

Aivon Oy

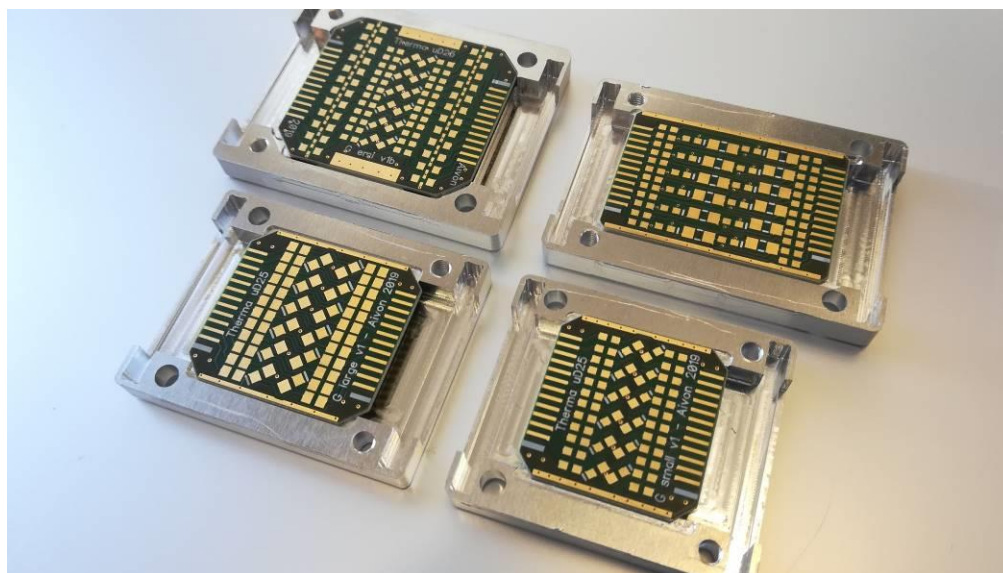
Brochure

Therma (2019)

RC-filter and thermalization block

AIVON OY

Therma



© Aivon Oy
Valimotie 13A
00380 Helsinki, Finland
www.aivon.fi

Table of Contents

Therma - uD25 - G - large/small	1
Therma - uD25 - PW	5
Therma - uD25 - G - emi	7
Therma - nc – G/PW	9
Pinout of Therma filters	11
Specifications	13
Document revision history	14

Therma

RC-filter and thermalization block

Aivon Therma is a RC-filter and thermalization block for 24 DC lines in robust aluminum enclosure. Copper (Oxygen-free, C10200) and gold-plated copper enclosures upon request.

In Therma-uD25 models, the connection in the block is via 1.27mm D-microminiature 25-contact Cinch/Glenair connectors, from male to female (or vice-versa due to the symmetry). In Therma-nc models, the connectors are replaced by solder vias for direct connection to cable by the customer. Enclosure can be easily opened if one wants to replace components or apply epoxy for e.g. rf suppression. One can also replace the brass screws with longer ones in order to attach the filter to external mount. The printed circuit board inside the filter has four layers of which the two inner layers form a perfect ground plane for better grounding and thermalization. This ground plane makes contact to enclosure in sides of the board.

Therma - uD25 - G - large/small

Therma-uD25-G is a RC-filter and thermalization block for 24 individual lines that are grounded capacitively to ground plane/filter body. The block is equipped with microminiature Cinch/Glenair connectors. Figure 1 illustrates the equivalent circuit consisting of SMD resistors and capacitors. Both resistors and capacitors have size code of either 0603 (small version) or 0805 (large version). In large version, the maximum capacitance value can be as high as 47 nF (NP0/C0G capacitor). Customer can choose suitable resistors and capacitors to meet the required filter cutoff and other requirements.

The body size with connectors is 49 mm x 32 mm x 10 mm (large) and 45 mm x 32 mm x 10 mm (small).

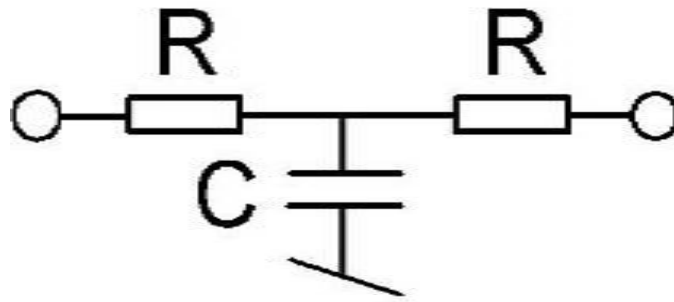


Figure 1: Equivalent circuit for one pair. Values could be e.g. $R = 1\text{ k}\Omega$, $C = 1\text{ nF}$.

