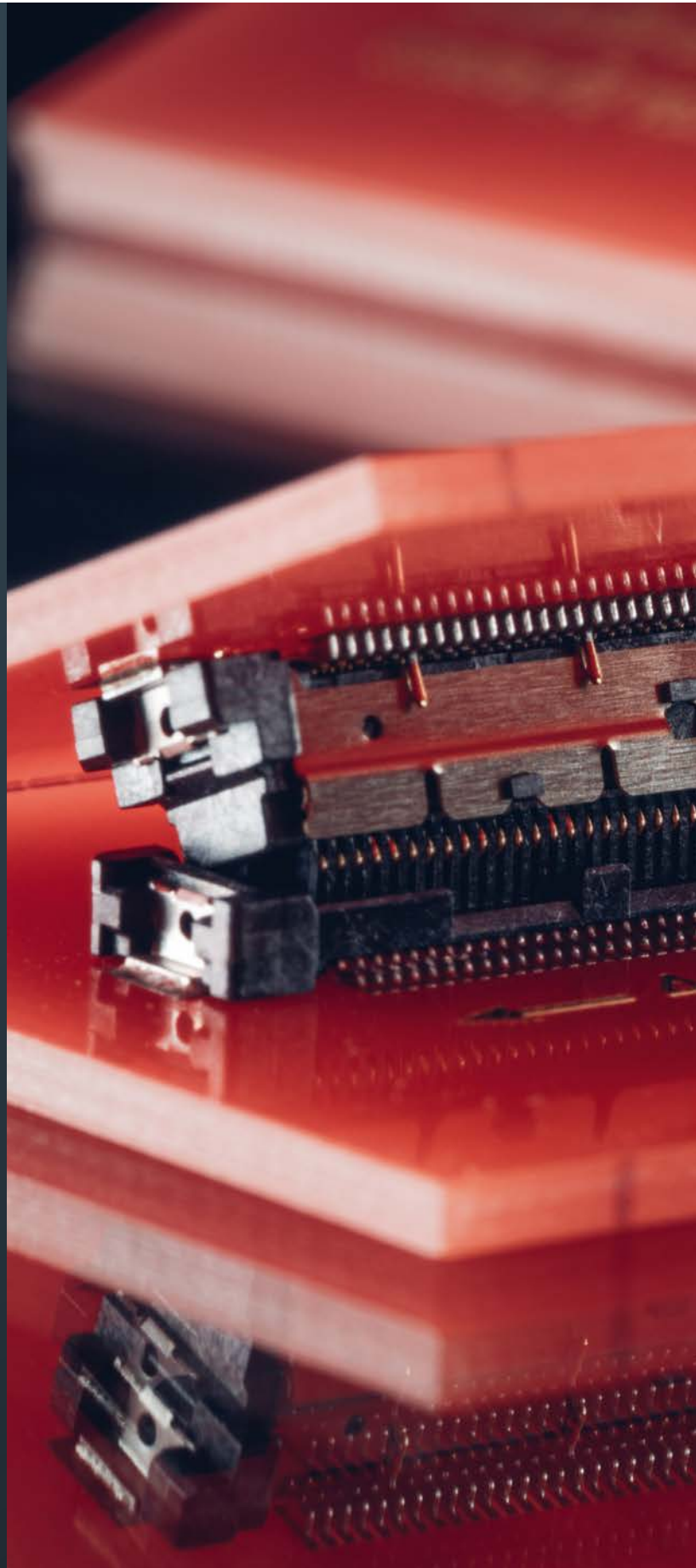


High-Speed Connector up to 25+ Gbps

COLIBRI®



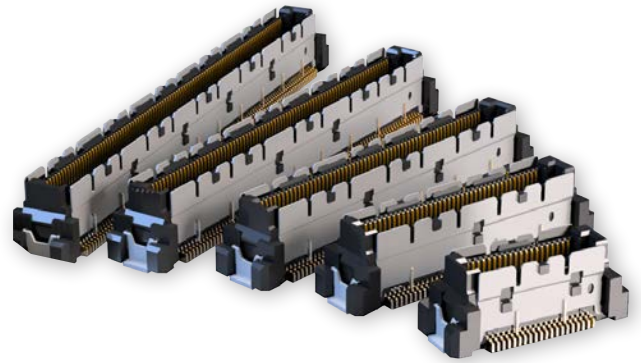
**Colibri®**

**High Speed up to 25+ Gbps**

## Small, Fast, Reliable

Colibri® is a shielded, two-row SMT connector system with a pitch of 0.5 mm, which is especially suitable for applications with high data transmission rates.

