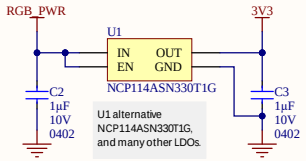
3V3 regulator

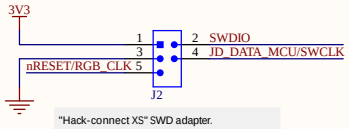


Recommendation: consider replacing NCP114 with an LDO that is robust to repeated spikes of 8V or more on its input in case there is noise on the Jacdac bus.

This component is either a power-consumer, or can be independently powered through the USB connector.

U1 alternative NCP114ASN330T1G, and many other LDOs.

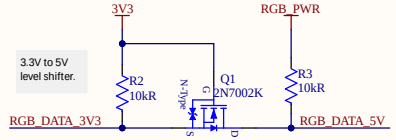
Programming/debug connector

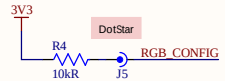


"Hack-connect XS" SWD adapter.

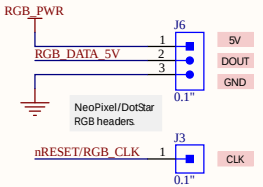
https://arcade.makecode.com/hardware/dbg

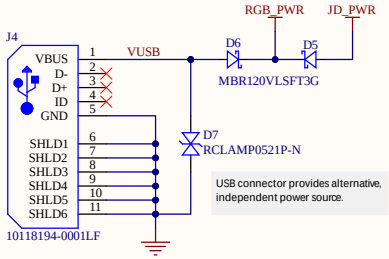
Independent power and RGB LED interfaces





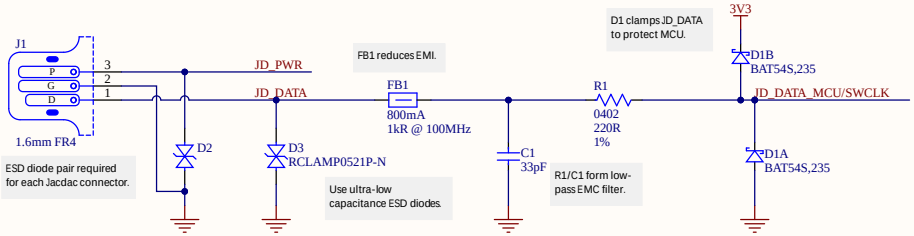
NeoPixel/DotStar configuration: Defaults to NeoPixel, blob for DotStar.





USB connector provides alternative, independent power source.

Jacdac connector



FB1 reduces EMI.

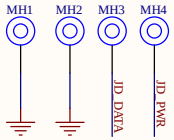
D1 clamps JD_DATA to protect MCU.

ESD diode pair required for each Jacdac connector.

Use ultra-low capacitance ESD diodes.

R1/C1 form low-pass EMC filter.

Mounting holes



Mounting holes are electrically connected to the Jacdac bus nets so they can be used as an alternative to the PCB edge connector. Please use the following reference designators and net mapping:

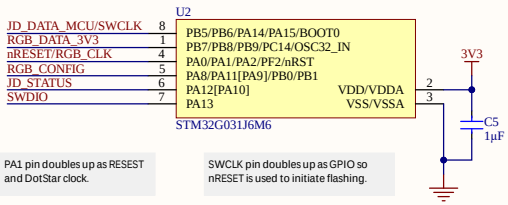
MH1 & MH2: GND
MH3: JD_DATA
MH4: JD_PWR

This design uses Jacdac 'small' mounting holes: PTH with finished diameter of 2.1mm, annular copper ring of 3.0mm diameter & copper/component keepout of 5.0mm. The mounting holes must be on 2.5mm pitch. Mounting holes should have appropriate silkscreen marker, and MH1 should have a pin 1 marker on the top side.

MCU

U2 critical pin mappings:
PB6 USART1_TX for JD data
PA12 JD monochromatic LED
PB7 RGB strip data
PA8 RGB strip config

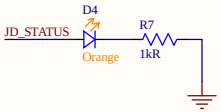
JD_DATA doesn't need WAKEUP pin because deepest sleep isn't used.



PA1 pin doubles up as RESEST and DotStar clock.

SWCLK pin doubles up as GPIO so nRESET is used to initiate flashing.

Status LED



Jacdac modules require a status LED.

The LED can be monochrome or multicolor depending on GPIO availability.

This reference design is a guideline. Please refer to the Jacdac docs online at https://aka.ms/jacdac for the definitive and most up-to-date information.

Silkscreen should include text to identify the module type and revision, and optionally a QR code.

This design uses a 'cute' board shape.

