

GEMnet Headers 90° / 180°, sealed / unsealed

- **i** **NOTE**
All numerical values are in metric units. Dimensions are in millimeters. Dimensions shown in parenthesis are for reference only. Figures and illustrations are for identification only and are not drawn to scale.

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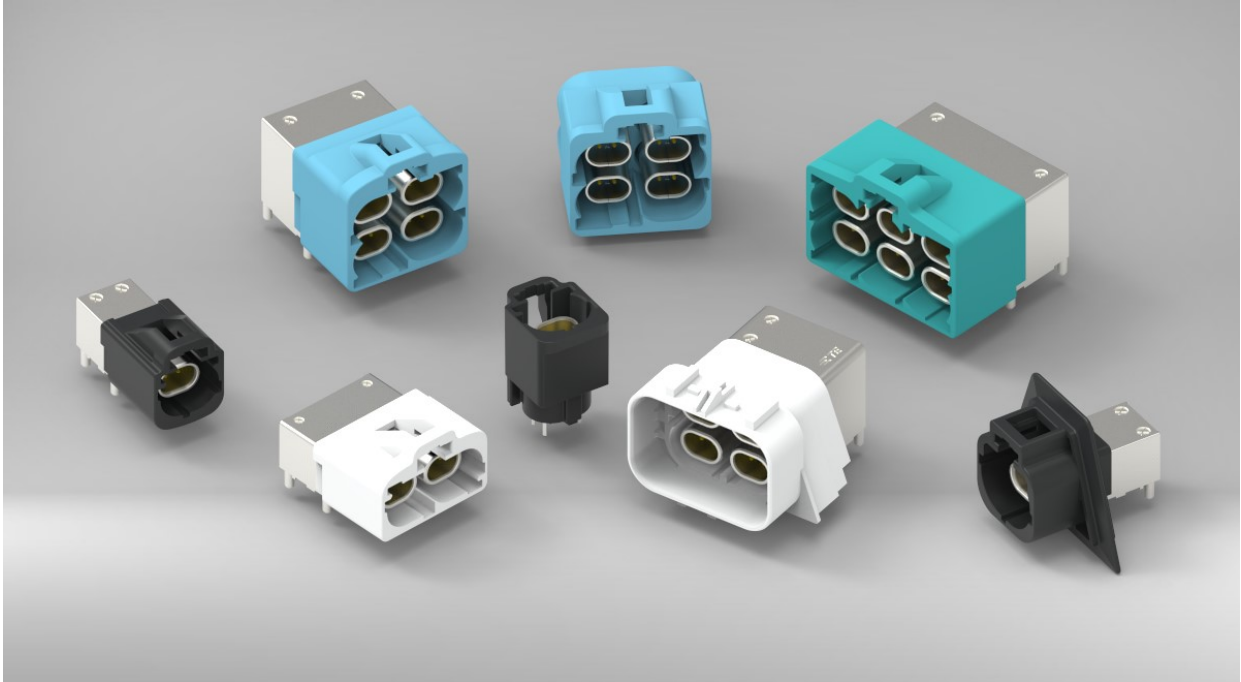
PRELIMINARY

GEMnet Headers 90° / 180°, sealed / unsealed

1. Introduction

This specification covers the requirements for the application of the GEMnet connector system family. This connector system is designed for use on automotive differential signaling applications for navigation systems, control modules, video and camera systems as well as other applications as applicable.

Each connector consists of a housing, outer shields, dielectrics (only for the 90° sealed/unsealed header and 180° 1P sealed header) and terminals.





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2. Reference Information**2.1. Customer Assistance**

Reference product base part numbers 2397137, 2409685, 2408290, 2390045, 2397248, 2374901, 2374902, 2374900, 2397129, 2397320, 2397322.

2.2. Customer Drawings

Customer drawings for product part numbers are available from www.te.com. Information contained in the customer drawing takes priority if there is a conflict with this specification or any other technical document provided by TE.

2.3. Specifications

108-160097 GEMnet Product Specification
108-160131 GEMnet Header Specification

3. Requirements**3.1. Safety**

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Limitations

The connectors are designed to operate in a temperature range of -40 to 105°C [-40 to 221°F].

3.3. Storage**A. Ultraviolet Light**

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the product material.

B. Reeled Contacts

When using tape-mounted reeled contacts, care must be taken to prevent stretching, sagging, or other distortion that would prevent smooth feeding of the reeled product through automatic machine feed mechanisms. Store coil wound reels horizontally and traverse wound reels vertically.

C. Shelf Life

The product should remain in the shipping containers until ready for use to prevent deformation to components. The product should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance. The solderability of pin header is generally guaranteed for the duration of 6 months if the storage conditions are according to DIN EN 60721-3-1.

D. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking in the material.

Alkalis	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur	Nitrites	Tartrates

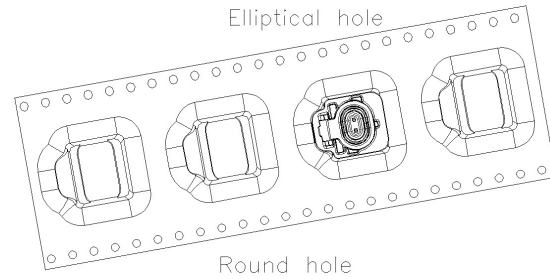
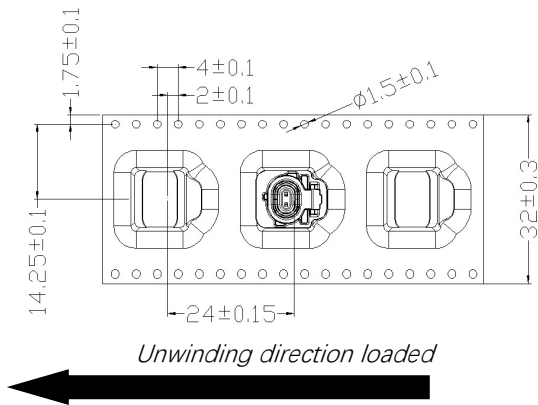
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4. Package of Pin Header

4.1. Delivery condition

Tape and reel packaging, vertical unsealed headers will use tray packaging.

