

Main display

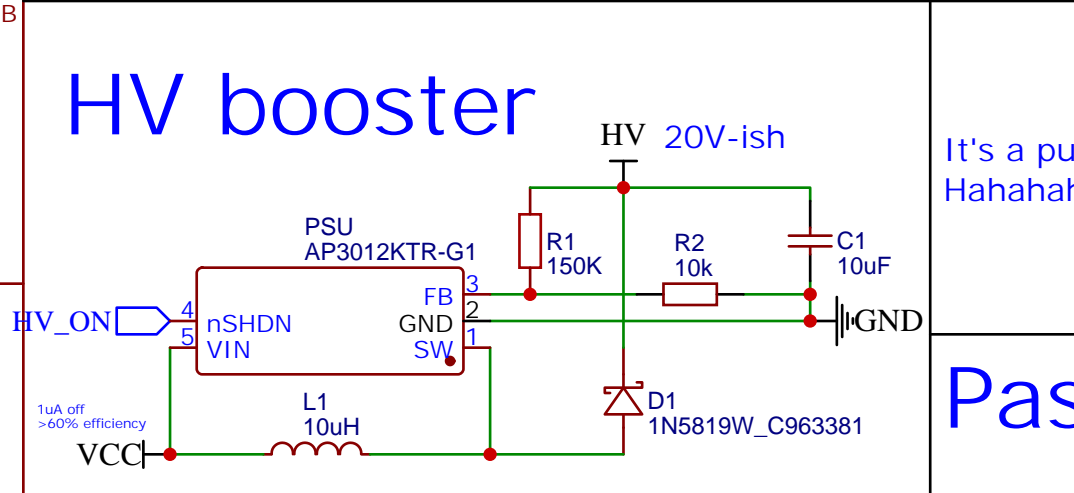
VFD
IVL2-7/5

The diagram illustrates the wiring for a 4-digit VFD display (IVL2-7/5). The display has four digits, each with seven segments labeled A through G. The connections are as follows:

- Segment Connections:** SEG1 to SEG7 are connected to the display segments A through G. The DOTS pin is connected to the DP1 pin.
- Grid Connections:** The display has four grids (1A, 1B, 2A, 2B, DP, 3A, 3B, 4A, 4B). The connections are: 1A to G1, 1B to G1, 2A to G2, 2B to G2, DP to DOTS, 3A to G3, 3B to G3, 4A to G4, and 4B to G4.
- Heating Element:** The display has a heating element (Heat) connected to pins 16 and 17. The circuit includes a VCC supply, a 100hm resistor, and a 33mA current at 3.3V. The heating element is labeled "Technically ESP driveable??".
- Other Components:** A 100hm resistor is connected to the DP1 pin. A 33mA current is drawn from the VCC supply. A 3.3V supply is connected to the DP1 pin. A 100hm resistor is connected to the DP1 pin.

Grid voltage = 20 ~ 30V
Heat voltage = 2,5 - 3,3V

100hm=33mA @ 3.3V



ESP32 control

measured 5V, 100mA during
SNTP acquire; 1.2mA during
deep sleep including devkit extras

ESP
ESP32-C3-WROOM-02-N4(4MB)

VCC
GND

D_HEAT
D_LOAD
BLANK
IO8
IO9

EN
IO0
IO1
IO2
IO3
IO19
IO18
TXD
RXD
IO10

EP
D_CLK
D_IN
IO2
BAT_2
HV_ON
BTN
TX
RX

PROG
SM04B-SRSS-TB (LF)(SN)

GND

Programming connector
JST SH
aka SparkFun Qwiic
(non standard)

15 - 20mA modem-sleep
130uA light sleep
5uA deep sleep
80-350mA RF-active

Pin	Signal	Function
IO8	TXD	15-20mA modem-sleep
IO9	RXD	130uA light sleep
IO10	TX	5uA deep sleep
IO11	RX	80-350mA RF-active

Reference: https://dl.espressif.com/dl/schematics/SCH_ESP32-C3-DEVKITC-02_V1_1_20210126A.pdf

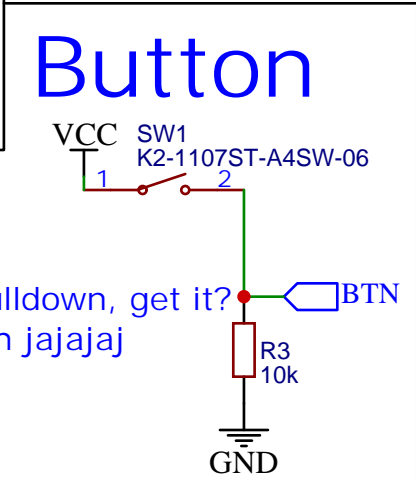
VFD driver

DRV
MAX6920AWP+

200-700uA max off

Pinout details:

- Pin 1: HV
- Pin 2: VBB (marked with a red dot)
- Pin 3: DOTS
- Pin 4: G4
- Pin 5: G3
- Pin 6: G2
- Pin 7: G1
- Pin 8: SEG7
- Pin 9: BLANK
- Pin 10: GND
- Pin 11: D_LOAD
- Pin 12: D_CLK
- Pin 13: SEG6
- Pin 14: SEG5
- Pin 15: SEG4
- Pin 16: SEG3
- Pin 17: SEG2
- Pin 18: SEG1
- Pin 19: D_IN
- Pin 20: VCC



ESP32 pullups

Battery monitor

Vbat

BAT_2

R4 10k

R5 10k

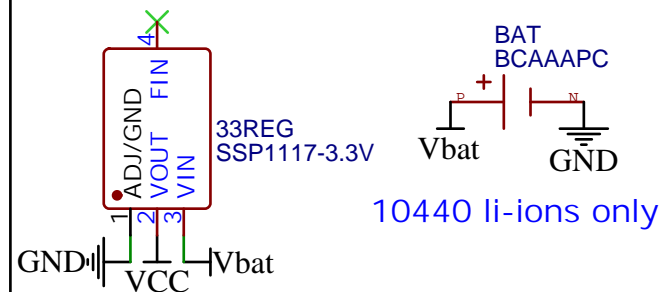
R8 10k

VCC

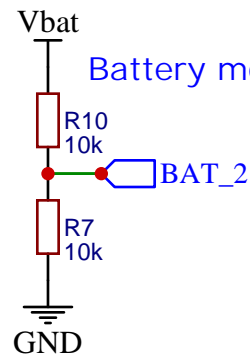
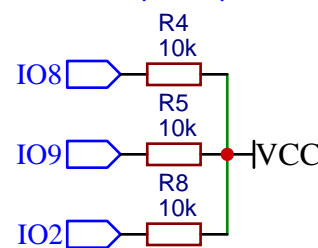
R10 10k


R7 10k

GND



Battery monitor



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