# Technical characteristics

Types B, 2B, 3B, C, 2C, 3C, R, 2R

| | |
|---|---|
| Number of contacts | 20-96 |
| Contact spacing (mm) | 2.54 |
| Working current | 2 A max. |
| see current carrying capacity chart | |
| Clearance | ≥ 1.2 mm |
| Creepage | ≥ 1.2 mm |
| Working voltage | |
| The working voltage also depends on the clearance and creepage dimensions of the PCB itself, and the associated wiring | according to the safety regulations of the equipment |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance | ≤ 15 mΩ |
| Insulation resistance | ≥ $10^{12}$ Ω |
| Temperature range | – 55 °C … + 125 °C |
| The higher temperature limit includes the local ambient and heating effects of the contacts under load | – 40 °C … + 105 °C for press-in connectors |
| During reflow soldering | max. + 240 °C for 15 s for SMC connectors |

## Electrical termination

| | |
|---|---|
| Male and female connectors | Solder pins for PCB connections Ø 1.0 ± 0.1 mm according to IEC 60 326-3 Compliant press-in terminations |
| Diameter of PCB plated through holes | see table on the right |
| PCB thickness | ≥ 1.6 mm |
| Recommended PCB holes for press-in process in acc. to EN 60 352-5 | |

| | |
|---|---|
| Insertion and withdrawal force | 20way ≤ 20 N<br>30way ≤ 30 N<br>32way ≤ 30 N<br>48way ≤ 45 N<br>64way ≤ 60 N<br>96way ≤ 90 N |

## Materials

| | |
|---|---|
| Mouldings | Poly Cyclohexylene Terephthalate (PCT), UL 94-V0 |
| Contacts | Copper alloy |

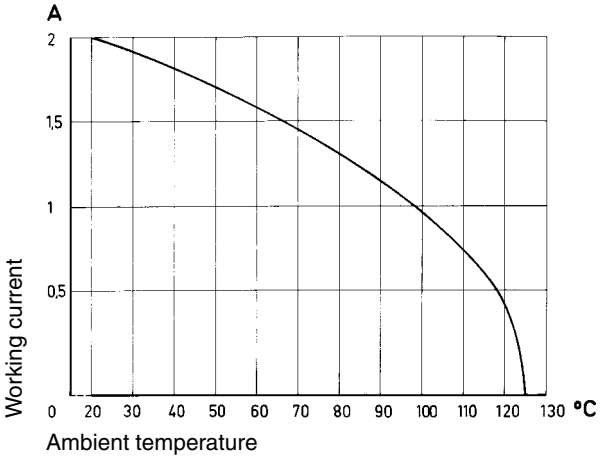
## Contact surface

| | |
|---|---|
| Contact zone | Selectively plated according to performance level |

## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512




## Recommended configuration of plated through holes

In addition to the hot-air-level (HAL) other PCB surfaces are getting more important. Due to their different properties, such as mechanical strength and coefficient of friction we recommend the following configuration of PCB through holes.

| | | |
|---|---|---|
| *Tin-lead plated PCB (HAL) acc. EN 60 352-5* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Sn | max. 15 µm |
| | Plated hole-Ø | 0.94-1.09 mm |
| *Chemical tin-plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Sn | min. 0.8 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *Au / Ni plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Ni | 3-7 µm |
| | Au | 0.05-0.12 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *Silver plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Ag | 0.1-0.3 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *OSP copper plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Plated hole-Ø | 1.00-1.10 mm |

PCB board thickness: ≥ 1.6 mm

# DIN 41 612 · complementary type 3B

Number of contacts

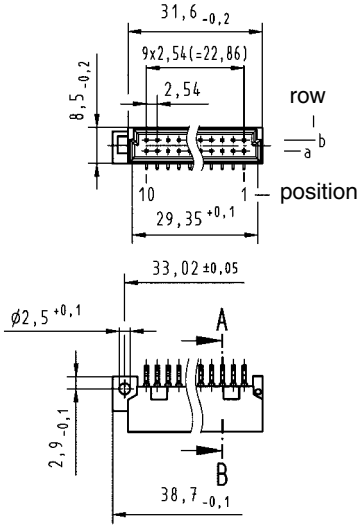
# 20

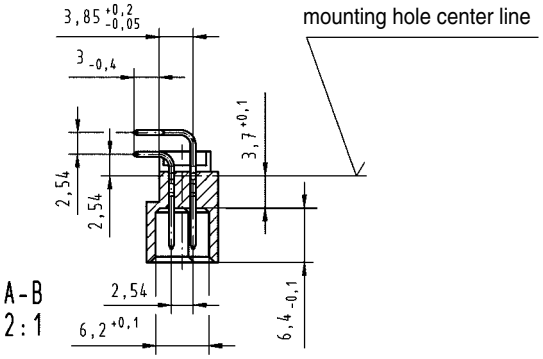
## Male connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| **Male connector with angled solder pins** | | | | | |
| with fixing flange | 20 |  | Performance level 3 on request | 09 24 120 6921 | Performance level 1 on request |
| with fixing flange, SMC | 20 |  | | 09 24 120 6919 | |
| without fixing flange | 20 |  | | 09 24 120 6571 | |
| without fixing flange, SMC | 20 |  | | 09 24 120 6579 | |

## Dimensions

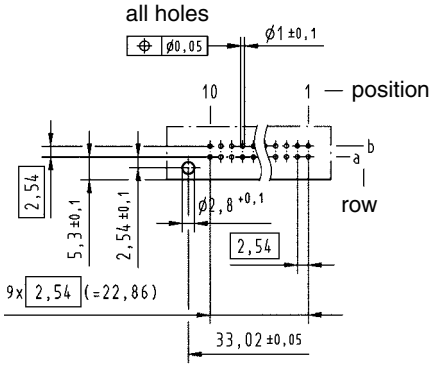
with fixing flange  without fixing flange



