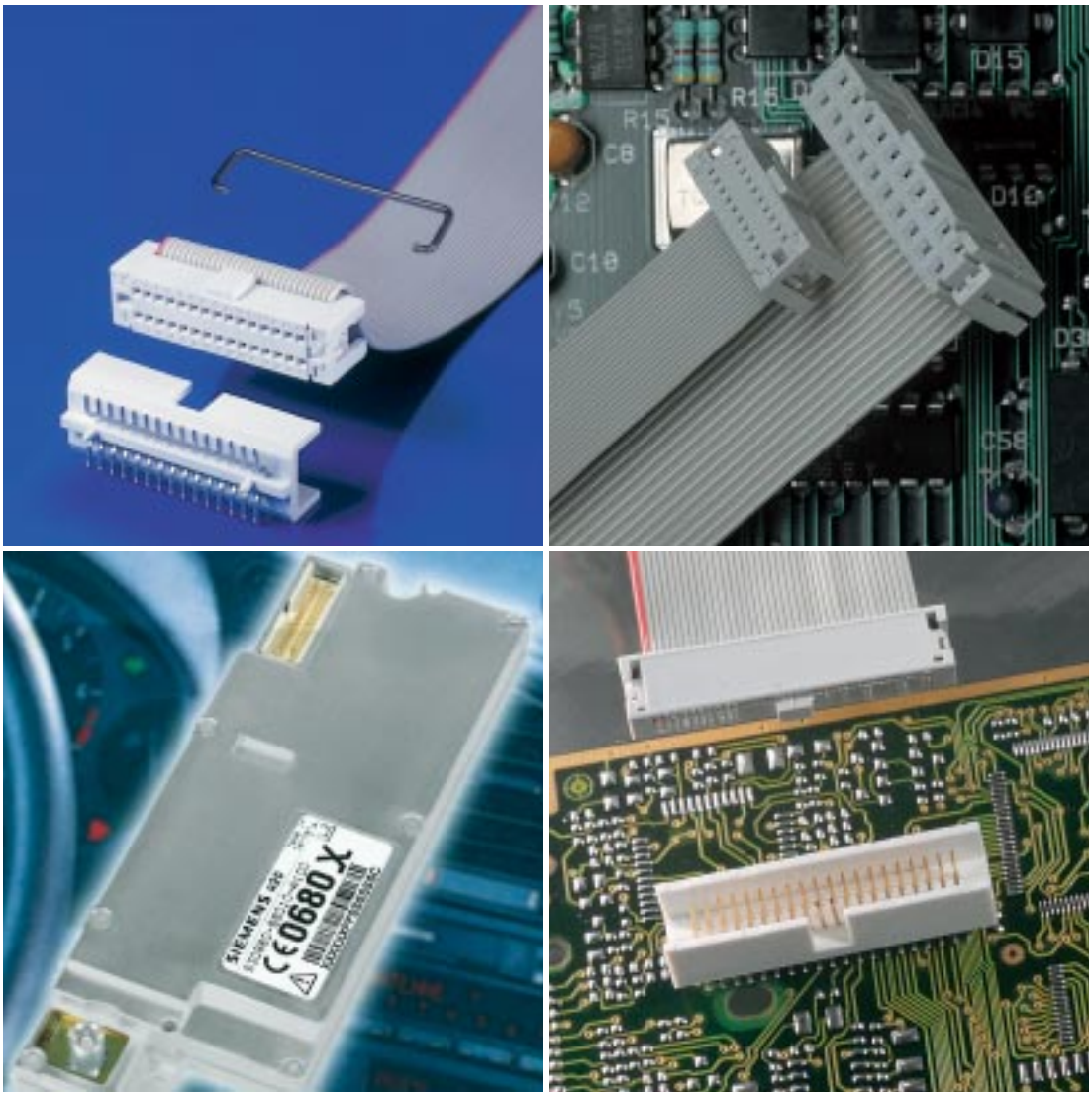
Catalogue Nr. 1007-c



ODU MINI-FIX

Board-to-Cable Connector

Grid 1.27 x 2.54 mm

ODU-Steckverbindungssysteme GmbH & Co. KG, Pregelstr. 11, D-84453 Mühldorf/Inn,
Telefon: +49/86 31/61 56-0, Telefax: +49/86 31/61 56 49 · E-Mail: zentral@odu.de, www.odu.de

Table of contents

All dimensions in mm.

All figures are illustrations.

Changes reserved.

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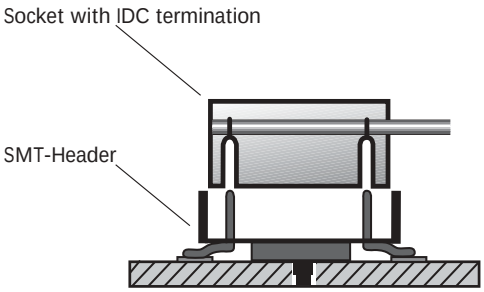
Experiences with SMT Connectors

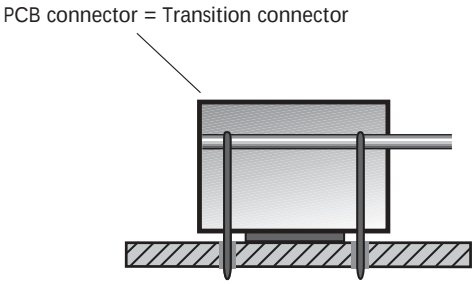
The MINI-FIX Series connectors offered by ODU are able to connect PCB´s over longer distances as well as individual and different angles.

We offer two solutions to connect the cable to the PCB.

1.) Mated pair with male part (soldered) and female part (with cable)



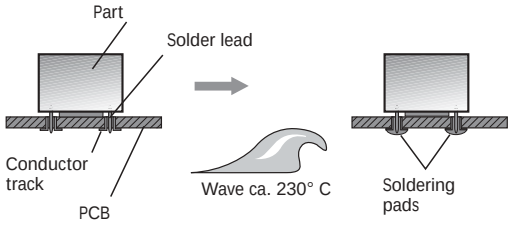
2.) Transition connector soldered directly to the circuit board



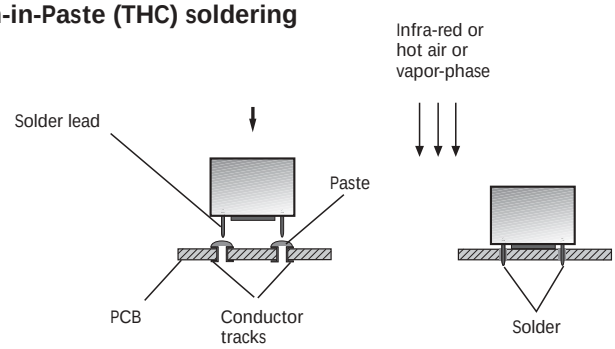
How to solder headers on the PCB.

There are three different possibilities:

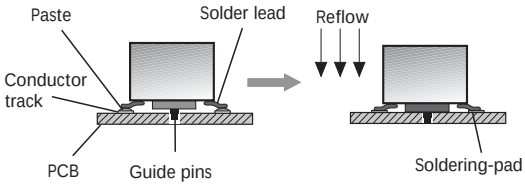
Wave soldering



Pin-in-Paste (THC) soldering



Surface Mount soldering



During the last years we have made the following experiences:

– the mateable connections (male/female) are used more widely than the transition connectors by a ratio of 10:1.

– the soldering of the male headers shows that the wave soldering is less popular than the fast growing SMT soldering. Presently the use of SMT to wave soldering is with a ratio of 4:1.

– Pin-in-Paste (THC) soldering for the grind 1.27 and pins ▫ 0.38 practically is of no importance.

The following refers to SMT soldered headers.

Requirements for SMT headers

– High temperature performance (up to 250°C)

– Automatic placement (Pick and Place)

– Resistance to mechanical forces (horizontal/vertical)

– Coplanarity <0,1 mm

– Automatic Checking

Requirements for the Pin-Socket combination

– Low insertion and withdrawal forces

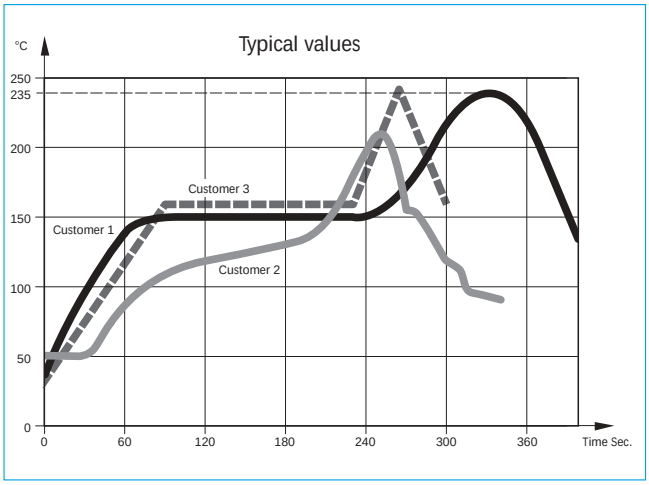
– Low and constant resistance

– Good high frequency properties

– Safe locking of the two connector halves

Temperature Performance

Our experience has shown that working temperatures have been reduced during recent years. Five or ten years ago peak temperatures of more than 240°C could be found frequently. Today they hardly reach 230°C.