TE-No.: 2397137



TE-No.: 2409685

TBD

TE-No.: 2408290

TBD

TE-No.: 2390045

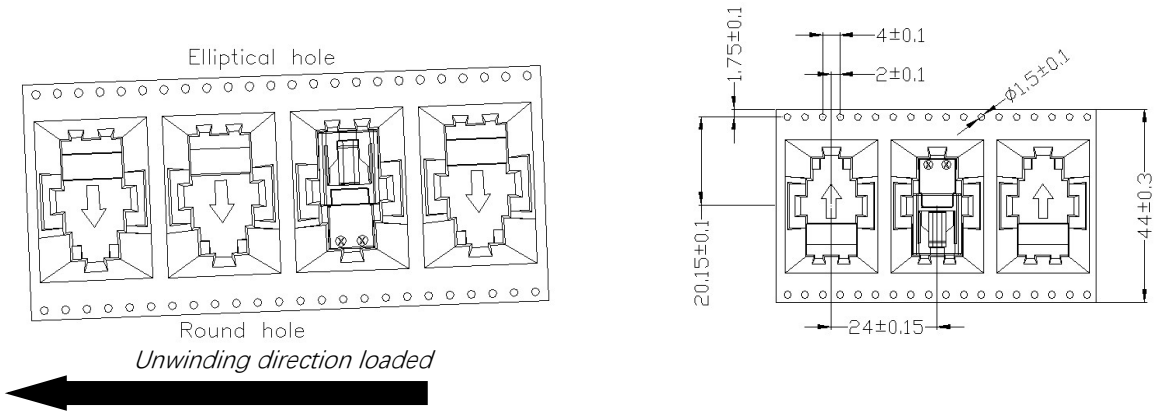
TBD

TE-No.: 2390045

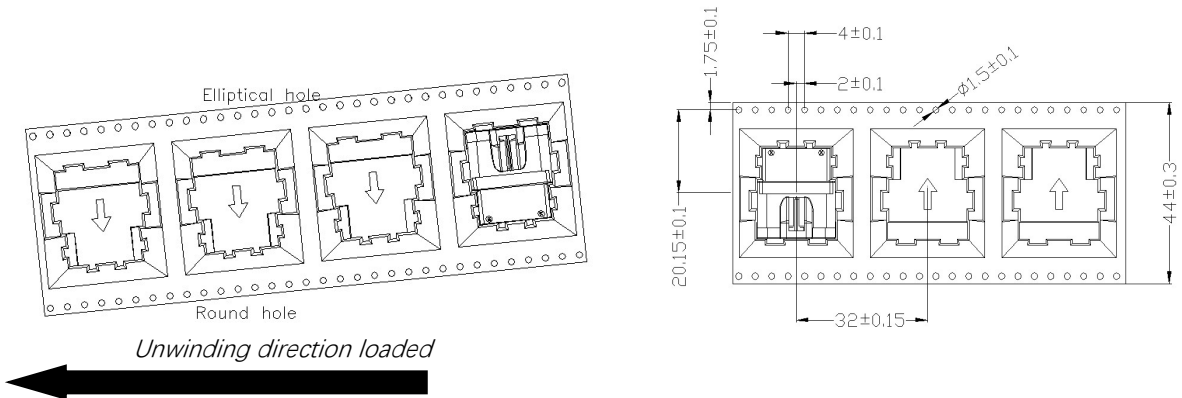
TBD

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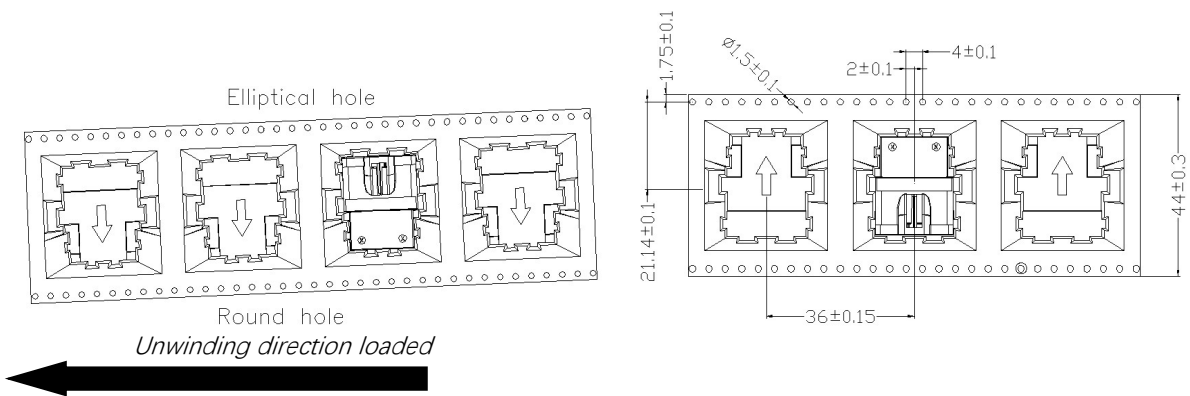
TE-No.:2374901



TE-No.: 2374902

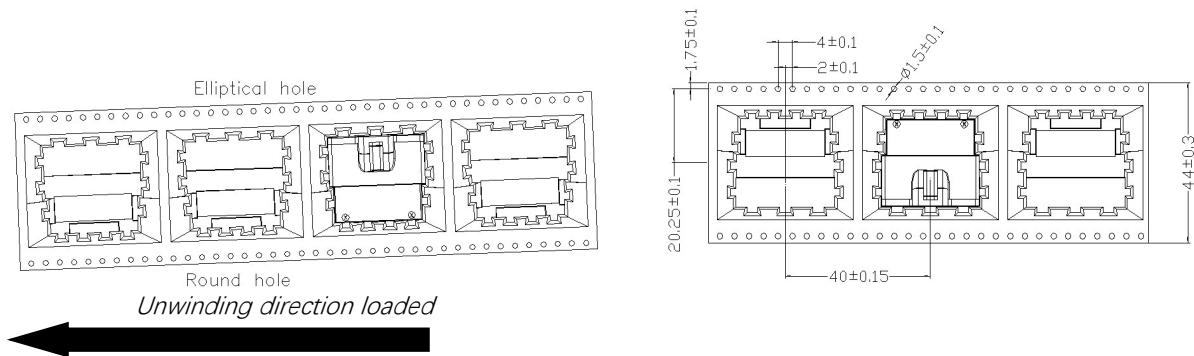


TE-No.: 2374900



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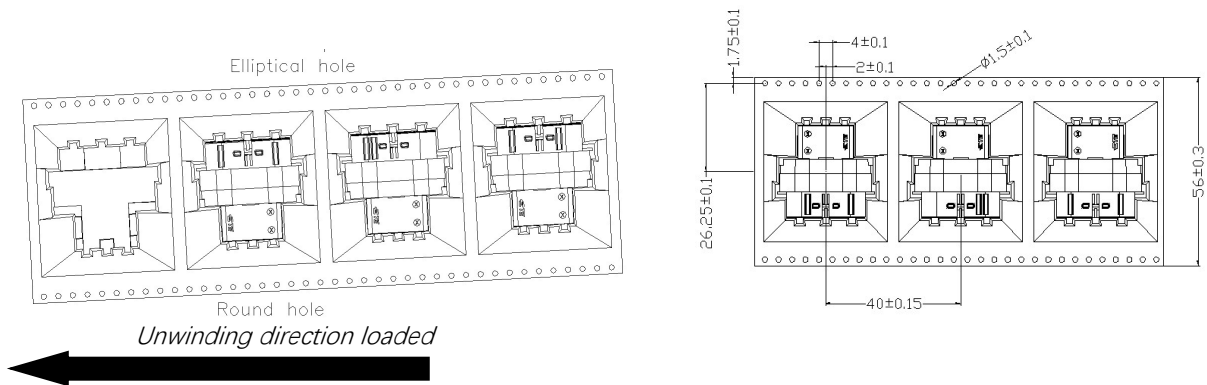
TE-No.: 2397129



TE-No.: 2397320

TBD

TE-No.: 2397322



4.2. Removal from packaging

Suction area: for dimension and position please check the respective customer drawing.

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5. Placement of Pin Header on PCB

5.1. PCB design

The GEMnet-Header can be applied to all PCB's which are suitable for reflow soldering process and have a thickness 1.5 mm min.

5.2. Placement

Connector can be placed either by hand or by automatic handling.

TE can provide two variants products of GEMnet 180 degree header: with and w/o pick-up cap. The pick-up cap is optional for customer according to assembly process and capability. The pick-up cap is used for picking and place and should be removed after reflow process.

