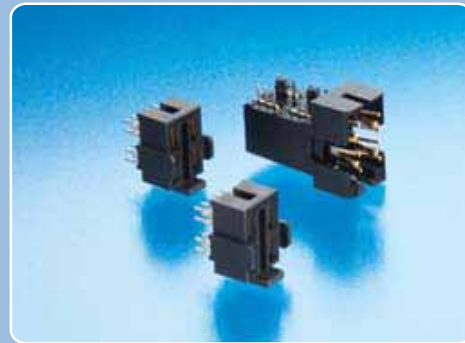




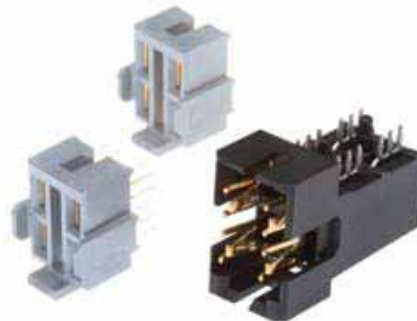
## METRAL® HIGH POWER CONNECTORS

-  Header, High Power
-  Receptacle, High Power

## Header, High Power

### FEATURES

- Available in 1x2 or 2x2 contact configurations
- Rated for up to 80 Amps current for a single module
- Voltage Rating: 150V
- Receptacle connectors can be provided with two contact lengths to enable first-mate/last break sequencing
- Protected backplane receptacle connector is UL 60950 (Finger Probe) compliant
- Layout compatible with Metral 2mm backplane connector family
- Press-fit termination



### TECHNICAL DATA

#### PHYSICAL

- Contacts: Copper Alloy
- Plating:
  - Gold over nickel on separable interface
  - Tin-lead over nickel on press-fit tails
- Housing: High temperature thermoplastic, UL 94V-0 compliant
- Performance level Telcordia CO

#### ELECTRICAL (see table below)

#### MECHANICAL PERFORMANCE

- Mating force: 31.2N max per connector
- Unmating force: 9.0N min per connector
- Press-fit insertion force: 67N max per individual contact tail

#### PACKAGING

- Tubes

#### PROCESSING INFORMATION

- Applicable process: wave/IR / vapor phase

#### REFERENCE DATA

- Product Specification GS-12-220
- Application Specification GS-20-023
- Safety UL 60950 & IEC 60950-1 Prevention of Operator Access to Energized Parts

### MATING DATA

#### Receptacle, page 151

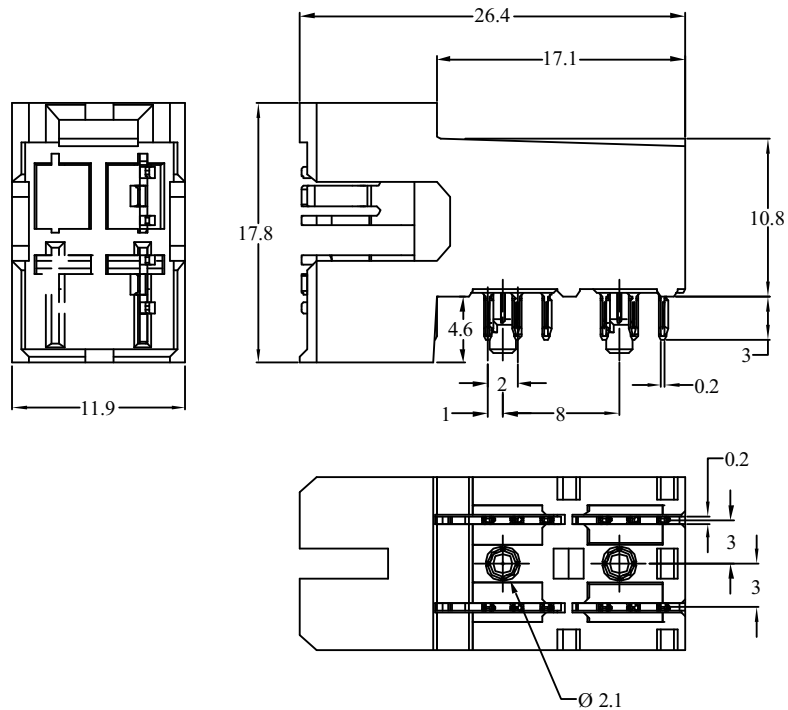
- Vertical receptacle, 8,0 mm mating length, 10009536-001
- Vertical receptacle, 6,5 mm mating length, 10009536-002
- Vertical receptacle, fmlb, 10025058-XXXX

### ELECTRICAL

| number of connectors,<br>Fully powered | copper pad weight  | Current ratings (max. Amps per contact) |       |
|----------------------------------------|--------------------|-----------------------------------------|-------|
|                                        |                    | 1 x 2                                   | 2 x 2 |
| 1                                      | 5 oz, double sided | 40                                      | 20    |
| up to 5 adjacent                       | 5 oz, double sided | 32                                      | 14    |
| 1                                      | 2 oz, double sided | 32                                      | 15    |
| up to 5 adjacent                       | 2 oz, double sided | 27                                      | 12    |

# Header, High Power

## PRODUCT



PCB pattern P23, see chapter PCB layouts

## PARTNUMBERS

10009542-001LF

10009556-001LF

Base Part Number

Configuration

LF

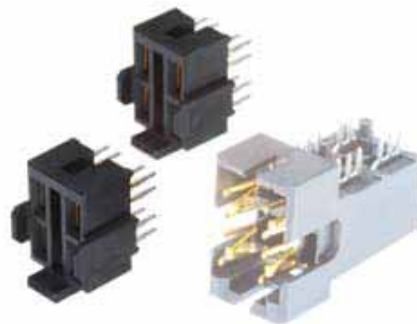
LF = lead free

| part number    | Description                      |
|----------------|----------------------------------|
| 10009542-001LF | Right-angle header, 2x2 Contacts |
| 10009556-001LF | Right-angle header, 1x2 Contacts |

## Receptacle, High Power

### FEATURES

- Available in 1x2 or 2x2 contact configurations
- Rated for up to 80 Amps current for a single module
- Voltage Rating: 150V
- Receptacle connectors can be provided with two contact lengths to enable first-mate/last break sequencing
- Protected backplane receptacle connector is UL 60950 (Finger Probe) compliant
- Layout compatible with Metral 2mm backplane connector family
- Press-fit termination



### TECHNICAL DATA

#### ■ PHYSICAL

- Contacts: Copper Alloy
- Plating:
  - Gold over nickel on separable interface
  - Tin-lead over nickel on press-fit tails
- Housing: High temperature thermoplastic, UL 94V-0 compliant
- Performance level Telcordia CO

#### ■ ELECTRICAL (see table below)

#### ■ MECHANICAL PERFORMANCE

- Mating force: 31.2N max per connector
- Unmating force: 9.0N min per connector
- Press-fit insertion force: 67N max per individual contact tail

#### ■ PACKAGING

- Tubes

#### ■ PROCESSING INFORMATION

- Applicable process: wave/IR / vapor phase

#### ■ REFERENCE DATA

- Product Specification GS-12-220
- Application Specification GS-20-023
- Safety UL 60950 & IEC 60950-1 Prevention of Operator Access to Energized Parts

### MATING DATA

#### ■ Header, page 149

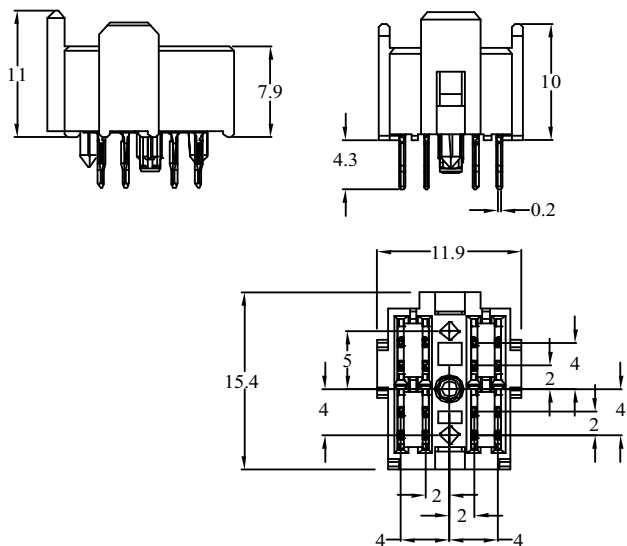
- right angle header, 2 x 2 contacts, partnumber, 10009452-001
- right angle header, 1 x 2 contacts, partnumber, 10009556-001

### ELECTRICAL

| number of connectors,<br>Fully powered | copper pad weight  | Current ratings (max. Amps per contact) |       |
|----------------------------------------|--------------------|-----------------------------------------|-------|
|                                        |                    | 1 x 2                                   | 2 x 2 |
| 1                                      | 5 oz, double sided | 40                                      | 20    |
| up to 5 adjacent                       | 5 oz, double sided | 32                                      | 14    |
| 1                                      | 2 oz, double sided | 32                                      | 15    |
| up to 5 adjacent                       | 2 oz, double sided | 27                                      | 12    |

# Receptacle, High Power

## PRODUCT

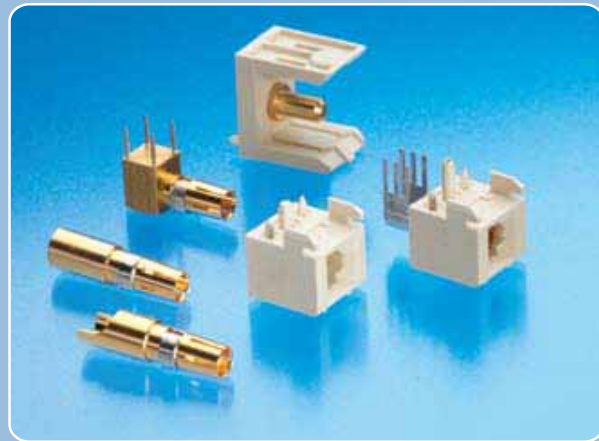


PCB pattern P24, see chapter PCB layouts

## PARTNUMBERS

| Base Part Number           |      | Pin Configuration | LF             |
|----------------------------|------|-------------------|----------------|
| 10009536-yyyLF             |      | yyy               | LF = lead free |
| receptacle, straight       |      |                   |                |
| receptacle straight        | 001  | -                 | 8,00 mm        |
|                            | 002  | -                 | 6,00 mm        |
| 10025058-yyyyLF            |      | yyyy              |                |
| receptacle, straight, FMLB |      |                   |                |
| receptacle straight FMLB   | 1222 | pos. 1            | 1,10 mm        |
|                            |      | pos. 2            | 2,60 mm        |
|                            |      | pos. 3            | 2,60 mm        |
|                            |      | pos. 4            | 2,60 mm        |
|                            | 1122 | pos. 1            | 1,10 mm        |
|                            |      | pos. 2            | 1,10 mm        |
|                            |      | pos. 3            | 2,60 mm        |
|                            |      | pos. 4            | 2,60 mm        |
|                            | 2122 | pos. 1            | 1,10 mm        |
|                            |      | pos. 2            | 1,10 mm        |
|                            |      | pos. 3            | 2,60 mm        |
|                            |      | pos. 4            | 2,60 mm        |
|                            | 2111 | pos. 1            | 2,60 mm        |
|                            |      | pos. 2            | 1,10 mm        |
|                            |      | pos. 3            | 2,60 mm        |
|                            |      | pos. 4            | 2,60 mm        |
|                            | 2112 | pos. 1            | 2,60 mm        |
|                            |      | pos. 2            | 1,10 mm        |
|                            |      | pos. 3            | 1,10 mm        |
|                            |      | pos. 4            | 2,60 mm        |





## METRAL® HYBRID CONNECTORS

-  DIN Standard High Power
-  Mini Power
-  DIN Standard Coax
-  Mini Coax

## Header, straight, DIN standard, High Power

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011



### TECHNICAL DATA

#### PHYSICAL

- housing: glass-filled LCP, colour natural
- flammability rating: UL 94 V-0
- contact material: Beryllium Copper
- performance level: Telcordia CO

#### ELECTRICAL

- current rating: up to 40 A
- insulation resistance:  $5 \times 10^3 \text{ M}\Omega$  initially,  $1 \times 10^3 \text{ M}\Omega$  after tests
- withstanding voltage: 1000 V rms (sea level)

#### MECHANICAL PERFORMANCE

- Recommended hole diameter:  $1,00 \pm 0,1 \text{ mm}$

#### ENVIRONMENTAL

- Operating temperature  $-55^\circ\text{C}$  to  $+125^\circ\text{C}$
- RoHS information, this product is compatible according to the European Union Directive 2002/95/IEC

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

- Applicable process: assemble to board

#### APPLICATION EQUIPMENT

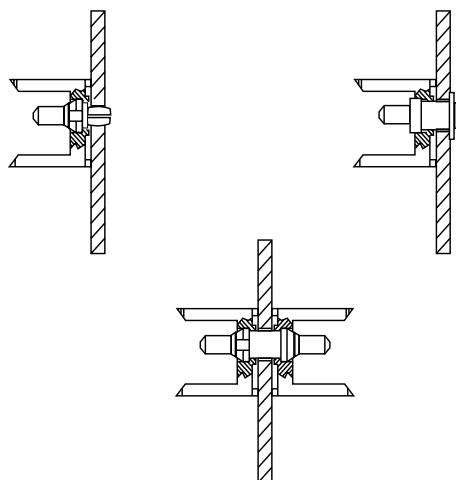
- for application equipment, check out the application equipment table on page 217-223

### MATING DATA

- Hybrid DIN standard receptacle, High power right angle, page 157

- |                                                                       |             |
|-----------------------------------------------------------------------|-------------|
| ■ Receptacle power insert right angle, solder to board                | 85995-103LF |
| ■ Receptacle power insert, right angle, solder to board, feed-through | 70424-003LF |