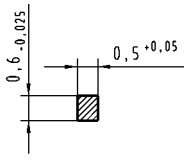




## Board drillings

Mounting side




## Cross section of solder terminations




Cross area (A) of contacts
row a, b: A = 0.29 - 0.33 mm²

Dimensions in mm

# DIN 41 612 · complementary type 3B

Number of contacts

# 20

## Female connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| **Female connector with solder pins 2.9 mm** | | | | | |
| with fixing flange | 20 |  | | 09 24 220 6824 | |
| with fixing flange, SMC | 20 |  | | 09 24 220 6841 | |
| without fixing flange, SMC | 20 |  | | 09 24 220 6414 | |
| **Female connector with solder pins 4.5 mm** | | | Performance level 3 on request | | Performance level 1 on request |
| with fixing flange | 20 |  | | 09 24 220 6825 | |
| **Female connector with press-in pins 4.5 mm** | | | | | |
| with fixing flange | 20 |  | | 09 24 220 6850 | |
| without fixing flange | 20 |  | | 09 24 220 6870 | |

# DIN 41 612 · complementary type 3B

Number of contacts

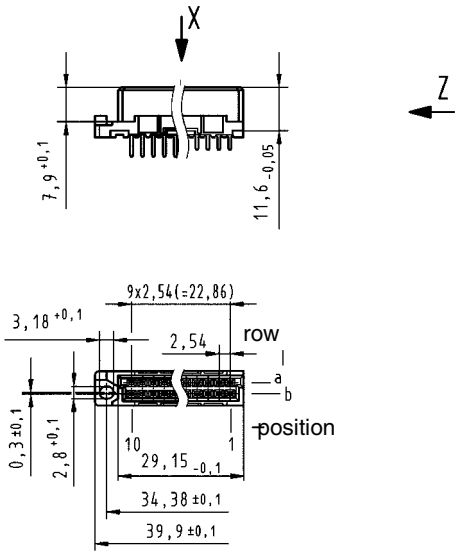
# 20

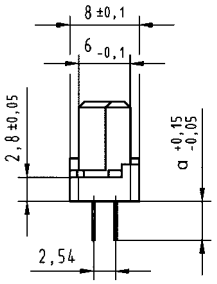
## Female connectors

| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Dimensions

with fixing flange without fixing flange



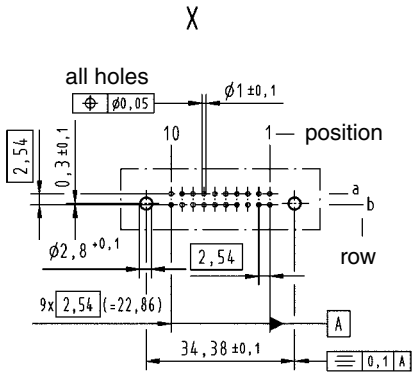




| a | |
|---|---|
| 2.9 | solder pins |
| 4.5 | |
| 4.5 | press-in pins |

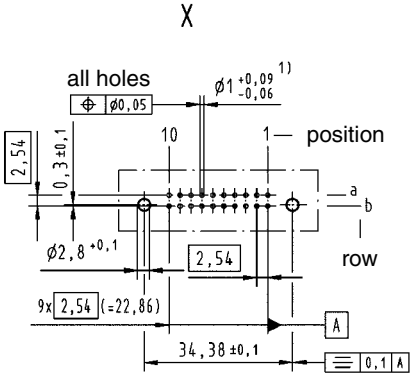
### Board drillings

Mounting side

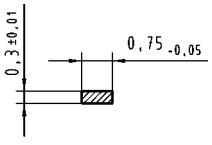
solder pins




press-in pins




### Cross section of solder terminations




Cross area (A) of contacts row a, b: A = 0.20 - 0.23 mm²

1) for press-in connection acc. to IEC 60352-2

Number of contacts

# 30, 20

## Male connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| **Male connector with angled solder pins** | | | | | |
| with fixing flange | 30 |  | | 09 25 130 6921 | |
| | 20 |  | | 09 25 120 6921 | |
| with fixing flange, SMC | 30 |  | | 09 25 130 6919 | |
| without fixing flange | 30 |  | | 09 25 130 6571 | |
| without fixing flange, SMC | 30 |  | | 09 25 130 6579 | |
| | | | Performance level 3 on request | | Performance level 1 on request |
| **Male connector with straight solder pins** | | | | | |
| with fixing flange | 30 |  | | 09 25 130 6922 | |
| | 20 |  | | 09 25 120 6922 | |
| without fixing flange | 30 |  | | 09 25 130 6572 | |
| without fixing flange, SMC | 30 |  | | 09 25 130 6590 | |