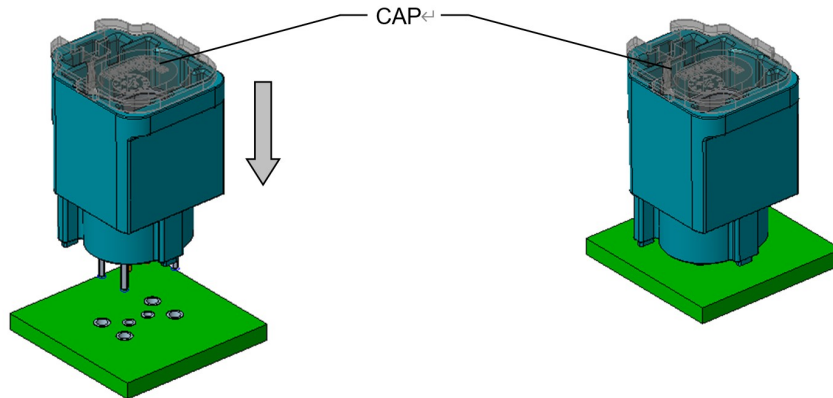


Fig. 1 / Pin Header 1P 180° unsealed, w/o cap, TE-No. 2397137
Pin Header 1P 180° unsealed, w/ cap, TE-No. 2421271

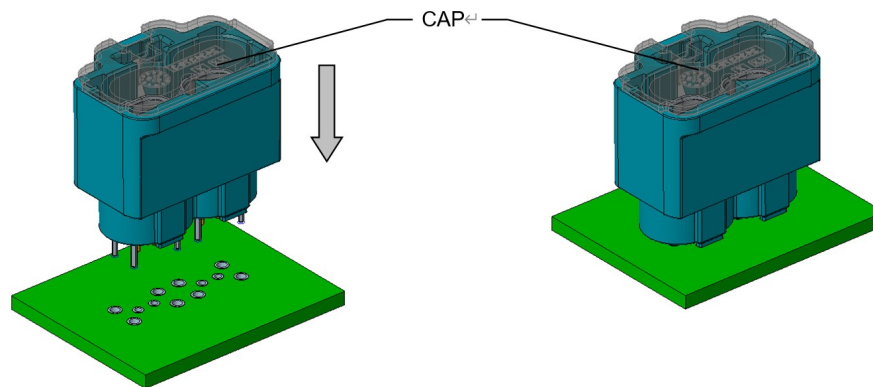


Fig. 2 / Pin Header 2P 180° unsealed, w/o cap, TE-No. 2409685
Pin Header 2P 180° unsealed, w/ cap, TE-No. 2452389

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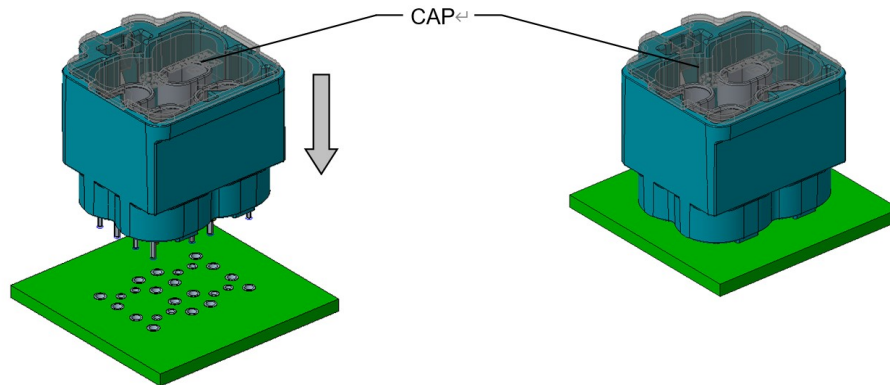


Fig. 3 / Pin Header 4P 180° unsealed, w/o cap, TE-No. 2408290
Pin Header 4P 180° unsealed, w/ cap, TE-No. 2438934

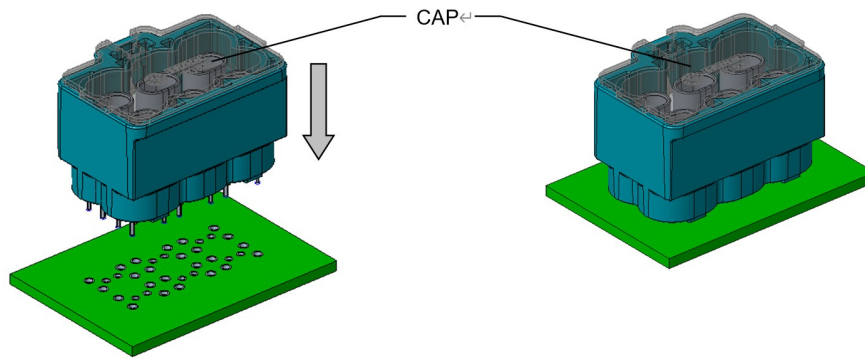


Fig. 4 / Pin Header 6P 180° unsealed, w/o cap, TE-No. 2390045
Pin Header 6P 180° unsealed, w/ cap, TE-No. 2434375

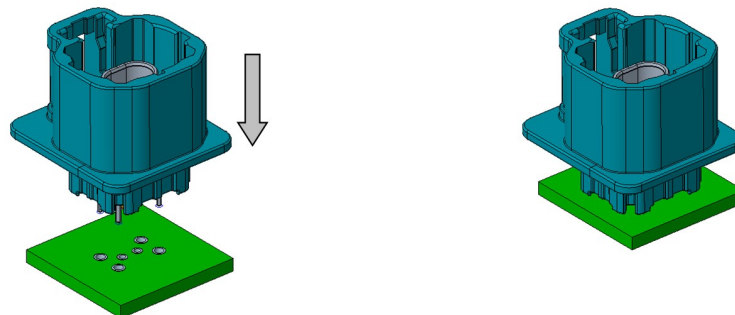


Fig. 5 / Pin Header 1P 180° sealed, w/o cap, TE-No. 2397248
Pin Header 1P 180° sealed, w/ cap, TE-No. TBD

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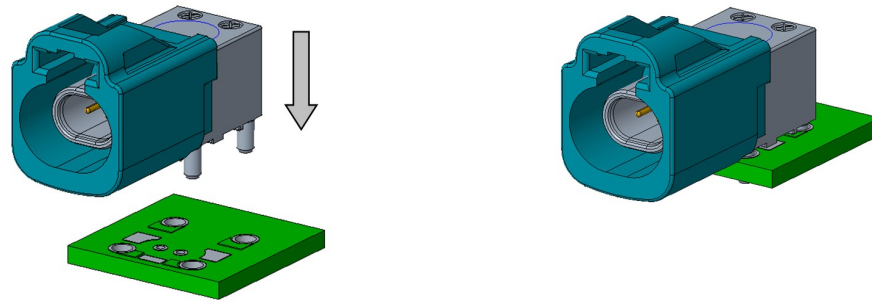


