

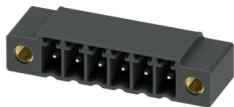
# MC 1,5/ 6-GF-3,5 P20 THR - PCB header



1789465

<https://www.phoenixcontact.com/nl/products/1789465>

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PCB headers, nominal cross section: 1.5 mm<sup>2</sup>, color: black, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Sn, contact connection type: Pin, number of potentials: 6, number of rows: 1, number of positions: 6, number of connections: 6, product range: MC 1,5/..-GF-THR, pitch: 3.5 mm, mounting: THR soldering, pin layout: Linear pinning, solder pin [P]: 2 mm, number of solder pins per potential: 1, plug-in system: COMBICON MC 1,5, Pin connector pattern alignment: Standard, locking: Screw locking mechanism, mounting method: Threaded flange, type of packaging: packed in cardboard

## Your advantages

- Designed for integration into the SMT soldering process
- Screwable flange for superior mechanical stability
- Maximum flexibility when it comes to device design – one header for connectors with different connection technologies

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1789465       |
| Packing unit                         | 100 pc        |
| Minimum order quantity               | 100 pc        |
| Sales key                            | AABTAA        |
| Product key                          | AABTAA        |
| GTIN                                 | 4046356612265 |
| Weight per piece (including packing) | 2,651 g       |
| Weight per piece (excluding packing) | 2,2 g         |
| Customs tariff number                | 85366990      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                           |                                            |
|---------------------------|--------------------------------------------|
| Product family            | MC 1,5/...-GF-THR                          |
| Product line              | COMBICON Connectors S                      |
| Type                      | Component suitable for through hole reflow |
| Number of positions       | 6                                          |
| Pitch                     | 3.5 mm                                     |
| Number of connections     | 6                                          |
| Number of rows            | 1                                          |
| Number of potentials      | 6                                          |
| Mounting type             | Threaded flange                            |
| Pin layout                | Linear pinning                             |
| Solder pins per potential | 1                                          |

### Electrical properties

#### Properties

|                             |        |
|-----------------------------|--------|
| Nominal current $I_N$       | 8 A    |
| Nominal voltage $U_N$       | 160 V  |
| Contact resistance          | 2.2 mΩ |
| Rated voltage (III/3)       | 160 V  |
| Rated surge voltage (III/3) | 2.5 kV |
| Rated voltage (III/2)       | 160 V  |
| Rated surge voltage (III/2) | 2.5 kV |
| Rated voltage (II/2)        | 250 V  |
| Rated surge voltage (II/2)  | 2.5 kV |

### Mounting

|               |                |
|---------------|----------------|
| Mounting type | THR soldering  |
| Pin layout    | Linear pinning |

#### Flange

|                   |        |
|-------------------|--------|
| Tightening torque | 0.3 Nm |
|-------------------|--------|

#### Processing notes

|                                  |                       |
|----------------------------------|-----------------------|
| Process                          | Reflow/wave soldering |
| Moisture Sensitive Level         | MSL 1                 |
| Classification temperature $T_c$ | 260 °C                |
| Solder cycles in the reflow      | 3                     |

### Material specifications

#### Material data - contact

|      |                                                                                  |
|------|----------------------------------------------------------------------------------|
| Note | WEEE/RoHS-compliant, free of whiskers according to IEC 60068-2-82/JEDEC JESD 201 |
|------|----------------------------------------------------------------------------------|

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|                                             |                           |
|---------------------------------------------|---------------------------|
| Contact material                            | Cu alloy                  |
| Surface characteristics                     | Tin-plated                |
| Metal surface contact area (top layer)      | Tin (3 µm - 5 µm Sn)      |
| Metal surface contact area (middle layer)   | Nickel (1.3 µm - 3 µm Ni) |
| Metal surface soldering area (top layer)    | Tin (3 µm - 5 µm Sn)      |
| Metal surface soldering area (middle layer) | Nickel (1.3 µm - 3 µm Ni) |

## Material data - housing

|                                        |              |
|----------------------------------------|--------------|
| Color (Housing)                        | black (9005) |
| Insulating material                    | LCP          |
| Insulating material group              | IIIa         |
| CTI according to IEC 60112             | 175          |
| Flammability rating according to UL 94 | V0           |

