

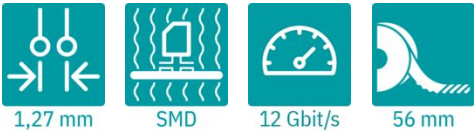
# FR 1,27/ 50-MH - SMD male connectors



1377303

<https://www.phoenixcontact.com/nl/products/1377303>

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SMD male connector, nominal current: 2 A, test voltage: 500 V AC, number of positions: 50, pitch: 1.27 mm, color: black, contact surface: Au, contact connection type: Pin, mounting: SMD soldering



## Your advantages

- The first high-speed data transmission at up to 28 Gbps using the established market standard, opens up new design possibilities.
- Robust 6-pos. to 100-pos. board-to-board and wire-to-board connectors ensure greater flexibility with regard to component options.
- Time savings during the development process with customer-specific simulations for data integrity
- Gold-plated contact points enable long-term stable signal transmission and currents of up to 2.3 A.
- Design-in support during device development using MCAD/ECAD data and a free sample service

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1377303       |
| Packing unit                         | 560 pc        |
| Minimum order quantity               | 560 pc        |
| Sales key                            | AAXGAA        |
| Product key                          | AAXGAA        |
| GTIN                                 | 4063151744212 |
| Weight per piece (including packing) | 2,573 g       |
| Weight per piece (excluding packing) | 1,7 g         |
| Customs tariff number                | 85366930      |
| Country of origin                    | CN            |

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## Technical data

### Product properties

|                     |                     |
|---------------------|---------------------|
| Product family      | FR 1,27/...-MH      |
| Number of positions | 50                  |
| Pitch               | 1.27 mm             |
| Number of rows      | 2                   |
| Pin layout          | Linear pad geometry |

### Electrical properties

#### Properties

|                       |                                              |
|-----------------------|----------------------------------------------|
| Nominal current $I_N$ | 2 A IEC 60512-5-2:2002-02 (at 20°C 100-pos.) |
| Contact resistance    | 10 mΩ                                        |
| Test voltage          | 500 V AC IEC 60512-4-1:2003-05               |

#### Data transmission

|                        |         |
|------------------------|---------|
| Data transmission rate | 12 Gbps |
|------------------------|---------|

### Mounting

|               |                     |
|---------------|---------------------|
| Mounting type | SMD soldering       |
| Pin layout    | Linear pad geometry |

#### Processing notes

|                                  |                  |
|----------------------------------|------------------|
| Process                          | Reflow 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 |
| Contact material                            | Cu alloy                                                                         |
| Surface characteristics                     | Selective coating                                                                |
| Metal surface contact area (top layer)      | Gold (min. 0.5 μm Au)                                                            |
| Metal surface contact area (middle layer)   | Nickel (1.27 μm - 4 μm Ni)                                                       |
| Metal surface soldering area (top layer)    | Tin (3 μm - 6 μm Sn)                                                             |
| Metal surface soldering area (middle layer) | Nickel (1.27 μm - 4 μm Ni)                                                       |

#### Material data - housing

|                            |              |
|----------------------------|--------------|
| Color (Housing)            | black (9005) |
| Insulating material        | LCP          |
| Insulating material group  | IIIb         |
| CTI according to IEC 60112 | 150          |

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|                                        |
|----------------------------------------|
| Flammability rating according to UL 94 |
|----------------------------------------|

|    |
|----|
| V0 |
|----|

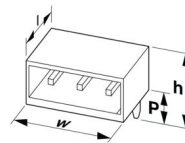
## Notes

|                    |
|--------------------|
| Notes on operation |
|--------------------|

|                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The permissible voltage during operation depends on the application, taking into consideration the air clearances and creepage distances within the scope of insulation requirements in accordance with IEC 60664-1. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Dimensions

|                     |
|---------------------|
| Dimensional drawing |
|---------------------|