Fig. 6 / Pin Header 1P 90° unsealed, TE-No. 2374901

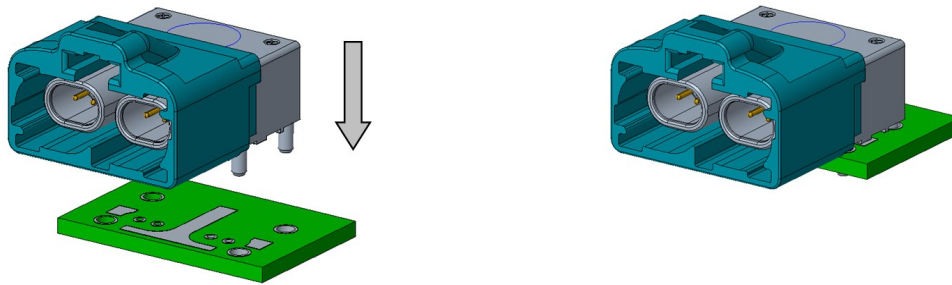


Fig. 7 / Pin Header 2P 90° unsealed, TE-No. 2974902

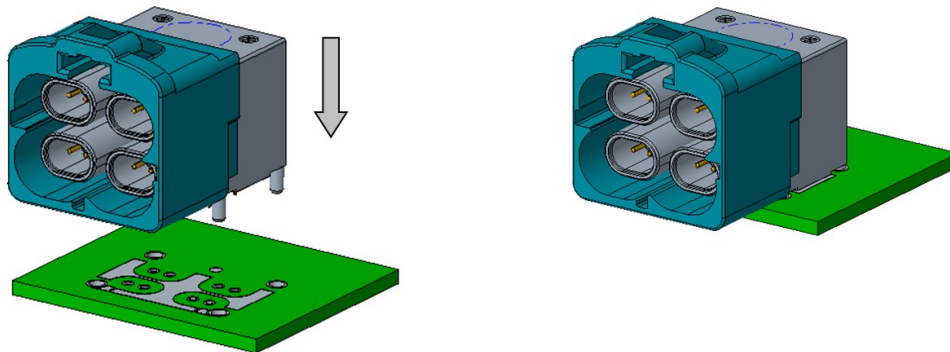


Fig. 8 / Pin Header 4P 90° unsealed, TE-No. 2374900

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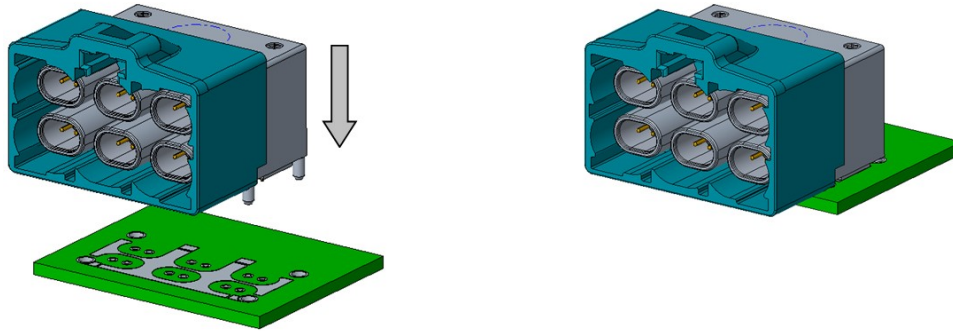


Fig. 9 / Pin Header 6P 90° unsealed, TE-No. 2397129

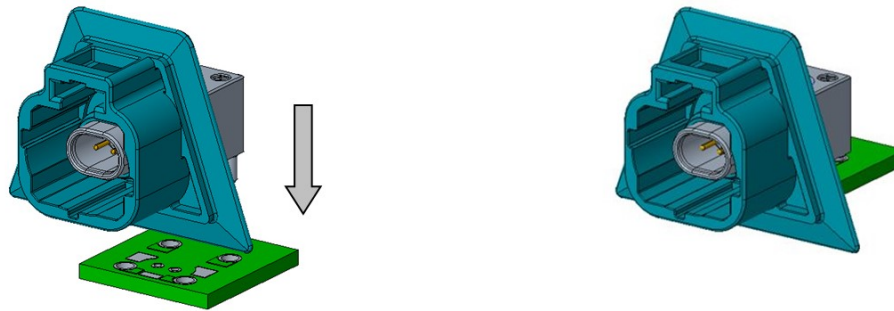


Fig. 10 / Pin Header 1P 90° sealed, TE-No. 2397320

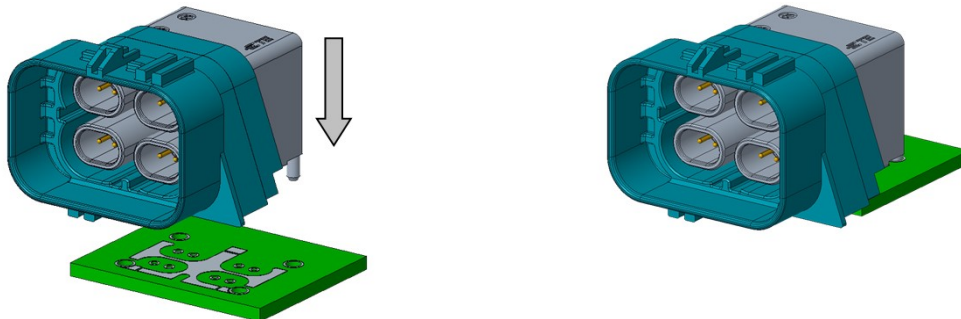


Fig. 11 / Pin Header 4P 90° sealed, TE-No. 2397322

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5.3. PCB-layout

The recommended PCB-layout is included in this specification (chapter 6.2).

Hole sizes and tolerances are to be regarded as recommendation and can be adapted to own mounting and soldering conditions.

6. Soldering Process of Pin Header

It is not practical to recommend an ideal reflow temperature profile for all situations. This depends on the used soldering paste and existing equipment.

Header is designed for reflow soldering, wave soldering and hand soldering process.

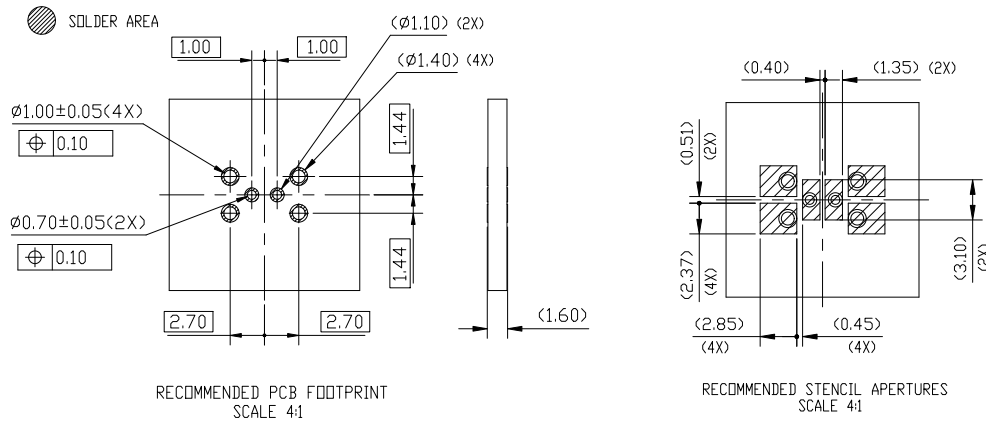
Recommended soldering processes only in reference to the respective soldering standard.

6.1. Temperature resistance of the components

Headers are heat resistant according to JEDEC J-STD-020D.

