# Project Documentation

## Ultimate 64 Keyboard Extension

Project number: 151

Revision: 0

Date: 26.06.2020

# Ultimate 64 Keyboard Extension Rev. 0

## Module Description

This is a keyboard extension for the Ultimate 64. It was designed in collaboration with @edu_arana.

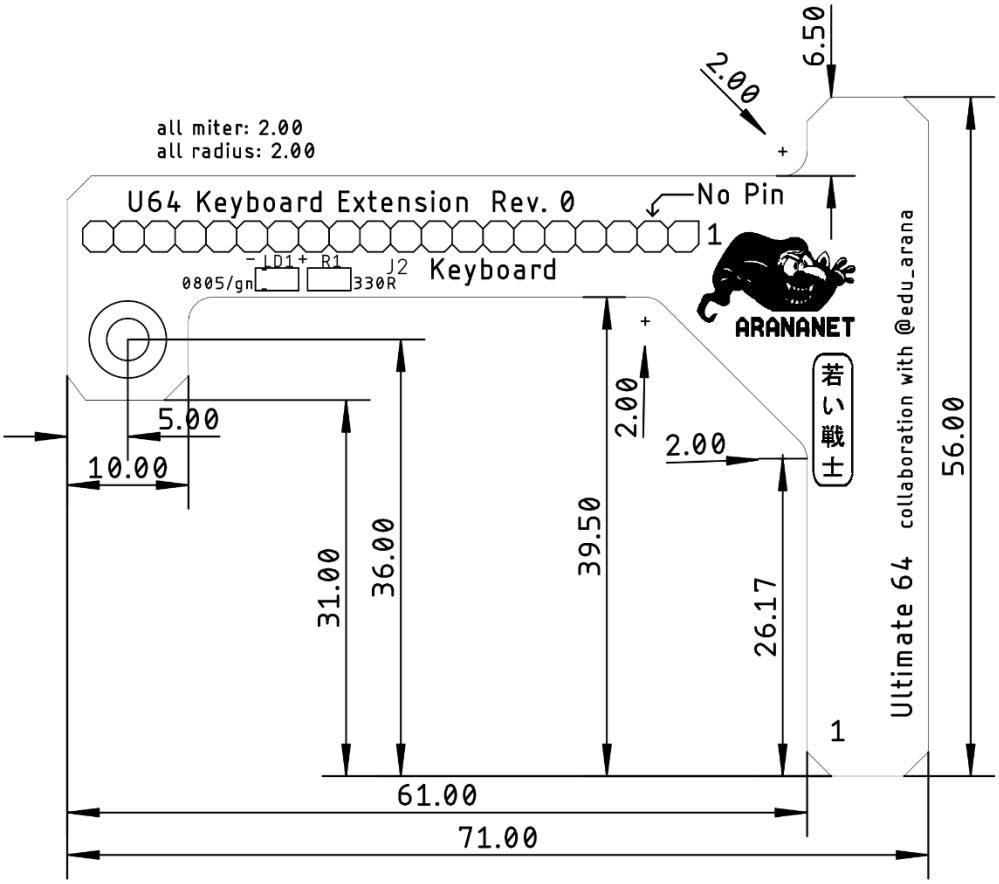



*Figure 1: Dimensions*

When using the 3D printed keyboard mounting bracket (https://www.thingiverse.com/thing:3220123), the access to the keyboard connector is blocked. Also, some keyboard cables are too short, so it does not reach the position of the connector or it is installed with a not acceptable tension. The Ultimate 64 Keyboard Extension fixes this problem.

The PCB offers an optional power LED (SMD 0805).

# Connectors

## J1 - Keyboard connector to Ultimate 64

Receptacle (1x20p, pitch 2.54mm) – Harwin M20-7862042

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | GND | 11 | ROW1 (PB1) |
| 2 | No pin | 12 | ROW0 (PB0) |
| 3 | $\overline{\text{RESTORE}}$ | 13 | COL0 (PA0) |
| 4 | +5V | 14 | COL6 (PA6) |
| 5 | ROW3 (PB3) | 15 | COL5 (PA5) |
| 6 | ROW6 (PB6) | 16 | COL4 (PA4) |
| 7 | ROW5 (PB5) | 17 | COL3 (PA3) |
| 8 | ROW4 (PB4) | 18 | COL2 (PA2) |
| 9 | ROW7 (PB7) | 19 | COL1 (PA1) |
| 10 | ROW2 (PB2) | 20 | COL7 (PA7) |

## J2 – Pin Header to Keyboard

Standard 1x20p, pitch 2.54. Pin 2 has to be removed to fit the C64 keyboard connector. The pin out is identical to J1.

