

 **ELECTRONICS**

**METRAL<sup>®</sup>**

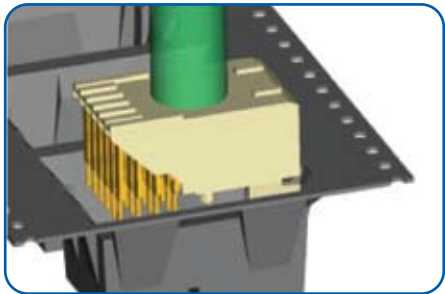
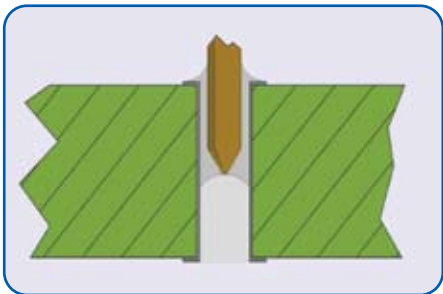
Board connectors for  
Pin-in-Paste processes

**FCI: SETTING  
THE STANDARD  
FOR CONNECTORS**

With operations in 30 countries,FCI is a leading manufacturer of connectors. Our 13,500 employees are committed to providing customers with high-quality, innovative products for a wide range of consumer and industrial applications.

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**NOTE**

This application guide is a brief review in implementing through-hole connectors to SMT-processes. The aim is to give information to all people involved in the process of developing and manufacturing electronic hardware.

**LIABILITY**

We believe that the information contained in this publication is the best currently available on the subject. It is offered as a possible helpful suggestion in any experimentation you may care to undertake and is subject to revision as additional knowledge and experience is gained. FCI makes no guarantee of results and assumes no obligation or liability whatsoever in connection with this information. This publication is not a license to operate under, or intended to suggest infringement of, any existing patent. Information given on the drawings in this document is not suitable for tooling design and construction. To obtain the correct drawings for these purposes, contact your local FCI representative.

## Board connectors for Pin-in-Paste processes

### Description

The METRAL® modular interconnect system is a standardized 2 mm backplane interconnect system complying with IEC 61076-4-104 that provides options to support low and high speed signaling applications. It features 4, 5 or 8 row of contacts with up to 5 mating levels with stackable modules that provides flexibility in integrating signal, power and coaxial connections at backplane interface.

### Pin-in-Paste

Pin-in-paste (PiP) technology allows the use of TMT products in SMT manufacturing processes. The connectors are automatically or manually placed on the board, then soldered in the same operations as the SMT components. Despite this, the mechanical strength of the TMT soldering is maintained. This is an important requirement for connectors nowadays in many industrial or automotive applications.

### Connector Design

In order to achieve compatibility with an automatic pick&place equipment, vision systems and reflow soldering processes connectors are adapted meeting specific requirements like housing design, holding features, plastic material and packaging. METRAL® PiP products are moulded in high temperature resistant LCP.

### Housing Design

Standoffs raise the housing body slightly above the PCB surface and thus allow the molten solder paste to flow freely from its printed position into the board hole and around the pin. The standoffs are correctly positioned for a good solder paste deposit around the pin. Please respect the stencil design guidelines below in order to avoid paste deposits around the standoffs.

### Pin Length

FCI uses a solder tail length of 2.9mm +/-0.2mm for METRAL® and SOFIX® Headers for a standard PCB of 1.6 mm thickness nominal.

### Packaging

For combining SMT and TMT components not only in the soldering process, but also in the assembly process, FCI proposes a choice of pick-and-place packaging for PiP connectors. The most common part numbers are available in tape-on-reel packaging, all others in tube.

## Application Design Guidelines

For application in a Pin-in-Paste process, FCI recommends the application design guidelines below.

