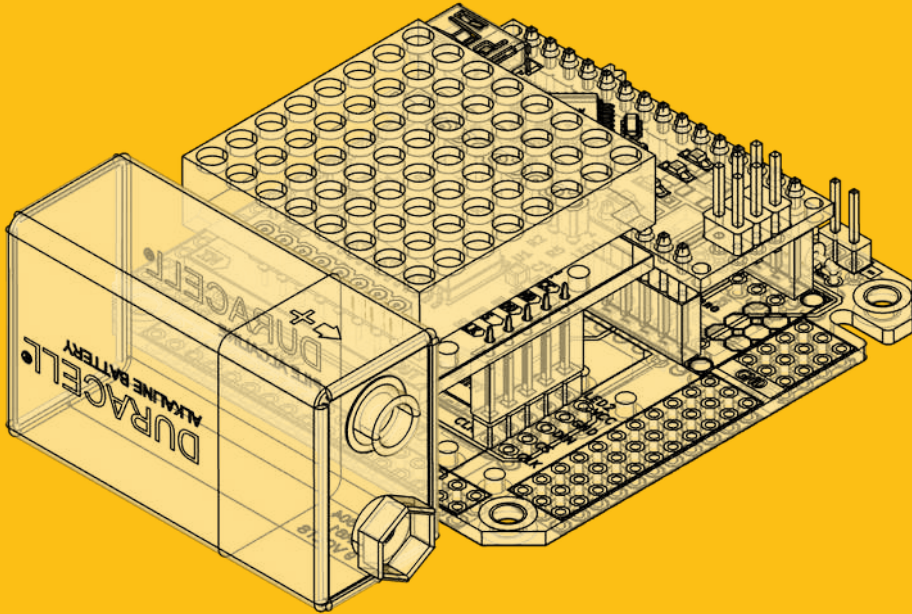# MAKER'S ASYLUM™

"Bag Tag" v3 Electronics
8x8 LED Matrix

(Proposed project for Innov School Jr)

Requirements

- Complexity level - SIMPLE
- Must include elements of
  - Electronics (soldering)
  - Arduino (programming)
  - Rapid prototyping (3DP/laser)
- BADGE form factor
- Powered by 9V battery
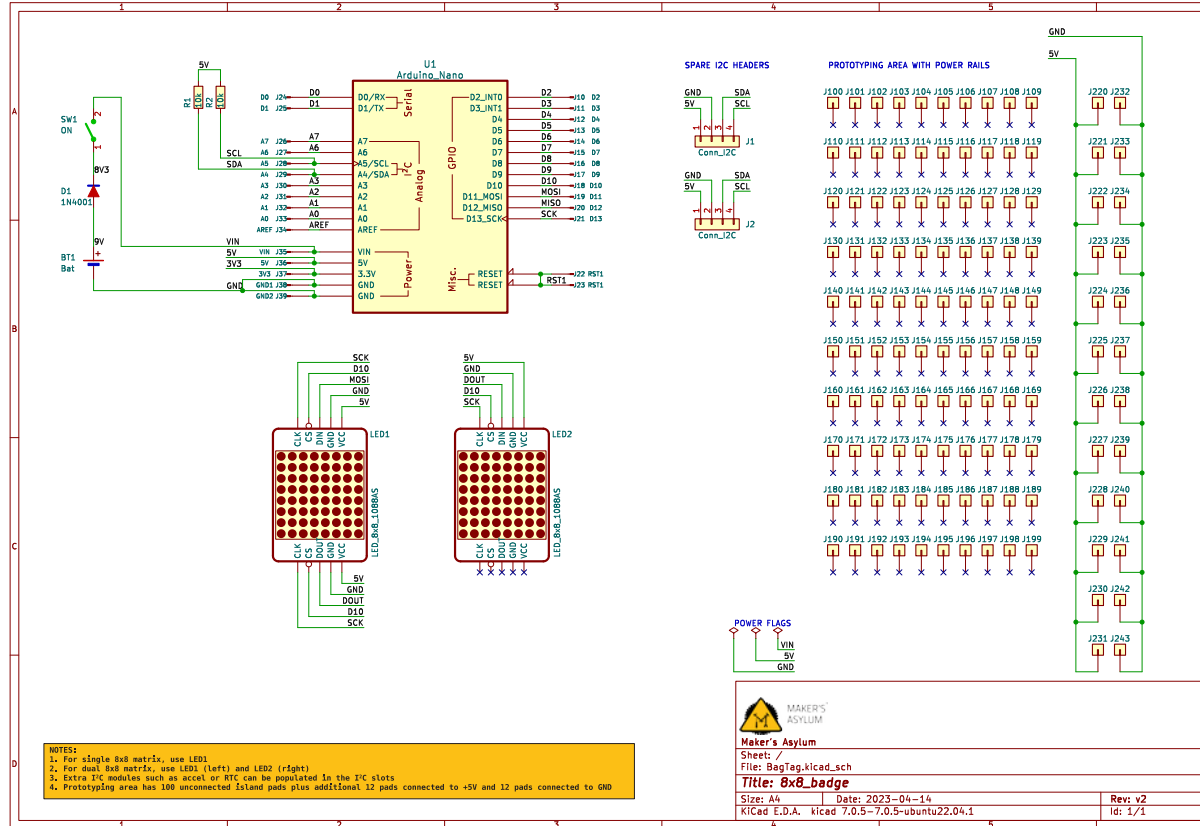- Expandable / Hackable