## Dimensions

|                       |                                                                                     |
|-----------------------|-------------------------------------------------------------------------------------|
| Dimensional drawing   |  |
| Pitch                 | 3.5 mm                                                                              |
| Width [w]             | 31.3 mm                                                                             |
| Height [h]            | 8.9 mm                                                                              |
| Length [l]            | 9.2 mm                                                                              |
| Installed height      | 6.9 mm                                                                              |
| Solder pin length [P] | 2 mm                                                                                |
| Pin dimensions        | 0.8 x 0.8 mm                                                                        |

## PCB design

|               |        |
|---------------|--------|
| Hole diameter | 1.4 mm |
|---------------|--------|

## Mechanical tests

### Visual inspection

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60512-1-1:2002-02 |
| Result        | Test passed           |

### Dimension check

|               |                       |
|---------------|-----------------------|
| Specification | IEC 60512-1-2:2002-02 |
| Result        | Test passed           |

### Resistance of inscriptions

|               |                        |
|---------------|------------------------|
| Specification | IEC 60068-2-70:1995-12 |
| Result        | Test passed            |

### Polarization and coding

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1789465

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|               |                        |
|---------------|------------------------|
| Specification | IEC 60512-13-5:2006-02 |
| Result        | Test passed            |

## Contact holder in insert

|                                                |                        |
|------------------------------------------------|------------------------|
| Specification                                  | IEC 60512-15-1:2008-05 |
| Contact holder in insert<br>Requirements >20 N | Test passed            |

## Insertion and withdrawal forces

|                                     |                        |
|-------------------------------------|------------------------|
| Specification                       | IEC 60512-13-2:2006-02 |
| Result                              | Test passed            |
| No. of cycles                       | 25                     |
| Insertion strength per pos. approx. | 8 N                    |
| Withdraw strength per pos. approx.  | 5 N                    |

## Electrical tests

### Thermal test | Test group C

|                            |                       |
|----------------------------|-----------------------|
| Specification              | IEC 60512-5-1:2002-02 |
| Tested number of positions | 16                    |

### Insulation resistance

|                                              |                       |
|----------------------------------------------|-----------------------|
| Specification                                | IEC 60512-3-1:2002-02 |
| Insulation resistance, neighboring positions | > 5 MΩ                |

### Air clearances and creepage distances |

|                                                        |                     |
|--------------------------------------------------------|---------------------|
| Specification                                          | IEC 60664-1:2007-04 |
| Insulating material group                              | IIIa                |
| Comparative tracking index (IEC 60112)                 | CTI 175             |
| Rated insulation voltage (III/3)                       | 160 V               |
| Rated surge voltage (III/3)                            | 2.5 kV              |
| minimum clearance value - non-homogenous field (III/3) | 1.5 mm              |
| minimum creepage distance (III/3)                      | 2.5 mm              |
| Rated insulation voltage (III/2)                       | 160 V               |
| Rated surge voltage (III/2)                            | 2.5 kV              |
| minimum clearance value - non-homogenous field (III/2) | 1.5 mm              |
| minimum creepage distance (III/2)                      | 1.6 mm              |
| Rated insulation voltage (II/2)                        | 250 V               |
| Rated surge voltage (II/2)                             | 2.5 kV              |
| minimum clearance value - non-homogenous field (II/2)  | 1.5 mm              |
| minimum creepage distance (II/2)                       | 2.5 mm              |

## Environmental and real-life conditions

### Durability test

|                                        |                       |
|----------------------------------------|-----------------------|
| Specification                          | IEC 60512-9-1:2010-03 |
| Impulse withstand voltage at sea level | 2.95 kV               |

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|                                              |                |
|----------------------------------------------|----------------|
| Contact resistance $R_1$                     | 2.2 m $\Omega$ |
| Contact resistance $R_2$                     | 2.1 m $\Omega$ |
| Insertion/withdrawal cycles                  | 25             |
| Insulation resistance, neighboring positions | > 5 M $\Omega$ |

## Climatic test

|                                   |                                                                           |
|-----------------------------------|---------------------------------------------------------------------------|
| Specification                     | EN ISO 22479:2022-06                                                      |
| Corrosive stress                  | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /40 °C/1 cycle |
| Thermal stress                    | 105 °C/168 h                                                              |
| Power-frequency withstand voltage | 1.39 kV                                                                   |