|       |
|-------|
| Pitch |
|-------|

|         |
|---------|
| 1.27 mm |
|---------|

|           |
|-----------|
| Width [w] |
|-----------|

|          |
|----------|
| 36.84 mm |
|----------|

|            |
|------------|
| Height [h] |
|------------|

|         |
|---------|
| 4.95 mm |
|---------|

|            |
|------------|
| Length [l] |
|------------|

|          |
|----------|
| 10.05 mm |
|----------|

|                  |
|------------------|
| Installed height |
|------------------|

|         |
|---------|
| 4.25 mm |
|---------|

## Application

|               |
|---------------|
| Contact cover |
|---------------|

|        |
|--------|
| 0.9 mm |
|--------|

|               |
|---------------|
| Center offset |
|---------------|

|                                                   |
|---------------------------------------------------|
| ± 0.7 mm in longitudinal and transverse direction |
|---------------------------------------------------|

|             |
|-------------|
| Wipe length |
|-------------|

|        |
|--------|
| 1.5 mm |
|--------|

|                   |
|-------------------|
| Angular tolerance |
|-------------------|

|                                                |
|------------------------------------------------|
| ± 5 ° in longitudinal and transverse direction |
|------------------------------------------------|

## PCB design

|              |
|--------------|
| Pad geometry |
|--------------|

|              |
|--------------|
| 0.8 x 0.8 mm |
|--------------|

## Electrical tests

### Thermal test | Test group C

|               |
|---------------|
| Specification |
|---------------|

|                       |
|-----------------------|
| IEC 60512-5-2:2002-02 |
|-----------------------|

### Insulation resistance

|               |
|---------------|
| Specification |
|---------------|

|                       |
|-----------------------|
| IEC 60512-3-1:2002-02 |
|-----------------------|

|                                              |
|----------------------------------------------|
| Insulation resistance, neighboring positions |
|----------------------------------------------|

|        |
|--------|
| ≥ 5 GΩ |
|--------|

### Air clearances and creepage distances |

|                           |
|---------------------------|
| Insulating material group |
|---------------------------|

|      |
|------|
| IIIb |
|------|

|                                                   |
|---------------------------------------------------|
| Minimum value for clearance and creepage distance |
|---------------------------------------------------|

|         |
|---------|
| 0.42 mm |
|---------|

## Environmental and real-life conditions

### Durability test

|               |
|---------------|
| Specification |
|---------------|

|                                   |
|-----------------------------------|
| IEC 60512-9-1:2010-03 (following) |
|-----------------------------------|

|                                   |
|-----------------------------------|
| Contact resistance R <sub>1</sub> |
|-----------------------------------|

|       |
|-------|
| 10 mΩ |
|-------|

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|                                              |                     |
|----------------------------------------------|---------------------|
| Contact resistance $R_2$                     | 15 m $\Omega$       |
| Insertion/withdrawal cycles                  | 500                 |
| Insulation resistance, neighboring positions | $\geq 5$ G $\Omega$ |

## Vibration test

|                        |                                          |
|------------------------|------------------------------------------|
| Specification          | IEC 60068-2-6:2007-12                    |
| Frequency              | 10 - 2000 - 10 Hz                        |
| Sweep speed            | 1 octave/min                             |
| Amplitude              | 1.5 mm (10 Hz ... 58 Hz)                 |
| Acceleration           | 200 m/s <sup>2</sup> (58 Hz ... 2000 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    | 490 m/s <sup>2</sup>              |
| 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 2, bogie-mounted                 |
| Frequency              | $f_1 = 5$ Hz to $f_2 = 250$ Hz                           |
| ASD level              | 6.12 (m/s <sup>2</sup> ) <sup>2</sup> /Hz                |
| Acceleration           | 30.6 m/s <sup>2</sup>                                    |
| 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<br>IEC 61373:2010-05 |
| Pulse shape                    | Semi-sinusoidal                                          |
| Acceleration                   | 490 m/s <sup>2</sup>                                     |
| 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 %    |

