

## FFH9 S1/32V F1 B RL

Weidmüller Interface GmbH &amp; Co. KG

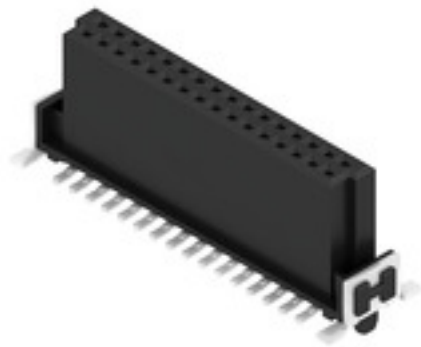
Klingenbergstraße 26

D-32758 Detmold

Germany

www.weidmueller.com

## Product image



## OMNIMATE® - Board-to-Board connectors

Flexible engineering of compact devices

The use of future-proof contact systems, as well as the optimisation of manufacturing processes, are increasingly important in the development of efficient industrial devices, especially in the field of Industry 4.0. OMNIMATE® board-to-board connectors feature a 1.27 mm pitch and offer maximum flexibility due to different designs.

- **Flexible device design** - Industrial suitable density combined with high flexible connection combinations (Mezzanine, Mother-to-Daughter, Extender-card, Cable-to-Board)
- **Automation-Ready** - Developed for automatic assembly with high precise pin coplanarity and SMT-fixation
- **Reliable contact** - Up to 500 mating cycles due to industry suitable gold-surface (PdNi-Au)
- **Process-Ready** - High performance LCP material for reflow soldering
- **Scalability** - Different heights with high contact overlapping ensure various solutions from 12 – 80 poles.
- **Robust miniaturisation** - simple and safe connection even possible under unfavorable mating conditions – e.g. inclination or offset.

## General ordering data

|              |  |
|--------------|--|
| Version      | PCB plug-in connector, female header, SMD solder connection, Pitch in mm (P): 1.27 mm, Number of poles: 32, 180°, Tape |
| Order No.    | <a href="#">2747380000</a>   |
| Type         | FFH9 S1/32V F1 B RL  |
| GTIN (EAN)   | 4064675001010  |
| Qty.         | 280 pc(s).   |
| Product data | IEC: / 2.8 A<br>UL: 150 V  |
| Packaging    | Tape   |

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## Technical data

## Dimensions and weights

|            |         |                 |            |
|------------|---------|-----------------|------------|
| Depth      | 7.8 mm  | Depth (inches)  | 0.307 inch |
| Height     | 9.9 mm  | Height (inches) | 0.39 inch  |
| Width      | 25.4 mm | Width (inches)  | 1 inch     |
| Net weight | 6.454 g |                 |            |

## System specifications

|                                |                  |                           |                                  |
|--------------------------------|------------------|---------------------------|----------------------------------|
| Transmission rate              | 3.125 Gbit/s     | Product family            | OMNIMATE Signal - Board-to-Board |
| Type of connection             | Board connection | Mounting onto the PCB     | SMD solder connection            |
| Pitch in mm (P)                | 1.27 mm          | Pitch in inches (P)       | 0.05 "                           |
| Outgoing elbow                 | 180°             | Number of poles           | 32                               |
| Number of solder pins per pole | 1                | Coplanarity:              | 0.1 mm                           |
| Number of rows                 | 1                | Pin series quantity       | 2                                |
| Protection degree              | IP20             | Volume resistance         | <25 mΩ                           |
| Plugging cycles                | 500              | Plugging force/pole, max. | 0.6 N                            |
| Pulling force/pole, max.       | 0.6 N            |                           |                                  |

## Material data

|                                 |  |                             |                  |
|---------------------------------|--|-----------------------------|------------------|
| Insulating material             | LCP  | Colour                      | black            |
| Colour chart (similar)          | RAL 9011   | Insulating material group   | IIIa             |
| Insulation strength             | $\geq 10^{10} \Omega$  | Moisture Level (MSL)        | 1                |
| UL 94 flammability rating       | V-0  | Contact base material       | Copper alloy     |
| Contact material                | Cu-alloy   | Contact surface             | Gold over nickel |
| Layer structure of plug contact | $\geq 2 \mu\text{m Ni} / \geq 0.4 \mu\text{m PdNi} / \geq 0.05 \mu\text{m Au}$ | Storage temperature, min.   | -40 °C           |
| Storage temperature, max.       | 70 °C  | Operating temperature, min. | -55 °C           |
| Operating temperature, max.     | 125 °C   |                             |                  |