## Vibration test

|                        |                             |
|------------------------|-----------------------------|
| Specification          | IEC 60068-2-6:2007-12       |
| Frequency              | 10 - 150 - 10 Hz            |
| Sweep speed            | 1 octave/min                |
| Amplitude              | 0.35 mm (10 Hz ... 60.1 Hz) |
| Acceleration           | 5g (60.1 Hz ... 150 Hz)     |
| Test duration per axis | 2.5 h                       |
| Test directions        | X-, Y- and Z-axis           |

## Shocks

|                 |                                   |
|-----------------|-----------------------------------|
| Specification   | IEC 60068-2-27:2008-02            |
| Pulse shape     | Semi-sinusoidal                   |
| Acceleration    | 30g                               |
| Shock duration  | 18 ms                             |
| Test directions | X-, Y- and Z-axis (pos. and neg.) |

## Railway application: Oscillation/broadband noise

|                        |                                                  |
|------------------------|--------------------------------------------------|
| Specification          | DIN EN 50155 (VDE 0115-200):2022-06              |
|                        | IEC 61373:2010-05                                |
| Spectrum               | Long life test category 1, class B, body mounted |
| Frequency              | $f_1 = 5$ Hz to $f_2 = 150$ Hz                   |
| ASD level              | 0.964 (m/s <sup>2</sup> ) <sup>2</sup> /Hz       |
| Acceleration           | 0.572 g                                          |
| Test duration per axis | 5 h                                              |
| Test directions        | X-, Y- and Z-axis                                |
| Contact interruption   | < 1 $\mu$ s                                      |
| Result                 | Test passed                                      |

## Railway application: Shocks

|                                |                                     |
|--------------------------------|-------------------------------------|
| Specification                  | DIN EN 50155 (VDE 0115-200):2022-06 |
|                                | IEC 61373:2010-05                   |
| Pulse shape                    | Semi-sinusoidal                     |
| Acceleration                   | 30g                                 |
| Shock duration                 | 18 ms                               |
| Number of shocks per direction | 3                                   |

# MC 1,5/ 6-GF-3,5 P20 THR - PCB header



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|                      |                                   |
|----------------------|-----------------------------------|
| Test directions      | X-, Y- and Z-axis (pos. and neg.) |
| Contact interruption | < 1 µs                            |
| Result               | Test passed                       |

## Ambient conditions

|                                         |                                                     |
|-----------------------------------------|-----------------------------------------------------|
| Ambient temperature (storage/transport) | -40 °C ... 70 °C                                    |
| Relative humidity (storage/transport)   | 30 % ... 70 %                                       |
| Ambient temperature (assembly)          | -5 °C ... 100 °C                                    |
| Ambient temperature (operation)         | -40 °C ... 100 °C (dependent on the derating curve) |

## Packaging specifications

|                   |                     |
|-------------------|---------------------|
| Type of packaging | packed in cardboard |
|-------------------|---------------------|