The product is available in different speeds, starting at 10 Gbps through 16 Gbps and up to 25 Gbps in the highest configuration. In addition to the available pin counts of 40, 80, 120 and 160, the versions with 220 and 440 contacts are primarily used for the now widespread COM Express® applications.



SMT



Parallel  
5 or 8 mm



High Speed



High Density



EMC





## COM Express®

COM Express® is a specification developed by PICMG for x86-based Computer-on-Modules (COM). The basic concept of plugging a COM module onto a carrier board offers the advantages of reducing development times and costs. In addition, the life cycle of products can not only be extended but also upgraded by plugging newer COM Express modules with higher performance onto the carrier board.

The Colibri connectors offered by ept are specified in the PICMG® design guide and the COM.0 specification. In addition, the 16+ and 25+ versions of Colibri® are suitable for applications requiring higher data transfer rates, in particular 16+ for PCI Express Gen. 4 and 25+ for 100 Gigabit Ethernet or USB 4.0.

Our Colibri Video:

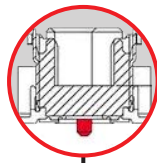


<https://youtu.be/rBry52V774Y>

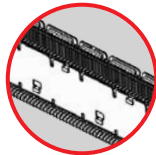


Guide Posts

anti-twist protection during positioning on the printed circuit board



Area for Pick-and-Place  
secure placement on the printed circuit board



Coplanarity

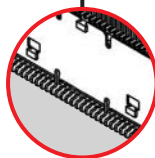
process-safe soldering during manufacturing



Plug (Male Connector/Base Board)

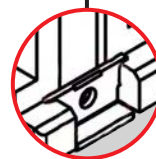
EMC Shielding

electromagnetic compatibility for optimal signal integrity

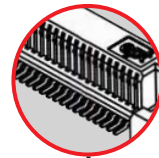


Board Lock

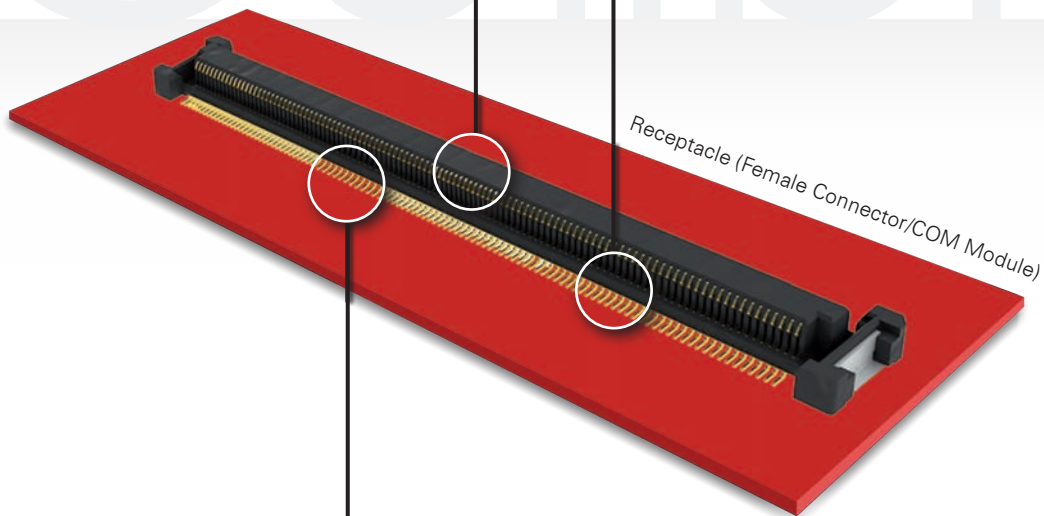
safe and robust connection to the printed circuit board



Area for Pick-and-Place  
secure placement on the printed circuit board



196 Signal and  
24 Ground Pins  
high density of signal contacts



Receptacle (Female Connector/COM Module)



