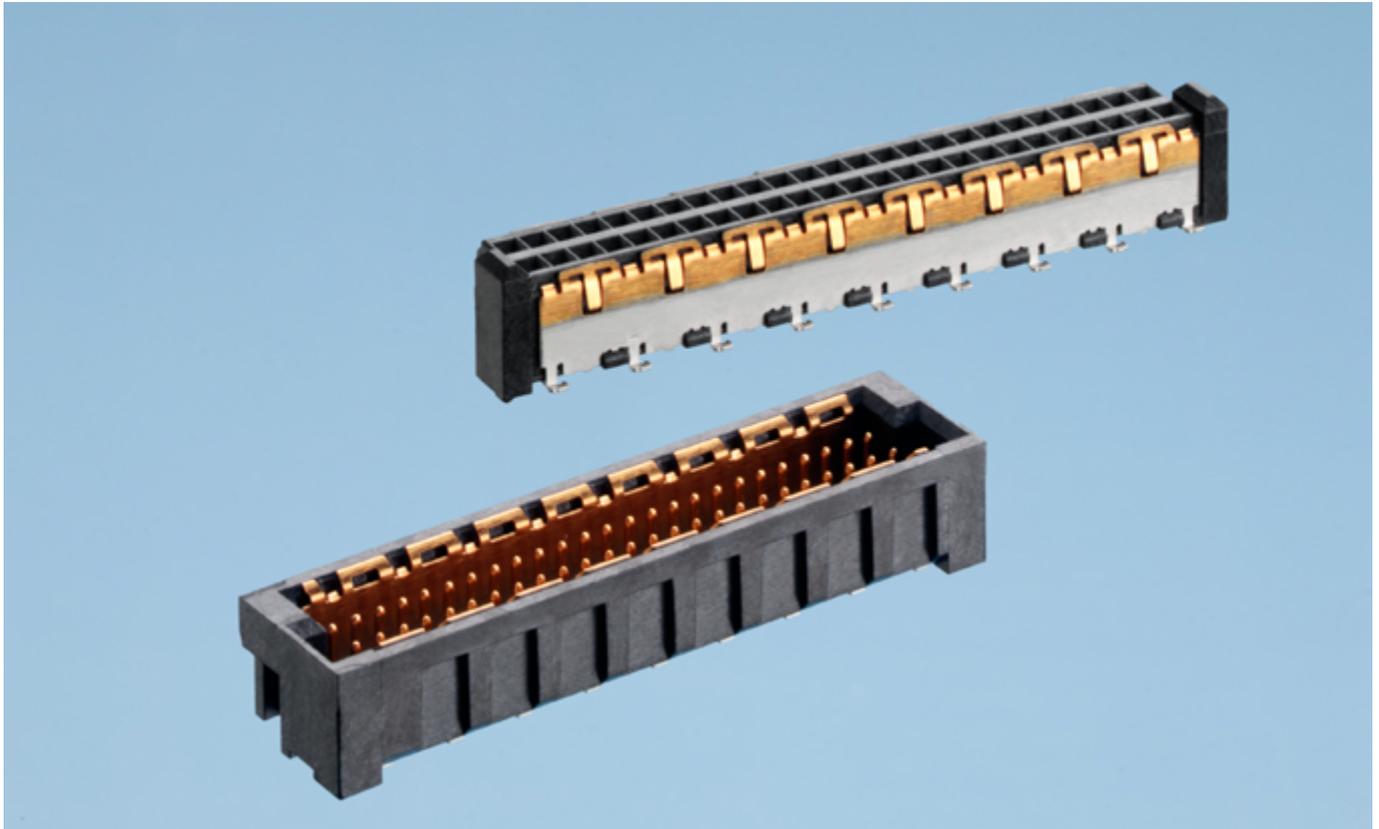


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# MicroSpeed<sup>®</sup> Application Note 4.0





### General

The high-speed SMT connector MicroSpeed with a pitch of 1.0 mm was especially designed for modern board-to-board applications in telecom and datacom equipments. For next generation systems with data rates of 10 GBit/s and more this modular connector system is the right solution. MicroSpeed features differential signal transmission with a impedance of 100 Ohm or single ended signal transmission with a impedance of 50 Ohm. An excellent signal integrity is achieved by a design with 2 signal and 2 shield contact rows. The termination pins of the shield contacts are available in 2 options: SMT or THR (Thru Hole Reflow). For fully automatic SMT assembly ERNI provides tape-and-reel packaging.

A further development for rugged applications is available - the MicroSpeed Blind Mate connector housing comes along with thicker side walls and is manufactured of high impact resisant thermoplastic UL94 V-0 rated LCP. The housing provides two polarized guide elements for alignment and secure mating.

For the completion of the MicroSpeed portfolio right angle versions are available. At present, customers can choose from a wide range of connector mating possibilities - direct attachment to a printed circuit board (PCB) in either a right angle, Board-to-Board or co-planar arrangement for space-saving connections.

For rugged applications the MicroSpeed 90° version are also comes along as blind mate version with reinforced side walls and two polarized guide elements for alignment and secure mating.

### Features

Pitch:

- within a row: 1.0 mm
- between rows: 1.5 mm

Style:

- Vertical male and vertical female connectors standard or blind mate
- Right angle male and female connectors standard or blind mate
- For vertical and right angle versions are also special EMC types available

Termination:

- signal contacts: SMT
- ground contacts: THR or SMT

### Technical Data

#### Electrical data

- Differential impedance: 100 Ohm
- Single ended impedance: 50 Ohm
- Crosstalk: < 2% at 50 ps signal risetime

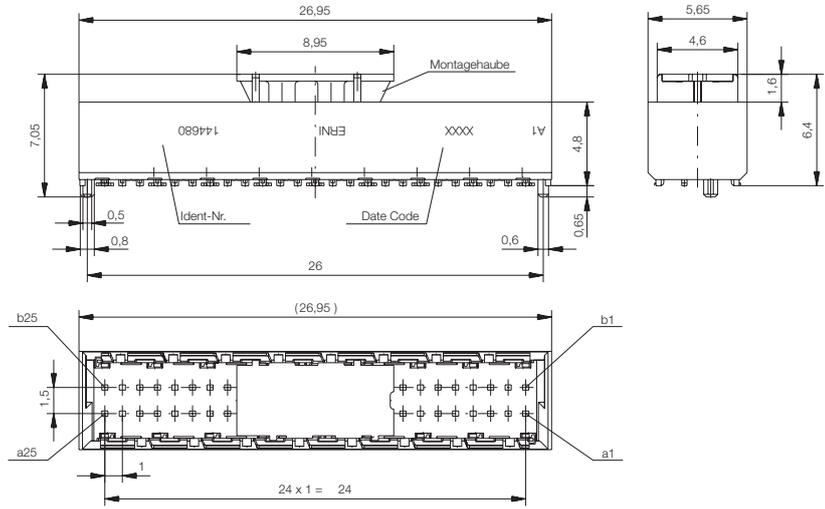
#### Material data

- Insulation body: LCP
- Contact material: Cu alloy
- Plating:
  - Mating area: Au
  - Termination area: Sn

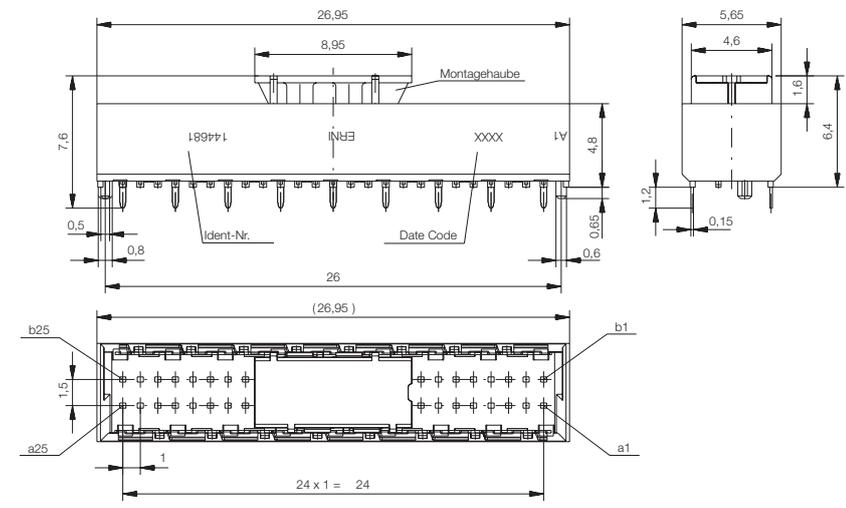


### Dimensional Drawings

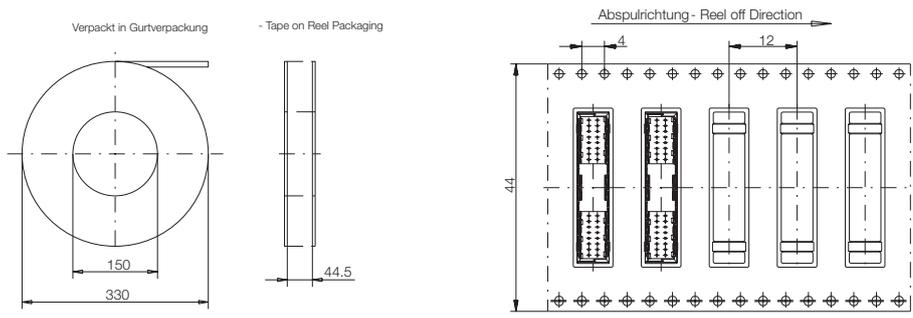
#### Male Connector SMT Version



#### Male Connector SMT/THR Version

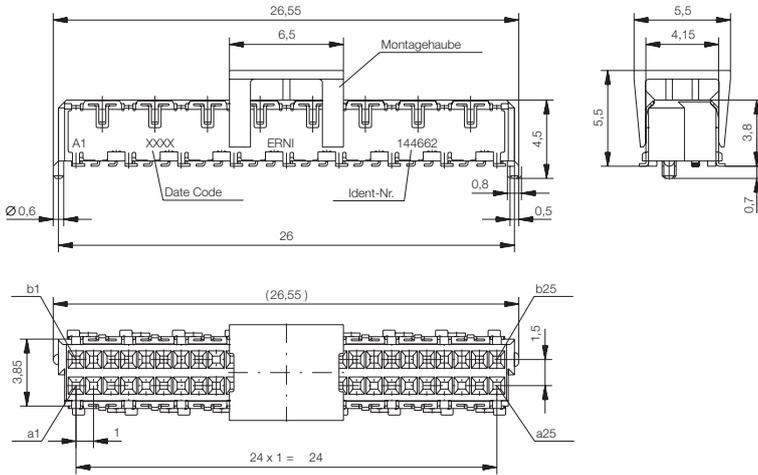


### Packaging

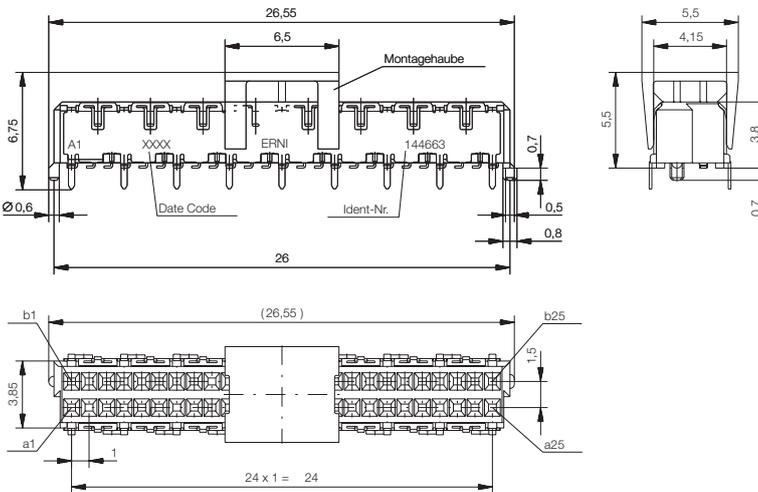




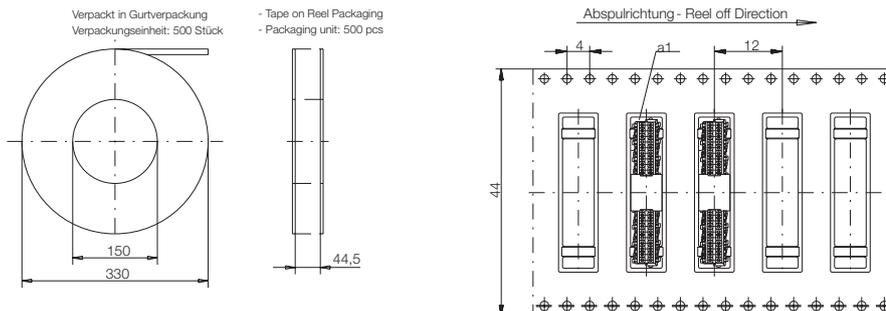
### Female Connector SMT Version



### Female Connector SMT/THR Version



### Packaging

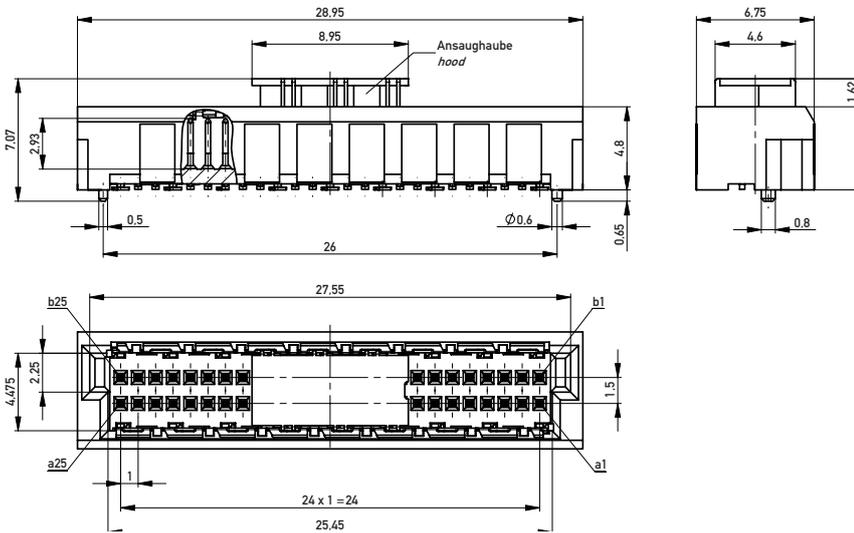


# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate 2-Row Vertical Connectors

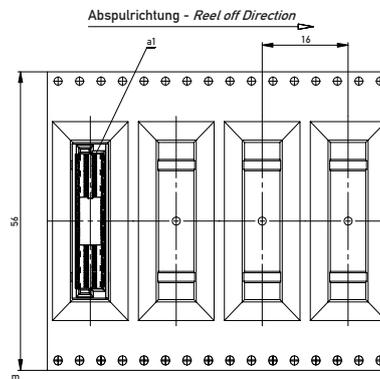
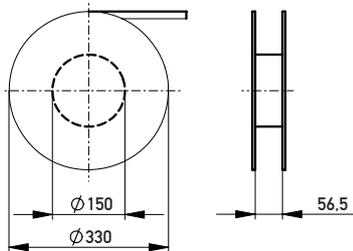


### Male Connector Blind Mate SMT Version



### Packaging

Verpackt in Gurtverpackung - *Tape on Reel Packaging*  
 Verpackungseinheit: 400 Stück - *Packaging unit: 400 pcs*

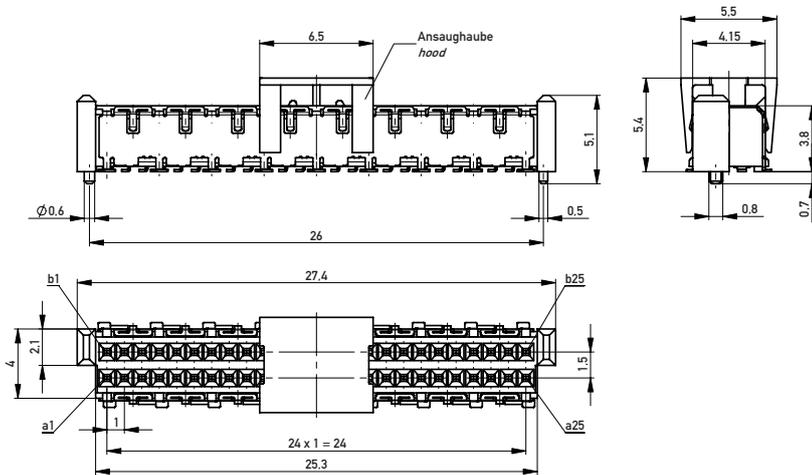


# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate 2-Row Vertical Connectors

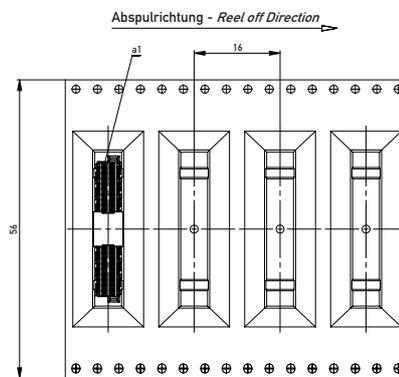
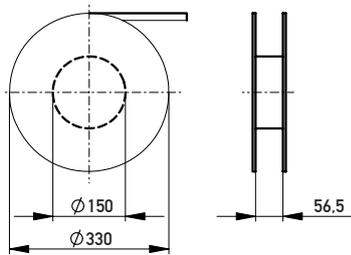


### Female Connector Blind Mate SMT Version



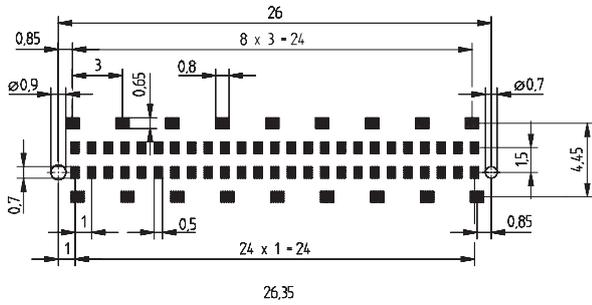
### Packaging

Verpackt in Gurtverpackung - *Tape on Reel Packaging*  
 Verpackungseinheit: 400 Stück - *Packaging unit: 400 pcs*

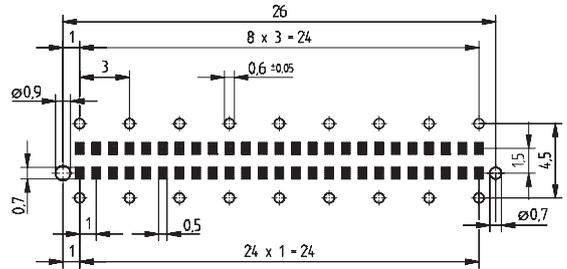




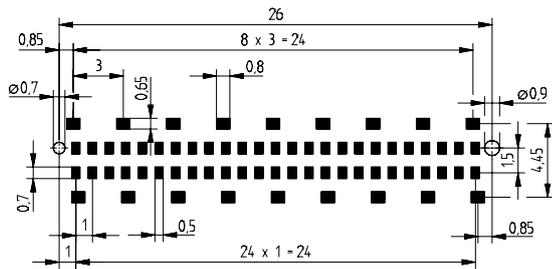
Vertical Male Connectors SMT Version



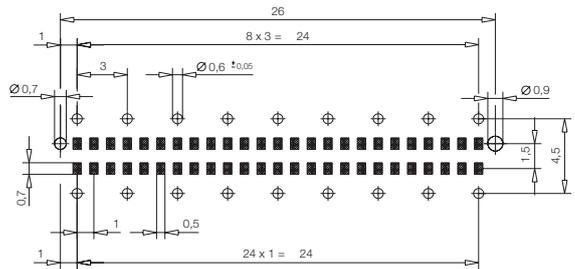
Vertical Male Connectors SMT/THR Version



Vertical Female Connectors SMT Version

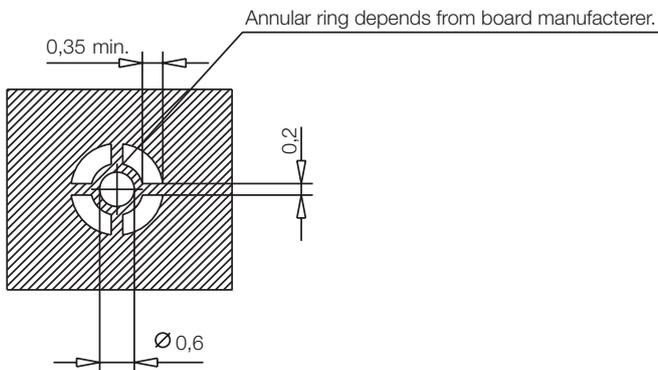


Vertical Female Connectors SMT/THR Version



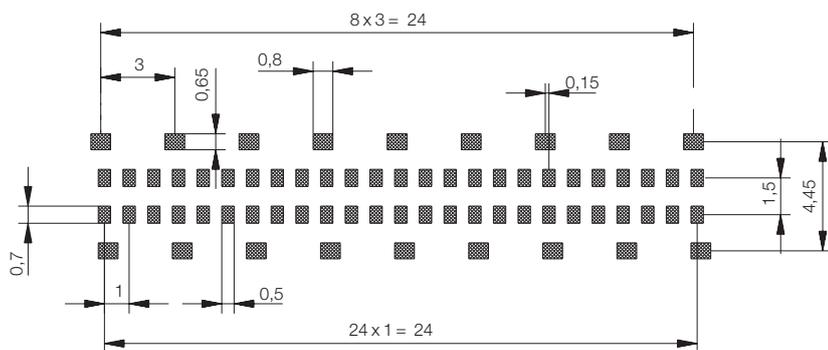
### Heat trap

We recommend the heat trap design for the shielding THR vias in the GND-Layer to improve soldering behavior.



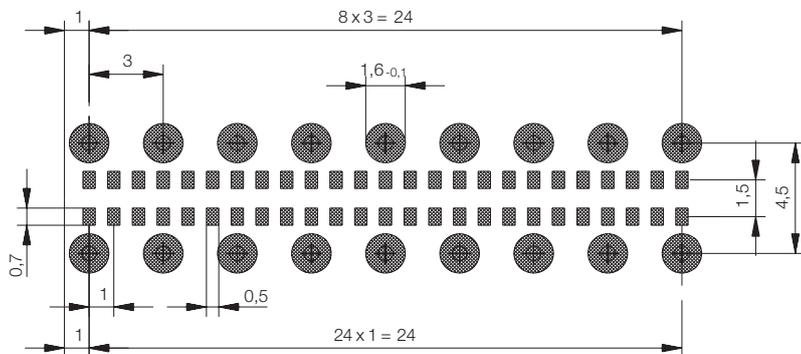
We recommend a stencil thickness of 6 mil/150µm.

### Stencil for SMT Version



Stencil is for male and female the same.  
The position in relationship to the guiding holes have to be considered.