6.2. PCB layout and stencil for GEMnet 180° variants

The layout recommended is suitable for reflow soldering process, both the layout and stencil are for reference only. According to the specific application, customer can define the soldering pad and stencil, or contact TE engineering for technical support.



**Fig. 12 / Pin Header 1P 180° unsealed, TE-No. 2397137
Pin Header 1P 180° sealed, TE-No. 2397248**

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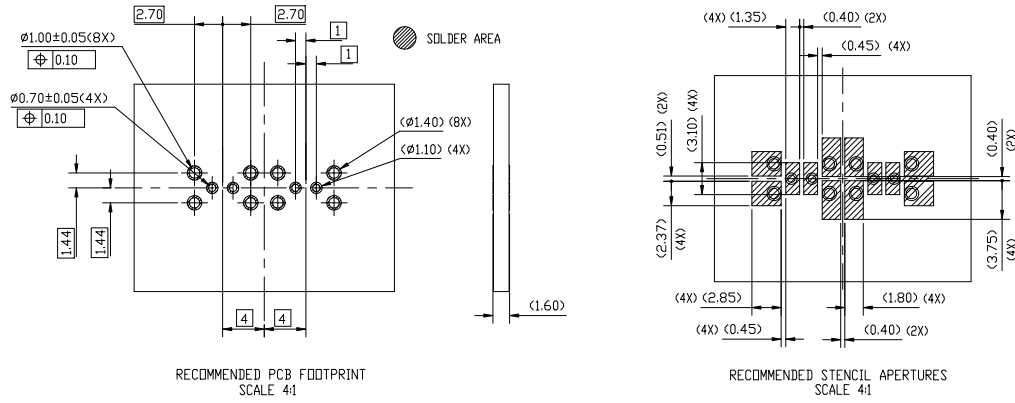


Fig. 13 / Pin Header 2P 180° unsealed, TE-No. 2409685

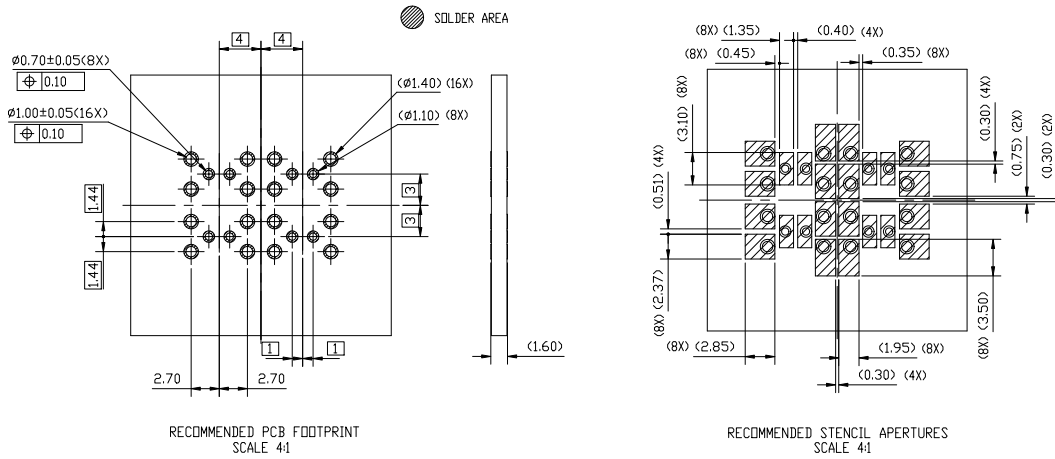


Fig. 14 / Pin Header 4P 180° unsealed, TE-No. 2408290

GEMnet Headers 90° / 180°, sealed / unsealed

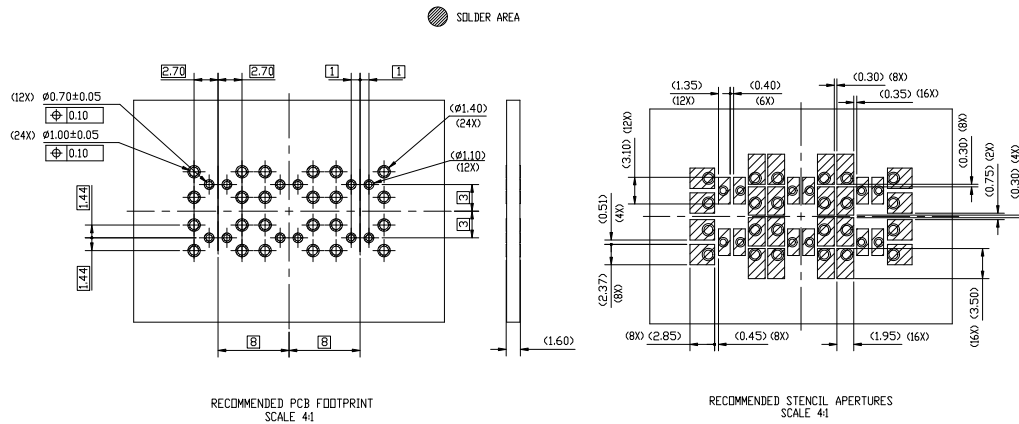


Fig. 15 / Pin Header 6P 180° unsealed, TE-No. 2390045

6.3. PCB layout and stencil for GEMnet 90° variants

The layout recommended is suitable for reflow soldering process, both the layout and stencil are for reference only. According to the specific application, customer can define the thickness or the width of the pad themselves, the same for the recommended stencil, but the keep out area on recommended layout must be retained.

