1.27 mm SMT Connectors for
Board-to-Board Applications

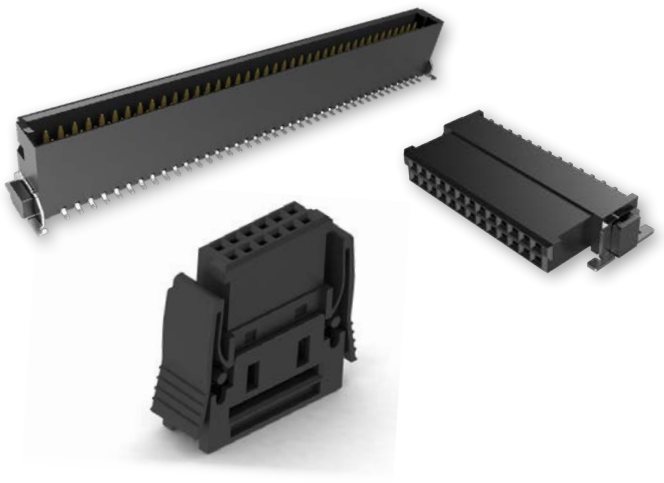
# ONE27.



## Compact, Rugged, Versatile

The One27® range offers a high level of flexibility and at the same time reliable connectors for a number of board-to-board applications. The product family is based on a pitch of 1.27 mm, offers both straight and angled types as well as connections with ribbon cable, and is available in pin counts from 12 to 80 pins.

The connectors are compatible with currently available products and their performance in tests has been excellent.




SMT


Parallel


Horizontal


Perpendicular

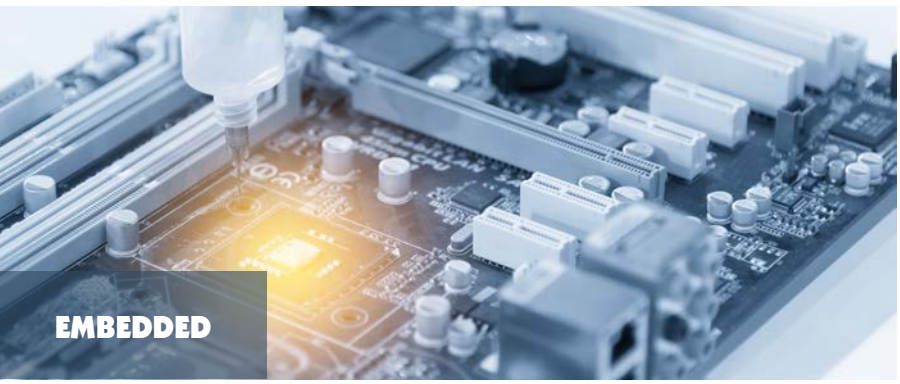

Cable

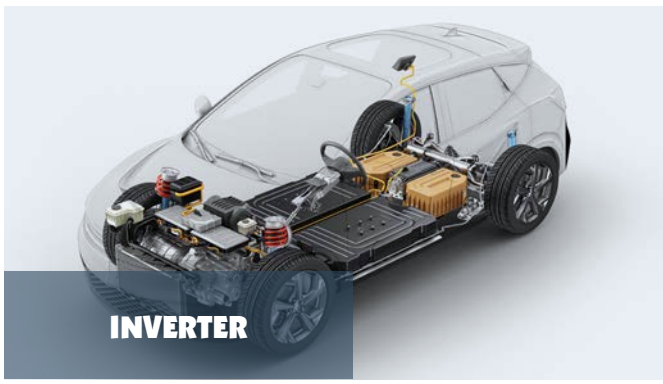

High Density











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## Key Features:

- 1.4 A Current carrying capacity
- 500 mating cycles
- Highest contact reliability
- Tested compatibility with other suppliers
- Female IDC available individually or assembled with cable

## Applications:

- Board-to-Board (mezzanine) from 8 mm to 20 mm
- Parallel, perpendicular and horizontal connections
- IDC connectability with ribbon cable