### Stencil Design

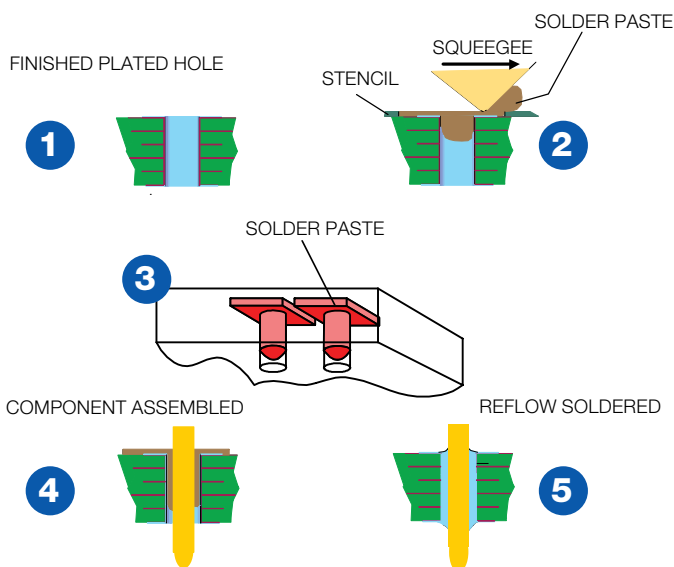
The stencil design is crucial for a good solder joint. It determines the quality of paste and the position of the paste print on the board. Each PCB hole has its own stencil aperture with enough spacing in between in order to have separate solder deposits. This prevents solder robbing from one hole to another and guarantees the correct quantity of solder paste for each hole. The print position is slightly asymmetrical so as to optimise the flow of molten solder paste.

### Paste Application

The quantity of paste for each hole depends on the soldering process parameters and the degree of hole filling. For the squeegee, FCI recommends a 45° angle. You can use a smaller angle for an even greater degree of hole filling. The squeegee moves in parallel with the shorter sides of the stencil apertures.

### Board Layout

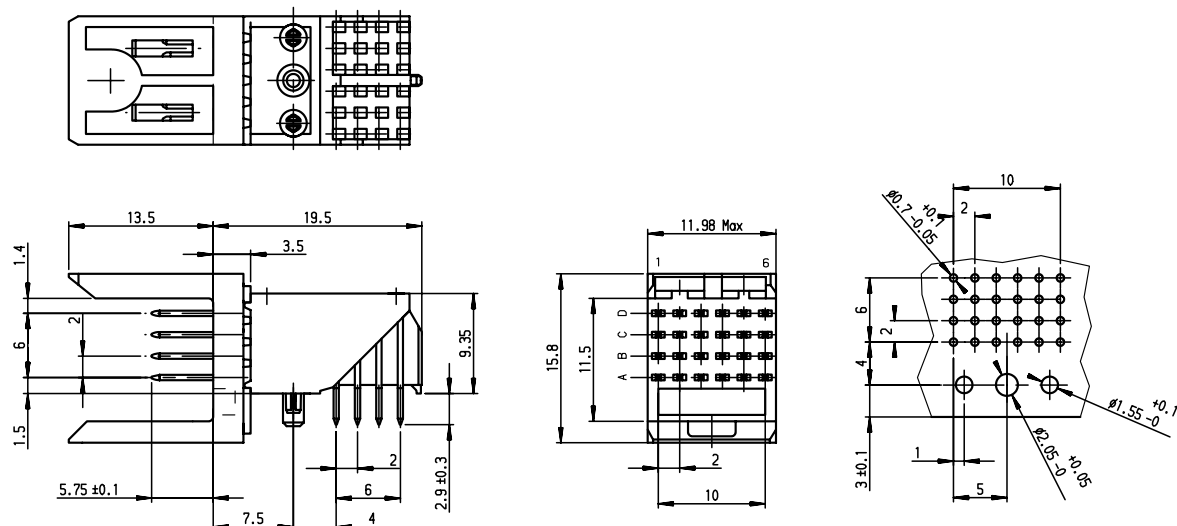
The recommended finished hole diameter for METRAL® PiP product on daughtercards is between 0.65mm and 0.80mm. For automatic pick-and-place, lean towards the upper end of the tolerance