# Mounting

The distance between this keyboard extension and the bottom of the case depends on the height of the receptacle. With a 8mm high receptacle, it is approximately 16mm. The project includes 3D printed a stand-off of this height.

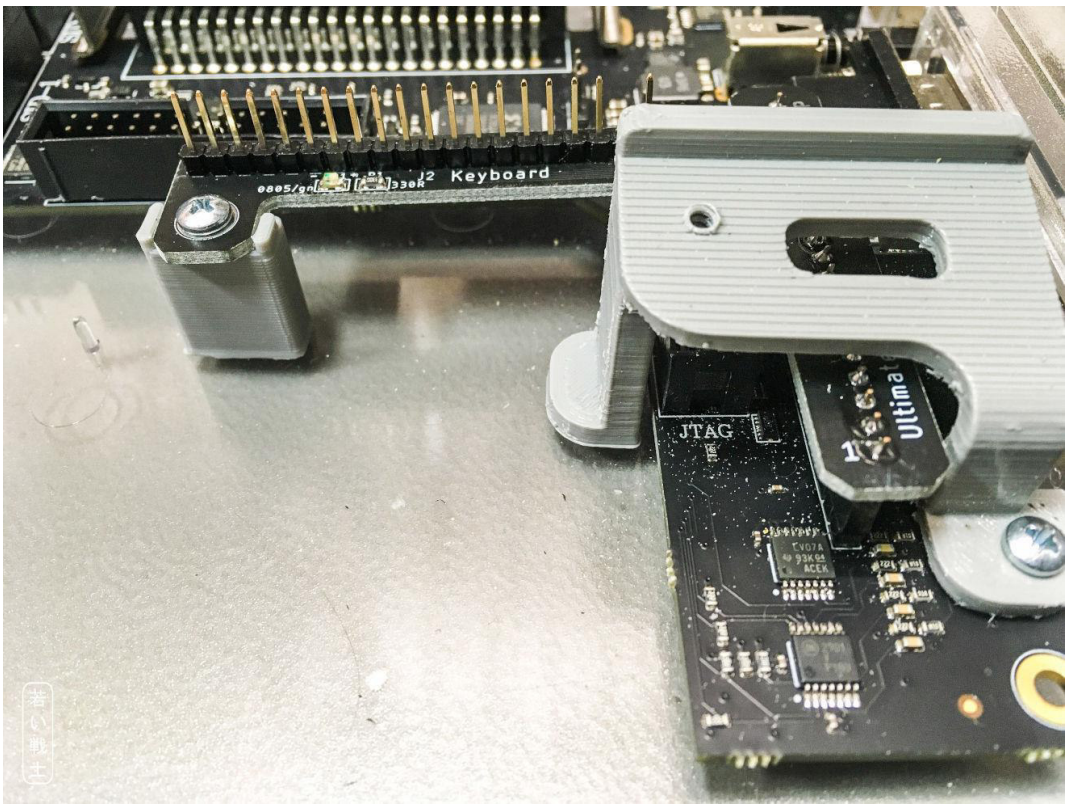



*Figure 2: Mounting of the keyboard extension with stand-off and keyboard bracket*

The recommended screw for the stand-off is a C2.9x9.5 DIN 7981.