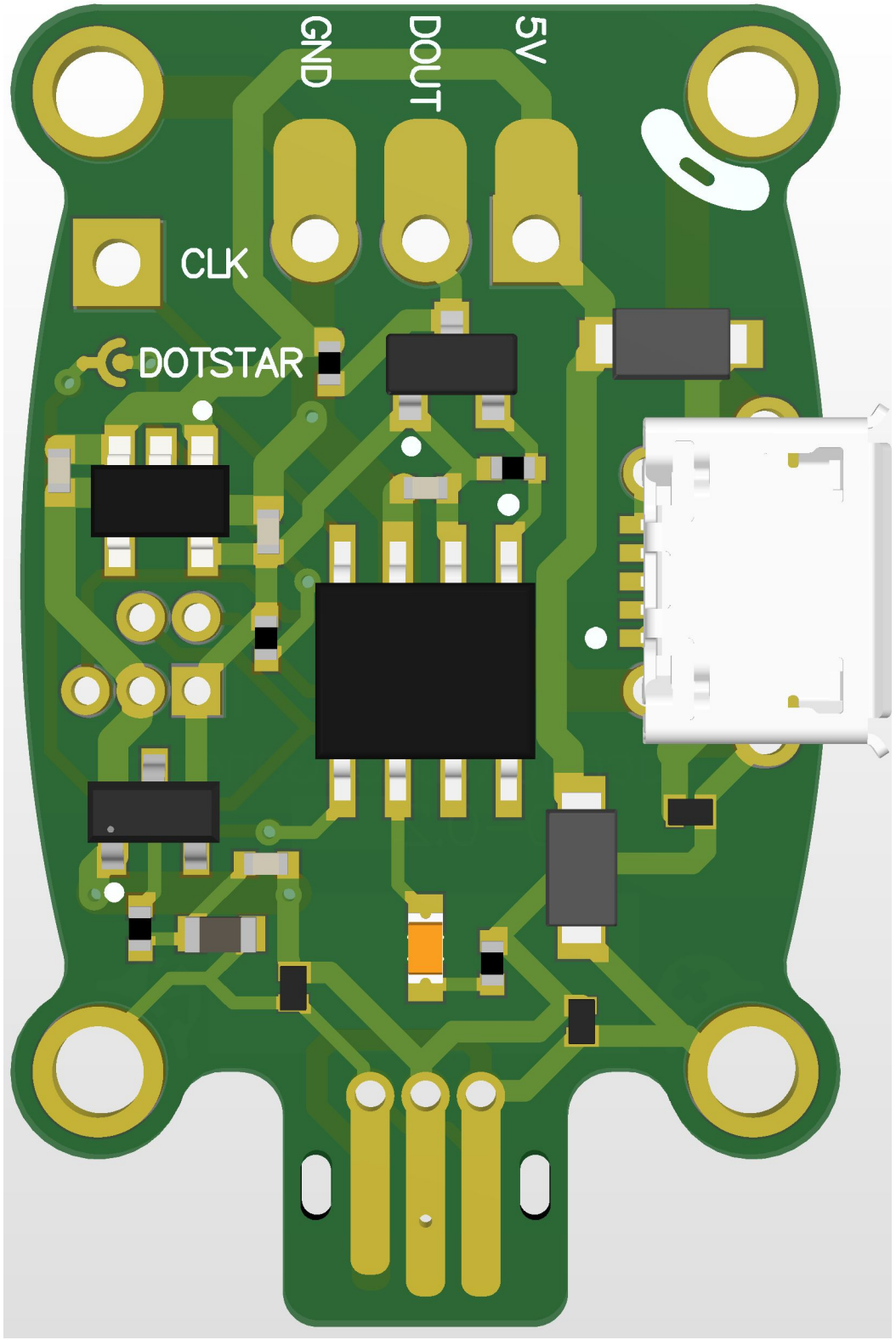
Silkscreen & layout notes

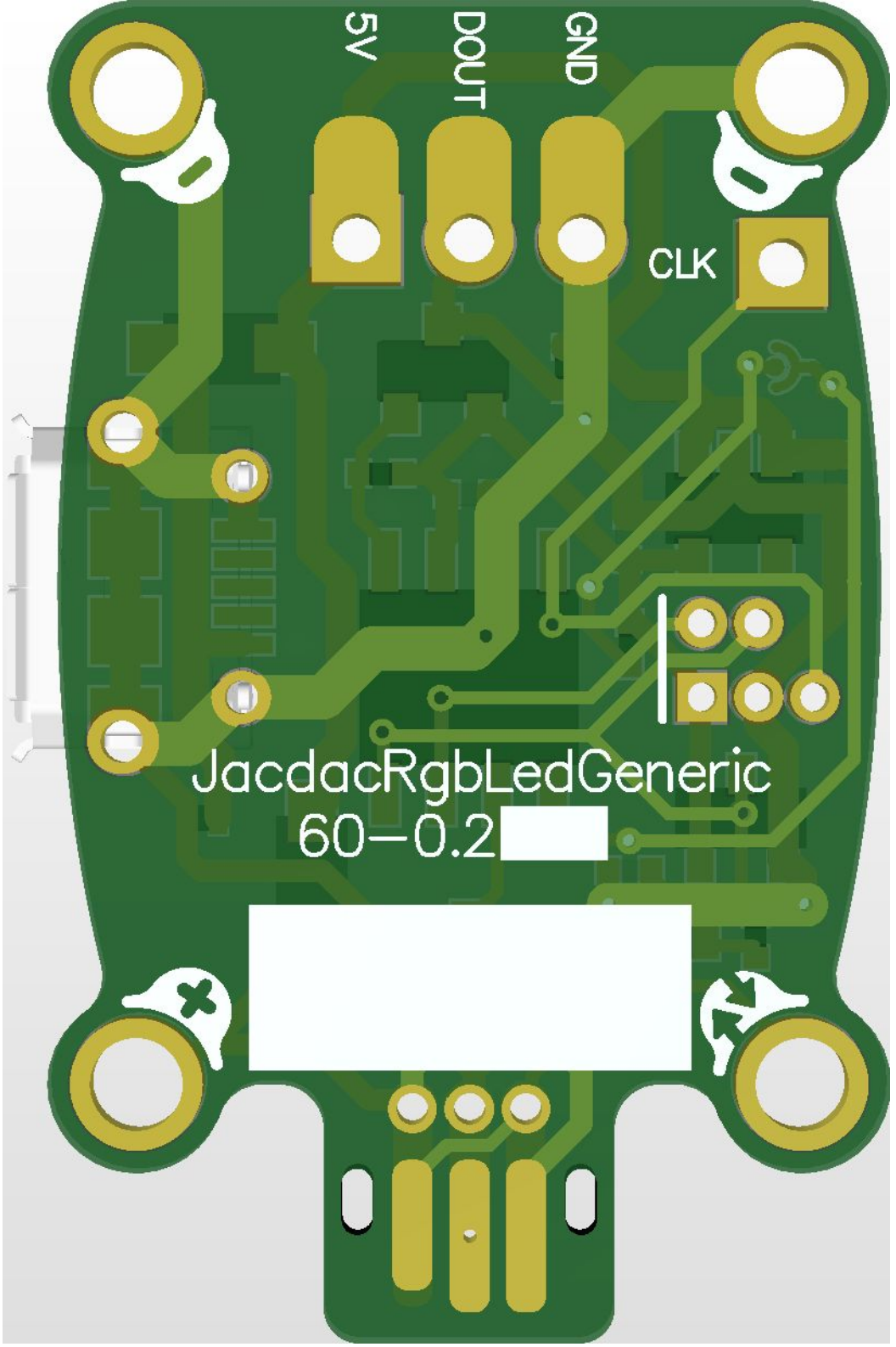
Block name

Design notes