# DIN 41 612 · complementary type 3C

Number of contacts

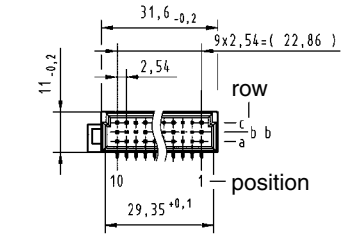
# 30, 20

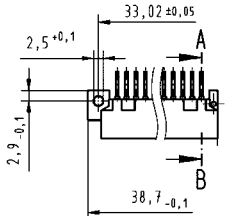
Male connectors

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Dimensions

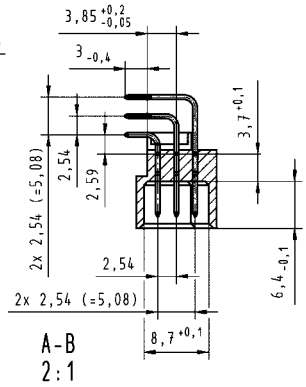
with fixing flange



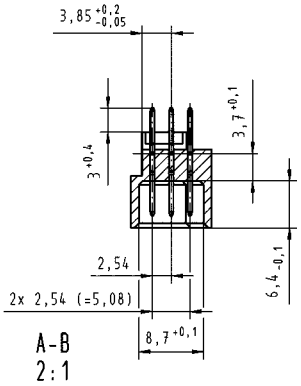




without fixing flange

angled solder pins

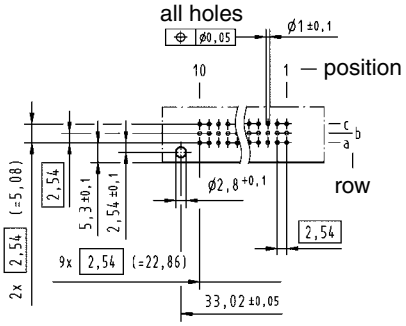



straight solder pins

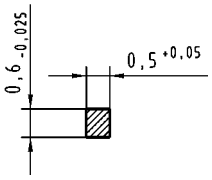



## Board drillings

Mounting side




## Cross section of solder terminations

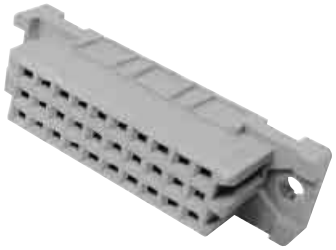



Cross area (A) of contacts row a, b, c: A = 0.29 - 0.33 mm²

# DIN 41 612 · complementary type 3C

Number of contacts

# 30, 20



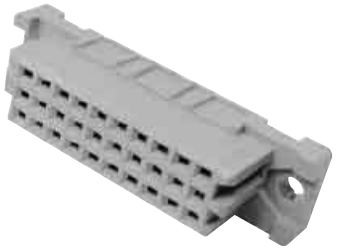
## Female connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| **Female connector with solder pins 2.9 mm** | | | | | |
| with fixing flange | 30 |  | | 09 25 230 6824 | |
| | 20 |  | | 09 25 220 6824 | |
| with fixing flange, SMC | 30 |  | | 09 25 230 6841 | |
| without fixing flange, SMC | 30 |  | | 09 25 230 6414 | |
| **Female connector with solder pins 4.5 mm** | | | Performance level 3 on request | | Performance level 1 on request |
| with fixing flange | 30 |  | | 09 25 230 6825 | |
| | 20 |  | | 09 25 220 6825 | |
| **Female connector with press-in pins 4.5 mm** | | | | | |
| with fixing flange | 30 |  | | 09 25 230 6850 | |
| without fixing flange | 30 |  | | 09 25 230 6870 | |

# DIN 41 612 · complementary type 3C

Number of contacts

# 30, 20

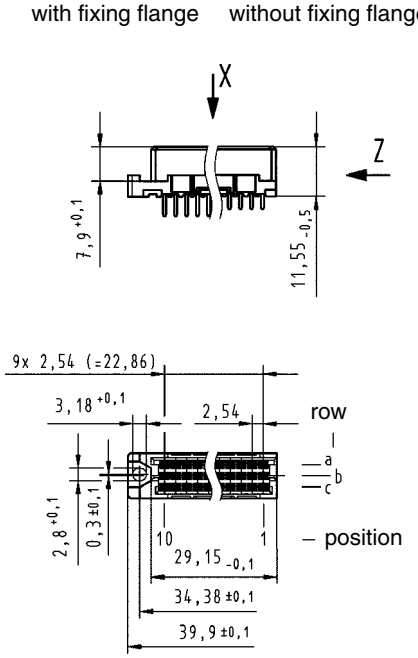


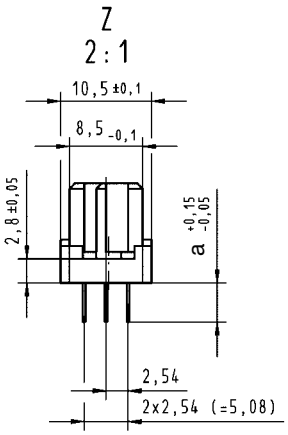
## Female connectors

| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Dimensions

with fixing flange  without fixing flange



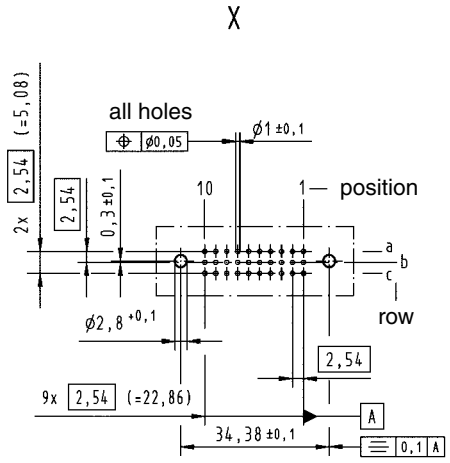




| a | |
|---|---|
| 2.9 | solder pins |
| 4.5 | press-in pins |
| 4.5 | press-in pins |

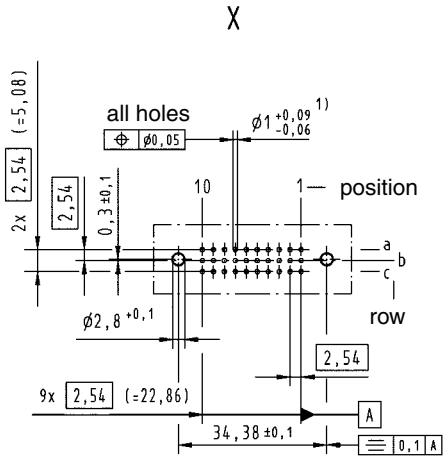
### Board drillings

Mounting side

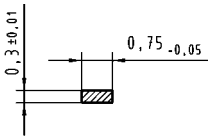
solder pins




press-in pins




### Cross section of solder terminations




Cross area (A) of contacts row a, b, c: A = 0.20 - 0.23 mm²

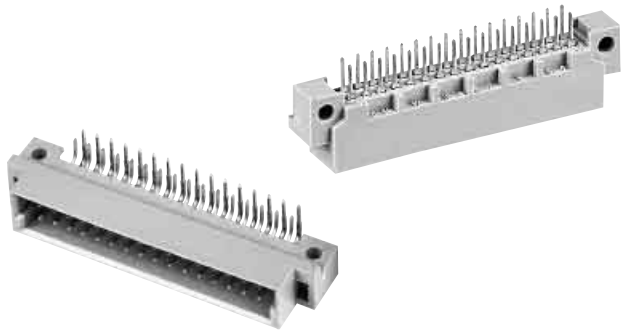
1) for press-in connection acc. to IEC 60352-2