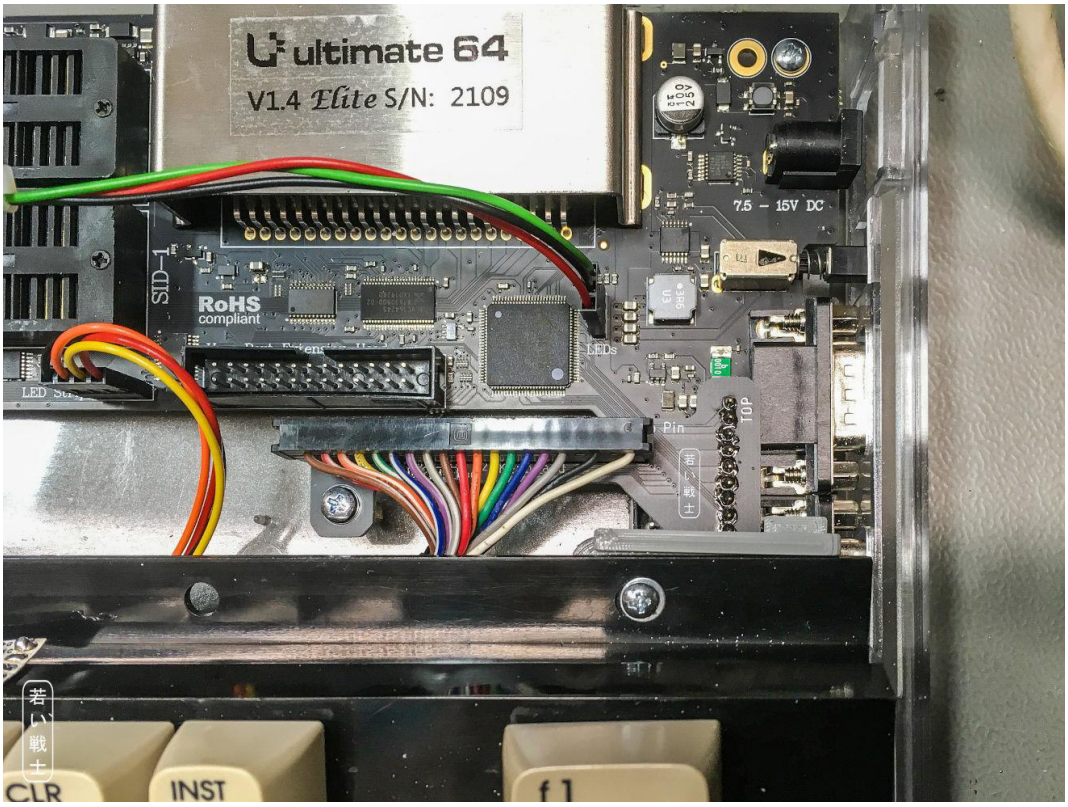
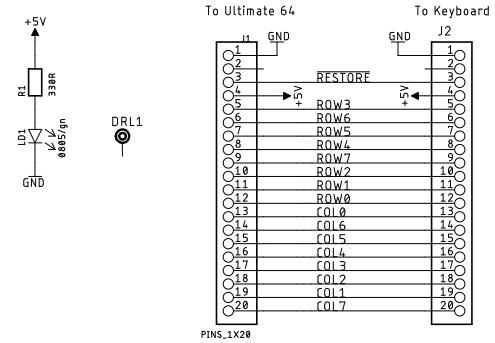