Changes in v3 (v/s v1 & v2)

- All parts on FRONT, but battery on side
- Two I^{2}C expansion headers
- Can install one or two 8x8 SINGLE color LED display based on MAX7219 chip
- Parts aligned along vertical axis for balance
- 100 prototyping pads and 12 each for +5V and GND
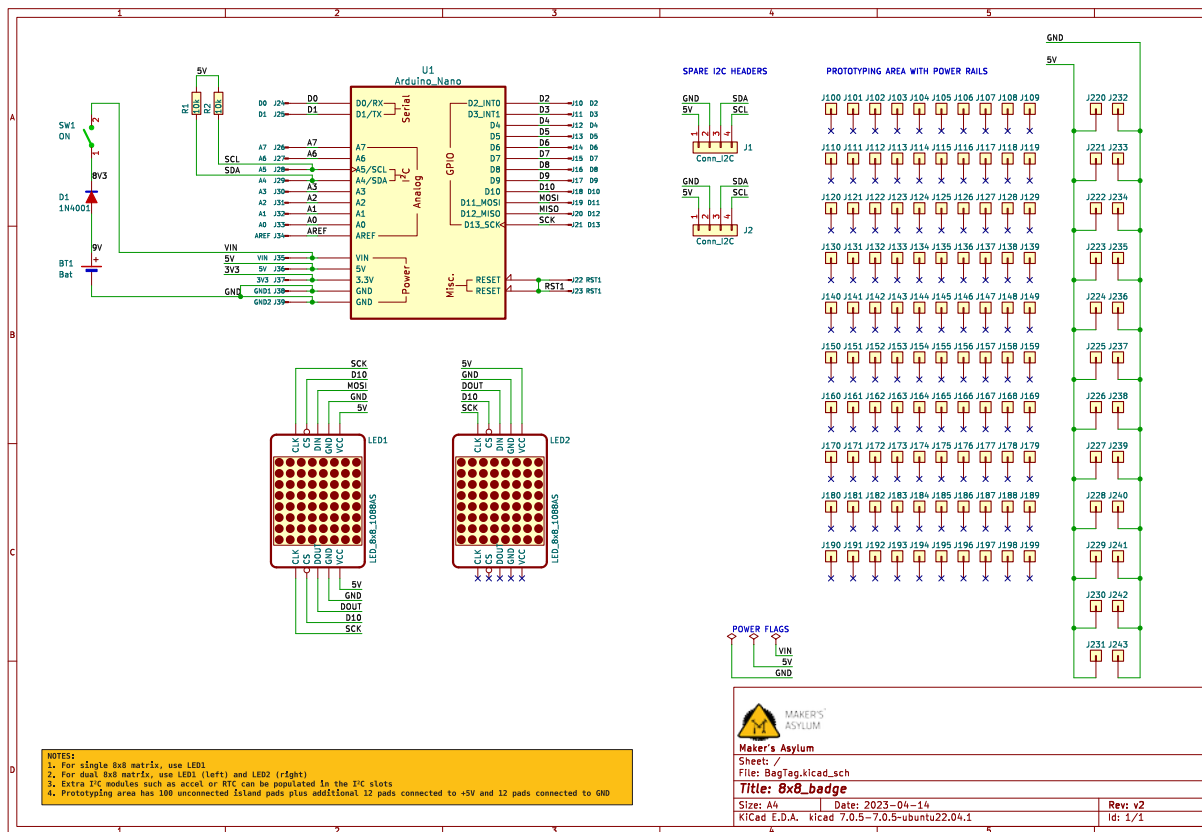
Schematic