# DIN 41 612 · complementary type 2B (SMC)

Number of contacts

# 32

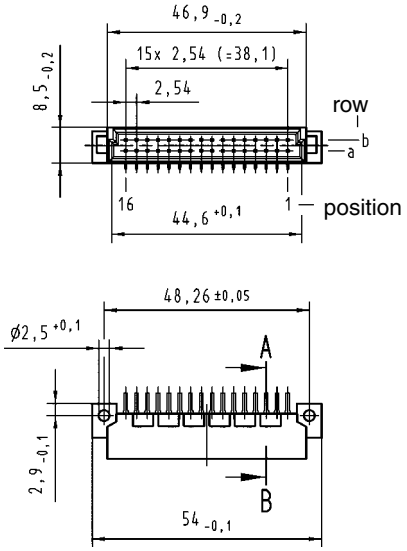
**CTI > 400**

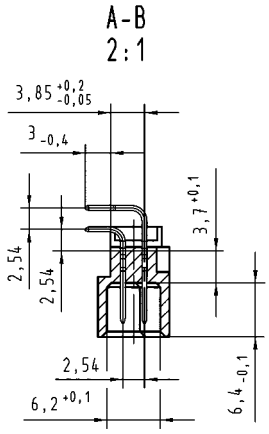


## Male connectors

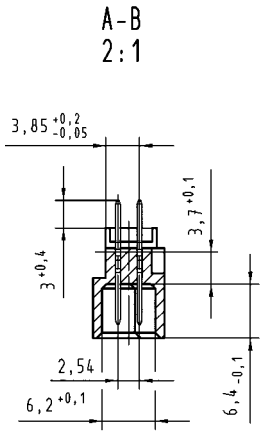
| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Male connector with angled solder pins | | | | | |
| without clip | 32 |  | Performance level 3 on request | 09 22 132 6919 | Performance level 1 on request |
| with clip | 32 |  | | 09 22 332 6919 | |
| Male connector with straight solder pins | 32 |  | | 09 22 132 6920 | |

### Dimensions



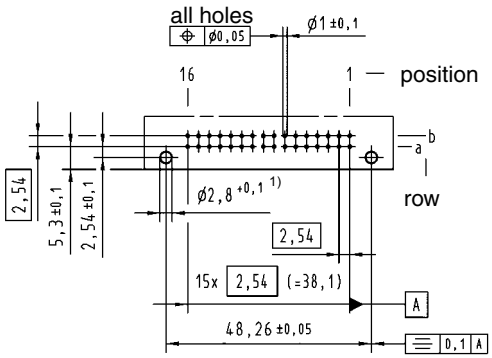

Angled solder pins



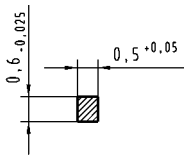

Straight solder pins

### Board drillings

Mounting side




### Cross section of solder terminations




Cross area (A) of contacts
row a, b: A = 0.29 - 0.33 mm²

Dimensions in mm

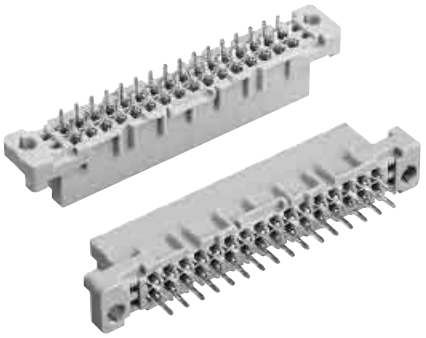
1) Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force

# DIN 41 612 · complementary type 2B (SMC)

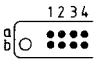
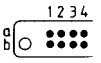
Number of contacts

# 32

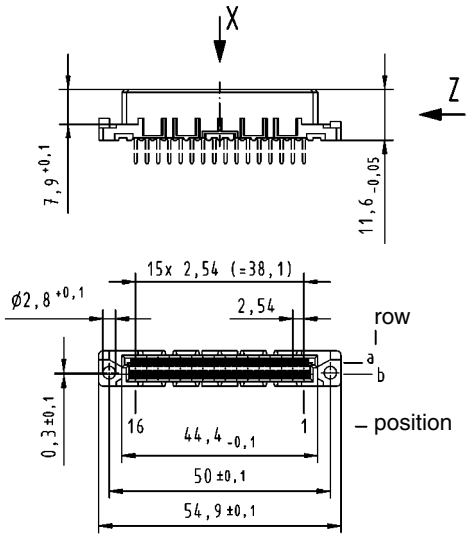
**CTI > 400**

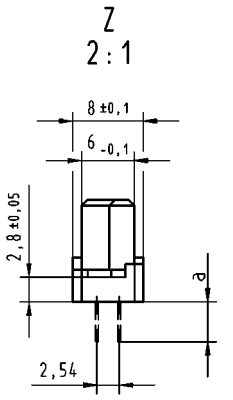


## Female connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Female connector with solder pins 2.9 mm | 32 |  | Performance level 3 on request | 09 22 232 6841 | Performance level 1 on request |
| Female connector with solder pins 4.5 mm | 32 |  | | 09 22 232 6829 | |