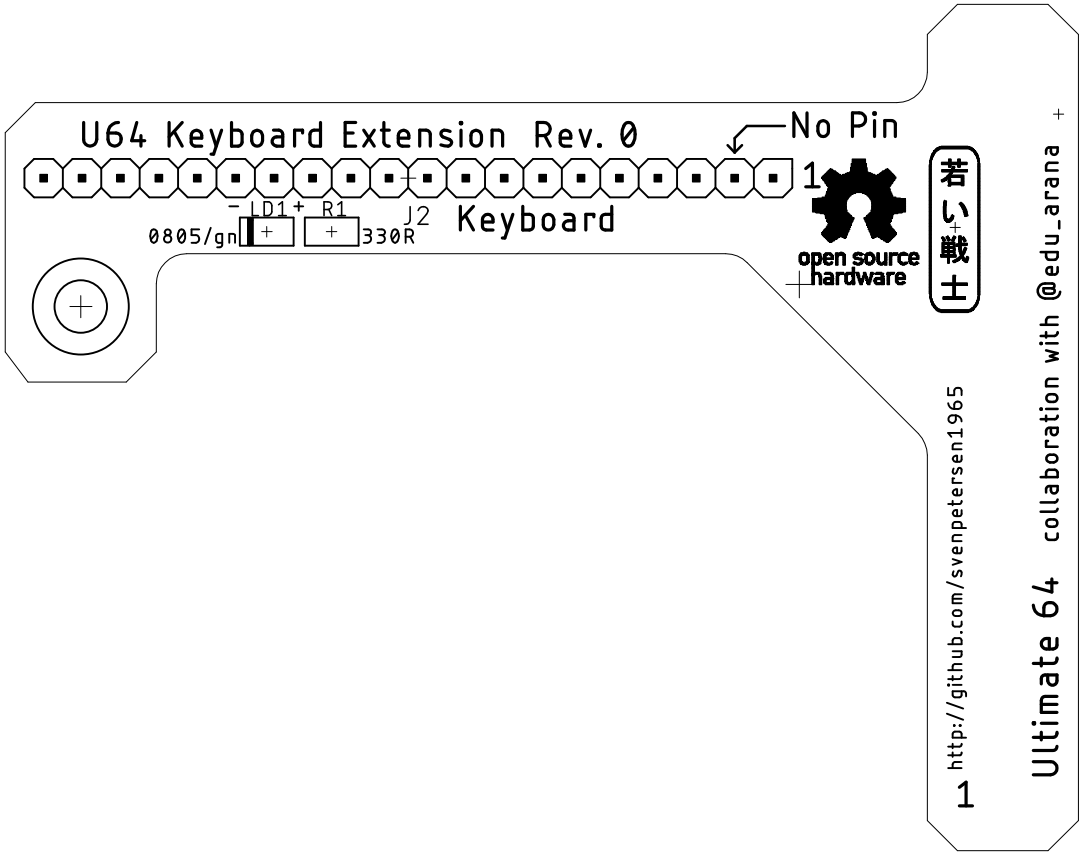

*Figure 3: Complete assembly with keyboard installed*



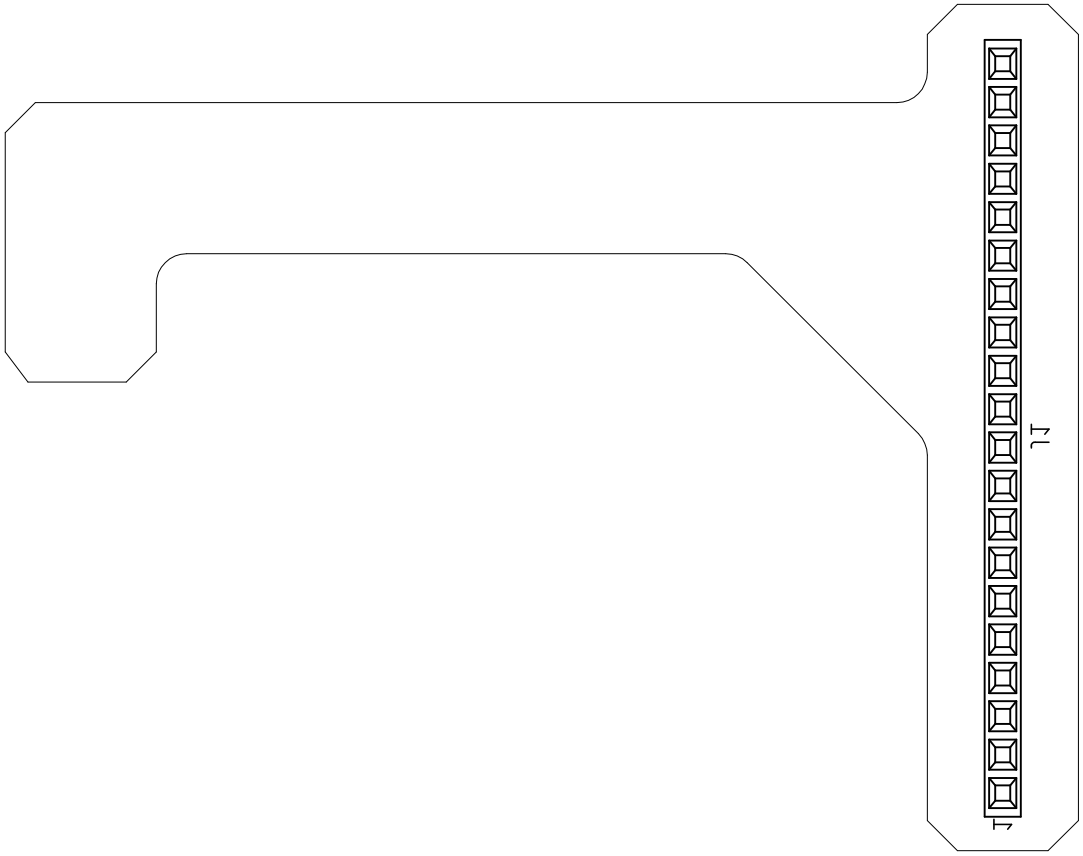

open source hardware

| | | | |
|---|---|---|---|
| Title: | Ultimate 64 Keyboard Adapter | Doc.-No.: | 151-1-01-00 |
| | | Draft.: | Sven Petersen |
| Date: | 26.06.2020 15:02 | Rev.: 0 | Page 1/1 |
| File: | U64_KB_Ada | | |
| | | | A3 |

| Sven Petersen 2020 | Doc.-No.: 151-2-01-00 | |
|---|---|---|
| | Cu: 35µm | Cu-Layers: 2 |
| U64_KB_Ada | | |
| 11.08.2020 19:16 | | Rev.: 0 |
| placement component side | | |



| | | |
|---|---|---|
| Sven Petersen<br>2020 | Doc.-No.: 151-2-01-00 | |
| | Cu: 35µm | Cu-Layers: 2 |
| U64_KB_Ada | | |
| 11.08.2020 19:16 | | Rev.: 0 |
| placement solder side | | |