# MC 1,5/ 6-GF-3,5 P20 THR - PCB header

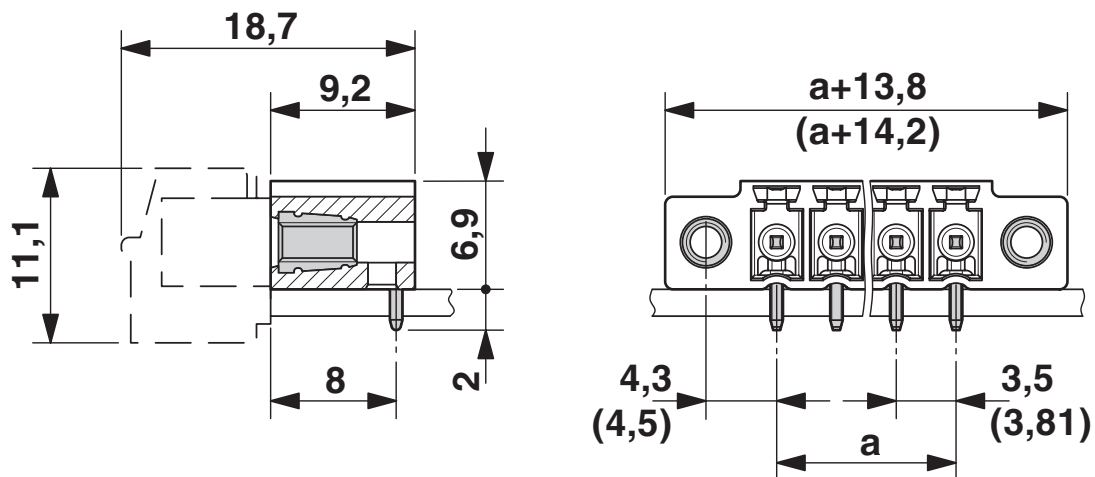
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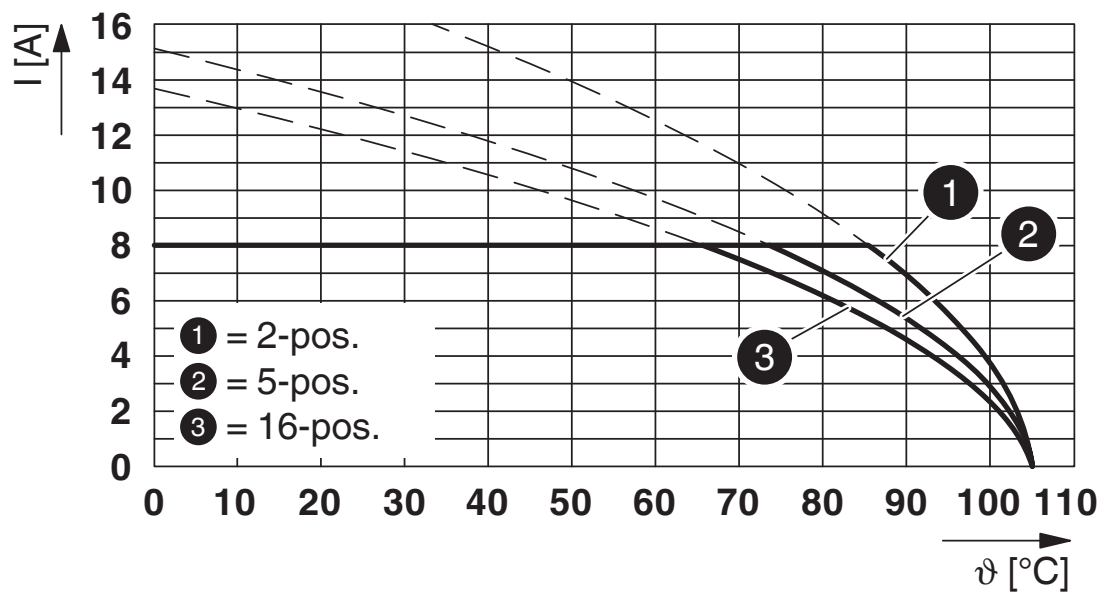