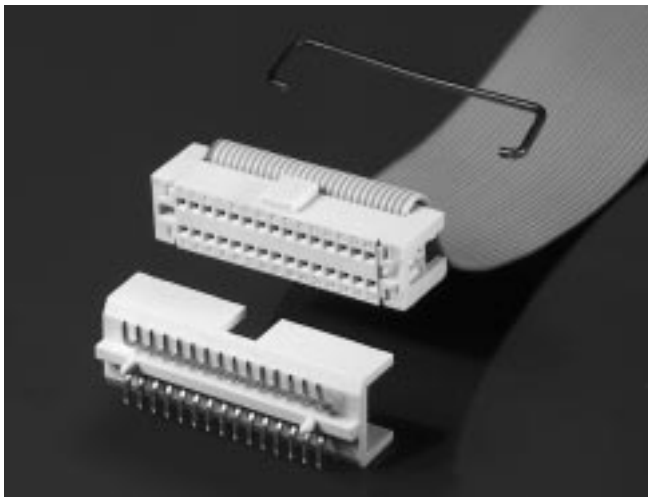
Automatic Placement

Today Tape and Reel packaging is a standard. The header, which is equipped with vacuum adapter plates, is taken out of the pocket by the pick and place machine, and is deposited on the PCB (quite frequently guided by an adjustment device with optical alignment)

Mechanical forces

The ODU headers in the series version have moulded guide pins. If the drilling of the PCB is a problem, the headers can be supplied without guide pins.

In some cases the guide pins have shown to be very useful. They absorb the horizontal forces and allow easy hand placement for prototypes and small production runs.



ODU MINI-FIX 30-way.
The header is shown with guide pins. The female socket is shown with cable and strain relief.

It is our experience that special soldering supports are not needed to take mechanical forces. It is true that the SMT soldered headers show a lower pull-off force than wave soldered headers but the safety margin against the contact separation is still very high. The vertical pull-off forces normally are not limited by the soldering method but by the adhesive force of the pad to the PCB.

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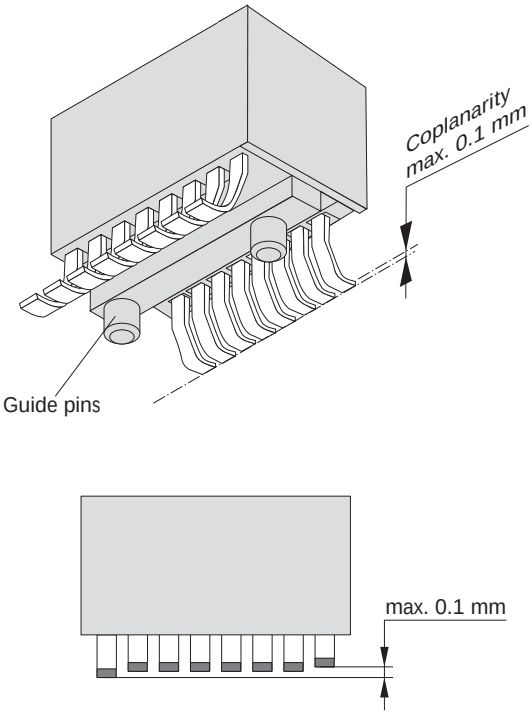
The following are guide values:

	SMT soldered Pin	Wave or Pin-in-Paste soldered Pin
Vertical Pull-off Force	> 8 N	> 50 N
Contact separation Force	0.1 – 0.3 N	0.1 – 0.3 N
Safety factor	> 25 : 1	> 150 : 1

Coplanarity

It is absolutely essential that a value of <0.1 is maintained. During the fully automatic assembly ODU has a 100% optical inspection to make sure that this value is maintained.



Automatic Testing

This is well possible due to the contact geometry, this means the solder legs and the solder areas are well accessible for camera systems.

Mating and unmating forces, resistance

The ODU MINI-FIX connector system has excellent contact properties .

The 2-sided sliding socket contact allows for as many as 100 mating cycles. The mating and demating force for a single pin/socket combination is around 0.1 N. For a whole connector, of up to 50 way it is around 0.2 N/contact, for 30-way connector appr. 6.0 N.

The contact resistance – even after many mating cycles – is very low – around 6 mΩ.

High-frequency properties

Signal integrity at high data and clock rates is maintained by:

– Maintenance of characteristic impedance of the signal-path to avoid loss by reflection

– Low crosstalk

– Avoiding EMI to the outside

– Resistance to Electro Magnetic Interference from the outside

It is not possible to make a general statement to indicate the maximum frequency which ODU MINI-FIX connectors may use. Such a statement is only possible if essentials like the configuration of the pins, the cable length and the specific requirements for signal integrity are known.

Today ODU MINI-FIX is used for analog frequencies up to 1 GHZ according to 2 Gbits/s.

Locking system

Here two systems are offered:

1.) Locking with metal clip (the socket can only be separated from the header by using a screwdriver or similar tool)

2.) Locking with latches – connectors can be separated by hand

Both systems have their advantages depending on specific requirements.

(see pages 16-17)

Modern care of the sick and elderly with electronic communication

Example for application

Hospital communication system with ODU MINI-FIX

To be able to offer security and comfort, hospitals need a precise, carefully thought out communication system.

ODU MINI-FIX is used in light paging systems for hospital rooms. The electronics are placed in a wall strip. Different modules can be connected to this strip: e.g. display, keyboard, and microphone elements. ODU MINI-FIX connects these units to the module in the wall.

Some modules (such as the keyboard) must be inserted horizontally and other modules (such as the microphone) must be inserted vertically. The MINI-FIX card-to-cable connector was selected to achieve flexibility here.

Communication-Terminal: Connection of Mother- and Daughter-Board with ODU MINI-FIX

! SHORTINFO !

- here: ODU MINI-FIX 20 pos
- SMT header
- Cable assembly: with IDC socket and PCB connector
- small grid: 1.27 mm

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Example for application

MINI-FIX in photographic technology

Measuring instrument for lighting engineering and photometry as well as a CINE meter for filming, all in one – MINI-FIX provides a flexible connection

A well-known manufacturer in photo and photometric technology is using ODU MINI-FIX card-to-cable connectors with 1.27 mm grid spacing in the multifunction exposure meter "Starlite". This is used in professional photography for measuring the intensity of the light, for example.

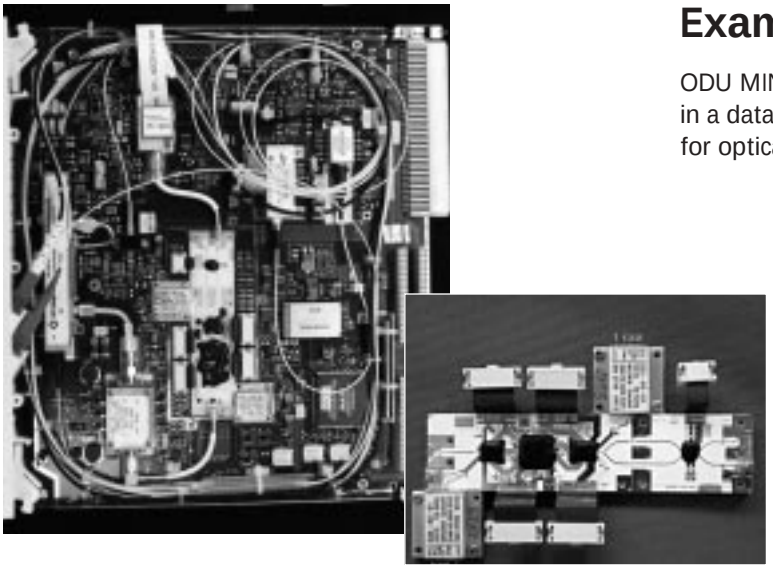
"Starlite" consists of a basic device and a rotating, multifunctional measuring head. Because the measuring head must be placed in different positions, a flexible connection is needed inside the device. MINI-FIX, in the small 1.27 mm grid, is ideally suited for this.