| Sven Petersen 2020 | Doc.-No.: 151-2-01-00 | |
|---|---|---|
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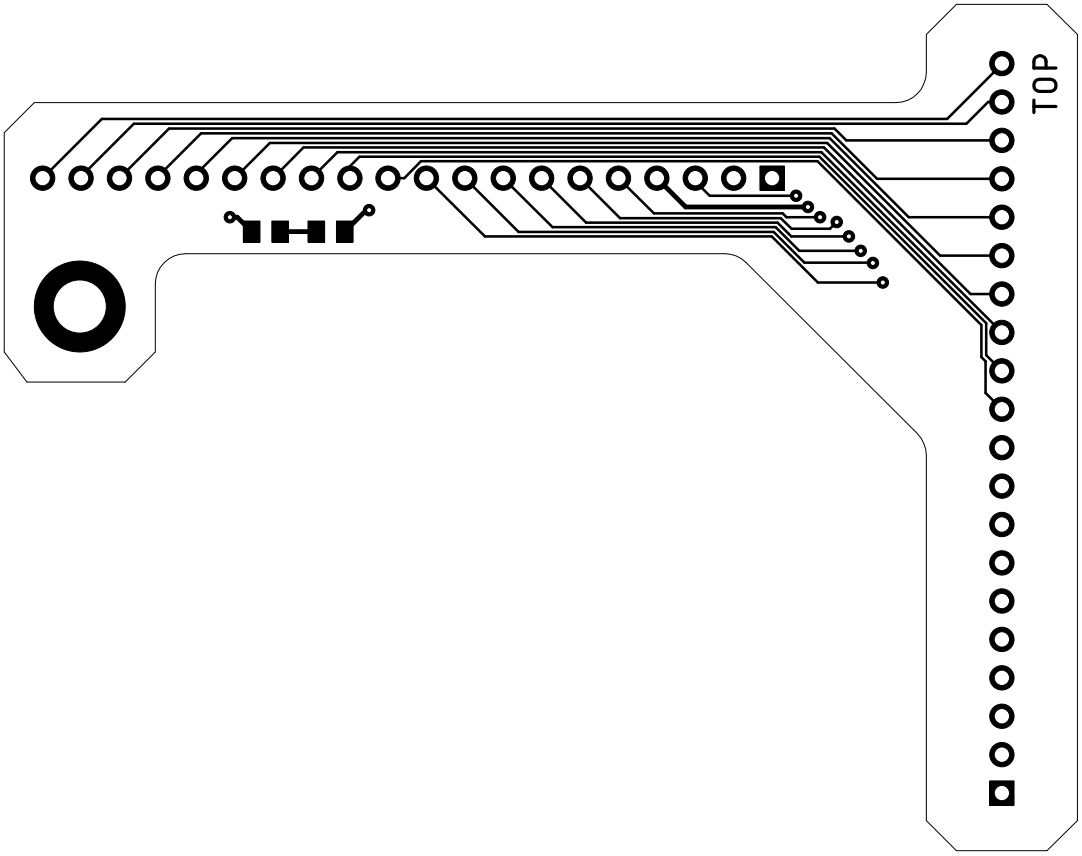
| 26.06.2020 07:49 | | Rev.: 0 |
| top | [redacted] | |



