Project Documentation

C128 Diagnostic – Keyboard PCB

Project number: 145

Revision: 1

Date: 15.05.2020

C128 Diagnostic – Keyboard PCB Rev. 1

Module Description

Introduction

This is the keyboard Dongle (PCB) for the Commodore C128 Diagnostic Rev. 588121. The required harness is identical to the C64 Diagnostic Rev. 586220 harness, except the keyboard PCB. The C64 harness can be found here:

https://github.com/svenpetersen1965/C64-Diagnostic-Rev.-586220-Harness

The C128DCR does not provide +5V at the keyboard connector. Thus, this C128 keyboard dongle does not work, since the IC requires supply voltage.

A part of the keyboard scan signals are shared with the control ports. To prevent a false "OK" while testing these, the feedbacks can be opened. The required analog switches are implemented on the user port PCB (Rev. 1) of the said C64 harness. The connection to the user port PCB is provided by a ribbon cable, which can be connected to the box pin header J3.

In case this feature is not desired or the user port PCB is of an earlier revision, the adjacent pins of J3 can be jumpered with standard jumpers (1-2, 3-4, 5-6, 7-8 and 9-10).

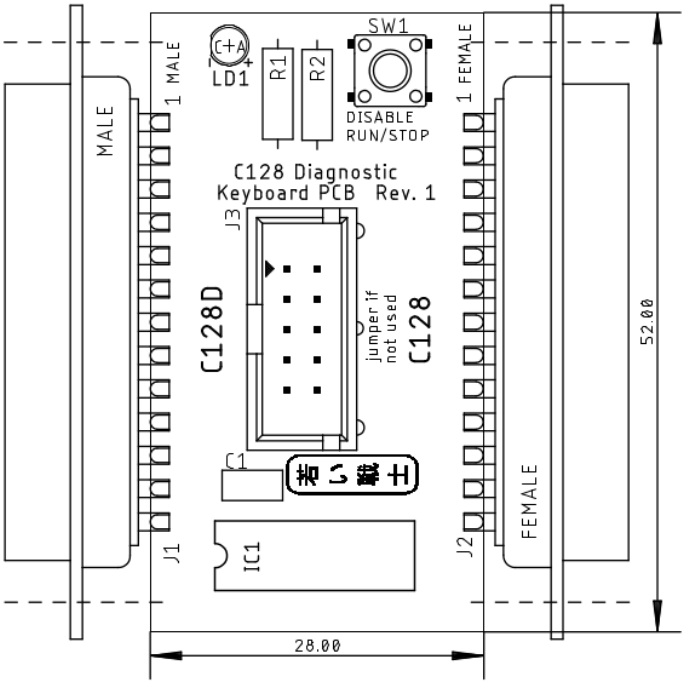


Figure 1: Dimensions of the C128 Diagnostic Keyboard PCB

The footprint of the keyboard connector on the C128 mainboard is for a 90° female DSub-25 connector (for the C128D). A special pin header is populated on the mainboard. It fits a female DSub-25 connector (J2). The pin numbering is in the opposite direction of a normal male DSub-25, though. This results in a discrepancy of the pin numbering of J2, which is correct.

The regular feedbacks are COL0 to ROW0, COL1 to ROW1, … COL7 to ROW7.

The feedback COL7 to ROW7 mimics a RUN/STOP while power up. This causes the C128 to boot into the monitor program, which is not desired. This can be circumvented by pressing the disable button on this PCB. This causes the analog switch (IC1) to open, which is responsible for this feedback.

Connectors

Signal	J1 (C128D)	J2 (C128)
GND	1	13
(no pin)	2	12
RESTORE	3	11
+5V	4	10
ROW3	5	9
ROW6	6	8
ROW5	7	7
ROW4	8	6
ROW7	9	5
ROW2	10	4
ROW1	11	3
ROW0	12	2
COL0	13	1
COL6	14	25
COL5	15	24
COL4	16	23
COL3	17	22
COL2	18	21
COL1	19	20
COL7	20	19
K0	21	18
K1	22	17
K2	23	16
40/80	24	15
CAPS LOCK	25	14

