

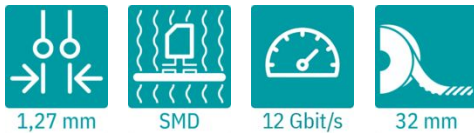
# FR 1,27/ 20-MH - SMD male connectors



1377299

<https://www.phoenixcontact.com/us/products/1377299>

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SMD male connector, nominal current: 2 A, test voltage: 500 V AC, number of positions: 20, 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	1377299
Packing unit	560 pc
Minimum order quantity	560 pc
Sales key	AA24
Product key	AAXGAA
GTIN	4063151744120
Weight per piece (including packing)	1.529 g
Weight per piece (excluding packing)	0.81 g
Customs tariff number	85366930
Country of origin	CN

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## Technical data

### Product properties

Product type	SMD male connector
Product family	FR 1,27/...-MH
Number of positions	20
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
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### 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

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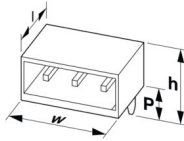
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CTI according to IEC 60112	150
Flammability rating according to UL 94	V0

## 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.
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## Dimensions

Dimensional drawing	
Pitch	1.27 mm
Width [w]	17.79 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
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## Electrical tests

### Thermal test | Test group C

Specification	IEC 60512-5-2:2002-02
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### 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)
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Contact resistance $R_1$	10 m $\Omega$
Contact resistance $R_2$	15 m $\Omega$
Insertion/withdrawal cycles	500
Insulation resistance, neighboring positions	$\geq 5 \text{ G}\Omega$

## 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
	IEC 61373:2010-05
Spectrum	Long life test category 2, bogie-mounted
Frequency	$f_1 = 5 \text{ Hz}$ to $f_2 = 250 \text{ Hz}$
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 $\mu\text{s}$
Result	Test passed

## Railway application: Shocks

Specification	DIN EN 50155 (VDE 0115-200):2022-06
	IEC 61373:2010-05
Pulse shape	Semi-sinusoidal
Acceleration	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 $\mu\text{s}$
Result	Test passed

## Ambient conditions

Ambient temperature (storage/transport)	-40 °C ... 70 °C
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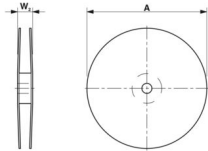


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Relative humidity (storage/transport)	30 % ... 70 %
Ambient temperature (assembly)	-5 °C ... 100 °C
Ambient temperature (operation)	-55 °C ... 125 °C

## Packaging specifications

Dimensional drawing	
Type of packaging	32 mm wide tape
[W] tape width	32 mm
[W2] coil overall dimension	≤ 38.4 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

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1377299>

 <b>cUL Recognized</b> 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> 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
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### UNSPSC

UNSPSC 21.0	39121400
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes, No exemptions
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### 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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