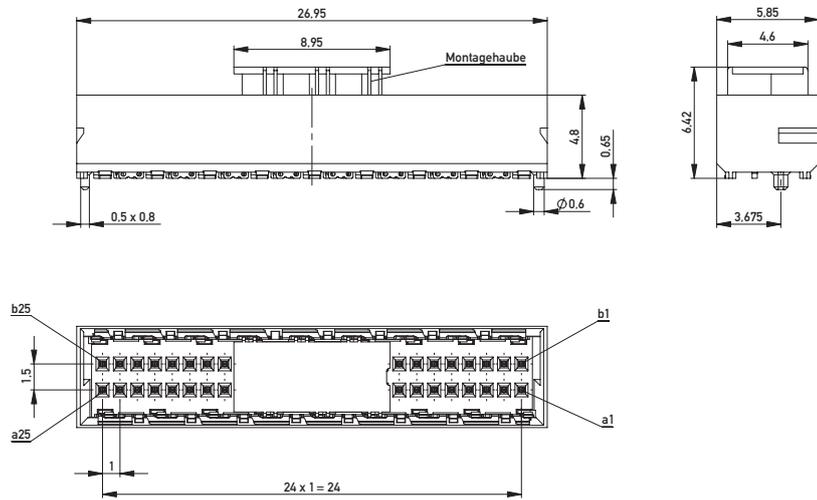
### Stencil for SMT/THR Version



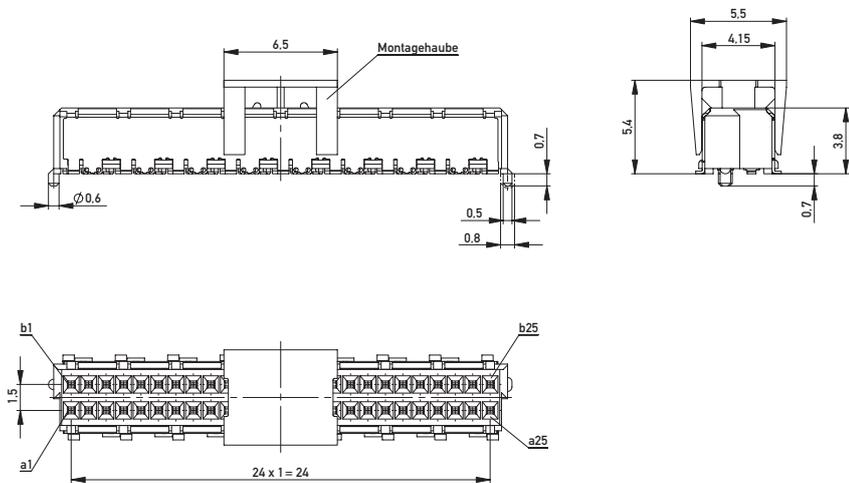


### Dimensional Drawings

#### Male Connector SMT Version

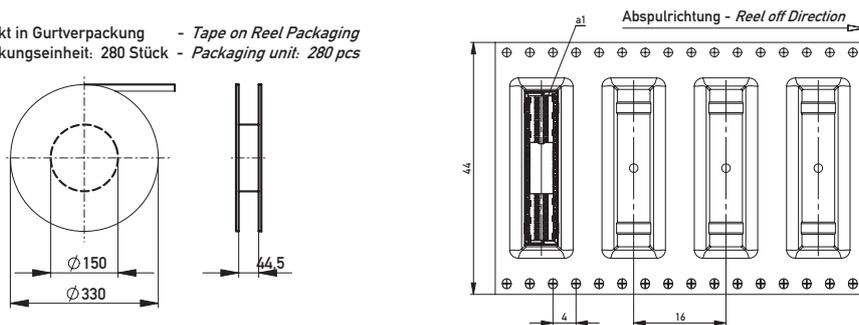


#### Female Connector SMT Version



### Packaging Male and Female Connectors

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 280 Stück - Packaging unit: 280 pcs

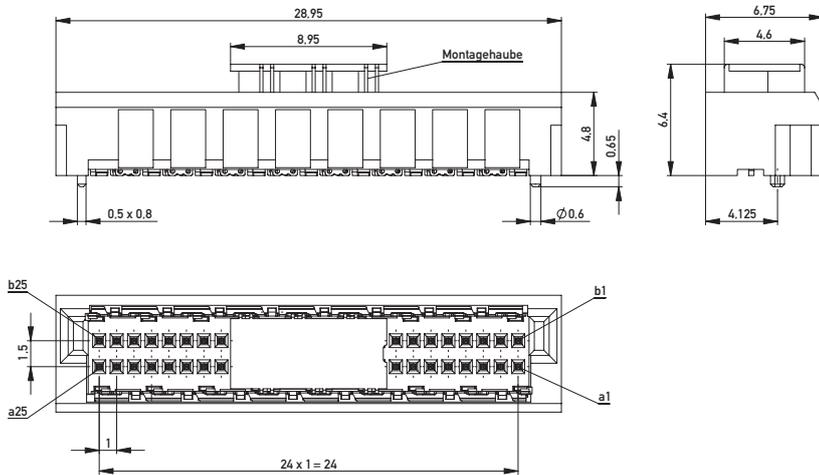


# ERNI MicroSpeed - Application Note 4.0

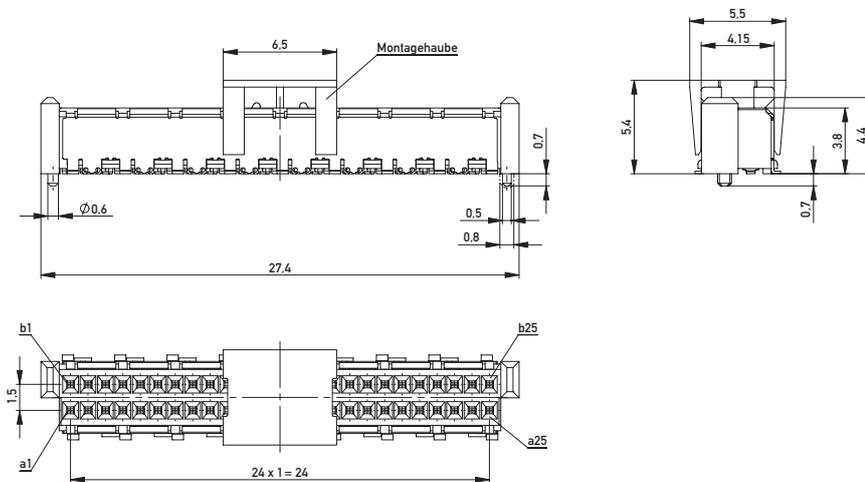
## EMC Blind Mate 2-Row Vertical Connectors



### Male Connector Blind Mate SMT Version

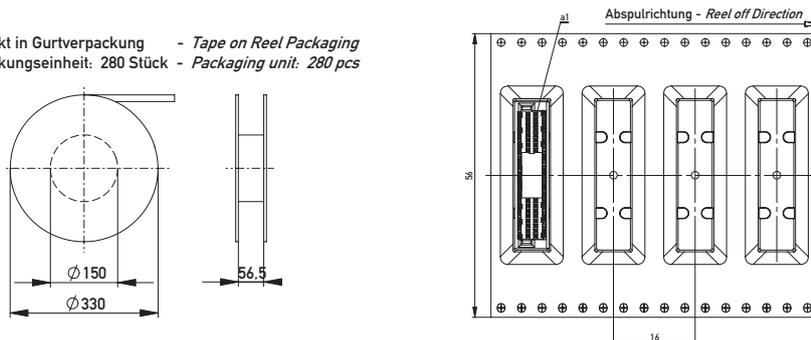


### Female Connector Blind Mate SMT Version



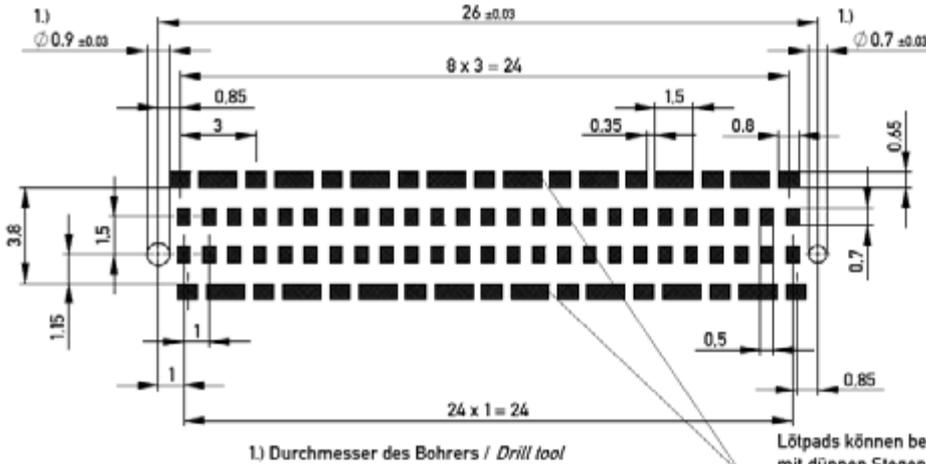
### Packaging Male and Female Connectors

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 280 Stück - Packaging unit: 280 pcs



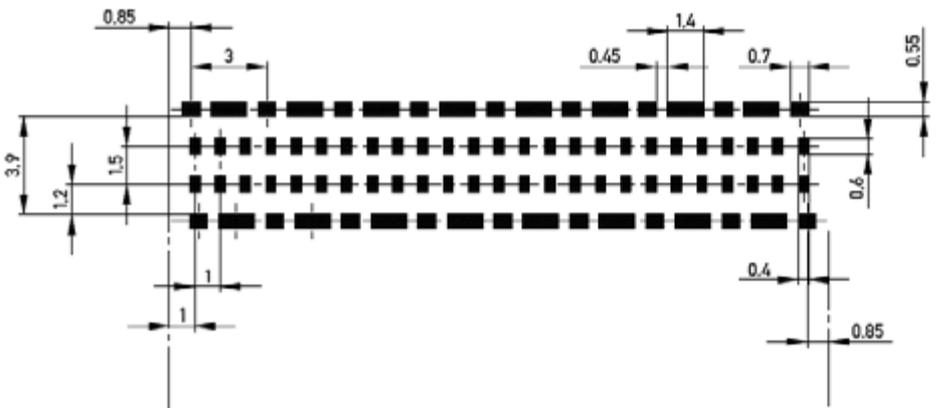


### Male Connectors

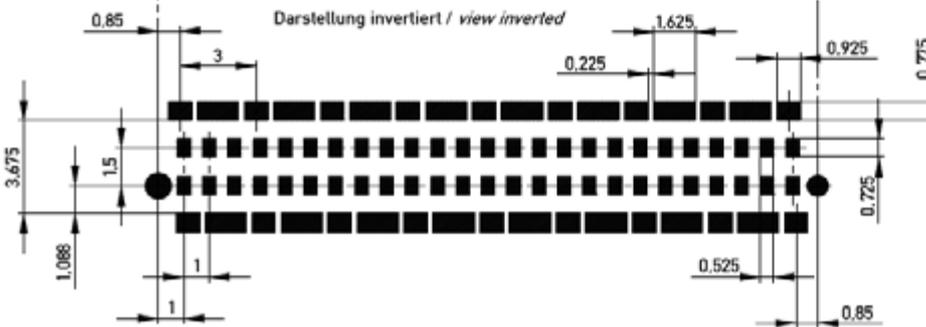


Copper Pads

Löt pads können bei bestimmten EMV-Anwendungen mit dünnen Stegen 0.2mm verbunden werden.  
 For special EMC requirements, pads can be connected with 0.2mm (8mil) traces.



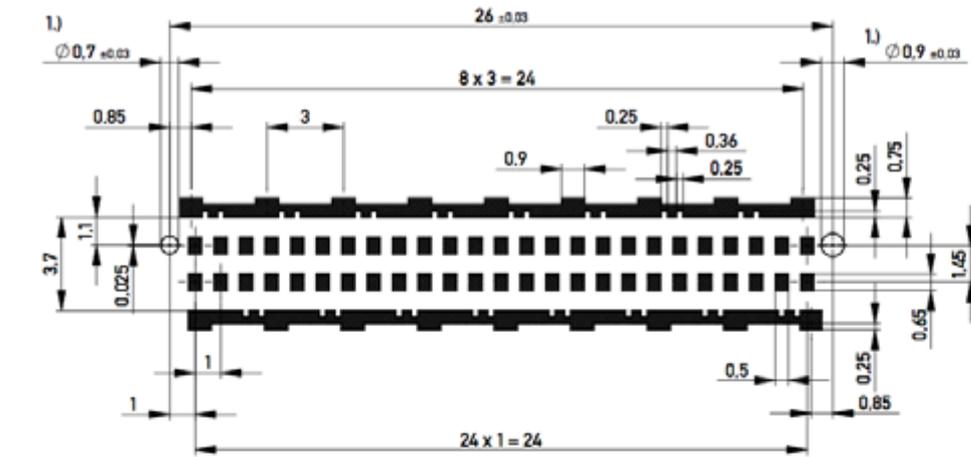
Solder Paste



Solder resist

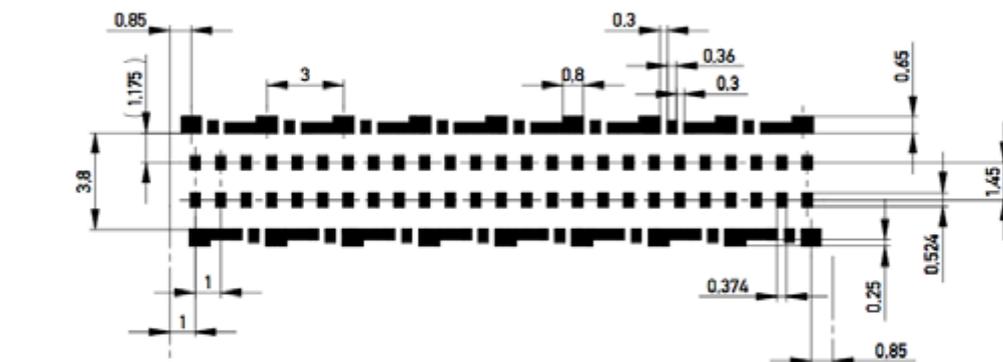


Female Connectors

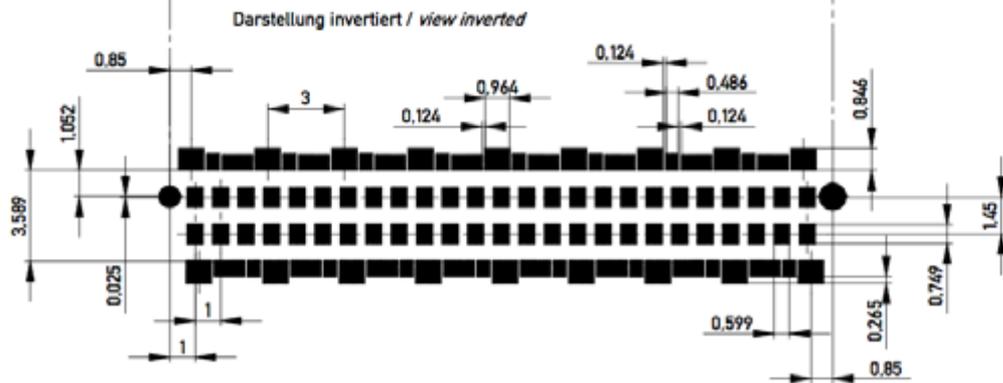


Copper Pads

1) Durchmesser des Bohrers / Drill tool



Solder Paste



Solder resist

# ERNI MicroSpeed - Application Note 4.0

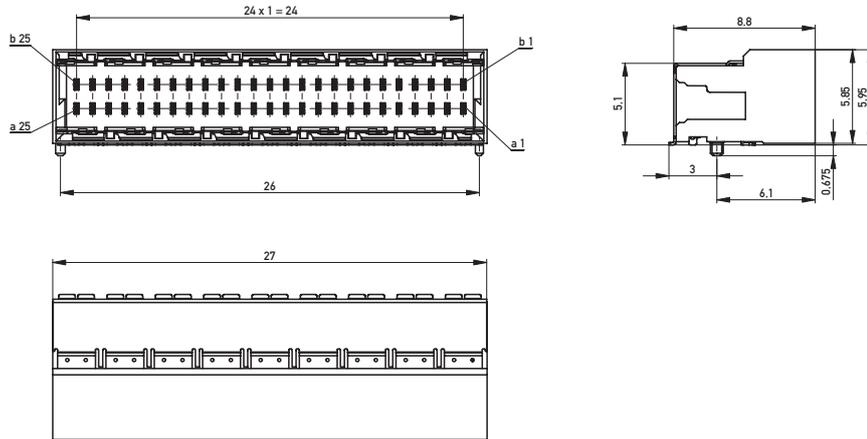
## EMC Standard 2-Row Right Angle Connectors



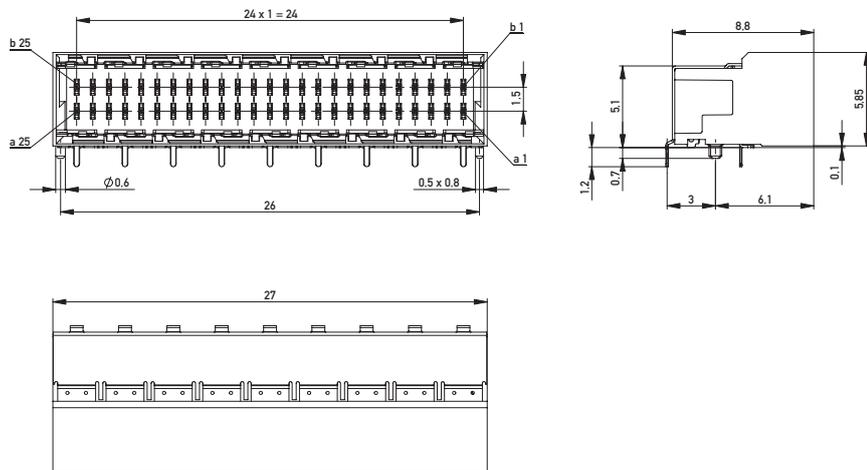
### Dimensional Drawings

Male Connectors

SMT Version

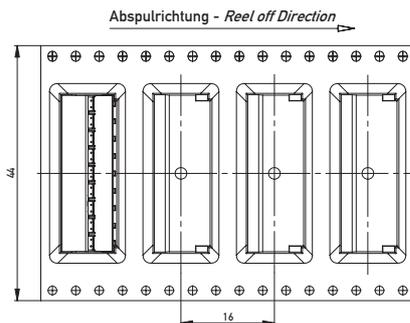
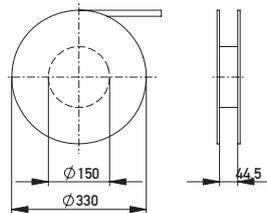


SMT/THR Version



### Packaging

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 400 Stück - Packaging unit: 400pcs



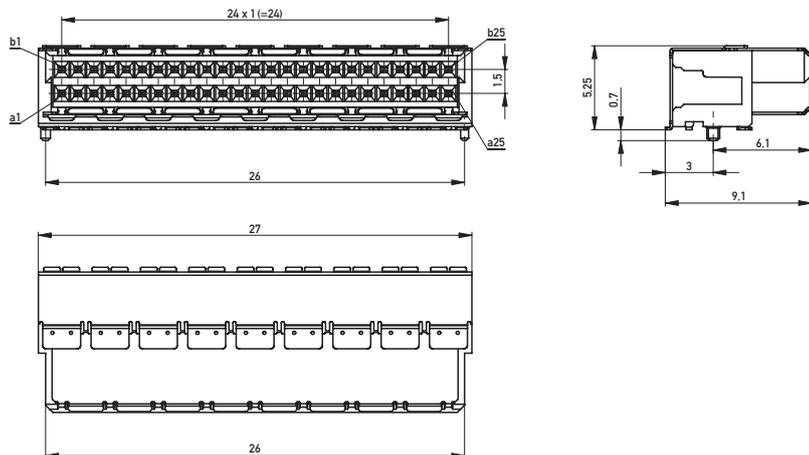
# ERNI MicroSpeed - Application Note 4.0

## EMC Standard 2-Row Right Angle Connectors

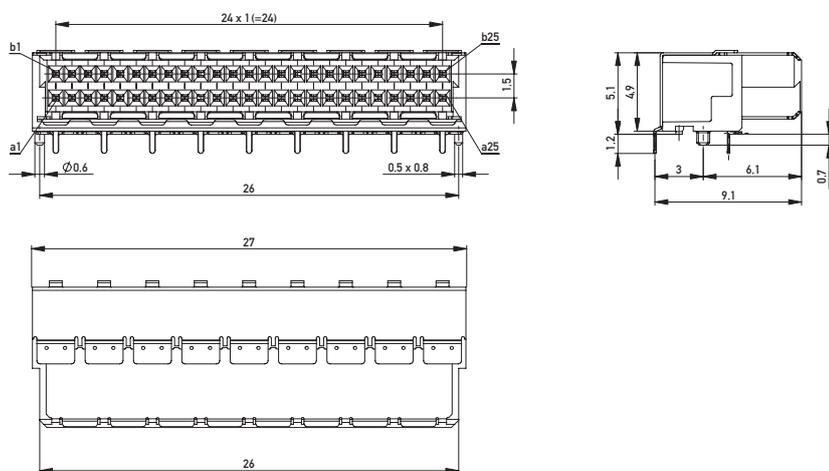


Female Connectors

SMT Version

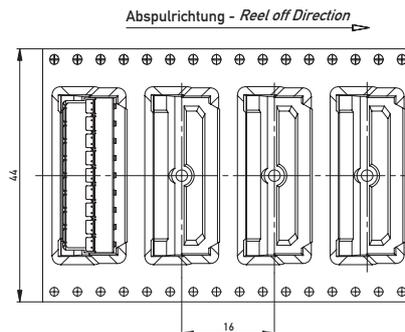
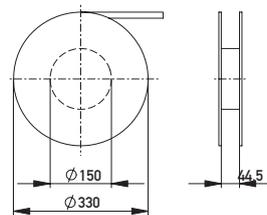


SMT/THR Version



### Packaging

Verpackt in Gurtverpackung - *Tape on Reel Packaging*  
 Verpackungseinheit: 500 Stück - *Packaging unit: 500 pcs*



# ERNI MicroSpeed - Application Note 4.0

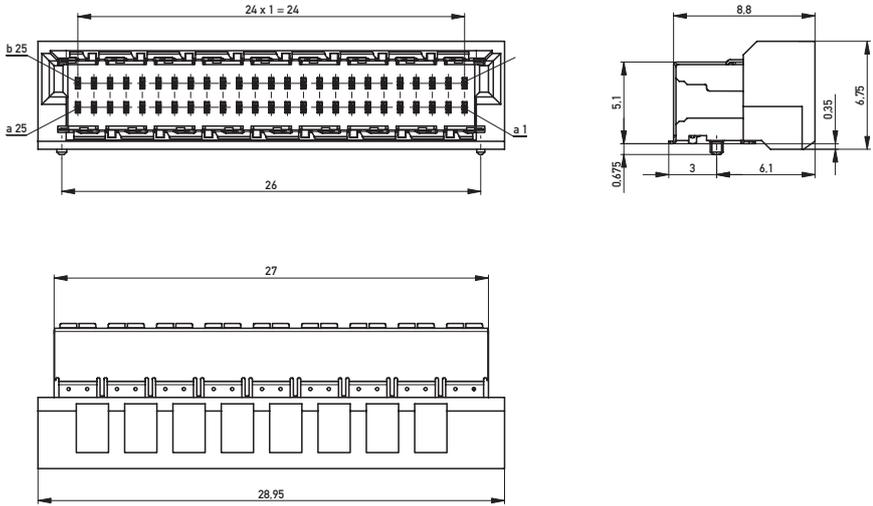
## EMC Blind Mate 2-Row Right Angle Connectors



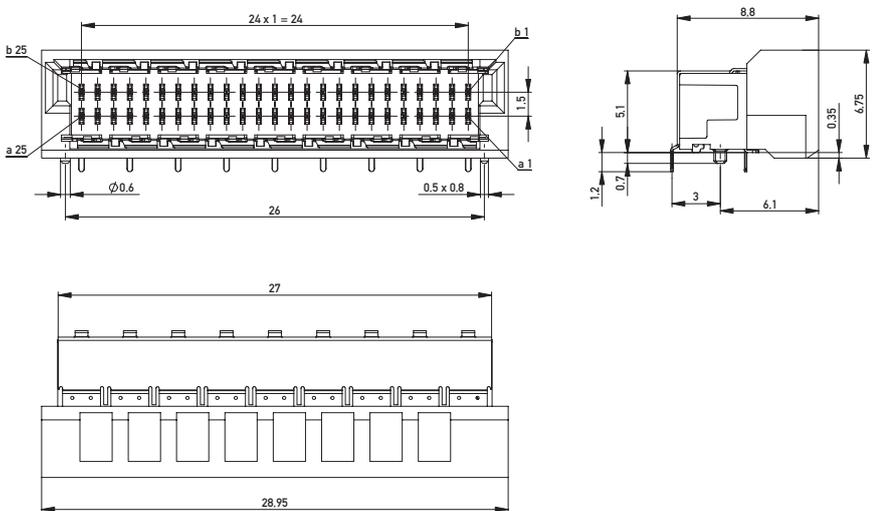
### Dimensional Drawings

Male Connectors Blind Mate

SMT Version

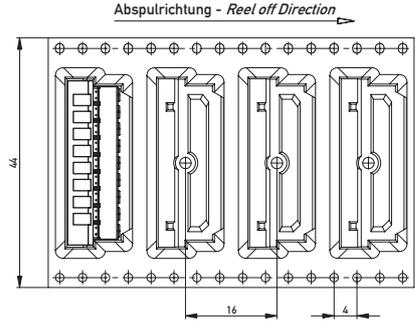
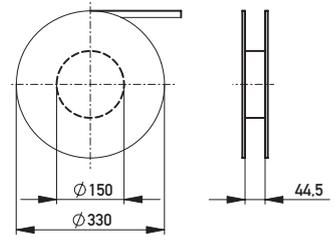