## Rated data acc. to IEC

|  |        |                 |        |
|--|--------|-----------------|--------|
| Rated current, min. number of poles (T <sub>u</sub> =20°C) | 2.8 A  | Clearance, min. | 0.4 mm |
| Creepage distance, min.                                    | 0.4 mm |                 |        |

## Rated data acc. to UL 1977

|                              |  |                                    |       |
|------------------------------|--|------------------------------------|-------|
| Reference to approval values | Specifications are maximum values, details - see approval certificate. | Rated voltage (UL 1977) (obsolete) | 150 V |
|------------------------------|--|------------------------------------|-------|

## Packing

|           |        |            |        |
|-----------|--------|------------|--------|
| Packaging | Tape   | VPE length | 350 mm |
| VPE width | 340 mm | VPE height | 135 mm |

## Classifications

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| ETIM 6.0    | EC002637    | ETIM 7.0    | EC002637    |
| ETIM 8.0    | EC002637    | ETIM 9.0    | EC002637    |
| ECLASS 9.0  | 27-44-04-02 | ECLASS 9.1  | 27-44-04-02 |
| ECLASS 10.0 | 27-44-04-02 | ECLASS 11.0 | 27-46-02-01 |
| ECLASS 12.0 | 27-46-02-01 | ECLASS 13.0 | 27-46-02-01 |
| ECLASS 14.0 | 27-46-02-01 |             |             |

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[www.weidmueller.com](http://www.weidmueller.com)**Technical data****Environmental Product Compliance**

|                        |                             |
|------------------------|-----------------------------|
| REACH SVHC             | /                           |
| RoHS Compliance Status | Compliant without exemption |

**Important note**

|                |  |
|----------------|--|
| IPC conformity | Conformity: The products are developed, manufactured and delivered according international recognized standards and norms and comply with the assured properties in the data sheet resp. fulfill decorative properties in accordance with IPC-A-610 "Class 2". Further claims on the products can be evaluated on request. |
|----------------|--|

**Approvals**

Approvals



|                         |            |
|-------------------------|------------|
| ROHS                    | Conform    |
| UL File Number Search   | UL Website |
| Certificate No. (cURus) | E92202     |

**Downloads**

|                             |  |
|-----------------------------|--|
| Engineering Data            | <a href="#">CAD data – STEP</a>  |
| Product Change Notification | <a href="#">Technische Änderung für Board-to-Board Steckverbinder - Lötstiftlänge und PPP</a><br><a href="#">Technical change to Board-to-Board connectors - solder pin length and PPP</a> |
| Catalogues                  | <a href="#">Catalogues in PDF-format</a>   |

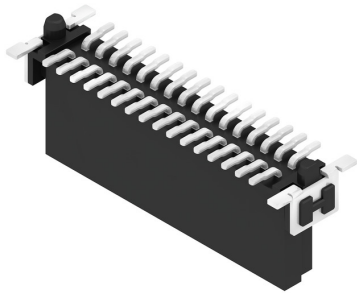
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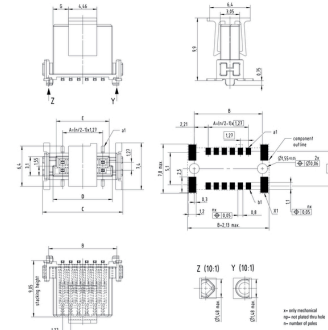
## Drawings