Components:

- Arduino Nano
- Single Color 8x8 LED Matrix based on MAX7219
- Switch
- Diode
- 9V Battery with clip
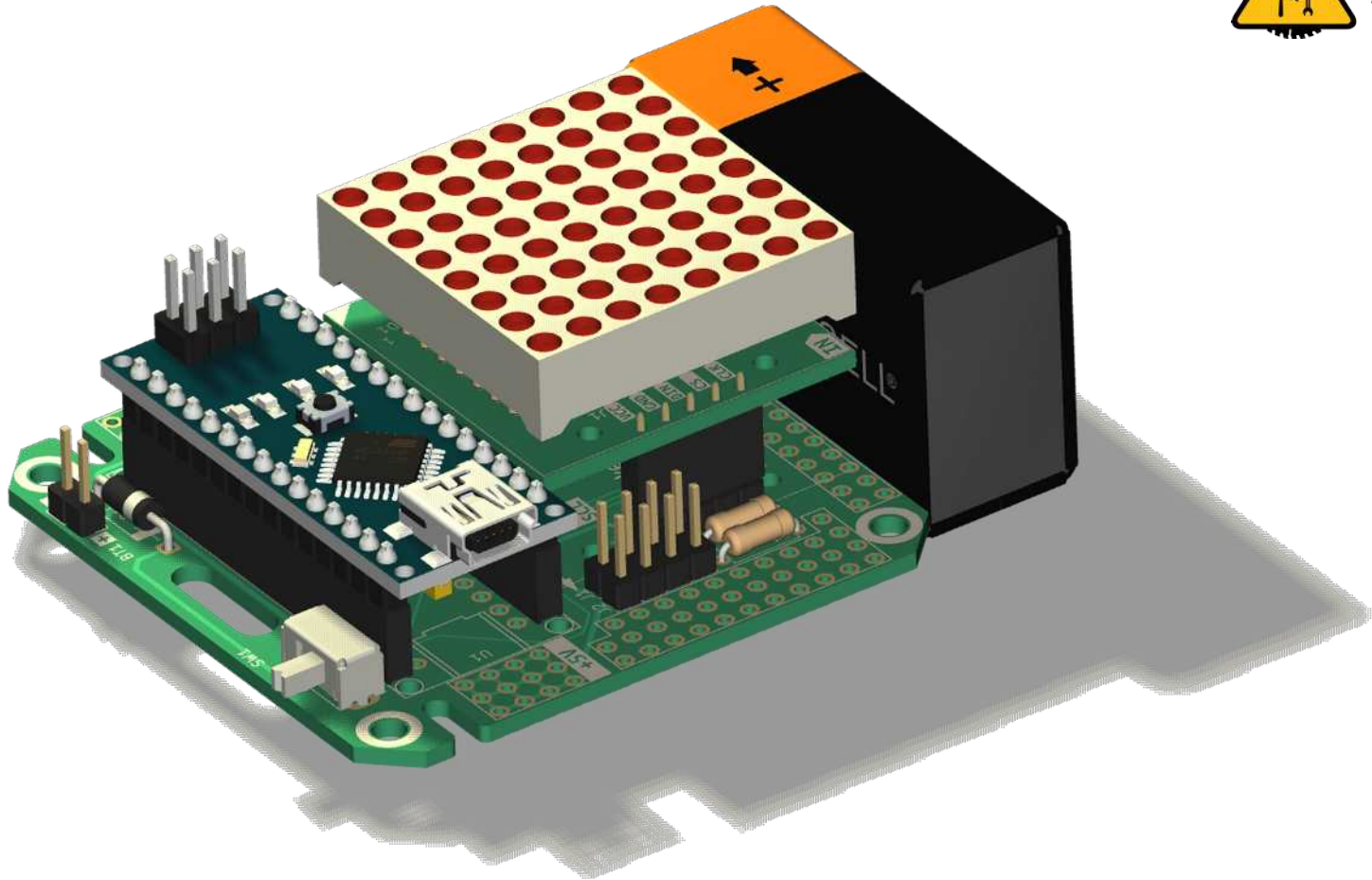- Header sockets
- Header pins
- PCB