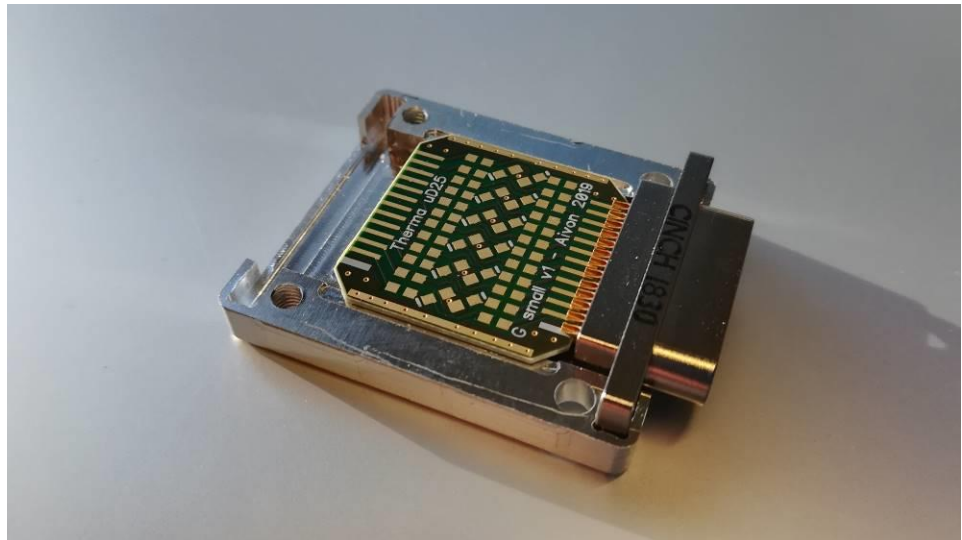


Figure 2: Thermo-uD25-G-small without components. R and C size 0603.

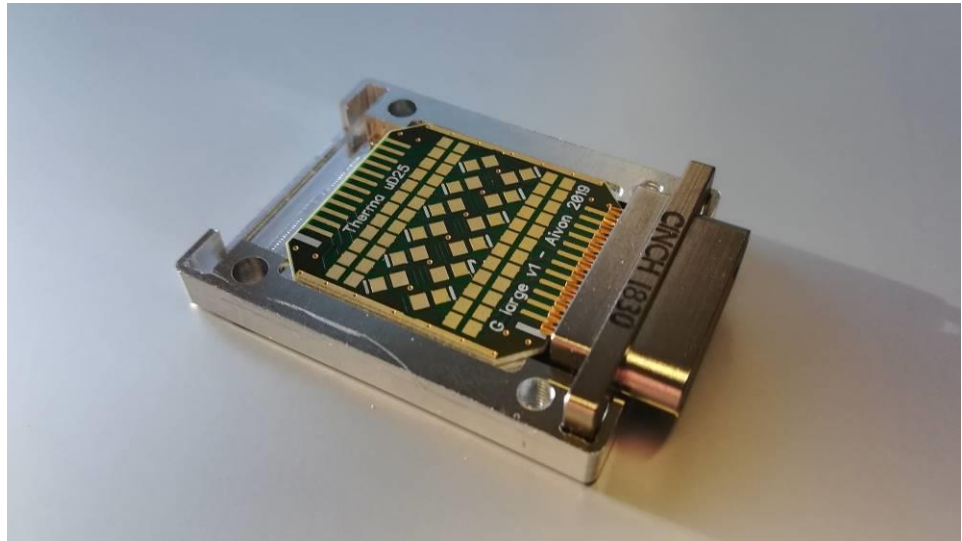


Figure 3: Thermo-uD25-G-large without components. R and C size 0805.