## Product image

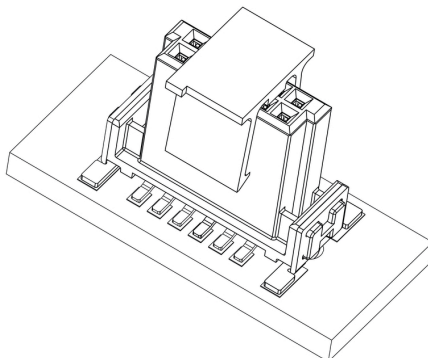


## Dimensional drawing

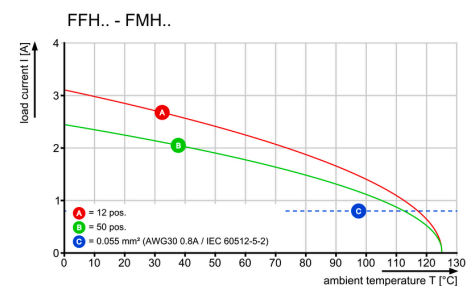
| Type                | Order no.  | No. of poles | A     | B     | C     | D     | E     | S     |
|---------------------|------------|--------------|-------|-------|-------|-------|-------|-------|
| FFH9 S1/32V F1 B RL | 2747500000 | 12           | 6,35  | 10,17 | 12,7  | 9,37  | 6,37  | 2,46  |
| FFH9 S1/32V F1 B RL | 2747500000 | 16           | 6,35  | 12,21 | 15,04 | 11,91 | 6,61  | 2,73  |
| FFH9 S1/32V F1 B RL | 2747500000 | 20           | 11,43 | 16,85 | 17,78 | 14,45 | 10,45 | 5     |
| FFH9 S1/32V F1 B RL | 2747500000 | 25           | 16,51 | 19,81 | 21,59 | 16,26 | 17,26 | 7,64  |
| FFH9 S1/32V F1 B RL | 2747500000 | 30           | 19,5  | 22,47 | 24,5  | 22,07 | 21,07 | 9,81  |
| FFH9 S1/32V F1 B RL | 2747500000 | 40           | 26,15 | 29,55 | 30,48 | 27,15 | 26,15 | 11,25 |
| FFH9 S1/32V F1 B RL | 2747500000 | 50           | 30,48 | 34,29 | 34,63 | 33,5  | 32,5  | 13,15 |
| FFH9 S1/32V F1 B RL | 2747500000 | 60           | 41,91 | 46,53 | 48,26 | 44,93 | 43,93 | 16,24 |
| FFH9 S1/32V F1 B RL | 2747500000 | 80           | 46,53 | 53,95 | 55,08 | 50,15 | 51,15 | 20,65 |