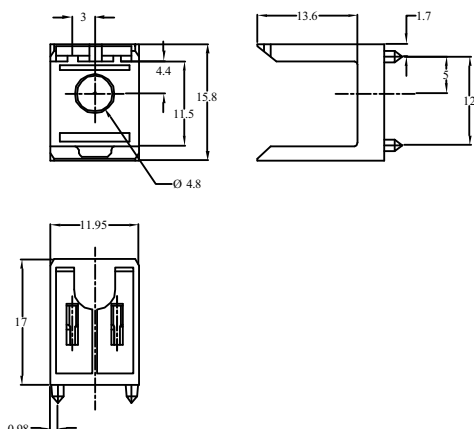
### TYPICAL APPLICATIONS



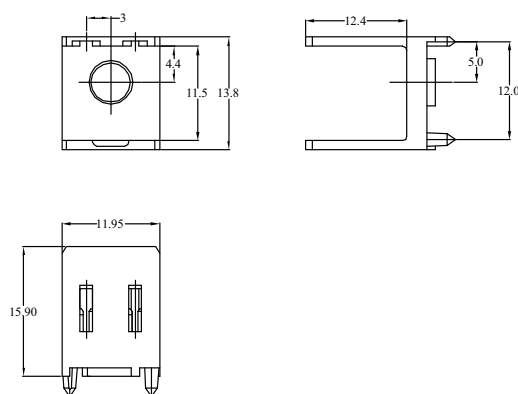
# Header, straight, DIN standard, High Power

## PRODUCT

### Wide Body Housing

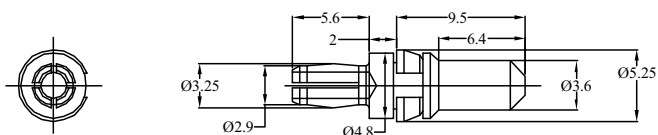


### Narrow Body Housing

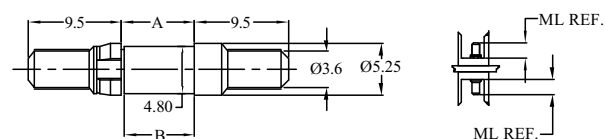


PCB pattern P9, see chapter PCB layouts

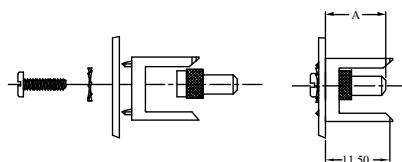
### Power insert, straight, press fit



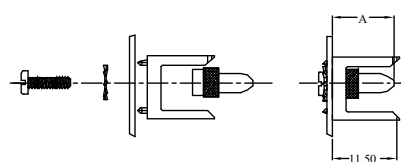
### Power coupler



### Screw to board, high power straight plug



POWER PIN ASSEMBLY  
STYLE A



POWER PIN ASSEMBLY  
STYLE B

## PARTNUMBERS

### Housings

| Partnumber         | Description         |
|--------------------|---------------------|
| <b>70290-001LF</b> | narrow body housing |
| <b>88911-101LF</b> | wide body housing   |

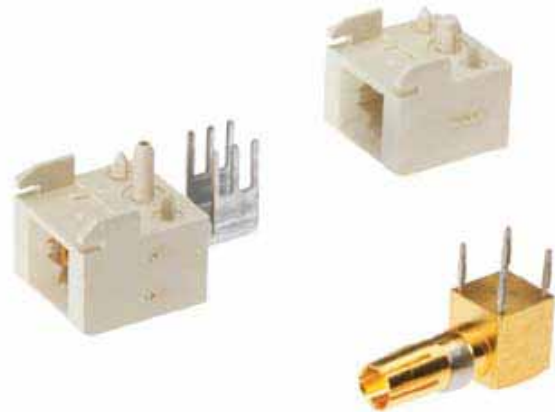
### Power inserts

| Partnumber         | Description                             | Current rating | PCB thickness |
|--------------------|-----------------------------------------|----------------|---------------|
| <b>85977-001LF</b> | power insert straight press-fit         | 30 A           | -             |
| <b>70201-001LF</b> | power coupler                           | 40 A           | 1,6 mm        |
| Partnumber         | Description                             | mating length  | dimension A   |
| <b>91570-001LF</b> | screw to board high power straight plug | 8,00 mm        | 11,50 mm      |

## Receptacle, Right angle, DIN standard, High Power

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011



### TECHNICAL DATA

#### PHYSICAL

- housing: glass-filled LCP, colour natural
- flammability rating: UL 94 V-0
- contact material: Beryllium Copper
- performance level: Telcordia CO

#### ELECTRICAL

- current rating: up to 40 A
- insulation resistance:  $5 \times 10^3 \text{ M}\Omega$  initially,  $1 \times 10^3 \text{ M}\Omega$  after tests
- withstanding voltage: 1000 V rms (sea level)

#### MECHANICAL PERFORMANCE

- Recommended hole diameter:  $1,00 \pm 0,1 \text{ mm}$

#### ENVIRONMENTAL

- Operating temperature  $-55^\circ\text{C}$  to  $+125^\circ\text{C}$
- RoHS information, this product is compatible according to the European Union Directive 2002/95/IEC

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

- Applicable process: wave / IR / vapor phase / press-fit

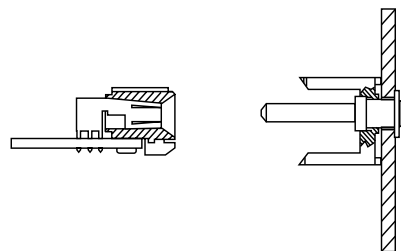
#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223

### MATING DATA

- High power plug insert, page 155
- partnumber, 91570-001LF

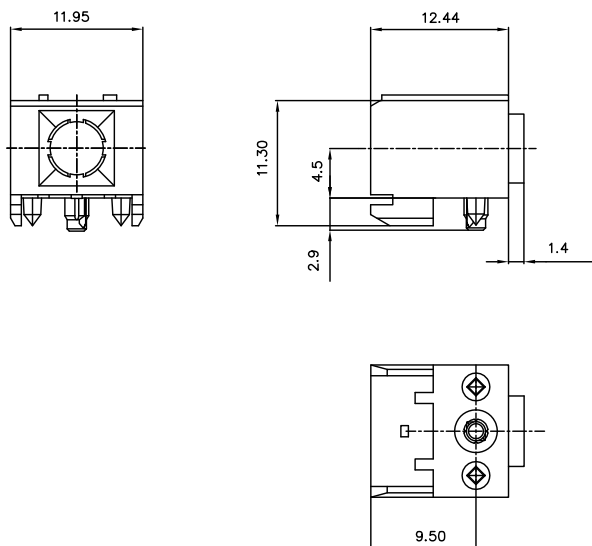
### TYPICAL APPLICATIONS



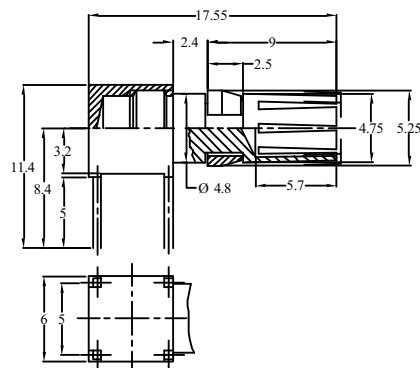
# Receptacle, Right angle, DIN standard, High Power

## PRODUCT

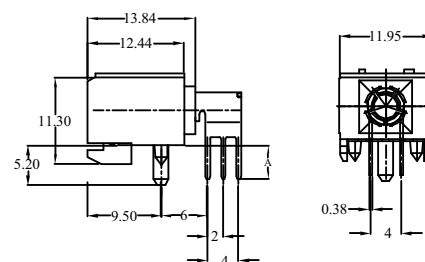
### Housings



### Power inserts



### KIT, pre-assembled housings & inserts



PCB pattern P8 / P10, see chapter PCB layouts

## PARTNUMBERS

### Housings

| Partnumber  | Description        | Feature   |
|-------------|--------------------|-----------|
| 89092-101LF | receptacle housing | press-peg |

### Power inserts

| Partnumber  | Description                                            | Current rating | PCB thickness |
|-------------|--------------------------------------------------------|----------------|---------------|
| 85995-103LF | receptacle power insert<br>right angle solder to board | 40 A           | -             |

### KIT, pre-assembled housings & inserts

| Partnumber  | Description                                                 | Current rating | PCB thickness |
|-------------|-------------------------------------------------------------|----------------|---------------|
| 70424-003LF | receptacle power insert<br>RA solder to board, feed through | 30 A           | 1,6 mm        |

## Header, Mini power

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011

### TECHNICAL DATA

#### PHYSICAL

- Housing material: glass filled LCP
- Flammability rating: UL 94 V-0
- Insert material shell Copper zinc 39 Pb 2
- Spring : Beryllium copper
- Insulator: PTFE Teflon
- Clip: BerylliumCopper
- Performance level Telcordia CO

#### ELECTRICAL (see table below)

#### MECHANICAL PERFORMANCE

- Insertion force, 0.9 N
- Extraction Force 0.9 N

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

- Applicable process: wave/IR / vapor phase / press-fit

#### REFERENCE DATA

- Application Specification TA-0941

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



### MATING DATA

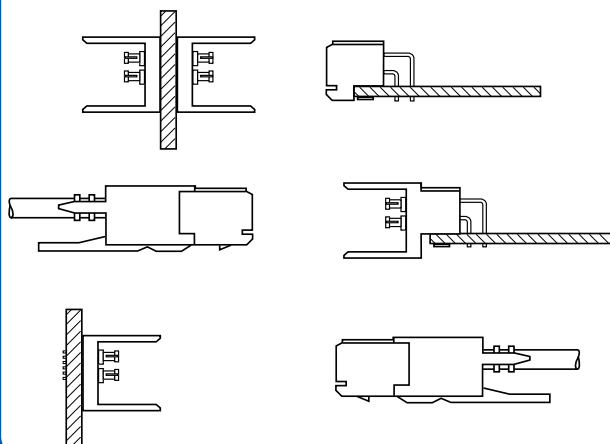
#### Housing, page 161

- partnumber 70244-102

#### Insert, page 161

- partnumber 85976-001LF
- partnumber 85976-002 LF

### TYPICAL APPLICATIONS



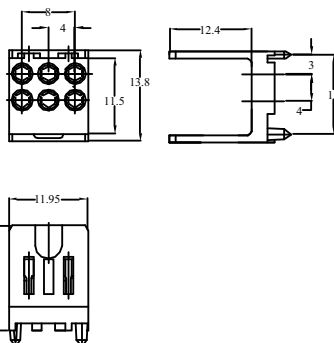
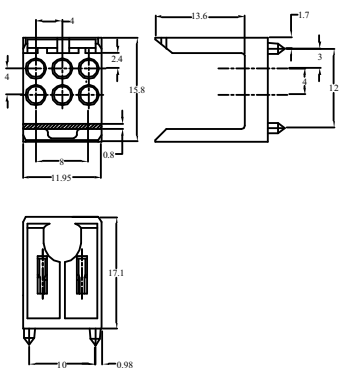
### ELECTRICAL

|                                            |                                              |                                           |
|--------------------------------------------|----------------------------------------------|-------------------------------------------|
| <b>Electrical characteristic impedance</b> | 50 $\Omega$                                  | 75 $\Omega$                               |
| <b>Working frequency</b>                   | 0 - 10 GHz                                   | 0 - 1,5 GHz                               |
| <b>Reflection coefficient</b>              | max.0,05 up to 1 GHz; max. 0,01 up to 10 Ghz | max.0,01 up to 1,5 GHz                    |
| <b>Peak voltage</b>                        | 750 V eff.                                   | 750 V eff.                                |
| <b>Operating voltage</b>                   | 250 V eff.                                   | 250 V eff.                                |
| <b>Insulation resistance</b>               | 1 x 10 <sup>3</sup> M $\Omega$ initially,    | 1 x 10 <sup>3</sup> M $\Omega$ initially, |
| <b>Temperature range</b>                   | -65°C to +165°C                              | -65°C to +165°C                           |

## Header, Mini power

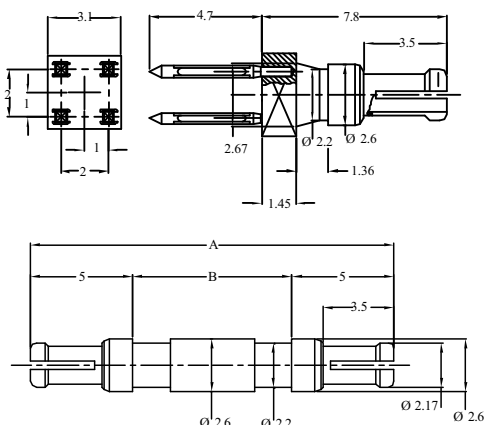
## PRODUCT

## Housings Straight

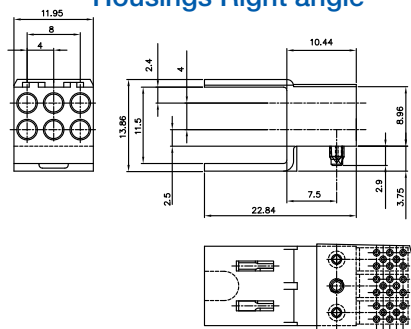


PCB pattern P12, see chapter PCB layouts

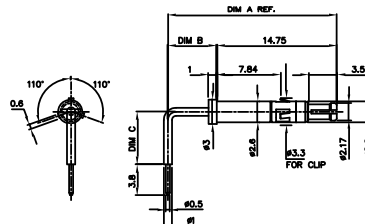
## Inserts Straight



### Housings Right angle



## Inserts Right angle



## PARTNUMBERS

## Housings Straight

| Partnumber         | Description                           |
|--------------------|---------------------------------------|
| <b>88913-111LF</b> | 6 position STR header-wide body-STB   |
| <b>70243-111LF</b> | 6 position STR header-narrow body-STB |

## Inserts Straight

| Partnumber         | Description               | (tail)<br>length | PCB<br>thickness |
|--------------------|---------------------------|------------------|------------------|
| <b>85973-001LF</b> | Mini power STR insert- PF | 4,45 mm          | -                |
| <b>85972-001LF</b> | Mini power plug/coupler   | 17,40 mm         | 1.6 mm           |

## Housings Right angle

| Partnumber  | Description                    |
|-------------|--------------------------------|
| 88982-102LF | 6 position RA header-press peg |

### Inserts Right angle

| Partnumber  | Description                 | Tail length | PCB thickness |
|-------------|-----------------------------|-------------|---------------|
| 85975-001LF | Mini power RA insert, row A | 3,8 mm      | 2,4 mm        |
| 85975-002LF | Mini power RA insert, row B | 3,8 mm      | 2,4 mm        |