## Drawings

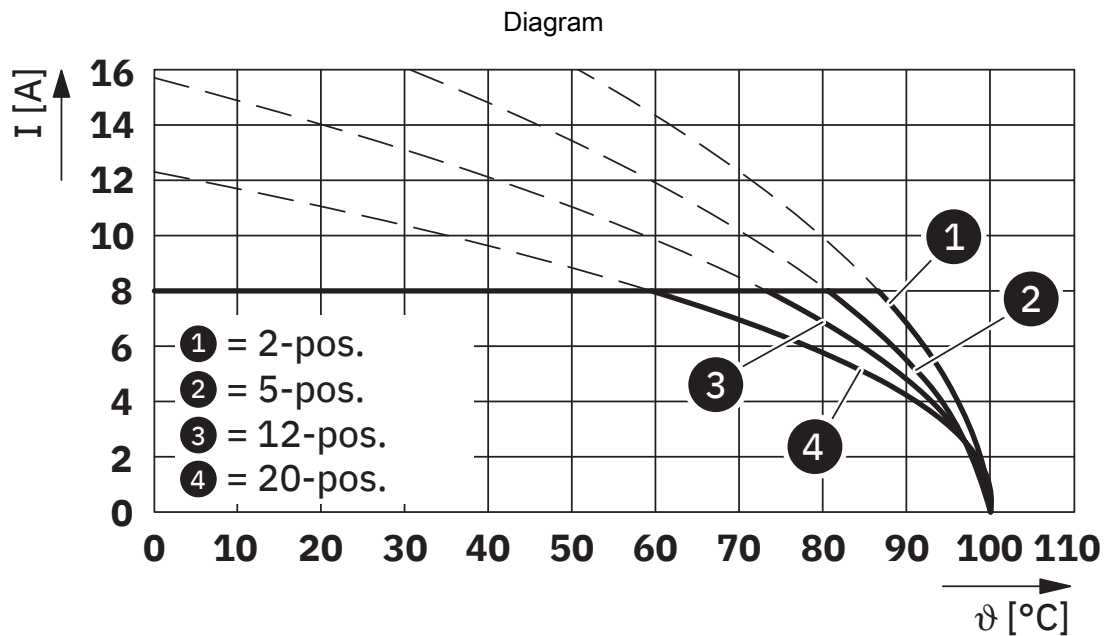
Dimensional drawing



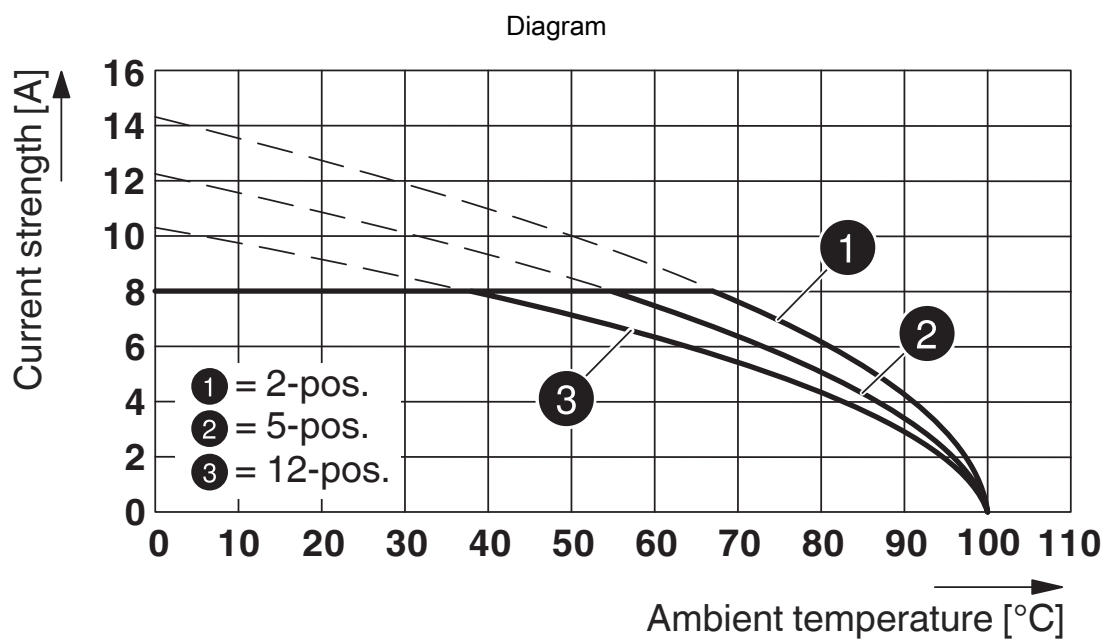
Diagram



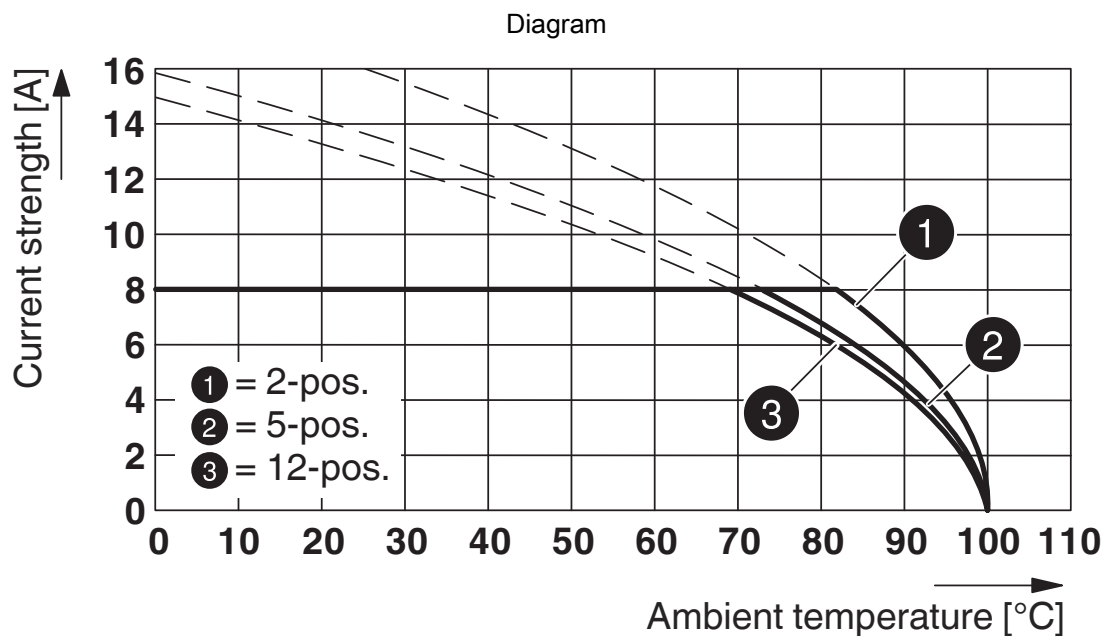
Type: XPC 1,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P... THR