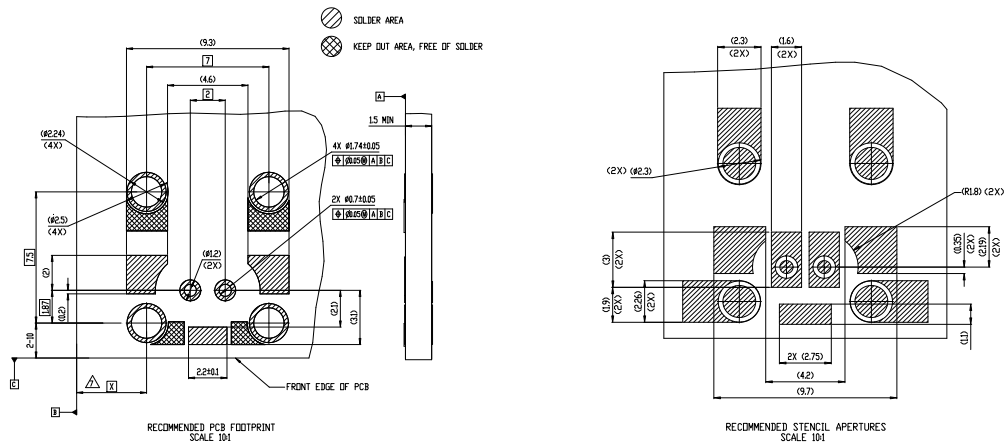


Fig. 16 / Pin Header 1P 90° unsealed, TE-No. 2374901

GEMnet Headers 90° / 180°, sealed / unsealed

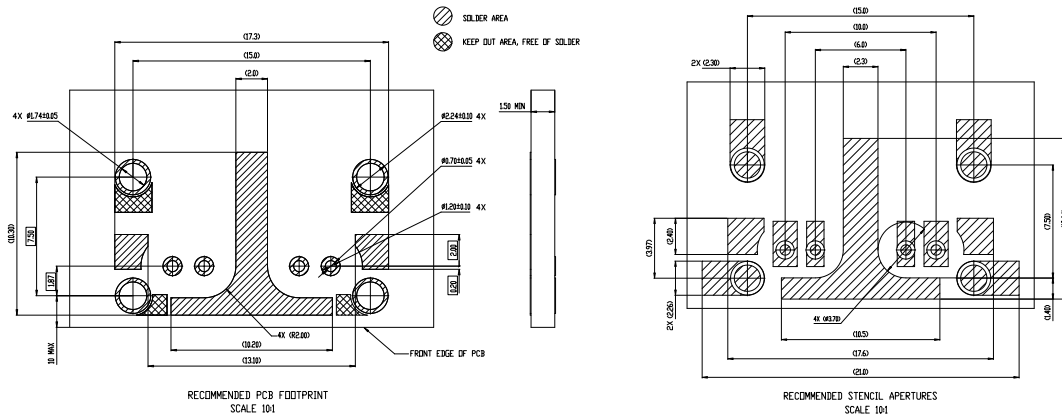


Fig. 17 / Pin Header 2P 90° unsealed, TE-No. 2974902

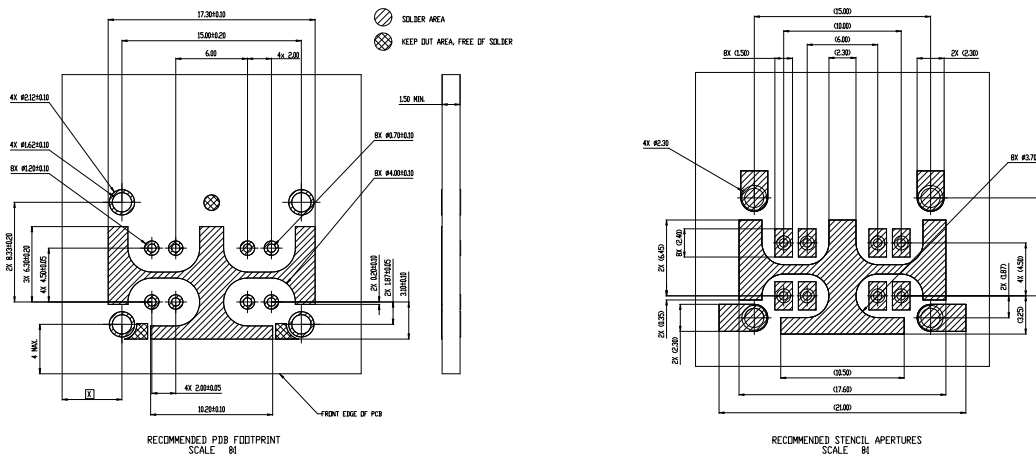


Fig. 18 / Pin Header 4P 90° unsealed, TE-No. 2374900

GEMnet Headers 90° / 180°, sealed / unsealed

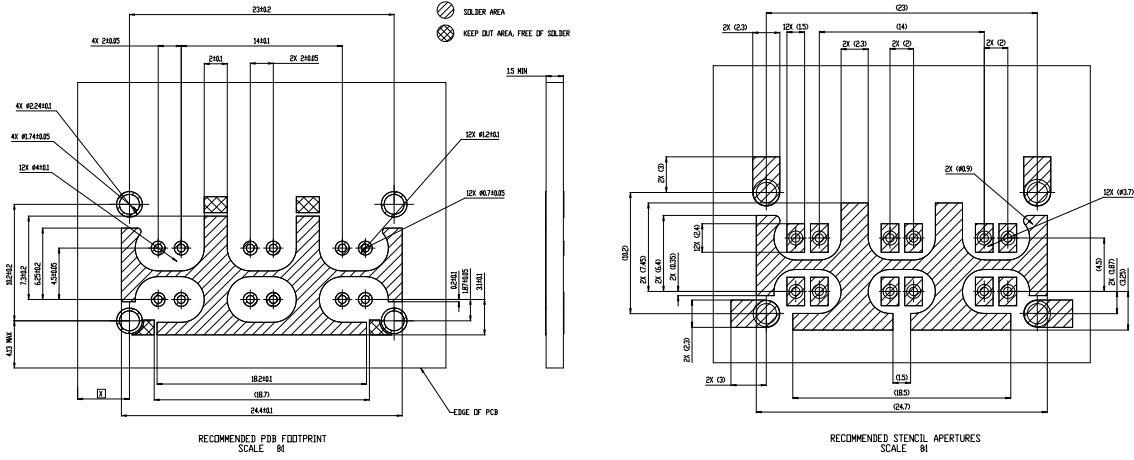


Fig. 19 / Pin Header 6P 90° unsealed, TE-No. 2397129

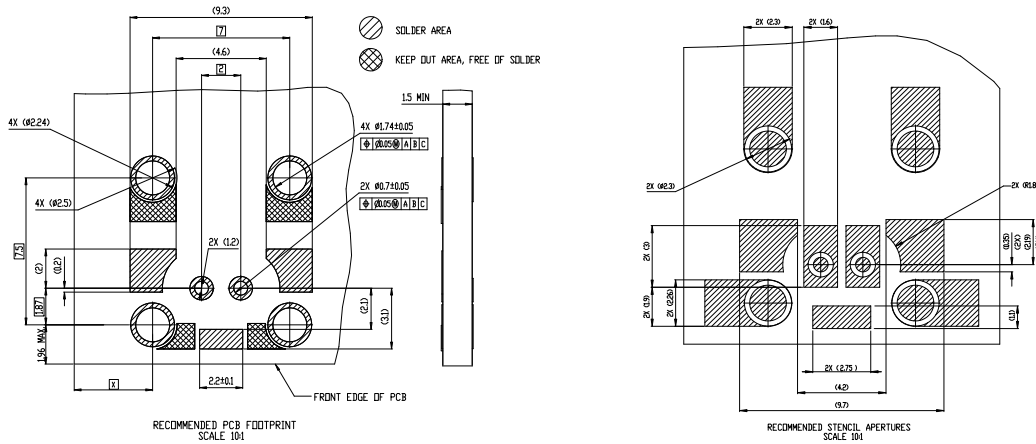


Fig. 20 / Pin Header 1P 90° sealed, TE-No. 2397320

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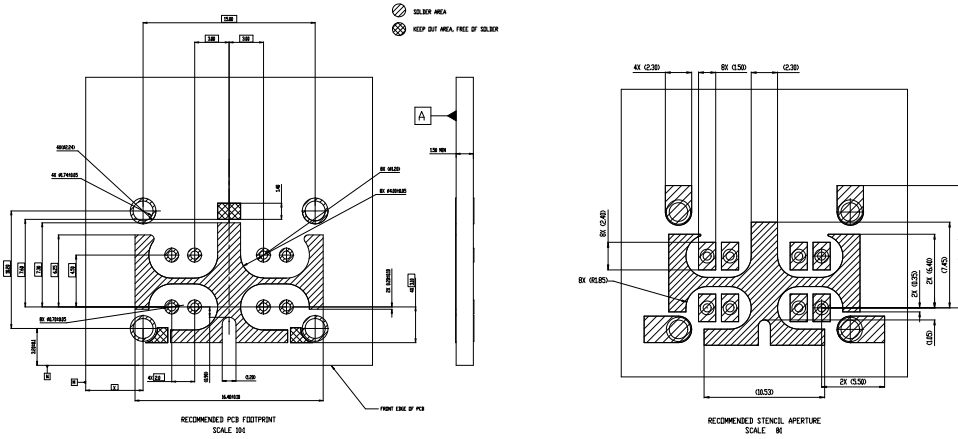
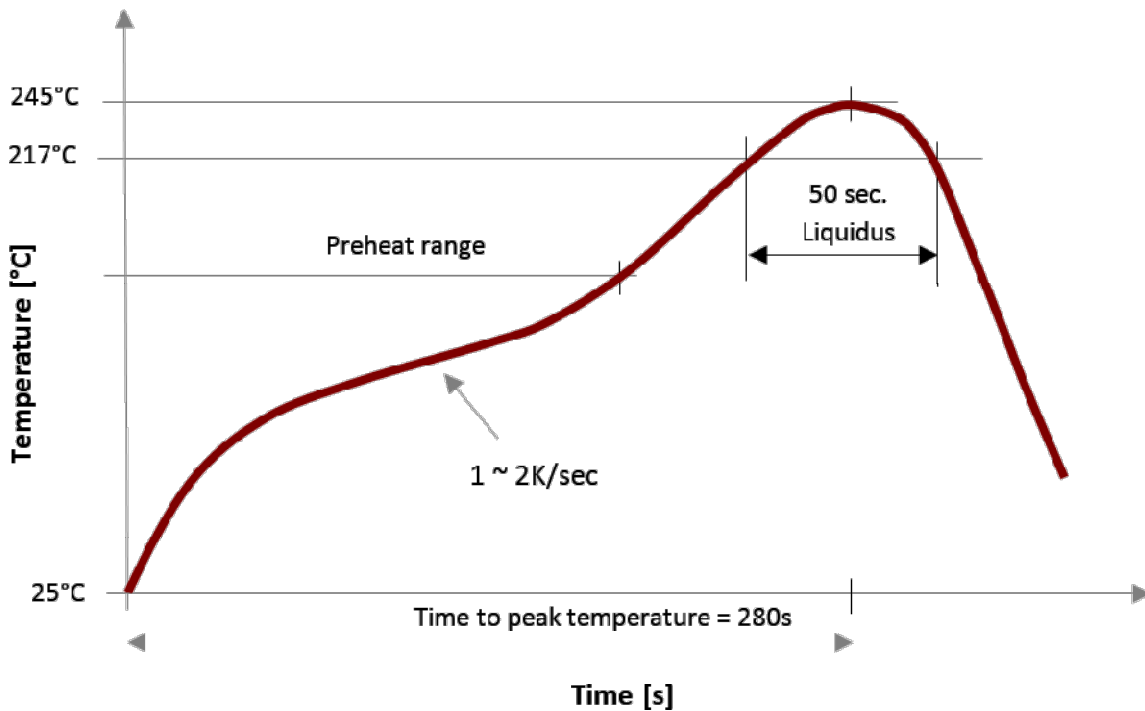


Fig. 21 / Pin Header 4P 90° sealed, TE-No. 2397322

6.4. Recommended parameters for the reflow soldering process (IPC/JEDEC J-STD-020D)

6.4.1. Temperature / Time profile



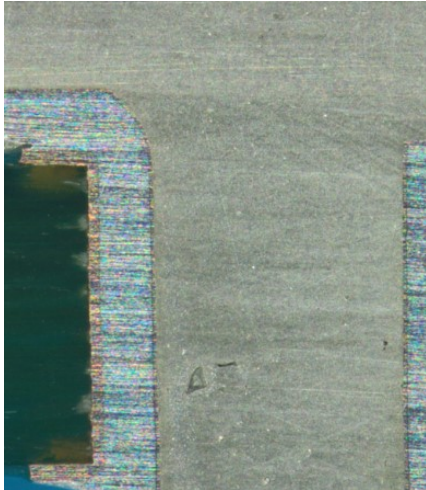
