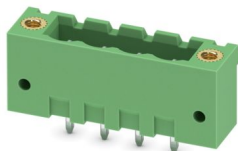


# MSTBV 2,5/ 4-GF-5,08 - PCB header

1777099

<https://www.phoenixcontact.com/us/products/1777099>

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PCB headers, nominal cross section: 2.5 mm<sup>2</sup>, color: green, nominal current: 12 A, rated voltage (III/2): 320 V, contact surface: Sn, contact connection type: Pin, number of potentials: 4, number of rows: 1, number of positions: 4, number of connections: 4, product range: MSTBV 2,5/...-GF, pitch: 5.08 mm, mounting: Wave soldering, pin layout: Linear pinning, solder pin [P]: 3.9 mm, number of solder pins per potential: 1, plug-in system: COMBICON MSTB 2,5, Pin connector pattern alignment: Standard, locking: Screw locking mechanism, mounting method: Threaded flange, type of packaging: packed in cardboard

## Your advantages

- Maximum flexibility when it comes to device design – one header for connectors with different connection technologies
- Well-known mounting principle allows worldwide use
- Vertical connection enables multi-row arrangement on the PCB
- Screwable flange for superior mechanical stability

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1777099       |
| Packing unit                         | 250 pc        |
| Minimum order quantity               | 250 pc        |
| Sales key                            | AA03          |
| Product key                          | AACSMD        |
| GTIN                                 | 4017918039264 |
| Weight per piece (including packing) | 3.22 g        |
| Weight per piece (excluding packing) | 3 g           |
| Customs tariff number                | 85366930      |
| Country of origin                    | DE            |

# MSTBV 2,5/ 4-GF-5,08 - PCB header



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## Technical data

### Product properties

|                           |                       |
|---------------------------|-----------------------|
| Product type              | PCB headers           |
| Product family            | MSTBV 2,5/..-GF       |
| Product line              | COMBICON Connectors M |
| Type                      | Standard              |
| Number of positions       | 4                     |
| Pitch                     | 5.08 mm               |
| Number of connections     | 4                     |
| Number of rows            | 1                     |
| Number of potentials      | 4                     |
| Mounting type             | Threaded flange       |
| Pin layout                | Linear pinning        |
| Solder pins per potential | 1                     |

### Electrical properties

#### Properties

|                             |       |
|-----------------------------|-------|
| Nominal current $I_N$       | 12 A  |
| Nominal voltage $U_N$       | 320 V |
| Contact resistance          | 2 mΩ  |
| Rated voltage (III/3)       | 250 V |
| Rated surge voltage (III/3) | 4 kV  |
| Rated voltage (III/2)       | 320 V |
| Rated surge voltage (III/2) | 4 kV  |
| Rated voltage (II/2)        | 400 V |
| Rated surge voltage (II/2)  | 4 kV  |

### Mounting

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

#### Flange

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

#### Attachment on the PCB

|                   |  |
|-------------------|--|
| Tightening torque | 0.3 Nm   |
| Screw             | Sheet metal screw ISO 1481-ST 2,2x6,5 C or ISO 7049-ST 2,2x6,5 C |

### 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) |

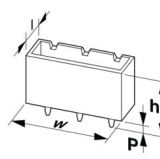
## Material data - housing

|  |              |
|--|--------------|
| Color (Housing)                        | green (6021) |
| Insulating material                    | PBT          |
| Insulating material group              | IIIa         |
| CTI according to IEC 60112             | 225          |
| Flammability rating according to UL 94 | V0           |

## Notes

|                    |  |
|--------------------|--|
| Notes on operation | In accordance with IEC 61984, COMBICON connectors have no switching power (COC). During designated use, they must not be plugged in or disconnected when carrying voltage or under load. |
|--------------------|--|

## Dimensions

|                       |  |
|-----------------------|--|
| Dimensional drawing   |  |
| Pitch                 | 5.08 mm  |
| Width [w]             | 30.48 mm   |
| Height [h]            | 15.9 mm  |
| Length [l]            | 8.6 mm   |
| Installed height      | 12 mm  |
| Solder pin length [P] | 3.9 mm   |
| Pin dimensions        | 1 x 1 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           |

# MSTBV 2,5/ 4-GF-5,08 - PCB header



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## Resistance of inscriptions

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

## Polarization and coding

|               |                        |
|---------------|------------------------|
| 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 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.  | 6 N                    |

## Electrical tests

### Thermal test | Test group C

|                            |                       |
|----------------------------|-----------------------|
| Specification              | IEC 60512-5-1:2002-02 |
| Tested number of positions | 20                    |