RA = right angle, STR = straight, STB = solder-to-board, PF = press-fit

## Receptacle, Mini Power

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011

### TECHNICAL DATA

#### PHYSICAL

- Housing material: glass filled LCP
- Flammability rating: UL 94 V-0
- Insert material shell Copper zinc 39 Pb 2
- Spring : Beryllium copper
- Insulator: PTFE Teflon
- Clip: BerylliumCopper
- Performance level Telcordia CO

#### ELECTRICAL (see table below)

#### MECHANICAL PERFORMANCE

- Insertion force, 0.9 N
- Extraction Force 0.9 N

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

- Applicable process: wave/IR / vapor phase

#### REFERENCE DATA

- Application Specification TA-0941

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



### MATING DATA

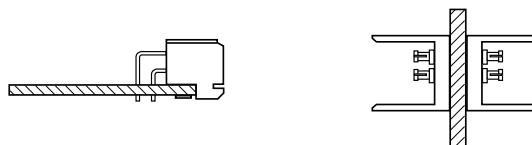
#### ■ Straight, page 159

- housing, partnumber 88913-111LF
- insert, partnumber 85973-001LF

#### ■ Right angle, page 159

- housing, partnumber 88982-102LF
- insert, partnumber 85975-001LF
- insert, partnumber 85975-002LF

### TYPICAL APPLICATIONS



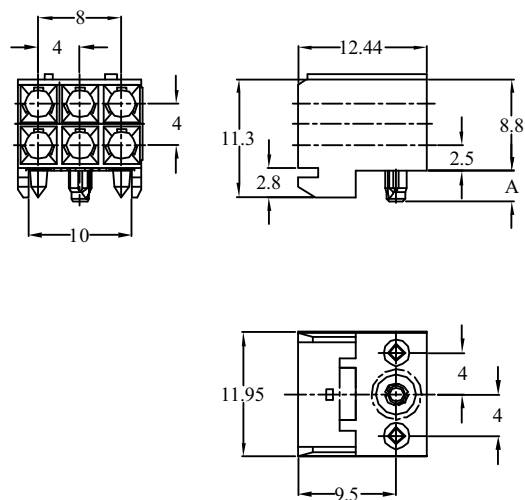
### ELECTRICAL

| Electrical characteristic impedance | 50 $\Omega$                                  | 75 $\Omega$                               |
|-------------------------------------|----------------------------------------------|-------------------------------------------|
| Working frequency                   | 0 - 10 GHz                                   | 0 - 1,5 GHz                               |
| Reflection coefficient              | max.0,05 up to 1 GHz; max. 0,01 up to 10 Ghz | max.0,01 up to 1,5 GHz                    |
| Peak voltage                        | 750 V eff.                                   | 750 V eff.                                |
| Operating voltage                   | 250 V eff.                                   | 250 V eff.                                |
| Insulation resistance               | 1 x 10 <sup>3</sup> M $\Omega$ initially,    | 1 x 10 <sup>3</sup> M $\Omega$ initially, |
| Temperature range                   | -65°C to +165°C                              | -65°C to +165°C                           |

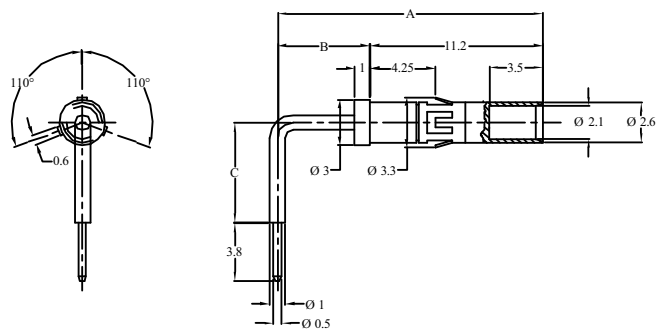
# Receptacle, Mini Power

## PRODUCT

### Housings



### Inserts



PCB pattern P20, see chapter PCB layouts

## PARTNUMBERS

### Housings

| Partnumber  | Description           |
|-------------|-----------------------|
| 70244-102LF | 6 position RA housing |

### Inserts

| Partnumber  | Description                             | tail length | PCB thickness |
|-------------|-----------------------------------------|-------------|---------------|
| 85976-001LF | Mini power RA insert- 2 position, row A | 3,8 mm      | 2,6 mm        |
| 85976-002LF | Mini power RA insert- 2 position, row B | 3,8 mm      | 2,4 mm        |

RA = right angle, STR = straight, STB = solder-to-board, PF = press-fit

## Header, straight, DIN standard, Coax

## FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011

## TECHNICAL DATA

## ■ PHYSICAL

- Housing material: glass filled LCP
- Flammability rating: UL 94 V-0
- Insert material shell Copper zinc 39 Pb 2
- Spring : Beryllium copper
- Insulator: PTFE Teflon
- Clip: Beryllium Copper
- Performance level Telcordia CO

## ■ ELECTRICAL (see table below)

## ■ MECHANICAL PERFORMANCE

- Insertion force, 0.9 N
- Extraction Force 0.9 N

## ■ PACKAGING

- Standard boxes/bags

## ■ PROCESSING INFORMATION

- Applicable process: assemble to board

## ■ REFERENCE DATA

- Application Specification TA-0941

## ■ APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



## MATING DATA

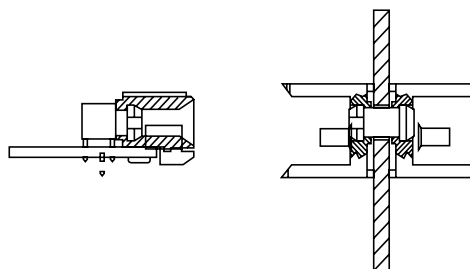
## ■ Right angle, solder to board, page 165

- housing, partnumber 89092-101LF
- insert, partnumber 93904-001LF

## ■ Right angle, press-fit, page 165

- housing, partnumber 89082-101LF
- insert, partnumber 72096-101LF

## TYPICAL APPLICATIONS



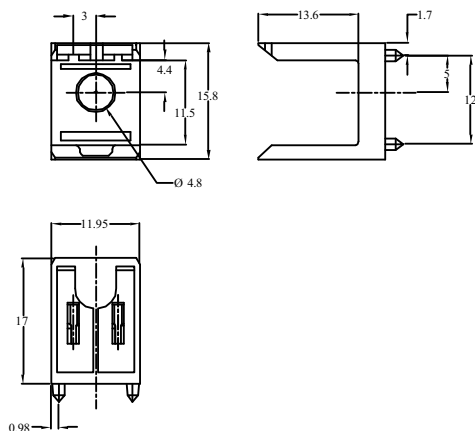
## ELECTRICAL

|                                            |                                              |                                           |
|--------------------------------------------|----------------------------------------------|-------------------------------------------|
| <b>Electrical characteristic impedance</b> | 50 $\Omega$                                  | 75 $\Omega$                               |
| <b>Working frequency</b>                   | 0 - 10 GHz                                   | 0 - 1,5 GHz                               |
| <b>Reflection coefficient</b>              | max.0,05 up to 1 GHz; max. 0,01 up to 10 Ghz | max.0,01 up to 1,5 GHz                    |
| <b>Peak voltage</b>                        | 750 V eff.                                   | 750 V eff.                                |
| <b>Operating voltage</b>                   | 250 V eff.                                   | 250 V eff.                                |
| <b>Insulation resistance</b>               | 1 x 10 <sup>3</sup> M $\Omega$ initially,    | 1 x 10 <sup>3</sup> M $\Omega$ initially, |
| <b>Temperature range</b>                   | -65°C to +165°C                              | -65°C to +165°C                           |

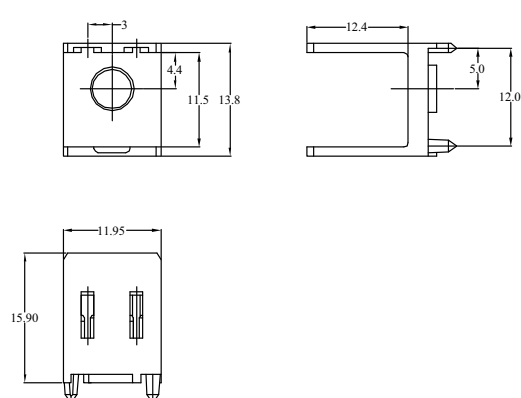
# Header, straight, DIN standard, Coax

## PRODUCT

### Wide Body Housing

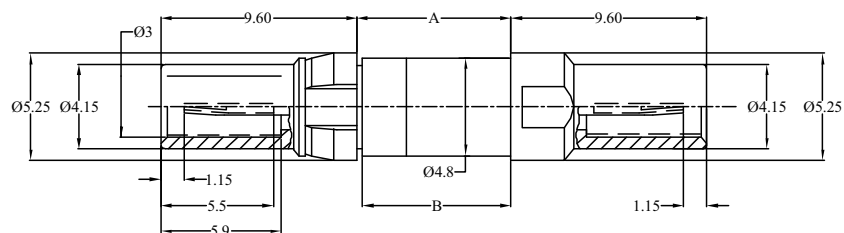


### Narrow Body Housing



PCB pattern P9, see chapter PCB layouts

### Coax inserts



## PARTNUMBERS

### Housings

| Partnumber         | Description            |
|--------------------|------------------------|
| <b>70290-001LF</b> | Header STR-narrow body |
| <b>88911-101LF</b> | Header STR-wide body   |

### Coax inserts

| Partnumber         | Description                        | impedance | length  | PCB thickness |
|--------------------|------------------------------------|-----------|---------|---------------|
| <b>70200-005LF</b> | receptacle/receptacle coax coupler | 50 Ω      | 28,4 mm | 4,8 mm        |
| <b>70212-005LF</b> | receptacle/receptacle coax coupler | 75 Ω      | 28,3 mm | 4,8 mm        |

RA = right angle, STR = straight, STB = solder-to-board, PF = press-fit

## Receptacle, right angle, DIN standard, Coax

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011

### TECHNICAL DATA

#### PHYSICAL

- Housing material: glass filled LCP
- Flammability rating: UL 94 V-0
- Insert material shell Copper zinc 39 Pb 2
- Spring : Beryllium copper
- Insulator: PTFE Teflon
- Clip: BerylliumCopper
- Performance level Telcordia CO

#### ELECTRICAL (see table below)

#### MECHANICAL PERFORMANCE

- Insertion force, 0.9 N
- Extraction Force 0.9 N

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

- Applicable process: wave/IR / vapor phase / press-fit

#### REFERENCE DATA

- Application Specification TA-0941

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223

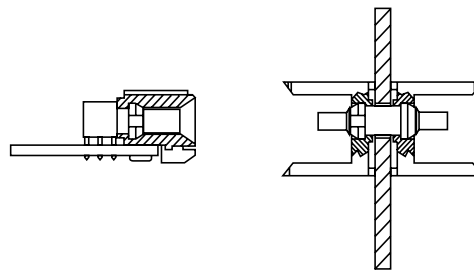


### MATING DATA

- Hybrid DIN standard receptacle, coax, page 163

- housing, partnumber 88911-101LF
- coupler, partnumber 70200-001LF

### TYPICAL APPLICATIONS



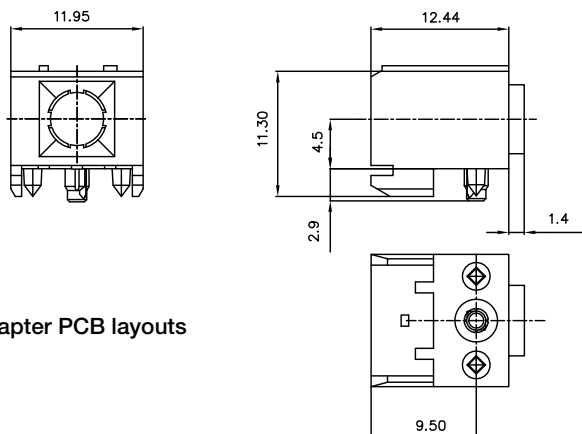
### ELECTRICAL

|                                            |                                              |                                           |
|--------------------------------------------|----------------------------------------------|-------------------------------------------|
| <b>Electrical characteristic impedance</b> | 50 $\Omega$                                  | 75 $\Omega$                               |
| <b>Working frequency</b>                   | 0 - 10 GHz                                   | 0 - 1,5 GHz                               |
| <b>Reflection coefficient</b>              | max.0,05 up to 1 GHz; max. 0,01 up to 10 Ghz | max.0,01 up to 1,5 GHz                    |
| <b>Peak voltage</b>                        | 750 V eff.                                   | 750 V eff.                                |
| <b>Operating voltage</b>                   | 250 V eff.                                   | 250 V eff.                                |
| <b>Insulation resistance</b>               | 1 x 10 <sup>3</sup> M $\Omega$ initially,    | 1 x 10 <sup>3</sup> M $\Omega$ initially, |
| <b>Temperature range</b>                   | -65°C to +165°C                              | -65°C to +165°C                           |

# Receptacle, right angle, DIN standard, Coax

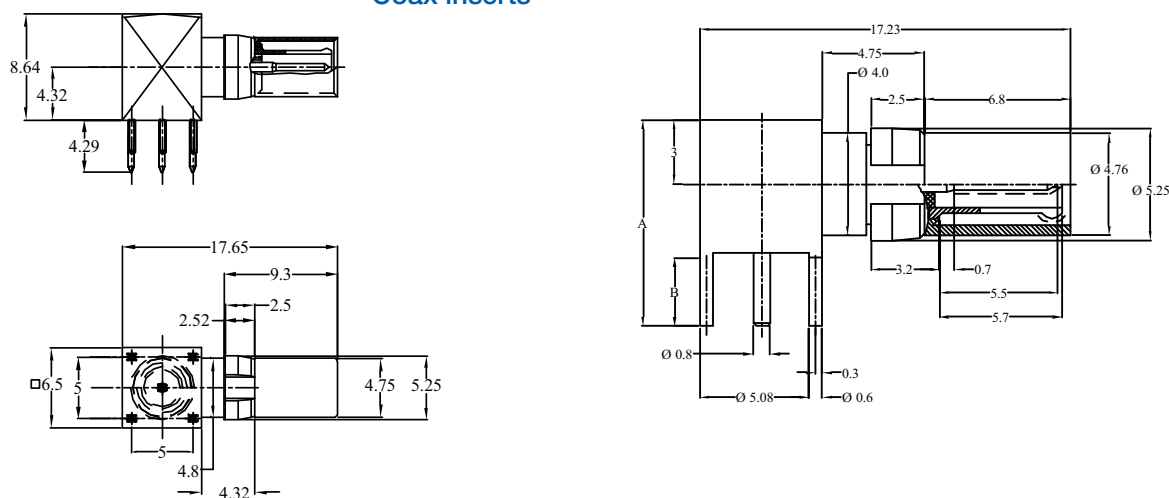
## PRODUCT

### Housings



PCB pattern P10, see chapter PCB layouts

### Coax inserts



## PARTNUMBERS

### Housings

| Partnumber         | Description            |
|--------------------|------------------------|
| <b>89092-101LF</b> | receptacle housing STR |