Exposure meter – connections inside the device between the basic device and the flexible measuring head with MINI-FIX

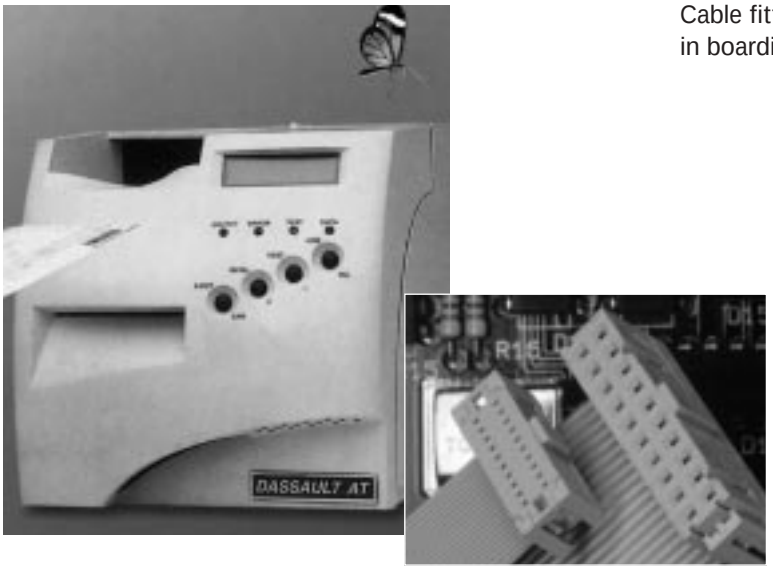
! SHORTINFO !

- here: 10 pos
- small grid: 1.27 mm
- flexible connection

Examples for applications



ODU MINI-FIX on flex foil
in a data transmission device
for optical multiplexing



Cable fittings and ODU MINI-FIX connector
in boarding pass printers

ODU MINI-FIX in a navigation system

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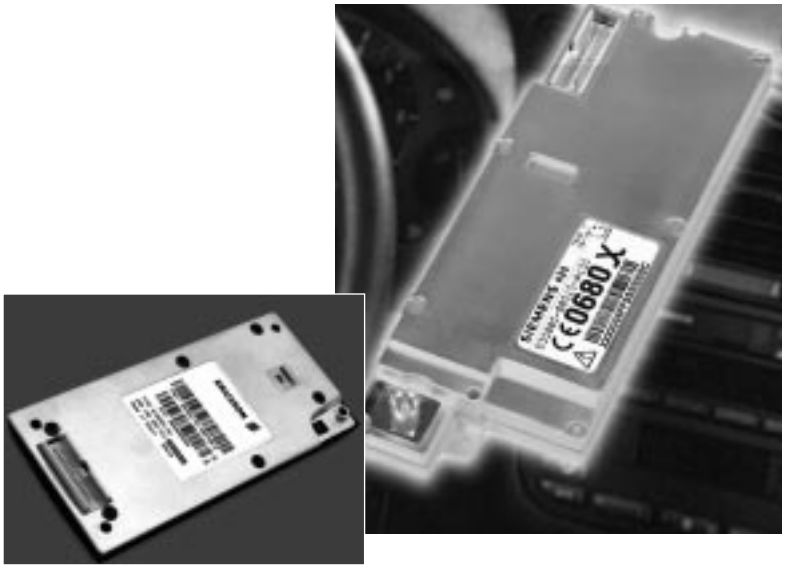
Examples for applications

ODU MINI-FIX interface connector
on cellular engines



Internal connection using ODU MINI-FIX
in ultrasound flow meter

Special monitor for x-ray diagnostic
with ODU MINI-FIX

Technical data

for Headers - Wave soldering (Page 11/12)
Socket Connector (Page 14)
Transition Connector (Page 15)

Electrical specification

Contact resistance:	≤ 6 mΩ
Test volgage:	750 Volt eff.
Operating voltage:	30 V
Operating current:	0.5 A
(Single contact at 25°C)	

Mechanical specification

Operating temperature:	-40°C to +125°C
Humidity:	75% rel. Humidity to DIN 40 040 / MIL-C-21 097B
Insertion force:	0.18 N/Contact
Mating cycles:	> 100

Material and surface

Contact surface	
Contact area:	0.75 µm Au over 1.25 µm Ni MIL-G-45 204B class 00
Material – Ins. body:	PBT, glass-filled grey, RAL 7035 Flammability UL 94 V-O
Material – Contact:	copper alloy

Technical data

for Header SMT (Page 13/22)
Socket SMT (Page 21)

Electrical specification

Contact resistance:	≤ 6 mΩ
Test volgage:	750 Volt eff.
Operating voltage:	30 V
Operating current:	0.5 A
(Single contact at 25°C)	

Mechanical specification

Operating temperature:	-40°C to +125°C
SMT-solder temperature max. 30s on the solder area:	220°C
Humidity:	75% rel. Humidity to DIN 40 040 / MIL-C-21 097B
Insertion force:	0.18 N/Contact
Mating cycles:	> 100

Material and surface

Contact surface	
Contact area:	0.75 µm Au over 1.25 µm Ni MIL-G-45 204B class 00
Material – Ins. body:	PET, GV to UL 94 V-O, natural-colored
Material – Contact:	copper alloy

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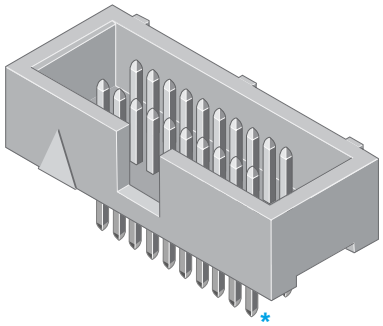
Header, series 515, straight solder pins
2-row, Grid 1.27 x 2.54 mm

Features

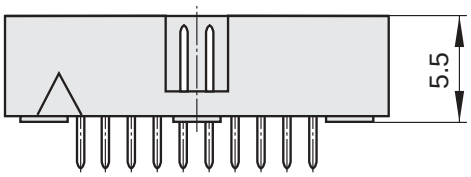
- protected header
- center polarization
- pin cross section 0.38 x 0.38 mm
- 10-20-30-40-50 positions available

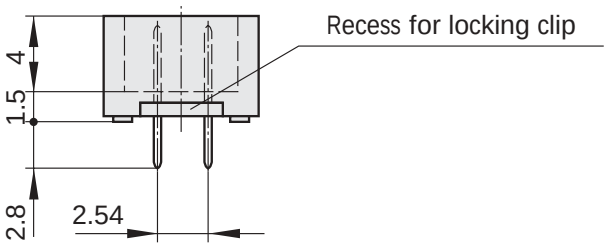


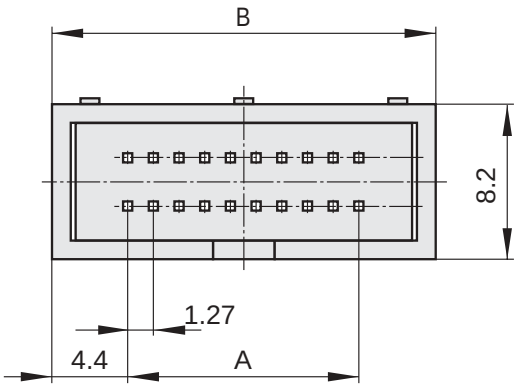
* termination area with embossed rounded corner

Technical data see page 10

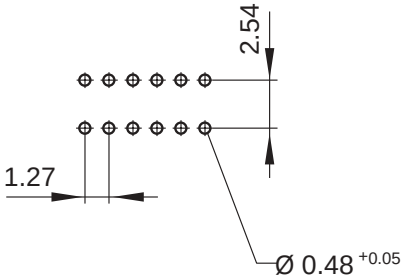
Assembly with Locking clip see page 16







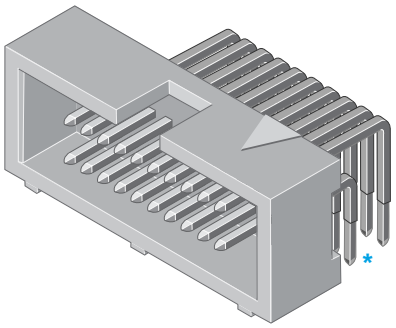
PCB pattern



Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim. A	Dim. B	Number of parts per packaging unit		
				XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	515.067.035.010.XXX	5.08	13.88	---	100	---
20	515.067.035.020.XXX	11.43	20.23	---	120	---
30	515.067.035.030.XXX	17.78	26.58	---	80	---
40	515.067.035.040.XXX	24.13	32.93	---	60	---
50	515.067.035.050.XXX	30.48	39.28	---	60	---