### 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 225             |
| Rated insulation voltage (III/3)                       | 250 V               |
| Rated surge voltage (III/3)                            | 4 kV                |
| minimum clearance value - non-homogenous field (III/3) | 3 mm                |
| minimum creepage distance (III/3)                      | 4 mm                |
| Rated insulation voltage (III/2)                       | 320 V               |
| Rated surge voltage (III/2)                            | 4 kV                |
| minimum clearance value - non-homogenous field (III/2) | 3 mm                |
| minimum creepage distance (III/2)                      | 3.2 mm              |
| Rated insulation voltage (II/2)                        | 400 V               |
| Rated surge voltage (II/2)                             | 4 kV                |
| minimum clearance value - non-homogenous field (II/2)  | 3 mm                |
| minimum creepage distance (II/2)                       | 4 mm                |

## Environmental and real-life conditions

### Durability test

|  |                       |
|--|-----------------------|
| Specification                                | IEC 60512-9-1:2010-03 |
| Impulse withstand voltage at sea level       | 4.8 kV                |
| Contact resistance R <sub>1</sub>            | 2 mΩ                  |
| Contact resistance R <sub>2</sub>            | 2.2 mΩ                |
| Insertion/withdrawal cycles                  | 25                    |
| Insulation resistance, neighboring positions | > 5 MΩ                |

### Climatic test

|                                   |   |
|-----------------------------------|---|
| Specification                     | ISO 6988:1985-02  |
| 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 | 2.21 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    | 20g                               |
| Shock duration  | 11 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<br>IEC 61373:2010-05 |
| Spectrum               | Long life test category 1, class B, body mounted         |
| Frequency              | f <sub>1</sub> = 5 Hz to f <sub>2</sub> = 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 μs   |
| Result                 | Test passed  |

### Railway application: Shocks

|               |                                     |
|---------------|-------------------------------------|
| Specification | DIN EN 50155 (VDE 0115-200):2022-06 |
|---------------|-------------------------------------|

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|                                |                                   |
|--------------------------------|-----------------------------------|
|                                | IEC 61373:2010-05                 |
| Pulse shape                    | Semi-sinusoidal                   |
| Acceleration                   | 20g                               |
| Shock duration                 | 11 ms                             |
| Number of shocks per direction | 3                                 |
| Test directions                | X-, Y- and Z-axis (pos. and neg.) |
| Contact interruption           | < 1 $\mu$ s                       |
| 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 ... 105 °C (dependent on the derating curve) |

## Packaging specifications

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

## Drawings

Diagram



Type: LPC 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

Diagram



Type: MSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

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Type: TVMSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



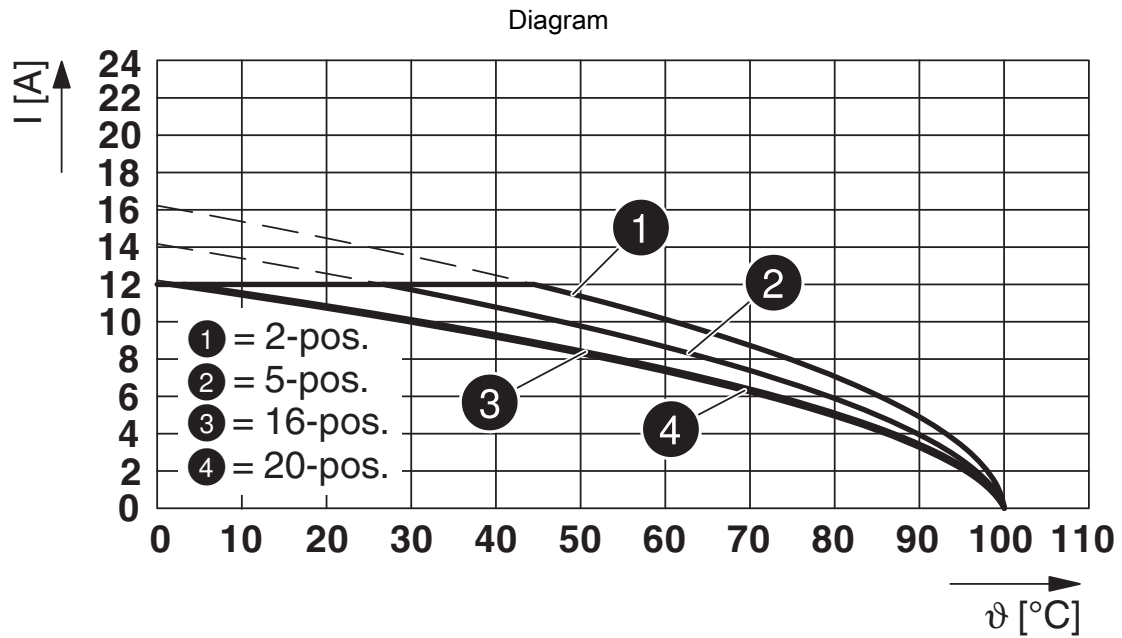
Type: TFKC 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