0.5 mm Pitch  
small space requirements  
on the printed circuit board

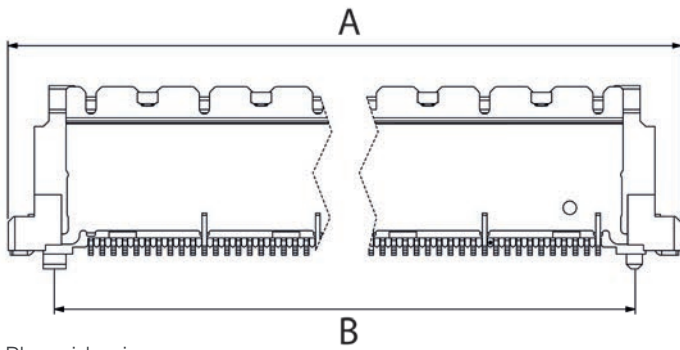


Other Features:

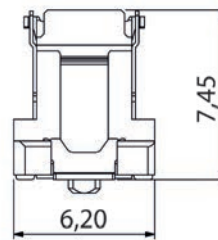
- Packaged in tape and reel or alternatively in tray
- Plug-in compatibility with other manufacturers
- SI models and extensive test reports available
- Plug optionally available with pick-and-place cap

# Colibri®

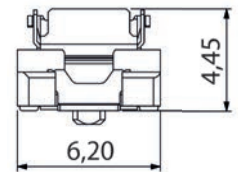
## Dimensions



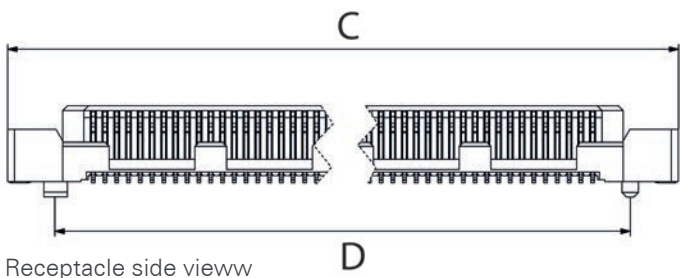
Plug side view



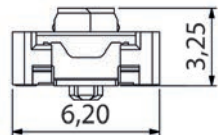
Plug 8 mm front view



Plug 5 mm front view



Receptacle side view



Receptacle front view

Connector lengths in mm:

Pins	A	B	C	D
40	16,80	12,20	16,80	12,10
80	26,80	22,20	26,80	22,10
120	36,80	32,20	36,80	32,10
160	46,80	42,20	46,80	42,10
220	61,80	57,20	61,80	57,10
440	61,80	57,20	61,80	57,10



Detailed drawings as well as a layout recommendation are available on [www.ept.de](http://www.ept.de) after selecting the corresponding article.

Basics		
Specification	PICMG COM.0	
Number of pins	40 / 80 / 120 / 160 / 220 / 440	
Termination	SMT	
Operating temperature range	-40°C to +125°C	

Material		
Insulator material	LCP	
CTI	175	IEC 60112
Contact material	Copper alloy	
Contact surface	Au over Ni	

Mechanical		
Pitch	0.5 mm	
Mating force per pin	≤ 0.9 N	
Separating force per pin	≥ 0.1 N	
Durability	30 mating cycles	IEC 60512-9-1
Coplanarity	≤ 0.1 mm	
Vibration, sinusoidal:	10 - 55 - 10 Hz, 18,5 g	Contact disturbance ≤ 1 μs IEC 60512-2-5
Shock, semi-sinusoidal:	50 g, 11 ms	Contact disturbance ≤ 1 μs IEC 60512-2-5

Electrical		
Operating current	0.5 A at 85°C (220 pins)	IEC 60512-5-2
Operating voltage	50 VAC	
Contact resistance	≤ 75 mΩ	IEC 60512-2-1
Isolation resistance	> 100 MΩ	IEC 60512-3-1
Test voltage	200 VAC	IEC 60512-4-1
Data transfer rate	10 Gbps, 16 Gbps, 25 Gbps	

Processing		
Soldering temperature	20 - 40 s at 260°C	JEDEC J-STD-020
MSL	1	JEDEC J-STD-020
Packaging	Tape & Reel or Tray	
Assembly	Pick and place	

Approval		
UL file	E130314	
Environment	RoHS compliant	



Detailed test reports are available at [www.ept.de](http://www.ept.de) after selecting the corresponding article.