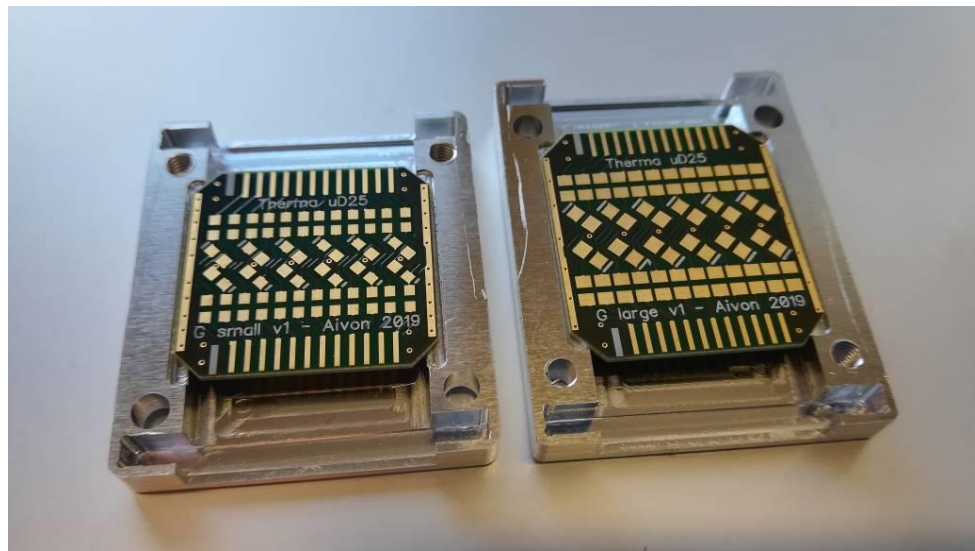


Figure 4: Thermo-uD25-G small and large



Figure 5: Therma-uD25-G large opened

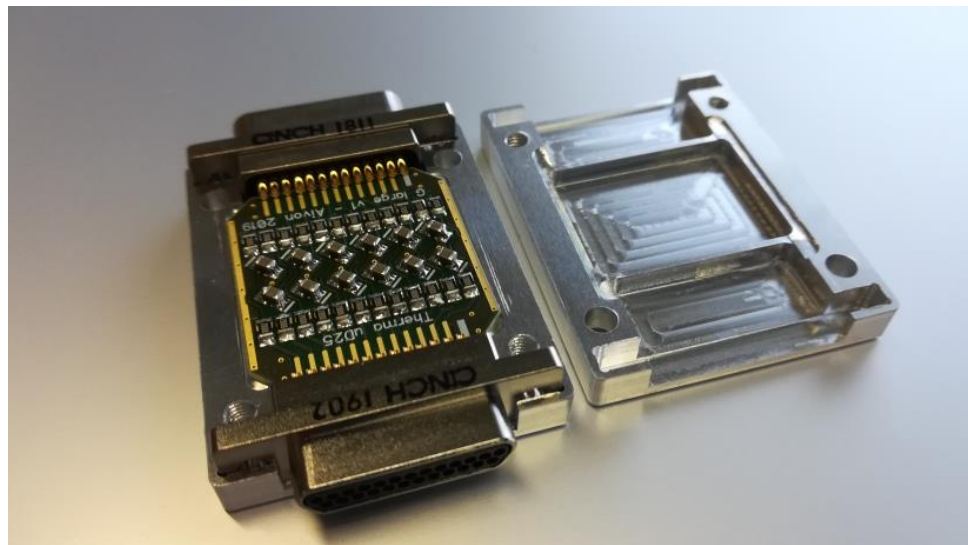


Figure 6: Therma-uD25-G large opened

Aivon can also provide second order RC filter i.e. two RC-stages in series. Please ask for more information.