### Coax inserts

| Partnumber         | Description                | impedance   |
|--------------------|----------------------------|-------------|
| <b>93904-001LF</b> | header coax insert STR stb | 50 $\Omega$ |
| <b>93903-001LF</b> | header coax insert STR stb | 75 $\Omega$ |
| <b>72096-101LF</b> | header coax insert STR pf  | 50 $\Omega$ |

RA = right angle, STR = straight, STB = solder-to-board, PF = press-fit

## Header, Mini Coax

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011

### TECHNICAL DATA

#### PHYSICAL

- Housing material: glass filled LCP
- Flammability rating: UL 94 V-0
- Insert material shell Copper zinc 39 Pb 2
- Spring : Beryllium copper
- Insulator: PTFE Teflon
- Clip: BerylliumCopper
- Performance level Telcordia CO

#### ELECTRICAL (see table below)

#### MECHANICAL PERFORMANCE

- Insertion force, 0.9 N
- Extraction Force 0.9 N

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

- Applicable process: wave/IR / vapor phase / press-fit

#### REFERENCE DATA

- Application Specification TA-0941

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223

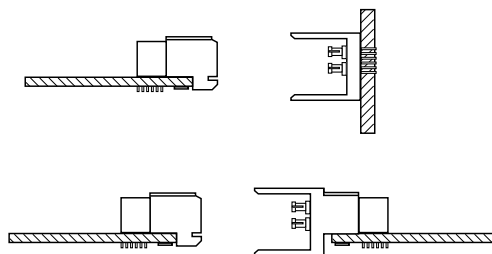


### MATING DATA

#### ■ Right angle, page 169

- housing, partnumber 70244-102LF
- insert, partnumber 70239-001LF

### TYPICAL APPLICATIONS



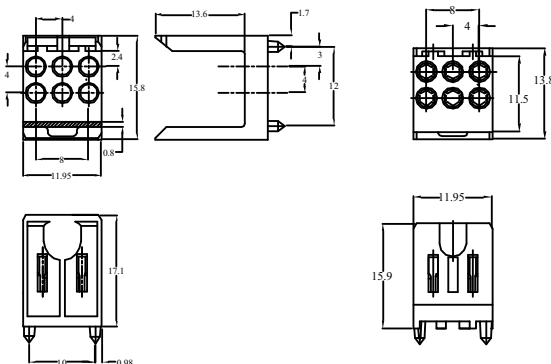
### ELECTRICAL

| Electrical characteristic impedance | 50 $\Omega$                                  | 75 $\Omega$                                |
|-------------------------------------|----------------------------------------------|--------------------------------------------|
| Working frequency                   | 0 - 10 GHz                                   | 0 - 1,5 GHz                                |
| Reflection coefficient              | max.0,05 up to 1 GHz; max. 0,01 up to 10 Ghz | max.0,01 up to 1,5 GHz                     |
| Peak voltage                        | 750 V eff.                                   | 750 V eff.                                 |
| Operating voltage                   | 250 V eff.                                   | 250 V eff.                                 |
| Insulation resistance               | $1 \times 10^3 \text{ M}\Omega$ initially,   | $1 \times 10^3 \text{ M}\Omega$ initially, |
| Temperature range                   | -65°C to +165°C                              | -65°C to +165°C                            |

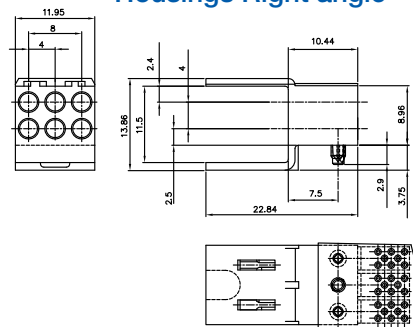
## Header, Mini Coax

## PRODUCT

## Housings Straight

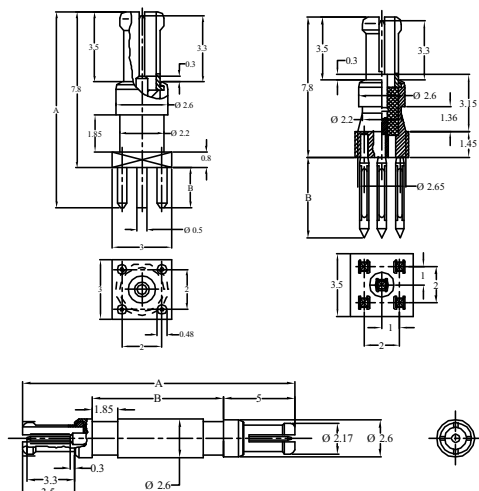


### Housings Right angle

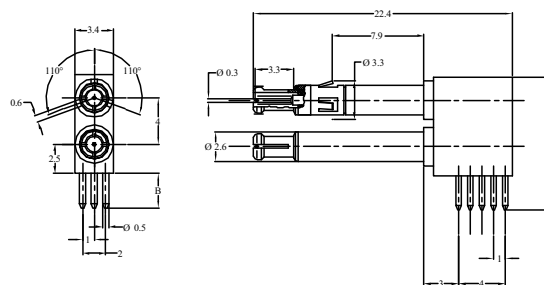


PCB pattern P12, see chapter PCB layouts

## Inserts Straight



## Inserts Right angle



## PARTNUMBERS

## Housings Straight

| Partnumber         | Description                           |
|--------------------|---------------------------------------|
| <b>88913-101LF</b> | 6 position STR header-wide body-STB   |
| <b>88913-111LF</b> | 6 position STR header-wide body-PF    |
| <b>70243-101LF</b> | 6 position STR header-narrow body-STB |
| <b>70243-111LF</b> | 6 position STR header-narrow body-PF  |

## Inserts Straight

| Partnumber         | Description                     | length   | PCB thickness |
|--------------------|---------------------------------|----------|---------------|
| <b>88980-002LF</b> | Mini Coax STR insert- STB       | -        | 1,6 mm        |
| <b>88978-001LF</b> | Mini Coax STR insert- PF        | -        | -             |
| <b>88971-003LF</b> | Mini Coax STR plug/plug coupler | 17,40 mm | 1,6 mm        |

### Housings Right angle

| Partnumber  | Description                    |
|-------------|--------------------------------|
| 88982-102LF | 6 position RA header-press peg |

## Inserts Right angle

| Partnumber  | Description              | Tail length | PCB thickness |
|-------------|--------------------------|-------------|---------------|
| 88983-001LF | Mini Coax RA insert- STB | 2,80 mm     | 1,6 mm        |

RA = right angle, STR = straight, STB = solder-to-board, PF = press-fit

## Receptacle, Mini Coax

### FEATURES

- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Insert according to DIN 41626
- Insert quality tested according to MIL-Std-202 and BS 9525 F0011

### TECHNICAL DATA

#### PHYSICAL

- Housing material: glass filled LCP
- Flammability rating: UL 94 V-0
- Insert material shell Copper zinc 39 Pb 2
- Spring : Beryllium copper
- Insulator: PTFE Teflon
- Clip: BerylliumCopper
- Performance level Telcordia CO

#### ELECTRICAL (see table below)

#### MECHANICAL PERFORMANCE

- Insertion force, 0.9 N
- Extraction Force 0.9 N

#### PACKAGING

- Standard boxes/bags

#### PROCESSING INFORMATION

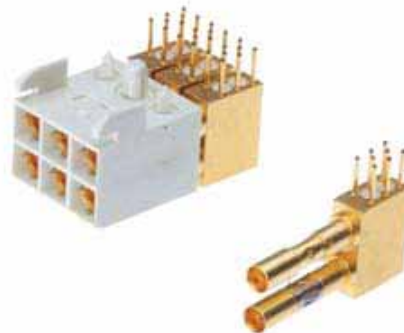
- Applicable process: wave/IR / vapor phase

#### REFERENCE DATA

- Application Specification TA-0941

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



### MATING DATA

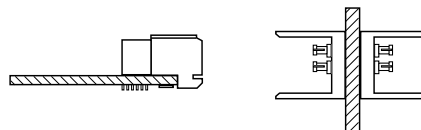
#### ■ Straight, page 167

- housing, partnumber 88913-111LF
- insert, partnumber 88978-001LF

#### ■ Right angle, page 167

- housing, partnumber 88982-102LF
- insert, partnumber 89030-001LF

### TYPICAL APPLICATIONS



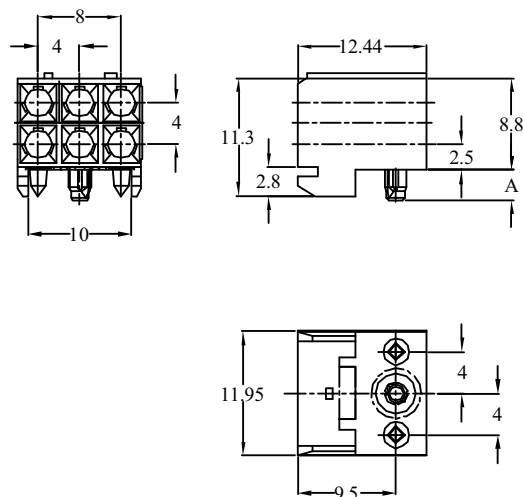
### ELECTRICAL

|                                            |                                              |                                           |
|--------------------------------------------|----------------------------------------------|-------------------------------------------|
| <b>Electrical characteristic impedance</b> | 50 $\Omega$                                  | 75 $\Omega$                               |
| <b>Working frequency</b>                   | 0 - 10 GHz                                   | 0 - 1,5 GHz                               |
| <b>Reflection coefficient</b>              | max.0,05 up to 1 GHz; max. 0,01 up to 10 Ghz | max.0,01 up to 1,5 GHz                    |
| <b>Peak voltage</b>                        | 750 V eff.                                   | 750 V eff.                                |
| <b>Operating voltage</b>                   | 250 V eff.                                   | 250 V eff.                                |
| <b>Insulation resistance</b>               | 1 x 10 <sup>3</sup> M $\Omega$ initially,    | 1 x 10 <sup>3</sup> M $\Omega$ initially, |
| <b>Temperature range</b>                   | -65°C to +165°C                              | -65°C to +165°C                           |

# Receptacle, Mini Coax

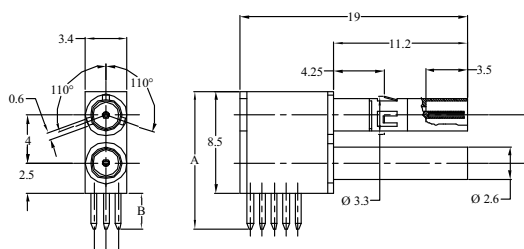
## PRODUCT

### Housings



PCB pattern P12, see chapter PCB layouts

### Inserts



## PARTNUMBERS

### Housings

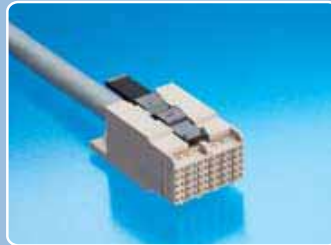
| Partnumber  | Description           |
|-------------|-----------------------|
| 70244-102LF | 6 position RA housing |

### Inserts

| Partnumber  | Description                     | type | PCB thickness |
|-------------|---------------------------------|------|---------------|
| 70239-001LF | Mini Coax RA insert- 2 position | STB  | 1,6 mm        |

RA = right angle, STR = straight, STB = solder-to-board, PF = press-fit





## METRAL® CABLE CONNECTORS

-  Cable connectors, Signal
-  Cable connectors, Shielded

## Cable Connectors, 4 row, signal

### FEATURES

- Interface compatible with IEC 61076-4-104 backpanel connectors
- Next generation design offers easy and fast cable assembly
- Four Row versions provide 24 or 48 dual beam contacts
- Insulation displacement design offers quick termination without the need to strip conductors
- Active backshell latches securely connect assembled cable connectors to standard Metral® headers
- Different latch designs are available to satisfy ergonomic and mechanical requirements
- End-stackable cable connectors enable adjacent connectors to plug to headers without loss of positions
- Application tooling supported by FCI



### TECHNICAL DATA

#### PHYSICAL

- spacing: 2,00 mm x 2,00 mm
- contact material: Phosphor bronze
- contact plating: Gold over nickel on mating face; pure tin over nickel in termination area
- housing Material: Glass filled 612 Polyamide UL 94-V0
- performance level: Telcordia CO

#### ELECTRICAL

- current Rating: 1.0A per contact
- withstanding Voltage: 1000 VDC
- insulation resistance: >1000 mega ohms after environmental exposure

#### MECHANICAL PERFORMANCE

- mating force: <1.0 Newtons per contact
- un-mating force: >.2 Newtons per contact; <1.13 Newtons per contact
- IDC termination retention: <.89 Newtons per contact
- durability: 200 cycles (Telcordia)
- temperature: -55C to +105 C

#### ENVIRONMENTAL

- meets Telcordia Central Office and IEC Class 1 requirements. Additional platings are also available to meet uncontrolled environmental requirements; consult product drawings and product specifications for the cable connectors and mating headers.

