Number:

2094VSM

Version:

230119

System/product:

MIREL systems production

Name:

Requirements for electronic components and PCB assembly

Further source and attached files:

	File	Description	Sheet/Connections
1			
2			
3			

The list of the document versions

Version	Description	Prepared by	Validated by	Approved by
160412	Introduction of the document	Ing. Žilinec	Ing. Žilinec	Ing.Michalec
160801	Change Name of the document	Ing. Žilinec	Ing. Žilinec	Ing.Michalec
201111	Change Name of the document, added chapter 4.4	Ing. Žilinec	Ing. Žilinec	Ing. Michalec
211005	Add descriptions of gerber files	Ing. Papán	Ing. Žilinec	Ing. Michalec
211029	Add layers Top/Bottom Coating	Ing. Papán	Ing. Žilinec	Ing. Michalec
220412	Changing the method of assembling foil capacitors	Ing. Papán	Ing. Žilinec	Ing. Michalec
221122	Addition of the requirement for assembling through-hole components. Chapter 4.5	Ing. Žilinec	Ing. Žilinec	Ing. Michalec
230119	Commitments in field of social responsibility	Ing. Sučan	Ing. Žilinec	Ing. Michalec

Content

1 Determination of the document

The document specifies the requirements for contractors and subcontractors, technical operations and production stages as required by HMH.

The document follows and refers to the following documents:

Number	Version	Name
[1] 3177HMH	230403	Supplier´s Code of Conduct

The document is intended for:

- workers of the manufacturer as a basis for the preparation of materials for production
- workers of the supplying companies

2 Specification changes to the document

Version 160412

Introduction of the document

Version 160801

Change Name of the document to “General requirements for electronic components“.

Version 201111

- Change Name of the document to Requirements for electronic components and PCB assembly
- Added chapter 4.4 Depanelization assembled PCB

Version 211005

- Add chapter – descriptions of gerber files

Version 211029

- Add layers Top/Bottom Coating

Version 220412

- Addition of subchapter - Special requirements for assembling electronic components
- Changing the method of assembling foil capacitors

Version 221122

- Addition of the requirement for assembling through-hole components. Chapter 4.5
- Addition of the requirements resulting from EN 50155:2022. Chapter 4.1

Version 230119

- Complementing of IDC connector installation´s description – Chapter 6.
- Complementing of commitments in field of social responsibility – Chapter 7.

3 Used abbreviations and terminology

PCB	Printed circuit board
FR4	Specification of materials and fireproof class (flame retardant cat. 4)
SMT	Surface mount technology
SMD	Surface mount device
BOM	Bill of materials
ppm	One millionth of the number (parts per million)
274X	Gerber data format
PBA	Printed board assembling

4 Requirements for electronic components and PCB assembly

4.1 A necessary condition for PCB assembly

1. Use only lead-technology
2. Based on the requirement of EN 50155:2022 on electronic assembly (PBA), the electronic embedding must be al least in accordance with class 2 of IPC-A-610G.

4.2 Supplied documents and data for assembling modules

3. Document “Scheme (ASSEMBLY)” for the corresponding module, in which all necessary documents such as bills of materials for different modifications of the module, as well as assembly plans of the individual modification are contained
4. Gerber documents in the form of 274-x for manufacturing of the assembly stencil if the module is populated with SMD components
5. The relevant files "pick & place" for SMT placement machine

4.3 Required parameters of the supplied electronic components

BOM in the documentation "Scheme" under "Amount" specifies the quantity of component used for the assembling modification, concurrently the given number is part of the material delivery for assembling.

If the specified number is "0", we assume the supply of the component by the supplier along with the PCB assembling.

Specifically, the amount requested is set out in column "Note" in brackets "()" before the part numbers of individual components.

4.3.1 For SMD resistors we require

1. Tolerance 1%.
2. Temperature range -50 ° C to 105 ° C
3. Operating voltage 150V
4. Thermal coefficient of ± 100ppm / ° C
5. Power rating SMD 0805 125mW @70°C
6. Power rating SMD 1206 250mW @70°C
7. Expiration period max 5 years from dispatching

4.3.2 For SMD ceramic capacitors we require

1. Tolerance 10%.
2. Working voltage for capacity < 1uF 50V
3. Working voltage for capacity > 1uF 16V
4. Temperature range -50 ° C to 105 ° C
5. Preferred thermal coefficient for capacity < 1nF NPO(COG)
6. Preferred thermal coefficient for capacity > 1nF NPO(COG)
7. Expiration period max 5 years from dispatching

4.3.3 For SMD semiconductor components we require

Further specification in the column “Name” applies and generally the following applies

1. Min temperature range -40°C ÷ 85°C
2. Preferred temperature range -40°C ÷ 105°C
3. Version automotive / industrial
4. Expiration period max 5 years from dispatching

4.4 Depanelization assembled PCB

In the case of assembly of panelized PCBs multiplied as multimotives on one panel, we require to deliver the individual assembled PCBs separated and cleaned from the remains of the panel mounting bridges. The width of the cutter used for peripheral milling of individual PCBs is 2 mm.