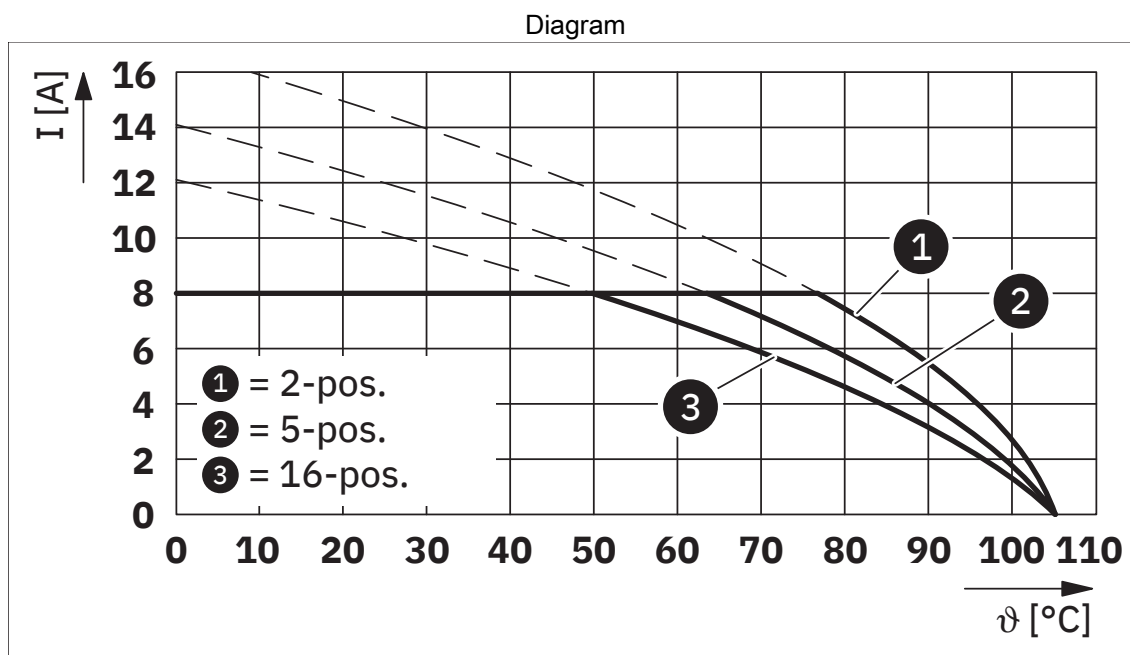
Type: MC 1,5/...-ST(F)-3,5 with MC 1,5/...-G(F)-3,5 P... THR