# Colibri®

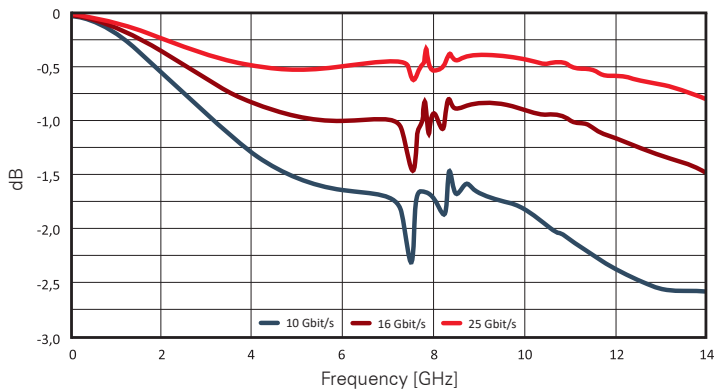
## High-Speed Capabilities

### However Fast You Want to Go, Our Colibri is Faster

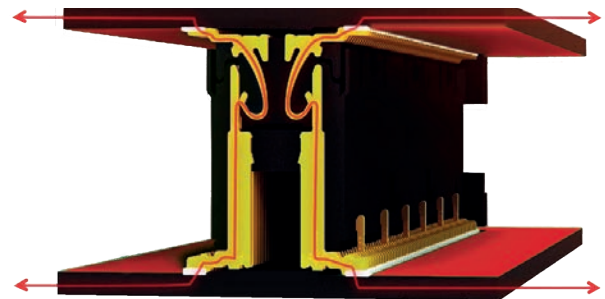
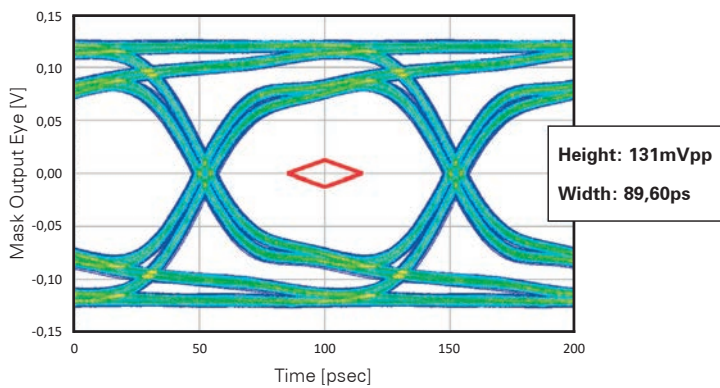
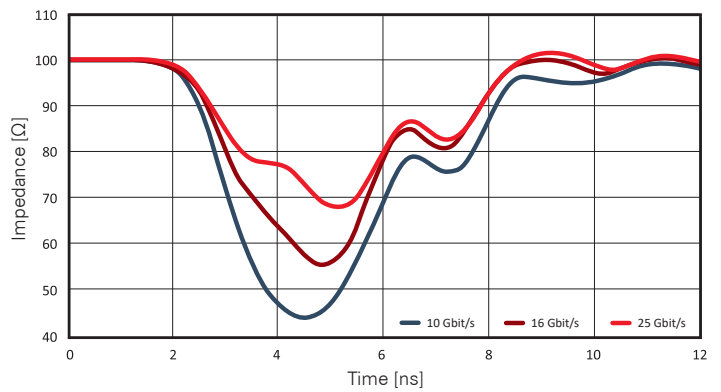
The Colibri connectors were specifically designed to meet the requirements of high-speed applications.

Through consistent further development, the plug is available in three different high-speed variants. To achieve the best signal integrity, ept's signal-transmission-optimized receptacle, should be used as part of the connector pair.

Insertion loss of the three variants:  
10+, 16+ and 25+



Differential impedance of the three variants:  
10+, 16+ and 25+



S-parameters and detailed test reports can be provided by ept for simulation and validation purposes.

