

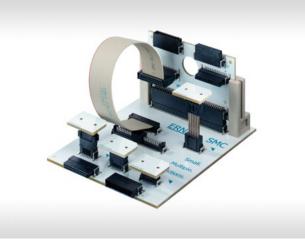
SMC

1.27 mm Connectors









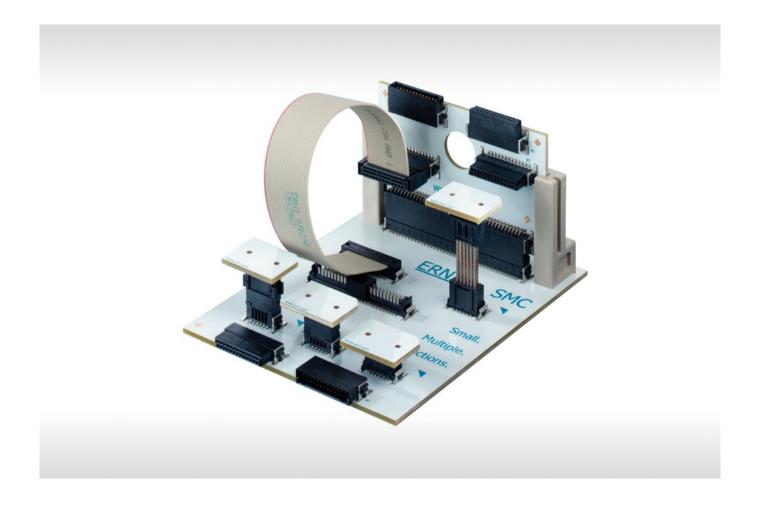
SMC - SMALL GRID, BIG POSSIBILITIES

Limited space and high performance demands are characteristics of many modern electronic systems, all of which the connectors must accommodate. There is a corresponding demand for compact, secure, and reliable connectors, with high signal integrity and a relatively high current-carrying capacity.

The comprehensive SMC range helps meet these requirements. The high-performance SMT connectors come in a number of different designs, heights, and contact densities in a 1.27 mm grid.

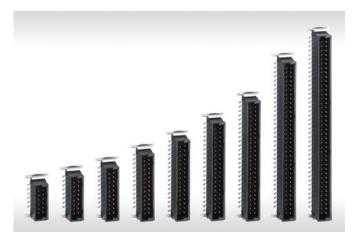
The basic design criteria for the SMC series include double-sided spring contacts for toprate contact properties and maximum contact reliability, a high-temperature resistant insulator with polarization and insertion chamfers, and a very high mating reliability.

The contact design exhibits a virtually continuous impedance profile and enables secure data transmission rates of up to 3 Gbit/s (differential) if the system is suitably designed.



FEATURES

Pitch	1.27 mm	
No. of Pins	12, 16, 20, 26, 32, 40, 50, 68, 80	
Termination technology	SMT, individual variants in pressfit technology	
	Data rate up to 3 Gbit/s	
	Current rating up to 1.7 A per contact	
	Board-to-Board connections:	
	- stacked (Mezzanine)	
Applications	- orthogonal	
	- coplanar	
	Wire-to-Board connections (ribbon cable):	
	- pluggable	
	- permanent	
	Male connectors, vertical and right angle	
	Female connectors, vertical and right angle	
Variants	Board-to-Board adapter	
variants	Board-on IDC	
	Cable assembly:	
	- Female connectors IDC, right angle	
	Lockable connectors	
	Pressfit male connectors	
Special versions	Reduced locating pegs / without pegs	
	First mate/early break contacts	





CAPABILITIES



Stacked boards (Mezzanine)



Board-to-Board adapter: enhanced board-to-Board heights



Extender card (coplanar)



Orthogonal boards



Wire-to-Board (pluggable)

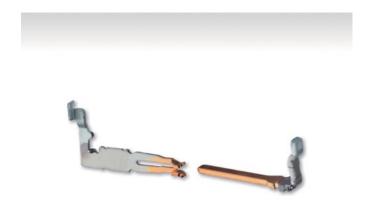


Wire-to-Board (permanent): Board-on IDC

ADVANTAGES

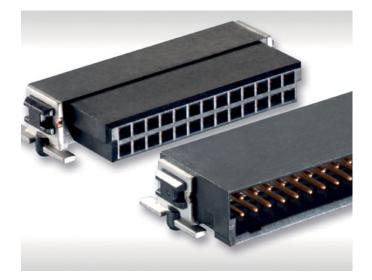
High Reliable Contact Design

- reliable, dual-beam female contact
- twisted contact tulip (90°)
- rolled, homogeneous surface, provides for more secure contact mating
- wide contact surfaces between the mated pairs
- extremely low surface roughness significantly reduces abrasion
- · low contact resistance