SMT/THR Version



### Packaging

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 400 Stück - Packaging unit: 400 pcs



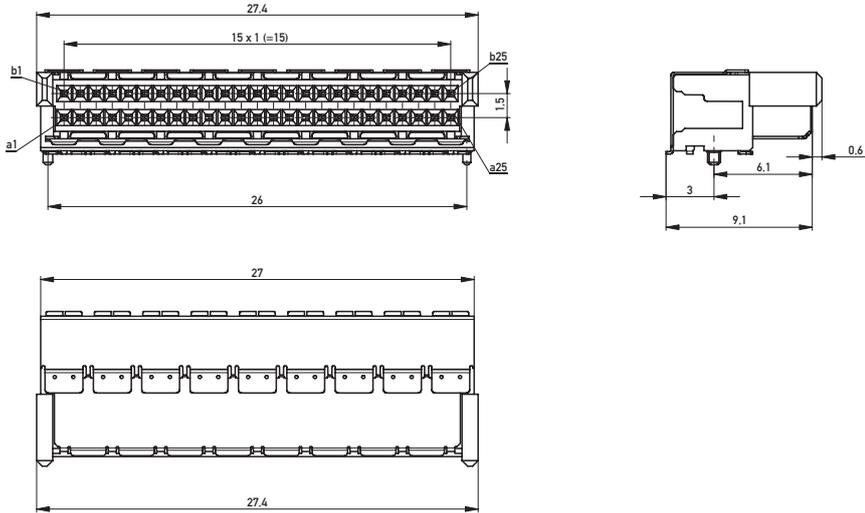
# ERNI MicroSpeed - Application Note 4.0

## EMC Blind Mate 2-Row Right Angle Connectors

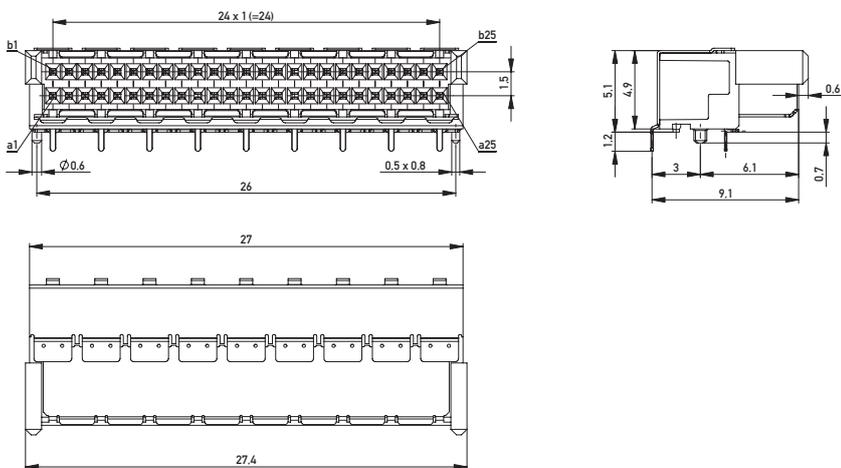


Female Connectors Blind Mate

SMT Version

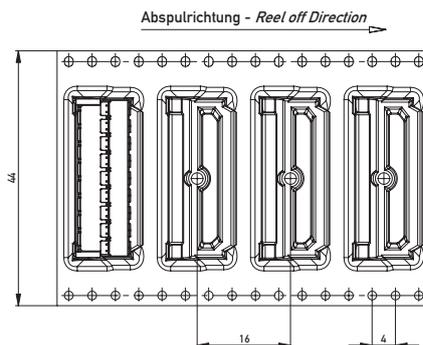
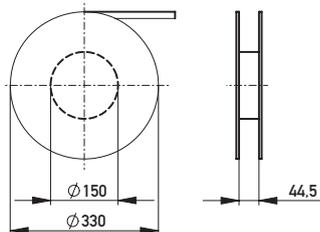


SMT/THR Version



### Packaging

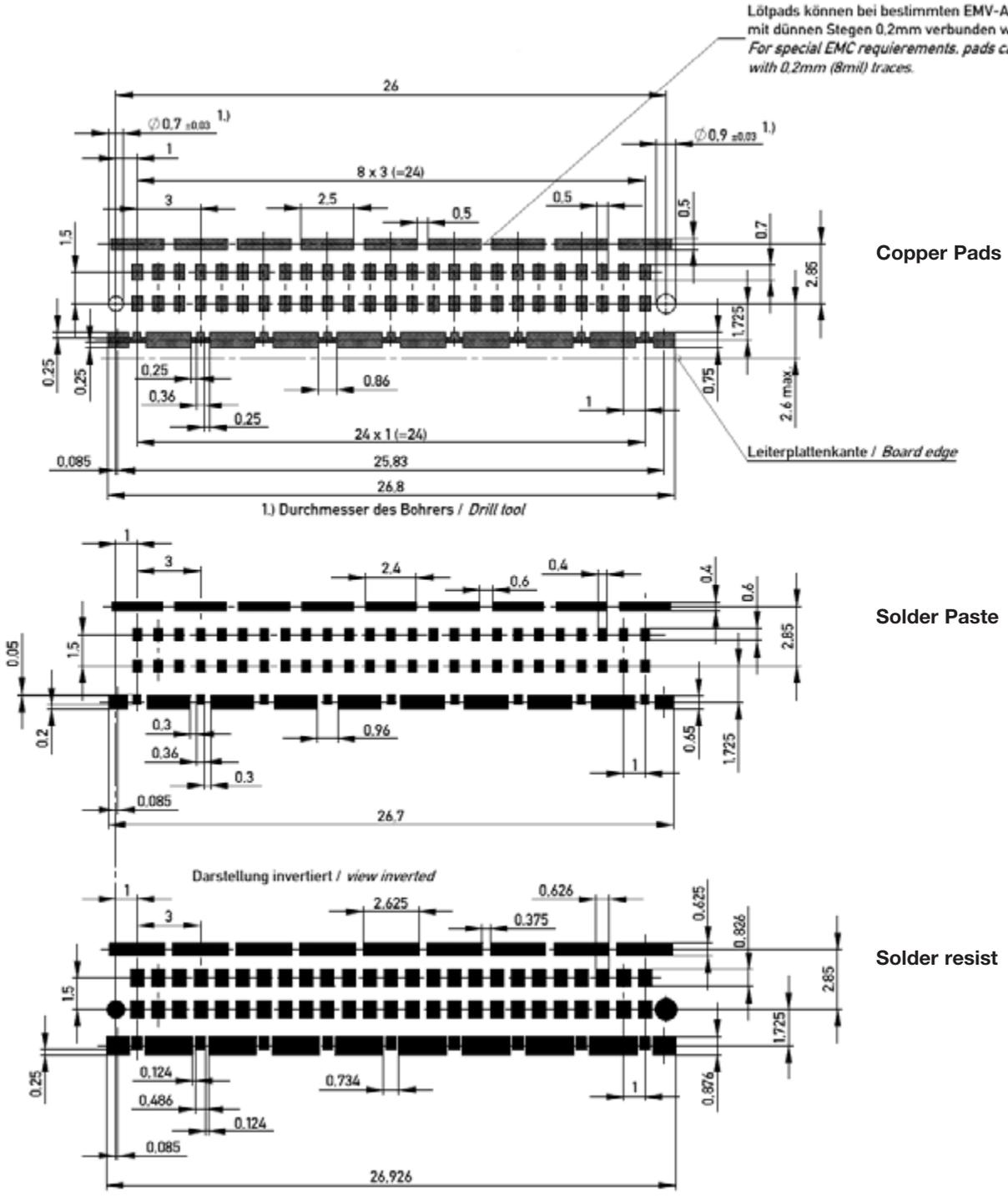
Verpackt in Gurtverpackung - *Tape on Reel Packaging*  
 Verpackungseinheit: 500 Stück - *Packaging unit: 500 pcs*





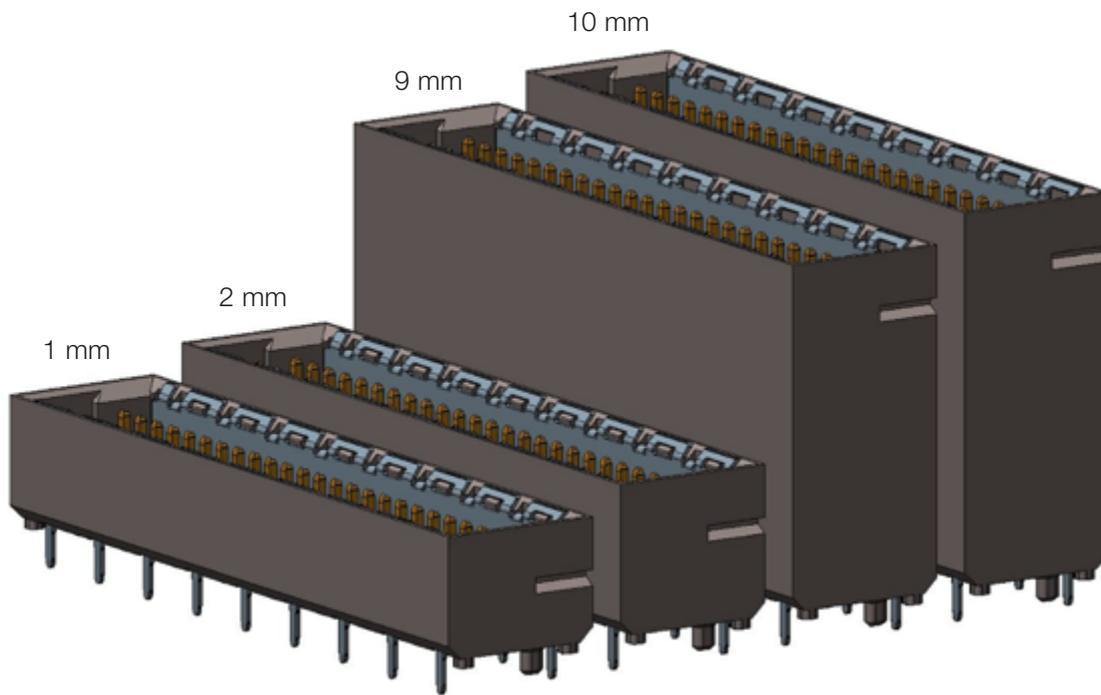
Male and Female Connectors Standard and Blind Mate

Löt pads können bei bestimmten EMV-Anwendungen mit dünnen Stegen 0.2mm verbunden werden.  
 For special EMC requirements, pads can be connected with 0.2mm (8mil) traces.

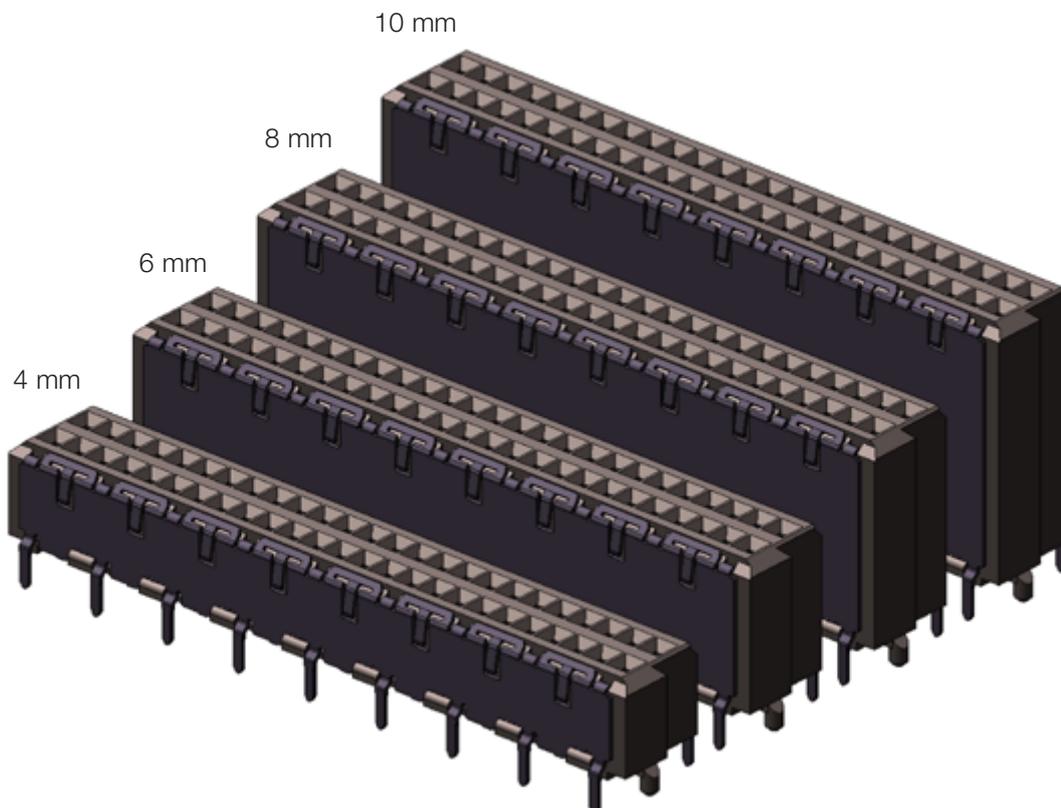




### Male Connector Heights



### Female Connector Heights





### Standard 2-Row Vertical Connectors

Male			Female			
Height	Part Number SMD	Part Number THR	Height	Part Number SMD	Part Number THR	Board-to-Board Height
1 mm	144680	144681	4 mm	144662	144663	5 mm
2 mm	224557	224558	4 mm	144662	144663	6 mm
1 mm	144680	144681	6 mm	224512	224513	7 mm
2 mm	224557	224558	6 mm	224512	224513	8 mm
1 mm	144680	144681	8 mm	224514	224515	9 mm
2 mm	224557	224558	8 mm	224514	224515	10 mm
1 mm	144680	144681	10 mm	224516	224517	11 mm
2 mm	224557	224558	10 mm	224516	224517	12 mm
9 mm	224559	224560	4 mm	144662	144663	13 mm
10 mm	224561	224562	4 mm	144662	144663	14 mm
9 mm	224559	224560	6 mm	224512	224513	15 mm
10 mm	224561	224562	6 mm	224512	224513	16 mm
9 mm	224559	224560	8 mm	224514	224515	17 mm
10 mm	224561	224562	8 mm	224514	224515	18 mm
9 mm	224559	224560	10 mm	224516	224517	19 mm
10 mm	224561	224562	10 mm	224516	224517	20 mm
10 mm	224561	224562	16 mm	234605	234606	26 mm



### Standard 2-Row Vertical Connectors Blind Mate

Male			Female			
Height	Part Number SMD	Part Number THR	Height	Part Number SMD	Part Number THR	Board-to-Board Height
1 mm	254877	354182	4 mm	254876	354175	5 mm
2 mm	354183	354184	4 mm	254876	354175	6 mm
1 mm	254877	354182	6 mm	354176	354177	7 mm
2 mm	354183	354184	6 mm	354176	354177	8 mm
1 mm	254877	354182	8 mm	354178	354179	9 mm
2 mm	354183	354184	8 mm	354178	354179	10 mm
1 mm	254877	354182	10 mm	354180	354181	11 mm
2 mm	354183	354184	10 mm	354180	354181	12 mm
9 mm	354185	354186	4 mm	254876	354175	13 mm
10 mm	354187	354188	4 mm	254876	354175	14 mm
9 mm	354185	354186	6 mm	354176	354177	15 mm
10 mm	354187	354188	6 mm	354176	354177	16 mm
9 mm	354185	354186	8 mm	354178	354179	17 mm
10 mm	354187	354188	8 mm	354178	354179	18 mm
9 mm	354185	354186	10 mm	354180	354181	19 mm
10 mm	354187	354188	10 mm	354180	354181	20 mm



## Available Connectors

### EMC Standard 2-Row Vertical Connectors

Male			Female			
Height	Part Number SMD	Part Number THR	Height	Part Number SMD	Part Number THR	Board-to-Board Height
1 mm	374732	-	4 mm	374730	-	5 mm
2 mm	374733	-	4 mm	374730	-	6 mm
1 mm	374732	-	10 mm	374734		11 mm
2 mm	374733	-	10 mm	374734		12 mm

### EMC Blind Mate 2-Row Vertical Connectors

Male			Female			
Height	Part Number SMD	Part Number THR	Height	Part Number SMD	Part Number THR	Board-to-Board Height
1 mm	374723	-	4 mm	374725	-	5 mm
2 mm	374724	-	4 mm	374725	-	6 mm
1 mm	374723	-	10 mm	374726		11 mm
2 mm	374724	-	10 mm	374726		12 mm

### EMC Standard 2-Row Right Angle Connectors

Male			Female		
Number of Pins	Part Number SMD	Part Number THR	Number of Pins	Part Number SMD	Part Number THR
50	244692	374721	50	244676	374719

### EMC Blind Mate 2-Row Right Angle Connectors

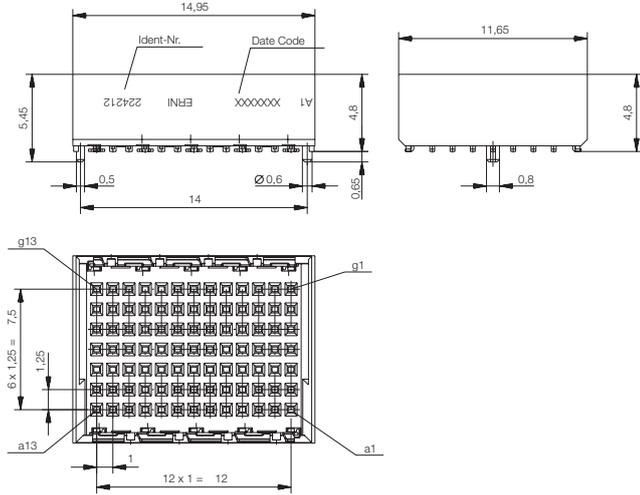
Male			Female		
Number of Pins	Part Number SMD	Part Number THR	Number of Pins	Part Number SMD	Part Number THR
50	284332	374722	50	284310	374720



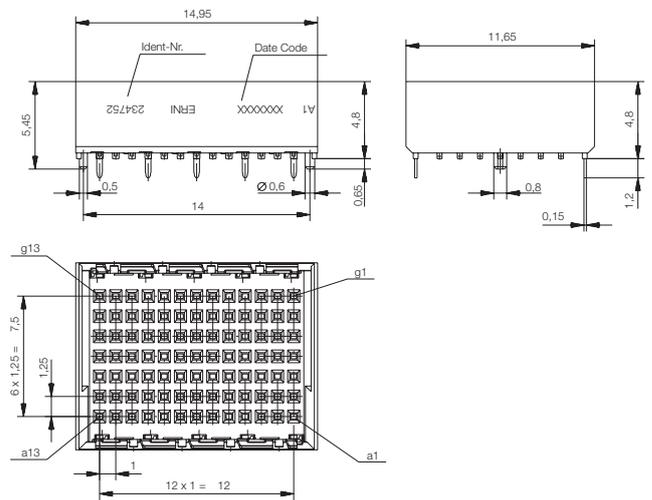
### Dimensional Drawings

Male Connectors 91 contacts

SMT Version

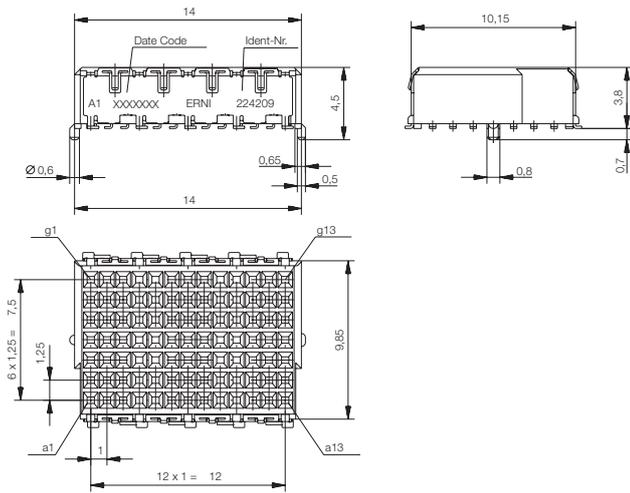


SMT/THR Version

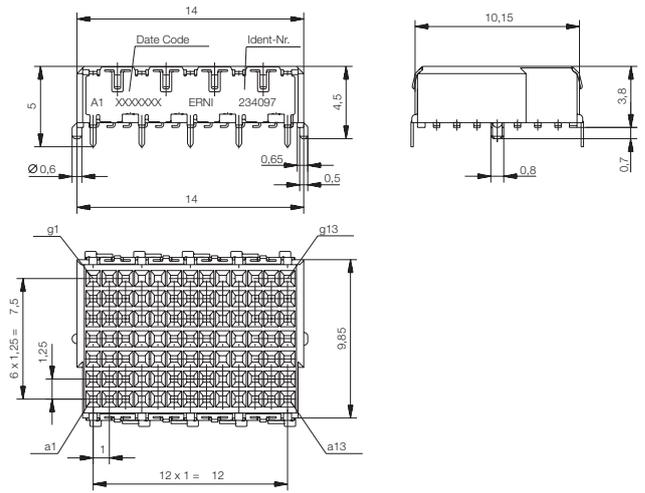


Female Connectors 91 contacts

SMT Version



SMT/THR Version

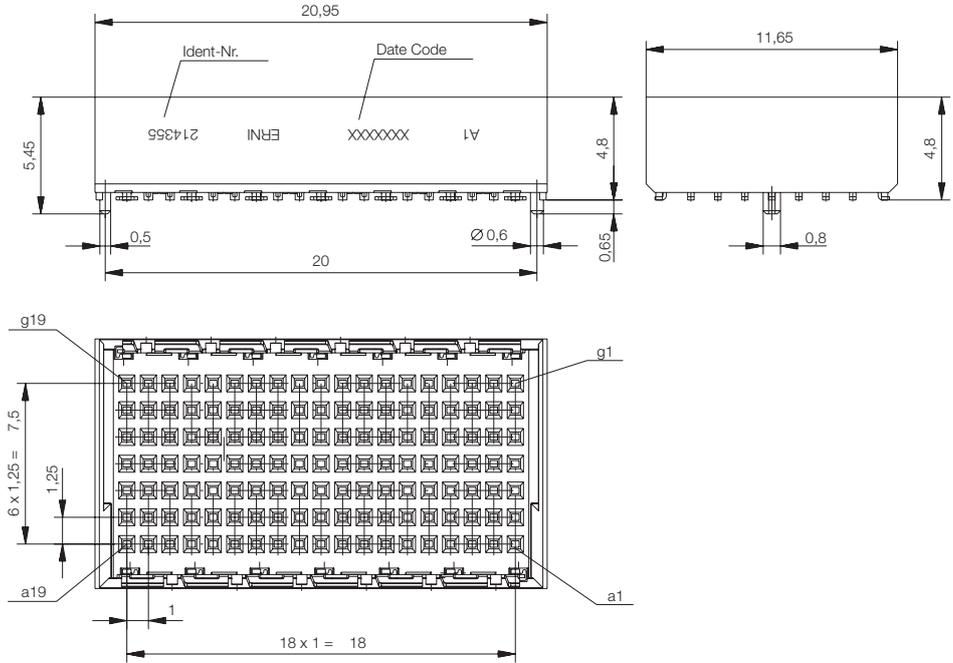




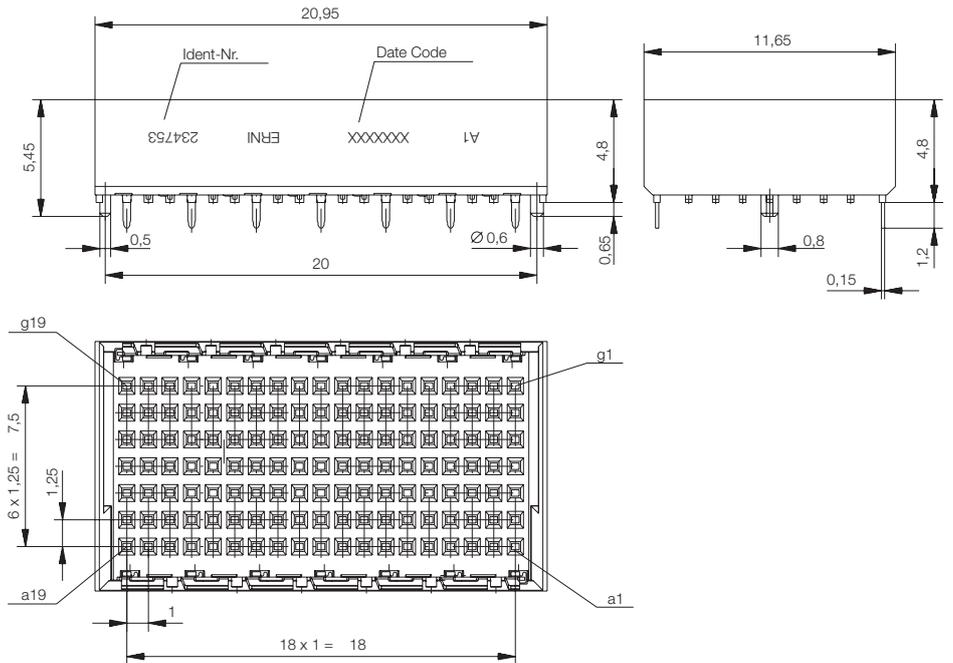
### Dimensional Drawings

Male Connectors 133 contacts

SMT Version



SMT/THR Version



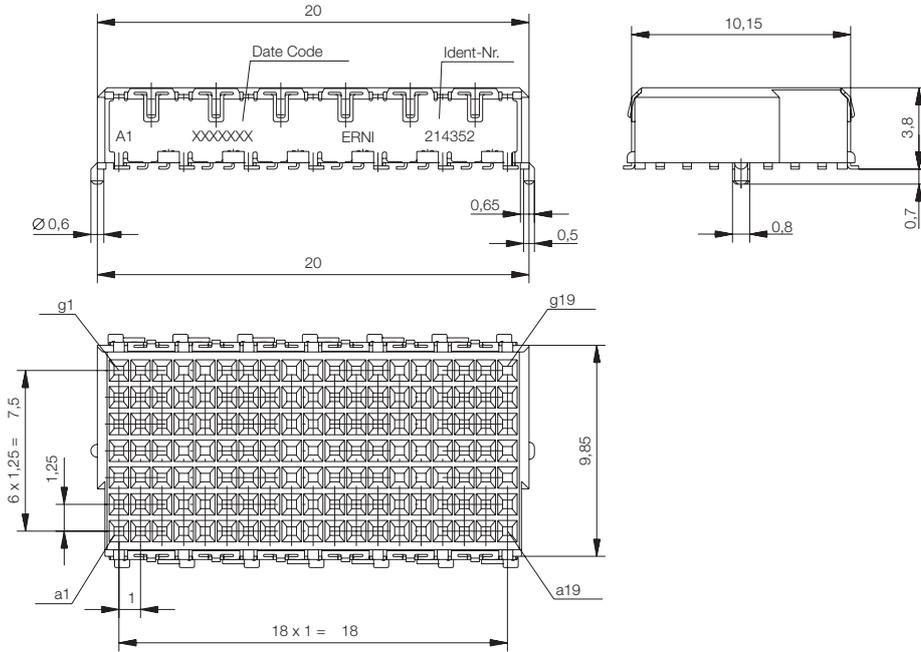
# ERNI MicroSpeed - Application Note 4.0