#### PACKAGING

- kits

#### REFERENCE DATA

- UL E66906, CSA LR46923
- Product Specifications: GS-12-015 (4 Row)
- Application Specifications: GS-20-002 (4 Row)
- Application tooling: GS-20-003 (4 Row)

#### APPLICATION EQUIPMENT

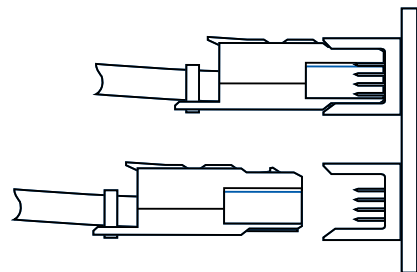
- for application equipment, check out the application equipment table on page 217-223

### MATING DATA

#### Header, straight, press-fit, page 27

- 1 module – part number 70232-116LF
- 2 modules – part number 70233-116LF
- 4 modules – part number 70234-116LF
- 8 modules – part number 70235-116LF

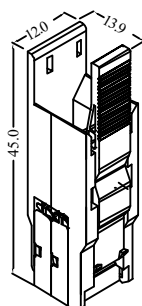
### TYPICAL APPLICATIONS



# Cable Connectors, 4 row, signal

## PRODUCT

### 1 Module 72476-1yx1LF

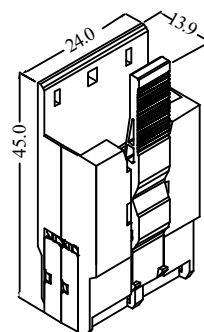


STANDARD LATCH FINGER  
FOR CABLE TIE BELOW  
LATCH FINGER AND EASIEST  
ACCESS TO LATCH FINGER

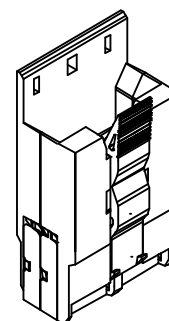


SHORT LATCH FINGER  
FOR CABLE TIE ABOVE  
LATCH FINGER AND LARGER  
CABLE SIZE CAPACITY

### 2 Module 72477-1yx1LF



STANDARD LATCH FINGER  
FOR CABLE TIE BELOW  
LATCH FINGER AND EASIEST  
ACCESS TO LATCH FINGER



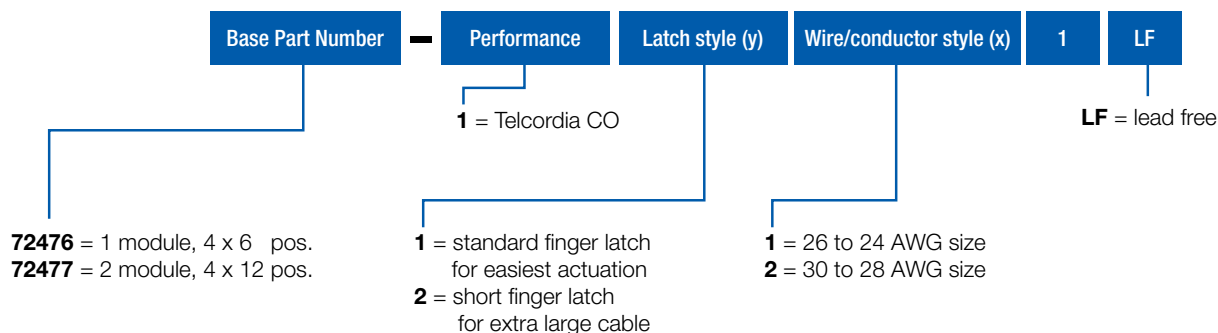
SHORT LATCH FINGER  
FOR CABLE TIE ABOVE  
LATCH FINGER AND LARGER  
CABLE SIZE CAPACITY

**standard latch** = for cable up to 6.00mm diameter  
**short latch** = for cable up to 9.00mm diameter

## PARTNUMBERS

72476 - 1yx1LF

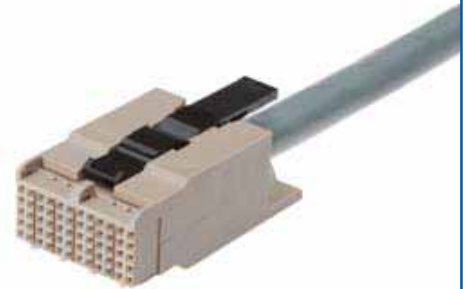
72477 - 1yx1LF



## Cable Connectors, 5 row, signal

### FEATURES

- Interface compatible with IEC 61076-4-104 backpanel connectors
- Next generation design offers easy and fast cable assembly
- Five Row versions provide 30 or 60 dual beam contacts
- Insulation displacement design offers quick termination without the need to strip conductors
- Active backshell latches securely connect assembled cable connectors to standard Metral® headers
- Different latch designs are available to satisfy ergonomic and mechanical requirements
- End-stackable cable connectors enable adjacent connectors to plug to headers without loss of positions
- Application tooling supported by FCI



### TECHNICAL DATA

#### PHYSICAL

- spacing: 2,00 mm x 2,00 mm
- contact material: Phosphor bronze
- contact plating: Gold over nickel on mating face; pure tin over nickel in termination area
- housing Material: Glass filled 612 Polyamide UL 94-V0
- performance level: Telcordia CO

#### ELECTRICAL

- current Rating: 1.0A per contact
- withstanding Voltage: 1000 VDC
- insulation resistance: >1000 mega ohms after environmental exposure

#### MECHANICAL PERFORMANCE

- mating force: <1.0 Newtons per contact
- un-mating force: >.2 Newtons per contact; <1.13 Newtons per contact
- IDC termination retention: <.89 Newtons per contact
- durability: 200 cycles (Telcordia)
- temperature: -55C to +105 C

#### ENVIRONMENTAL

- meets Telcordia Central Office and IEC Class 1 requirements. Additional platings are also available to meet uncontrolled environmental requirements; consult product drawings and product specifications for the cable connectors and mating headers.

#### PACKAGING

- kits

#### REFERENCE DATA

- UL E66906, CSA LR46923
- Product Specifications: GS-12-016 (5 Row)
- Applicationspecification: GS-20-003 (5 Row)
- Application tooling : GS-20-003 (5 Row)

#### APPLICATION EQUIPMENT

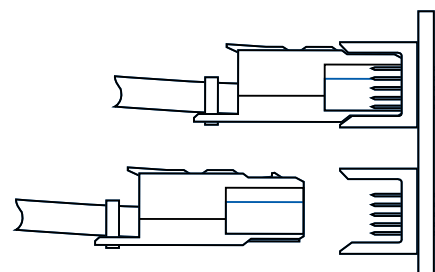
- for application equipment, check out the application equipment table on page 217-223

### MATING DATA

- Header straight, press-fit, page 41

- 1 module – part number 89006-116LF
- 2 modules – part number 89007-116LF
- 4 modules – part number 89008-116LF
- 8 modules – part number 89009-116LF

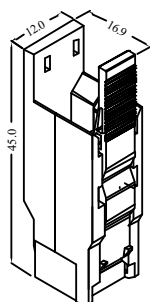
### TYPICAL APPLICATIONS



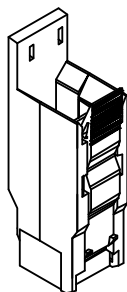
# Cable Connectors, 5 row, signal

## PRODUCT

**1 Module**  
**72478-1yx1LF**

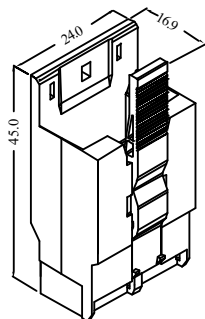


STANDARD LATCH FINGER  
FOR CABLE TIE BELOW  
LATCH FINGER AND EASIEST  
ACCESS TO LATCH FINGER

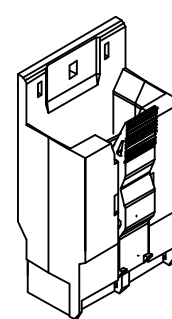


SHORT LATCH FINGER  
FOR CABLE TIE ABOVE  
LATCH FINGER AND LARGER  
CABLE SIZE CAPACITY

**2 Module**  
**72479-1yx1LF**



STANDARD LATCH FINGER  
FOR CABLE TIE BELOW  
LATCH FINGER AND EASIEST  
ACCESS TO LATCH FINGER



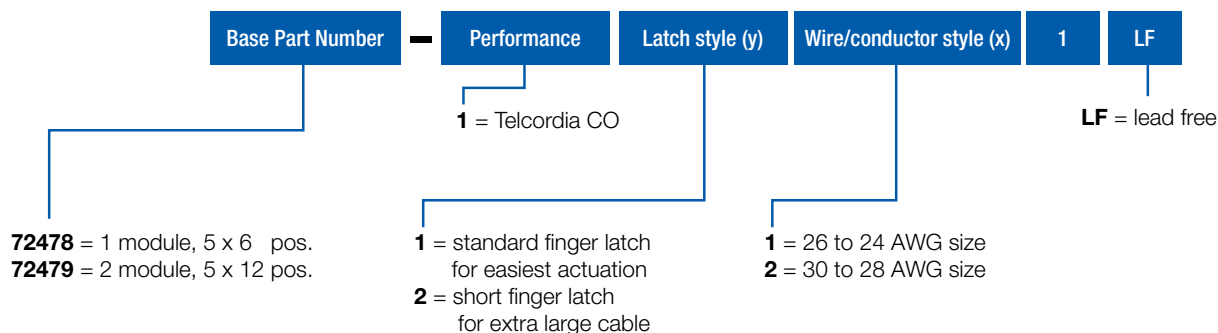
SHORT LATCH FINGER  
FOR CABLE TIE ABOVE  
LATCH FINGER AND LARGER  
CABLE SIZE CAPACITY

**standard latch** = for cable up to 6.00mm diameter  
**short latch** = for cable up to 9.00mm diameter

## PARTNUMBERS

**72478 - 1yx1LF**

**72479 - 1yx1LF**



## Cable connectors, shielded

### FEATURES

- Contact type Signal - Shielded
- Number of contacts (per row) 24
- Number of contacts (Total) 72
- Number of rows 3
- Orientation Straight
- Product Type Receptacle
- Termination Style IDC - Crimp
- Mating half 10022805-201LF
- Quantity 96
- Dimensional
- Size (Wire) AWG 26

### TECHNICAL DATA

#### PHYSICAL

- contact material: Phosphor bronze
- plating Telecom class Gold
- plating (Contact area) 2 µm (79 µin.) Gold
- plating Specification (Tail area) Telecom class Gold
- housing Material: Glass - Filled Thermoplastic Polyester
- performance level: Telcordia CO

#### ELECTRICAL

- current Rating: 1.0A per contact
- withstanding Voltage: 1000 rms
- insulation resistance: >1000 mega ohms after
- environmental exposure

#### MECHANICAL PERFORMANCE

- Insertion force (max per contact) 1.1N max. per contact
- withdrawal Force 0.15N min. per contact
- retention force 5N
- durability: 100 cycles (Telcordia)
- temperature: -55C to +105 C

#### ENVIRONMENTAL

- meets Telcordia Central Office and IEC Class 1 requirements. Additional platings are also available to meet uncontrolled environmental requirements; consult product drawings and product specifications for the cable connectors and mating headers.

#### PACKAGING

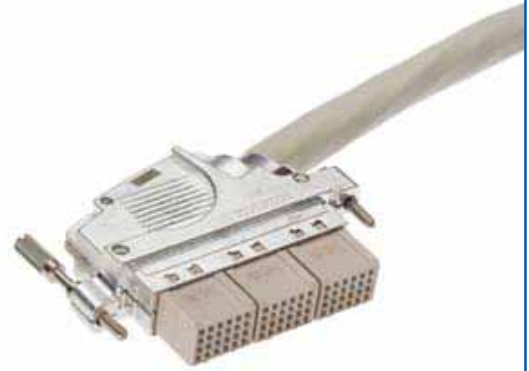
- bags

#### REFERENCE DATA

- Literature 950511-001
- product specification: GS-12-308
- Packaging specification: GS-14-008

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



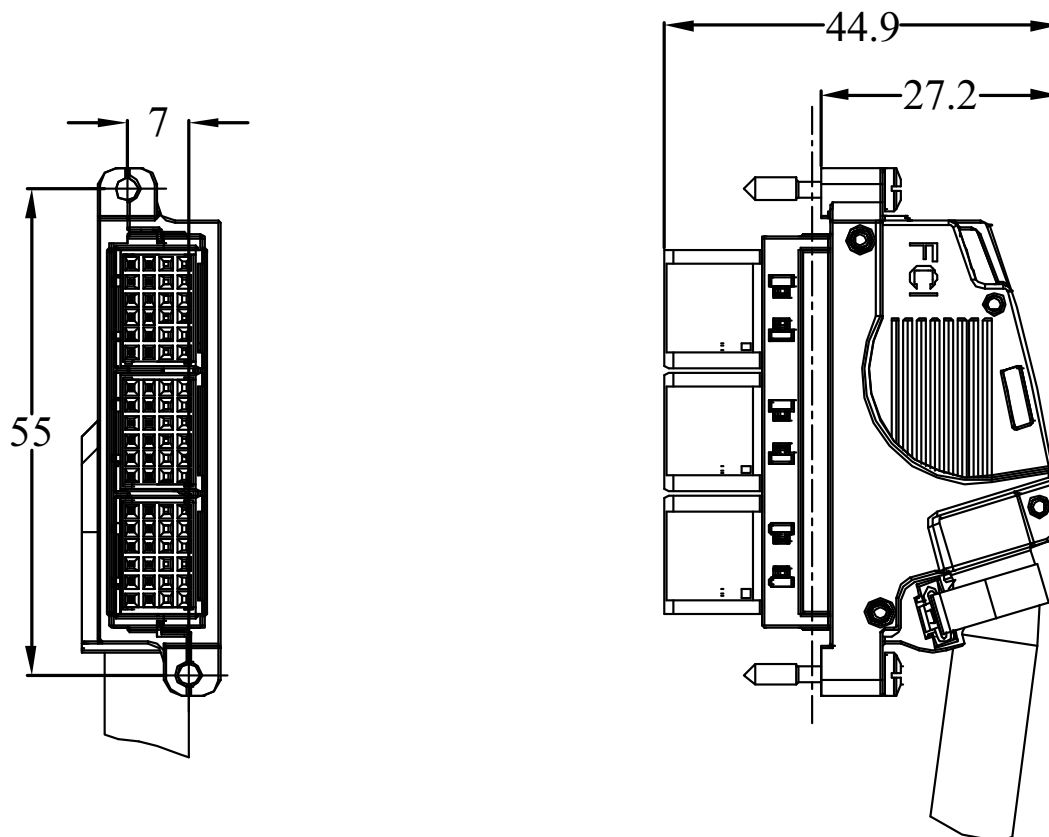
### MATING DATA

- mating part, page 200

- Mating half 10022805-101LF

## Cable connectors, shielded

### PRODUCT



### PARTNUMBERS

**10013881 - 231LF** = 72 position IDC cable connector





## METRAL® ACCESSORIES

- Coding Keys
- Guide Pin
- Ramping Module
- Shorting Clip
- End wall
- Hybrid housing

## Coding Keys

### FEATURES

- designed in accordance with IEC 61076-4-104
- User friendly system, easy application.
- No additional space required.
- Provides infinite number of coding possibilities for board to board connection.
- Extended keys for early engagement (for 5 row only).
- Standard coding, codes all METRAL connectors when mating length is not exceeding 6,5 mm.
- Extended keys codes from 5 up to 8 mm mating length.