J3 – box pin header 2x5 circuits

Signal	Pin	Pin	Signal
COL4	1	2	ROW4
COL3	3	4	ROW3
COL2	5	6	ROW2
COL1	7	8	ROW1
COL0	9	10	ROW0

Links

This PCB is designed based on the following information:

- http://blog.worldofjani.com/?p=164
- http://personalpages.tds.net/~rcarlsen/cbm/c128/SCHEMATICS/
- https://commons.wikimedia.org/wiki/File:C128mobo.jpg?uselang=de

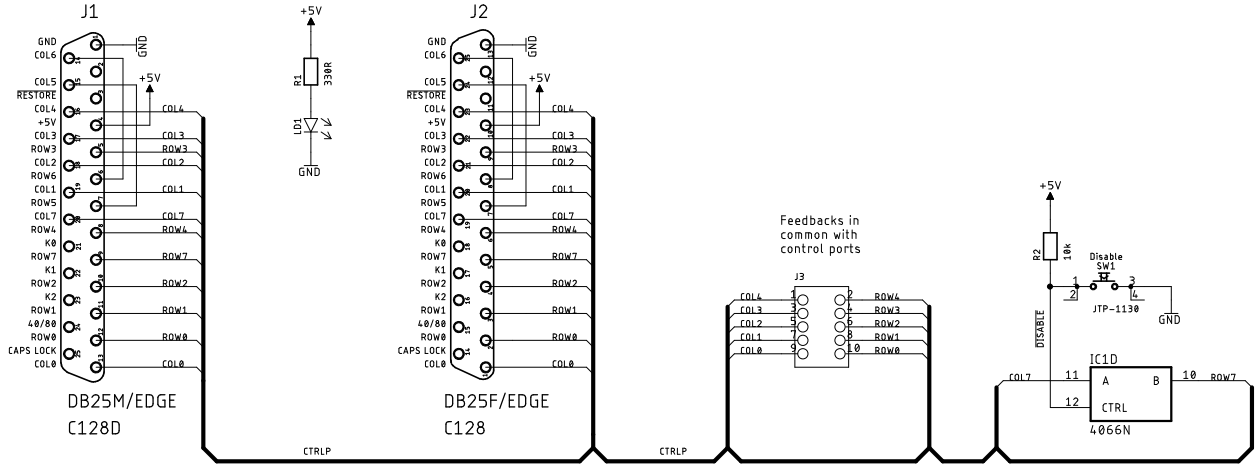
Revision History

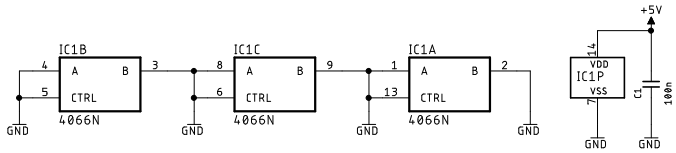
Rev. 0