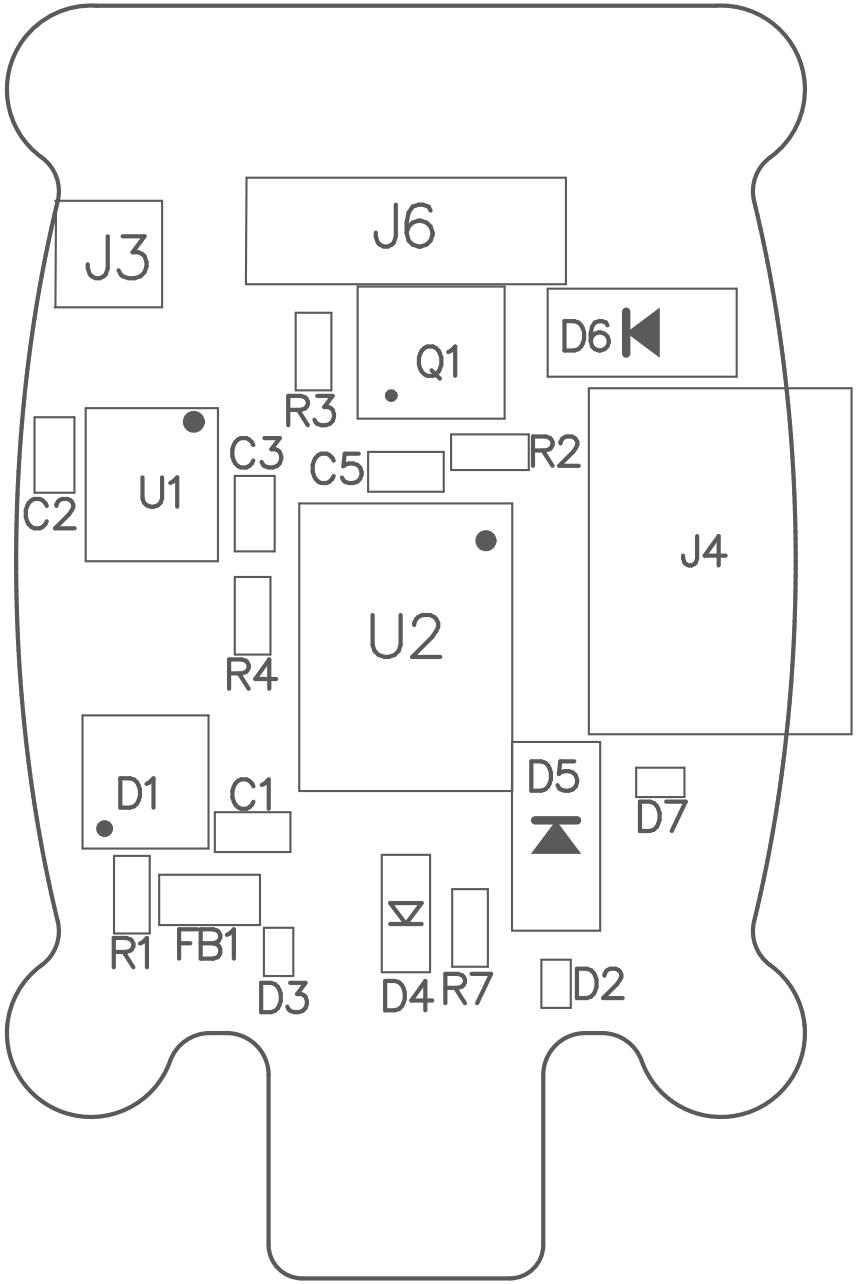
When this PDF is viewed with Adobe Reader, clicking on components shows part numbers and other details.