### TECHNICAL DATA

#### PHYSICAL

- Material: Glass - Filled Thermoplastic Polyester

#### MECHANICAL PERFORMANCE

- temperature: -55 °C to +125 °C

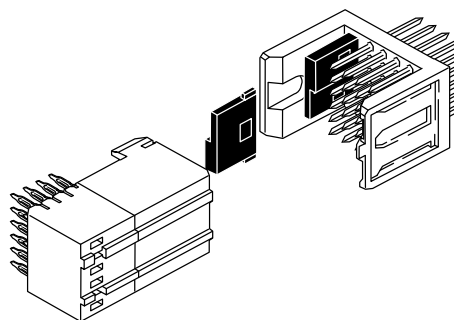
#### ENVIRONMENTAL

- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

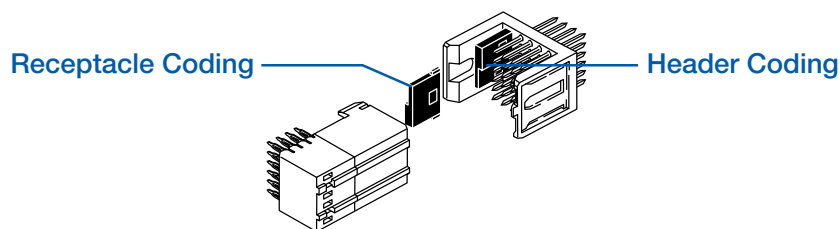
#### PACKAGING

- 100 parts, min. order quantity 100 parts

### TYPICAL APPLICATIONS



# Coding Keys



## PARTNUMBERS

|             | Receptacle Coding                                            |                                                              | Header Coding                                            |                                                          |
|-------------|--------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| mating pair | IEC standardized                                             | Extended                                                     | IEC standardized                                         | Extended                                                 |
|             | <p>6,3<br/>up to 6,5 mm<br/>pin length</p>                   | <p>8,3<br/>up to 8,0 mm<br/>pin length</p>                   | <p>6,3<br/>up to 6,5 mm<br/>pin length</p>               | <p>8,3<br/>up to 8,0 mm<br/>pin length</p>               |
| Full        |                                                              |                                                              | <b>Full Header Key</b><br><p>90837-102LF<br/>green</p>   | <b>Full Header Key</b><br><p>85811-101LF<br/>green</p>   |
| Full        | <b>Full Receptacle Key</b><br><p>91210-101LF<br/>green</p>   | <b>Full Receptacle Key</b><br><p>85812-101LF<br/>green</p>   |                                                          |                                                          |
| Left        | <b>Left Receptacle Key</b><br><p>91290-102LF<br/>pink</p>    | <b>Left Receptacle Key</b><br><p>85814-102LF<br/>pink</p>    | <b>Right Header Key</b><br><p>91289-102LF<br/>pink</p>   | <b>Right Header Key</b><br><p>85813-102LF<br/>pink</p>   |
| Middle      | <b>Middle Receptacle Key</b><br><p>91290-103LF<br/>brown</p> | <b>Middle Receptacle Key</b><br><p>85814-103LF<br/>brown</p> | <b>Middle Header Key</b><br><p>91289-103LF<br/>brown</p> | <b>Middle Header Key</b><br><p>85813-103LF<br/>brown</p> |
| Right       | <b>Right Receptacle Key</b><br><p>91290-101LF<br/>blue</p>   | <b>Right Receptacle Key</b><br><p>85814-101LF<br/>blue</p>   | <b>Left Header Key</b><br><p>91289-101LF<br/>blue</p>    | <b>Left Header Key</b><br><p>85813-101LF<br/>blue</p>    |

**Note:** blue marked part numbers are product selector parts

## Cable Connector Coding Keys

### FEATURES

- designed in accordance with IEC 61076-4-104
- User friendly system, easy application.
- No additional space required.
- Applicable for 4 and 5 row cable connectors.
- Provides 18 coding possibilities for cable to board connections.



### TECHNICAL DATA

#### PHYSICAL

- Material: Glass - Filled polyamide

#### MECHANICAL PERFORMANCE

- temperature: -55 °C to +125 °C

#### ENVIRONMENTAL

- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

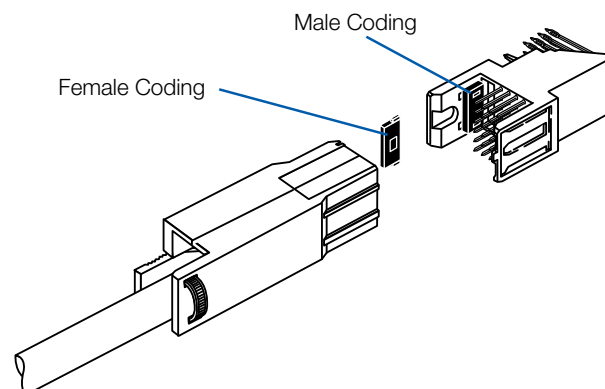
#### PACKAGING

- 100 parts, packed by bags

#### REFERENCE DATA

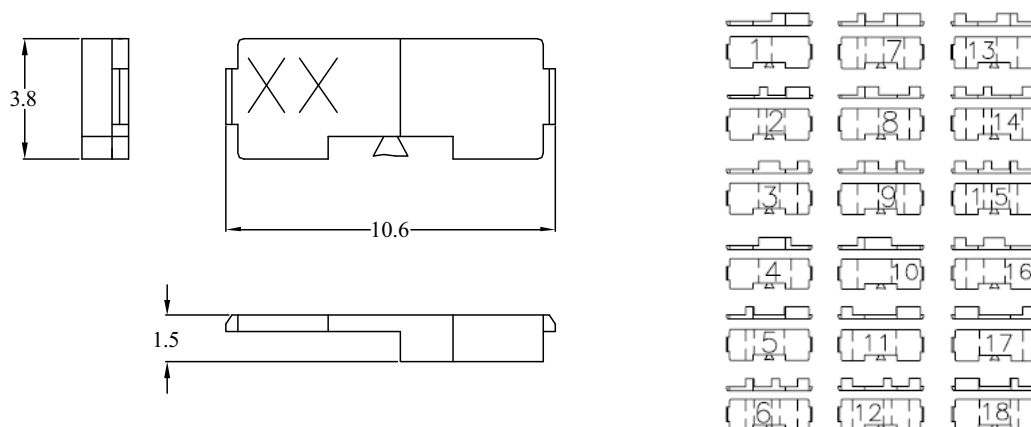
- Application Specifications: GS-20-002 (4 Row)  
GS-20-003 (5 Row)

### TYPICAL APPLICATIONS



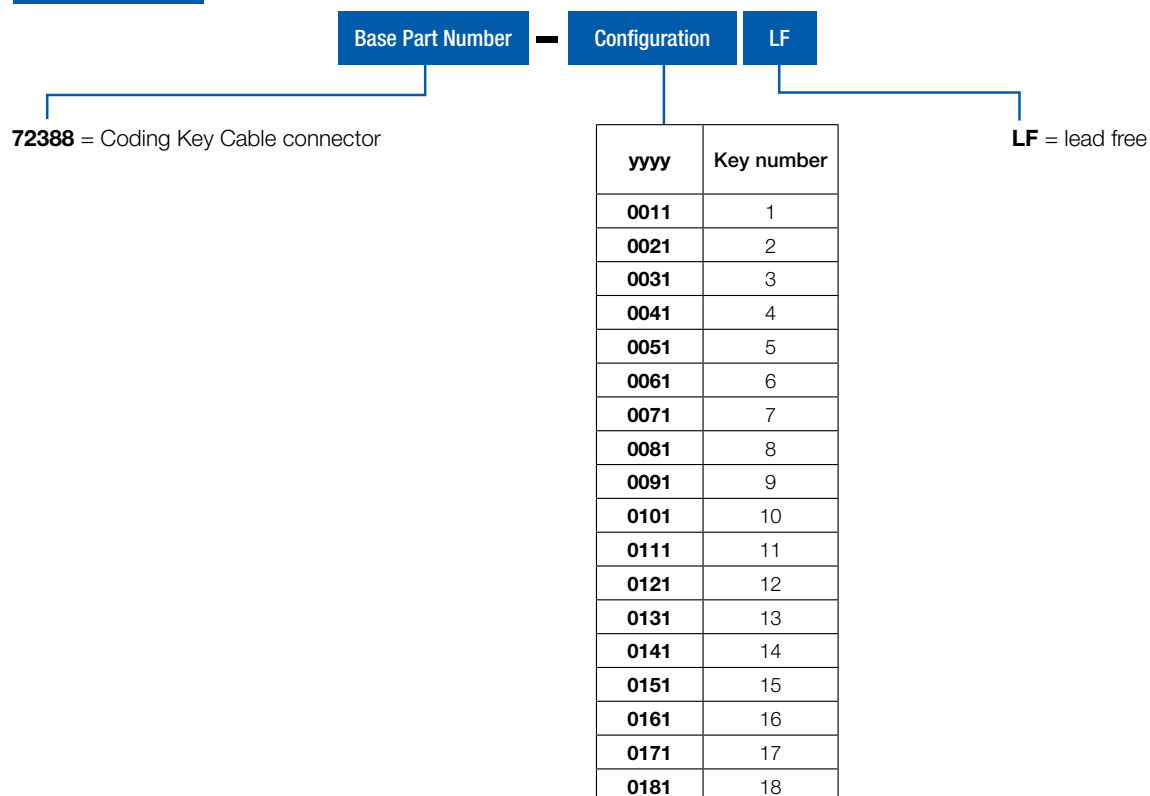
# Cable Connector Coding Keys

## PRODUCT



## PARTNUMBERS

72388 - yyyyLF



## Guide Pin

### FEATURES

- Early capture of daughter card.
- Stackable end-to-end without loss of position.
- Stackable with other METRAL function modules (e.g. signal, power, coax).
- Front and/or rear guiding.
- Plug polarization by design.

### TECHNICAL DATA

#### ■ PHYSICAL

- Guide pin material: stainless steel

#### ■ ENVIRONMENTAL

- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### ■ PACKAGING

- 100 parts, min. order quantity 100 parts

#### ■ APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223

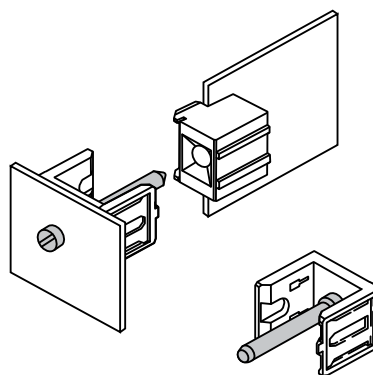


### MATING DATA

#### ■ mating part, page .....

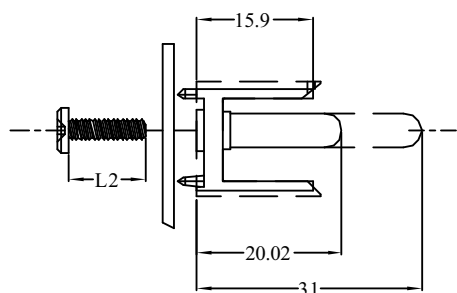
- Receptacle housing: part no 70292-101LF, page 157
- Header housing, narrow body: part no 70290-101LF, page 155
- wide body: part no 88911-101LF, page 155

### TYPICAL APPLICATIONS

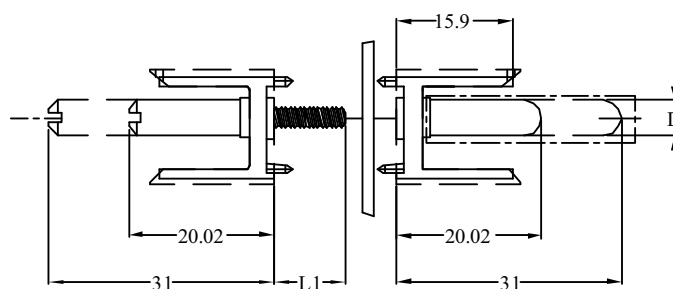


# Guide Pin

## PRODUCT



Single Guide Pin



Double Guide Pin

PCB pattern P9, see chapter PCB layouts

## PARTNUMBERS

| Narrow Body Header Housing |       |                  |                       |                         |                             |
|----------------------------|-------|------------------|-----------------------|-------------------------|-----------------------------|
| Guide Pin Type             |       | guide pin length | Part number Guide Pin | Required Header Housing | Required Receptacle Housing |
| single sided               | short | 20,0 mm          | <b>70295-001LF</b>    | (1x) 70290-101LF        | (1x) 70292-101LF            |
|                            | long  | 31,0 mm          | <b>70295-002LF</b>    | (1x) 70290-101LF        | (1x) 70292-101LF            |
| double sided               | short | 20,0 mm          | <b>70295-003LF</b>    | (2x) 70290-101LF        | (2x) 70292-101LF            |
|                            | long  | 31,0 mm          | <b>70295-004LF</b>    | (2x) 70290-101LF        | (2x) 70292-101LF            |