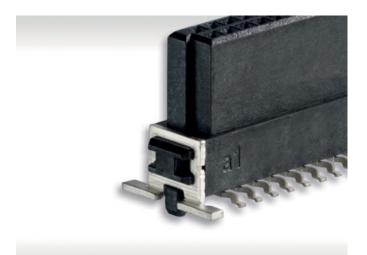
Polarization / Mating Face

- mating face polarization guards against mismating and incorrect connection
- more secure mating due to insertion chamfers in the capture range
- · distinctive guide elements for precise insertion



Robust Solder Clips

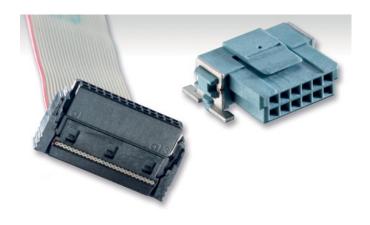
- outstanding retention forces on the circuit board
- soldering brackets absorb mechanical stress and are able to withstand high shock and vibration loads
- documented shear and tear-off forces build trust in surface-mounted connectors (e.g., shear force: min. 1000 N; tear-off force: min. 100 N)



ADVANTAGES

Interlocking Snap-In

- lockable printed circuit board (PCB) and cable connectors
- secured against heavy vibration and shock loads
- snap-in: locking when mating; can only be released with tools
- cable connector: integrated locking lever; can be manually released without tools
- protection against accidental release of Wire-to-Board connections
- cable guide provides for strain relief



Snap-In B-to-B Adapter

- single-sided locking of Board-to-Board adapters on low-profile female connectors
- enables the mating and release of two boards always on one specified side



Locating Pegs

- geometrically heterogeneous locating pegs for precise positioning on the circuit board
- enables excellent compensation of PCB holes for both positive and negative tolerances



PROCESSING

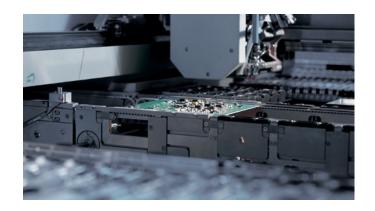
Tape and Reel Packaging

- transport safe packaging
- automatic assembly



Automatic Assembly and Reflow Soldering

• for efficient processing on modern assembly lines



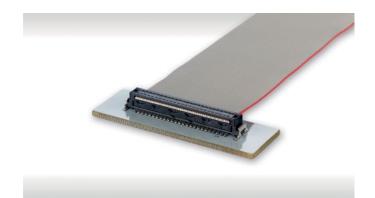
Backside Reflow Soldering

• capable of two sided reflow soldering



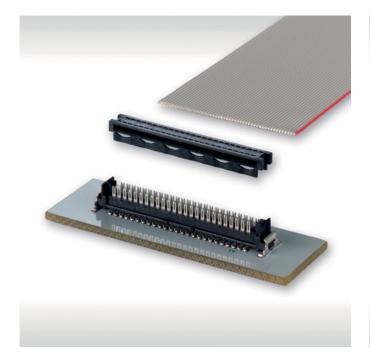
Permanent Wire-to-Board Connection (Board-on IDC)

• automated and cost-efficient assembly of ribbon cables

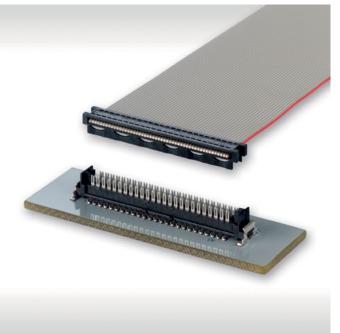


BOARD-ON IDC

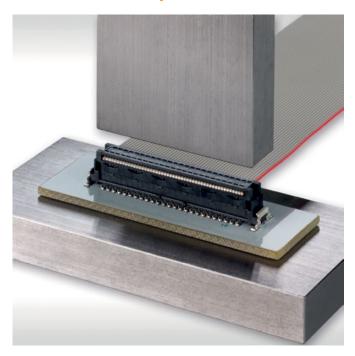
Automated Assembly



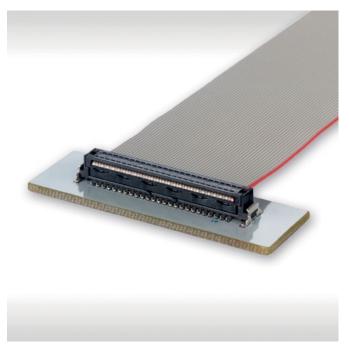
Feeding of the Ribbon Cable and Cable Guide