- Prototype

Rev. 1

- PCB Revision: board is now 28mm wide

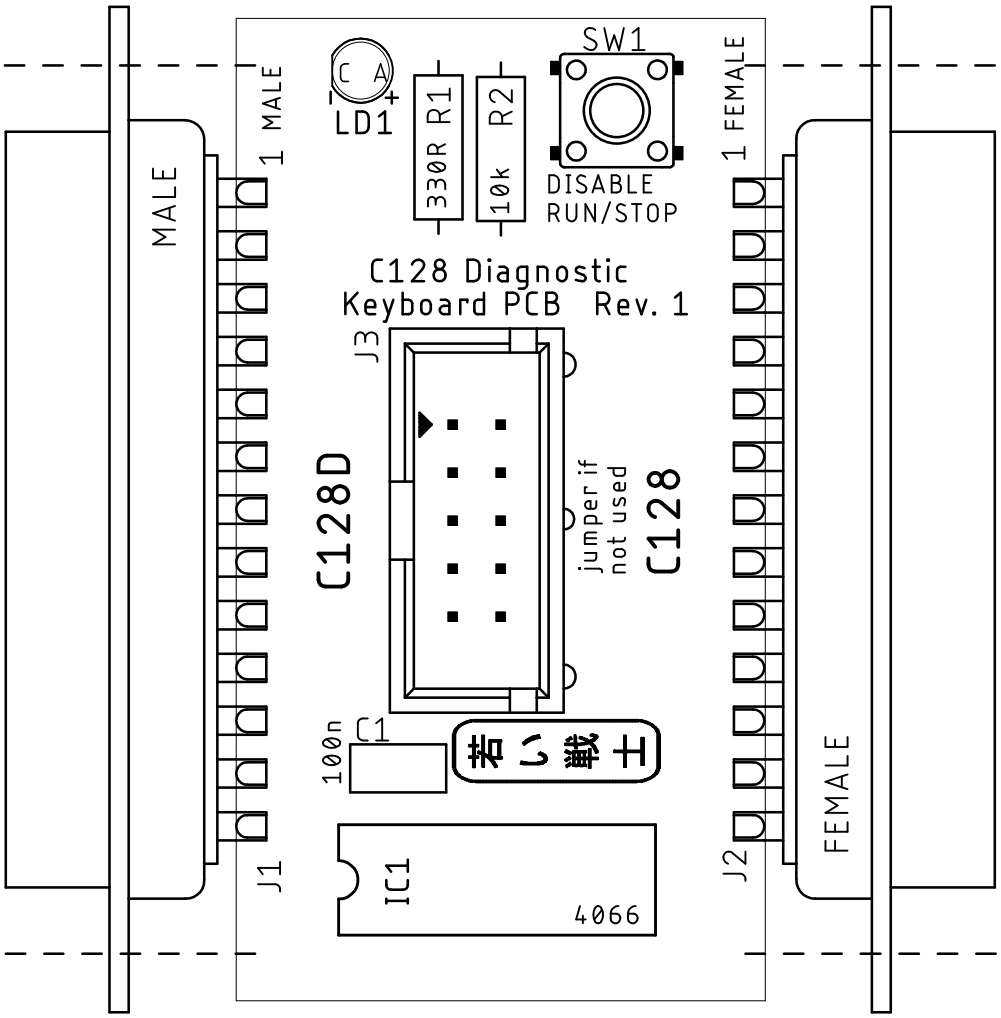




Title:	Diagnostic Harness C128 Keyboard Dongle	Doc.–No.:	145–1–01–01
		Draft.:	Sven Petersen
Date:	11.08.2020 13:18	Rev.: 1	Page 1/1
File:	C128_Keyb_Test		
	http://github.com/svenpetersen1965		A3

open source hardware

Sven Petersen 2020	Doc.-No.: 145-2-01-01	
	Cu: 35µ	Cu-Layers: 2
C128_Keyb_Test		
11.08.2020 13:21		Rev.: 1
placement component side		