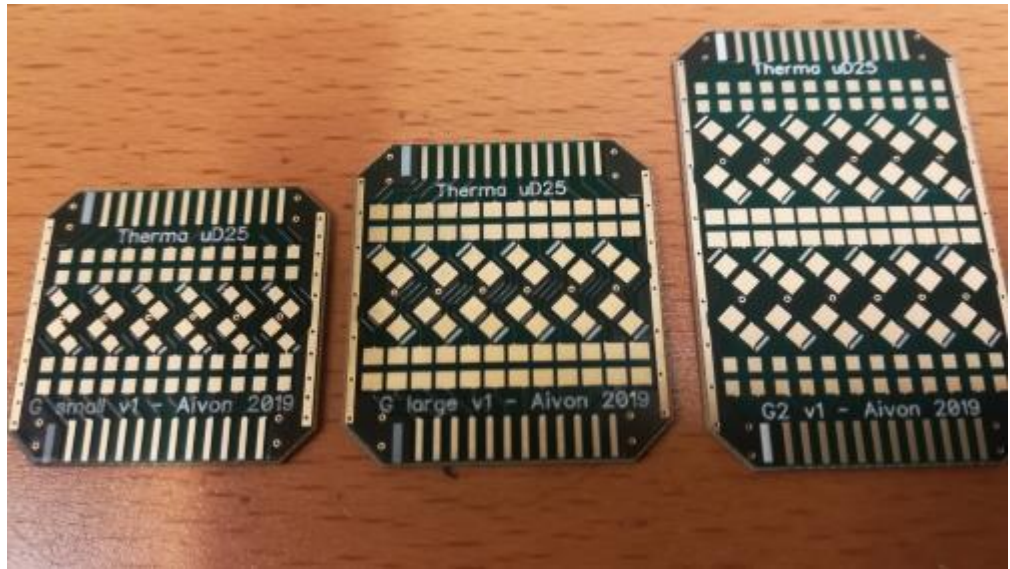


Figure 7: Thermo G small, large and 2nd order pcbs

Therma - uD25 - PW

Therma-uD25-PW is a RC-filter and thermalization block for 12-pairs, where paired lines are filtered pairwise. The pairs are formed by pins 1-14, 2-15 etc of the connector. Connection in the block is via 1.27mm D-microminiature 25-contact Cinch/Glenair connectors, from male to female (or vice-versa due to the symmetry). Figure 3 illustrates the equivalent circuit consisting of SMD resistors and capacitors. Customer can choose suitable resistors and capacitors to meet the required filter cutoff and other requirements.

The body size with connectors is 54 mm x 32 mm x 10 mm.

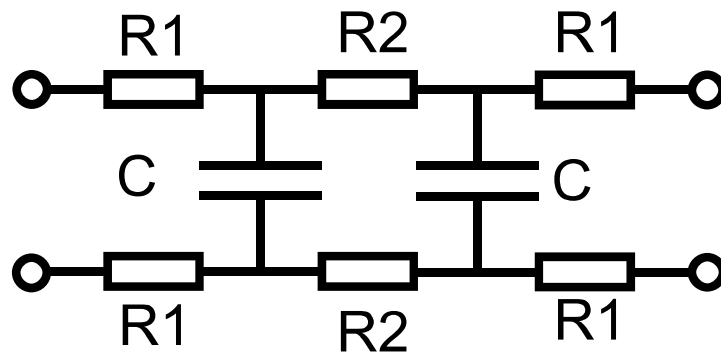


Figure 8: Equivalent circuit for one pair. Resistor R1 size 0603, R2 size 1206. Capacitor C size 0603. Values could be e.g. $R1=1\text{ k}\Omega$, $R2=10\text{ k}\Omega$, $C=1\text{ nF}$.