Header, series 515, right-angle solder pins
2-row, Grid 1.27 x 2.54 mm



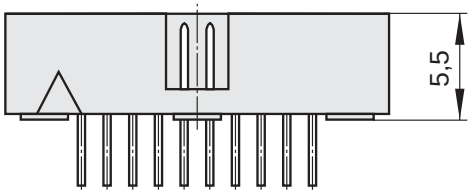
Features

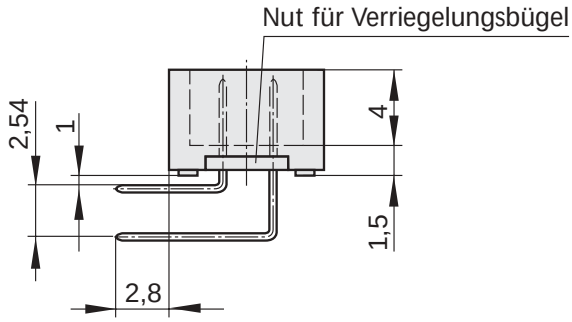
- protected header
- center polarization
- pin cross section 1.27 x 2.54 mm
- 10-20-30-40-50 positions available

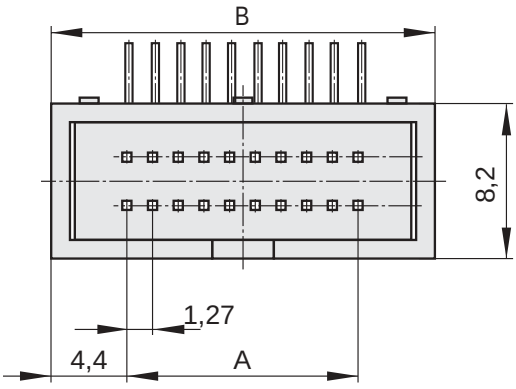
* termination area with embossed rounded corner

Technical data see page 10

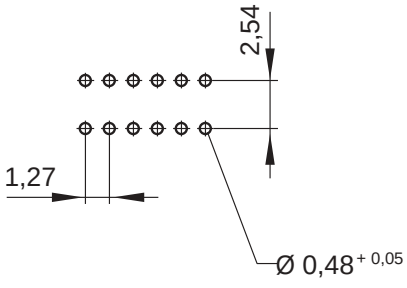
Assembly with Locking clip see page 16







Montagemaß (Lötbild)



Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim. A	Dim. B	Number of parts per packaging unit XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	515.267.035.010.XXX	5.08	13.88	---	100	---
20	515.267.035.020.XXX	11.43	20.23	---	120	---
30	515.267.035.030.XXX	17.78	26.58	---	80	---
40	515.267.035.040.XXX	24.13	32.93	---	60	---
50	515.267.035.050.XXX	30.48	39.28	---	60	---

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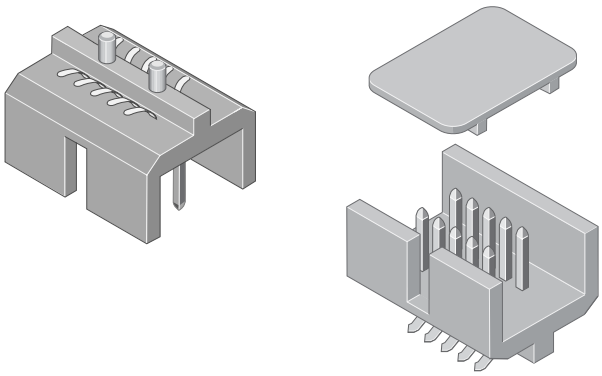
Header, series 515, straight, SMT
2-row, Grid 1.27 x 2.54 mm

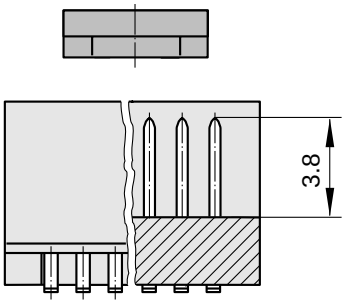
Features

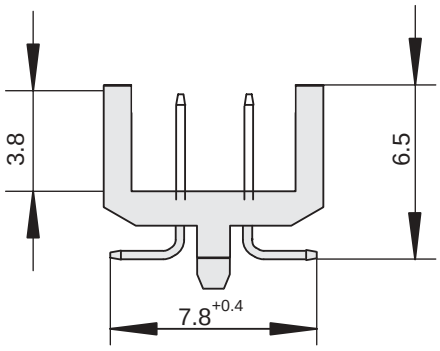
- with vacuum adapter plate
- SMT version
- pin cross section 0.38 x 0.38 mm
- 10-20-30-40-50 positions available
- 2 integrated guide pins

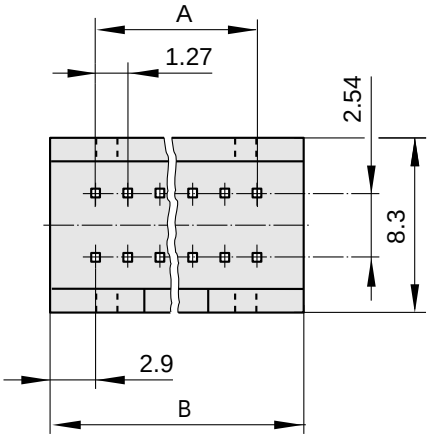


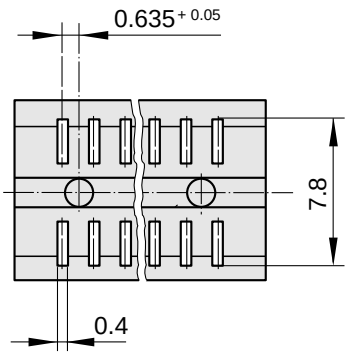
Technical data see page 10

Assembly with Locking clip and locking latches see page 16/17

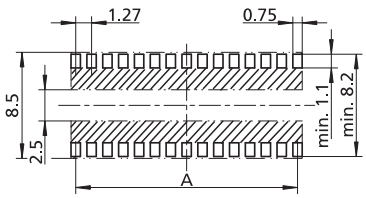








PCB pattern

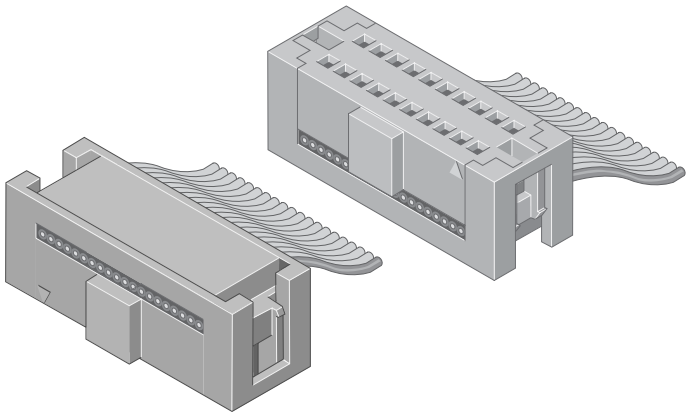


= Space requirement for Termination

Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim. A	Dim. B	Dim. C	Number of parts per packaging unit XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	515.568.035.010.XXX	5.08	10.88	3.81	39	---	400
20	515.568.035.020.XXX	11.43	17.23	10.16	25	---	400
30	515.568.035.030.XXX	17.78	23.58	16.51	18	---	400
40	515.568.035.040.XXX	24.13	29.93	22.86	14	---	400
50	515.568.035.050.XXX	30.48	36.28	29.21	10	---	400

Socket connector, series 525, single-U IDC contact, double-wiping spring contact Grid 1.27 x 2.54 mm, ribbon cable termination