Microsoft	PROJECT DESCRIPTION Jacdac module to interface with RGB strip						SHEET DESCRIPTION Complete design	
SHEET FILENAME JacdacRgbLedGeneric 60.SchDoc	PROJECT FILENAME JacdacRgbLedGeneric 60.PrjPCB	PROJECT CODENAME JacdacRgbLedGeneric	LICENCE Attribution 4.0 International (CC BY 4.0)	LAST MODIFIED 20/12/2021	PAGE 1 OF 1	DRAWN BY D. Gakure & S. Hodges	REVISION 0.2	PCB ID 60-0.2


GND
DOUT
5V
CLK
DOTSTAR


5V
DOUT
GND
CLK
JacdacRgbLedGeneric
60–0.2

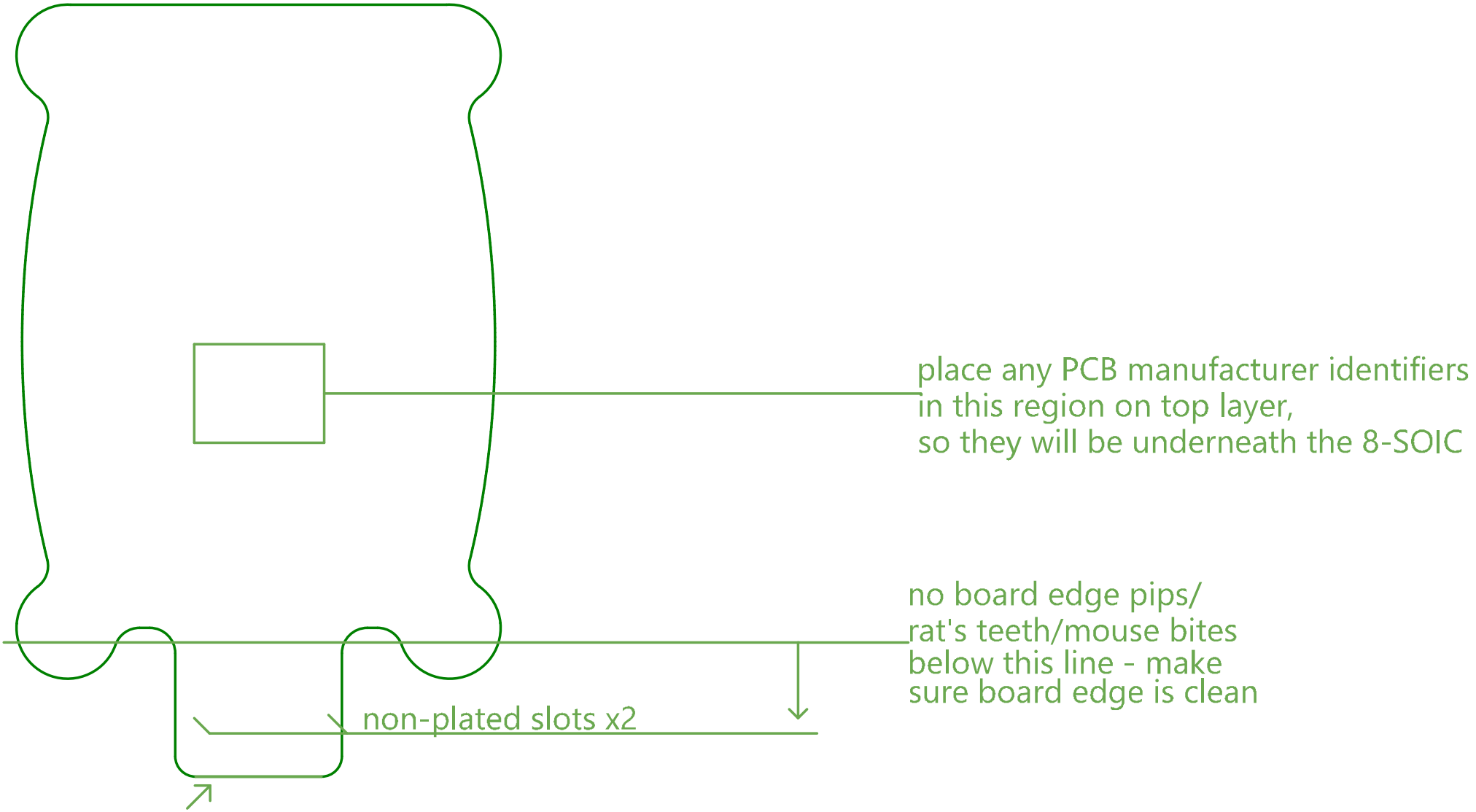
Board Outline
Top Assy



Board Outline

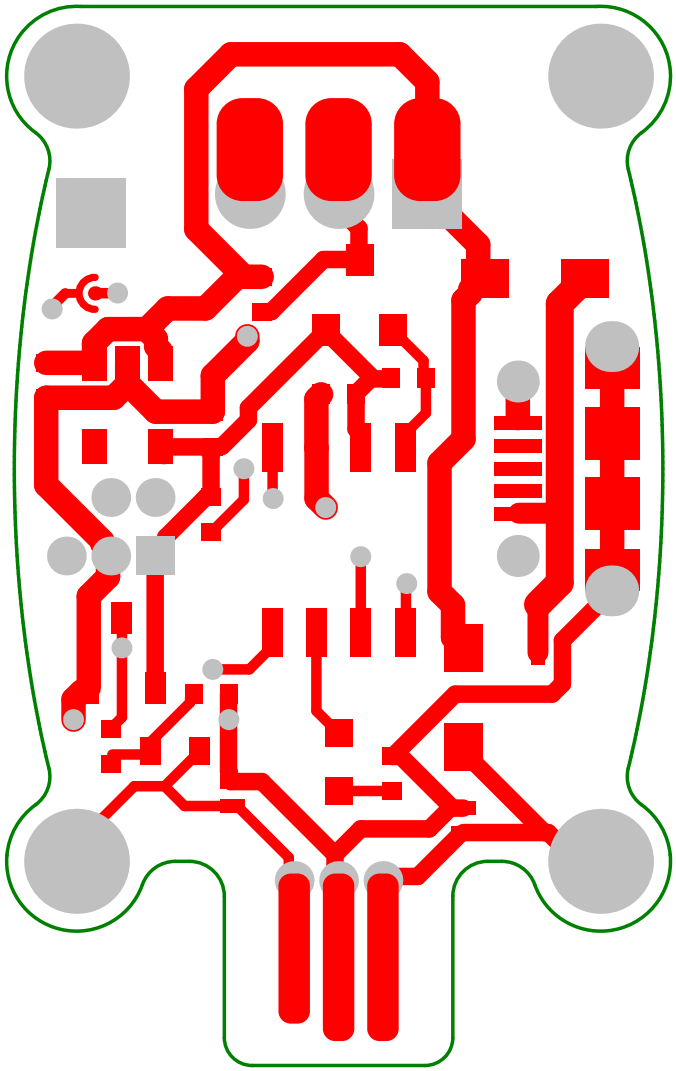
Bottom Assy

Fabrication Notes
Board Outline



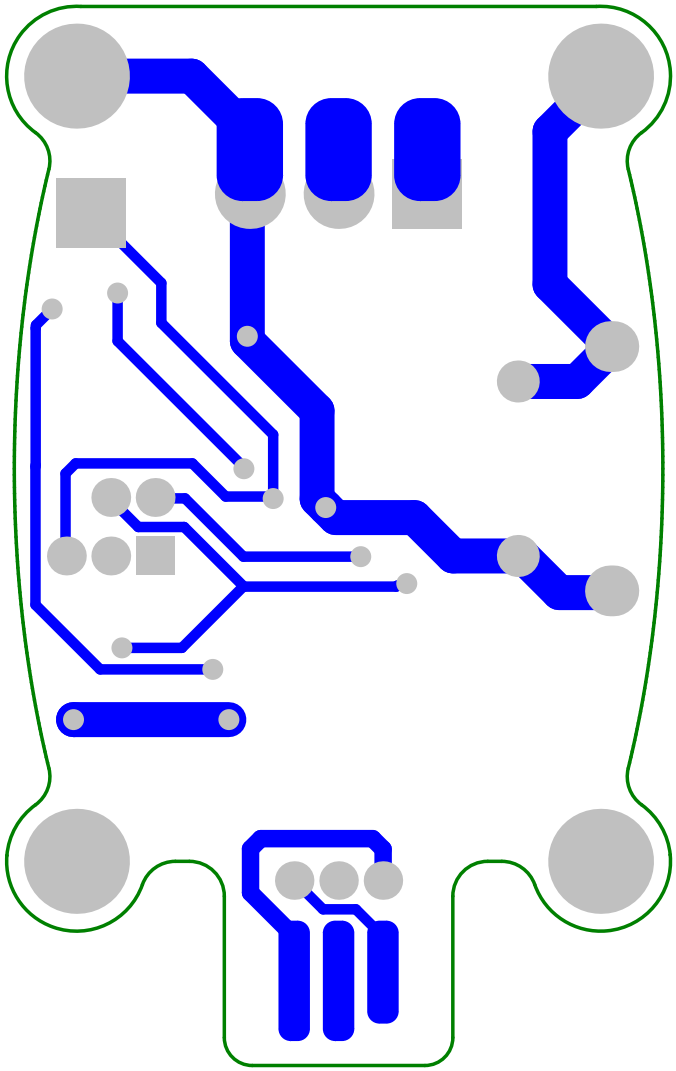
Top Layer