Options

Optional upgrades
(not included in kit)

- 2nd single color 8x8 LED Matrix
- Add extra modules
  - I2C modules such as accelerometer, IMU, RTC
  - Buttons, joystick etc
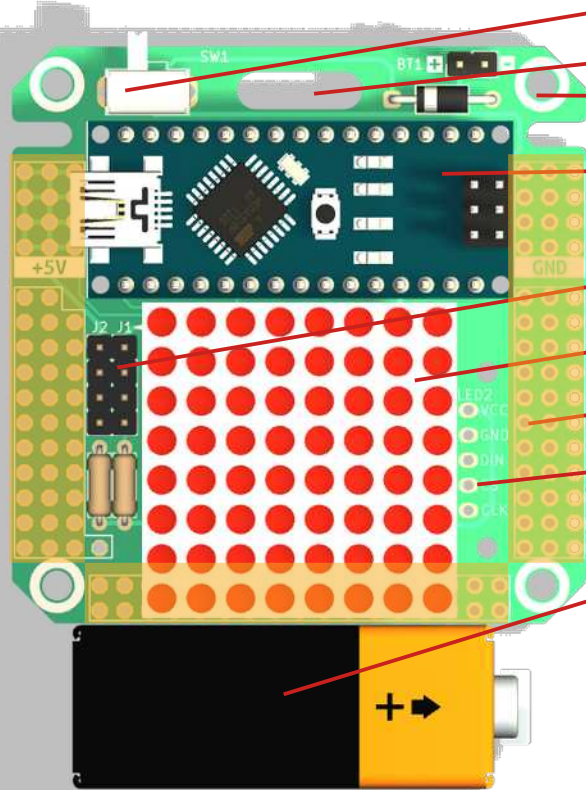- Hackable via prototyping area with 100 pads+ 24 power rail pads