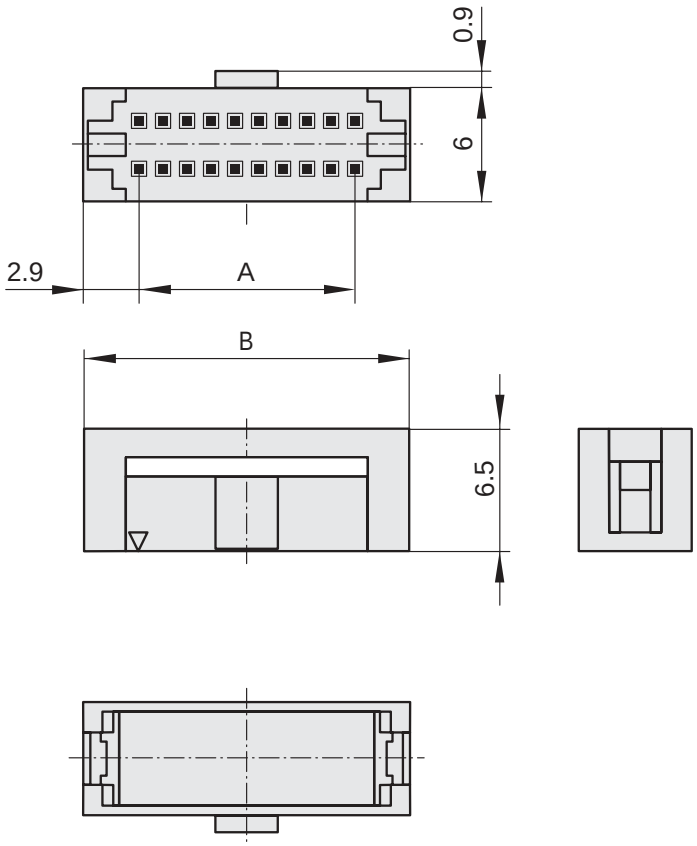


Features

- 10-20-30-40-50 positions available
- with polarization key
- available with locking clip – metal or locking latches – plastic

Technical data see page 10

Assembly with locking clip and locking latches see page 16/17



Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim. A	Dim. B	Number of parts per packaging unit XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	525.060.035.010.XXX	5.08	10.88	---	100	---
20	525.060.035.020.XXX	11.43	17.23	---	60	---
30	525.060.035.030.XXX	17.78	23.58	---	40	---
40	525.060.035.040.XXX	24.13	29.93	---	30	---
50	525.060.035.050.XXX	30.48	36.28	---	20	---

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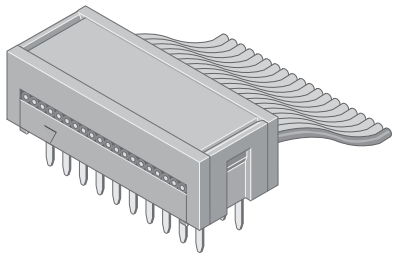
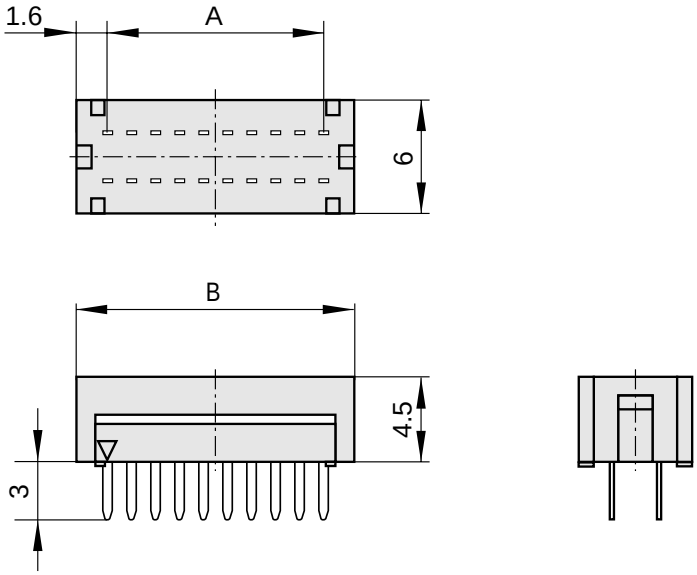
Transition connector series 533
2-row, Grid 1.27 x 2.54 mm, ribbon cable termination

Features

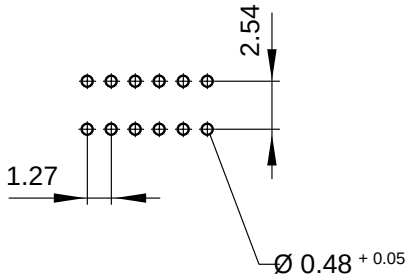
- 10-20-30-40-50 positions available



Technical data see page 10



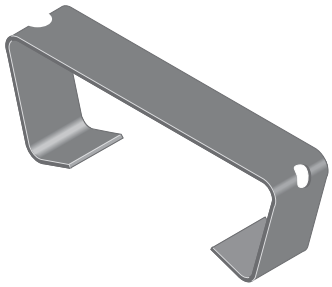
PCB pattern



Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim.. A	Dim. B	Number of parts per packaging unit		
				XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	533.040.024.010.XXX	5.08	8.28	---	100	---
20	533.040.024.020.XXX	11.43	14.63	---	60	---
30	533.040.024.030.XXX	17.78	20.98	---	80	---
40	533.040.024.040.XXX	24.13	27.33	---	60	---
50	533.040.024.050.XXX	30.48	33.68	---	60	---

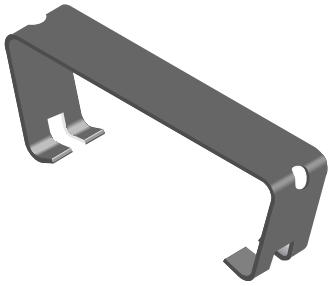
Locking clip for headers-Solder-In series 515.067... 515.267...



Features

- To lock headers series 515, straight and right-angle design with socket connectors series 525

Locking clip for headers SMT series 515.568... 515.569...



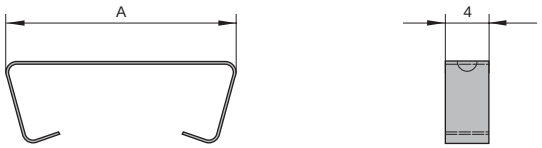
Features

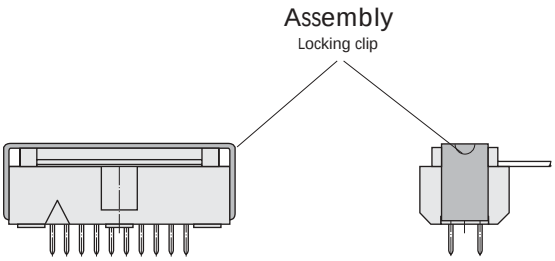
- To lock headers series 515, in SMT design with socket connectors series 525

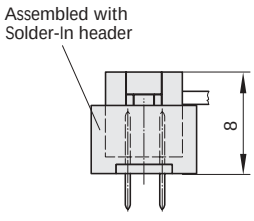
General information

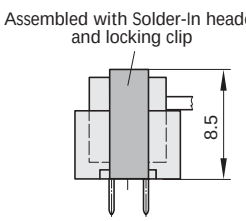
Made of high-quality Steel. Absolutely secure, yet simple assembly and disassembly (use small screwdriver).

Dimensions

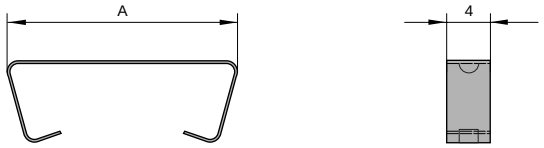


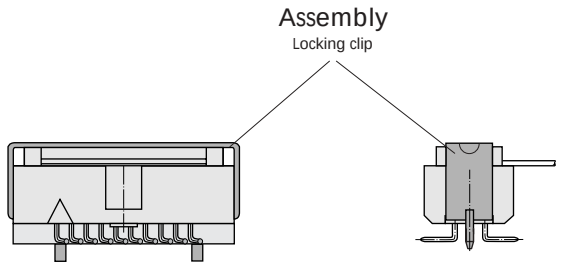


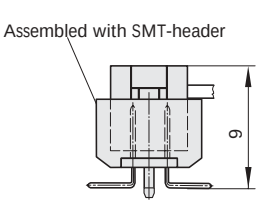


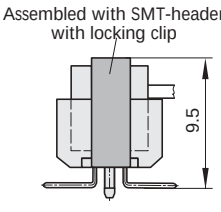


Dimensions









Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim.. A
10	515.067.710.700.000	14.35
20	515.067.720.700.000	20.70
30	515.067.730.700.000	27.05
40	515.067.740.700.000	33.40
50	515.067.750.700.000	39.75

Position	Part number	Dim. A
10	515.568.710.700.000	11.0
20	515.568.720.700.000	17.3
30	515.568.730.700.000	23.7
40	515.568.740.700.000	30.0
50	515.568.750.700.000	36.4