## Our One27 Video:

https://youtu.be/6doPp-7ea88



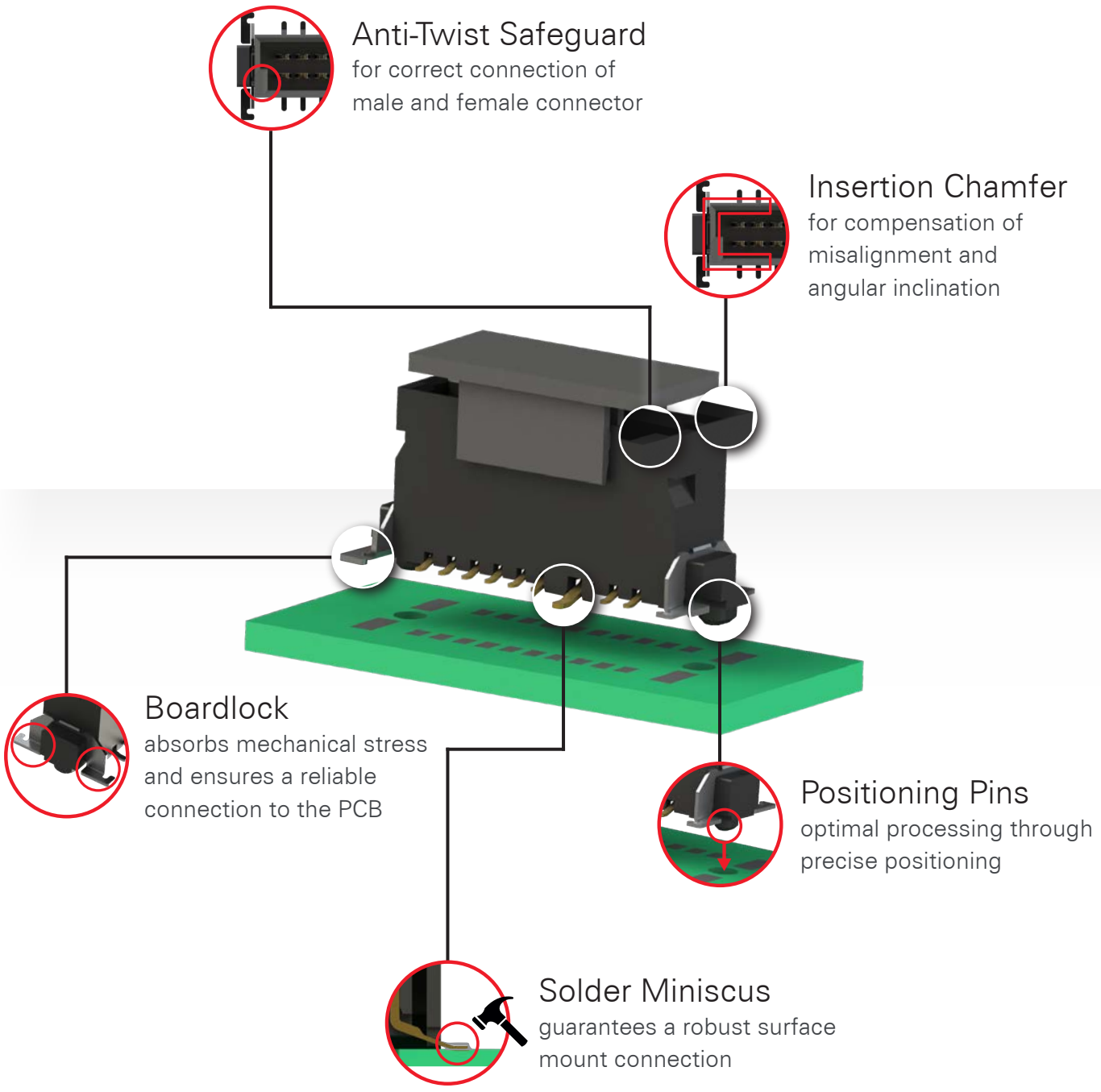









# Advantages & Features



## Anti-Twist Safeguard
for correct connection of