## Headers, Signal, Right Angle, Pin-in-Paste

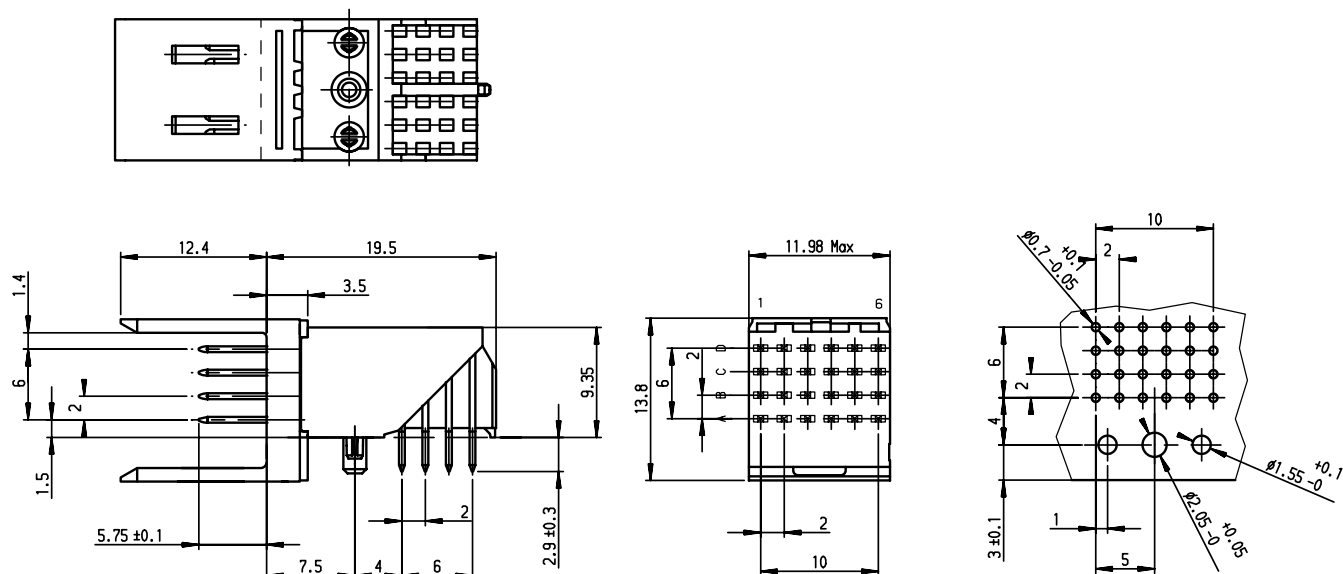
### Header, 4 row, Signal, wide body

Part number: HM1L41LFP000H6PLF



### Header, 4 row, Signal, narrow body

Part number: 58361-101LF



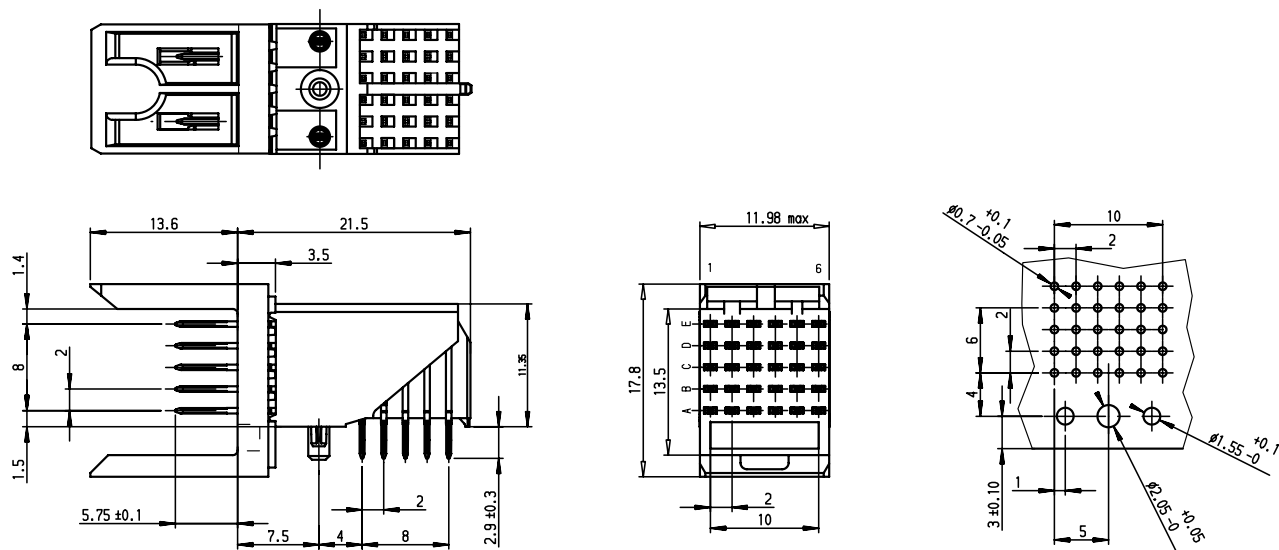
## References

Type	Description	Reference number
Product specification	METRAL® - solder -to-board and Pin-in-Paste	GS-12-446