| Sven Petersen 2020 | Doc.-No.: 151-2-01-00 | |
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| U64_KB_Ada | | |
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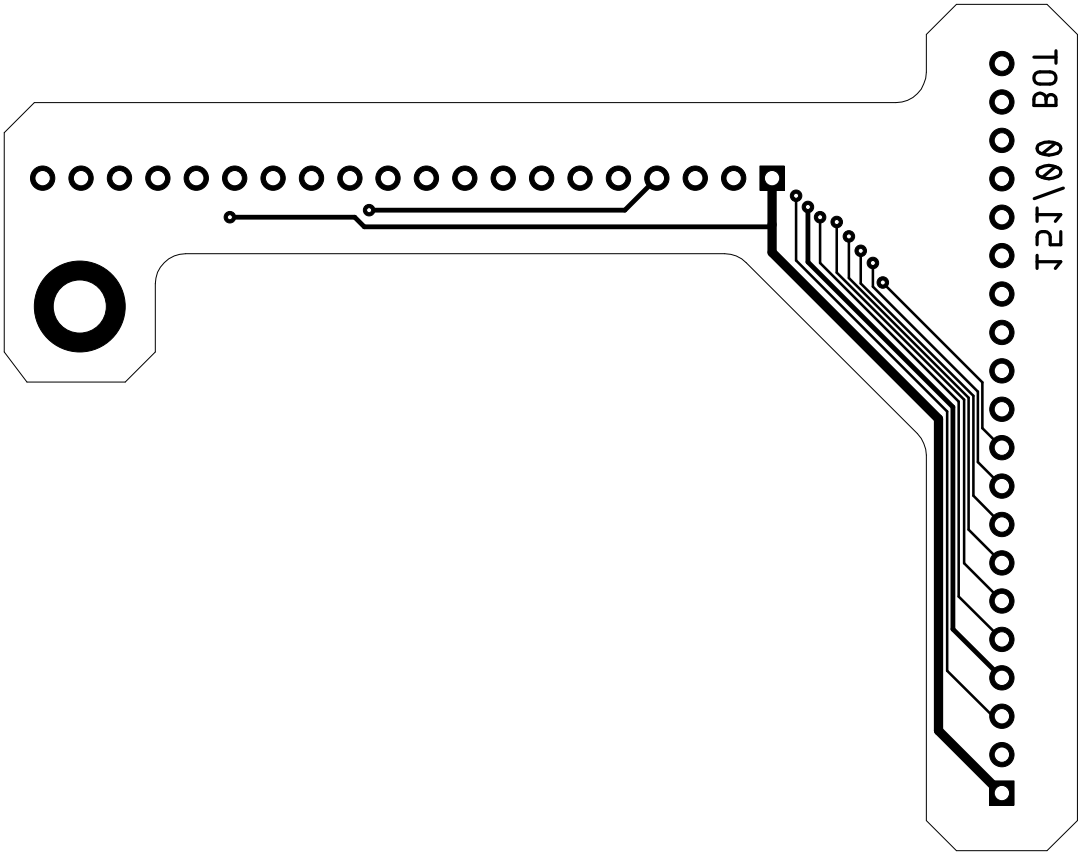
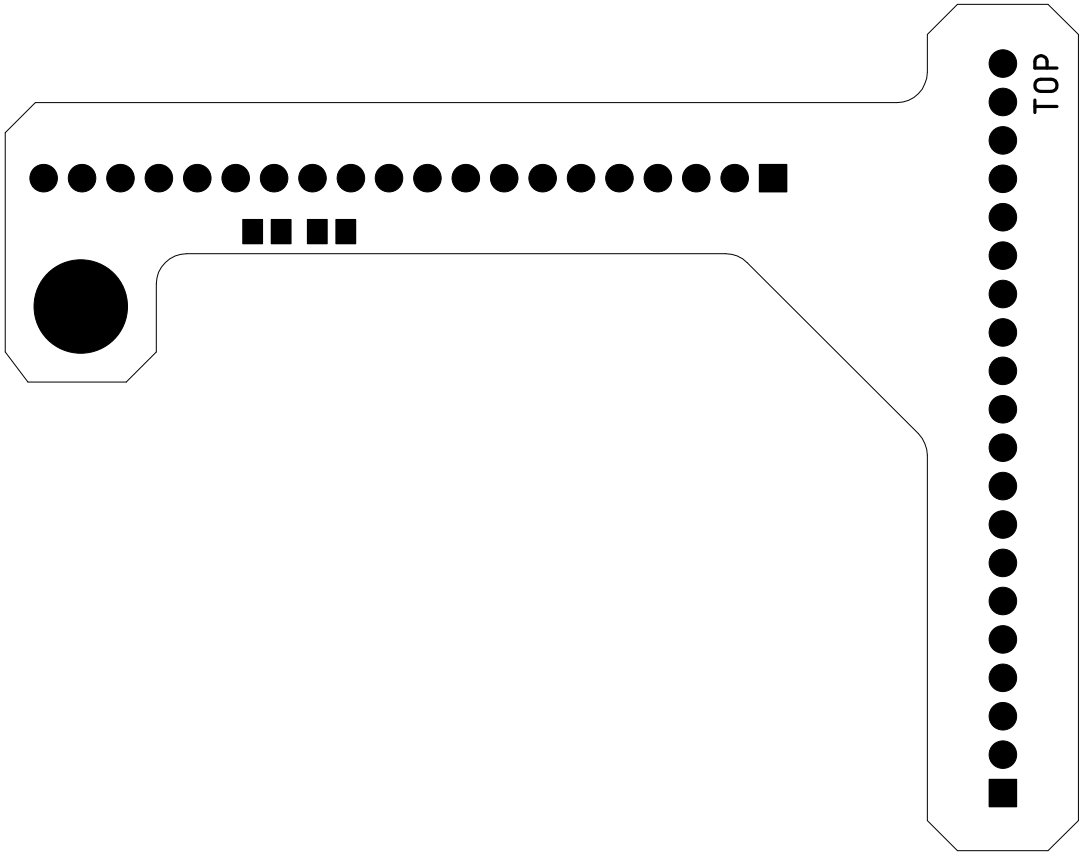
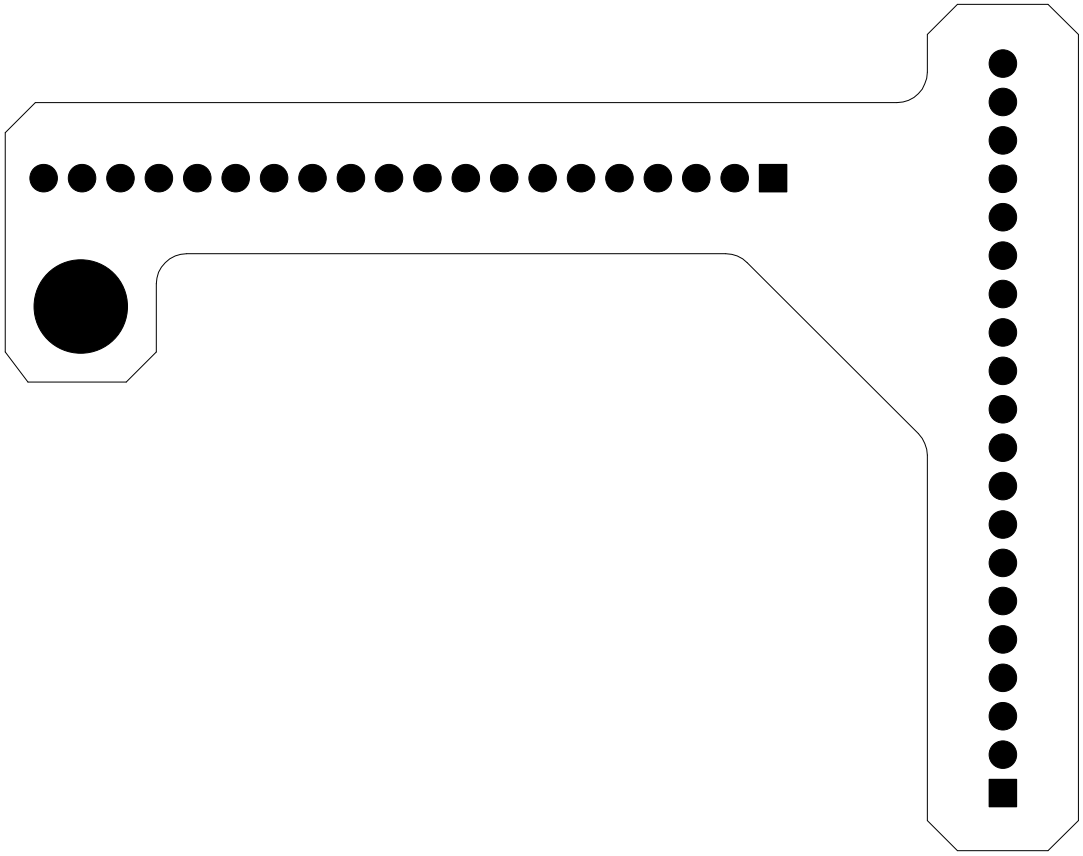
| bottom | [redacted] | |