male and female connector

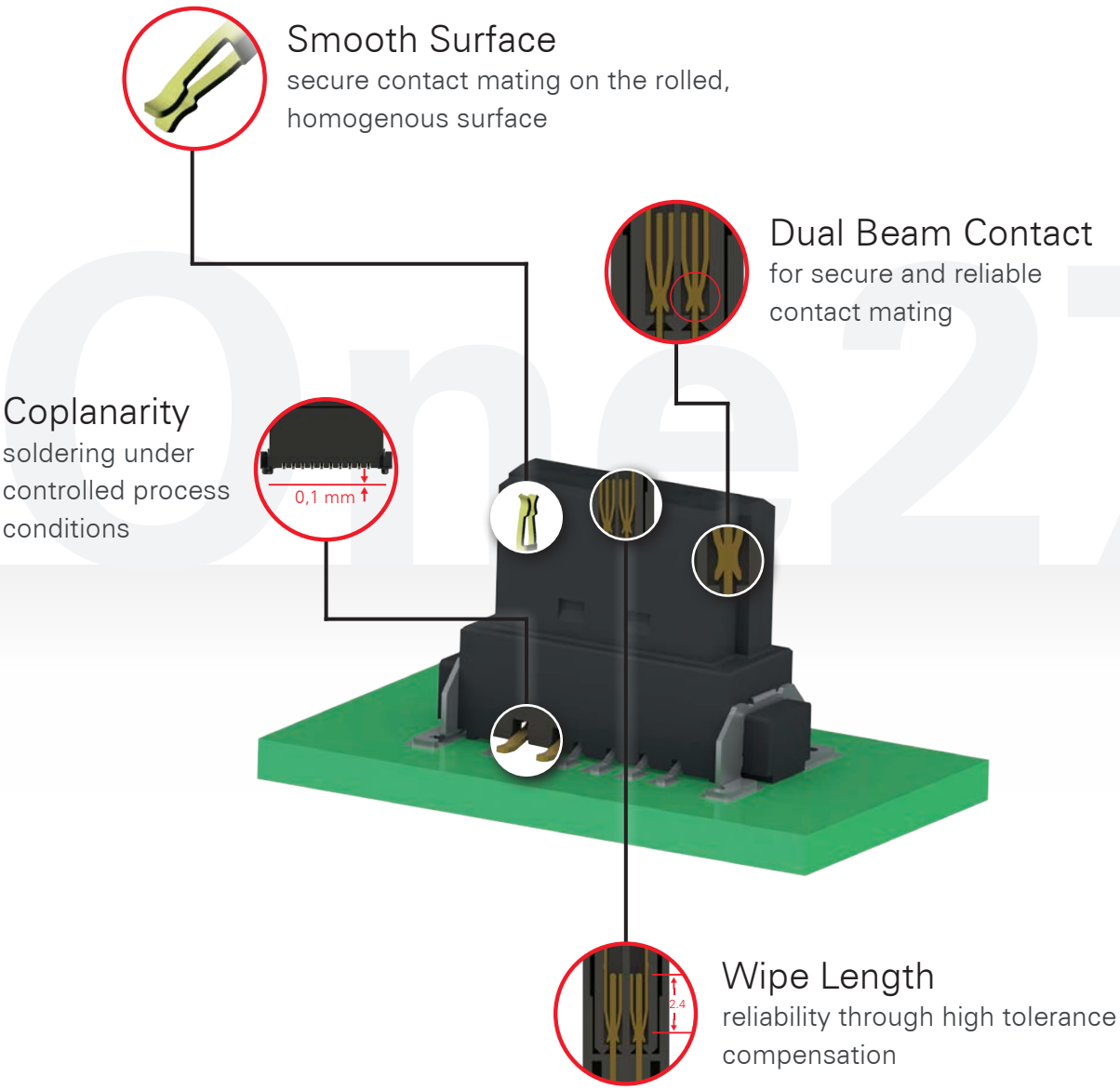
## Insertion Chamfer
for compensation of
misalignment and
angular inclination