Packaging specification	Labeling and packaging specification for lead-free and Pin-in-Paste	GS-14-920

# Headers, Signal, Right Angle, Pin-in-Paste

## Header, 5 row, Signal, wide body

Part number: HM1L51LFP000H6PLF



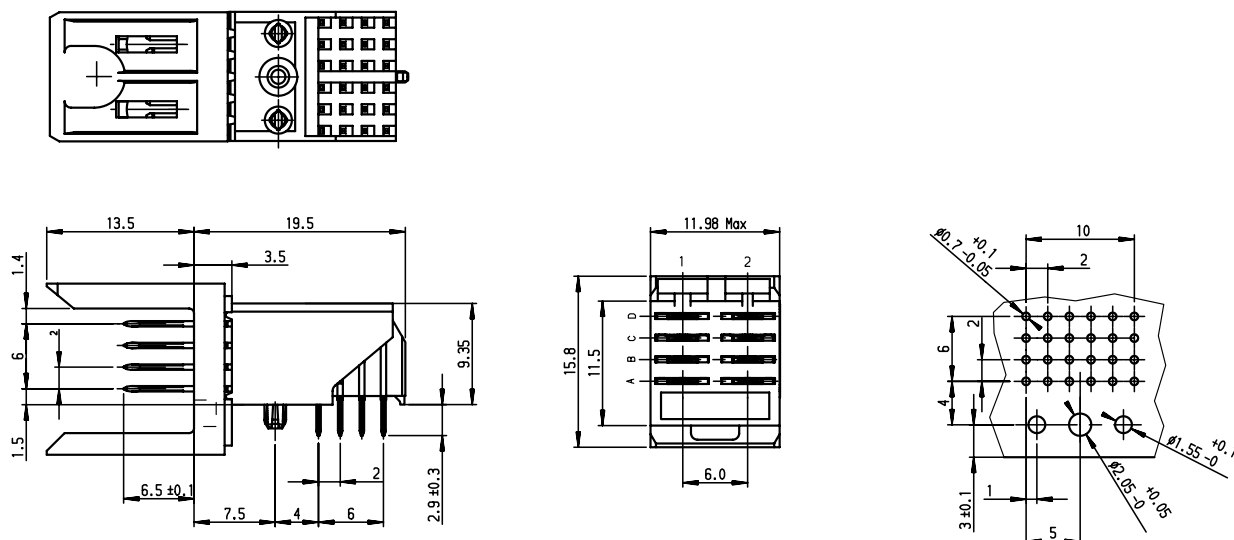
## References

Type	Description	Reference number
Product specification	METRAL® - solder -to-board and Pin-in-Paste	GS-12-446
Packaging specification	Labeling and packaging specification for lead-free and Pin-in-Paste	GS-14-920