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6.4.2. Soldering paste

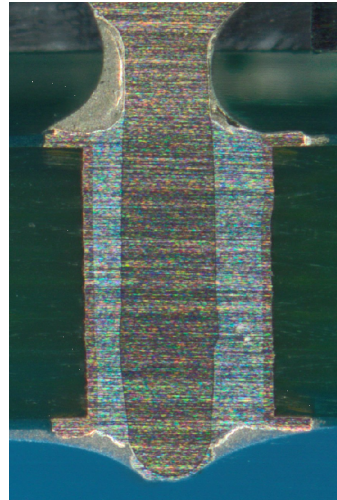
Recommended soldering paste: ALPHA OM-338T

6.5. Judgement of the soldering joint

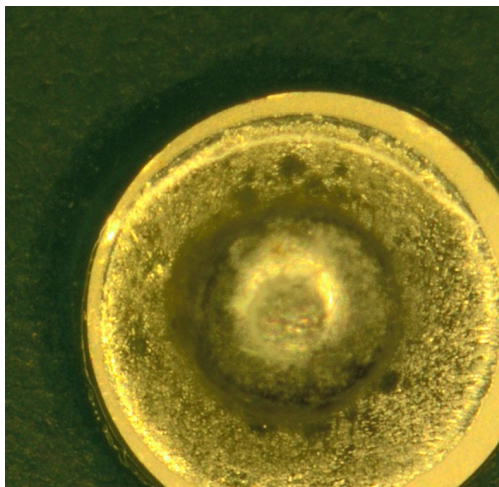
Micrograph: For an optimal soldering joint it is necessary to have at least a 75% through hole soldering. Judgement of the soldering joint will be done by optical inspection according to the acceptance criteria of IPC A610.



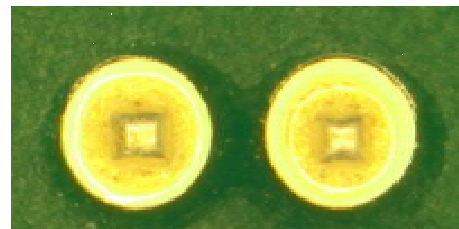
Micrograph from reflow shield pin



Micrograph from reflow signal pins



Soldering shield pin



Soldering signal pin

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7. Assembly of Pin Header with Device Housing

The front plate and installation shown as following for reference only, the customer needs to design it according to the practical application, the size of the opening on front plate must be ensured that product can through it.