## Boardlock
absorbs mechanical stress
and ensures a reliable
connection to the PCB

## Positioning Pins
optimal processing through
precise positioning

## Solder Miniscus
guarantees a robust surface
mount connection

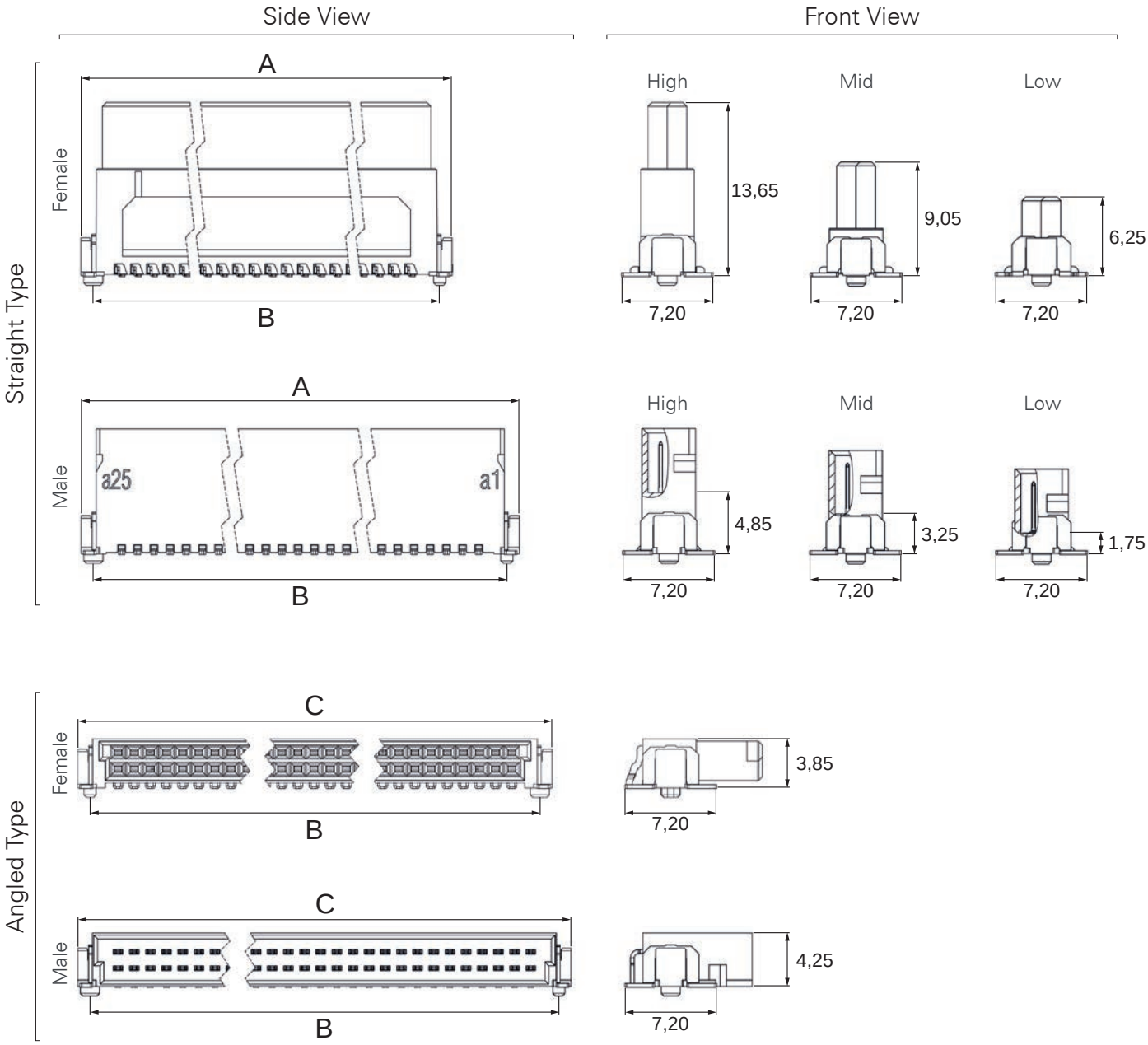

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**Other features:**

- Test reports available for compatibility with other connectors on the market
- Tape & reel packaging for automated assembly
- Custom variants available on request

# One27®
## Dimensions




Connector lengths in mm:

| Pins | A | B | C |
|---|---|---|---|
| **12** | 12,70 | 10,77 | 12,71 |
| **16** | 15,24 | 13,31 | 15,25 |
| **20** | 17,78 | 15,85 | 17,79 |
| **26** | 21,59 | 19,66 | 21,60 |
| **32** | 25,40 | 23,47 | 25,41 |
| **40** | 30,48 | 28,55 | 30,49 |
| **50** | 36,83 | 34,90 | 36,84 |
| **68** | 48,26 | 46,33 | 48,27 |
| **80** | 55,88 | 53,95 | 55,89 |

Detailed drawings as well as a layout recommendation are available on www.ept.de after selecting the corresponding article.


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| Basics | | |
|---|---|---|
| Number of pins | 12 / 16 / 20 / 26 / 32 / 40 / 50 / 68 / 80 | |
| Termination | SMT | |
| Operating temperature range | -55°C to +125°C | |

| Material | | |
|---|---|---|
| Insulator material | LCP | |
| CTI | 175 | IEC 60112 |
| Contact material | Copper alloy | |
| Contact surface | Au over PdNi over Ni<br>Au over NiP over Ni | |
| Termination area | Sn | |

| Mechanical | | |
|---|---|---|
| Pitch | 1.27 mm | |
| Mating force per pin | ≤ 0.5 N | |
| Separating force per pin | ≥ 0.1 N | |
| Durability | Performance lv. I: 500 mating cycles | IEC 60512-9-1 |
| Coplanarity | ≤ 0.1 mm | |
| Vibration, sinusoidal | 10 - 2000 Hz, 20 g | IEC 60512-6-4 |
| Contact mating problems if vibrations occur, sinusoidal | < 1 µs | IEC 60512-2-5 |
| Shock, semi-sinusoidal | 50 g, 11 ms | IEC 60512-6-3 |
| Contact mating problems if shocks occur, semi-sinusoidal | < 1 µs | IEC 60512-2-5 |

| Electrical | | |
|---|---|---|
| Operational current | max. 1.4 A at 20°C (50 pins) | IEC 60512-5-2 |
| Contact resistance | max. 25 mΩ<br>max. 10 mΩ (female IDC + cable) | IEC 60512-2-1 |
| Clearance and creepage | min. 0.4 mm | |
| Insulation resistance | max. 10 GΩ | IEC 60512-3-1 |
| Test voltage | 500 VAC | IEC 60512-4-1 |
| Data transfer rate | 3 Gbit/s | |

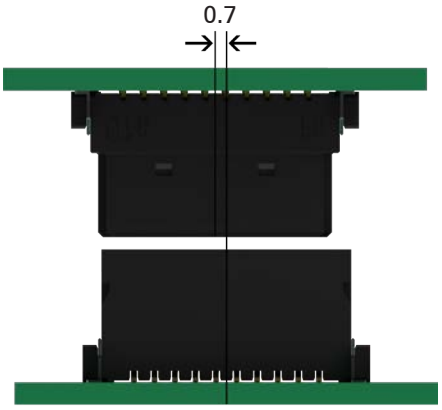
| Processing | | |
|---|---|---|
| Soldering temperature | max. SMT reflow soldering temp.<br>20 - 40 s bei 260°C | JEDEC J-STD-020 |
| MSL | 1 | JEDEC J-STD-020 |
| Packaging | Tape & Reel, Tray (female IDC) | |
| Assembly | Pick and place | |

| Approval | | |
|---|---|---|
| UL file | E130314 | |
| Environment | RoHS compliant | |

Detailed test reports are available at www.ept.de
after selecting the corresponding article.