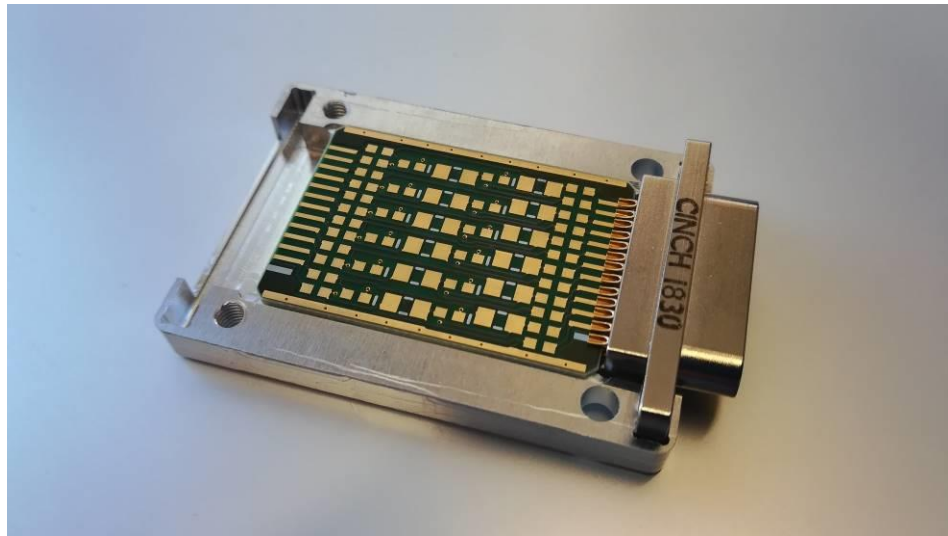


Figure 9: Therna-uD25-PW



Figure 10: Therma-uD25-PW closed

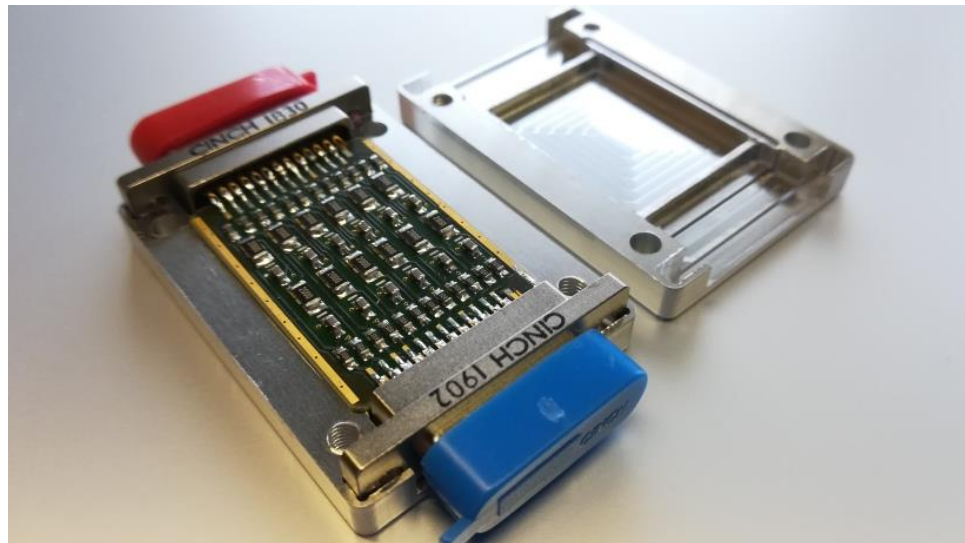


Figure 11: Therma-uD25-PW opened

Therma - uD25 - G - emi

Therma-uD25-G-emi is a RC-filter and thermalization block for 24 individual lines that have capacitive EMI filters (feedthrough capacitor) and are grounded capacitively to ground plane/filter body. The block is equipped with microminiature Cinch/Glenair connectors. Figure 1 illustrates the equivalent circuit consisting of SMD resistors and capacitors. Both resistors and capacitors have size code of 0603. The EMI filter size code is 0805 with side pads for

grounding. Customer can choose suitable resistors and capacitors to meet the required filter cutoff and other requirements.

The body size with connectors is 54 mm x 36 mm x 10 mm.

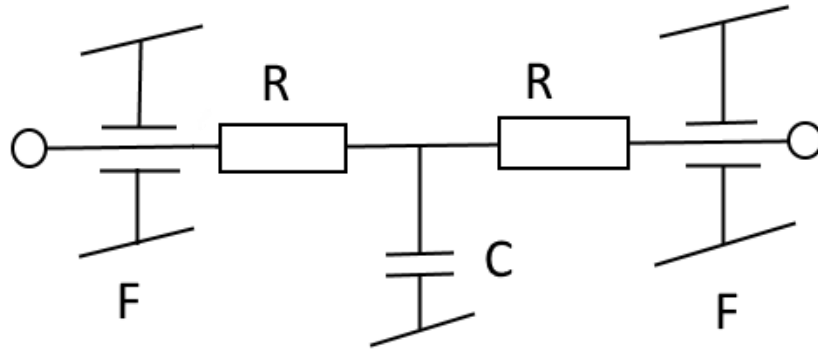


Figure 12: Equivalent circuit for one pair. Values could be e.g. $R = 1\text{ k}\Omega$, $C = 1\text{ nF}$ and EMI filter $F = 100\text{ pF}$ (feedthrough capacitor).



Figure 13: Therma-uD25-G-emi.