## Headers, Power, Right Angle, Pin-in-Paste

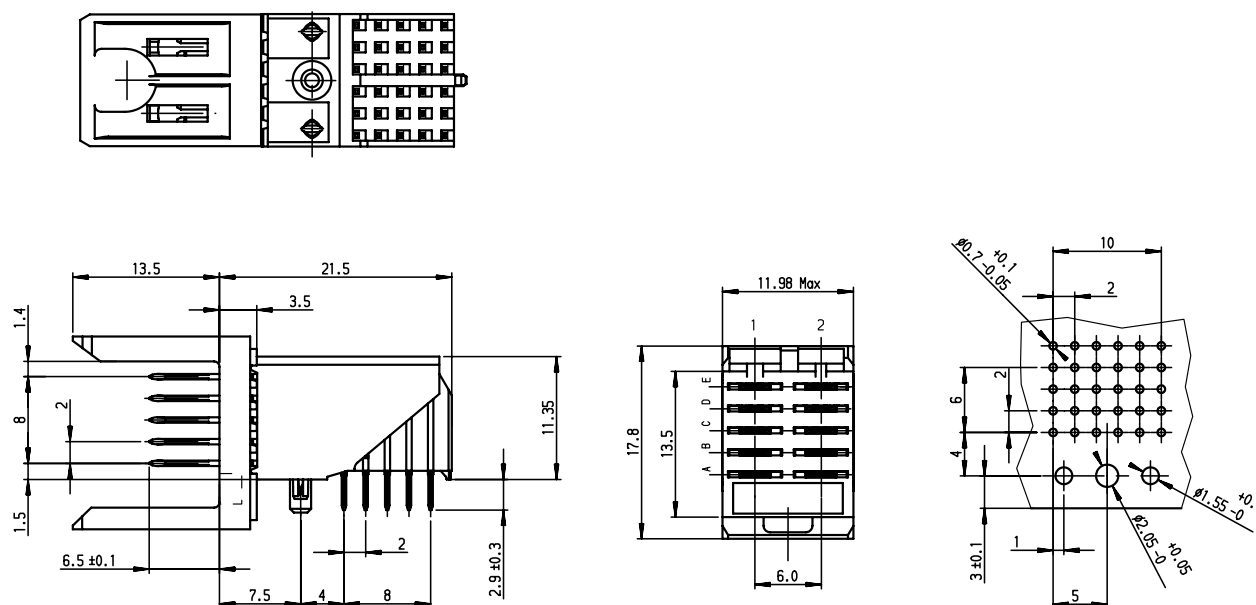
### Header, 4 row, Power, wide body

Part number: HM1K41DFP000H6PLF



### Header, 5 row, Power, wide body

Part number: HM1K51DFP000H6PLF



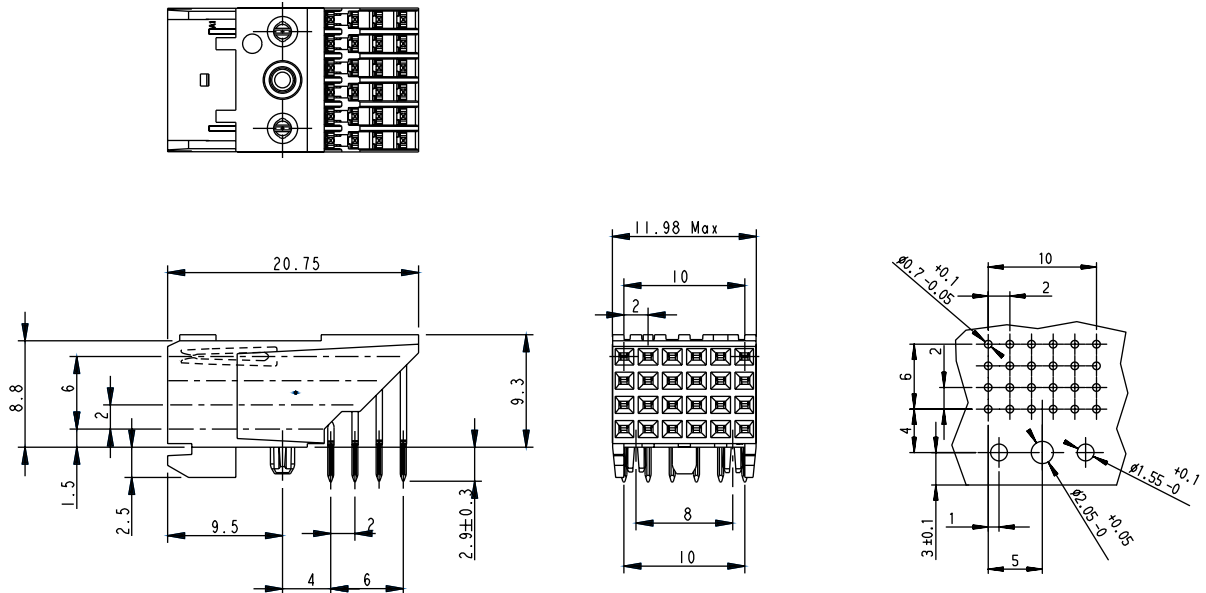
## References

Type	Description	Reference number
Product specification	METRAL® - solder -to-board and Pin-in-Paste	GS-12-446
Packaging specification	Labeling and packaging specification for lead-free and Pin-in-Paste	GS-14-920