## Allowed Misalignment Tolerances

longitudinal: ± 0.7 mm

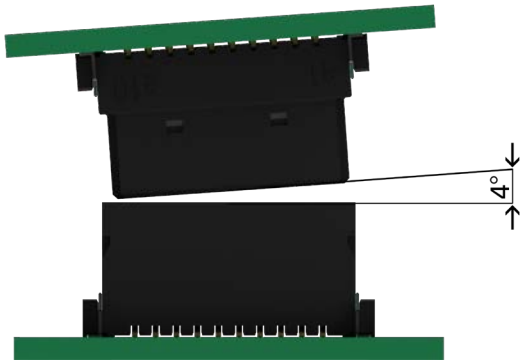



transverse: ± 0.7 mm

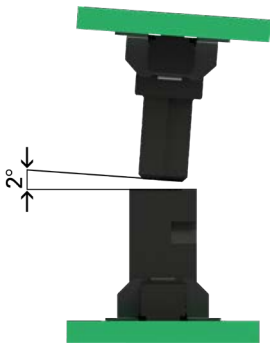



## Allowed Angular Inclination Tolerances

longitudinal: ± 4°



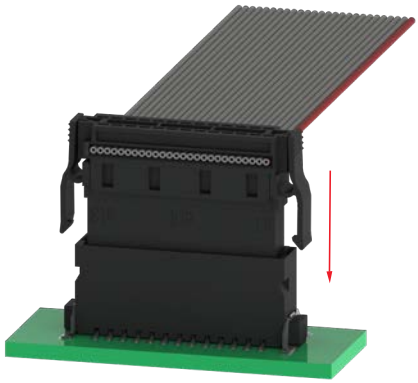

transverse: ± 2°



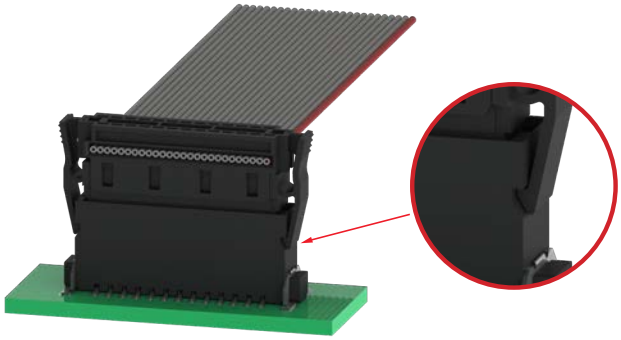


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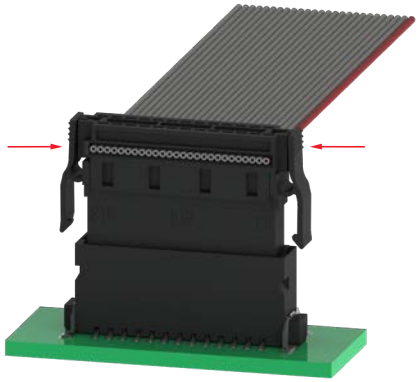
## Locking of One27 IDC-Female Connectors



While inserting the IDC-female connector into the male connector, the snap-fits lock automatically into their slots.



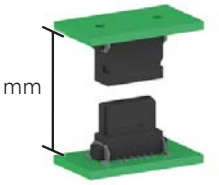
If the snap-fits are visibly locked into their slots, the connection between female and male connector is secured.



To disconnect simply press the snap-fits together.

# Part Numbers for B-t-B Applications

## Parallel Connector Pairs




**Board-to-Board Distance in mm**

| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** 8.0 - 9.5 | **B** 9.5 - 11.0 | **C** 11.1 - 12.6 | **D** 10.8 - 12.3 | **E** 12.3 - 13.8 | | **F** 13.9 - 15.4 | **G** 15.4 - 16.9 | **H** 16.9 - 18.4 | **I** 18.5 - 20.0 | | | |

Please refer to the connector combinations table on page 11

## Part Number Key

**Type Low & Mid**
**413** Male
**414** Female

**Type High & Angled**
**403** Male
**404** Female

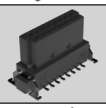
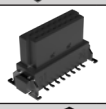
**Profile**
**51** Angled
**52** Low
**53** Mid
**54** High

**X X X - X X 0 N N - 5 1**

**12, 16, 20, 26, 32, 40, 50, 68, 80**
**Pins**


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## Connector Combinations Table

| | Female | | Male | |
|---|---|---|---|---|
| Pairing | Part number | | Part number | |
| **A** | low |  414-520NN-51 | low |  413-520NN-51 |
| **B** | low |  414-520NN-51 | mid |  413-530NN-51 |
| **C** | low |  414-520NN-51 | high |  403-540NN-51 |
| **D** | mid |  414-530NN-51 | low |  413-520NN-51 |
| **E** | mid |  414-530NN-51 | mid |  413-530NN-51 |
| **F** | mid |  414-530NN-51 | high |  403-540NN-51 |
| **G** | high |  404-540NN-51 | low |  413-520NN-51 |
| **H** | high |  404-540NN-51 | mid |  413-530NN-51 |
| **I** | high |  404-540NN-51 | high |  403-540NN-51 |

| | | |
|---|---|---|
| Packaging Tape & Reel **low** | 600 pcs. | 550 pcs. |
| Packaging Tape & Reel **mid** | 460 pcs. | 470 pcs. |
| Packaging Tape & Reel **high** | 260 pcs. | 300 pcs. |

Available Options:

- Custom pin counts
- Other performance levels
- Custom variants

# Part Numbers for B-t-B Applications

## Angled Connector Pairs




**Required Installation Space in mm**

| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|
| **A** 11.25 - 12.75 | | | **C** 14.05 - 15.55 | **E** 15.65 - 17.15 | | | | **F** 18.65 - 20.15 | |
| | **B** 12.55 - 14.05 | | **D** 14.05 - 15.55 | | | | | | |