## Standard 7-Row Vertical Connectors

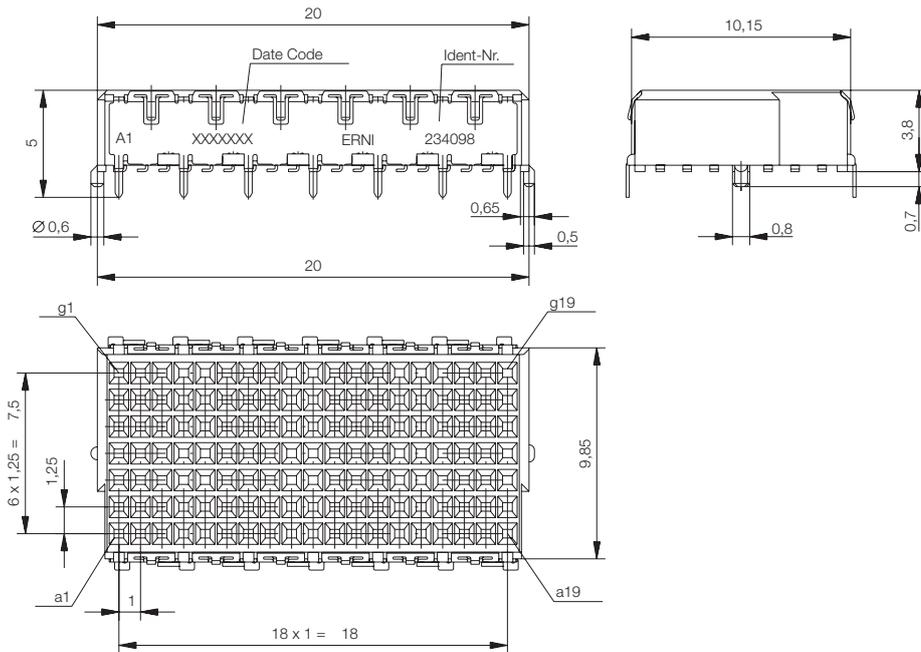


Female Connectors 133 contacts

SMT Version



SMT/THR Version



# ERNI MicroSpeed - Application Note 4.0

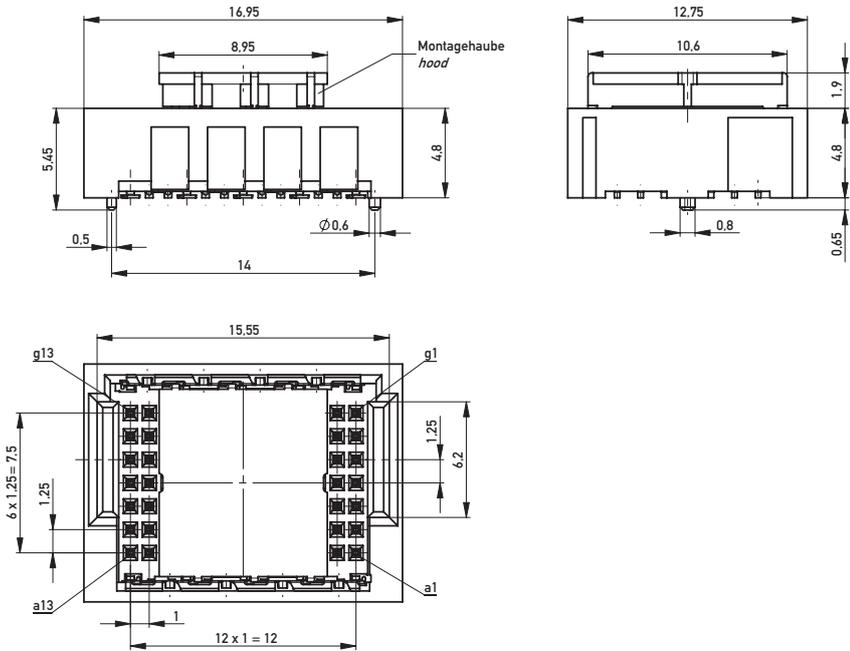
## Standard Blind Mate 7-Row Vertical Connectors



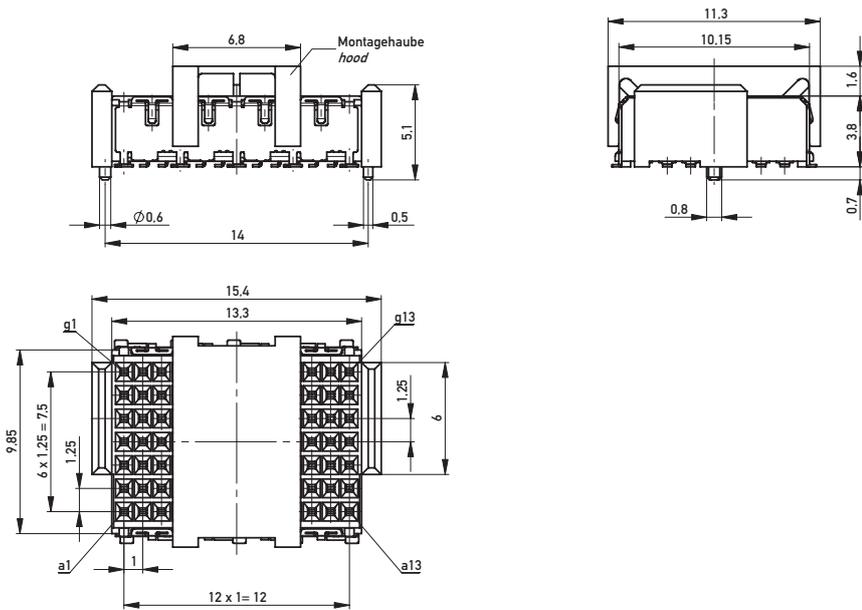
### Dimensional Drawings

Connectors Blind Mate 91 contacts

Male Connectors



Female Connectors



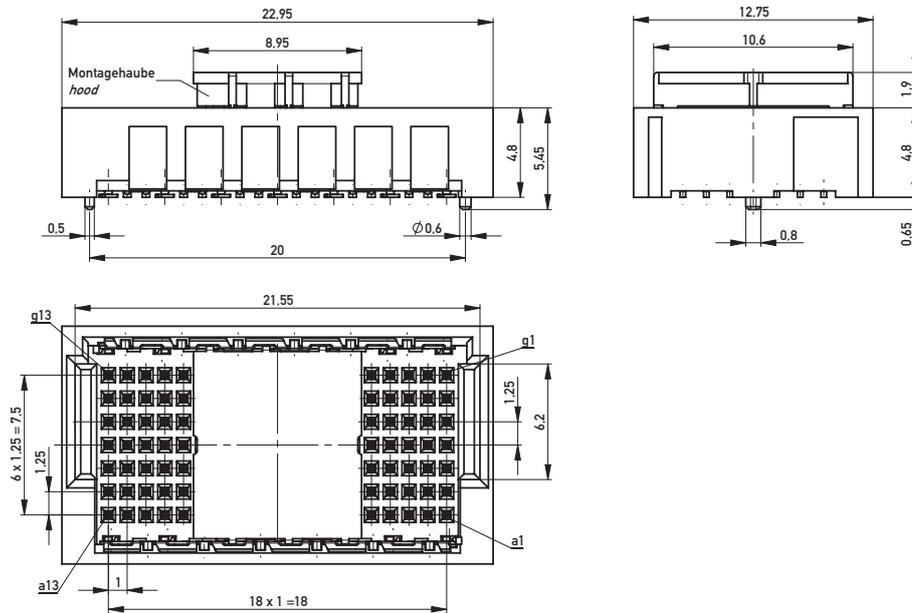
# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate 7-Row Vertical Connectors

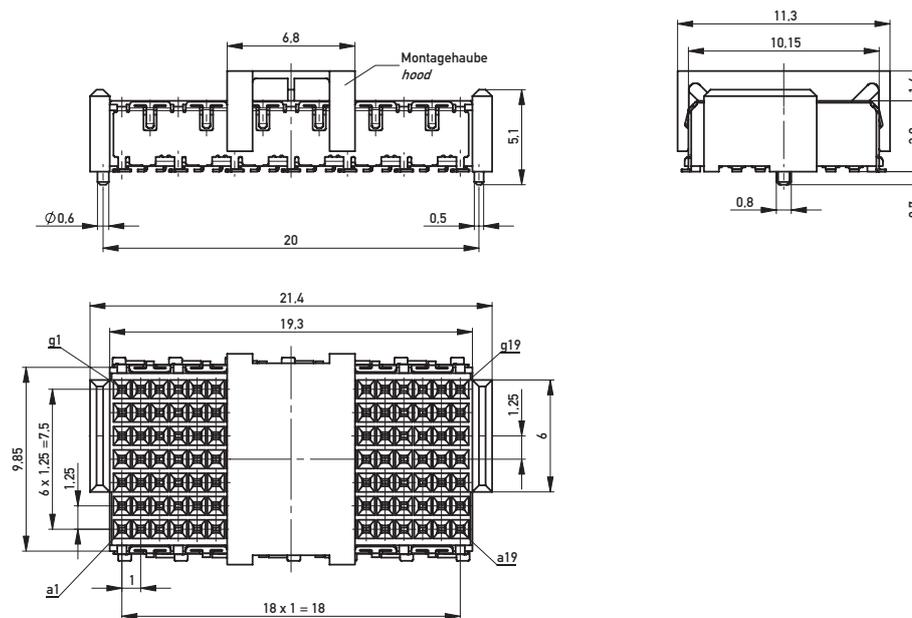


Connectors Blind Mate 133 contacts

Male Connectors



Female Connectors



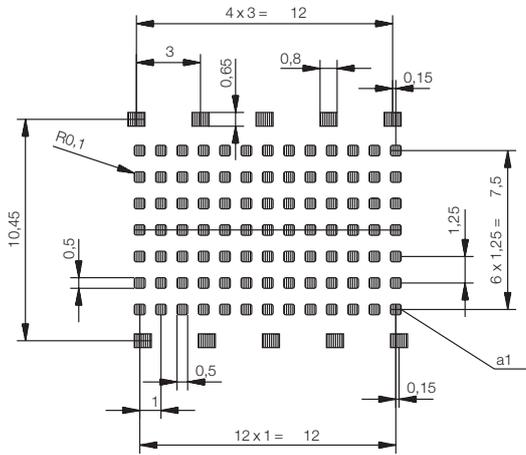




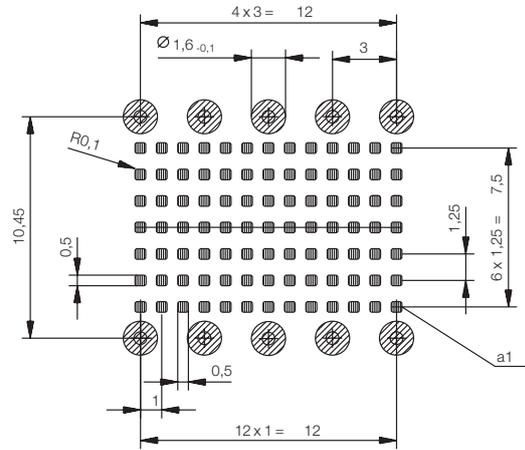
Stencil Standard and Blind Mate 7-Row Vertical Connectors

Male Connectors 91 contacts

SMT Version



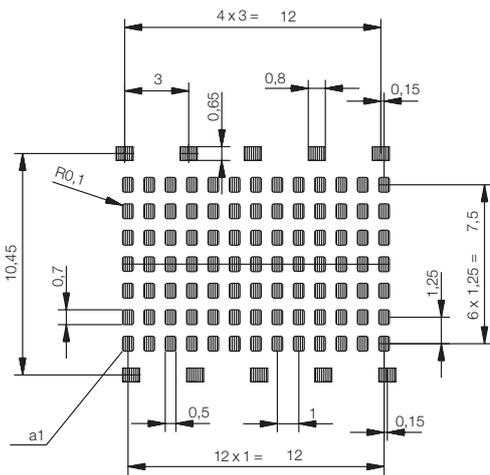
SMT/THR Version



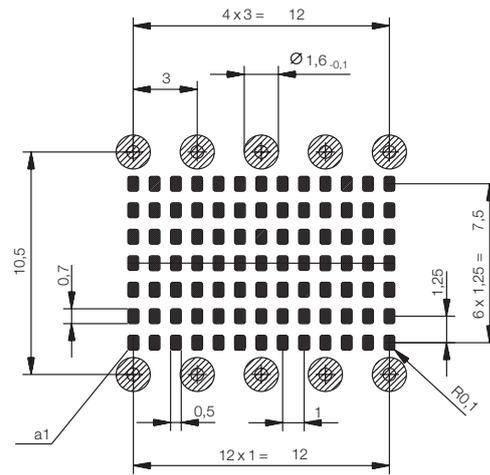
The position in relationship to the guiding holes have to be considered.

Female Connectors 91 contacts

SMT Version



SMT/THR Version



The position in relationship to the guiding holes have to be considered.

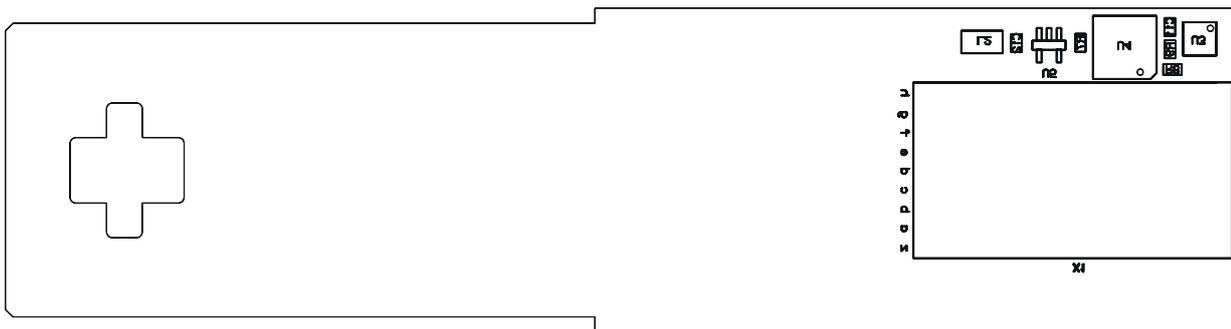


## Application Example for 7-Row Vertical Connectors

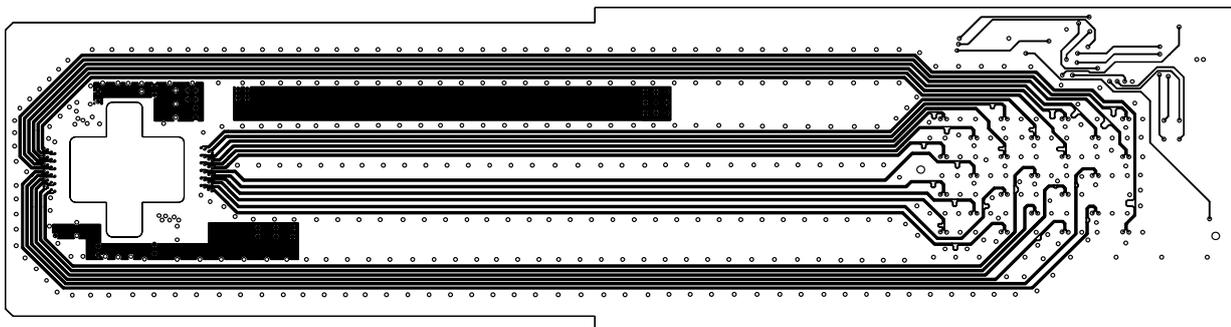
Real-world application example:

24 x 10 Gigabit per second differential transmission on 4-layer flexible printed circuit board (FPC). Highspeed inner layer shown only. For connector location refer silk screen's rectangular shape. Fully shielded stripline design. Differential lines length-matched for skew-compensation.

ERNI Electronics - Silk screen bottom



ERNI Electronics - Inner layer 2



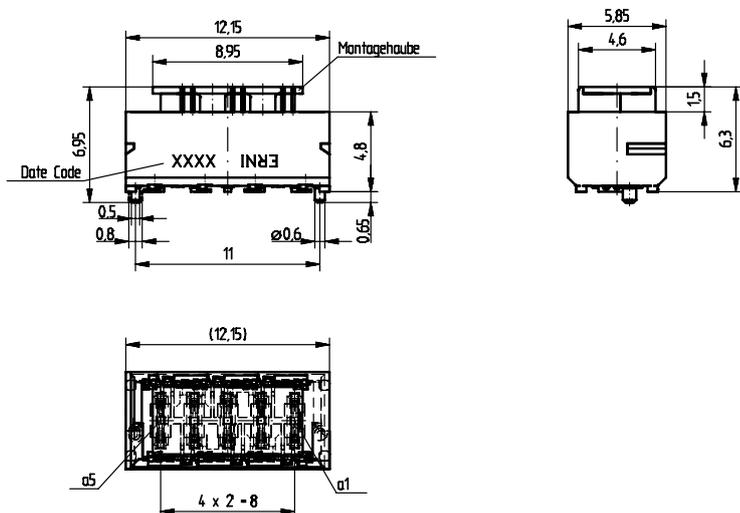
# ERNI MicroSpeed - Application Note 4.0

## Standard Vertical Power Modules

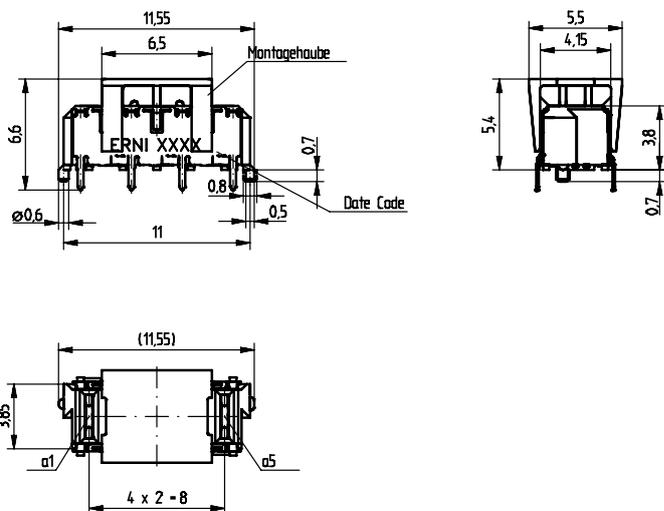


Male Power Modules

SMT Version

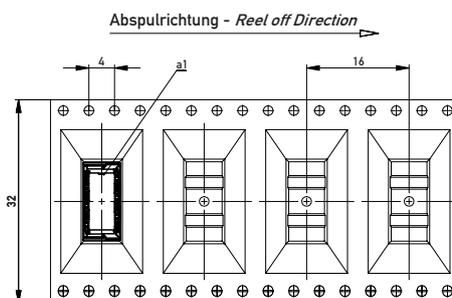
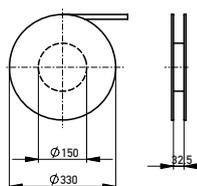


SMT/THR Version



### Packaging

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 400 Stück - Packaging unit: 400 pcs



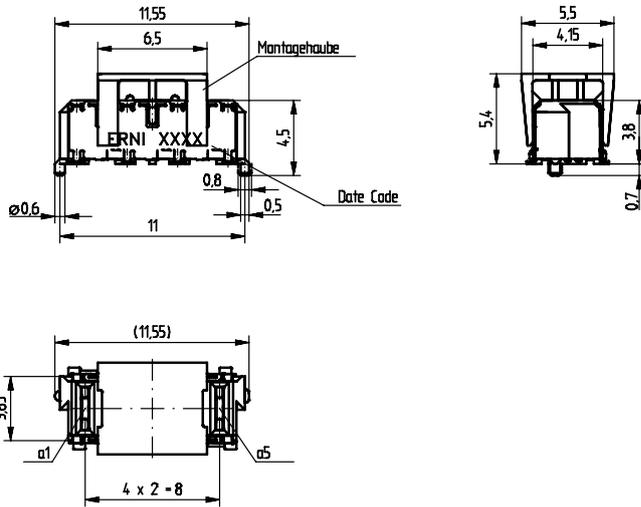
# ERNI MicroSpeed - Application Note 4.0

## Standard Vertical Power Modules

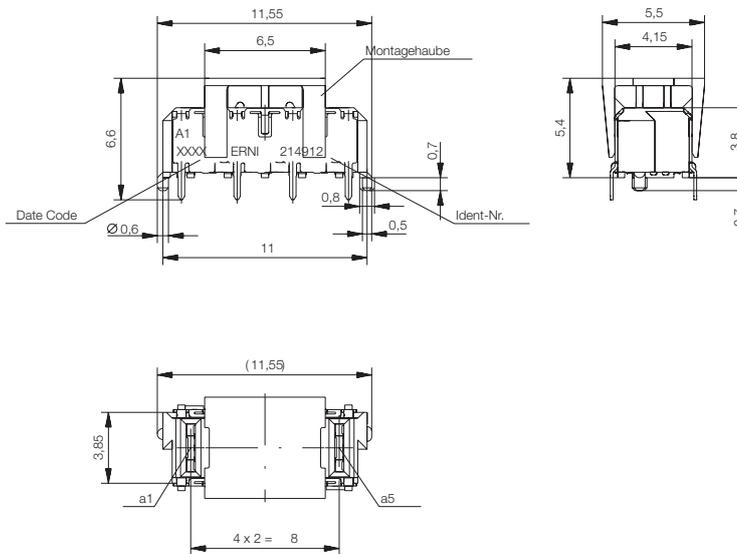


Female Power Module

SMT Version



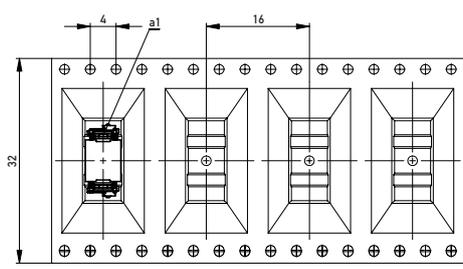
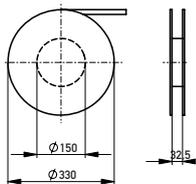
SMT/THR Version