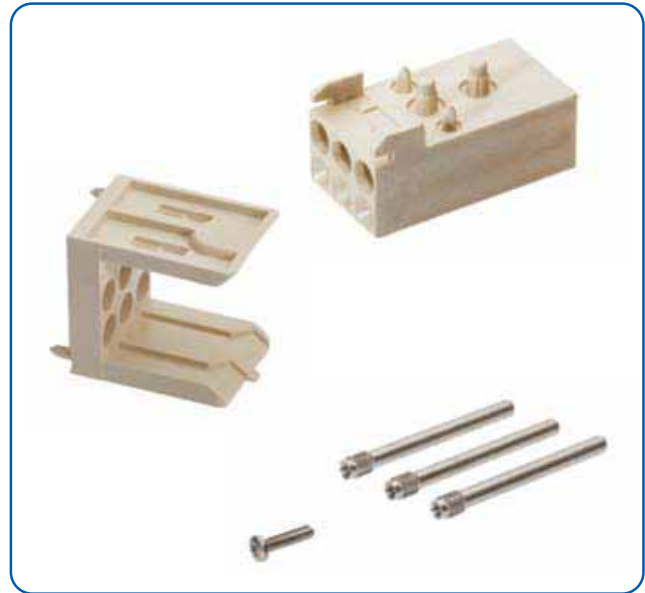
| Wide Body Header Housing |       |                  |                       |                         |                             |
|--------------------------|-------|------------------|-----------------------|-------------------------|-----------------------------|
| Guide Pin Type           |       | guide pin length | Part number Guide Pin | Required Header Housing | Required Receptacle Housing |
| single sided             | short | 20,0 mm          | <b>70295-001LF</b>    | (1x) 88911-101LF        | (1x) 70292-101LF            |
|                          | long  | 31,0 mm          | <b>70295-002LF</b>    | (1x) 88911-101LF        | (1x) 70292-101LF            |
| double sided             | short | 20,0 mm          | <b>70295-003LF</b>    | (2x) 88911-101LF        | (2x) 70292-101LF            |
|                          | long  | 31,0 mm          | <b>70295-004LF</b>    | (2x) 88911-101LF        | (2x) 70292-101LF            |

**Note:** Housings not supplied with guide pins  
For details on housings see section Hybrid Headers and receptacles

## Board-to-Board Keying system

### FEATURES

- Daughter card keying
- Provides 20 keying combinations
- Modular design guarantees flexibility
- Stackable end-to-end without loss of position
- Engagement before 8.25 mm pins
- Precedes card latch engagement
- Receptacle available as 20 unique molded parts



### TECHNICAL DATA

#### ■ PHYSICAL

- Keying pin material: stainless steel
- Housing material: Glass filled LCP,UL94V-0

#### ■ ENVIRONMENTAL

- Operating temperature -55°C to +105°C
- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### ■ PACKAGING

- Receptacle housing: 50 housing/bag
- Keying pins with screws: 300 pins/bag

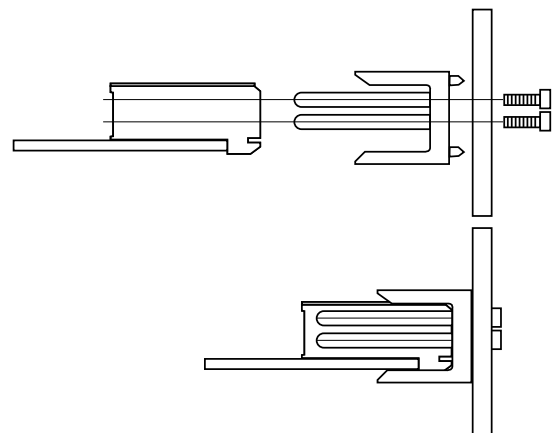
#### ■ PROCESSING INFORMATION

- Wave, IR Vapor phase

### MATING DATA

- Shroud, wide body 6 position, page 167
- part number 88913-101LF

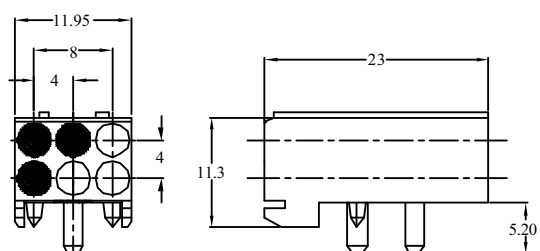
### TYPICAL APPLICATIONS



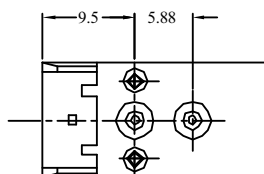
# Board-to-Board Keying system

## PRODUCT

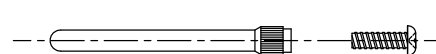
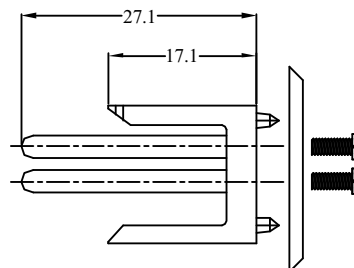
Receptacle Keying module with press peg



● = denotes plugged position



Keying Pin



## PARTNUMBERS

Base Part Number

Pin Configuration

LF

LF = lead free

88914 - 0yyLF

Keying Pin

| pin configuration | pcb thickness  |
|-------------------|----------------|
| 011               | 2,31 - 3,10 mm |
| 012               | 3,10 - 3,89 mm |
| 013               | 3,89 - 4,67 mm |

88916 - 2yyLF

Receptacle Keying module with press peg

| pin configuration |  |  |  |  |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|--|--|--|--|
| pin configuration |  |  |  |  |  |  |  |  |  |  |

## Ramping Module

### FEATURES

- Provides initial vertical alignment on daughter card
- Symmetrical application; 2 required per slot
- Utilizes 6 mm of slot space
- Provides end-caps for backplane header slots
- Used independently of cabinet hardware design

### TECHNICAL DATA

#### PHYSICAL

- ramping module material, glass-filled nylon, color natural , UL94 V-0.

#### MECHANICAL PERFORMANCE

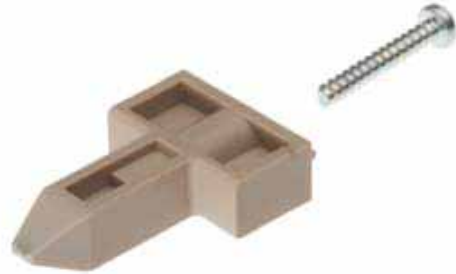
- temperature: -55C to +105 C

#### ENVIRONMENTAL

- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### PACKAGING

- Bag of 500 pieces

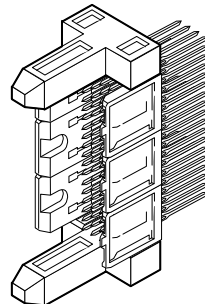


### MATING DATA

#### Used in combination with Header

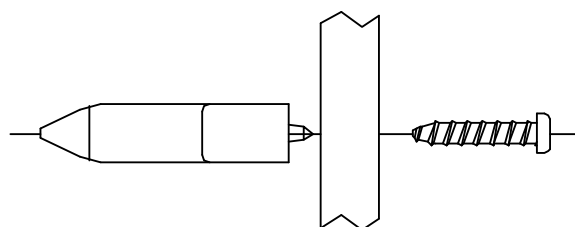
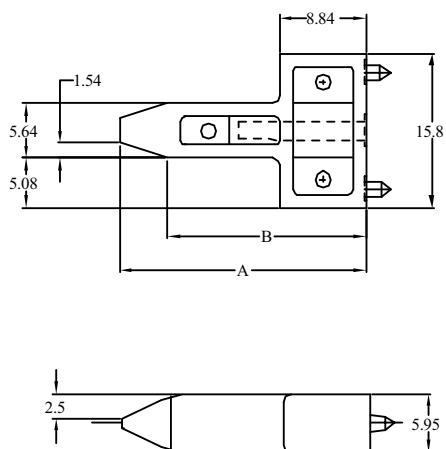
- 4 row Header straight, solder-to-board, page 25
  - 1 mod, part number 88951-101LF
  - 2 mod, part number 88952-101LF
  - 4 mod, part number 88953-101LF
  - 8 mod, part number 88954-101LF
- 4 row Header straight, press-fit, page 27
  - 1 mod, part number 70232-116LF
  - 2 mod, part number 70233-116LF
  - 4 mod, part number 70234-116LF
  - 8 mod, part number 70235-116LF

### TYPICAL APPLICATIONS



# Ramping Module

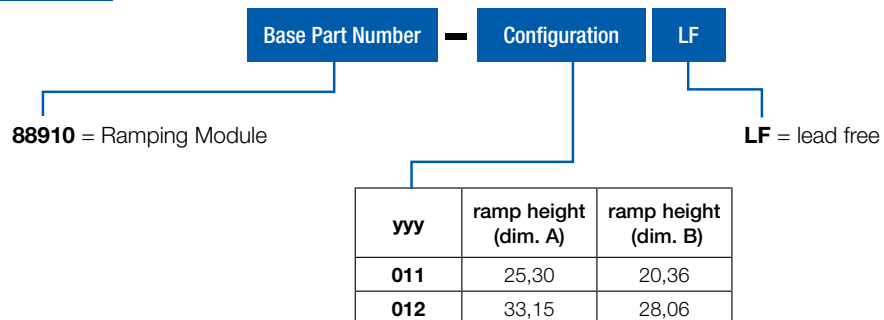
## PRODUCT



PCB pattern P19, see chapter PCB layouts

## PARTNUMBERS

88910 - yyyLF



## Shorting Clip header, 4 row, signal, straight, press-fit, wide body

### FEATURES

- shorts any adjacent pin pair in row A of the Header signal pins mate before shorting clips break
- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Eye of the needle press-fit contact

### TECHNICAL DATA

#### PHYSICAL

- spacing: 2,00 mm x 2,00 mm
- housing: glass-filled LCP, colour natural
- flammability rating: UL 94 V-0
- pin material: phosphor bronze
- performance level: Telcordia CO

#### ELECTRICAL

- current rating: 1 A
- insulation resistance:  $5 \times 10^3 \text{ M}\Omega$  initially,  $1 \times 10^3 \text{ M}\Omega$  after tests
- withstanding voltage: 1000 V rms (sea level)

#### MECHANICAL PERFORMANCE

- insertion force: 0,45 N max. per individual signal contact (mating)
- withdrawal force: 0,15 N max. per individual signal contact (unmating)
- press-fit contact insertion: 65 N max. per pin
- press-fit pin withdrawal: 15 N min. per pin
- recommended hole diameter: 0,65-0,80 mm

#### ENVIRONMENTAL

- Operating temperature range: -55°C to +125°C
- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### PACKAGING

- standard: tubes

#### PROCESSING INFORMATION

- Applicable process: press-fit

#### REFERENCE DATA

- file no. GS-12-180
- application specification: BUS-20-073

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



### MATING DATA

#### Receptacle, right angle, press-fit, page 35

- 1 mod – part number 88945-102LF
- 2 mod – part number 88946-102LF
- 4 mod – part number 88947-102LF
- 8 mod – part number 88948-102LF

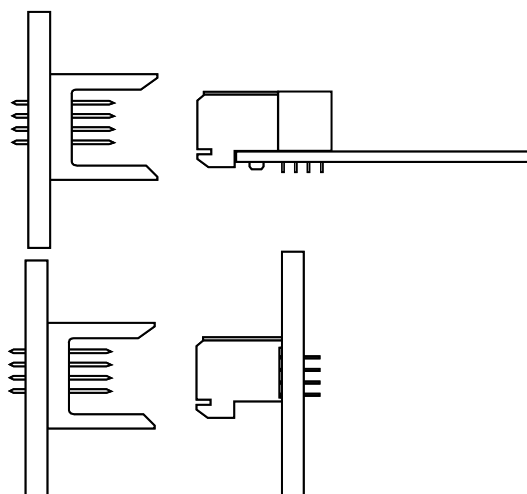
#### Receptacle, right angle, solder-to-board, page 33

- 1 mod – part numbers 89035-101LF
- 2 mod – part numbers 89036-101LF
- 4 mod – part numbers 89037-101LF
- 8 mod – part numbers 89038-101LF

#### Receptacle, right angle, Pin-in-Paste, page 37

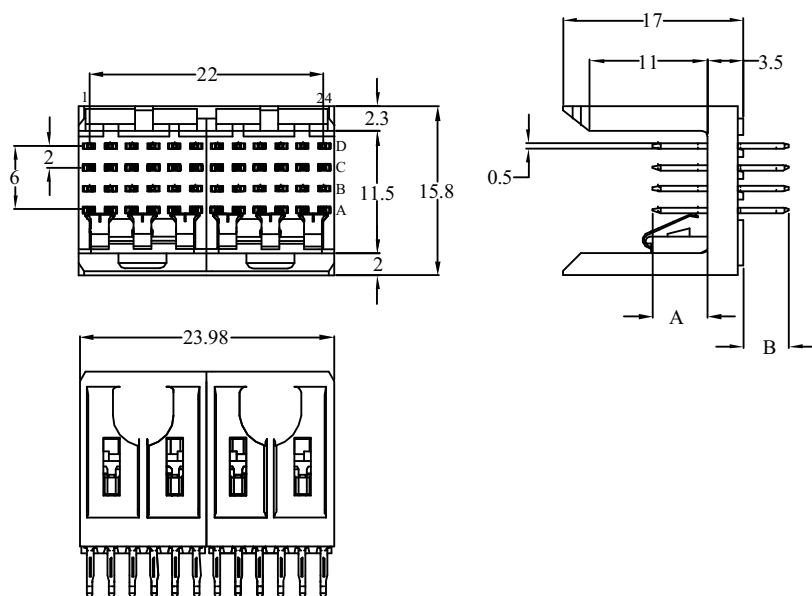
- 1 mod – part numbers 52048-101LF

### TYPICAL APPLICATIONS



# Shorting Clip header, 4 row, signal, straight, press-fit, wide body

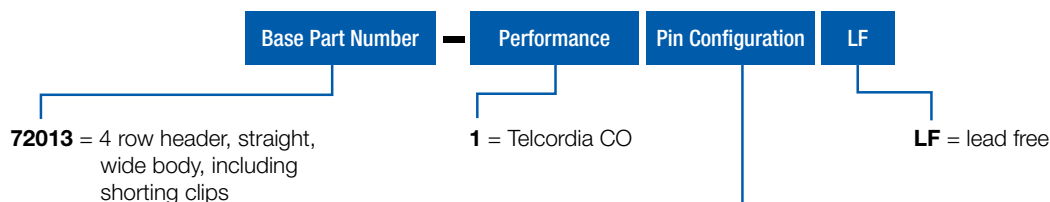
## PRODUCT



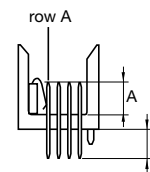
PCB pattern P6, see chapter PCB layouts

## PARTNUMBERS

72013 - 1yyyLF



| yyy             | modules | no. of positions | mating length A | tail lengthB | shorting clip at |
|-----------------|---------|------------------|-----------------|--------------|------------------|
| on request only | 1       | 4 x 6            | 5,75 mm         | 4,30 mm      | all row A pins   |
| 003             | 2       | 4 x 12           | 5,75 mm         | 4,30 mm      | all row A pins   |
| 004             | 3       | 4 x 24           | 5,75 mm         | 4,30 mm      | all row A pins   |
| 005             | 4       | 4 x 48           | 5,75 mm         | 4,30 mm      | all row A pins   |