## Receptacles, Signal, Right Angle, Pin-in-Paste

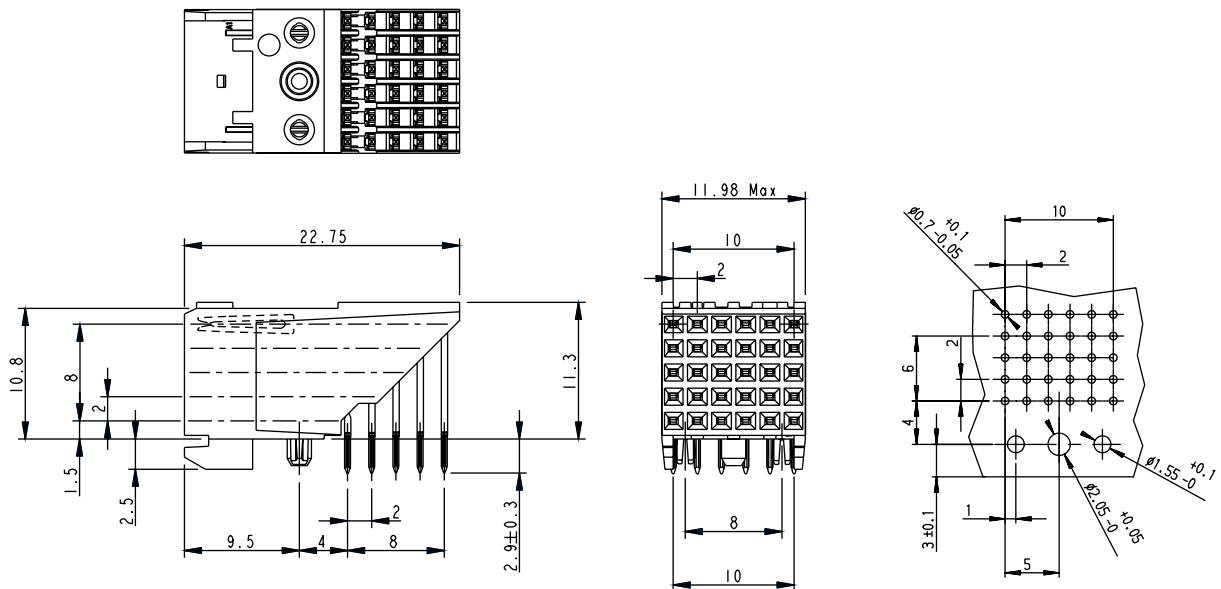
## Receptacle, 4 row, Signal

Part number: 52048-101LF



## Receptacle, 5 row, Signal

Part number: 52049-101LF



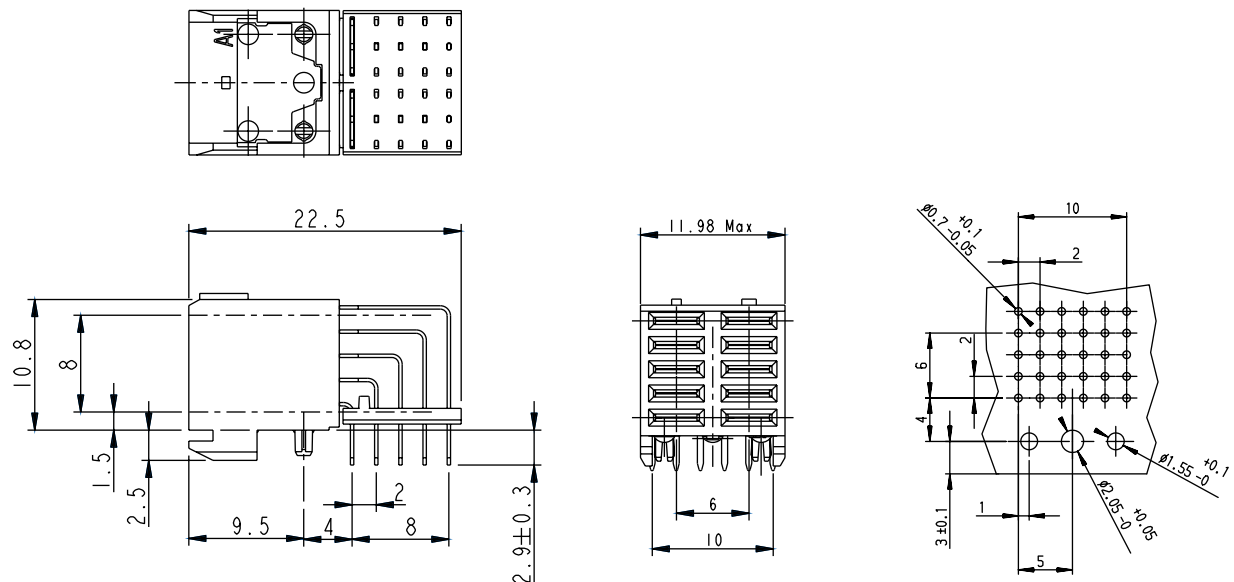
## References

Type	Description	Reference number
Product specification	METRAL® - receptacle - solder -to-board and Pin-in-Paste	GS-12-215
Packaging specification	Labeling and packaging specification for lead-free and Pin-in-Paste	GS-14-920