### Packaging

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 400 Stück - Packaging unit: 400 pcs

Abspulrichtung - Reel off Direction →



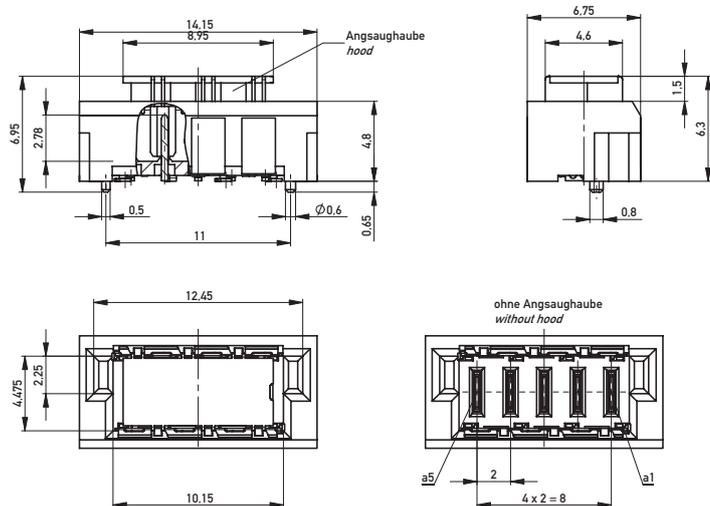
# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate Vertical Power Modules

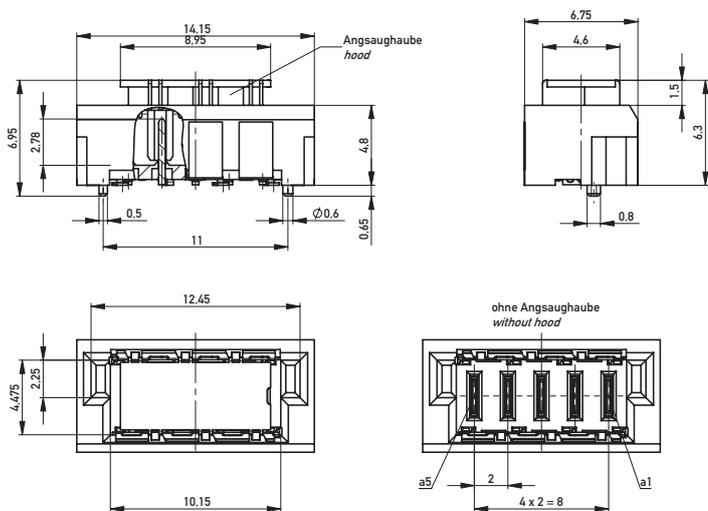


### Male Blind Mate Power Modules

#### SMT Version

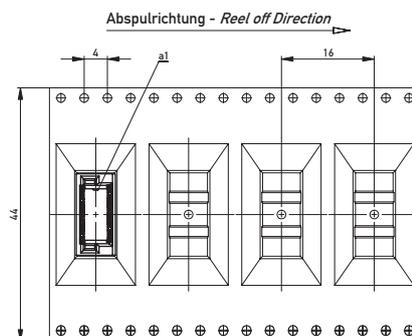
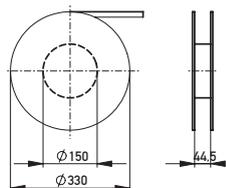


#### SMT/THR Version



### Packaging

Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 400 Stück - Packaging unit: 400 pcs



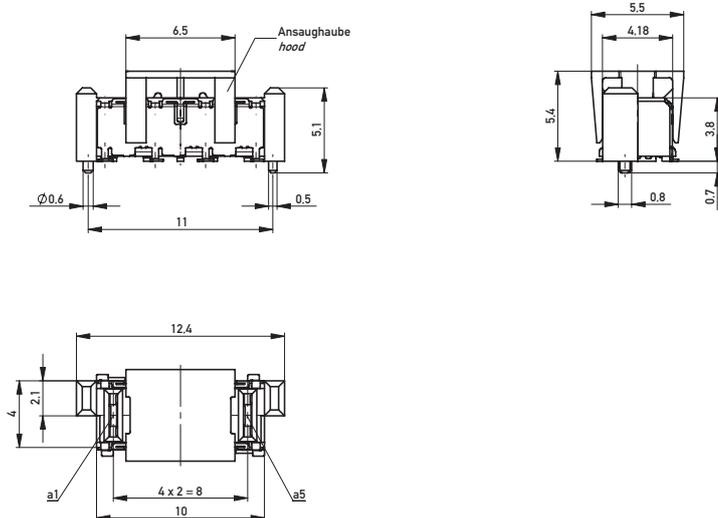
# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate Vertical Power Modules

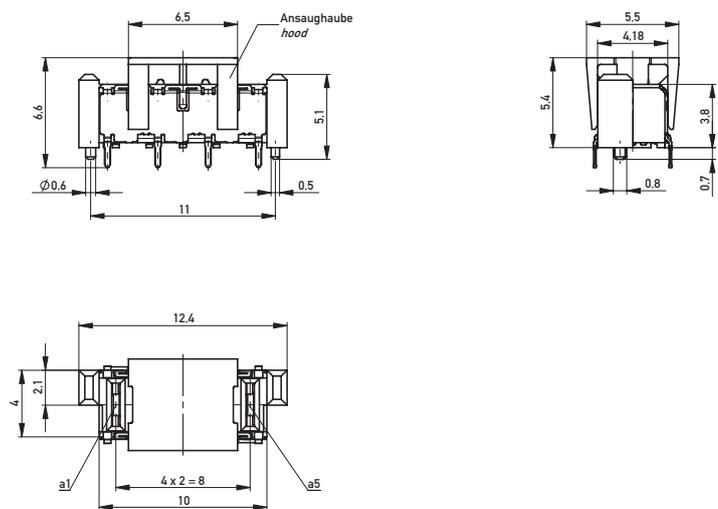


### Female Blind Mate Power Module

#### SMT Version

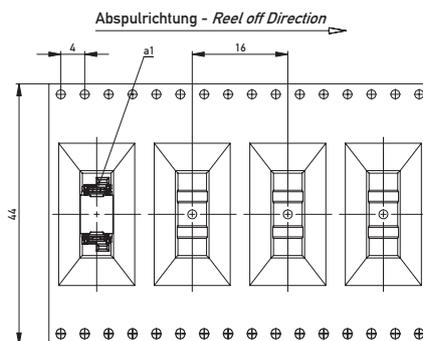
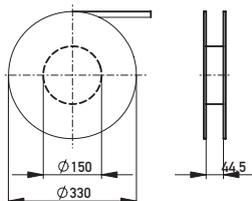


#### SMT/THR Version



### Packaging

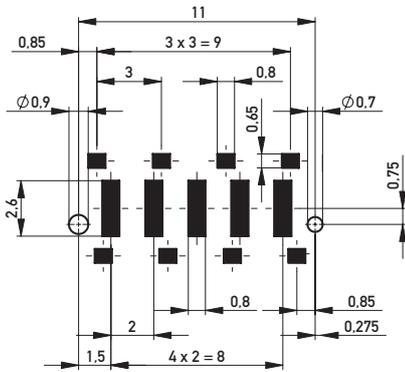
Verpackt in Gurtverpackung - Tape on Reel Packaging  
 Verpackungseinheit: 400 Stück - Packaging unit: 400 pcs



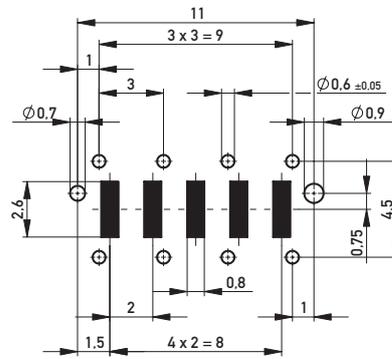


### Male Power Modules

#### SMT Version

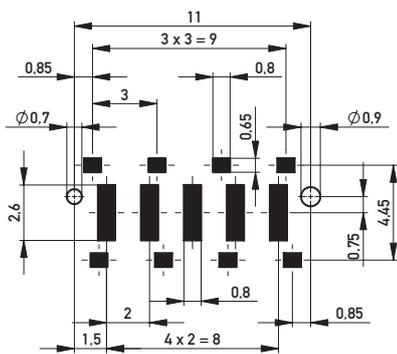


#### SMT/THR Version

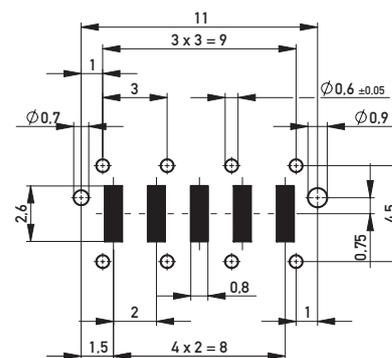


### Female Power Modules

#### SMT Version

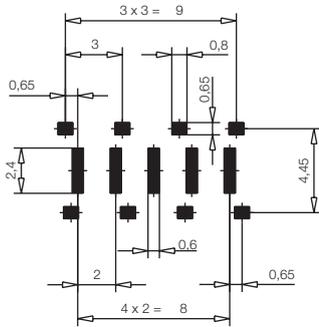


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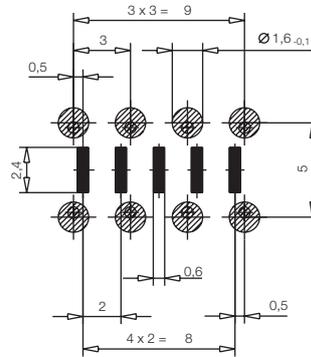


Male Power Modules

SMT Version



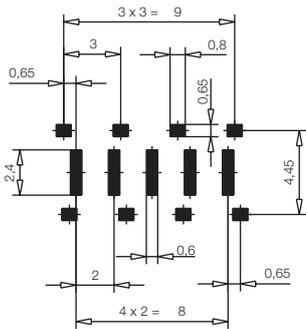
SMT/THR Version



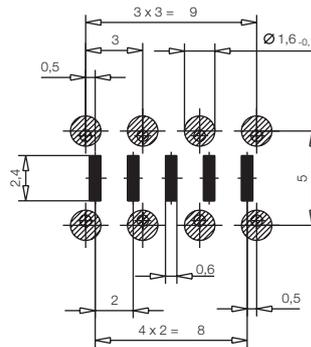
The position in relationship to the guiding holes have to be considered.

Female Power Modules

SMT Version



SMT/THR Version



The position in relationship to the guiding holes have to be considered.

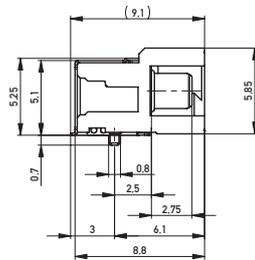
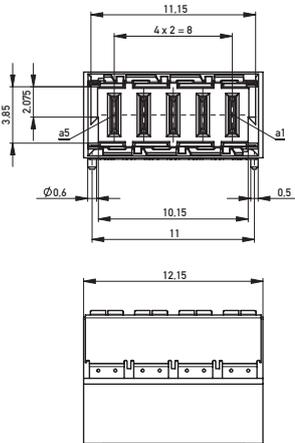
# ERNI MicroSpeed - Application Note 4.0

## Standard Right Angle Power Modules

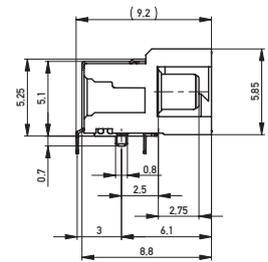
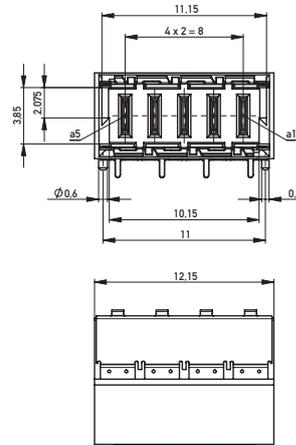


### Male Power Modules

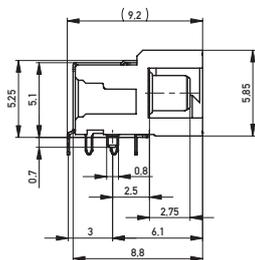
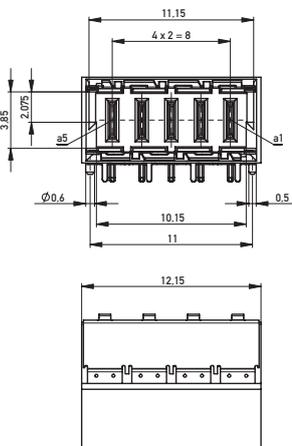
#### SMT Version



#### SMT/THR Version



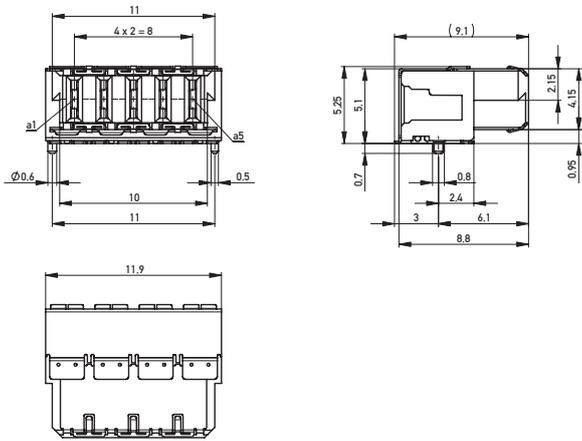
#### THR Version



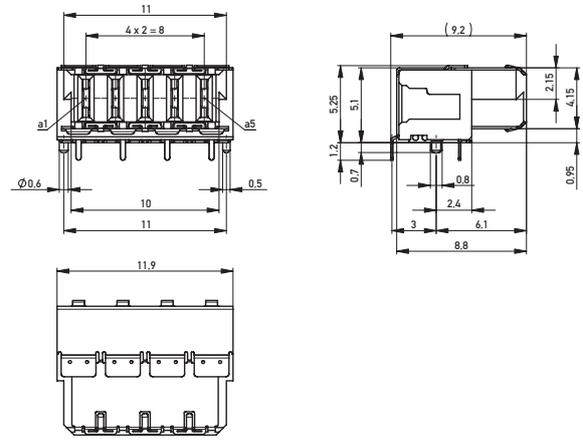


### Female Power Modules

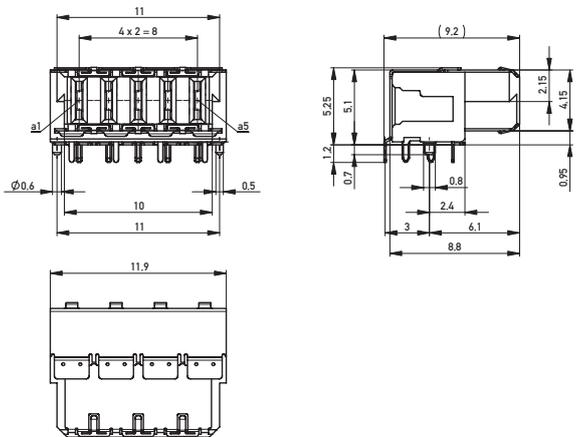
#### SMT Version



#### SMT/THR Version



#### THR Version



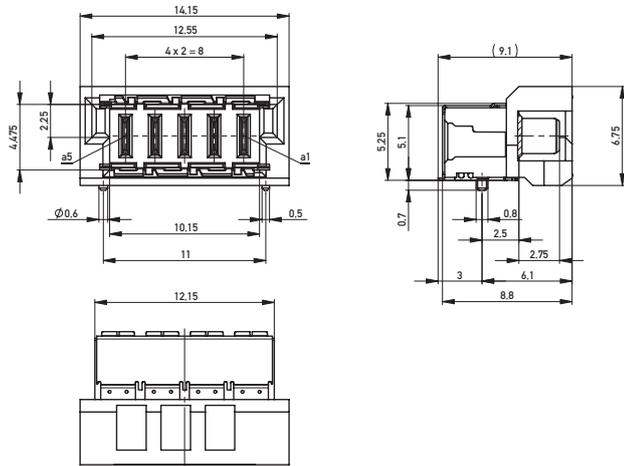
# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate Right Angle Power Modules

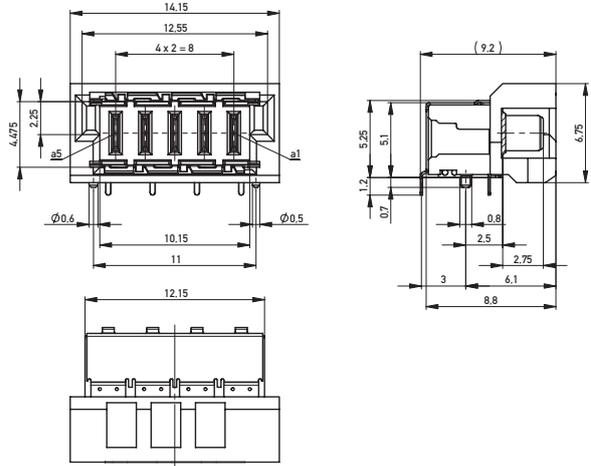


### Male Blind Mate Power Modules

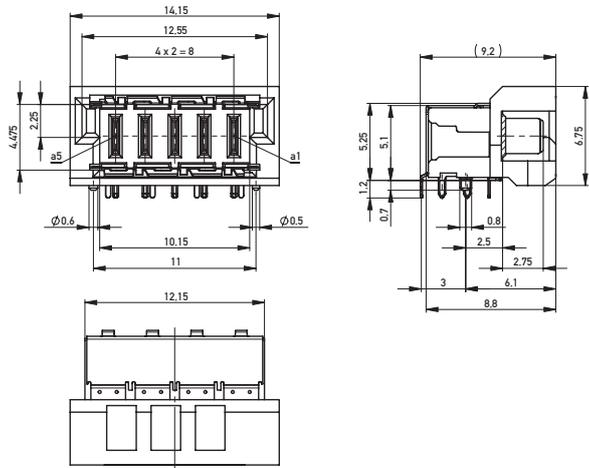
#### SMT Version



#### SMT/THR Version



#### THR Version



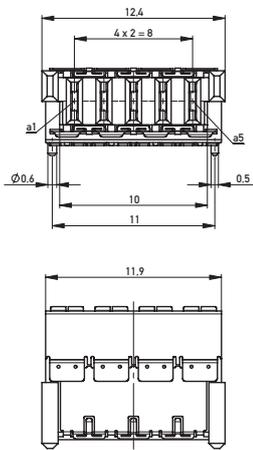
# ERNI MicroSpeed - Application Note 4.0

## Standard Blind Mate Right Angle Power Modules

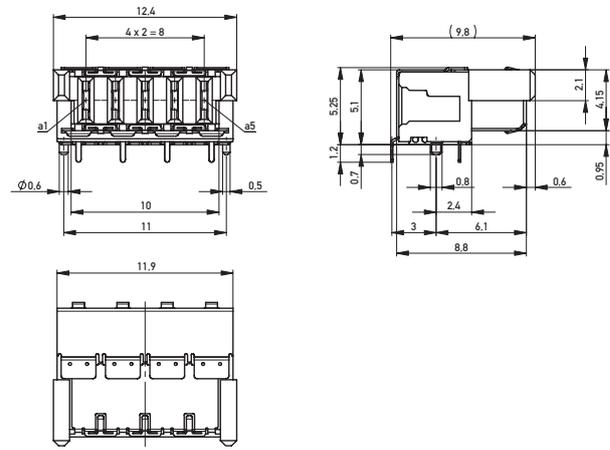


### Female Blind Mate Power Modules

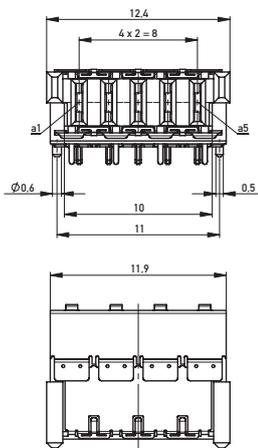
#### SMT Version



#### SMT/THR Version



#### THR Version



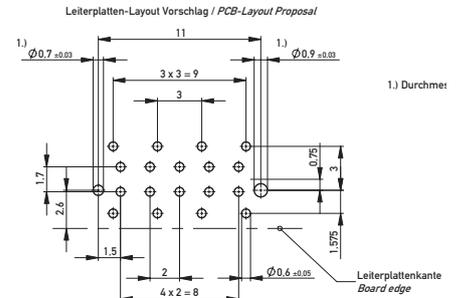
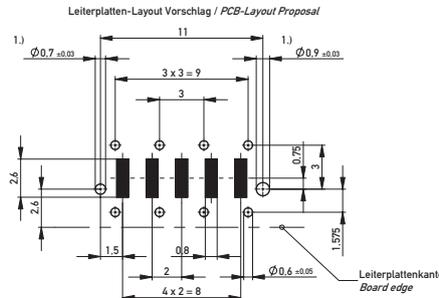
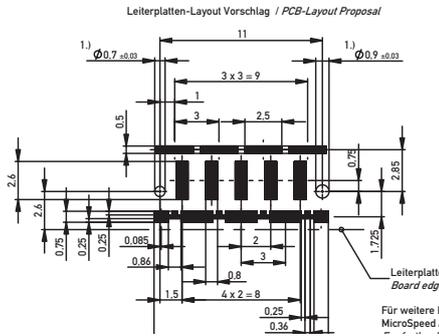
## Layouts Standard and Blind Mate Right Angle Power Modules

### Male Power Modules

#### SMT Version

#### SMT/THR Version

#### THR Version

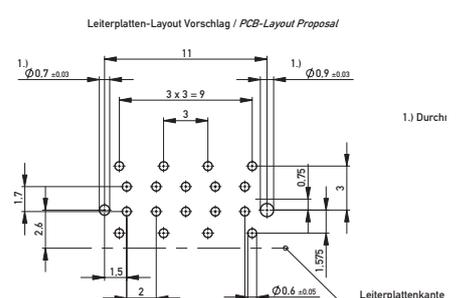
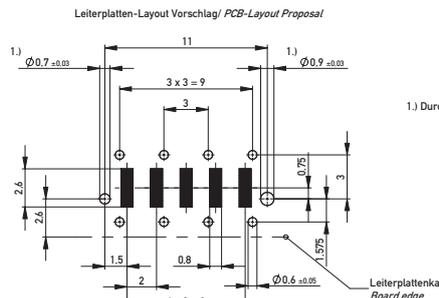
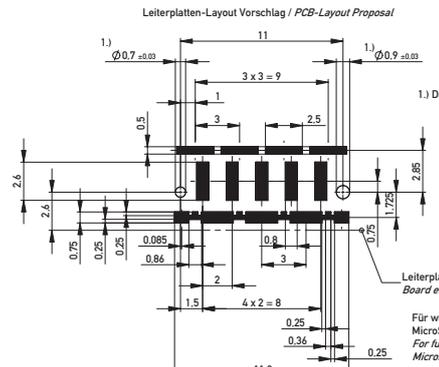