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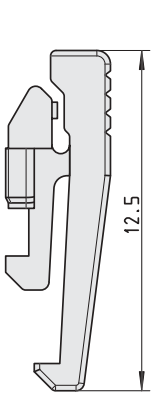
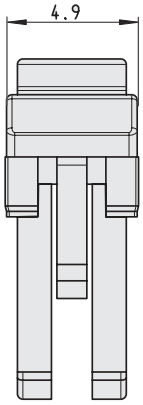
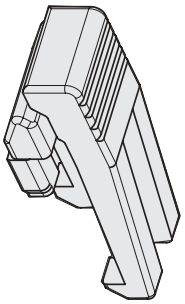
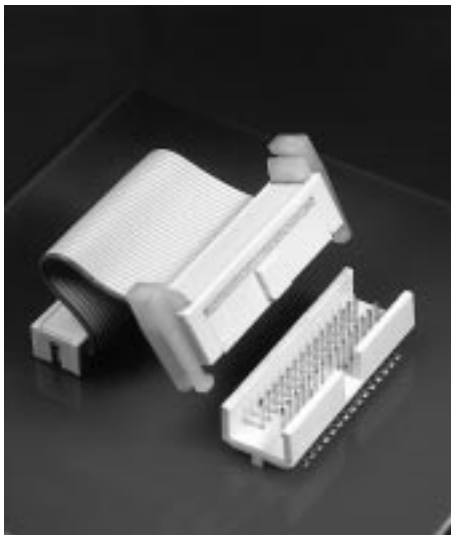
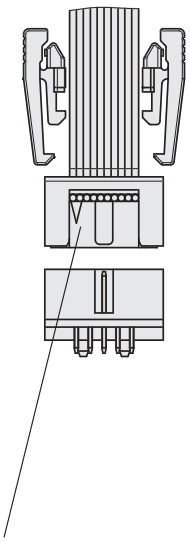
Locking latches made out of plastic only for SMT-headers



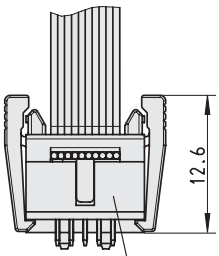




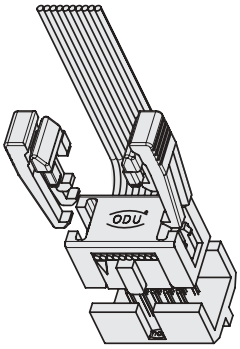


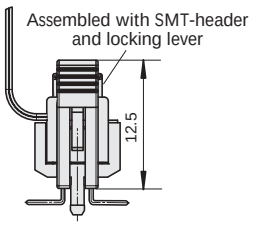


For socket
525.060.035.0...000



For header
515.568.035.0...000
515.569.035.0...000

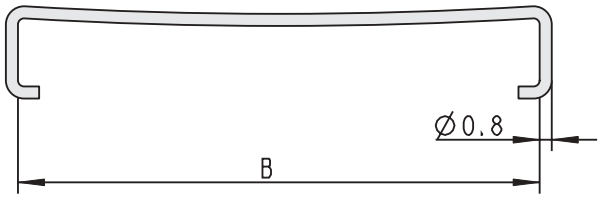




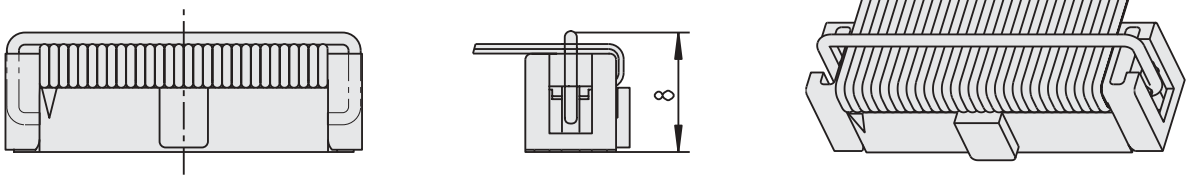
Material: PA

Part number: 525.060.105.923.000

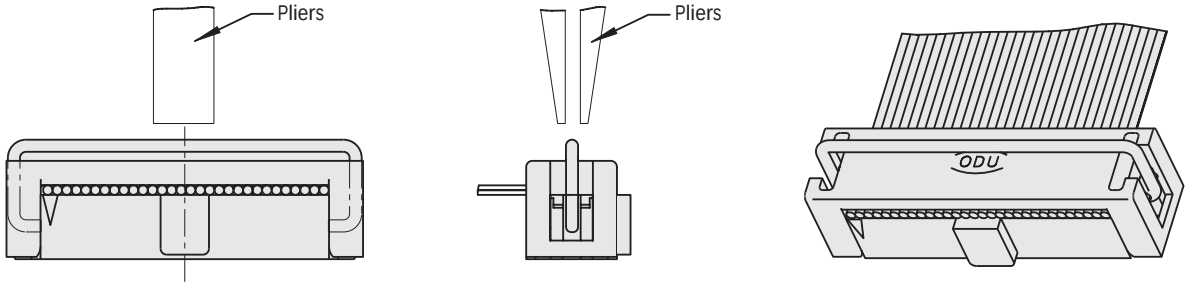
Strain relief for socket connector with IDC termination series 525.060...
Material: Spring-hard-wire

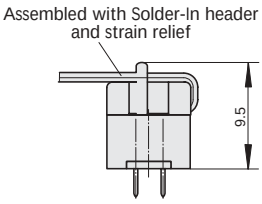


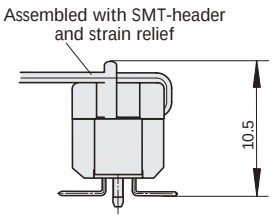
1) Shackle as a Strain Relief



2) Shackle as a discharge help







Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim. B
10	525.060.710.700.000	9.10
20	525.060.720.700.000	15.45
30	525.060.730.700.000	21.80
40	525.060.740.700.000	28.15
50	525.060.750.700.000	34.50

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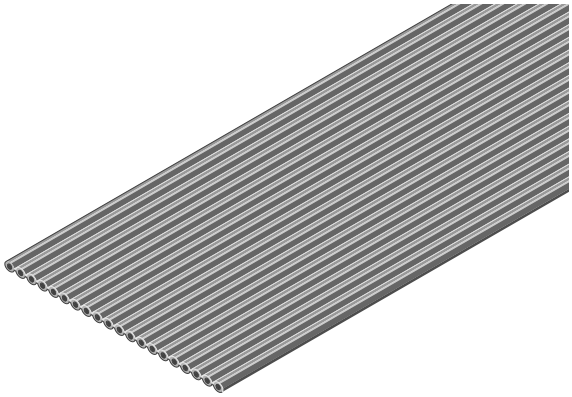
Ribbon cable AWG 30, series MINIFIX
grey, Center-to-Center spacing 0.635 mm (.025“), UL-Style 2678

Features

- 0.635 mm (.025“) spacing
- stranded conductor
- AWG 30
- mini-ribbon cable, single color
- recognized Nr. E-42.256



Technical data

Electrical specification

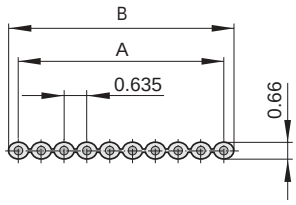
Cross section:	ca. 0.057 mm²
Conductor diameter:	ca. 0.30 mm
Conductor:	7 Stck. mit Ø 0.102 mm
Test voltage:	1500 V
Operating voltage:	150 V max.
Current load:	500 mA max.
Conductor resistance:	354 Ω/km max.
Insulation resistance:	30 MΩ x km

Mechanical specification

Operating temperature:	-20°C to +105°C

Material and surface

Conductor:	Cu-strands, tinned, (AWG 30)
Insolation:	special PVC, similar YI8 to VDE 0207; color: gray acc. RAL 7032 with single red stripe flammability acc. to VDE 0472, § 804 und UL Shore-hardness A: 90 ± 5



Ordering information and dimensions

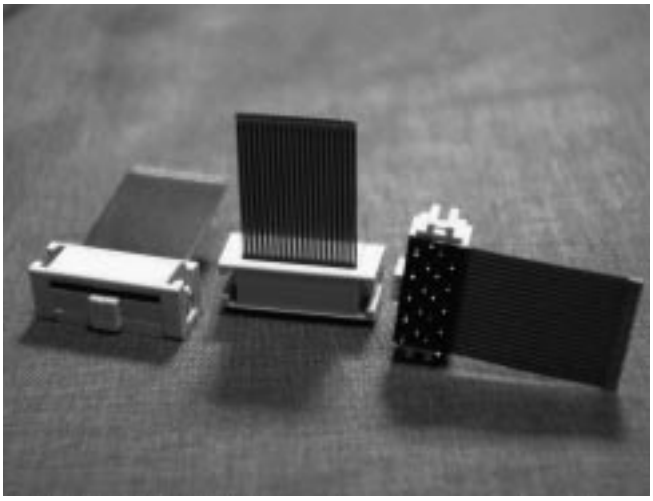
Pos.	Part number solder pin length= 15 mm	Dim. A	Dim. B	Tolerance Dim. A and B	Ordering information
10	921.659.031.010.000	5.72	6.35	± 0.15	supplied in rolls of 30.5 m (100 ft)
20	921.659.031.020.000	12.07	12.70	± 0.15	
30	921.659.031.030.000	18.42	19.05	± 0.15	
40	921.659.031.040.000	24.77	25.40	± 0.20	
50	921.659.031.050.000	31.12	31.75	± 0.20	

MINI-FIX Cable assemblies

In addition to components ODU can also supply complete cable assemblies.