### Dimensions



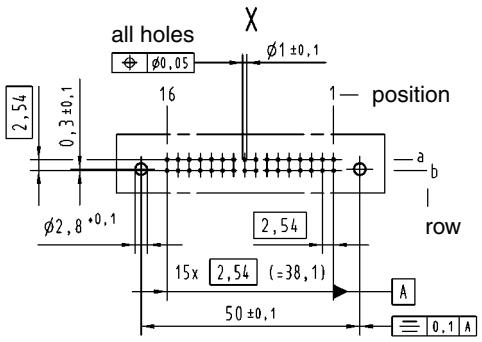




| a |
|---|
| 2.9 |
| 4.5 |

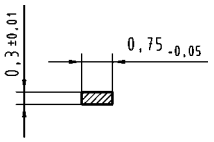
Solder pins

### Board drillings

Mounting side




### Cross section of solder terminations




Cross area (A) of contacts
row a, b: A = 0.20 - 0.23 mm²

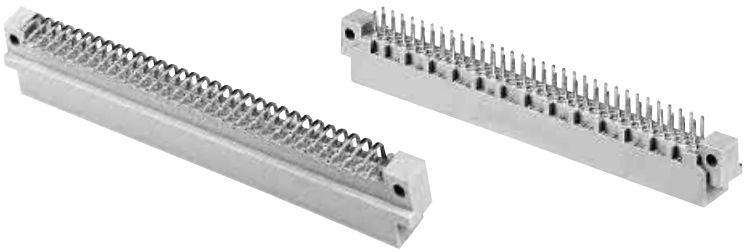
Dimensions in mm

# DIN 41 612 · Type B (SMC)

Number of contacts

64

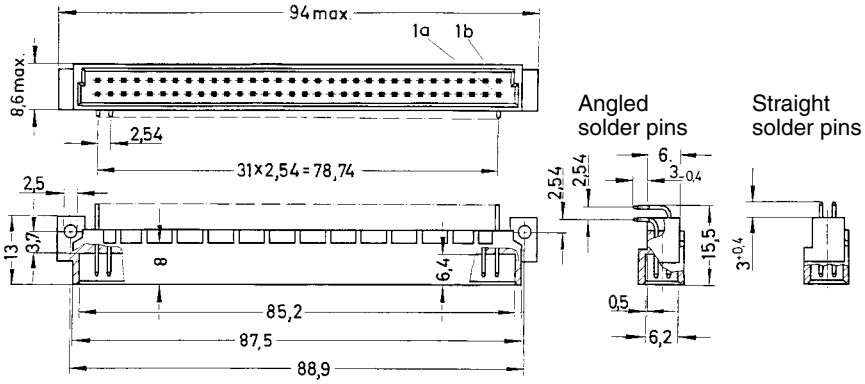
CTI > 400



## Male connectors

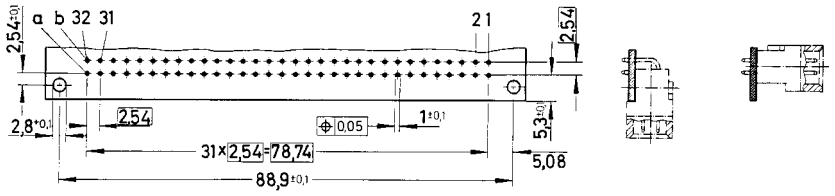
| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Male connector with angled solder pins | 64 |  | 09 02 164 7919 | 09 02 164 6919 | Performance level 1 on request |
| Male connector with straight solder pins | 64 |  | Performance level 3 on request | 09 02 164 6920 | |

Dimensions

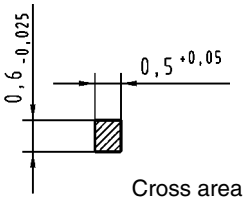



Board drillings

Mounting side




Cross section of solder terminations




Cross area (A) of contacts row a, b: A = 0.29 - 0.33 mm²

Dimensions in mm

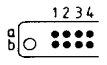
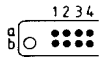
# DIN 41 612 · Type B (SMC)

Number of contacts

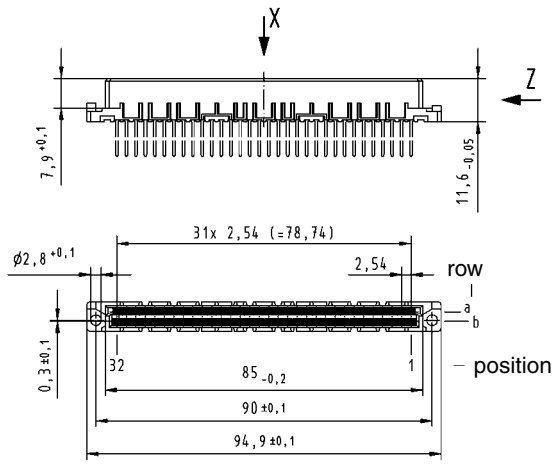
# 64

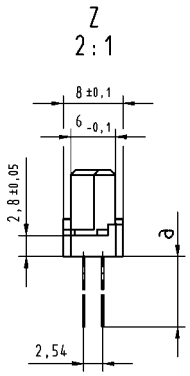
**CTI > 400**

## Female connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Female connector with solder pins 2.9 mm | 64 |  | Performance level 3 on request | 09 02 264 6841 | Performance level 1 on request |
| Female connector with solder pins 4.5 mm | 64 |  | | 09 02 264 6829 | |

