

TECHIN-514 Lab2

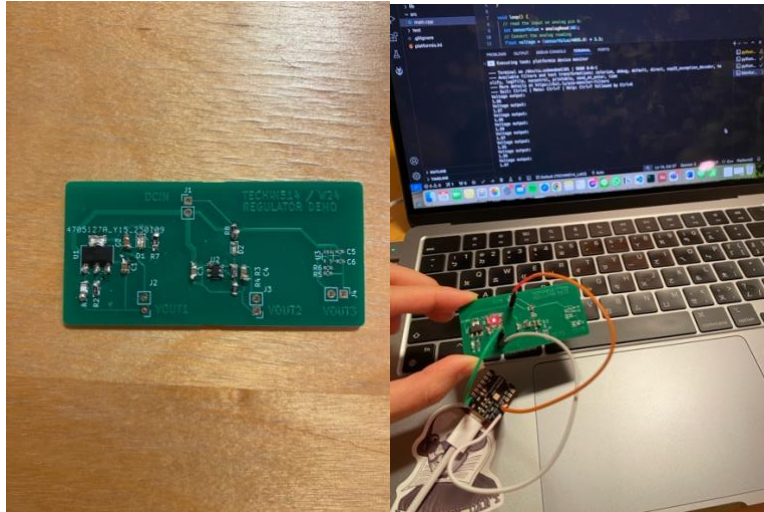
Selected Resistors and Calculations

- $V_{OUT_1} = 2.03V$
 - By the datasheet of LM317, $V_{out} = V_{ref} \left(1 + \frac{R1}{R2}\right) + (I_{adj} * R2)$
 - Since I_{adj} is neglectable, solve $2.03 = 1.25 \left(1 + \frac{R1}{R2}\right)$ and get $\frac{R1}{R2} = 0.624$
 - By the datasheet of the LED LS R976, forward voltage is 2V, and current is 20mA
 - $R7 = \frac{(V_{out}-2)}{0.02} = \frac{2.03-2}{0.02} = 1.5$
- $V_{OUT_2} = 2.13V$
 - By the datasheet of TPS79301, $V_{out} = V_{ref} \left(1 + \frac{R3}{R4}\right)$
 - Solve $2.13 = 1.2246 \left(1 + \frac{R3}{R4}\right)$ and get $\frac{R3}{R4} = 0.7393$
 - By the datasheet of the LED LTST-C191KRKT, forward voltage is 2V, and current is 30mA
 - $R8 = \frac{(V_{out}-2)}{0.03} = \frac{2.13-2}{0.03} = 4.3$
- $V_{OUT_3} = 2.13V$
 - By the datasheet of MIC5377, $V_{out} = 1 + \frac{R5}{R6}$
 - Solve $2.13 = 1 + \frac{R5}{R6}$ and get $\frac{R5}{R6} = 1.13$

BOM Spreadsheet

	A	B	C	D	E	F
1	Reference	Value	Datasheet	Footprint	Qty	DNP
2	C1,C2,C3,C4,C5,C6	1uF	~	-- mixed values --	6	
3	D1	LS R976	~	LED_SMD:LED_0805_2012Metric_Pad1.15x1.40mm_HandSolder	1	
4	D2	LTST-C191KRKT	~	LED_SMD:LED_0603_1608Metric_Pad1.05x0.95mm_HandSolder	1	
5	J1,J2,J3,J4	n.m.	~	Connector_PinHeader_2.54mm:PinHeader_1x02_P2.54mm_Vertical	4	
6	R1	270K Ohm	~	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder	1	
7	R2	430K Ohm	~	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder	1	
8	R3	360K Ohm	~	Resistor_SMD:R_0603_1608Metric_Pad0.98x0.95mm_HandSolder	1	
9	R4	470K Ohm	~	Resistor_SMD:R_0603_1608Metric_Pad0.98x0.95mm_HandSolder	1	
10	R5	750K Ohm	~	Resistor_SMD:R_0402_1005Metric_Pad0.72x0.64mm_HandSolder	1	
11	R6	680K Ohm	~	Resistor_SMD:R_0402_1005Metric_Pad0.72x0.64mm_HandSolder	1	
12	R7	1.5 Ohm	~	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder	1	
13	R8	4.3 Ohm	~	Resistor_SMD:R_0603_1608Metric_Pad0.98x0.95mm_HandSolder	1	
14	U1	LM317_SOT-223	http://www.ti	Package_TO_SOT_SMD:SOT-223-3_TabPin2	1	
15	U2	TPS79301-EP	http://www.ti	Package_TO_SOT_SMD:SOT-23-6	1	
16	U3	MIC5377	http://ww1.ti	Package_TO_SOT_SMD:SOT-353_SC-70-5	1	
17						

PCB Board



ESP32 code on GitHub

Link: <https://github.com/corylus98/techin514-lab2/blob/main/src/main.cpp>

Serial Output from ESP32

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

--- Terminal on /dev/cu.usbmodem1101 | 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

Voltage output:
1.99
Voltage output:
1.94
Voltage output:
1.94
Voltage output:
1.95
Voltage output:
1.98
Voltage output:
1.98
Voltage output:
1.95
Voltage output:
1.94
Voltage output:
1.97

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
* Executing task: platformio device monitor

--- Terminal on /dev/cu.usbmodem1101 | 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

Voltage output:
1.91
Voltage output:
1.92
Voltage output:
1.91
Voltage output:
1.92
Voltage output:
1.92
Voltage output:
1.91
```