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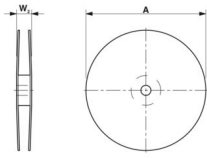


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|                                 |                   |
|---------------------------------|-------------------|
| Ambient temperature (assembly)  | -5 °C ... 100 °C  |
| Ambient temperature (operation) | -55 °C ... 125 °C |

## Packaging specifications

|                             |                                                                                    |
|-----------------------------|------------------------------------------------------------------------------------|
| Dimensional drawing         |  |
| Type of packaging           | 56 mm wide tape                                                                    |
| [W] tape width              | 56 mm                                                                              |
| [W2] coil overall dimension | ≤ 62.4 mm                                                                          |
| [A] coil diameter           | ≤ 330 mm                                                                           |
| Outer packaging type        | Transparent-Bag                                                                    |

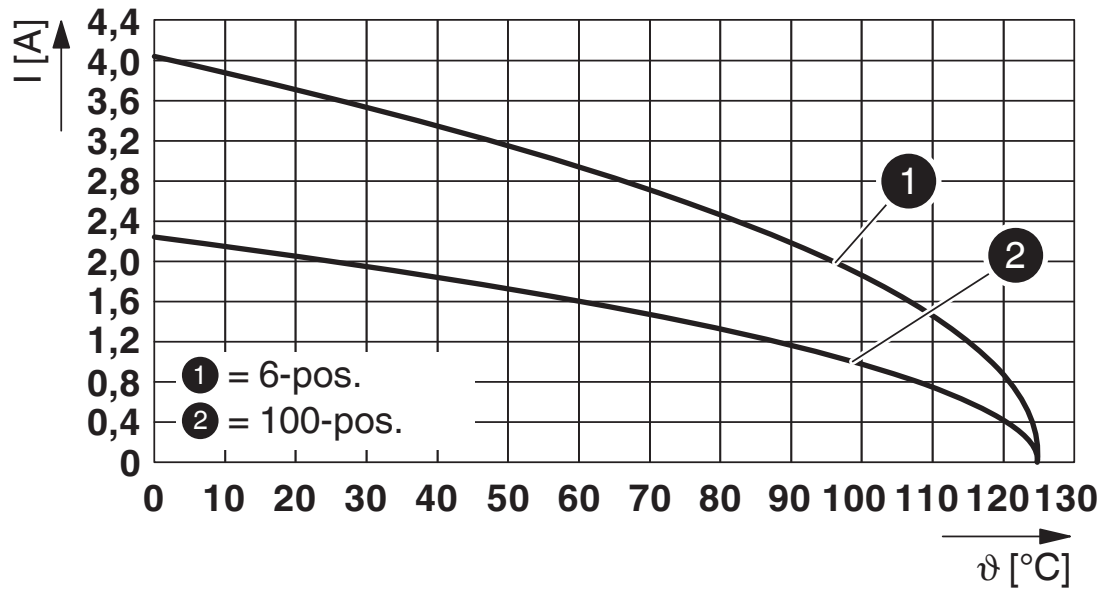
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## Drawings

Diagram



Type: FR 1,27/...-FH with FR 1,27/...-MH

# FR 1,27/ 50-MH - SMD male connectors



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/nl/products/1377303>

|  <b>cUL Recognized</b><br>Approval ID: E118976-20230317 |                       |                       |                   |                             |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                                          | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine                                                                                                                                    |                       |                       |                   |                             |
|                                                                                                                                          | 29.9 V                | 1.4 A                 | -                 | -                           |

|  <b>UL Recognized</b><br>Approval ID: E118976-20230317 |                       |                       |                   |                             |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|
|                                                                                                                                         | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
| keine                                                                                                                                   |                       |                       |                   |                             |
|                                                                                                                                         | 29.9 V                | 2 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 |
|-------------|----------|



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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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