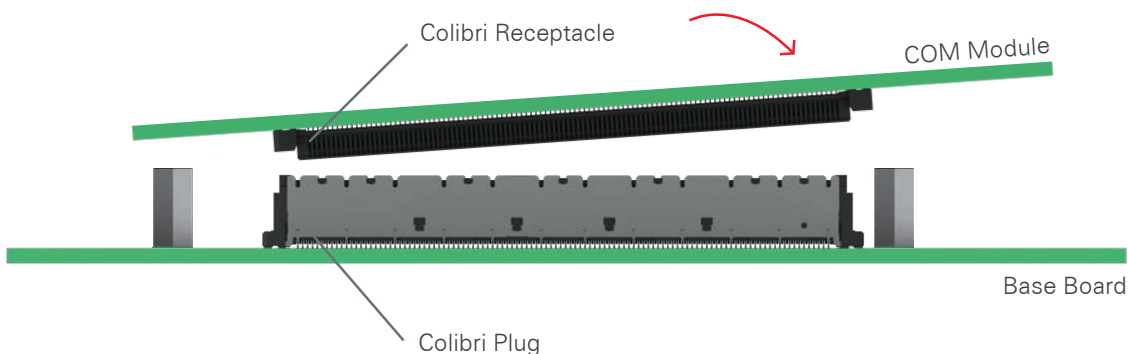
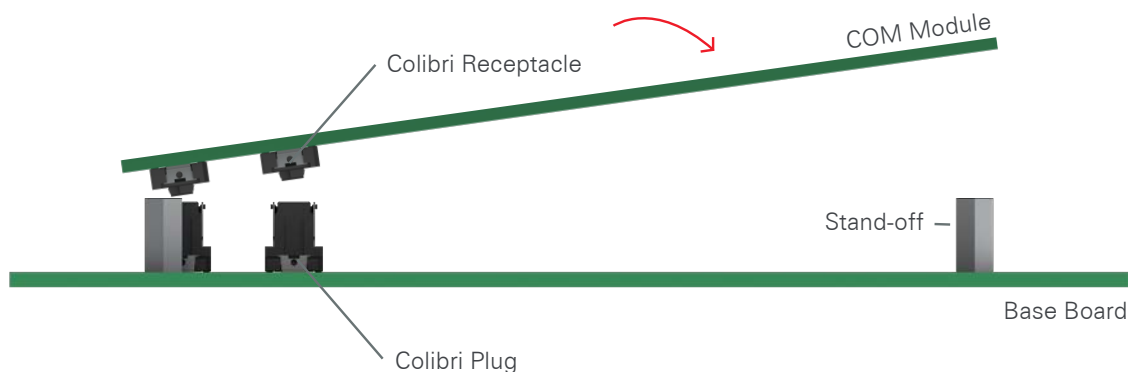


## How to Plug and Unplug COM Express® Modules

When plugging in a COM Express® module of the sizes basic, compact or extended, comparatively high plug-in forces are generated due to the high number of 440 pins.

The same applies to high pulling forces that occur when the module is removed from the baseboard. To prevent possible malfunctions, ept provides the following recommendations.

Position the COM module with the Colibri Receptacle tilted and without pressure on the Colibri Plug.



A detailed recommendation for mating and unmating Colibri connectors - COM Express® form factor Compact and Basic can be found on our website:





		Plug		Receptacle	
Pins	Data transfer rate		Part number		Part number
220	10+		401-51101-51		402-51101-51
	16+		401-51103-51		
440	10+		401-51501-51		402-51501-51
	16+		401-51503-51		
Packaging Tape & Reel - 220p		875 pcs.		1.050 pcs.	
Packaging Tape & Reel - 440p		350 pcs.		400 pcs.	