### Female Power Modules

#### SMT Version

#### SMT/THR Version

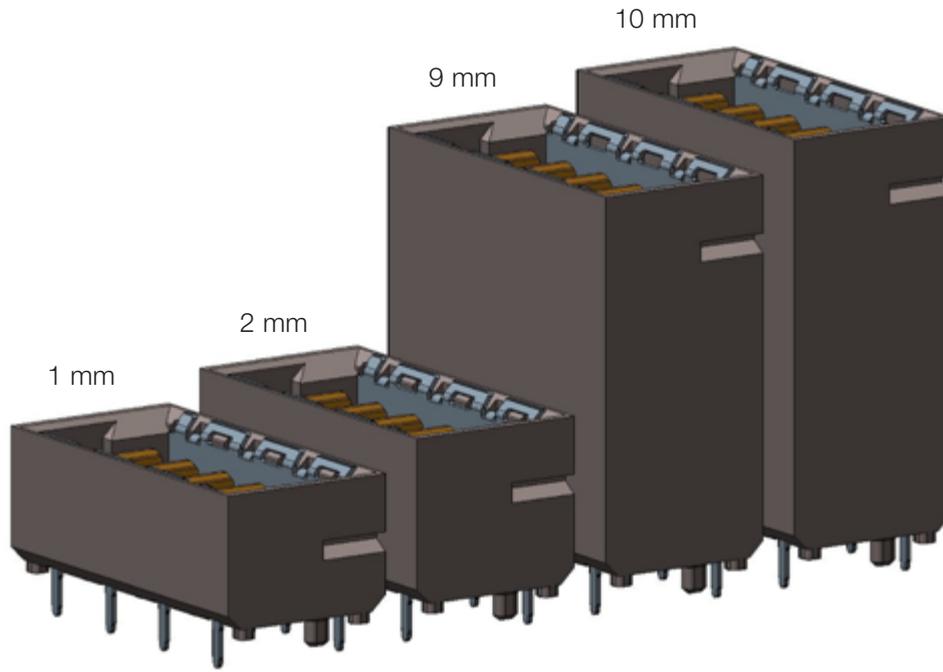
#### THR Version



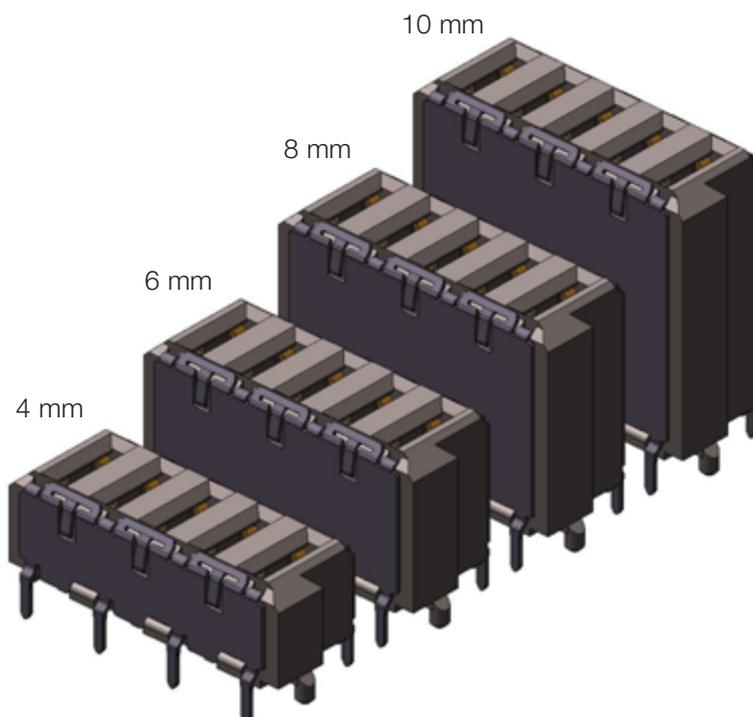


### Available Power Module Heights

Male Power Module Heights



Female Power Module Heights





### Standard Vertical Power Modules

Male			Female			
Height	Part Number SMT	Part Number THR	Height	Part Number SMT	Part Number THR	Board-to-Board Height
1 mm	214357	214916	4 mm	214356	214912	5 mm
2 mm	214550	214917	4 mm	214356	214912	6 mm
1 mm	214357	214916	6 mm	214547	214913	7 mm
2 mm	214550	214917	6 mm	214547	214913	8 mm
1 mm	214357	214916	8 mm	214548	214914	9 mm
2 mm	214550	214917	8 mm	214548	214914	10 mm
1 mm	214357	214916	10 mm	214549	214915	11 mm
2 mm	214550	214917	10 mm	214549	214915	12 mm
9 mm	214551	214918	4 mm	214356	214912	13 mm
10 mm	214552	214919	4 mm	214356	214912	14 mm
9 mm	214551	214918	6 mm	214547	214913	15 mm
10 mm	214552	214919	6 mm	214547	214913	16 mm
9 mm	214551	214918	8 mm	214548	214914	17 mm
10 mm	214552	214919	8 mm	214548	214914	18 mm
9 mm	214551	214918	10 mm	214549	214915	19 mm
10 mm	214552	214919	10 mm	214549	214915	20 mm



### Standard Vertical Power Modules Blind Mate

Male			Female			
Height	Part Number SMT	Part Number THR	Height	Part Number SMT	Part Number THR	Board-to-Board Height
1 mm	354275	354276	4 mm	354262	354263	5 mm
2 mm	354277	354278	4 mm	354262	354263	6 mm
1 mm	354275	354276	6 mm	354264	354265	7 mm
2 mm	354277	354278	6 mm	354264	354265	8 mm
1 mm	354275	354276	8 mm	354266	354267	9 mm
2 mm	354277	354278	8 mm	354266	354267	10 mm
1 mm	354275	354276	10 mm	354268	354269	11 mm
2 mm	354277	354278	10 mm	354268	354269	12 mm
9 mm	354279	354280	4 mm	354262	354263	13 mm
10 mm	354281	354282	4 mm	354262	354263	14 mm
9 mm	354279	354280	6 mm	354264	354265	15 mm
10 mm	354281	354282	6 mm	354264	354265	16 mm
9 mm	354279	354280	8 mm	354266	354267	17 mm
10 mm	354281	354282	8 mm	354266	354267	18 mm
9 mm	354279	354280	10 mm	354268	354269	19 mm
10 mm	354281	354282	10 mm	354268	354269	20 mm



### Standard Right Angle Power Modules

Male				Female			
Number of Pins	Part Number SMT	Part Number SMT/THR	Part Number THR	Number of Pins	Part Number SMT	Part Number SMT/THR	Part Number THR
5	364705	364706	394573	5	364709	364710	394571

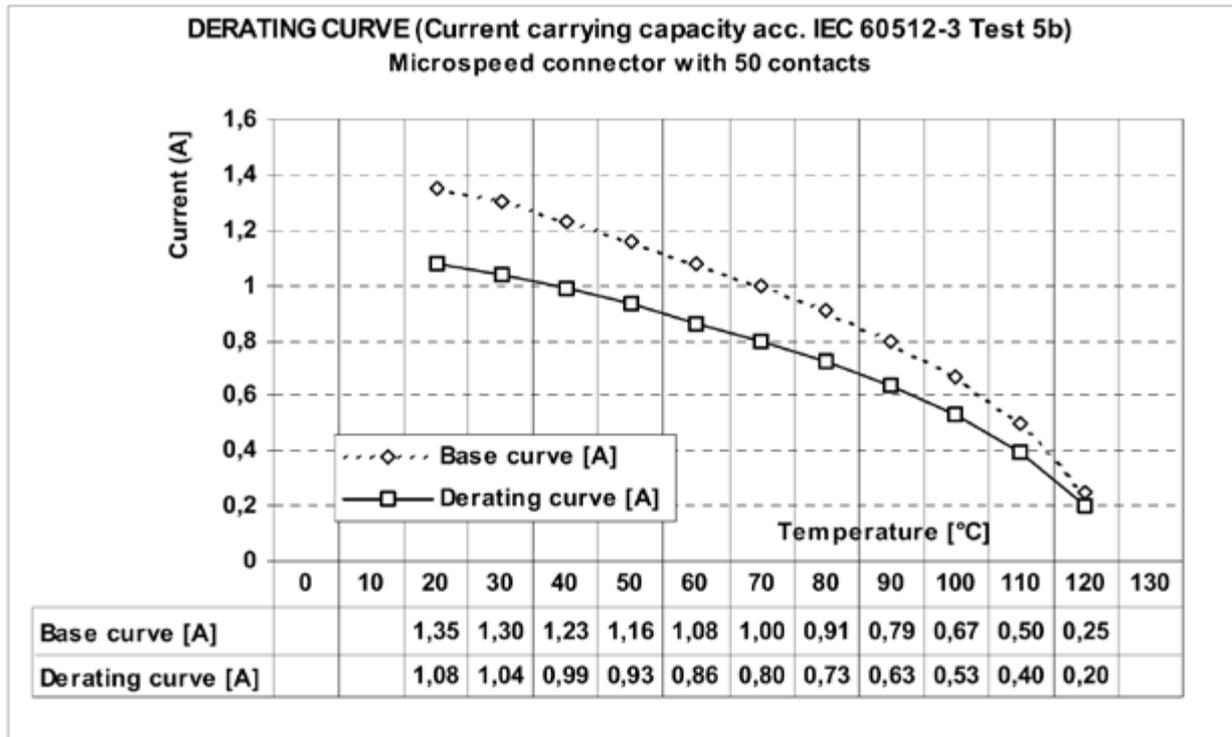
### Standard Right Angle Power Modules Blind Mate

Male				Female			
Number of Pins	Part Number SMT	Part Number SMT/THR	Part Number THR	Number of Pins	Part Number SMT	Part Number SMT/THR	Part Number THR
5	364703	364704	394572	5	364707	364708	394570

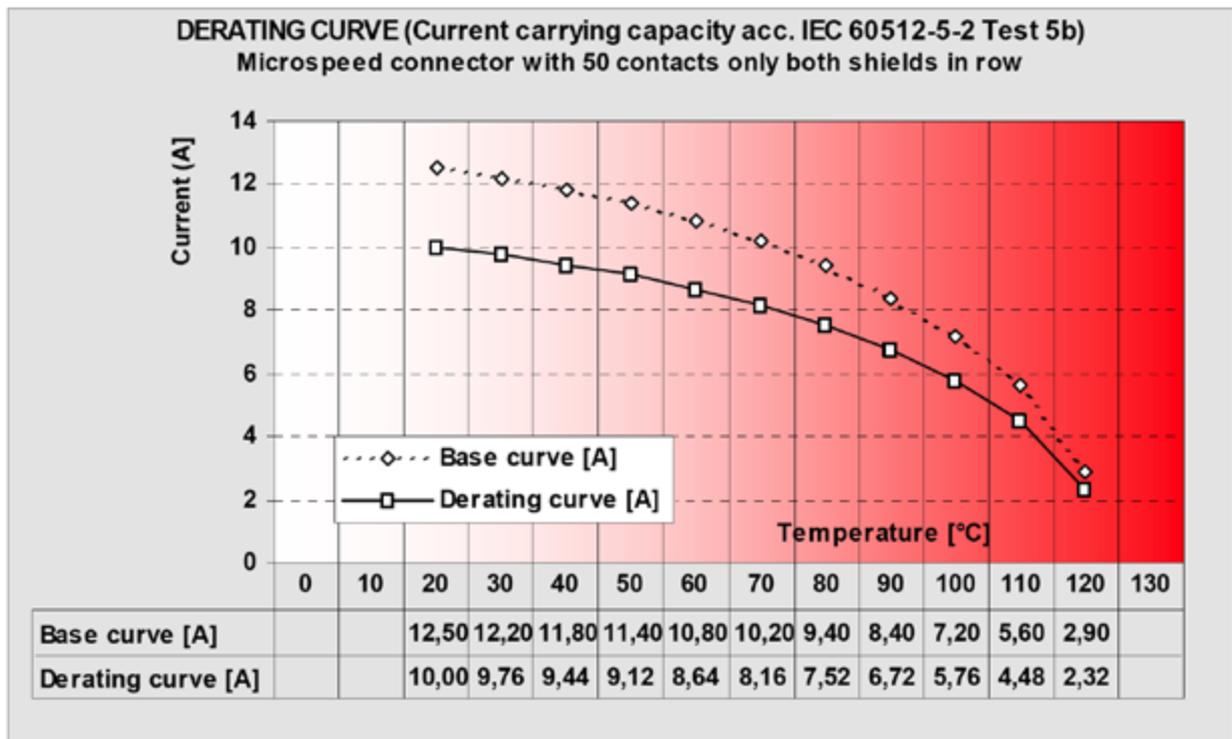
Derating Curves

Derating Curves for 5 mm Board-to-Board Height Version

MicroSpeed 50 Contacts

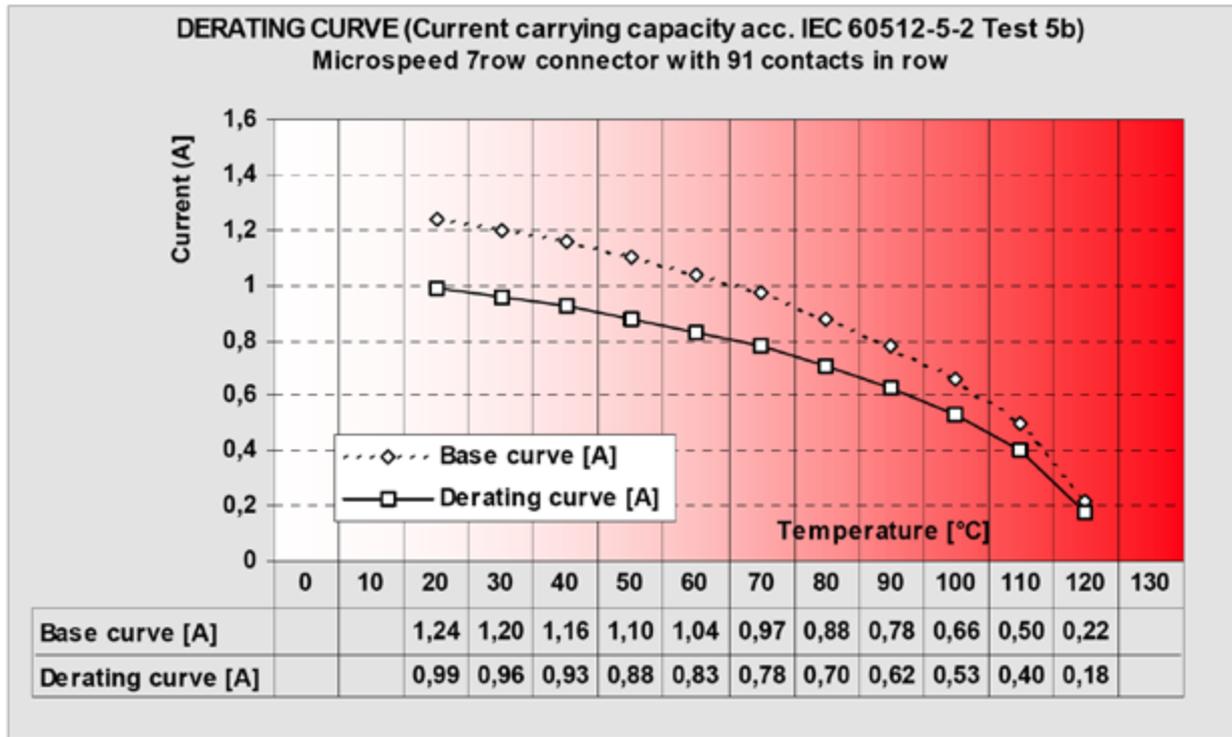


MicroSpeed 50 Contacts only Shield

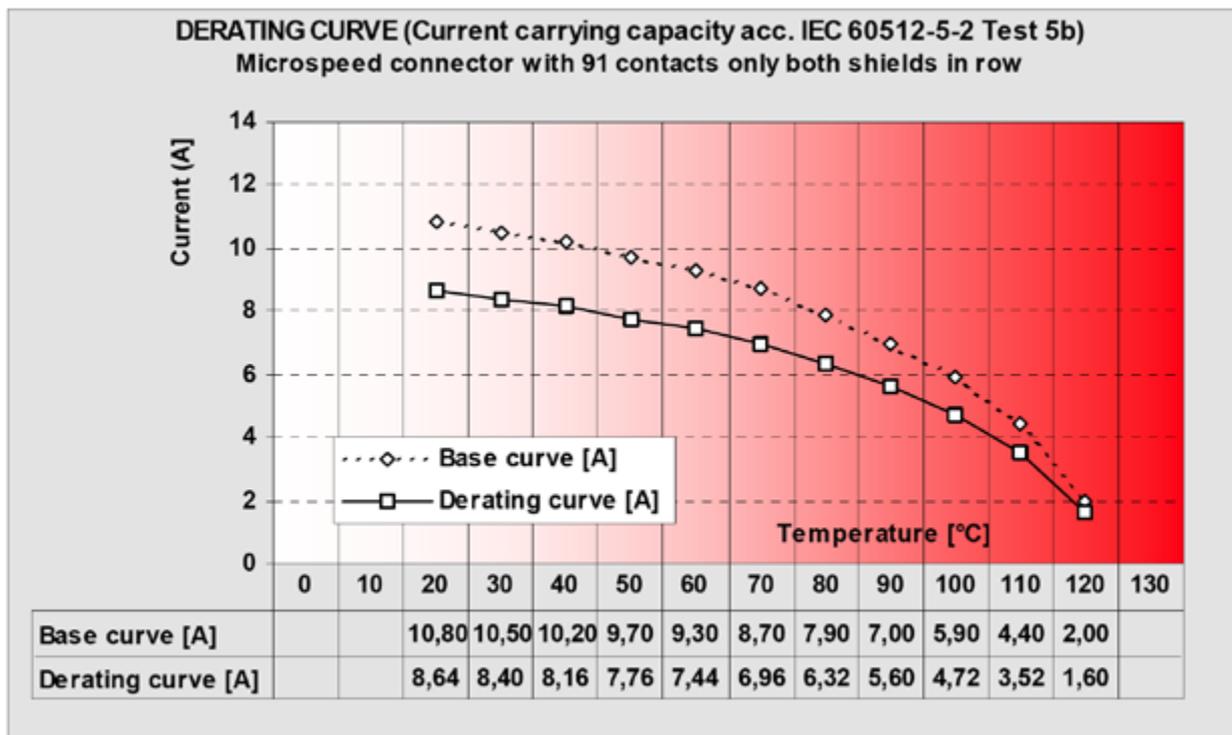


Derating Curves

MicroSpeed 91 Contacts

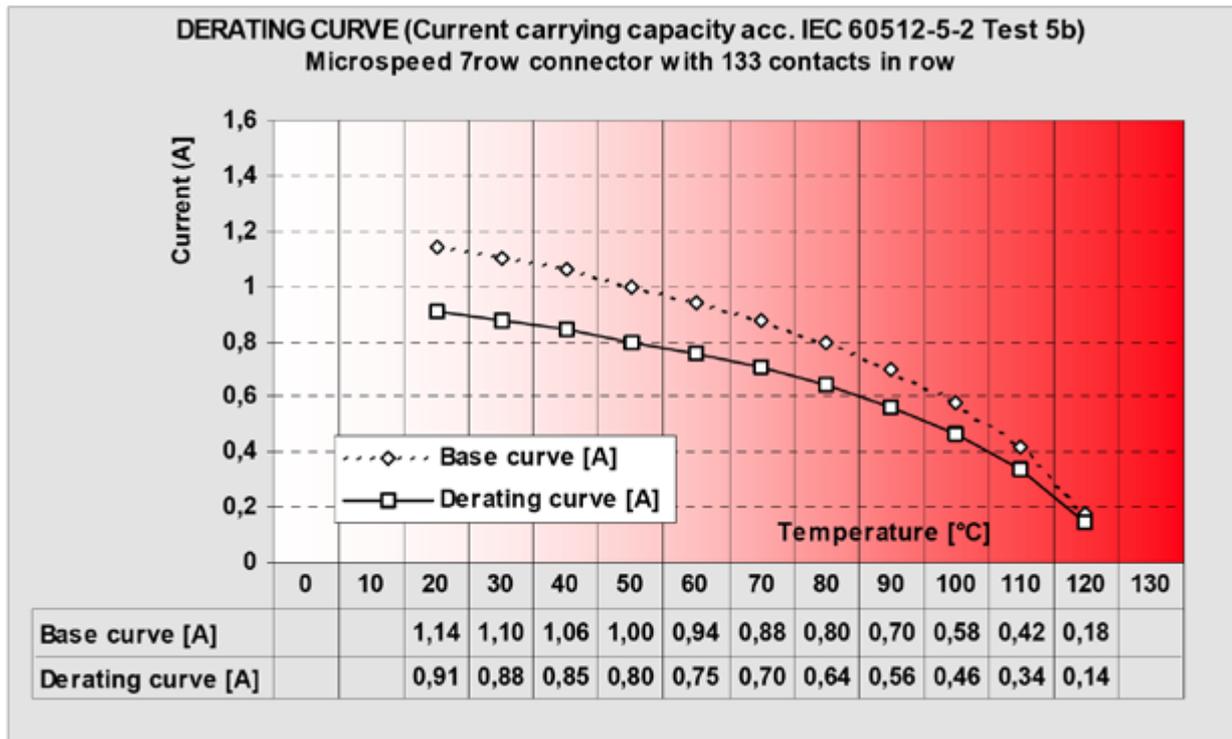


MicroSpeed 91 Contacts only Shield

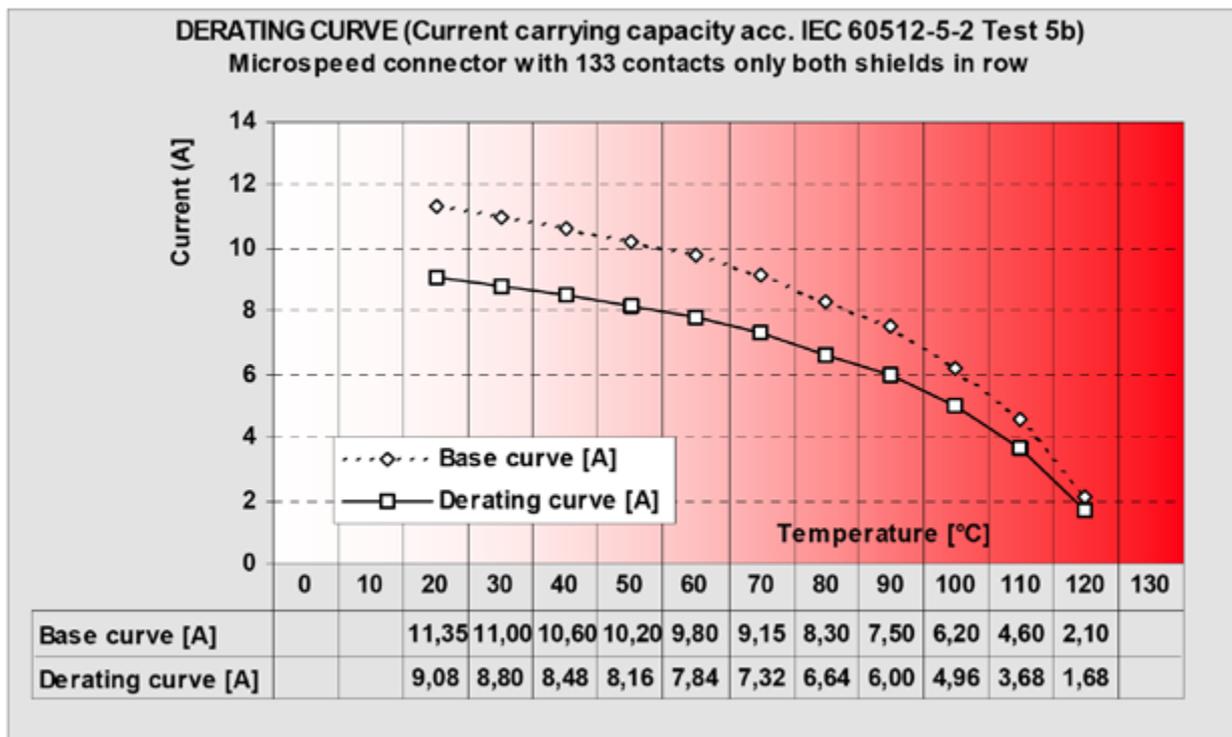


Derating Curves

MicroSpeed 133 Contacts

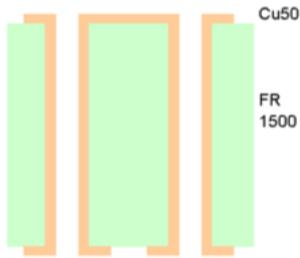


MicroSpeed 133 Contacts only Shield

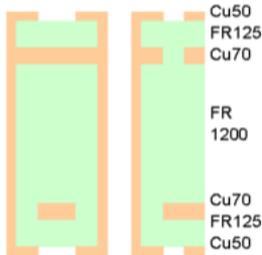
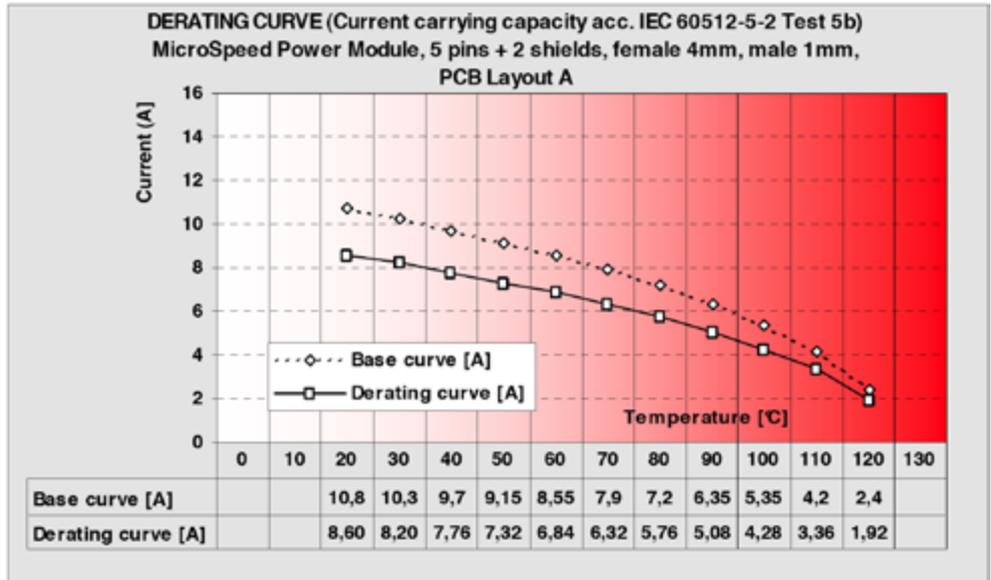