## Receptacle, Power, Right Angle, Pin-in-Paste

## Receptacle, 5 row, Power

Part number: 63793-101LF



## References

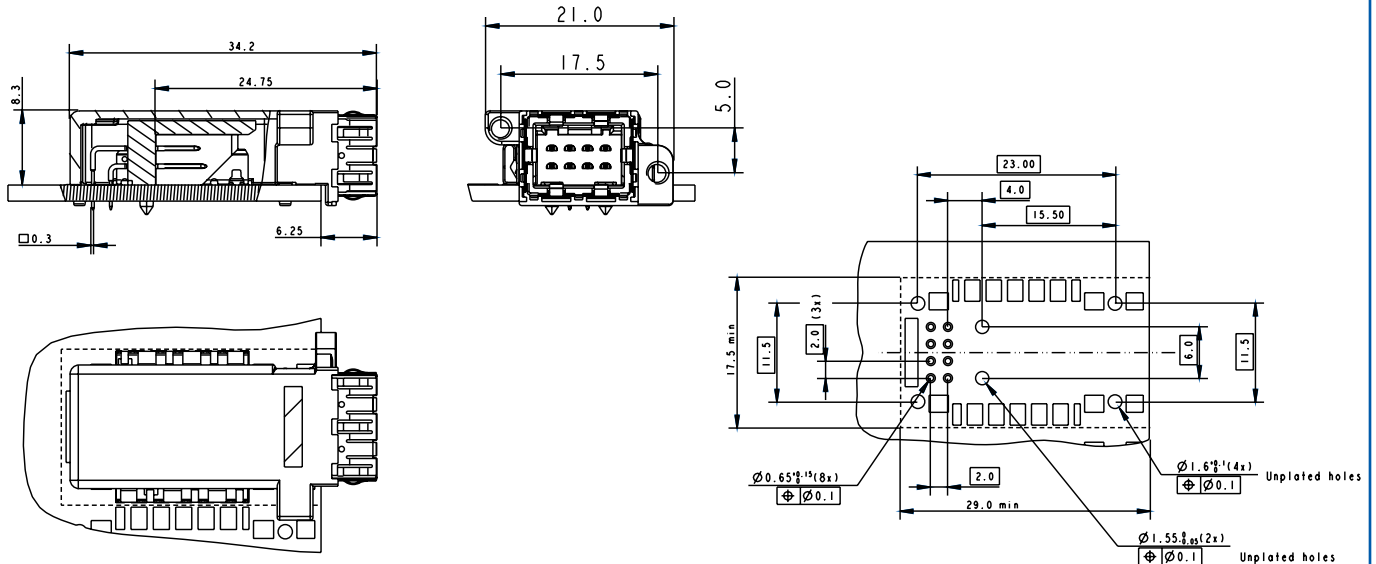
Type	Description	Reference number
Application specification	METRAL® - Right angle Solder to Board Receptacles, signal and power	BUS-20-061
Packaging specification	Labeling and packaging specification for lead-free and Pin-in-Paste	GS-14-920