Board Outline



Bottom Layer

Board Outline

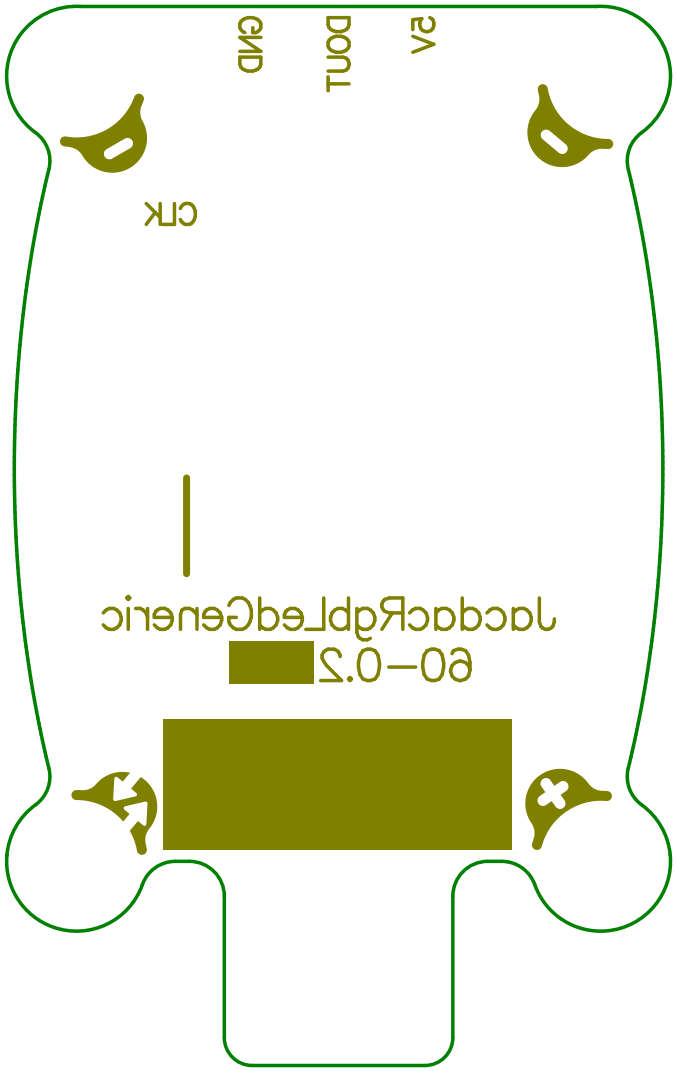


Board Outline

Top Overlay

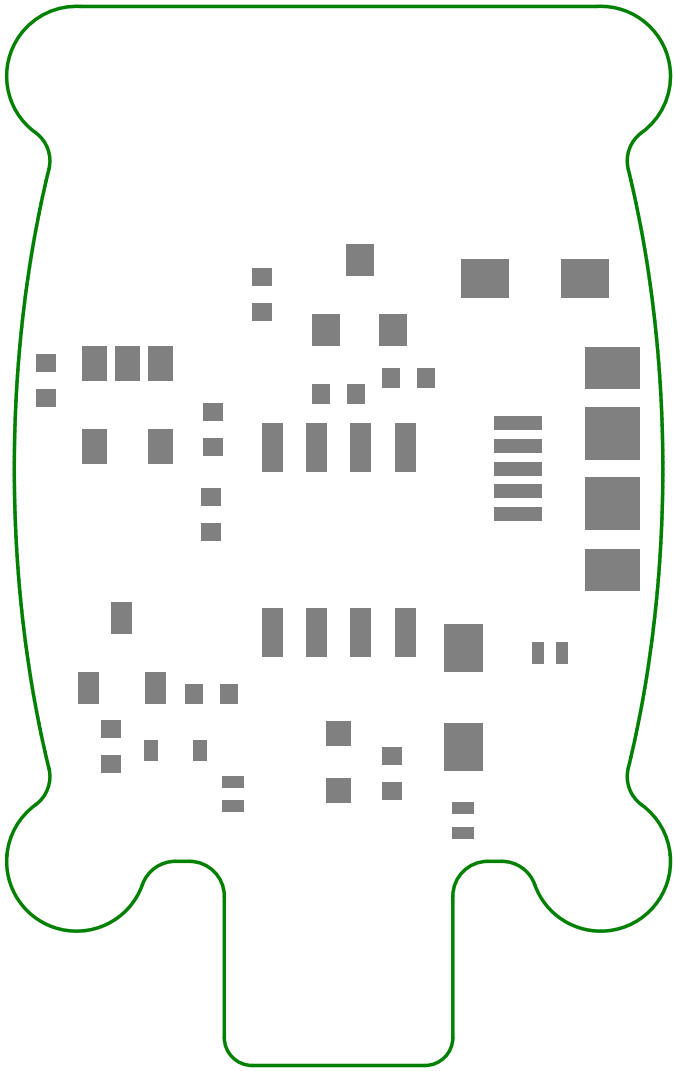
Board Outline

Bottom Overlay

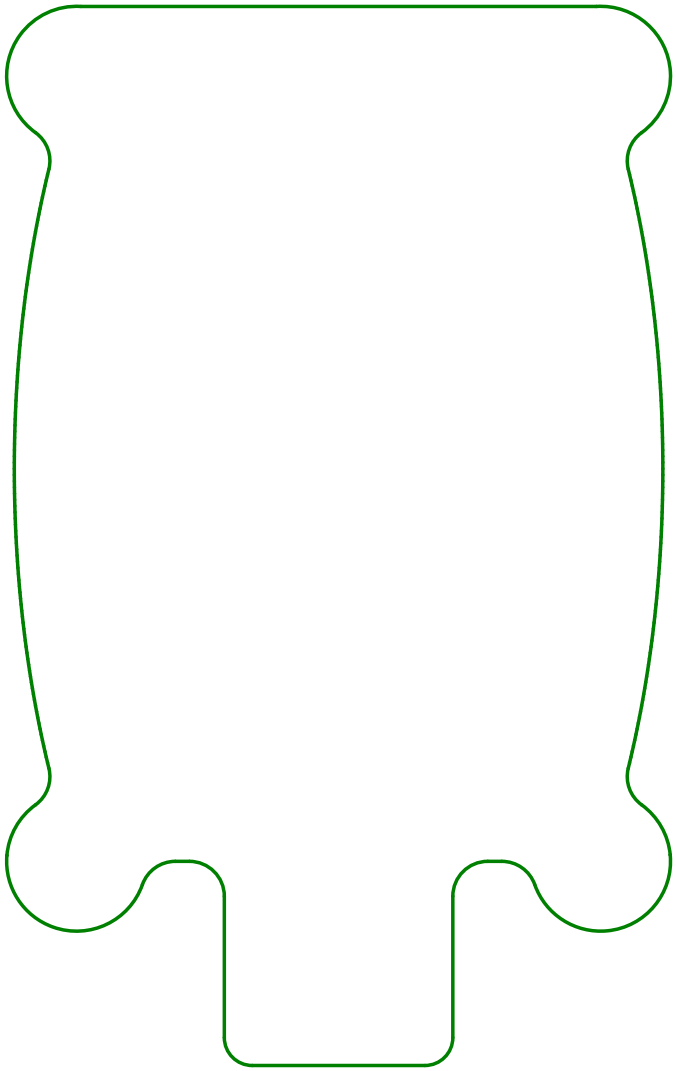