## Derating Curves

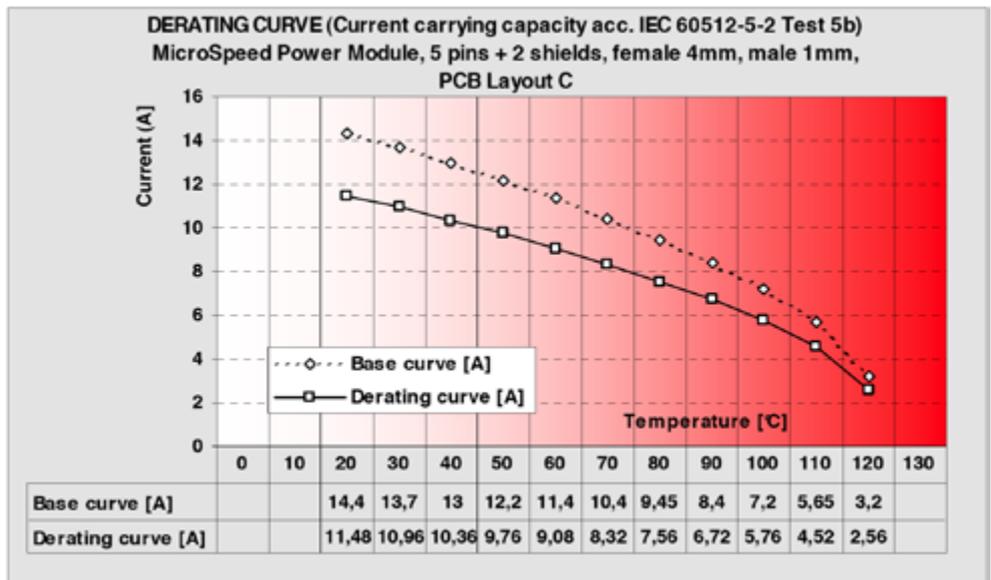
### MicroSpeed Power Modules 5 Contacts with Shields



Derating diagram for a 2-layer board



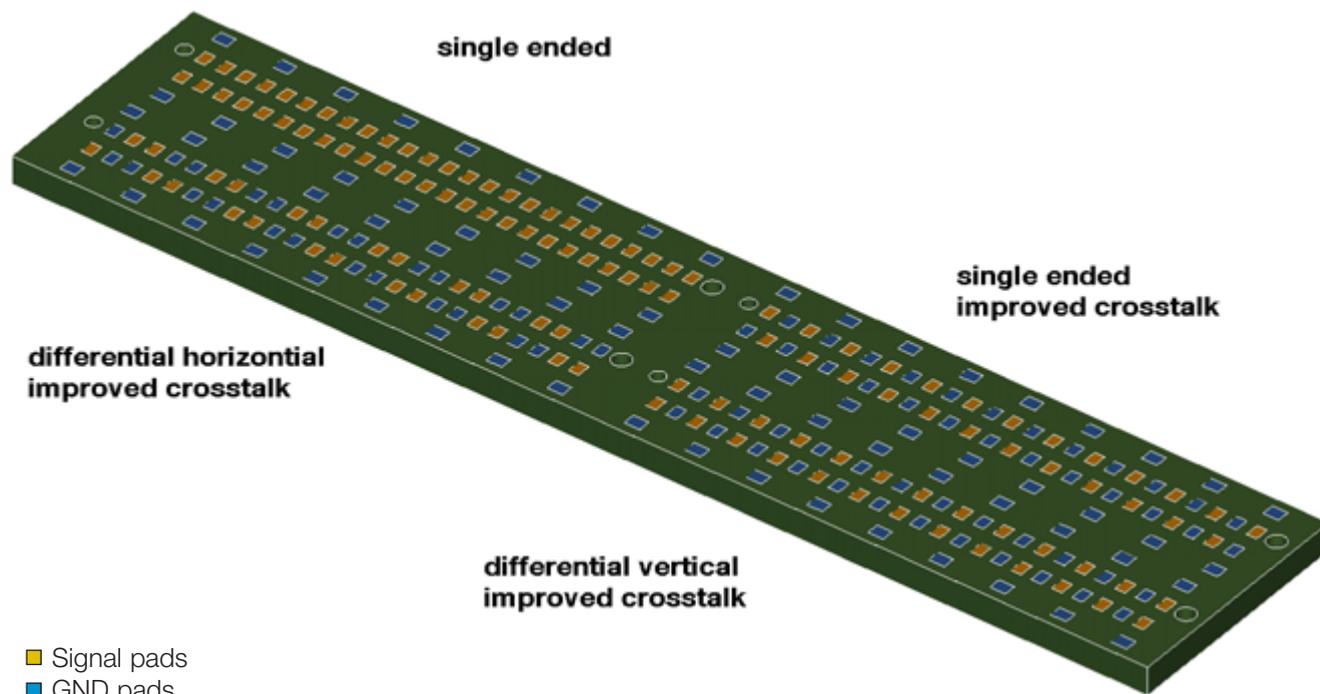
Derating diagram for a Multilayer board



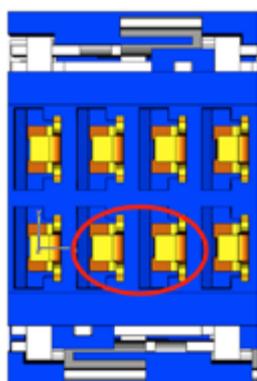
Due to the better heat conductivity of copper, the power connector derating performance can be increased by 30-50% in Multilayer applications.  
 The derating diagrams are showing full current loading to every contact. If full current loading is applied to selective pins, the capacity can also be increased by another 30-50%.

**Possible Pin Configurations**

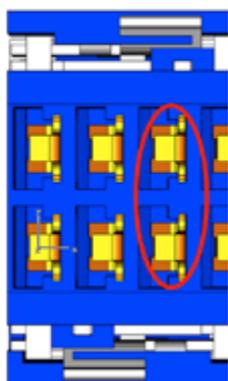
Signal Connectors



Differential Routing



Horizontal



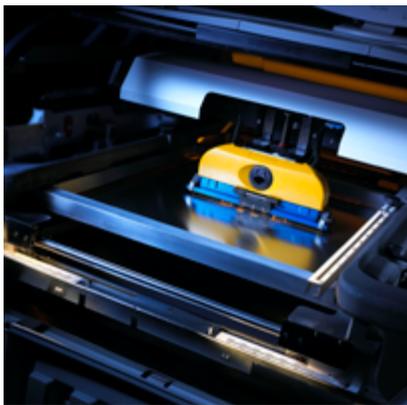
Vertical

Due to the grid ratio (1x1.5 mm) we achieve 100 Ohm differential routing in vertical and horizontal direction.

**Recommended paste printing process with regards to the THR pins**

The DEK ProFlow System such a closed printing system can be used, when space for a solder paste depot is restricted. With this system the solder paste filling of the vias can be improved.

Process description



Transfer head on contact height.



PCB moved to printing position.



Transfer head moved to printing height.



Transfer head moved over the stencil. Solder paste is induced into a rolling action.



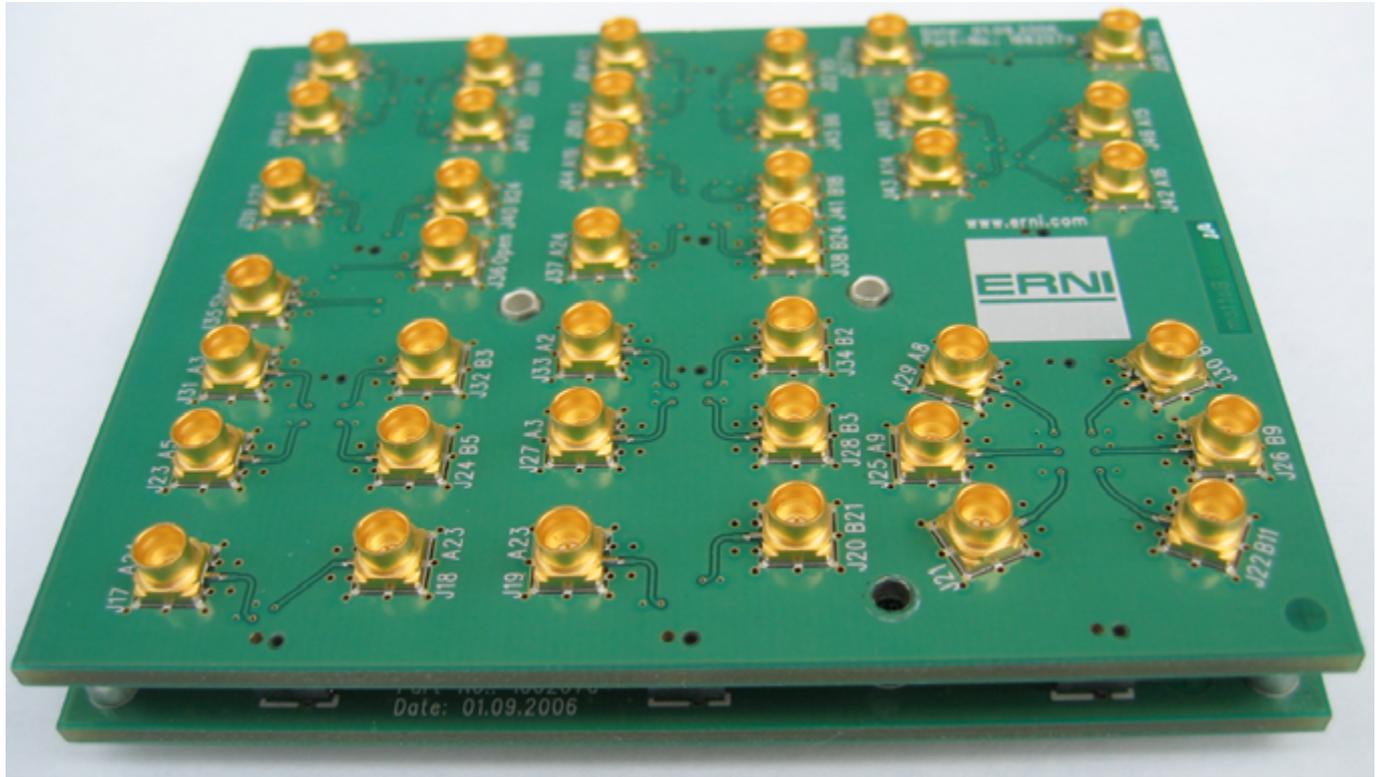
Paste printing is finished.



Transfer head moved back to contact height.



### Results for Board-to-Board Connections



Measurements done with the network Analyzer HP 8510 20GHz.

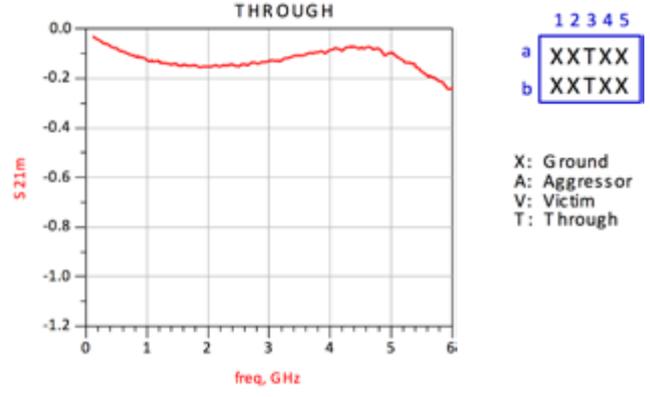
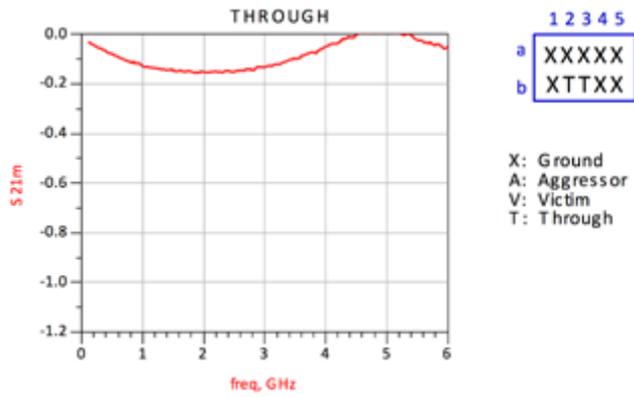


## Measurement Results

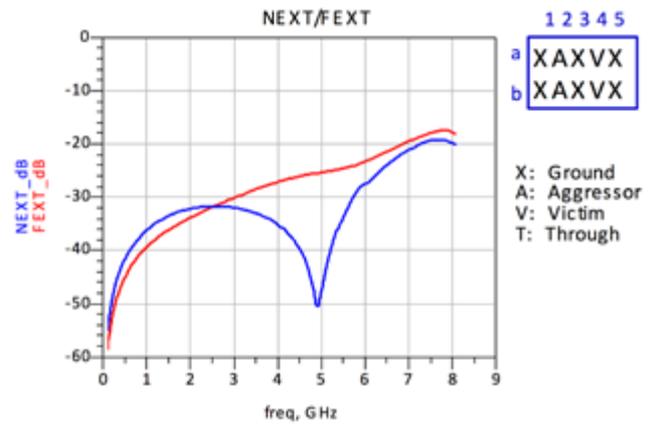
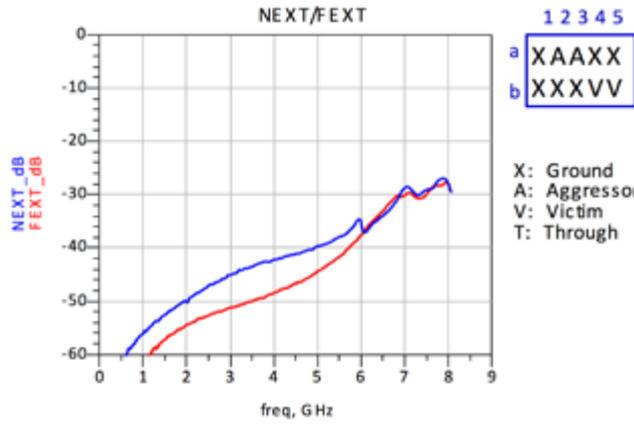
### 5 mm Board-to-Board Height

#### Differential Signals

##### Insertion Loss

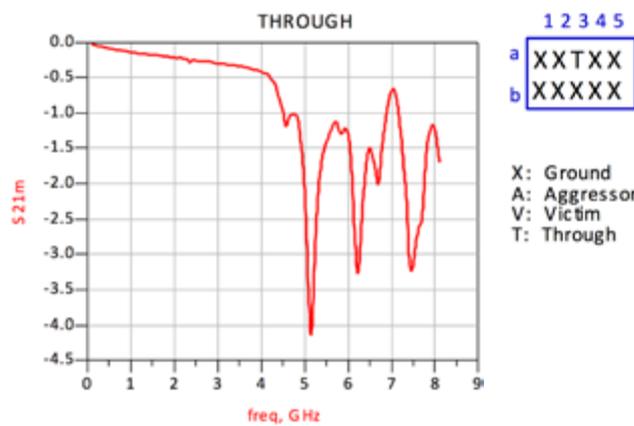


##### Crosstalk

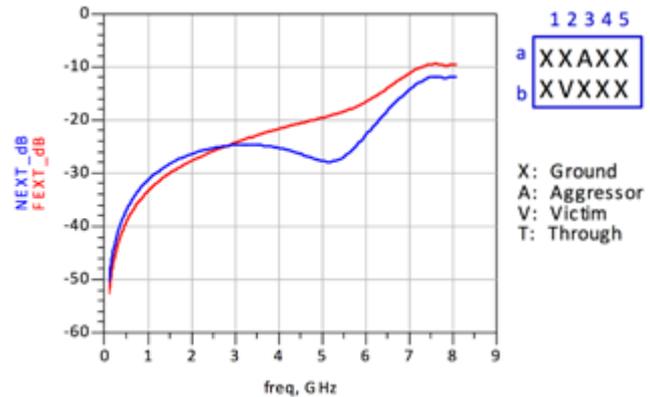


#### Single Ended Signals

##### Insertion Loss



##### Crosstalk

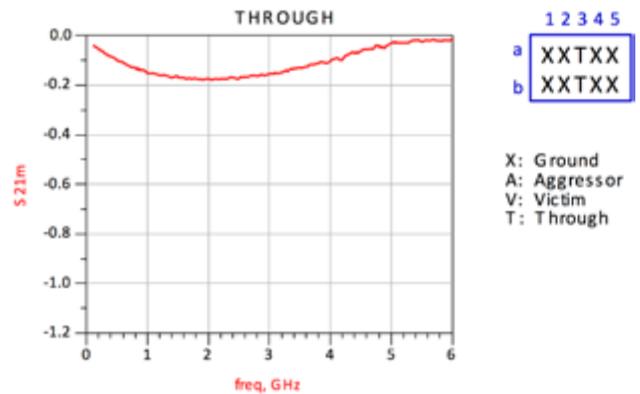
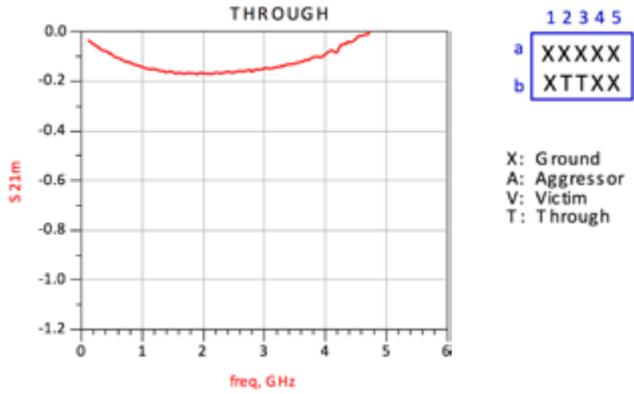


## Measurement Results

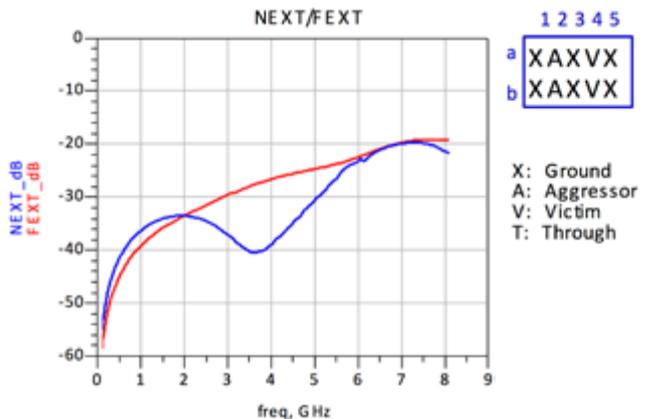
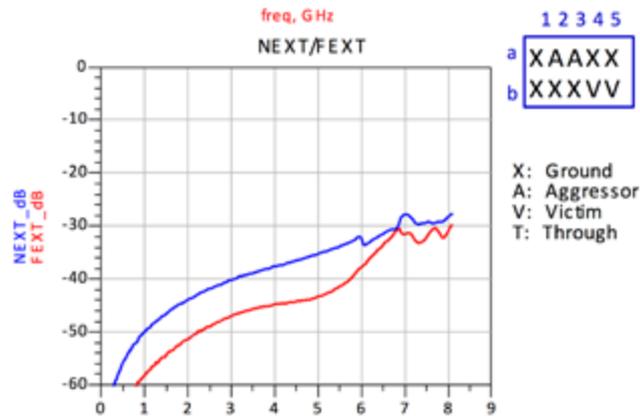
### 8 mm Board-to-Board Height

#### Differential Signals

##### Insertion Loss

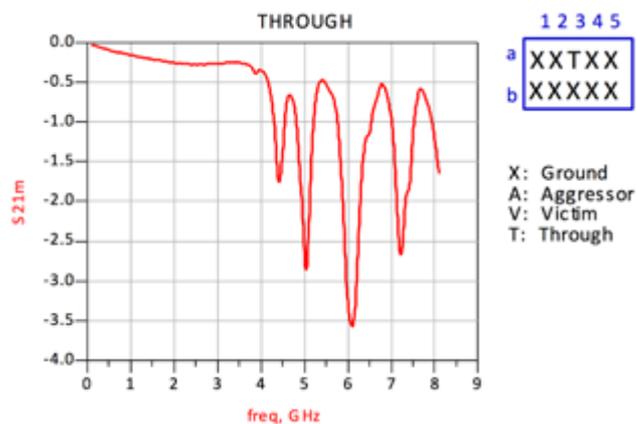


##### Crosstalk

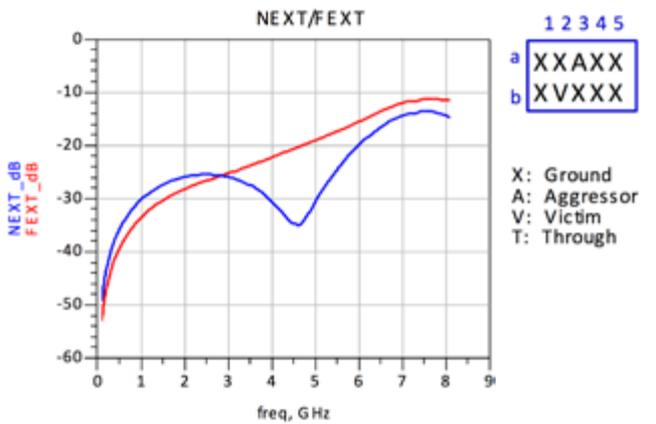


#### Single Ended Signals

##### Insertion Loss



##### Crosstalk

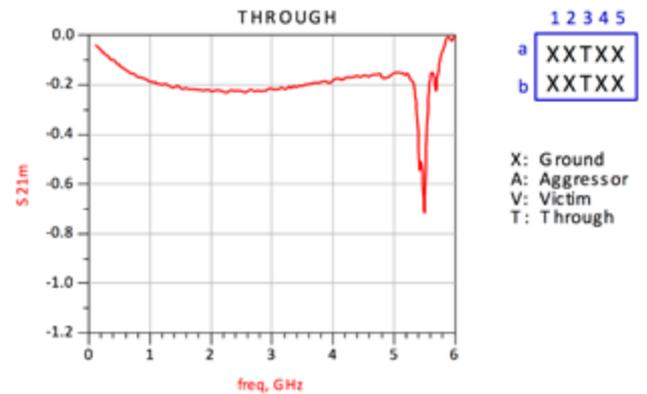
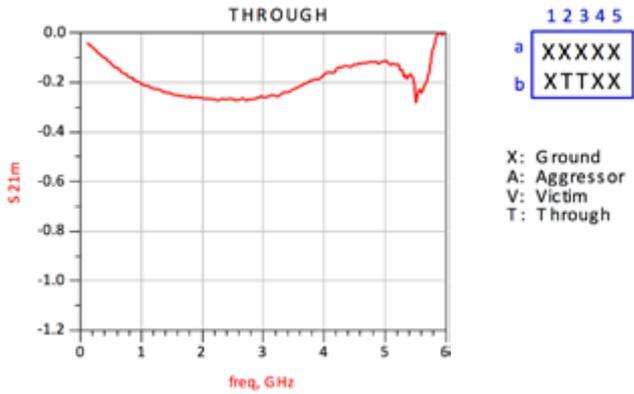