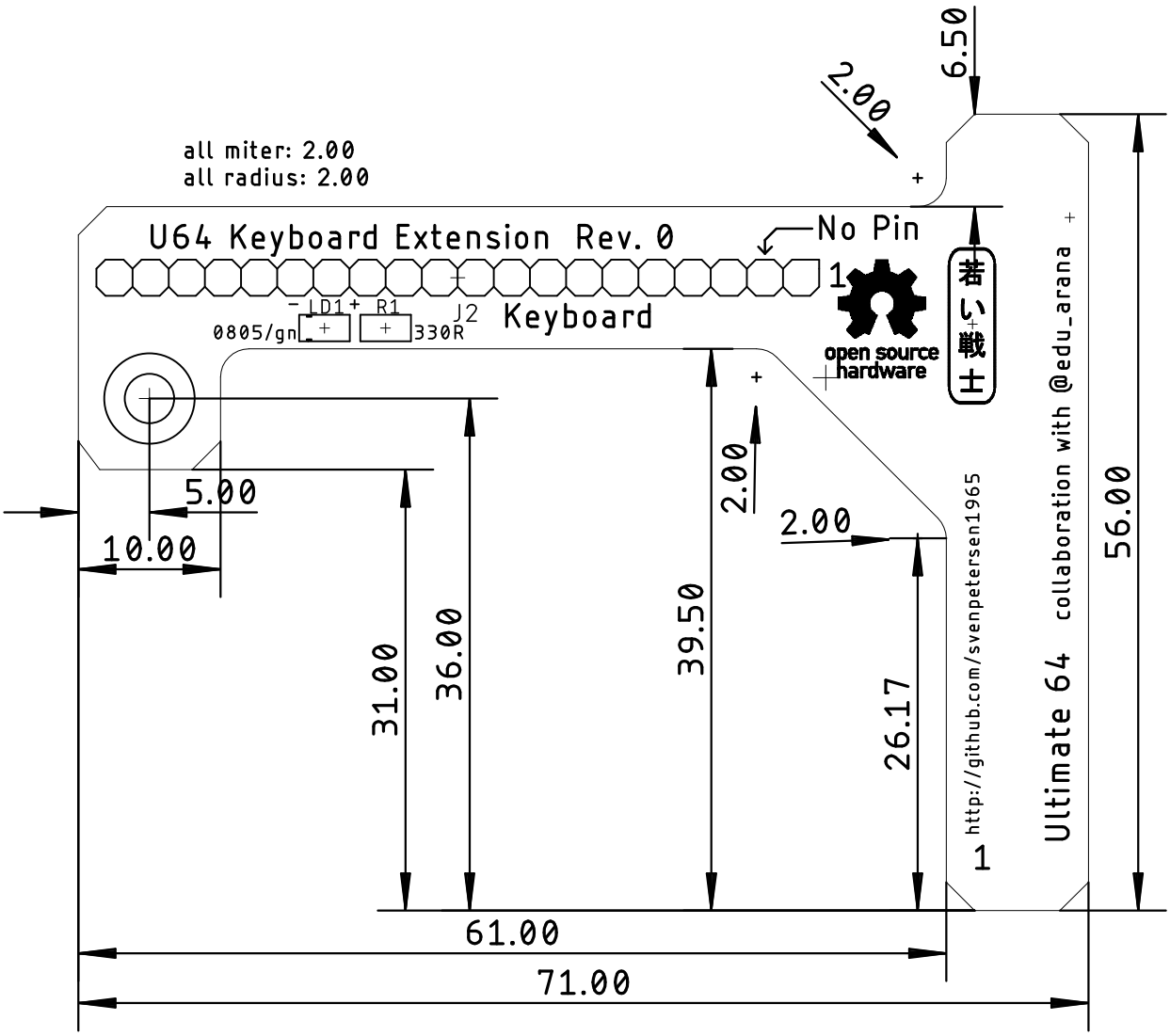
| Sven Petersen 2020 | Doc.-No.: 151-2-01-00 | |
|---|---|---|
| | Cu: 35µm | Cu-Layers: 2 |
| U64_KB_Ada | | |
| 26.06.2020 08:35 | | Rev.: 0 |
| stopmask component side | | |



