R_0402_1005Metric_Pad0.72x0.64mm_HandSolder	
<b>13</b>	R7	1	5Ω	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder	
<b>14</b>	R8	1	11Ω	Resistor_SMD:R_0603_1608Metric_Pad0.98x0.95mm_HandSolder	
<b>15</b>	U1	1	LM317_SOT-223	Package_TO_SOT_SMD:SOT-223-3_TabPin2	
<b>16</b>	U2	1	TPS79301-EP	Package_TO_SOT_SMD:SOT-23-6	
<b>17</b>	U3	1	MIC5377	Package_TO_SOT_SMD:SOT-353_SC-70-5	

### 3. A picture of my board



## 4. Serial Output

```
* Executing task in folder lab2: platformio device monitor
--- Terminal on /dev/cu.usbmodem101 | 9600 8-N-1
--- Available filters and text transformations: colorize, debug, default, direct, esp32_exception_decoder, hexlify, log2file, nocontrol, printable, send_on_enter, time
--- More details at https://bit.ly/pio-monitor-filters
--- Quit: Ctrl+C | Menu: Ctrl+T | Help: Ctrl+T followed by Ctrl+H
910  Voltage: 0.73 V
ADC: 912  Voltage: 0.73 V
ADC: 891  Voltage: 0.72 V
ADC: 880  Voltage: 0.71 V
ADC: 878  Voltage: 0.71 V
ADC: 878  Voltage: 0.71 V
ADC: 920  Voltage: 0.74 V
ADC: 918  Voltage: 0.74 V
ADC: 747  Voltage: 0.60 V
ADC: 872  Voltage: 0.70 V
ADC: 893  Voltage: 0.72 V
ADC: 894  Voltage: 0.72 V
ADC: 908  Voltage: 0.73 V
ADC: 905  Voltage: 0.73 V
ADC: 873  Voltage: 0.70 V
ADC: 873  Voltage: 0.70 V
ADC: 911  Voltage: 0.73 V
ADC: 910  Voltage: 0.73 V
ADC: 891  Voltage: 0.72 V
```

## 5. Code

```
#include <Arduino.h>

const int analogPin = A0;

void setup() {
    Serial.begin(115200);
    delay(1000);
    Serial.println("Starting ADC read...");
}

void loop() {
    int adcValue = analogRead(analogPin);
    float voltage = (adcValue / 4095.0) * 3.3;
    Serial.print("ADC: ");
    Serial.print(adcValue);
    Serial.print("    Voltage: ");
    Serial.print(voltage);
    Serial.println(" V");
    delay(1000);
}
```