## SOFIX®, Header, Signal, Right Angle, Pin-in-Paste

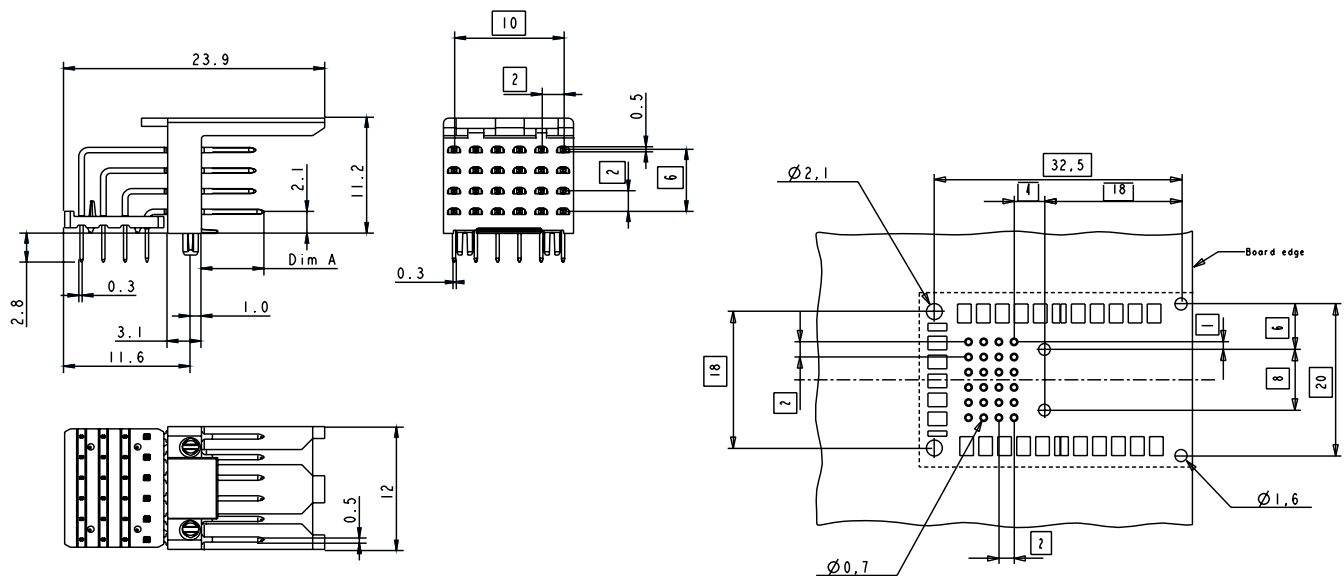
## SOFIX®, Header, 4 row, Signal, 2 x 4 position

Part number: 72860-103LF



## SOFIX®, Header, 4 row, Signal, 2 x 6 position

Part number: 72850-101LF



## References

Type	Description	Reference number
Product specification	SOFIX® - headers	GS-12-307
Packaging specification	Labeling and packaging specification for lead-free and Pin-in-Paste	GS-14-920

For more information about e-catalog or FCI  
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- Консультации по применению компонента;
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