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16.05.2020 02:53		Rev.: 1
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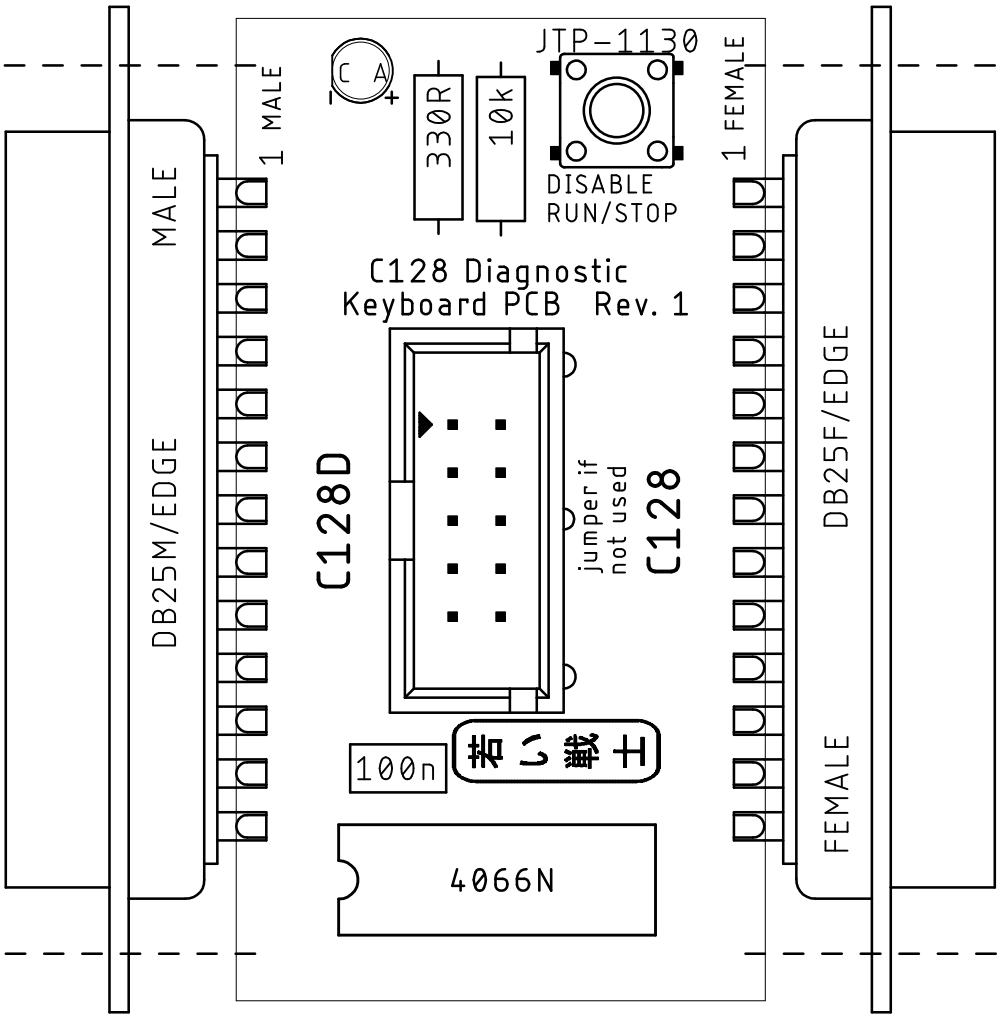

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11.08.2020 13:21		Rev.: 1
placement solder side		

https://github.com/
svenpetersen1965

Sven Petersen 2020	Doc.-No.: 145-2-01-01	
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16.05.2020 02:53		Rev.: 1
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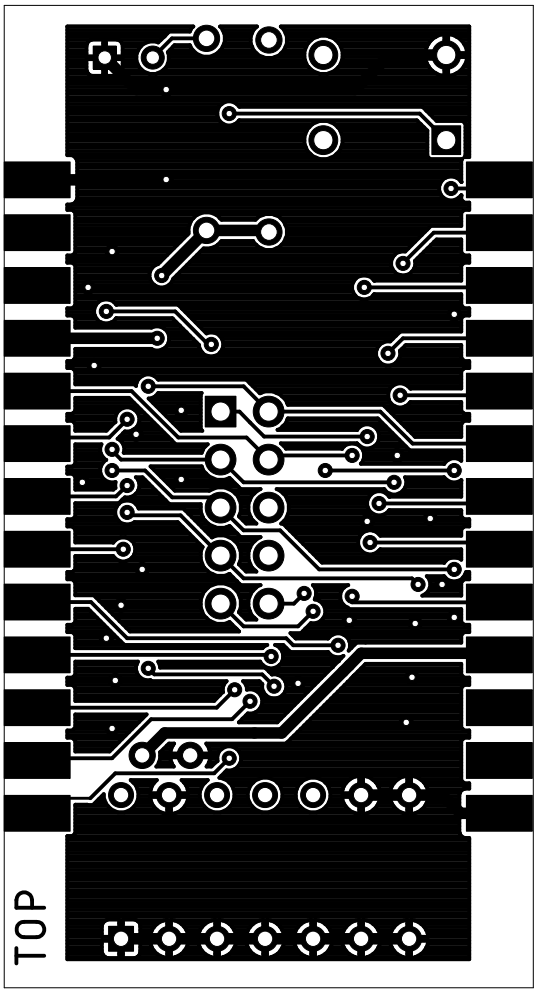