Please refer to the connector combinations table on page 13

## Part Number Key

**Type Low & Mid**
**413** Male
**414** Female

**Type High & Angled**
**403** Male
**404** Female

**Profile**
**51** Angled
**52** Low
**53** Mid
**54** High

**X X X - X X 0 N N - 5 1**

**12, 16, 20, 26, 32, 40, 50, 68, 80**
**Pins**


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## Connector Combinations Table

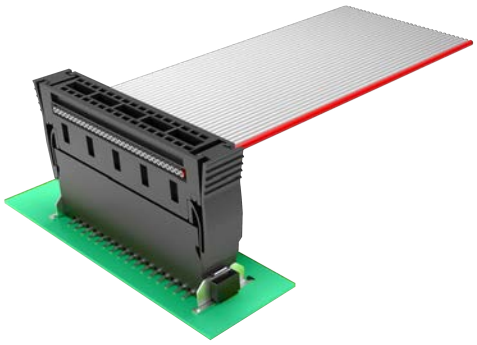
| | Female | | Male | |
|---|---|---|---|---|
| Pairing 90° | Part number | | Part number | |
| **A** | low |  414-520NN-51 | 90° |  403-510NN-51 |
| **B** | 90° |  404-510NN-51 | low |  413-520NN-51 |
| **C** | mid |  414-530NN-51 | 90° |  403-510NN-51 |
| **D** | 90° |  404-510NN-51 | mid |  413-530NN-51 |
| **E** | 90° |  404-510NN-51 | high |  403-540NN-51 |
| **F** | high |  404-540NN-51 | 90° |  403-510NN-51 |

| Pairing horizontal | Part number | | Part number | |
|---|---|---|---|---|
| **Horizontal** 15.65 - 17.15 mm | 90° |  404-510NN-51 | 90° |  403-510NN-51 |

| | | |
|---|---|---|
| Packaging Tape & Reel **low** | 600 pcs. | 550 pcs. |
| Packaging Tape & Reel **mid** | 460 pcs. | 470 pcs. |
| Packaging Tape & Reel **high** | 260 pcs. | 300 pcs. |
| Packaging Tape & Reel **angled** | 920 pcs. | 970 pcs. |

Available Options:
- Custom pin counts
- Other performance levels
- Custom variants

## One27 Female IDC Pre-Assembled with Cable



- Alignment of the connectors, pin count and cable length freely selectable
- Cable AWG 30/7 - cross section 0.06 mm²
- Insulation displacement connection technology (IDC)
- Cable type PVC: -30°C to + 105°C (at rest)
- Colored wire on a1
- IDC female connector single or with cable assembled available

## Part Number Key for Cable Assembly

**Cable type**
**61** PVC
**62** High temperature
**66** Halogen-free

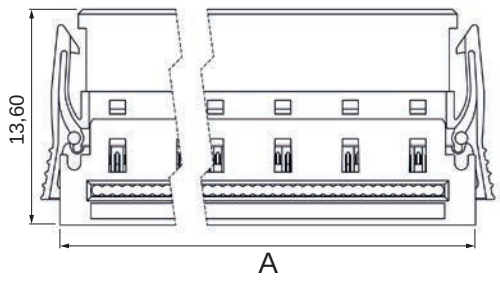
**Cable length in mm**
from 30 to 999 mm
i.e. **080** = 80 mm
**660** = 660 mm

**4 0 4 - X X N N - L L L - C C C - 1**

**12, 16, 20, 26, 32, 40, 50, 68, 80**
**Pins**

**See next page**

## Dimensions







Connector lengths in mm:

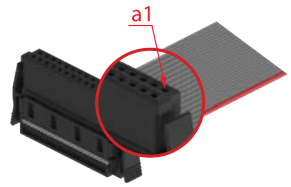
| Part number | Pins | A |
|---|---|---|
| 404-59012-61 | 12 | 5 |
| 404-59016-61 | 16 | 7 |
| 404-59020-61 | 20 | 9 |
| 404-59026-61 | 26 | 12 |
| 404-59032-61 | 32 | 15 |
| 404-59040-61 | 40 | 19 |
| 404-59050-61 | 50 | 24 |
| 404-59068-61 | 68 | 33 |
| 404-59080-61 | 80 | 39 |

Detailed drawings as well as a layout recommendation are available on www.ept.de after selecting the corresponding article.