PCB Render

PCB Front view

Switch

Lanyard slot

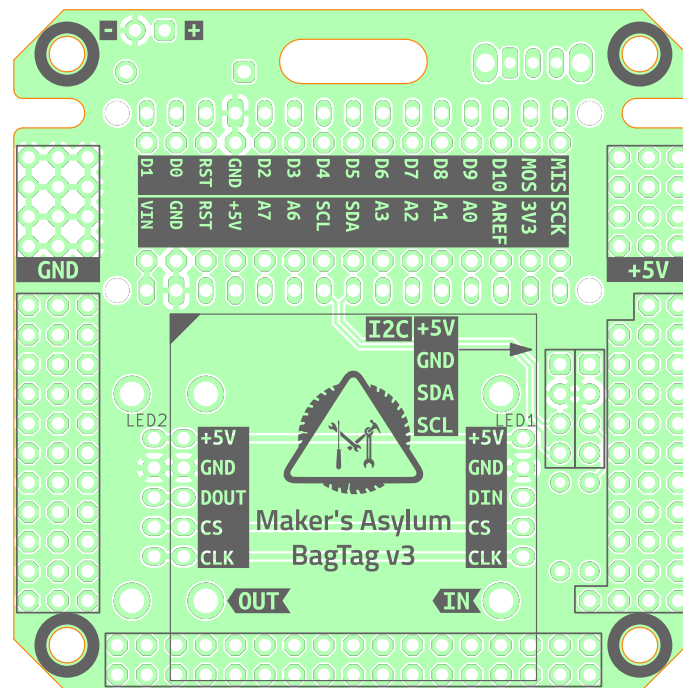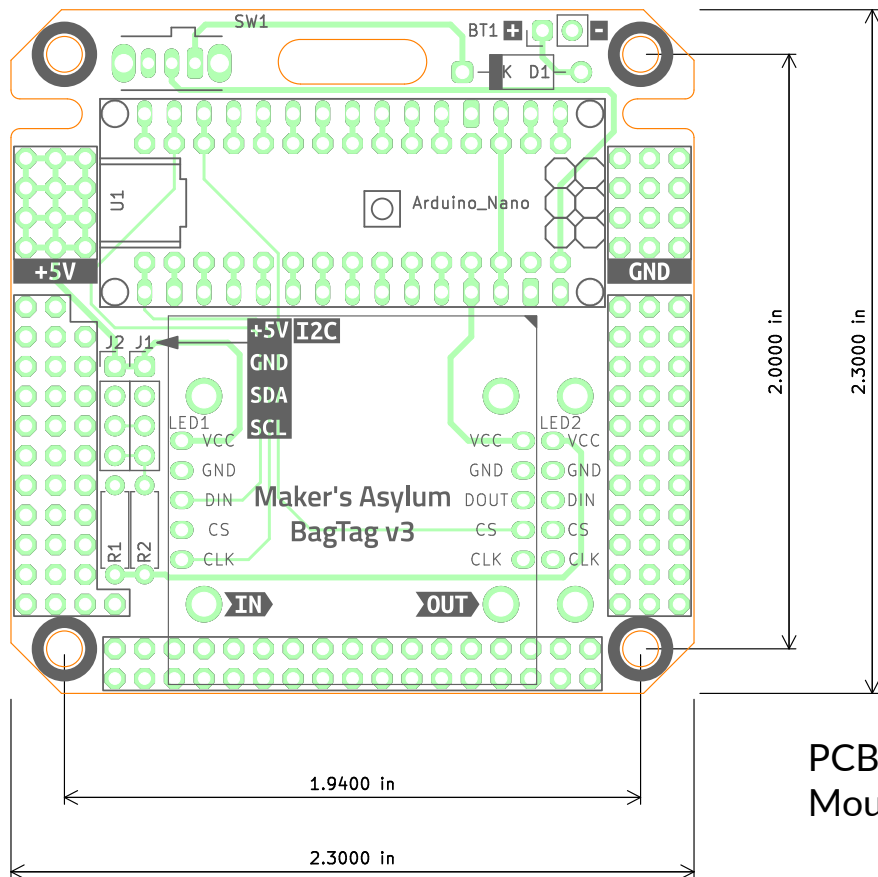Mount holes, x4