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16.05.2020 02:56		Rev.: 1
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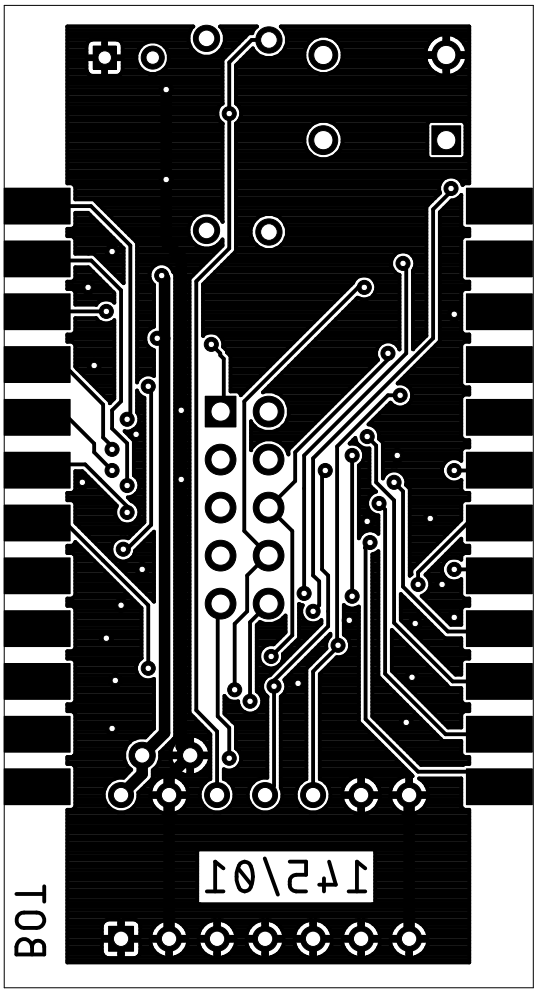

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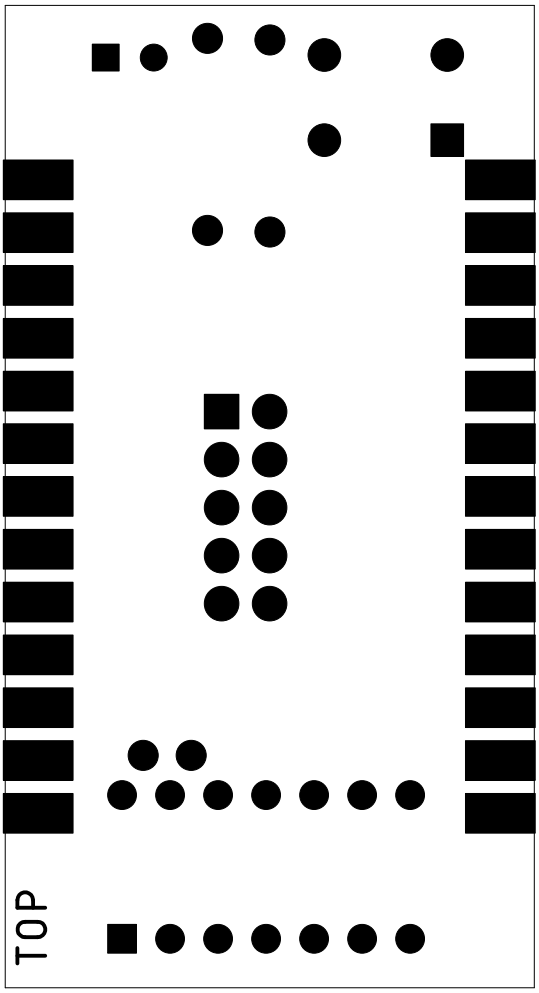
16.05.2020 02:56		Rev.: 1
stopmask component side		