| Sven Petersen 2020 | Doc.-No.: 151-2-01-00 | |
|---|---|---|
| | Cu: 35µm | Cu-Layers: 2 |
| U64_KB_Ada | | |
| 26.06.2020 08:35 | | Rev.: 0 |
| stopmask solder side | | |



| Sven Petersen 2020 | Doc.-No.: 151-2-01-00 | |
|---|---|---|
| | Cu: 35µm | Cu-Layers: 2 |
| U64_KB_Ada | | |
| 11.08.2020 19:16 | | Rev.: 0 |
| placement component side measures | | |



# Ultimate 64 Keyboard Extension Rev. 0
## Bill of Material Rev. 0.0

| Pos. | Qty | Value | Footprint | Ref.-No. | Comment |
|---|---|---|---|---|---|
| 1 | 1 | 151-2-01-00 | 2 Layer | PCB Rev. 0 | 2 layer, Cu 35$\mu$, HASL, LLL x BBB, 1.6mm FR4 |
| 2 | 1 | 1x20, 2.54mm, h=8mm | 1x20 | J1 | standard receptacle for pin header, pitch 2.54mm, height appr. 8mm |
| 3 | 1 | 1x20p, 2.54mm | 1x20p | J2 | standard pin header 1x20p, pitch 2.54, pin 2 removed |
| 4 | 1 | 330R | 0805 | R1 | optional, SMD 0805 resistor 10% or better |
| 5 | 1 | LED 0805/green | LED0805 | LD1 | optional SMD LED |
| | | | | | |