### Dimensions

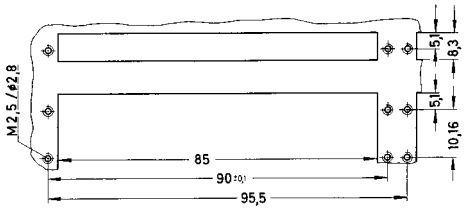



| a |
|---|
| 2.9 |
| 4.5 |

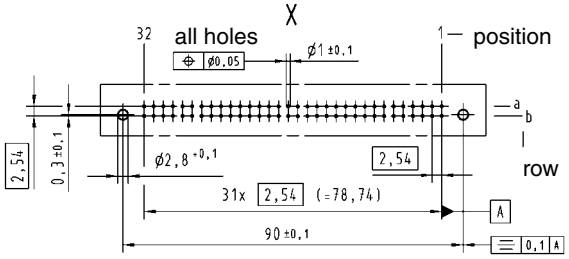
Solder pins

### Panel cut out

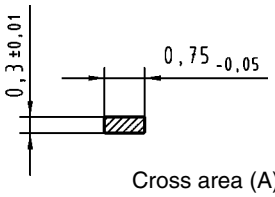



### Board drillings

Mounting side




### Cross section of solder terminations




Cross area (A) of contacts row a, b: A = 0.20 - 0.23 mm²

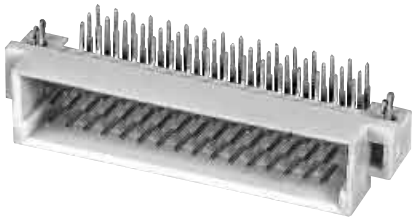
Dimensions in mm

# DIN 41 612 · complementary type 2C (SMC)

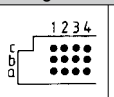
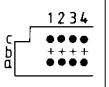
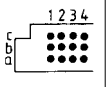
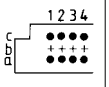
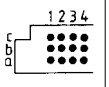
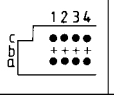
Number of contacts

# 48, 32

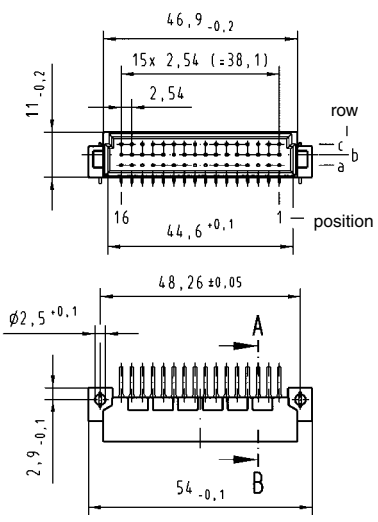
**CTI > 400**

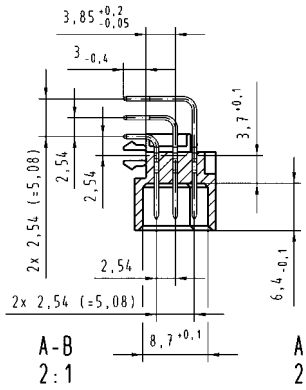


## Male connectors

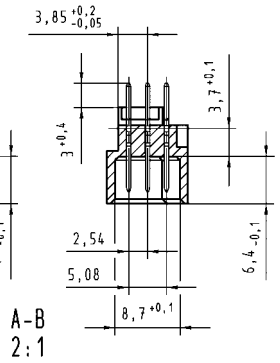
| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Male connector with angled solder pins | 48 |  | 09 23 148 7919 | 09 23 148 6919 | 09 23 148 2919 |
| without clip | 32 |  | | 09 23 132 6919 | 09 23 132 2919 |
| with clip | 48 |  | | 09 23 348 6919 | 09 23 348 2919 |
| | 32 |  | | 09 23 332 6919 | 09 23 332 2919 |
| Male connector with straight solder pins | 48 |  | | 09 23 148 6920 | |
| | 32 |  | | 09 23 132 6920 | |

### Dimensions



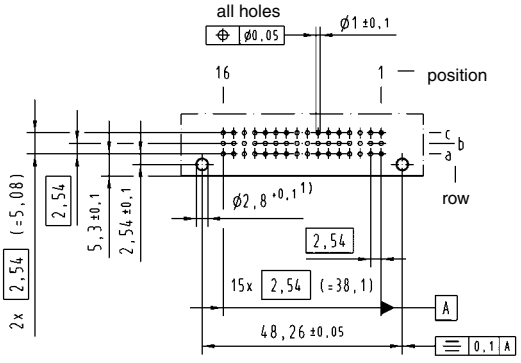

Angled solder pins



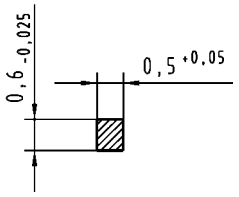

Straight solder pins

### Board drillings

Mounting side




### Cross section of solder terminations




Cross area (A) of contacts
row a, b, c: A = 0.29 - 0.33 mm²

Dimensions in mm

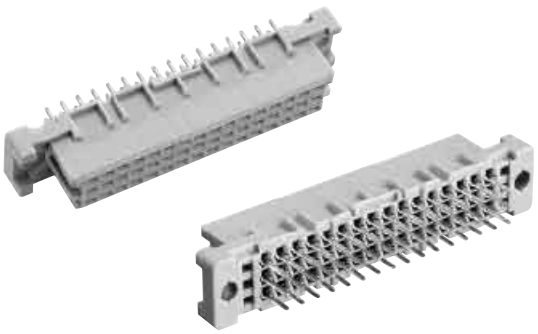
[1] Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force