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C128_Keyb_Test		
16.05.2020 02:56		Rev.: 1
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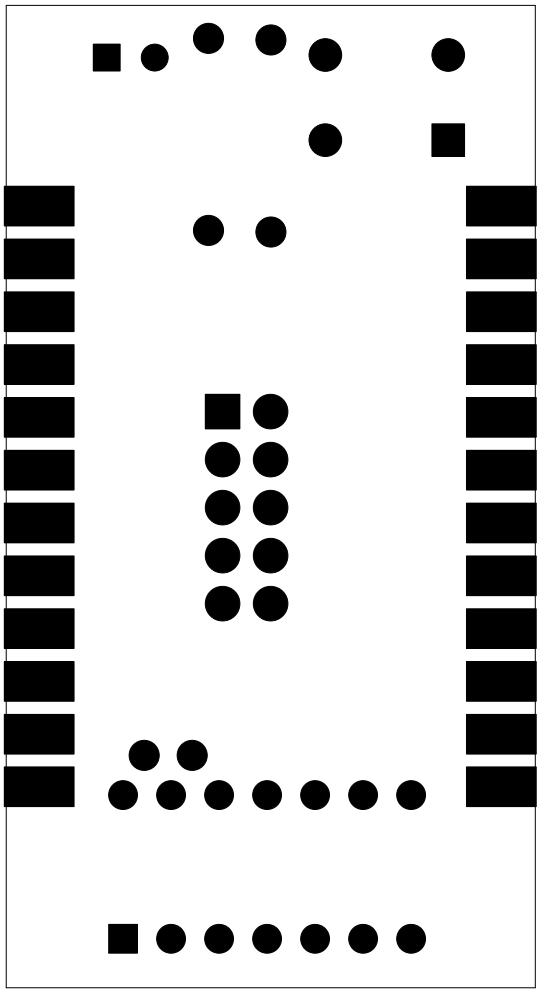

Sven Petersen 2020	Doc.-No.: 145-2-01-01	
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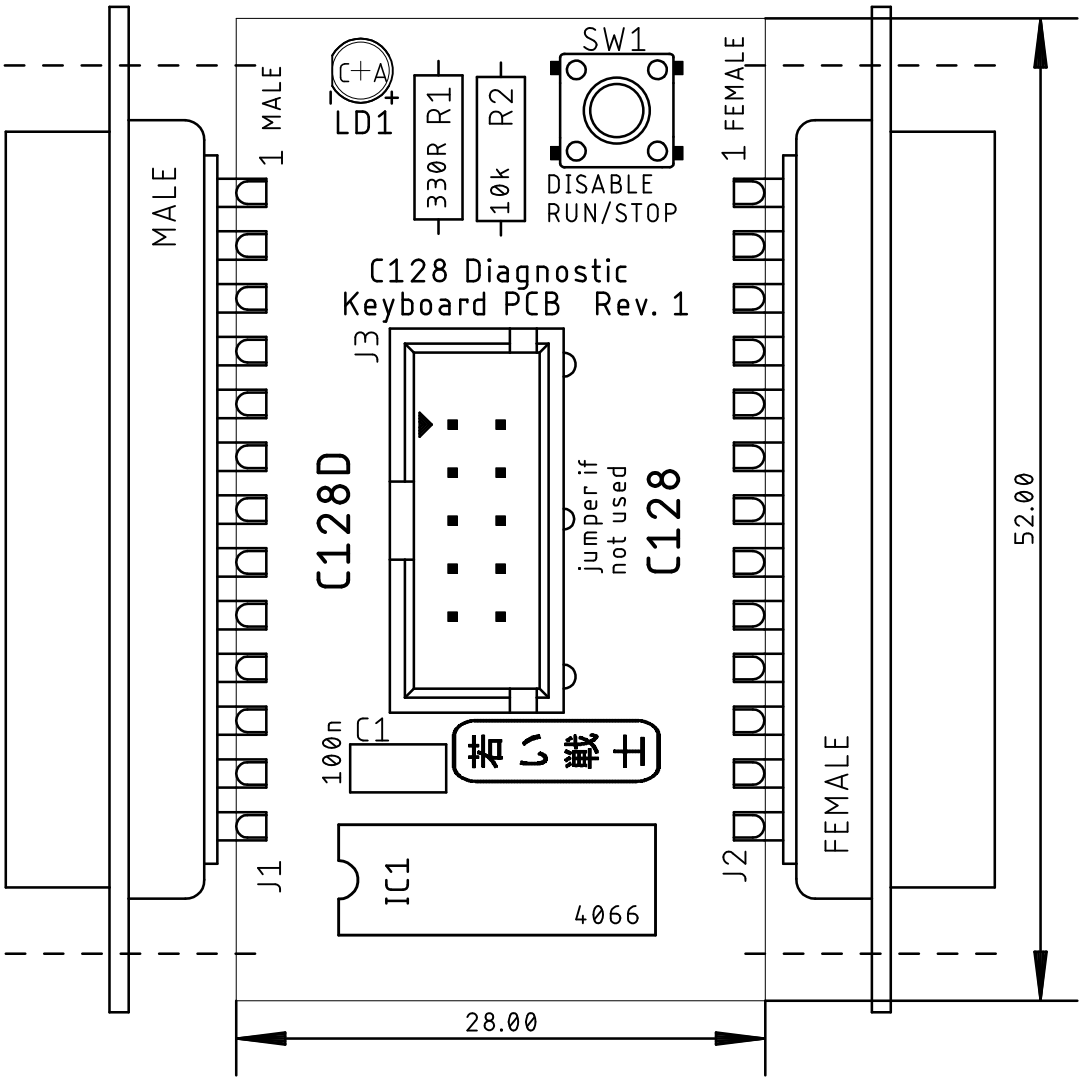
C128_Keyb_Test		
11.08.2020 13:21		Rev.: 1
placement component side measures		