## Detailed drawing



## Derating curve



**FFH9 S1/32V F1 B RL**

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Drawings

Extender-Board



Mezzanine



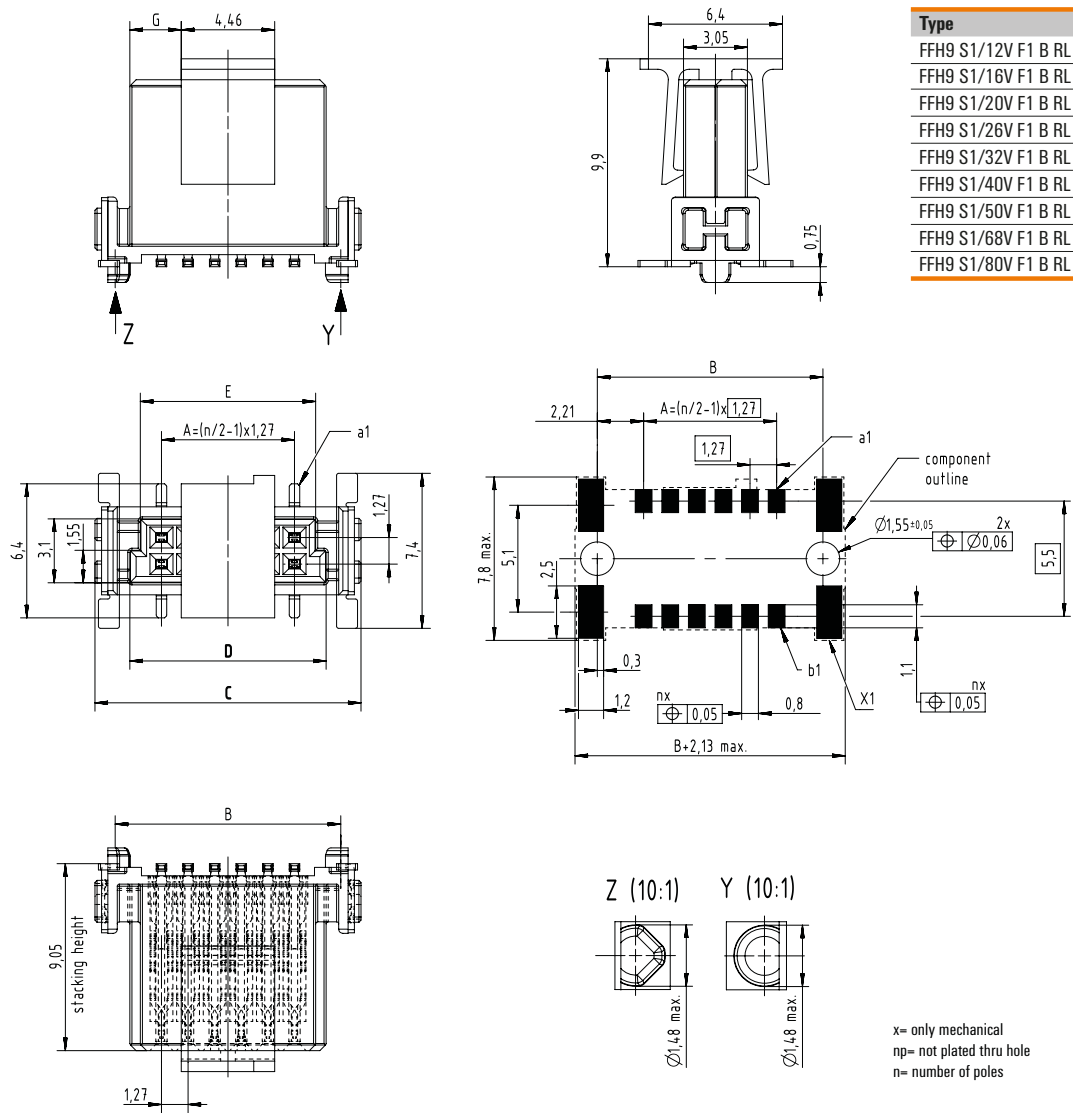
Mother-to-Daughter



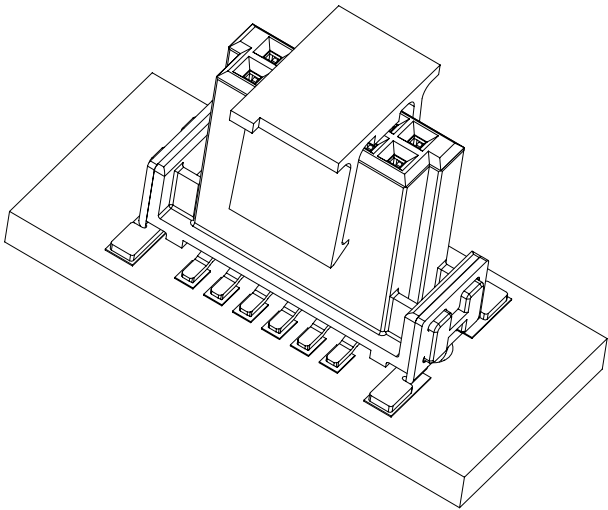
Board-to-Wire



FFH9 S1/..V F1 B RL



| Type                | Order no.  | No. of poles | A     | B     | C     | D     | E     | G     |
|---------------------|------------|--------------|-------|-------|-------|-------|-------|-------|
| FFH9 S1/12V F1 B RL | 2747340000 | 12           | 6,35  | 10,77 | 12,7  | 9,37  | 8,37  | 2,46  |
| FFH9 S1/16V F1 B RL | 2747350000 | 16           | 8,89  | 13,31 | 15,24 | 11,91 | 10,91 | 3,73  |
| FFH9 S1/20V F1 B RL | 2747360000 | 20           | 11,43 | 15,85 | 17,78 | 14,45 | 13,45 | 5     |
| FFH9 S1/26V F1 B RL | 2747370000 | 26           | 15,24 | 19,66 | 21,59 | 18,26 | 17,26 | 7,54  |
| FFH9 S1/32V F1 B RL | 2747380000 | 32           | 19,5  | 23,47 | 25,4  | 22,07 | 21,07 | 8,81  |
| FFH9 S1/40V F1 B RL | 2747390000 | 40           | 24,13 | 28,55 | 30,48 | 27,15 | 26,15 | 11,35 |
| FFH9 S1/50V F1 B RL | 2747400000 | 50           | 30,48 | 34,29 | 36,83 | 33,5  | 32,5  | 15,16 |
| FFH9 S1/68V F1 B RL | 2747410000 | 68           | 41,91 | 46,33 | 48,26 | 44,93 | 43,93 | 20,24 |
| FFH9 S1/80V F1 B RL | 2747420000 | 80           | 49,53 | 53,95 | 55,88 | 52,55 | 51,55 | 24,05 |