## Part Number Key

<p><b>Type</b> 401 Plug 402 Receptacle</p>	<p><b>b-t-b distance</b> 51 Plug 5 mm 51 Receptacle 55 Plug 8 mm</p>	<p><b>Pick &amp; place cap</b> 0 without pick &amp; place cap 5 with pick &amp; place cap (Plug only)</p>	<p><b>Optional tray packaging</b> 220p and 440p only</p>
<p><b>X X X</b> - <b>X X</b> <b>X X</b> - <b>X X</b> <b>VP1</b></p>			
	<p><b>Pins</b> 1 220p 3 160p 4 120p 5 440p 6 80p 7 40p</p>	<p><b>Variant</b> 51 Standard version 52 Heavy Au <b>Coating</b> 1 Standard version 3 16+ plug only 4 25+ plug only</p>	



8 mm Board-to-Board Distance

		Plug		Receptacle	
Pins	Data transfer rate		Part number		Part number
220	10+		401-55101-51		402-51101-51
	16+		401-55103-51		
440	10+		401-55501-51		402-51501-51
	16+		401-55503-51		
<b>Packaging Tape &amp; Reel - 220p</b>		600 pcs.		1.050 pcs.	
<b>Packaging Tape &amp; Reel - 440p</b>		240 pcs.		400 pcs.	



**Available options:**




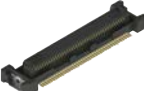

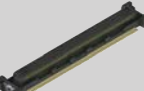

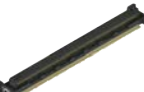
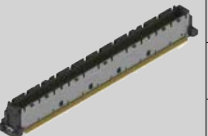

- Pins with 0.76  $\mu$ m gold plating
- Packaging in tray
- Plug with pick-and-place cap





5 mm Board-to-Board Distance

Plug	Receptacle
------	------------

Pins	Data transfer rate		Part number		Part number
40	10+		401-51701-51		402-51701-51
	16+		401-51703-51		402-51701-51
80	10+		401-51601-51		402-51701-51
	16+		401-51603-51		402-51701-51
120	10+		401-51401-51		402-51701-51
	16+		401-51403-51		402-51701-51
160	10+		401-51301-51		402-51701-51
	16+		401-51303-51		402-51701-51
220	10+		401-51101-51		402-51101-51
	16+		401-51103-51		
	25+		401-51104-51		

Packaging Tape & Reel	875 pcs.	1.050 pcs.
-----------------------	----------	------------

## Part Number Key

<p><b>Type</b></p> <p><b>401</b> Plug <b>402</b> Receptacle</p>	<p><b>b-t-b distance</b></p> <p><b>51</b> Plug 5 mm <b>51</b> Receptacle <b>55</b> Plug 8 mm</p>	<p><b>Pick &amp; place cap</b></p> <p><b>0</b> without pick &amp; place cap <b>5</b> with pick &amp; place cap (Plug only)</p>	<p><b>Optional tray packaging</b></p> <p>220p and 440p only</p>
<div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <span style="font-size: 2em; margin: 0 10px;">-</span> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div>	<div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div>	<div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <span style="font-size: 2em; margin: 0 10px;">-</span> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin: 0 5px;">X</div>	<div style="border: 1px solid red; padding: 2px; display: inline-block; font-size: 2em; opacity: 0.5;">VP1</div>
	<p><b>1</b> 220p <b>3</b> 160p <b>4</b> 120p <b>5</b> 440p <b>6</b> 80p <b>7</b> 40p</p> <p><b>Pins</b></p>	<p><b>51</b> Standard version <b>52</b> Heavy Au</p> <p><b>Coating</b></p> <p><b>1</b> Standard version <b>3</b> 16+ plug only <b>4</b> 25+ plug only</p> <p><b>Variant</b></p>	