**Note:** for other special patterns or loadings, please check drawings, all other configurations on request only

## Shorting Clip header, 5 row, signal, straight, press-fit, wide body

### FEATURES

- shorts any adjacent pin pair in row A of the Header signal pins mate before shorting clips break
- In accordance with IEC 60917 and IEC 61076-4-104 (Futurebus+)
- Eye of the needle press-fit contact

### TECHNICAL DATA

#### PHYSICAL

- spacing: 2,00 mm x 2,00 mm
- housing: glass-filled LCP, colour natural
- flammability rating: UL 94 V-0
- pin material: phosphor bronze
- performance level: Telcordia CO

#### ELECTRICAL

- current rating: 1 A
- insulation resistance:  $5 \times 10^3 \text{ M}\Omega$  initially,  $1 \times 10^3 \text{ M}\Omega$  after tests
- withstanding voltage: 1000 V rms (sea level)

#### MECHANICAL PERFORMANCE

- insertion force: 0,45 N max. per individual signal contact (mating)
- withdrawal force: 0,15 N max. per individual signal contact (unmating)
- press-fit contact insertion: 65 N max. per pin
- press-fit pin withdrawal: 15 N min. per pin
- recommended hole diameter: 0,65-0,80 mm

#### ENVIRONMENTAL

- Operating temperature range: -55°C to +125°C
- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### PACKAGING

- standard: tubes

#### PROCESSING INFORMATION

- press fit

#### REFERENCE DATA

- file no. GS-12-180
- application specification: BUS-20-073

#### APPLICATION EQUIPMENT

- for application equipment, check out the application equipment table on page 217-223



### MATING DATA

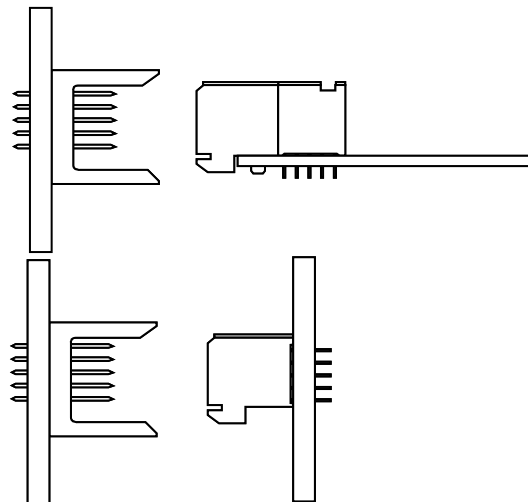
#### ■ Receptacle, right angle, press-fit, pag 45

- 1 mod – part number 89047
- 2 mod – part number 89093
- 4 mod – part number 89094
- 8 mod – part number 89095

#### ■ Receptacle, right angle, solder-to-board, page 43

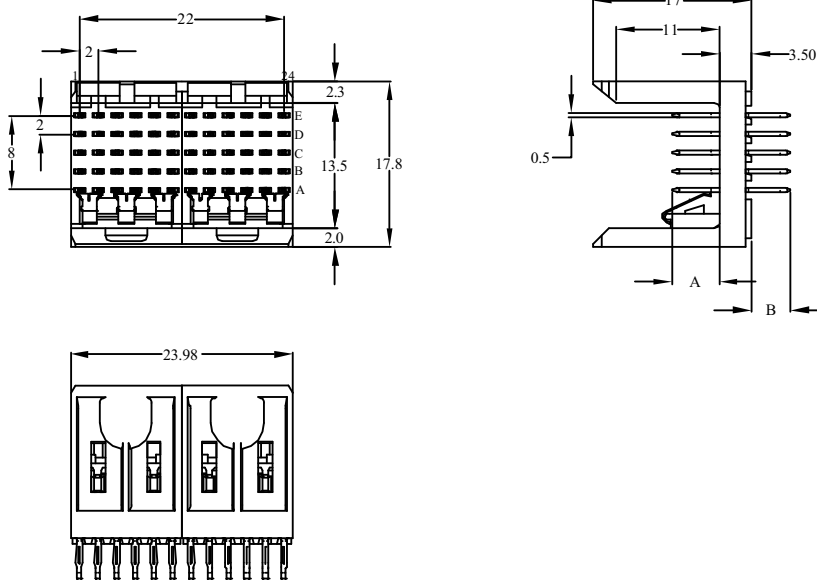
- 1 mod – part numbers 85863
- 2 mod – part numbers 85864
- 4 mod – part numbers 85865
- 8 mod – part numbers 85866

### TYPICAL APPLICATIONS



# Shorting Clip header, 5 row, signal, straight, press-fit, wide body

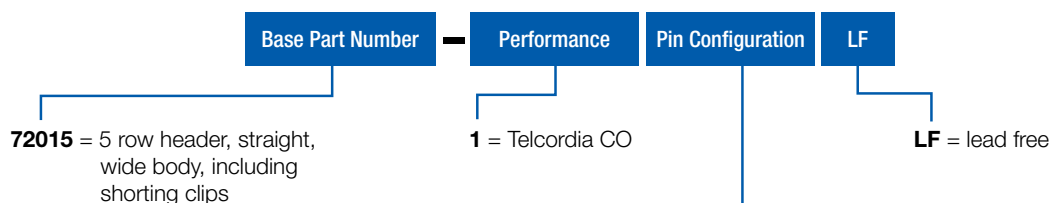
## PRODUCT



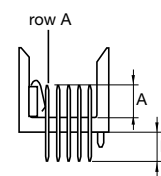
PCB pattern P7, see chapter PCB layouts

## PARTNUMBERS

72015 - 1yyyLF



| yyy             | modules | no. of positions | mating length A | tail length B | shorting clip at |
|-----------------|---------|------------------|-----------------|---------------|------------------|
| 003             | 1       | 5 x 6            | 5,75 mm         | 4,30 mm       | all row A pins   |
| on request only | 2       | 5 x 12           | 5,75 mm         | 4,30 mm       | all row A pins   |
| on request only | 3       | 5 x 24           | 5,75 mm         | 4,30 mm       | all row A pins   |
| on request only | 4       | 5 x 48           | 5,75 mm         | 4,30 mm       | all row A pins   |



**Note:** for other special patterns or loadings, please check drawings, all other configurations on request only

## End wall

### FEATURES

- End wall can be used on either side of the Header
- Latch feature to prevent mismatch
- Protection feature
- Match with 4 row and 5 row shroud

### TECHNICAL DATA

#### ■ PHYSICAL

- housing: 30% glass-filled flame retardant accessory, color natural, flammability rating: UL 94 V-0
- The housing withstand exposure to 260°C peak temperature for 15 seconds in a wave solder application with 1.5mm minimum PCB.

#### ■ ENVIRONMENTAL

- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### ■ REFERENCE DATA

- Product specification GS-12-199



### MATING DATA

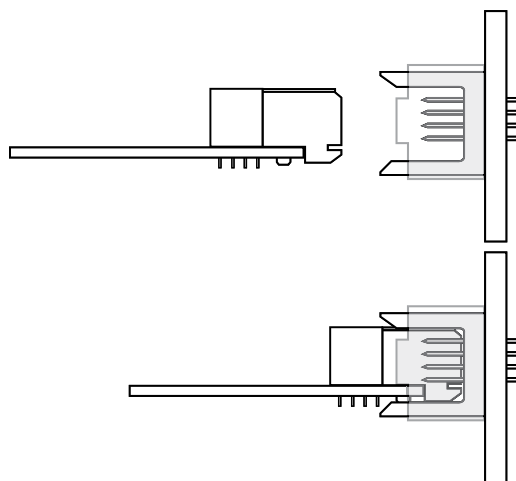
#### ■ 4 row

- Shroud, part number 70203-xxxLF, page 83
- Hybrid header housing, part number 88911-xxxLF, page 155
- part number 88913-xxxLF, page 159

#### ■ 5 row

- Shroud, part number 89055-xxxLF, page 85
- Header, part number 89006-116LF (1 mod), 89007-116LF (2 mod), 89008-116LF (4 mod) and 89009-116LF (8 mod), page 41

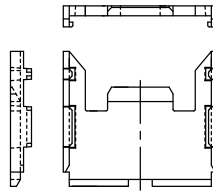
### TYPICAL APPLICATIONS



# End wall

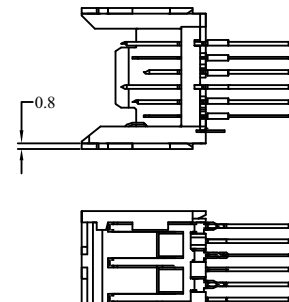
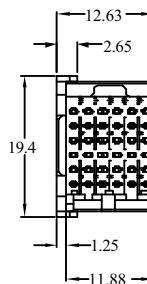
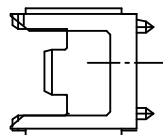
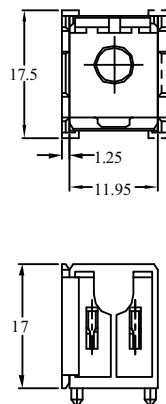
## PRODUCT

### End Wall



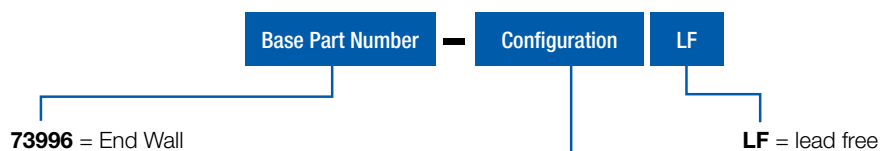
**73996-002**  
( 4 row application )

**73996-011**  
( 5 row application )



## PARTNUMBERS

**73996 - yyyLF**



| yyy        | description                   |
|------------|-------------------------------|
| <b>002</b> | 4 row Shroud & Hybrid housing |
| <b>011</b> | 5 row Shroud & Header         |

## Hybrid housing

### FEATURES

- create stand off of 3,5 mm
- can be used for DIN standard power, coax and guide pin



### TECHNICAL DATA

#### PHYSICAL

- housing: glass-filled LCP, color natural
- flammability rating: UL 94 V-0
- temperature withstanding till 260C for 60 seconds

#### ENVIRONMENTAL

- RoHs information, this product is compatible according to the European Union Directive 2002/95/IEC

#### PROCESSING INFORMATION

- Infra-red or vapor phase reflow oven

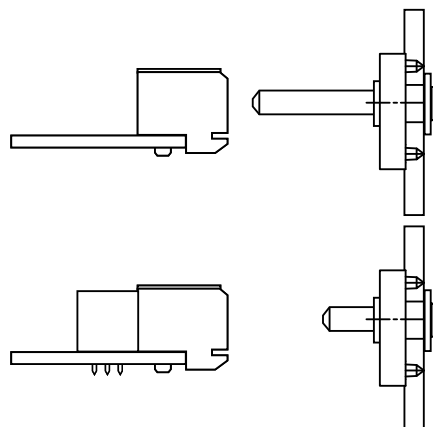
#### RECOMMENDED HOLE DIAMETER

| 4 row Hybrid header housing<br>in combination with | Hole diameter<br>(unplated) |
|----------------------------------------------------|-----------------------------|
| guide pin                                          | 3,25 mm +/-0,10 mm          |
| screw to board high power insert                   | 3,25 mm +/-0,10 mm          |
| plug / plug high power coupler                     | 6,00 mm +0,10 mm            |
| receptacle / receptacle coax coupler               | 6,00 mm +0,10 mm            |

### MATING DATA

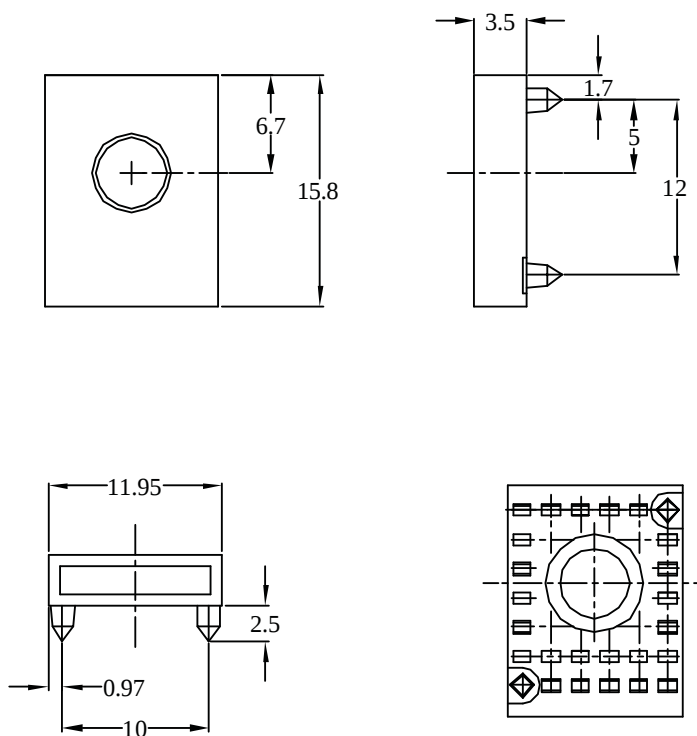
- Guide Pin, page 185
  - part number 70295-00XLF
- Screw to board high power insert, page 155
  - part number 91570-001LF
- Plug / plug high power coupler, page 155
  - part number 70201-001LF
- Receptacle / receptacle coax coupler, page 163
  - part number 70200-001LF

### TYPICAL APPLICATIONS



# Hybrid housing

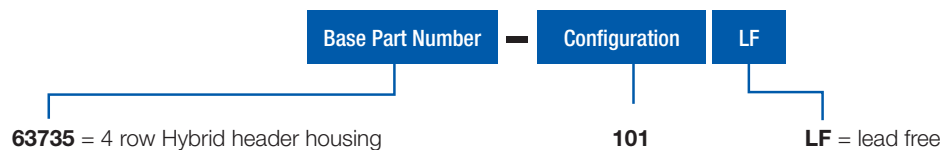
## PRODUCT



PCB pattern P25, see chapter PCB layouts

## PARTNUMBERS

**63735 - 101LF**



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