# DIN 41 612 · complementary type 2C (SMC)

Number of contacts

# 48, 32

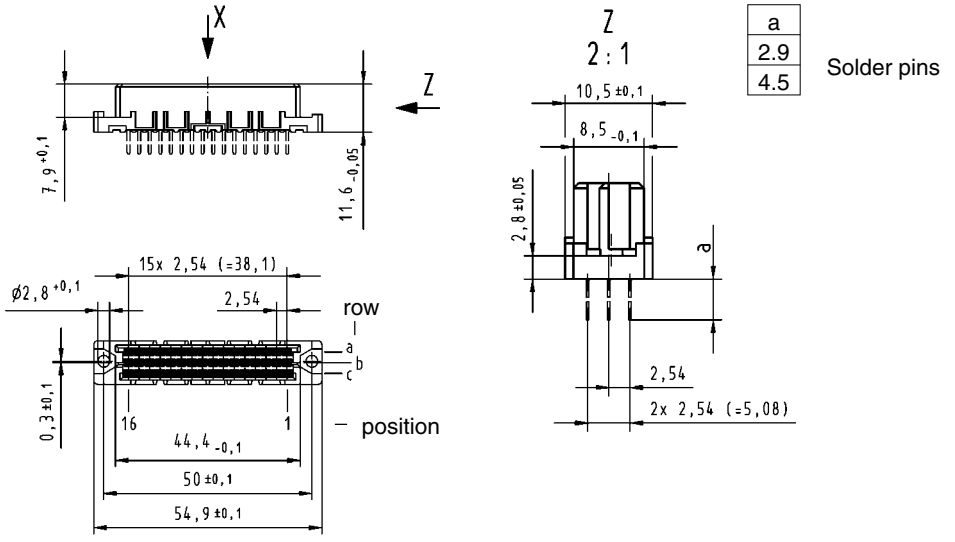
**CTI > 400**



## Female connectors

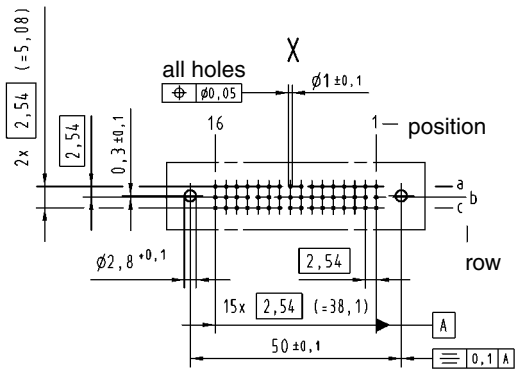
| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Female connector with solder pins 2.9 mm | 48 |  | Performance level 3 on request | 09 23 248 6841 | Performance level 1 on request |
| | 32 |  | | 09 23 232 6841 | |
| Female connector with solder pins 4.5 mm | 48 |  | | 09 23 248 6829 | |
| | 32 |  | | 09 23 232 6829 | |

Dimensions

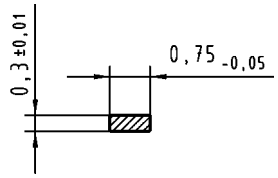



Board drillings

Mounting side




Cross section of solder terminations




Cross area (A) of contacts
row a, b, c: A = 0.20 - 0.23 mm²

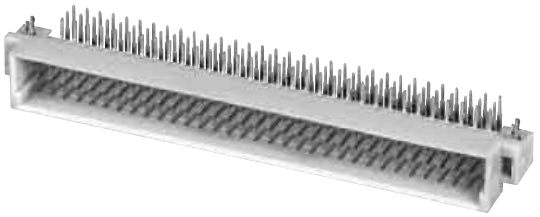
Dimensions in mm

# DIN 41 612 · Type C (SMC)

Number of contacts

# 96, 64

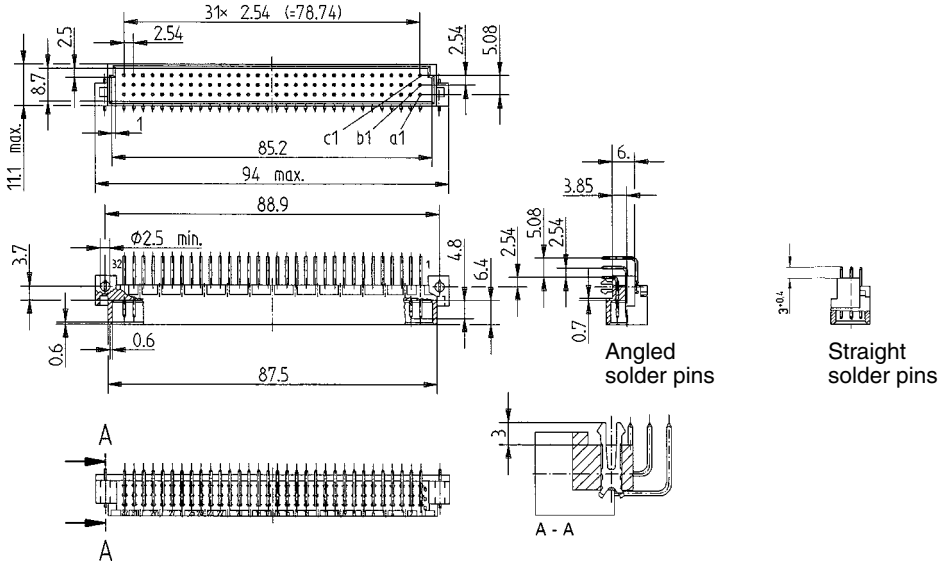
**CTI > 400**



## Male connectors

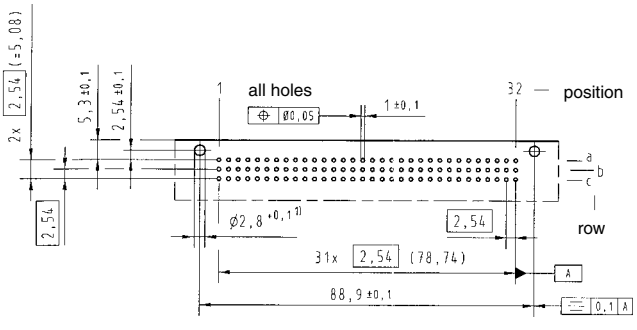
| Identification | Number of contacts | Contact arrangement | Part No. Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|
| Male connector with angled solder pins | 96 |  | 09 03 196 6919<br>09 03 696 6919[c] | 09 03 196 2919 |
| without clip | 64 |  | 09 03 164 6919 | 09 03 164 2919 |
| | 62 + 2▲ |  | | 09 03 164 2918 |
| with clip | 96 |  | 09 03 396 6919 | 09 03 396 2919 |
| | 94 + 2▲ |  | 09 03 396 6918 | |
| | 64 |  | 09 03 364 6919 | 09 03 364 2919 |
| Male connector with straight solder pins | 96 |  | 09 03 196 6920 | |

Dimensions

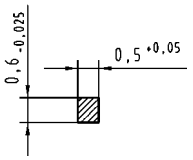



Board drillings

Mounting side




Cross section of solder terminations




Cross area (A) of contacts
row a, b, c: A = 0.29 - 0.33 mm²

Dimensions in mm

▲ Male connectors with 2 leading contacts [(0.8 mm) pos. a1 and a32]. Lagging pins row b on request.
[1] Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force
[c] Connectors with coding