4.5 Special requirements for assembling electronic components

1. Do not assembly foil capacitors (marked with the code **CFxxxxxxxx**) with in-line wave, but manually with maximum heating time 4s

2. Through-hole components have to be mounted with minimum height of overhang above the PCB. For example, tap disc HV capacitors, connectors, resistors, etc. The requirement applies to all through-hole components, unless another mounting method is indicated in the relevant documentation.

5 Description of the layers of gerber files

File extensions	Layer name	Explanation of the gerber file
.GTL	Top Layer	Top layer
.GLP	Top Paste Mask	Top SMT stencil
.GM6	Top Coating	Top removable mask when mounted with in-line wave
.GM8	Top Assembly	Top assembly – outline of components
.GM21	Top Designator	Top designators of components
.GM23	Top Value	Top values of components
.GBL	Bottom Layer	Bottom layer
.GBP	Bottom Paste Mask	Bottom SMT stencil
.GM7	Bottom Coating	Bottom removable mask when mounted with in-line wave
.GM9	Bottom Assembly	Bottom assembly – outline of components
.GM22	Bottom Designator	Bottom designators of components
.GM24	Bottom Value	Bottom values of components
.GM1	Dimensions	Outline of PCB

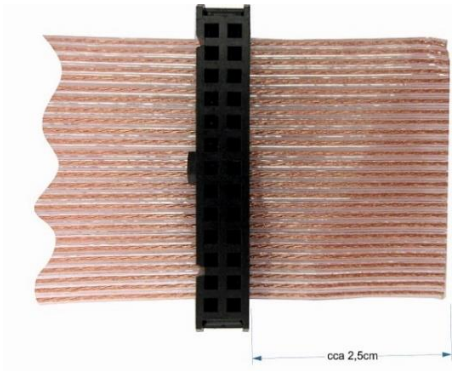
6 Description of IDC Connector Installation on Ribbon Cables

Installation of IDC connectors on ribbon cables consists of slipping connector (its orientation in accordance with documentation) over ribbon cable, its proper positioning and crimping. Recommended detailed procedure for flat conductors with silicone insulation (soft), which can be applied also on flat conductors with hard insulation is described below:

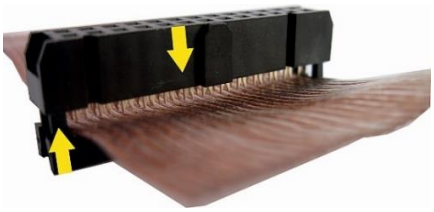
1) Slip connector over cable and position it at least 2,5cm from its edge (if possible).
2) Lightly press connector (so that connector pins don´t penetrate into insulation) and hold it in fingers.
3) Pull the cable with the other hand downwards and bend it simultaneously and slightly to the left and right side. Bending can be repeated several times, but gradually with a smaller deflection. Approximately 1cm from the cable edge pull the cable only in straight direction (cable and connector are perpendicularly oriented to each other) and position connector by pulling it on cable end.
4) Check visually the proper conductor positioning in relation to connector cutting pins, crimp connector with pliers or with specific crimping tool.

Graphical depiction of a.m. procedure:

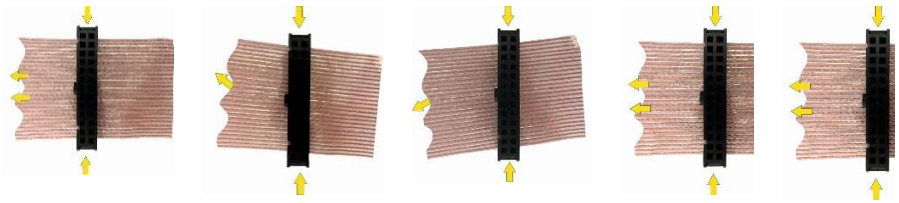
1)



2)



3)



4)

7 Commitments in Field of Social Responsibility

Present times challenges lead to the fact that HMH s.r.o. Company has become aware of danger arising from irresponsible treatment of resources and capital. In its endeavour to demonstrate capability to deliver products and services respecting requirements and expectations of the entire society, HMH considers as indispensable to transfer commitments in field of social responsibility on its suppliers as well. The goal of activities in mentioned field is to ensure fulfilment of all social responsibility pillars in fields of economy, social and environmental affairs.

A closer specification of commitments in field of social responsibility for our suppliers can be found in document 3177HMH. Supplier´s Code of Conduct. The topic of commitments in field of social responsibility is concerned with by us within the framework of relation establishing during process of approval, verification and auditing of our suppliers.