## Female vertical - FFH6 | FFH9

## Application - dimensions

|      |              |               |               |                 |                 |
|------|--------------|---------------|---------------|-----------------|-----------------|
|      | 14 mm        |               |               |                 |                 |
|      | 13 mm        |               |               |                 |                 |
|      | 12 mm        |               |               |                 |                 |
|      | 11 mm        |               |               |                 |                 |
|      | 10 mm        |               |               |                 |                 |
|      | 9 mm         |               |               |                 |                 |
|      | 8 mm         |               |               |                 |                 |
| X    | stacking     | male 1,75mm   | male 3,25mm   | male 1,75mm     | male 3,25mm     |
| Y    | heights      | female 6,25mm | female 6,25mm | female 9,05mm   | female 9,05mm   |
| S    | PCB distance | 8mm - 9,5mm   | 9,5mm - 11mm  | 10,8mm - 12,3mm | 12,3mm - 13,8mm |
| Type |              | FMH1..        | FMH3..        | FMH1..          | FMH3..          |
|      |              | FFH6..        | FFH6..        | FFH9..          | FFH9..          |

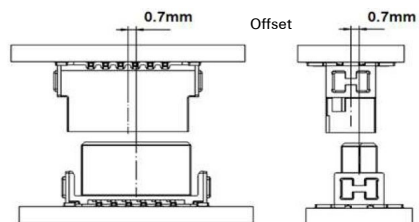


\*S max. = S min. + 1,15 wiping length with additional contact overlap security



| X    | Y    | S min. | *S max. | P min. | O     |
|------|------|--------|---------|--------|-------|
| 3,25 | 9,05 | 12,3   | 13,8    | -      | -     |
| 1,75 | 9,05 | 10,8   | 12,3    | -      | -     |
| 3,25 | 6,25 | 9,5    | 11      | -      | -     |
| 1,75 | 6,25 | 8      | 9,5     | -      | -     |
| -    | 9,05 | -      | -       | 10,5   | 14,33 |
| -    | 6,25 | -      | -       | 7,7    | 11,53 |

## Mating conditions



## Tape - dimensions

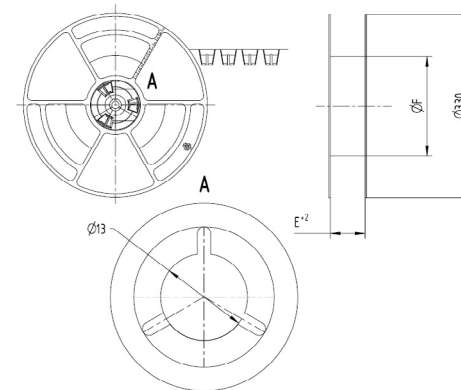


| Tape dimensions | A    | F           | I    | K        |
|-----------------|------|-------------|------|----------|
| Pole 12         | 24,0 | 11,5 ± 0,1  | -    | 2 ± 0,1  |
| Poles 14 to 20  | 32,0 | 14,2 ± 0,1  | 28,4 | 2 ± 0,1  |
| Poles 22 to 40  | 44,0 | 20,2 ± 0,15 | 40,2 | 2 ± 0,15 |
| Poles 42 to 56  | 56,0 | 26,2 ± 0,15 | 52,4 | 2 ± 0,15 |
| Poles 58 to 80  | 72,0 | 34,2 ± 0,3  | 68,4 | 2 ± 0,2  |

① No double sprocket holes for 12 pole numbers (tape size 24)



## Reel - dimensions



| Reel dimensions | E    | F                         |
|-----------------|------|---------------------------|
| Pole 12         | 24,4 |                           |
| Poles 14 to 20  | 32,4 |                           |
| Poles 22 to 40  | 44,4 | 178mm for stacking height |
| Poles 42 to 56  | 56,4 | 1,75mm & 3,25mm           |
| Poles 58 to 80  | 72,4 |                           |

## Recommended reflow soldering profile

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## Reflow soldering profile

The perfect soldering profile for SMT Surface Mount Technology is one the most exiting question in SMT production. But there are more than one correct answer: The diagram of temperature-on-time is related to processing features of solder paste and to maximum load of components.

We have to consider the following parameters:

- Time for pre heating
- Maximum temperature
- Time above melting point
- Time for cooling
- Maximum heating rate
- Maximum cooling rate

We recommend a typical solder profile with associated process limits. With preheating components and board are prepared smoothly for the solder phase. Heating rate is typically  $\leq +3\text{K/s}$ . In parallel the solder paste is 'activated'. The time above melting point of 217°C the paste gets liquid and components and boards begin to connect. The maximum temperature of 245°C to 254°C should stay between 10 and 40 seconds. In the cooling phase at  $\geq -6\text{K/s}$  solder is cured. Board and components cool down while avoiding cold cracks.