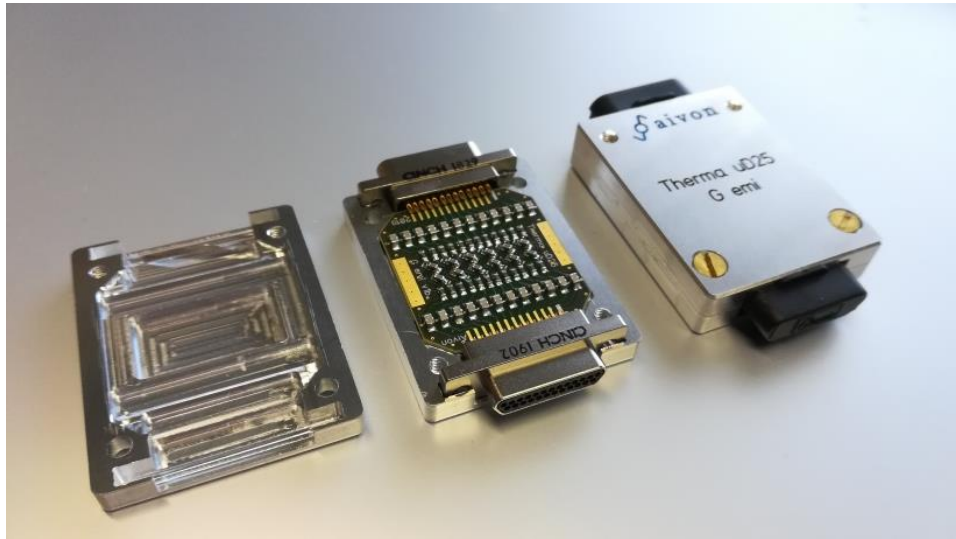


Figure 14: Therma-uD25-G-emi opened. Center: with Cinch connectors, right: with Glenair connectors.

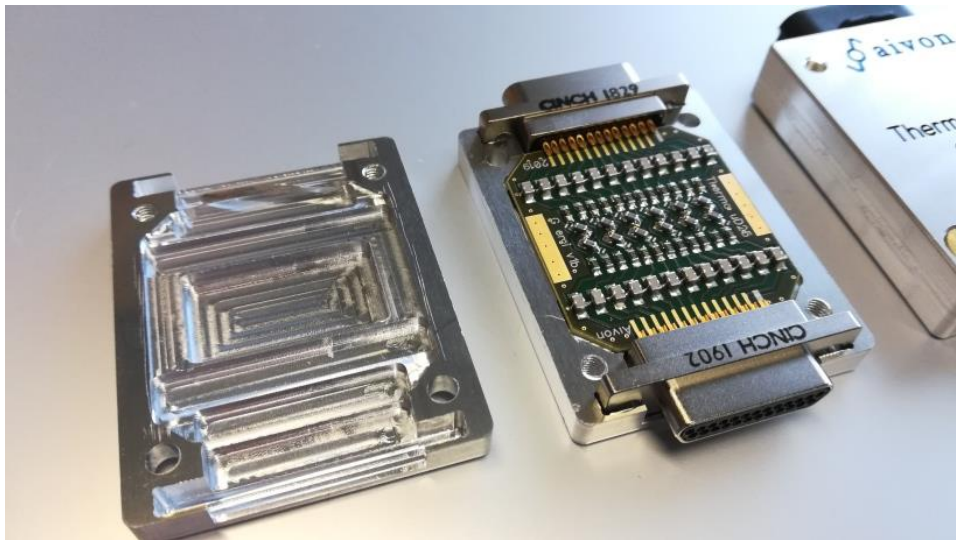


Figure 15: Therma-uD25-G-emi closeup

Therma - nc – G/PW

Therma-nc-G-large/small is similar to Therma-uD25-G-large/small except that D-connector is replaced by solder vias. The customer can attach own wiring directly to the filter by soldering. The filter enclosure is smaller due to the absence of connectors. Otherwise the printed circuit board is the same with either 0805 (large) or 0603 (small) sized components.

Therma-nc-PW is a connectorless counterpart to Therma-uD25-PW model. The body size is 38 mm x 32 mm x 8 mm (large) and 34 mm x 32 mm x 8 mm (small).