8 mm Board-to-Board Distance

			Plug	Receptacle	
--	--	--	------	------------	--

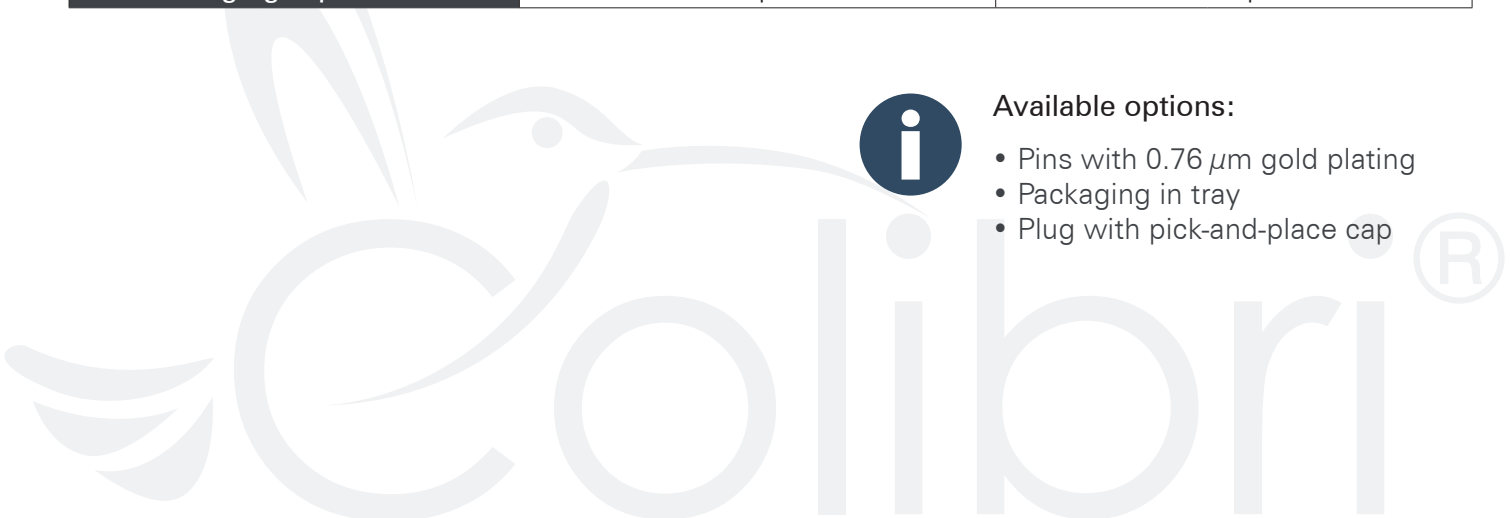
Pins	Data transfer rate		Part number		Part number
40	10+		401-55701-51		402-51701-51
	16+		401-55703-51		
80	10+		401-55601-51		402-51601-51
	16+		401-55603-51		
120	10+		401-55401-51		402-51401-51
	16+		401-55403-51		
160	10+		401-55301-51		402-51301-51
	16+		401-55303-51		
220	10+		401-55101-51		402-51101-51
	16+		401-55103-51		
	25+		401-55104-51		

Packaging Tape & Reel	600 pcs.	1.050 pcs.
-----------------------	----------	------------



**Available options:**

- Pins with 0.76 µm gold plating
- Packaging in tray
- Plug with pick-and-place cap

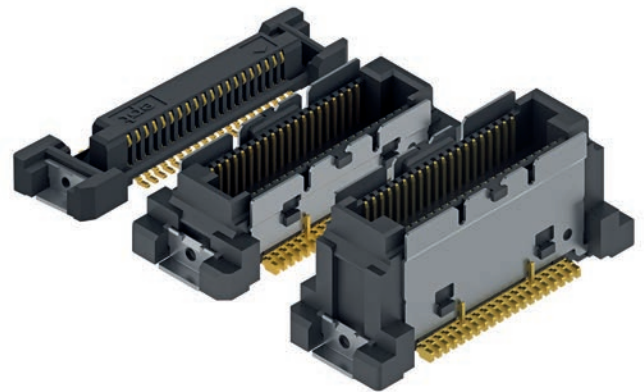


## Fast and Simple

You can receive product samples from ept quickly, easily and free of charge. Either with a few easy steps on [www.ept.de](http://www.ept.de) or by contacting us directly under +49-8861-2501-0 (recommended for special features, such as modifications).

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

Order your product samples here:



### One Stop Supplier

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

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







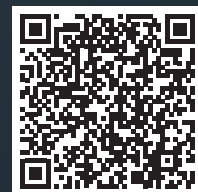
## ept GmbH

tel. +49 (0) 8861 / 2501 0  
fax +49 (0) 8861 / 5507  
sales@ept.de  
Bergwerkstr. 50  
86971 Peiting, Germany

## Other Locations

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

## Distributors Worldwide



The information contained, including drawings and illustrations intended for illustrative purposes only, is deemed reliable. ept does not, however, guarantee its accuracy or completeness and disclaims any liability in connection with its use. ept's obligations are limited to the information contained in the General Terms and Conditions of Sale, which are available at [www.ept.de](http://www.ept.de).

Users of ept's products should determine through a self-performed evaluation whether the products used are suitable for the intended application in each case.