## Measurement Results

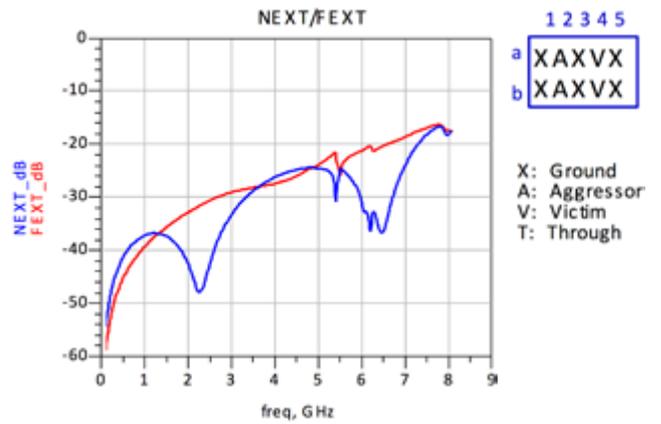
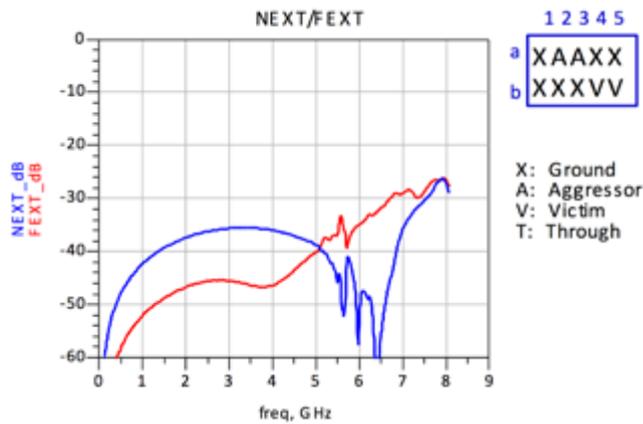
### 17 mm Board-to-Board Height

#### Differential Signals

##### Insertion Loss

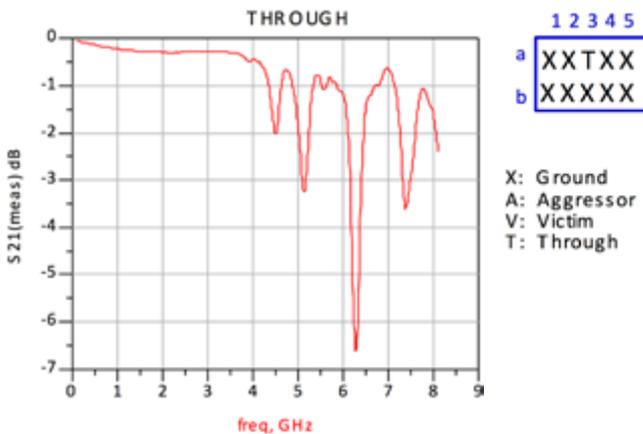


##### Crosstalk

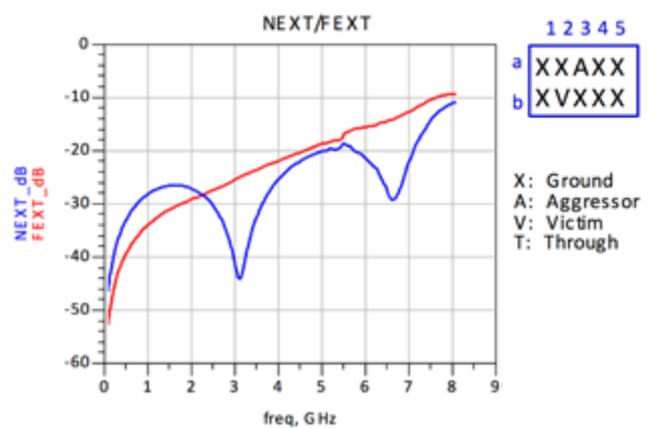


#### Single Ended Signals

##### Insertion Loss



##### Crosstalk

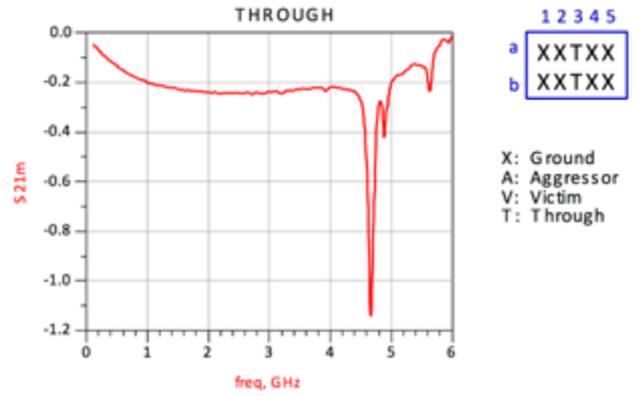
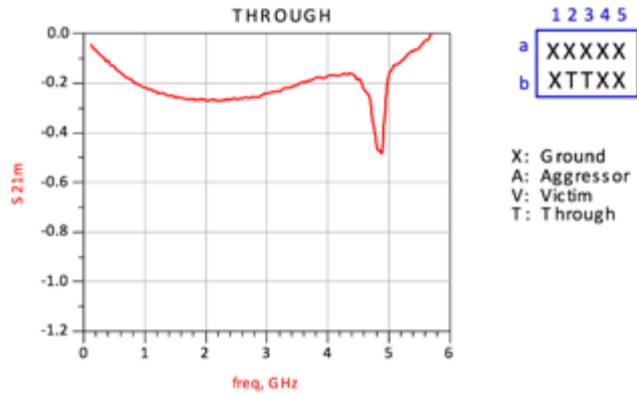


## Measurement Results

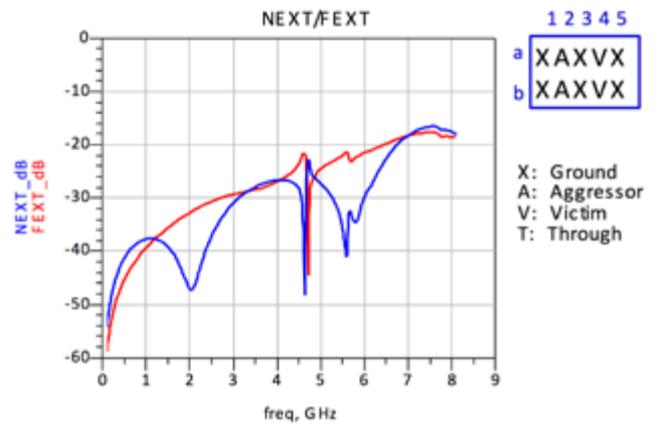
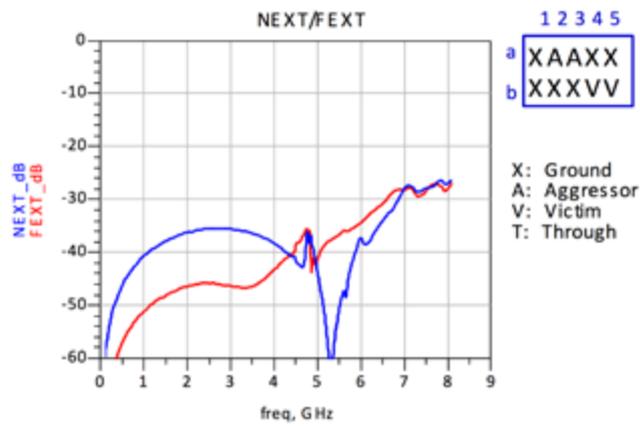
### 20 mm Board-to-Board Height

#### Differential Signals

##### Insertion Loss

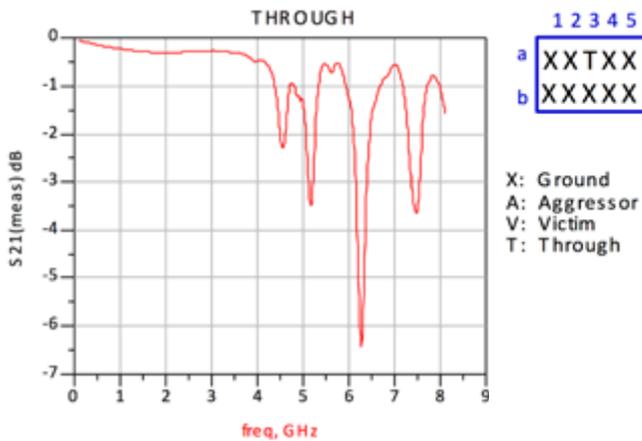


##### Crosstalk

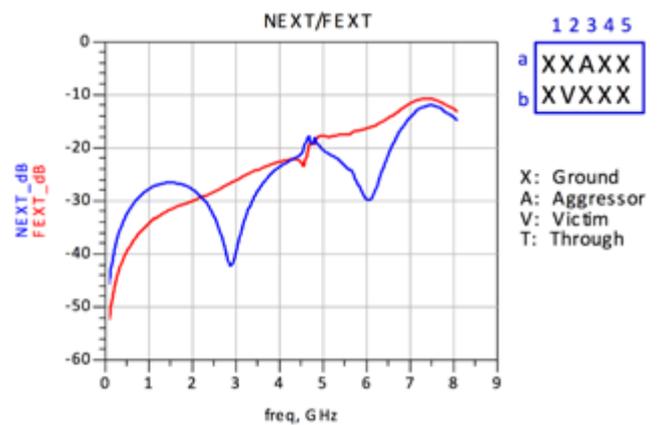


#### Single Ended Signals

##### Insertion Loss

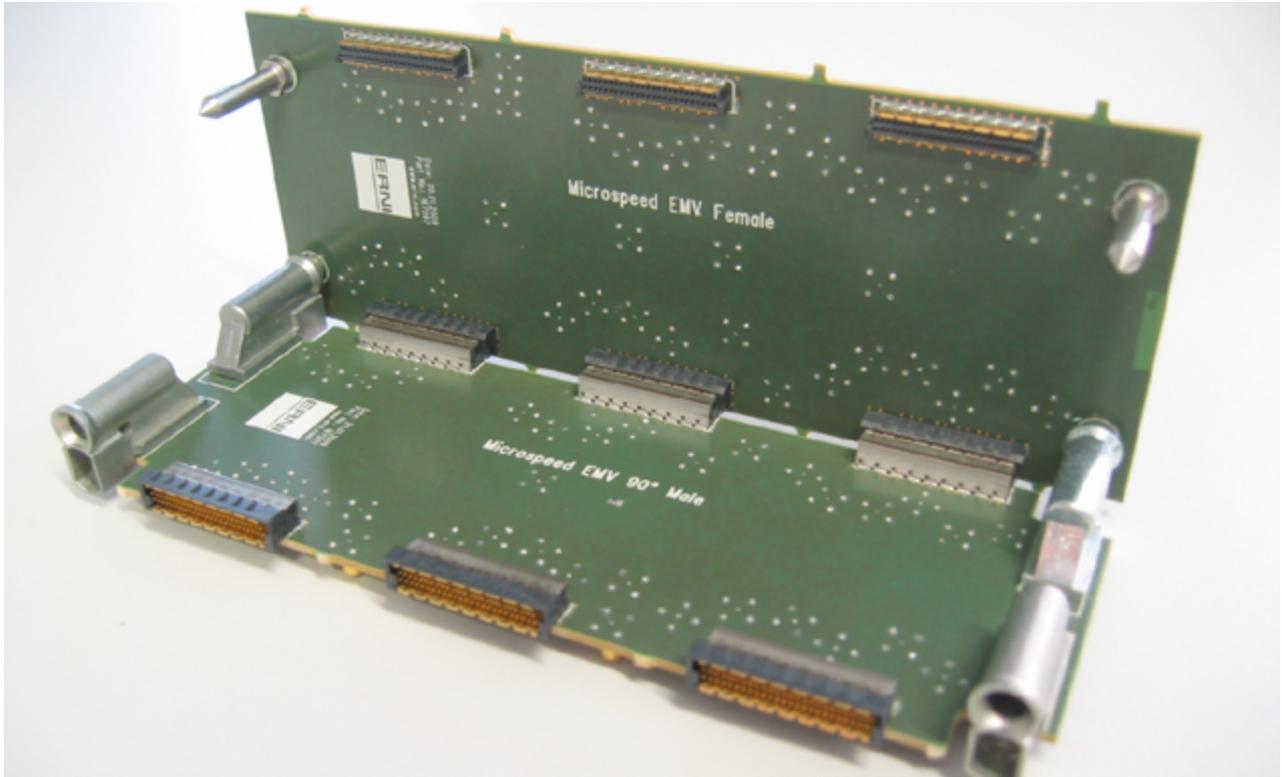


##### Crosstalk

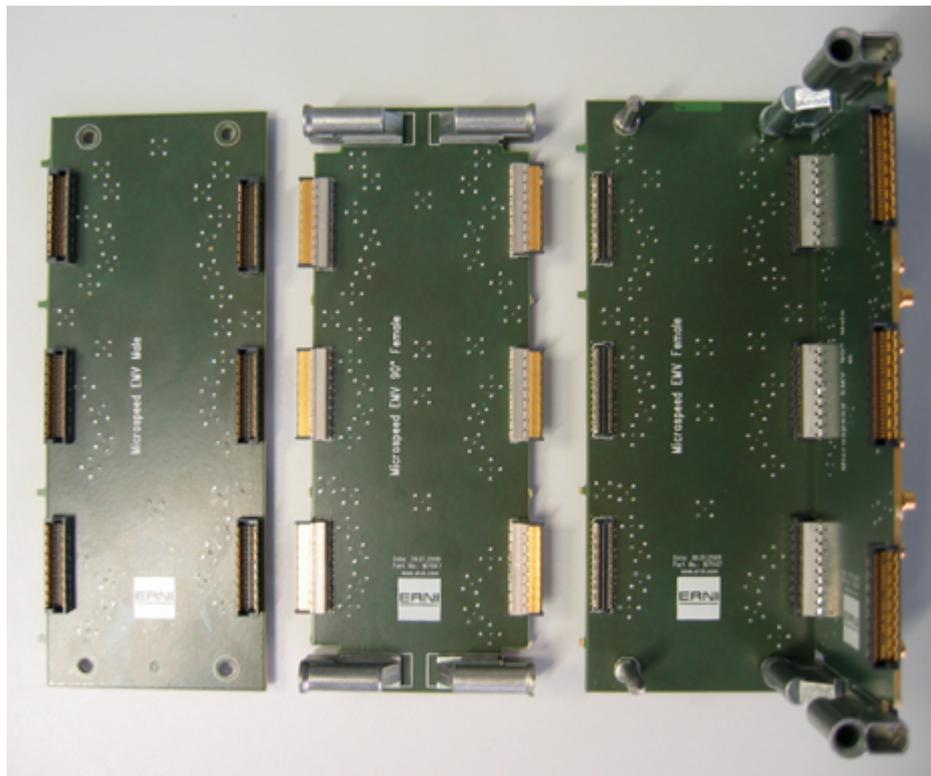




### Results for Right Angle Female and Vertical Male Connections



Measurements done with the network Analyzer HP 8510 20GHz.



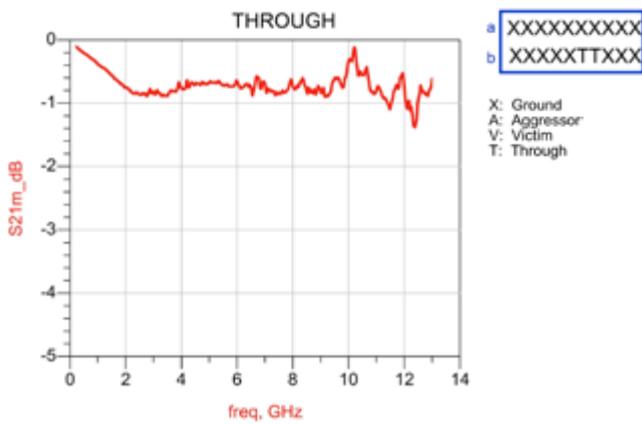
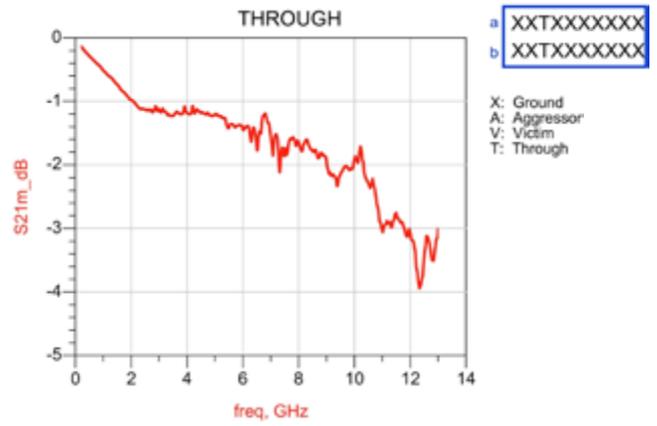
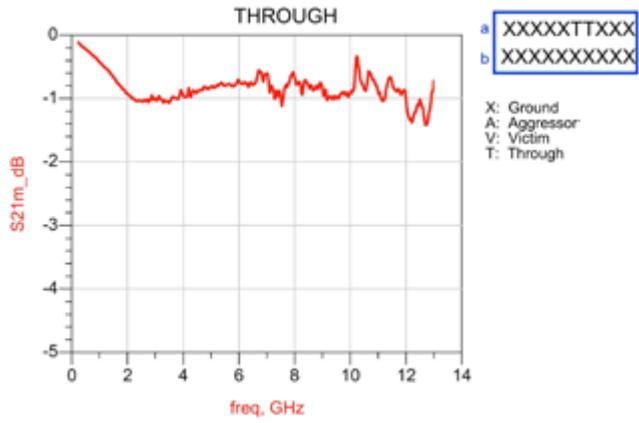


## Measurement Results

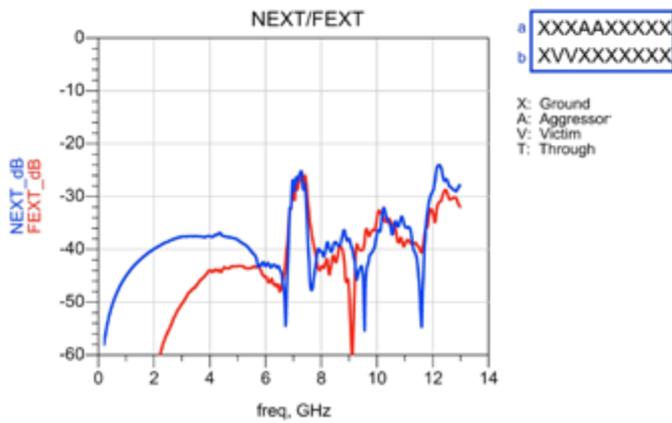
### Right Angle Female and Vertical Male Connectors

#### Differential Signals

Insertion Loss



Crosstalk



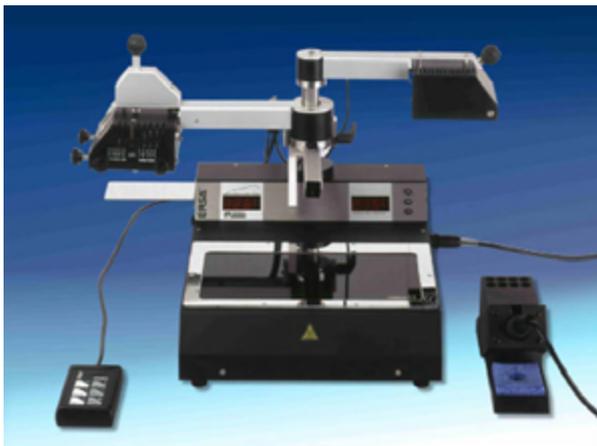
More measurement results are available in separate reports.

## Repair Tools

Depending on the equipment, we recommend preheating the entire assembly group to 70-80°C, to reduce the local heat stress during the repair process. When using a local repair station, the solder energy has to be applied predominantly to the bottom of the pcb.

Examples for commercially rework systems available at the market:

ERSA - IR 550



MARTIN - Expert-07.6



FINETECH - FINEPLACER CRS 10



VJ ELECTRONICS - Summit 2200 or Summit 1100



## Repair Tools

### ZEVAC Onyx 29

The machine precision, automatic processes and easy operation have been the basics for the development of this new platform.



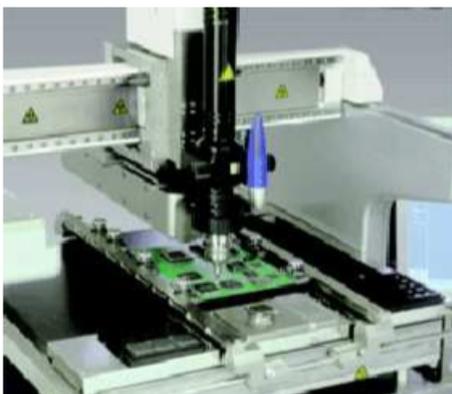
#### TECHNICAL DESIGN

The machine design follows the one of the multifunctional platform ONYX 32. The open and user friendly design of the ONYX 32 has been awarded with the Good Design Award in 2002.

In the ONYX 29, this open construction supports the motorised X, Y, Z and Vision movements, whereby 2 axes are equipped with linear motors enabling optimized and smart motions for the applications.

#### BOTTOM PREHEATER

The powerful, large 4 zones bottom preheater for large printed circuit boards has an active zone of 400 x 400mm.



#### ONYX 29 KEY FEATURES SUMMARY

- **AXIS MOVEMENTS**  
All 7 axis motorised, closed loop motion control
- **MANUAL MOTION**  
via integrated hand wheels
- **PC**  
With Windows based software.
- **UP TO 8 THERMOCOUPLE PORTS**  
to control process temperatures.
- **AUTOMATIC SITE SOLDER CLEANING SYSTEM**  
with motorised X/Y/Z-System.
- **CLOSED LOOP AIRFLOW CONTROL**  
8 to 80 l/min. using a massflow controller.
- **STANDARD ZEVAC GAS NOZZLES**
- **BOARD CARRIER**  
handles irregular-shaped assemblies without special fixturing.
- **FORCE MEASUREMENT**  
Closed loop force control for automatic picking, fluxing, placing and removing.
- **VISION**  
New MFOV Vision System allows viewing of component up to 75x75mm, Adjustable Vision LED illumination intensity.

#### VISION SYSTEM

advanced MFOV Vision System allows to see components as large as 75 x 75mm.

#### FORCE MEASUREMENT SYSTEM

Beneath other parameters, the force measuring system is used for placement to protect sensitive components and allows process automation.

#### SELECTIVE AUTOMATION

Defined process parts can be executed fully automatic. This guarantees the soldering results but also helps the operators to execute repeatable and controlled processes.

The programmed software parameters automatically control the desoldering program, the placement and the soldering program.



### **SITE SOLDER REMOVAL SYSTEM**

Especially for the rework of BGA's, the fully automatic Site Solder Removal System is an important feature.

### **SPECIAL SOFTWARE**

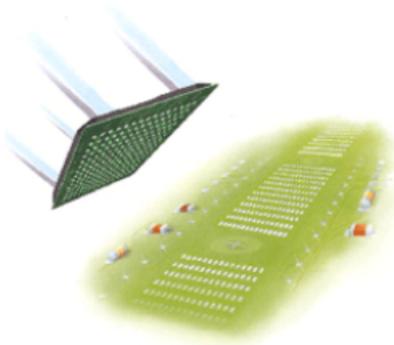
The ONYX 29 profits by the in-house developed software, a strong and modern software to support the operator with an easy-to-use surface and to make complex features for today's and tomorrow's applications available to the machine.

### **LEAD FREE SOLDERING**

The basic ONYX 29 is outlined for lead free soldering already. The use of the respective materials and a 2000W top and 6000W bottom heating together with the nitrogen input assure reliable and reproducible thermo profiles and soldering results to meet the increasing needs of the electronic industry.

### **WIDE APPLICATION RANGE**

Not only options to the ONYX 29 complete the basic unit, also existing DRS gas nozzles can be used. So applications for all existing SMD components like 0201, CSP, BGA, Flip Chip, LGA, connectors shildedings or special components can be done with the ONYX 29.











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