# MSTBV 2,5/ 4-GF-5,08 - PCB header

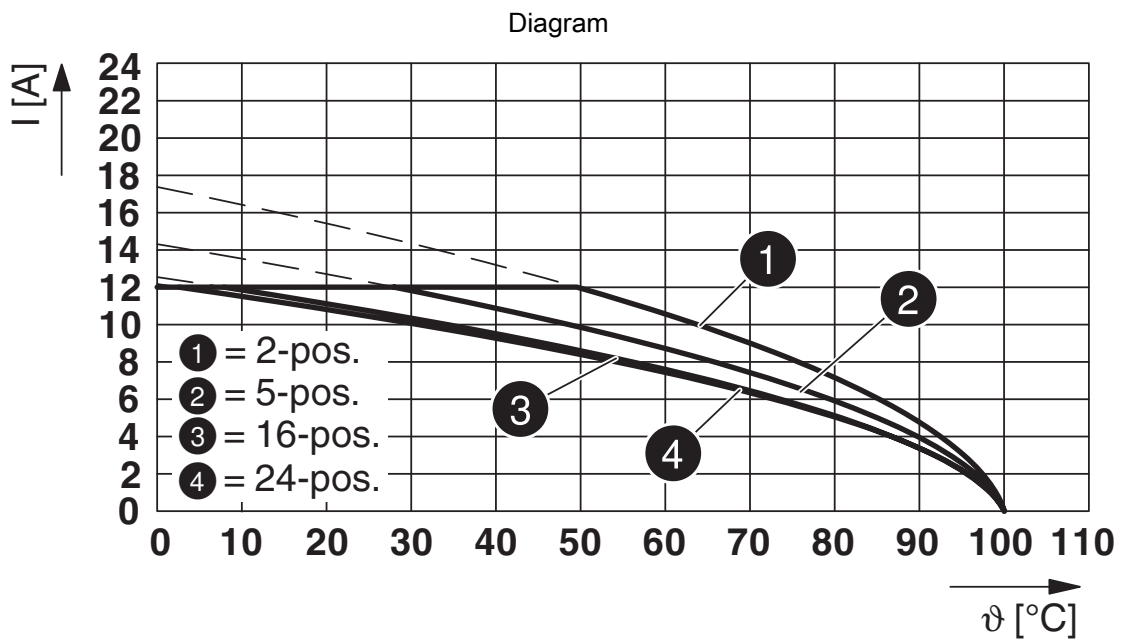


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Type: MVSTB(R/W) 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



Type: SMSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

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Diagram



Type: FKCVR 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

Diagram



Type: FKCVW 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

# MSTBV 2,5/ 4-GF-5,08 - PCB header

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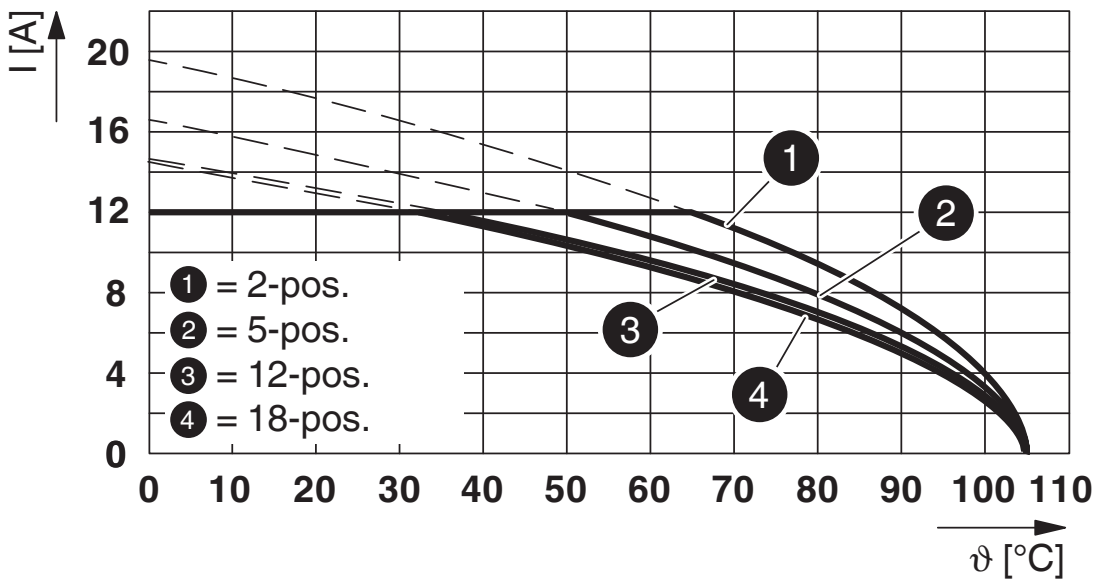
<https://www.phoenixcontact.com/us/products/1777099>