Please send us your technical drawings.

Special version
Card-to-Flex foil



Technical data

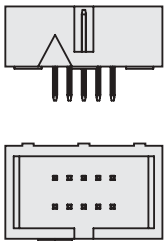
Test voltage:	Socket with flexlayer 250 Veff
Operating voltage:	Socket with flexlayer recommended < 30 V
Operating current:	0.5 A

Mechanical specification

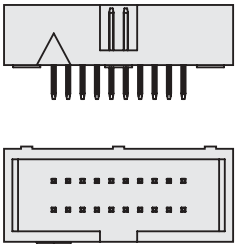
Operating temperature:	-40°C to +100°C
Insertion force:	0.18 N / contact
Mating cycles:	> 100

Header
515.067.035.....000

....010....



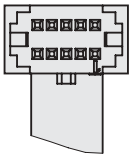
....020....



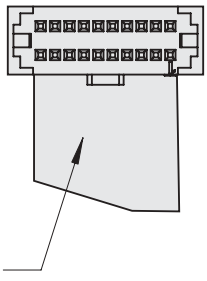
Dimensions see page 11

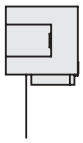
Socket
525.060.035.....000

....010....



....020....





For specification of the flexlayer please request our datasheet.

Dimensions see page 14

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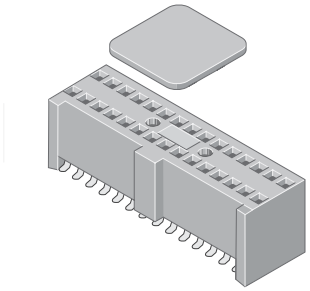
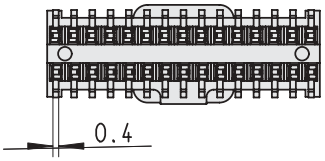
Special version
Socket SMT with broadened Insulation body plugable in MINI-FIX Header

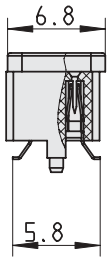
Features

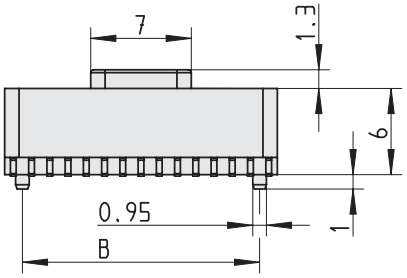
- 10-20-30-40-50 positions available
- Vacuum adapter plate
- 2 integrated guide pins

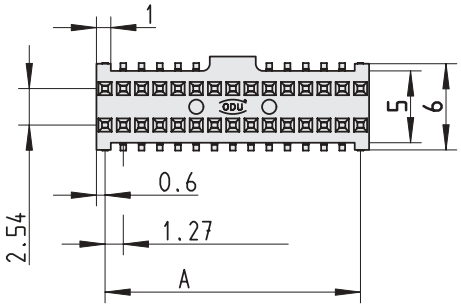


Technical data see page 10

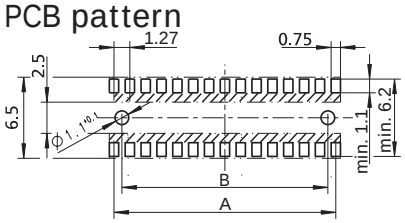








PCB pattern



= Space requirement for Termination

Plugable with MINI-FIX SMT-header (515.568. – page 13 and 515.569. – page 22)

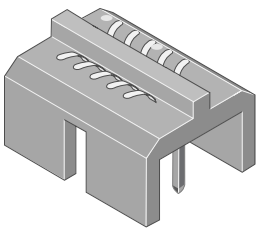
Ordering information and dimensions (All dimensions in mm)

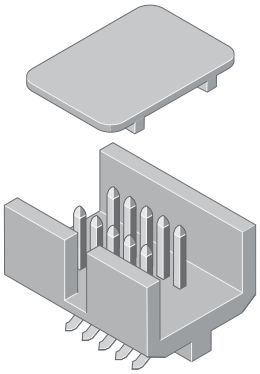
Position	Part number	Dim. A	Dim. B	Number of parts per packaging unit		
				XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	525.041.035.010.XXX*	5.08	3.81	---	---	---
20	525.041.035.020.XXX*	11.43	10.16	---	---	---
30	525.041.035.030.XXX	17.78	16.51	22	---	500
40	525.041.035.040.XXX	24.13	22.86	16	---	550
50	525.041.035.050.XXX*	30.48	29.21	---	---	---

* in preparation

Special version

SMT-header without guide pins

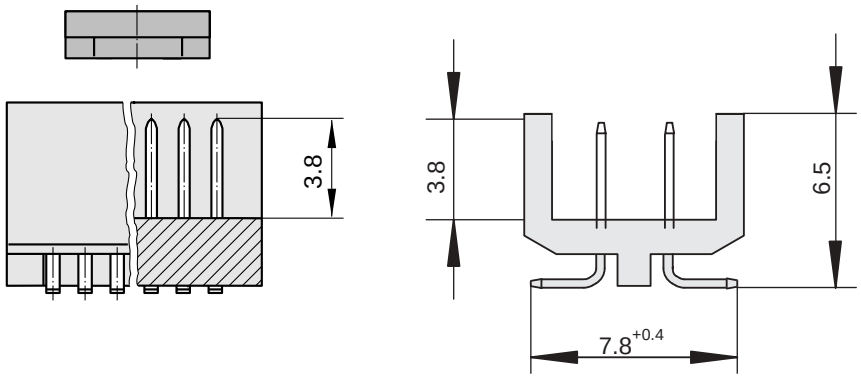


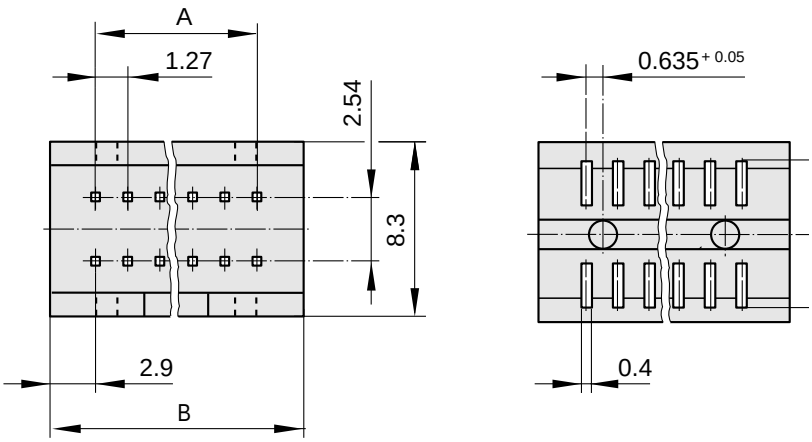


Features

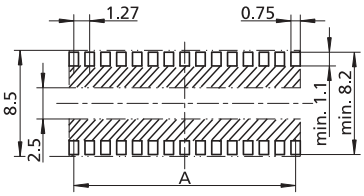
- Vacuum adapter plate
- SMT version
- pin cross-section 0.38 x 0.38 mm
- 10-20-30-40-50 positions available
- without guide pins

Technical data see page 10





PCB pattern



= Space requirement for Termination

Ordering information and dimensions (All dimensions in mm)

Position	Part number	Dim. A	Dim. B	Number of parts per packaging unit		
				XXX = 003 Tube	XXX = 010 Box	XXX = 050 Tape/Reel
10	515.569.035.010.XXX*	5.08	3.81	39	---	530
20	515.569.035.020.XXX*	11.43	10.16	25	---	530
30	515.569.035.030.XXX	17.78	16.51	18	---	530
40	515.569.035.040.XXX	24.13	22.86	14	---	530
50	515.569.035.050.XXX*	30.48	29.21	10	---	530

* in preparation

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Tooling

For efficient and cost effective termination between ODU MINI-FIX and ODU FLAKAFIX (Grid 2,54 x 2,54 mm) connectors and ribbon cables ODU offers a number of specially developed tools and accessories. All tools meet the demand for high quality. The tools are designed for simple and quick exchange of inserts and press plates for all position Numbers 10-20-30-40-50. Connectors can be terminated parallel or in a right-angle to the tool.