Arduino Nano

Spare I²C, x2

Display

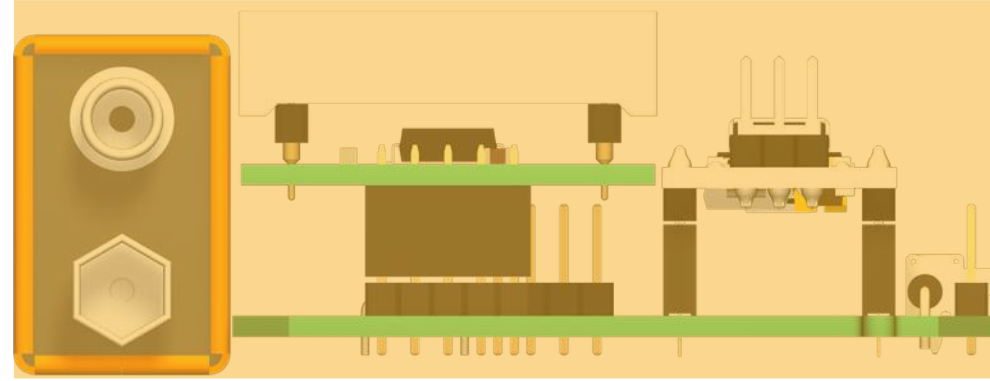Proto area

2ⁿᵈ Display

Battery, 9V

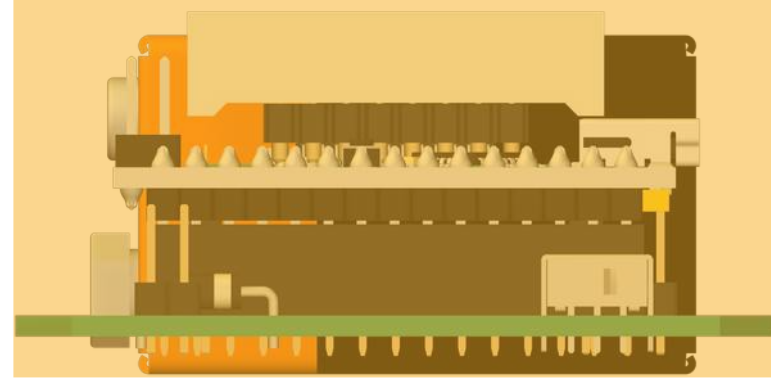MAKER'S ASYLUM

PCB dimensions

PCB = 2.30" x 2.30" (58.4 mm x 58.4 mm)
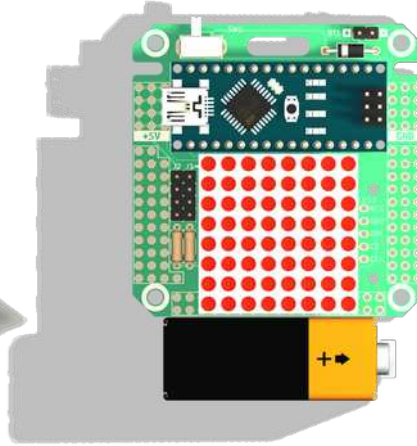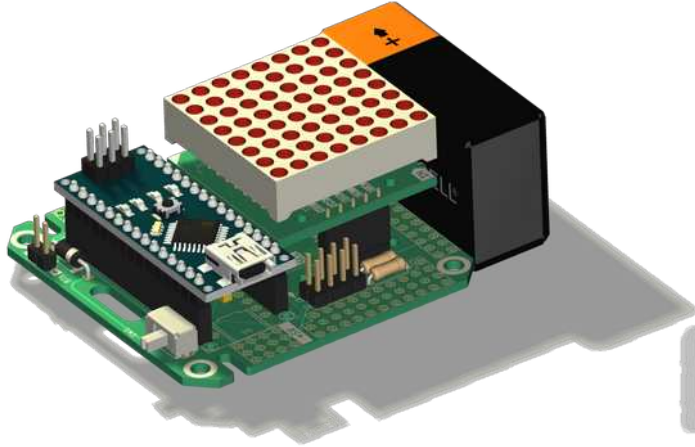Mounting = 1.94" x 2.00" (49.3 mm x 50.8 mm)
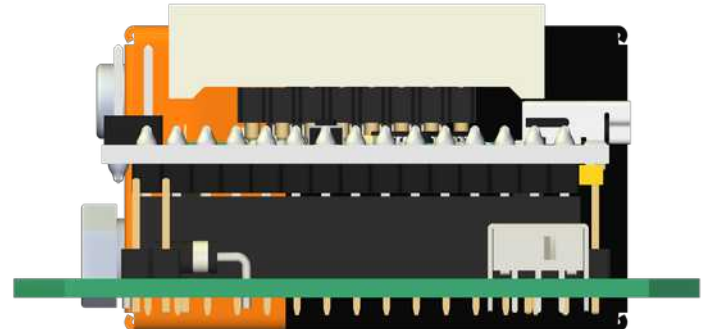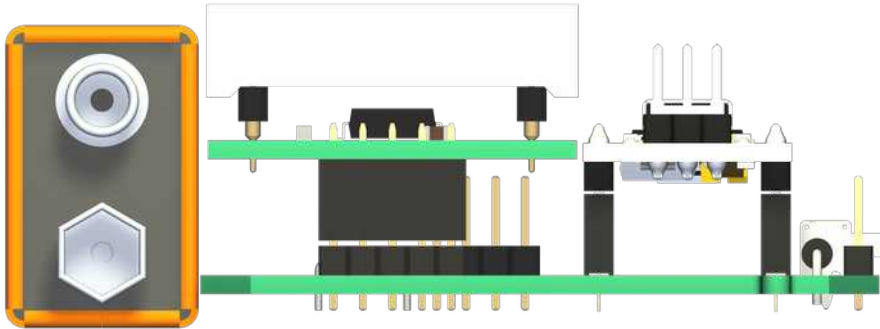
PCB Side views