Diagram



Type: FRONT-MSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

Diagram



Type: MSTBT 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

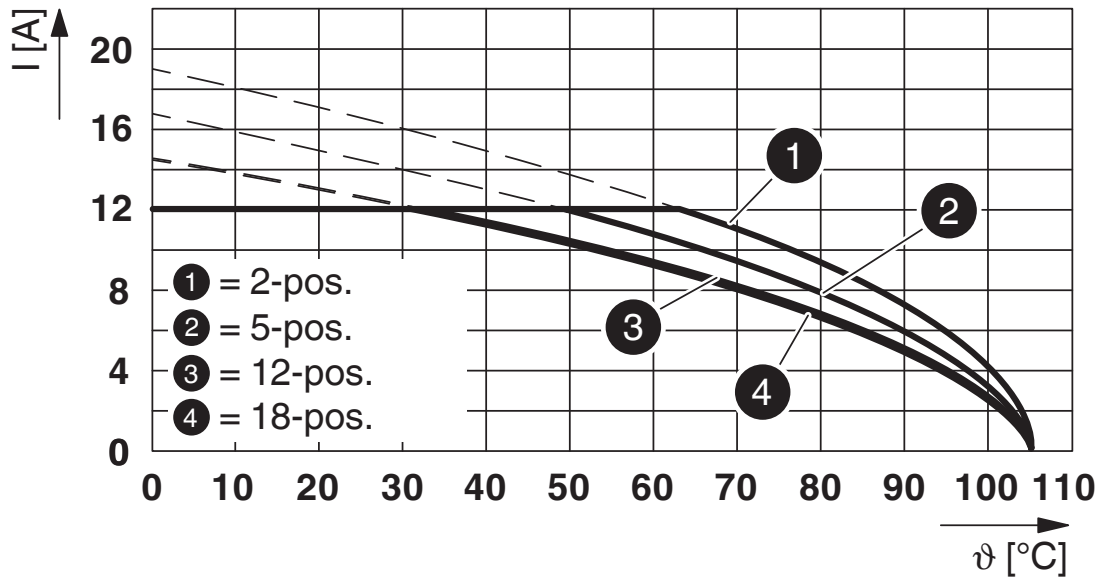
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Diagram



Type: FKCT 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

Diagram



Type: FKCN 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

# MSTBV 2,5/ 4-GF-5,08 - PCB header



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Diagram



Type: FKC 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

# MSTBV 2,5/ 4-GF-5,08 - PCB header



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1777099>

|  <b>CSA</b><br>Approval ID: 13631-2585951 |                       |                       |                   |                             |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B  | 300 V                 | 12 A                  | -                 | -                           |
| D  | 300 V                 | 10 A                  | -                 | -                           |

|  <b>cULus Recognized</b><br>Approval ID: E60425-19931011 |                       |                       |                   |                             |
|---|-----------------------|-----------------------|-------------------|-----------------------------|
|   | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| B   | 300 V                 | 12 A                  | -                 | -                           |
| D   | 300 V                 | 10 A                  | -                 | -                           |

|  <b>DNV GL</b><br>Approval ID: TAE00001EY |  |  |  |  |
|--|--|--|--|--|
|--|--|--|--|--|

|  <b>VDE approval of drawings</b><br>Approval ID: 40050648 |                       |                       |                   |                             |
|--|-----------------------|-----------------------|-------------------|-----------------------------|
|  | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine  | 250 V                 | 12 A                  | -                 | -                           |

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## Classifications

### ECLASS

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

### ETIM

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

### UNSPSC

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

# MSTBV 2,5/ 4-GF-5,08 - PCB header



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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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