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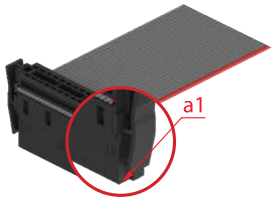
Assembled version 100

Part number
404-6XNN-LLL-100-1



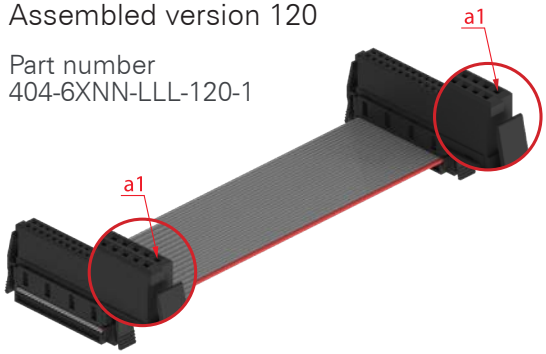

Assembled version 400

Part number
404-6XNN-LLL-400-1



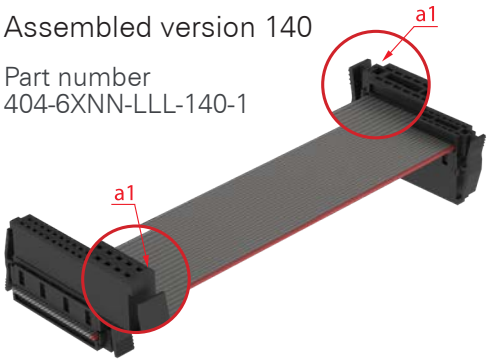

Assembled version 120

Part number
404-6XNN-LLL-120-1



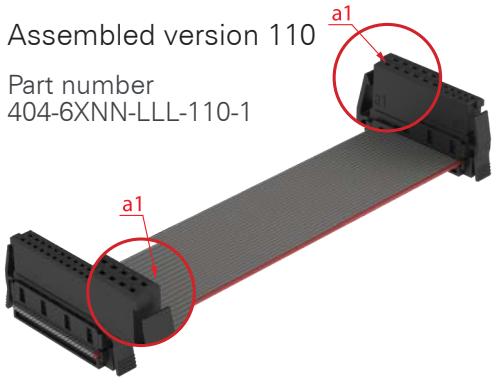

Assembled version 140

Part number
404-6XNN-LLL-140-1



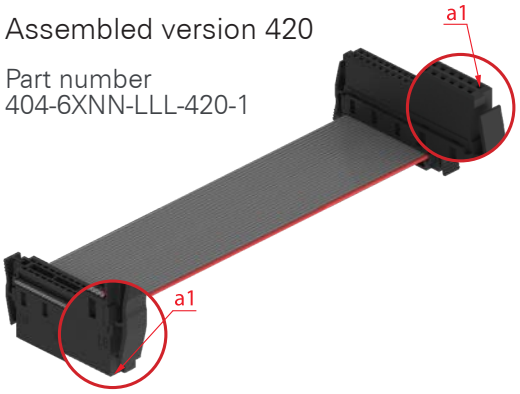

Assembled version 110

Part number
404-6XNN-LLL-110-1



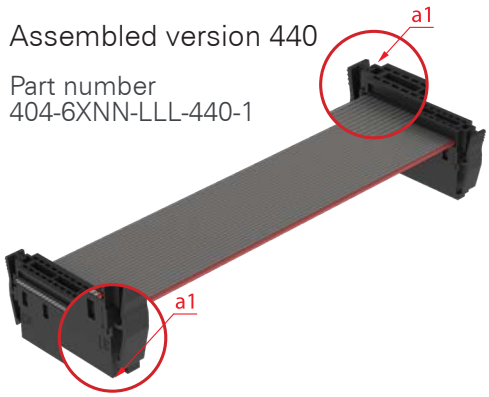

Assembled version 420

Part number
404-6XNN-LLL-420-1



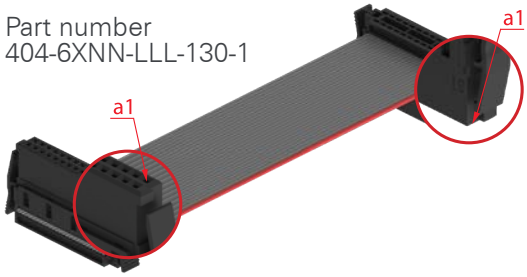

Assembled version 440

Part number
404-6XNN-LLL-440-1




Assembled version 130

Part number
404-6XNN-LLL-130-1



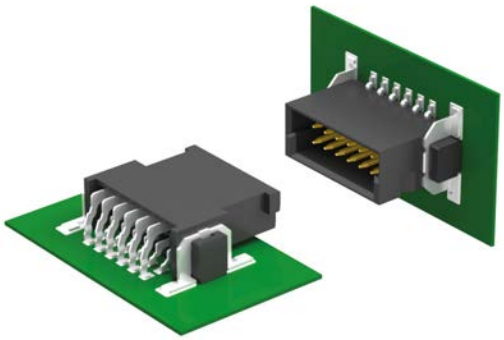

On request we can also provide other cable assemblies

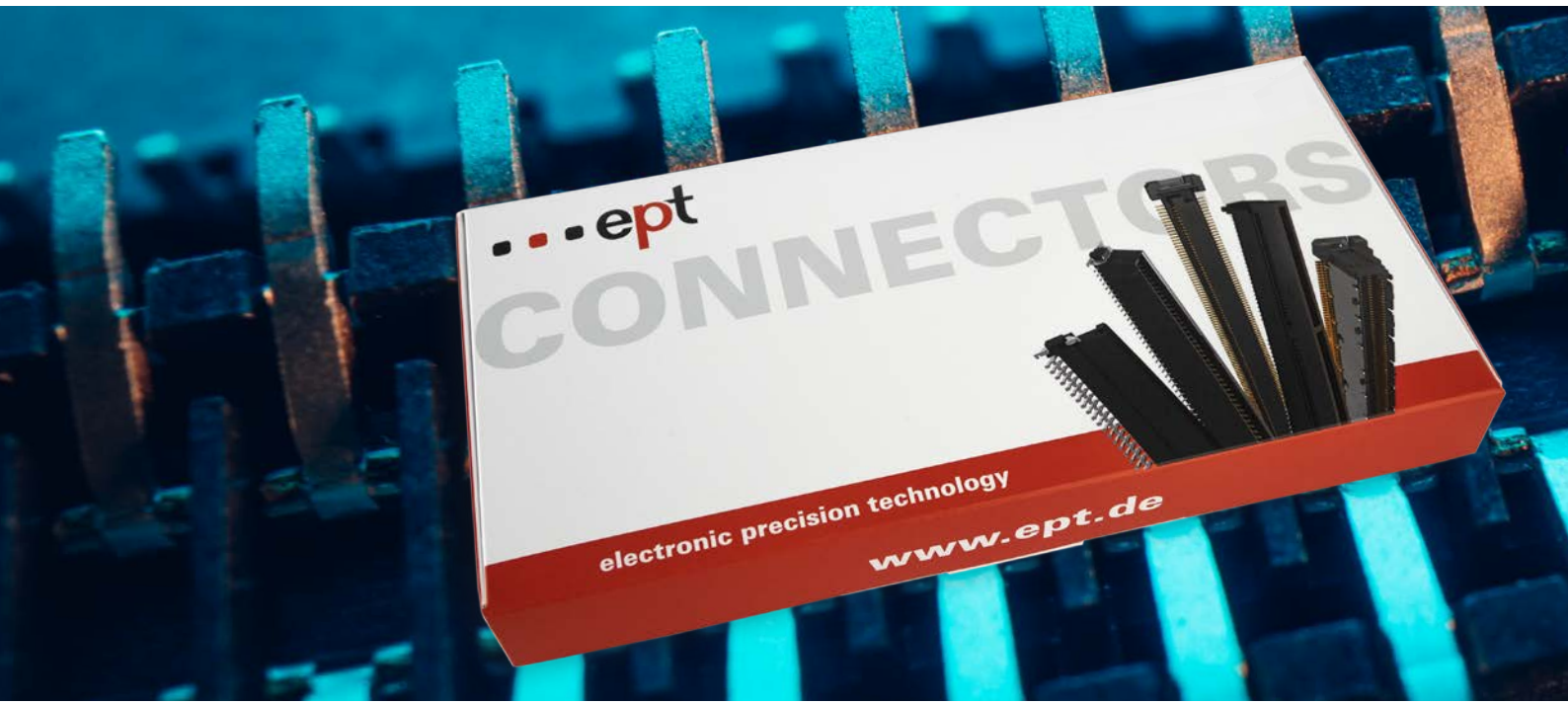
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For detailed coordination as well as individual consultation, you can choose between our sales representative in your area, our service representative in Peiting or a local sales partner or distributor.