76 mm

28 mm

60 mm

- Side views of the PCB.
- 8x8 LED matrix display and Arduino Nano require header pins and sockets.
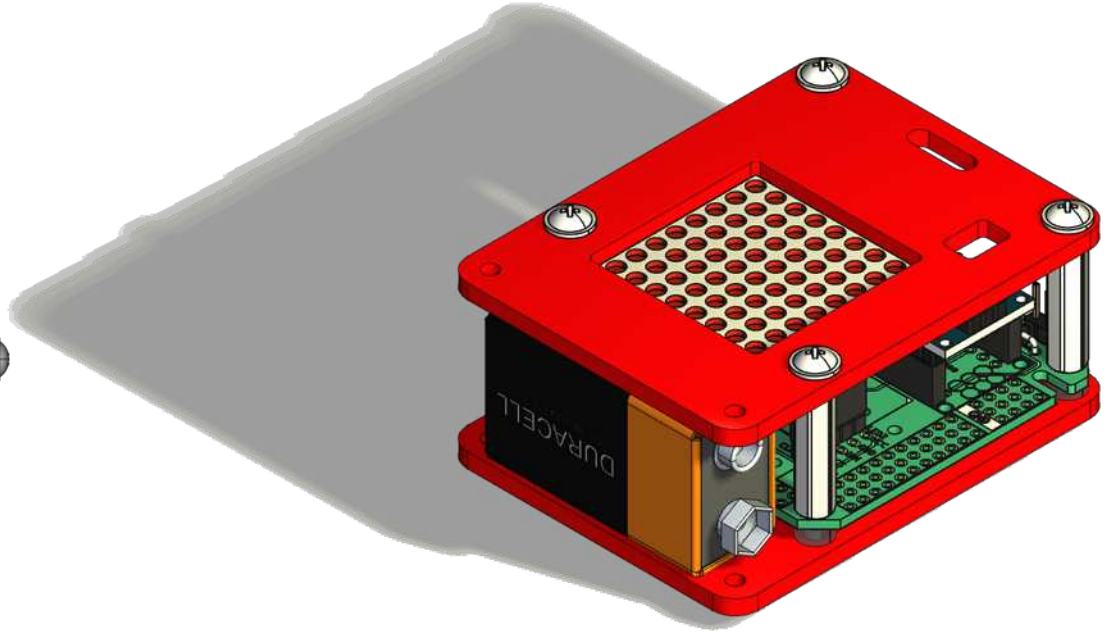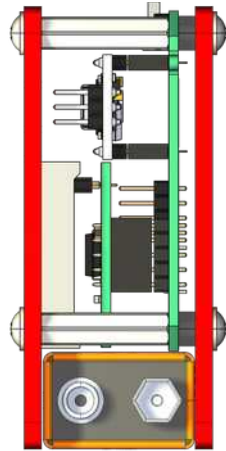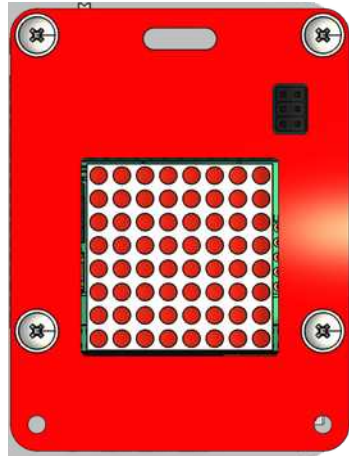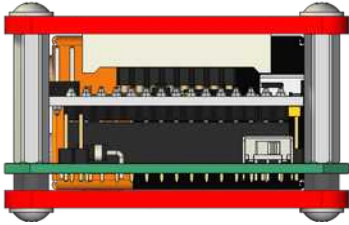- BagTag will fit inside a volume of 76 mm x 60 mm x 28 mm

PCB Battery location

- Battery is not located on the PCB.
- Battery mounting / orientation / location depends on enclosure

Enclosure suggestion

Hacking

- Two extra I^{2}C headers and 100 copper pads for future hacking
- Add a second 8x8 LED matrix, I^{2}C modules (accel, IMU, RTC), buttons etc.
- Some hacking ideas:
  - Electronic Dice (using accelerometer for shake detection)
  - Timer or Clock (using RTC)
  - SNAKE game (using 5 buttons)
  - PONG game using two joysticks
  - Ornament or Wearable
  - VU meter (sound decibel display, using microphone module)