The bench press is of compact and rugged design. Selection of tools and inserts is simple and should prevent investment in the wrong tool set for a particular production

Cable tooling

Bench press, size 2
mounted on base plate,
table for tool insert

Features

- hand press
- ideal for small production runs for all ODU MINI-FIX

Ordering information

Bench press, size 2

Part number: 099.100.000.000.000

Tool inserts for bench press, size 2

The tools are adjustable for every position.

Ordering information

Version	for series	Base plate	Upper plate
Socket connector, single-U contact, double wiping	525.060	598.120.005.600.000	598.120.019.600.000
Transition, 2-row	533.040	598.120.005.600.000	598.120.018.600.000

Hand cable cutter

Features

- cuts ribbon cables
- easy to use
- sideway stop
- true right-angle cutting

Ordering information

Hand cable cutter

Part number: 080.001.001.000.000

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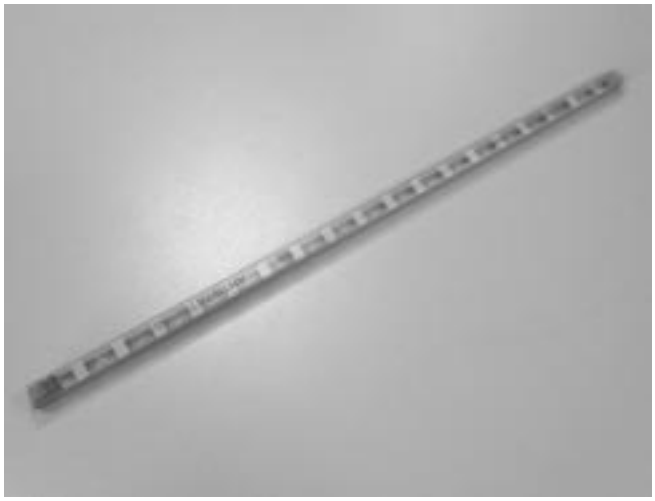
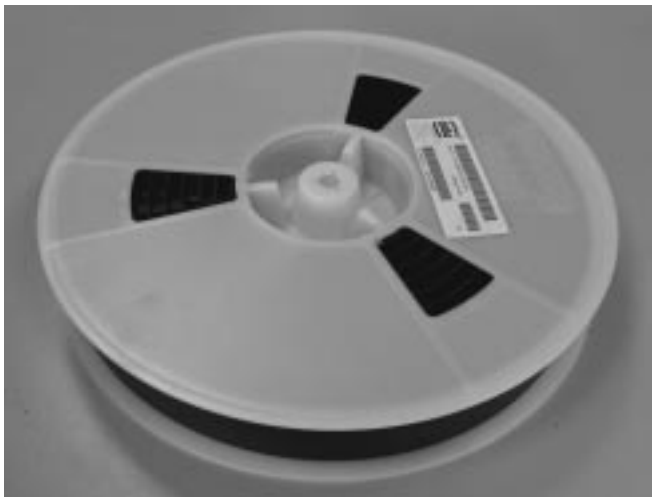
Packing versions for ODU MINI-FIX

Box
XXX = 010

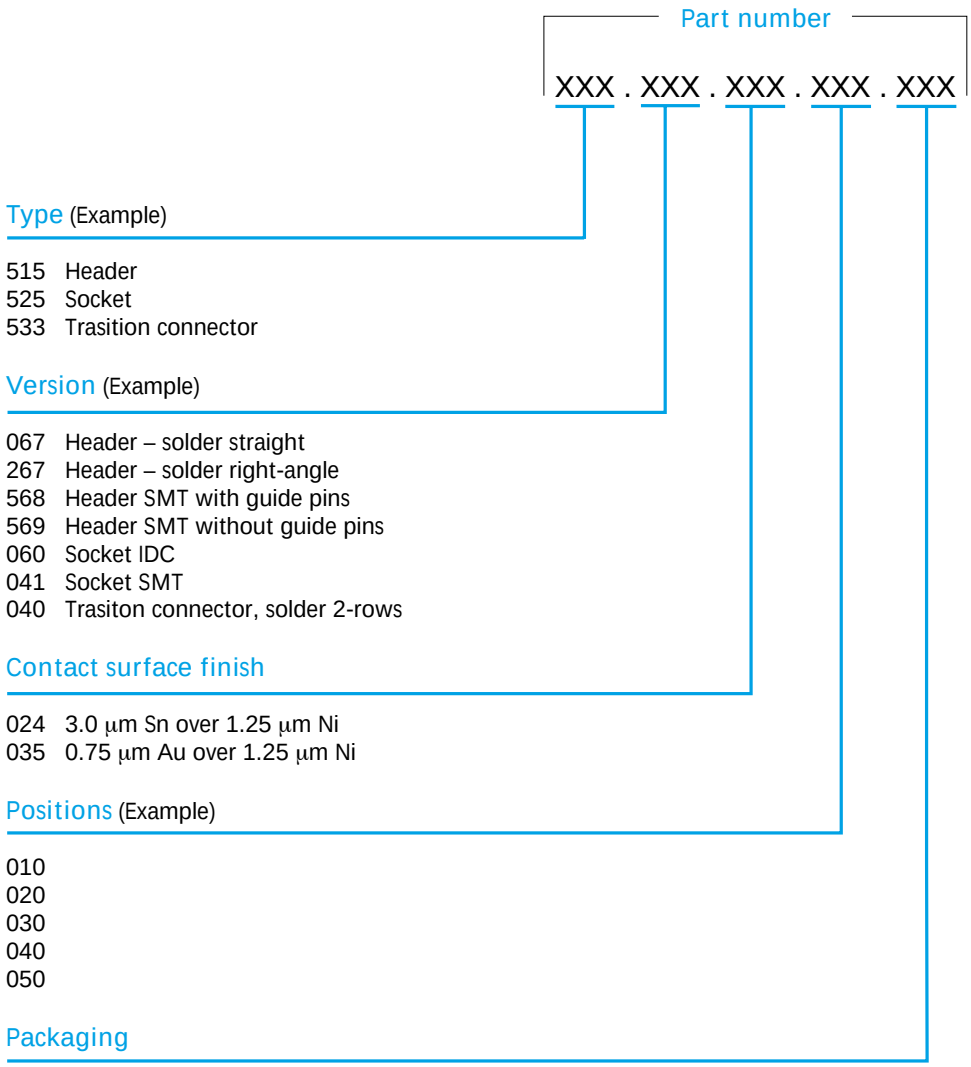
Tube
XXX = 003



Tape/Reel
XXX = 050



Ordering key



Type (Example)

515 Header
525 Socket
533 Trasition connector

Version (Example)

067 Header – solder straight
267 Header – solder right-angle
568 Header SMT with guide pins
569 Header SMT without guide pins
060 Socket IDC
041 Socket SMT
040 Trasiton connector, solder 2-rows

Contact surface finish

024 3.0 µm Sn over 1.25 µm Ni
035 0.75 µm Au over 1.25 µm Ni

Positions (Example)

010
020
030
040
050

Packaging

003 Tube
010 Box
050 Tape/Reel

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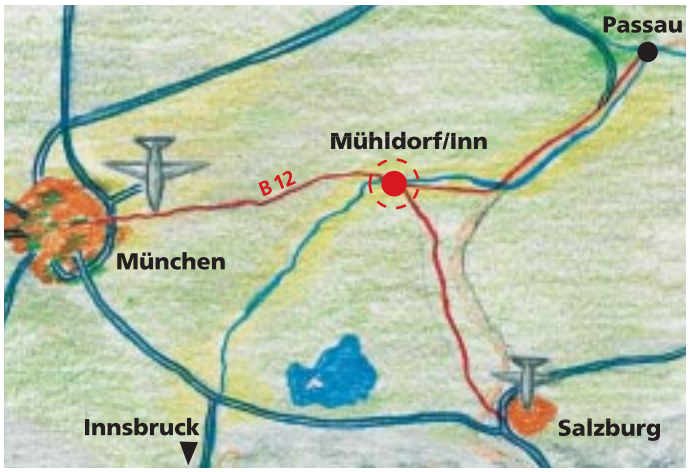
ODU´s headquarters and factory are located in Mühldorf, at the river Inn, approximately 50 miles east of Munich, at the foothills of the Bavarian Alps.

Photo of city Mühldorf/Inn

Mühldorf – an idyllic small town with its typicall Inn-Salzach architecture.



Werr. 06/02

Steckverbindungssysteme

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