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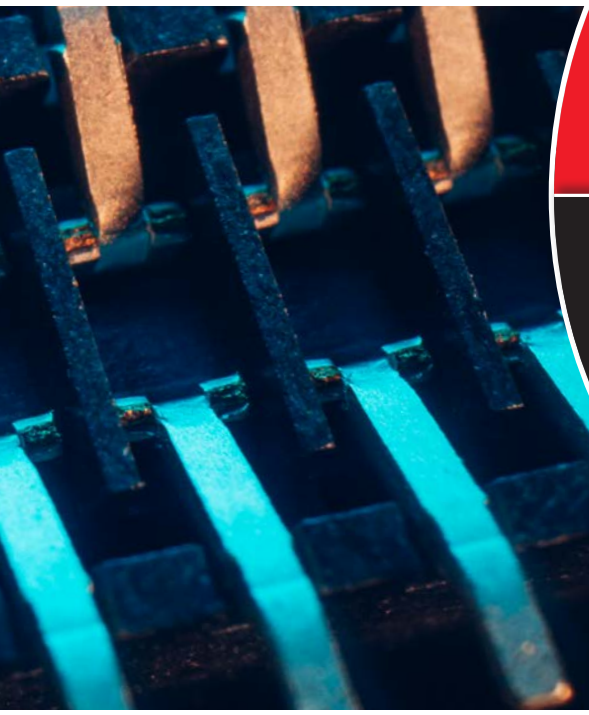


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## One Stop Supplier

ept is a German quality supplier with sophisticated products in the field of electrical connectivity. Our products and capabilities are used in high-quality and demanding applications such as industrial automation, healthcare, measurement and traffic technology as well as automotive electronics.

At six locations worldwide, connectors are manufactured in-house using highly automated processes across four manufacturing steps (stamping, electroplating injection molding and assembly). Over five decades, we have formed trusting and successful partnerships with our customers, who are at the center of everything we do.





# Notes



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86971 Peiting, Germany

## Other Locations

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**Augsburg,** Germany
**Habartov,** Czech Republic
**South Chesterfield,** USA
**Shanghai,** China

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