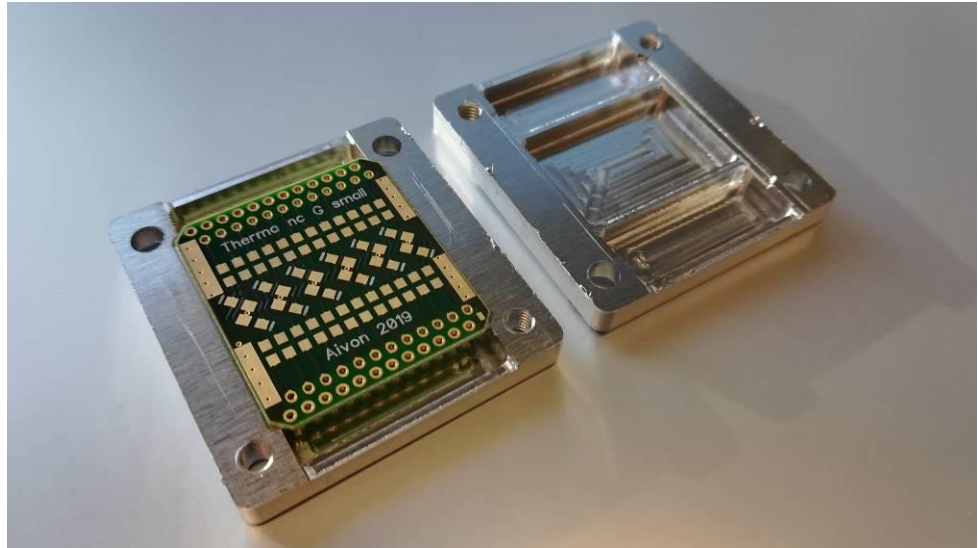


Figure 16: Therma-nc-G-small

Pinout of Therma filters

Therma filters use microminiature D-connectors such as Cinch dcdm-25 series. One end on Therma filter has male and the other end has female connector.

As there are 25-pins in the connectors but the pcb has only 24 lines, one pin is left unconnected. The images below show the unconnected pin in various Therma pcb designs. Female connector is Cinch “red” socket. Images show the 13-pin top side of the pcb. Bottom side has 12-pins and all are connected.