Type: MCV(W/R) 2,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P...THR



Type: FMC 1,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P.. THR

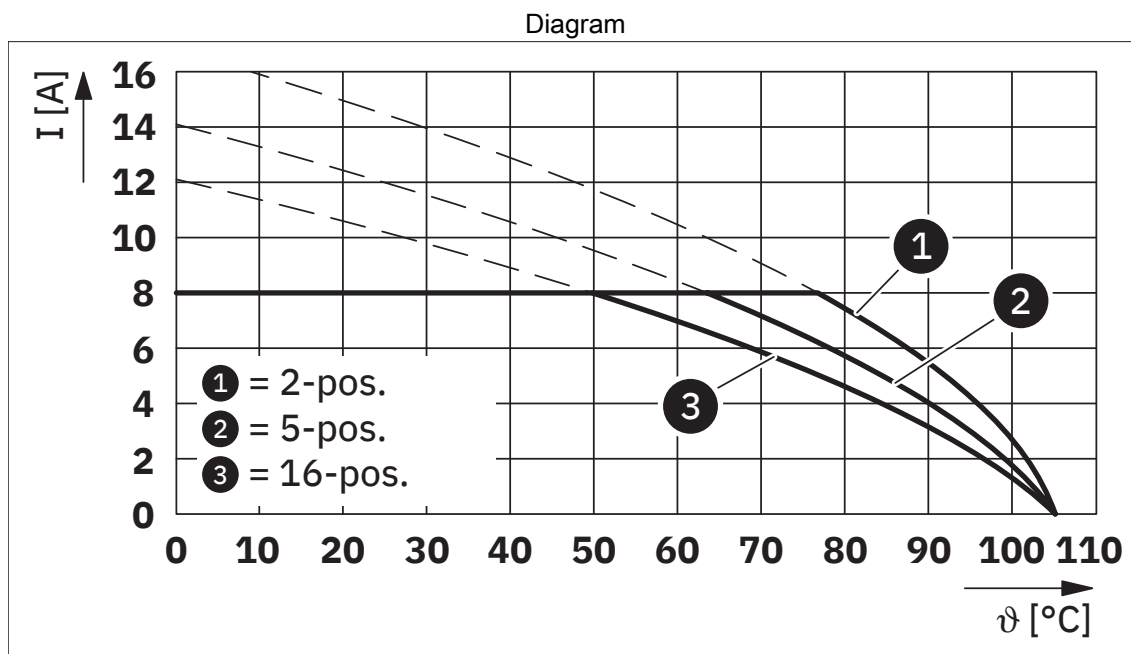


Type: FMCOR 1,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P... THR

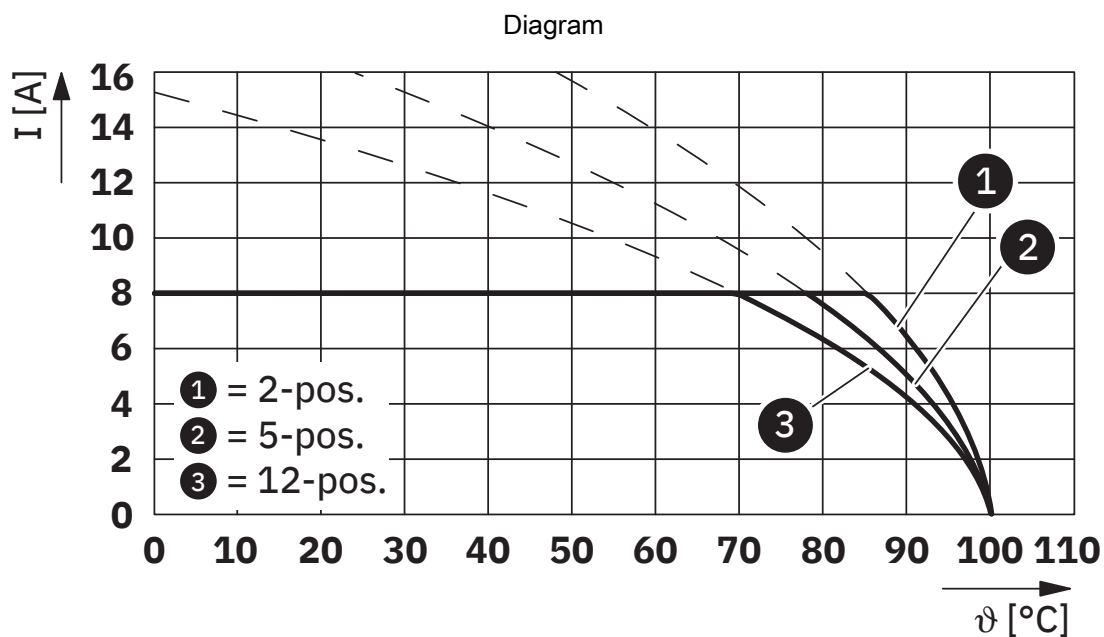
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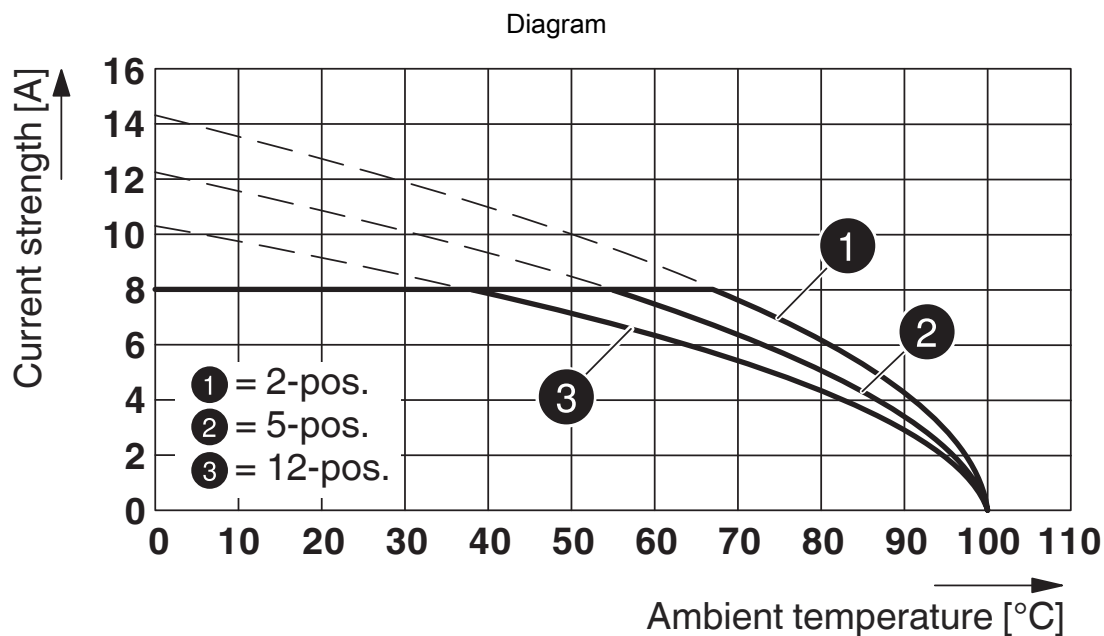
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Type: FMCOW 1,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P... THR



Type: FK-MCP 1,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P... THR



Type: MCV(W/R) 2,5/...-STF-3,5 with MC 1,5/...-GF-3,5 P...THR

Drilling plan/solder pad geometry



# MC 1,5/ 6-GF-3,5 P20 THR - PCB header

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/nl/products/1789465>

|                                                                                                                                           |                       |                       |                   |                             |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|  <b>cULus Recognized</b><br>Approval ID: E60425-20110128 |                       |                       |                   |                             |
|                                                                                                                                           | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B                                                                                                                                         |                       |                       |                   |                             |
|                                                                                                                                           | 300 V                 | 8 A                   | -                 | -                           |
| D                                                                                                                                         |                       |                       |                   |                             |
|                                                                                                                                           | 300 V                 | 8 A                   | -                 | -                           |

|                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------|--|
|  <b>VDE approval of drawings</b><br>Approval ID: 40011723 |  |
|--------------------------------------------------------------------------------------------------------------------------------------------|--|

|                                                                                                                                              |  |
|----------------------------------------------------------------------------------------------------------------------------------------------|--|
|  <b>VDE approval of drawings</b><br>Approval ID: 40011723 |  |
|----------------------------------------------------------------------------------------------------------------------------------------------|--|

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27460201 |
| ECLASS-15.0 | 27460201 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC002637 |
|-----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121400 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|                                         |                    |
|-----------------------------------------|--------------------|
| Fulfills EU RoHS substance requirements | Yes, No exemptions |
|-----------------------------------------|--------------------|

### China RoHS

|                                        |                                          |
|----------------------------------------|------------------------------------------|
| Environment friendly use period (EFUP) | EFUP-E                                   |
|                                        | No hazardous substances above the limits |

### EU REACH SVHC

|                                     |                            |
|-------------------------------------|----------------------------|
| REACH candidate substance (CAS No.) | No substance above 0.1 wt% |
|-------------------------------------|----------------------------|

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