Board Outline

Top Paste

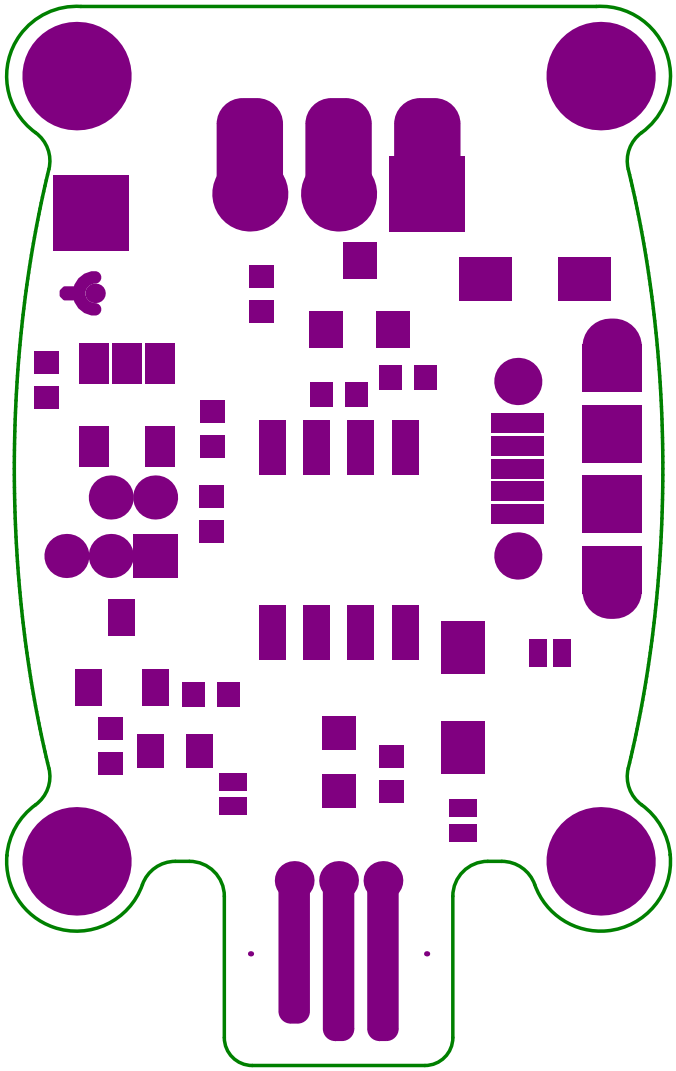


Board Outline



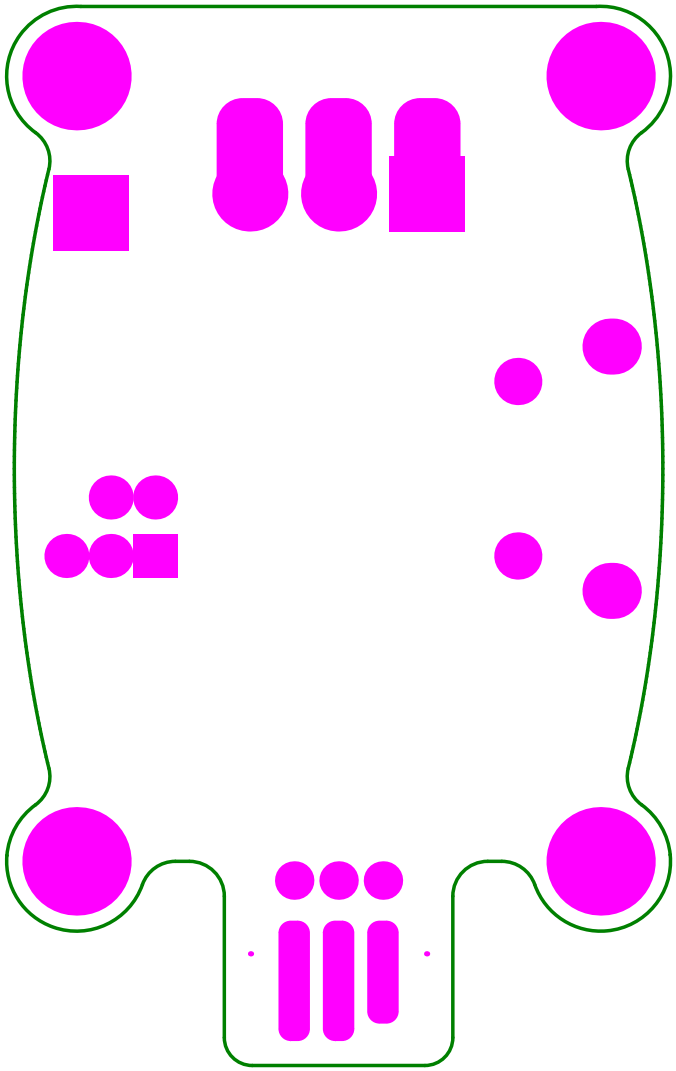
Bottom Paste

Board Outline



Top Solder (resist)

Board Outline



Bottom Solder (resist)

Board Outline