C128 Diagnostic Keyboard PCB Rev. 1
Bill of Material Rev. 1.0

Pos.	Qty	Value	Footprint	Ref.-No.	Comment
1	1	145-2-01-01	2 Layer	PCB Rev. 1	2 layer, Cu 35µ, HASL, 28.0 x 48.0mm, 1.6mm FR4
2	1	2x5pin box header, 2.54mm pitch	2X05WV	J3	e.g. Reichelt.de: WSL 10G.
3	1	LED 3mm, green	3MM	LD1	LED, standard
4	1	330R	R-10	R1	Resistor, 0.25W, 5% or better
5	1	DB25F/EDGE	DB25F-EDGE	J2	DSub 25, female, solder cups, e.g. Reichelt.de: D-SUB BU 25
6	1	DB25M/EDGE	DB25M-EDGE	J1	DSub 25, male, solder cups, e.g. Reichelt.de: D-SUB ST 25
7	1	10k	R-10	R1	Resistor, 0.25W, 5% or better
8	1	JTP-1130	JTP-1130	SW2	Standard 6x6mm tact switch, e.g. Namae JTP-1130 or any other
9	1	HCF4066B	DIL14	IC1	ST Micro or equivalent (4066)
10	1	DIL 14	DIL14	(IC1)	DIL IC sockets
11	1	100n/50V	C-2,5	C1	cer. cap, 2.5mm pitch

Rev. History

Rev. 0.0 → 1.0

Pos. 1 PCB Revision

C128 Diagnostic Keyboard PCB Rev. 1
Bill of Material Rev. 1.1

Pos.	Qty	Value	Footprint	Ref.-No.	Comment
1	1	145-2-01-01	2 Layer	PCB Rev. 1	2 layer, Cu 35µ, HASL, 28.0 x 48.0mm, 1.6mm FR4
2	1	2x5pin box header, 2.54mm pitch	2X05WV	J3	e.g. Reichelt.de: WSL 10G.
3	1	LED 3mm, green	3MM	LD1	LED, standard
4	1	330R	R-10	R1	Resistor, 0.25W, 5% or better
5	1	DB25F/EDGE	DB25F-EDGE	J2	DSub 25, female, solder cups, e.g. Reichelt.de: D-SUB BU 25. Recommended type: Amphenol DB25S064TLF (Digikey 609-1519-ND)
6	1	DB25M/EDGE	DB25M-EDGE	J1	DSub 25, male, solder cups, e.g. Reichelt.de: D-SUB ST 25
7	1	10k	R-10	R1	Resistor, 0.25W, 5% or better
8	1	JTP-1130	JTP-1130	SW2	Standard 6x6mm tact switch, e.g. Namae JTP-1130 or any other
9	1	HCF4066B	DIL14	IC1	ST Micro or equivalent (4066)
10	1	DIL 14	DIL14	(IC1)	DIL IC sockets
11	1	100n/50V	C-2,5	C1	cer. cap, 2.5mm pitch

Rev. History

Rev. 0.0 → 1.0

Pos. 1 PCB Revision

Rev. 1.0 -> 1.1

Pos. 5 Recommended: Amphenol