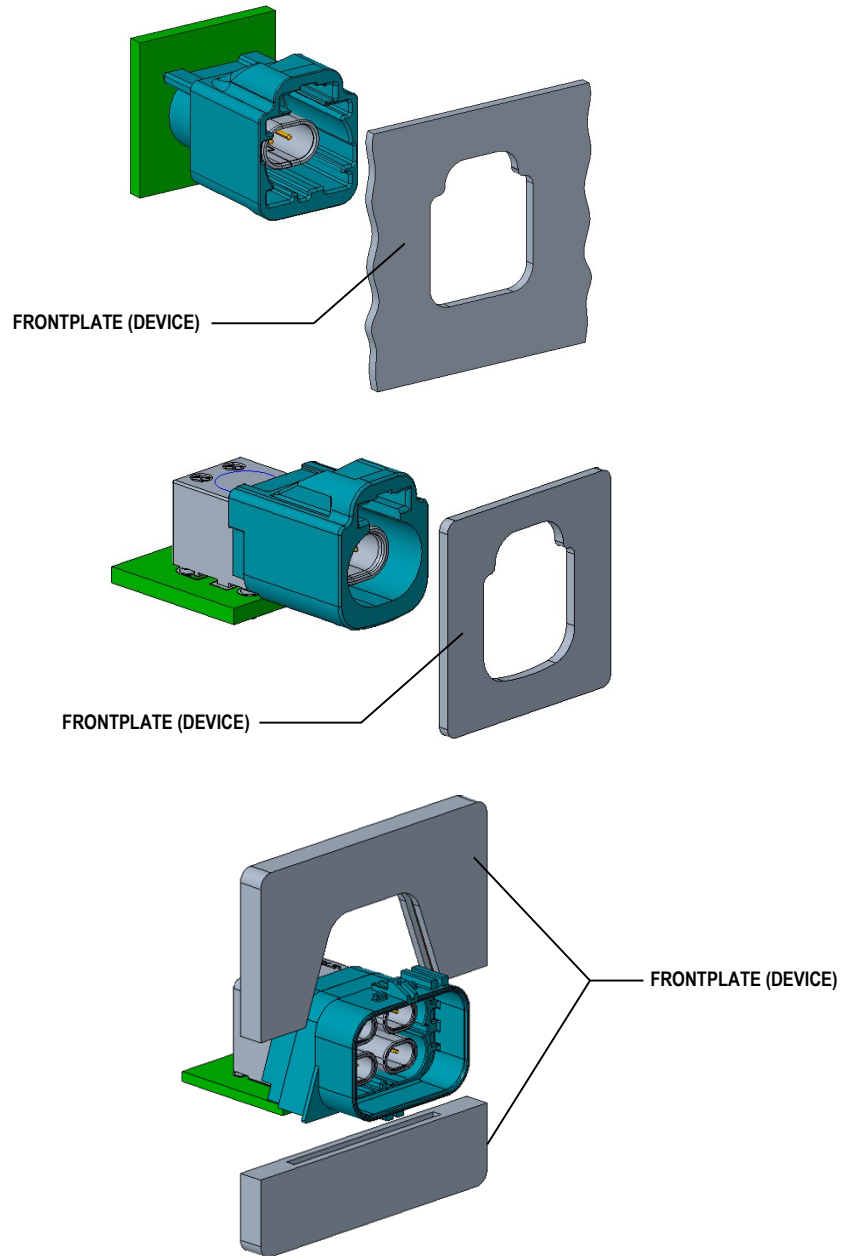


Fig. 22 / Assembly of Pin Header with Device Housing

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8. Cable Connector

8.1. Connector mated

It's proposed that the header and plug are mated in the axial direction with the locking window and latch locked.

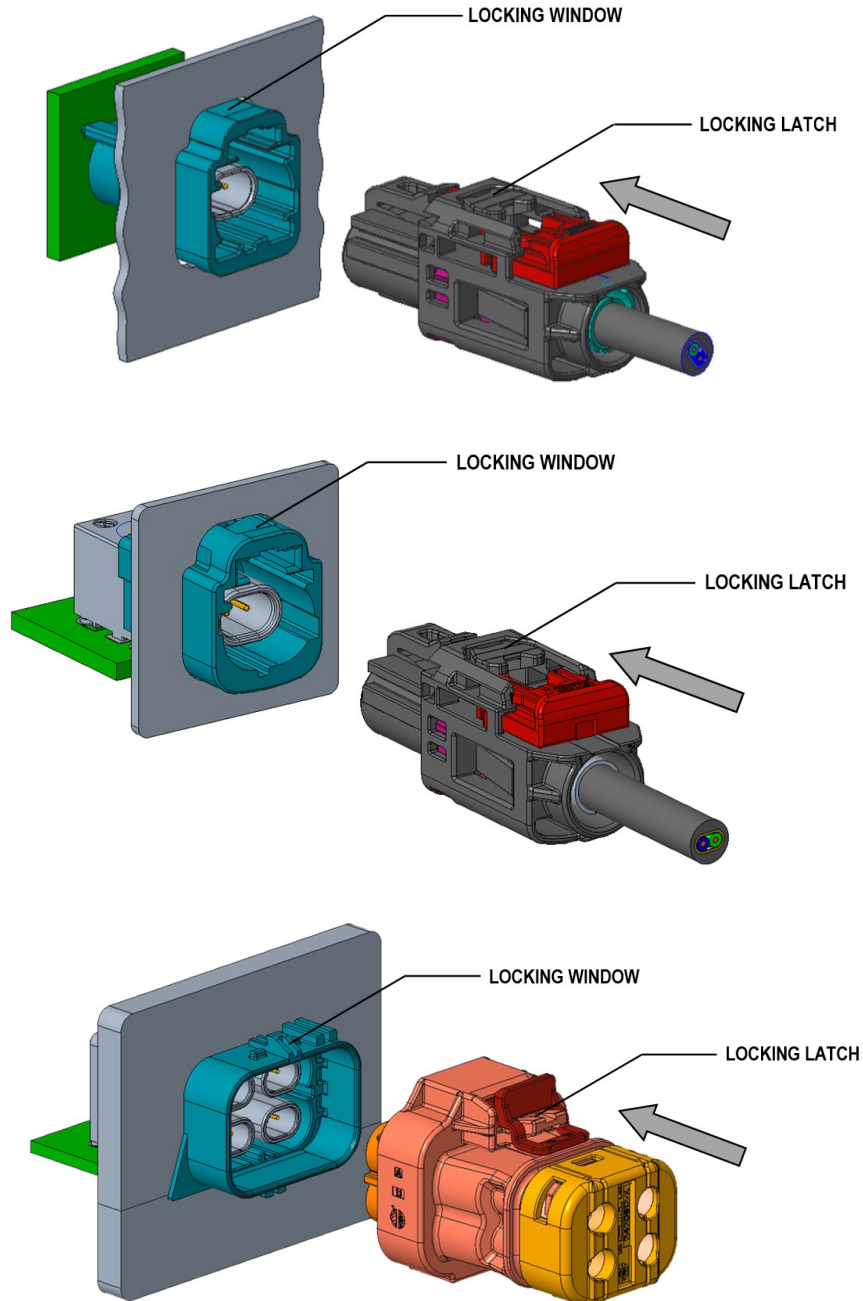


Fig. 23 / Orientation of cable connector and assembly in this direction



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8.2. Family List

Sealable	Position	Part No. (Header)	Description	Part No. (Plug) (recommended)
Unsealed	1 Port	2374901	Header, 90°	2368022
		2397137	Header, 180°, without cap	
		2421271	Header, 180°, with cap	
	2 Port	2374902	Header, 90°	2386612
		2409685	Header, 180°, without cap	
		2452389	Header, 180°, with cap	
	4 Port	2374900	Header, 90°	2386629
		2408290	Header, 180°, without cap	
		2438934	Header, 180°, with cap	
6 Port	2397129	Header, 90°	2428482	
	2390045	Header, 180°, without cap		
	2434375	Header, 180°, with cap		
Sealed	1 Port	2397248	Header, 180°, without cap	1802794
		2397320	Header, 90°	
	4 Port	2397322	Header, 90°	2420615



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9. History of Change

Revision	Date	Remark	Engineer
1	27-Mar-2023	Initial draft	Anor Zhao