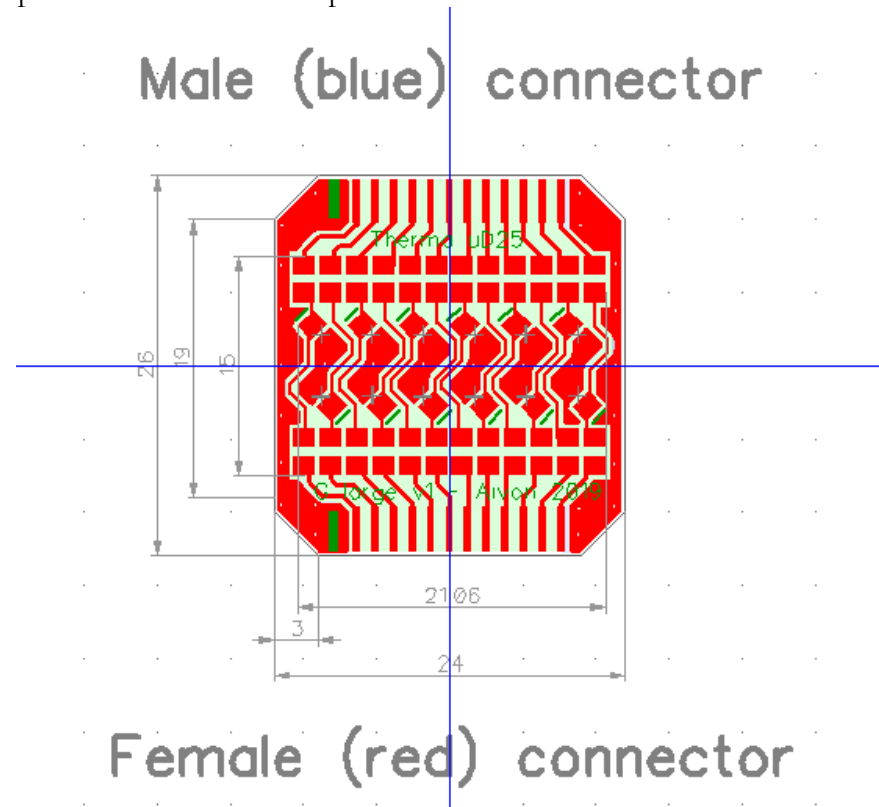


Figure 17: Therma uD25 G large

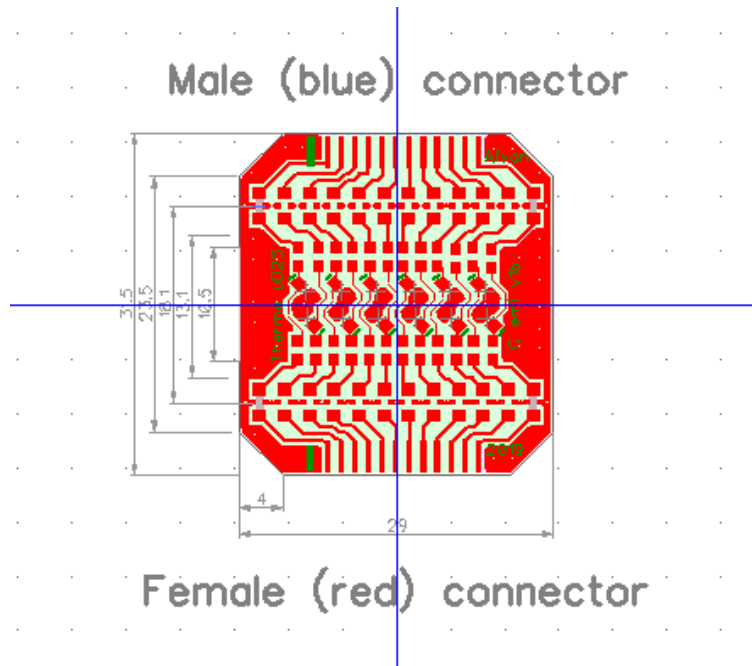


Figure 18: Therma uD25 G emi

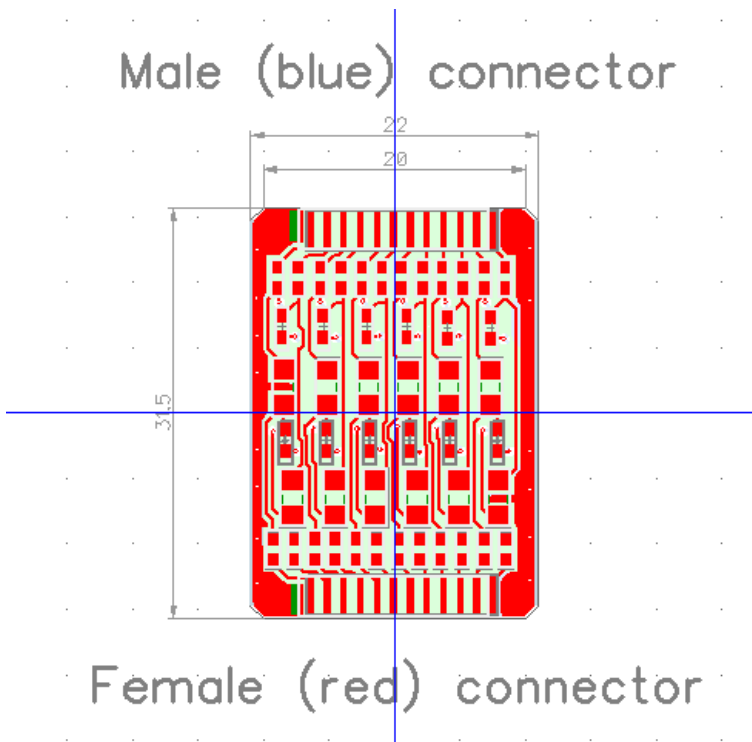


Figure 19: therma uD25 PW

Specifications

Data for the components is following:

- All size 0603 and 0805 resistors
 - TE Holsworthy RN73 series, values 4R7 – 511k
 - Specs at room temperature:
 - $\pm 10\text{ppm}/^{\circ}\text{C}$
 - $\pm 0.1\%$
 - 63mW (0603), 100mW (0805)
- R2 and R: thin film 1206 resistor
 - TE Holsworthy RP73 series, values 4R7 – 1M
 - Specs at room temperature:
 - $\pm 15\text{ppm}/^{\circ}\text{C}$
 - $\pm 0.1\%$
 - 250mW
- All size 0603 and 0805 capacitors
 - COG / NPO, 50V or better (except 0805, 47 nF)
 - COG / NPO, 25V (0805, 47 nF)
 - Specs at room temperature:
 - 5%
- EMI filters
 - Knowles Syfer FlexiCAP-feedthrough capacitors in 0805 size and COG/NPO dielectric
 - 47 – 470 pF

Enclosure

Material	Raw aluminum
Male connector plug	Cinch DCDM-25PSBN-LF or Glenair MWDM2L-25PS
Female connector socket	Cinch DCDM-25SSBN-LF or Glenair MWDM2L-25SS

Document revision history

Date	Version	Description	Author
3.6.2016	0.1	Initial draft	JSP
20.1.2019	1.0	First version of MY2019	JSP
21.3.2019	1.1	Second version of MY2019	JSP
13.5.2019	1.2	Added pinouts	JSP
29.7.2021	1.3	Added EMI filter data and corrected bugs	JSP