# DIN 41 612 · Type C (SMC)

Number of contacts

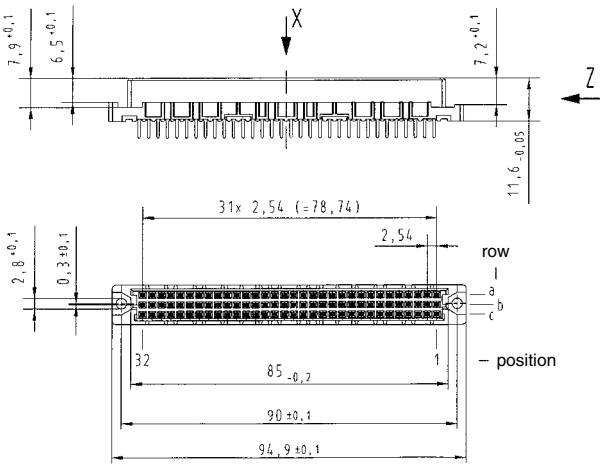
# 96, 64

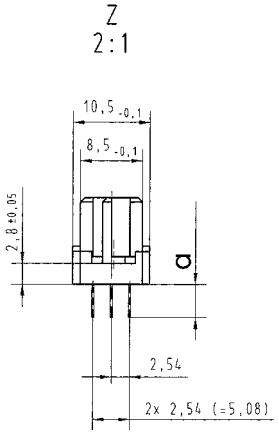
**CTI > 400**

## Female connectors

| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Female connector with solder pins 2.9 mm | 96 |  | Performance level 3 on request | 09 03 296 6841 | Performance level 1 on request |
| | 64 |  | | 09 03 264 6841 | |
| Female connector with solder pins 4.5 mm | 96 |  | | 09 03 296 6829 | |
| | 64 |  | | 09 03 264 6829 | |

### Dimensions



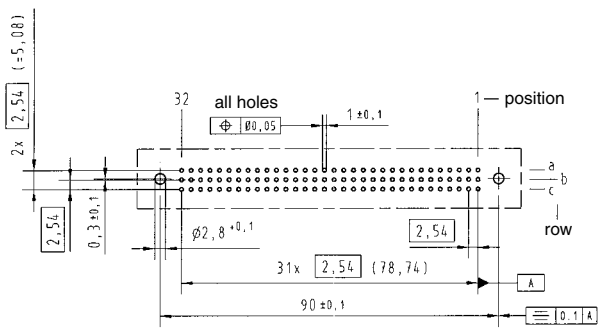




| a |
|---|
| 2.9 |
| 4.5 |

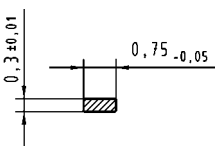
Solder pins

### Board drillings

Mounting side




### Cross section of solder terminations




Cross area (A) of contacts
row a, b, c: A = 0.20 - 0.23 mm²

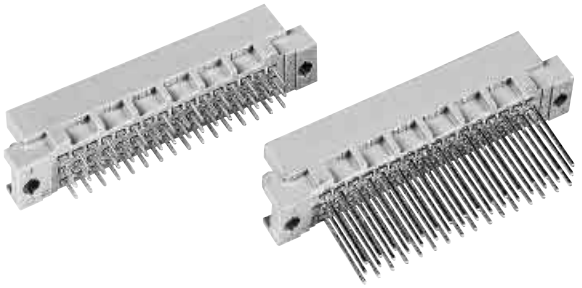
Dimensions in mm

# DIN 41 612 · complementary type 2R (SMC)

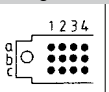
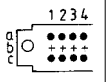
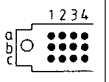
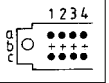
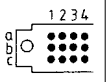
Number of contacts

# 48, 32

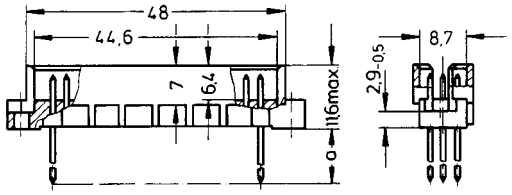
**CTI > 400**



## Male connectors

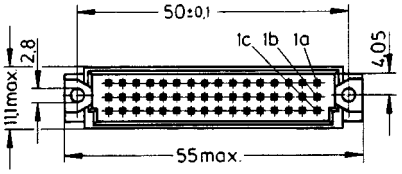
| Identification | Number of contacts | Contact arrangement | Part No. 3 | Performance levels according to IEC 60 603-2. 2 | 1 |
|---|---|---|---|---|---|
| Male connector with straight solder pins 2.5 mm | 48 |  | Performance level 3 on request | 09 28 148 6519 | Performance level 1 on request |
| | 32 |  | | 09 28 132 6519 | |
| Male connector with straight solder pins 4.0 mm | 48 |  | | 09 28 148 6520 | |
| | 32 |  | | 09 28 132 6520 | |
| Male connector with straight solder pins 13 mm | 48 |  | | 09 28 148 6521 | |

### Dimensions



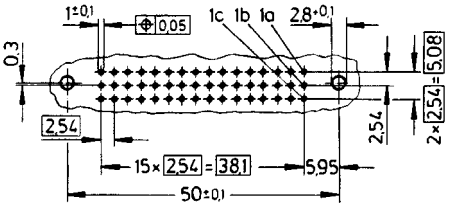

| a |
|---|
| 2.5 |
| 4 |
| 13 |

Solder pins

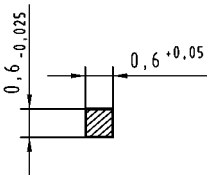



### Board drillings

Mounting side




### Cross section of solder terminations




Cross area (A) of contacts row a, b, c: A = 0.35 - 0.39 mm²

Dimensions in mm