Press-in without Special Tool

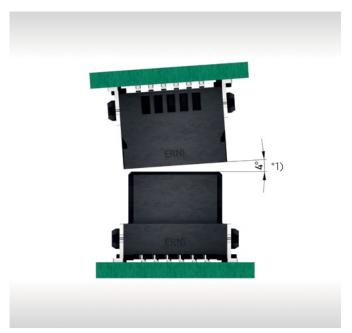


Processed Connection



MATING CONDITIONS

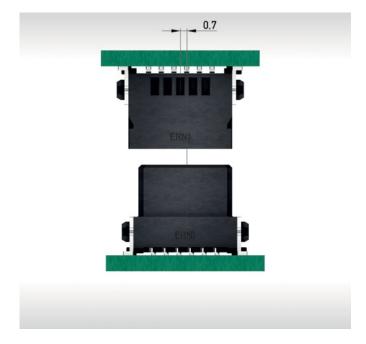
Allowed Inclination for a more Secure Self-Centering





^{*1)} depends on no. of pins and misalignment tolerance

Allowed Misalignment Tolerances for a more Secure Self-Centering





BOARD-TO-BOARD HEIGHT

Stacked Boards / Mezzanine



Board-to-Board Height	Male Stacking Height	Female Stacking Height
8.00 - 9.50 mm	1.75 mm	6.25 mm
9.50 - 11.00 mm	3.25 mm	6.25 mm
10.80 - 12.30 mm	1.75 mm	9.05 mm
12.30 - 13.80 mm	3.25 mm	9.05 mm
13.90 - 15.40 mm	4.85 mm	9.05 mm
15.40 - 16.90 mm	1.75 mm	13.65 mm
16.90 - 18.40 mm	3.25 mm	13.65 mm
18.50 - 20.00 mm	4.85 mm	13.65 mm



Board-to-Board Height	Board-to-Board Adapter	Female Stacking Height
20 mm	20 mm	2 x 6.25 mm
22 mm	22 mm	2 x 6.25 mm
24 mm	24 mm	2 x 6.25 mm
26 mm	26 mm	2 x 6.25 mm
28 mm	28 mm	2 x 6.25 mm
30 mm	30 mm	2 x 6.25 mm
32 mm	32 mm	2 x 6.25 mm
34 mm	34 mm	2 x 6.25 mm
36 mm	36 mm	2 x 6.25 mm
38 mm	38 mm	2 x 6.25 mm
40 mm	38 mm (wipe length)	2 x 6.25 mm

ELECTRICAL AND MECHANICAL CHARACTERISTICS

Technical Data

Climate category		Assemblies, B-to-B Adapter	30, 250 mm)
	DIN EN 60068-1 test b	55 / 150 / 56	55 / 125 / 56
		-55 / 125 °C (PCB Connectors)	FF (10F 00 (TDF 0 0 1 1)
Temperature range		-55 / 125 °C (TPE-S Cable)	-55 / 125 °C (TPE-S Cable)
Current rating per contact	IEC60512 test 5b	· ·	C ambient temperature: ith optimized layout)
Air- and creepage distance		contact - cont	act min. 0.4 mm
Operating voltage	IEC 60664	The permissible operating voltages depend on the customer applicat and on the applicable or specified safety requirements. Insulation coordination according to IEC 60664-1 has to be regarded for the comple electrical device. Therefore, the maximum creepage and clearance distances of the mated connectors are specified for consideration as a proof of the whole current path. In practice, reductions in creepage or cleas ance distances may occur due to the conductive pattern of the printer board or the wiring used, and have to be taken into account separated As a result the creepage and clearance distances for the application are reduced compared to those of the connector.	
Dielectric strength	IEC 60512 test 4a	contact - co	ntact 500 V _{rms}
Contact resistance	IEC 60512 test 2a	< 25 m Ω < 35 m Ω (Board-to-Board Height 18.50 - 20.00 mm) < 10 m Ω (cable assemblies)	< 10 mΩ
Insulation resistance	IEC 60512 test 3a) ⁴ MΩ
Vibration, sine	IEC 60512 test 6d	10 - 2000 Hz 20 g	
Contact disturbance (while vibration test)	IEC 60512 test 2e	< 1 µs	
Shock halfsine	IEC 60512 test 6c		0 g ms
Contact disturbance (while shock test)	IEC 60512 test 2e	<	1 μs
Mechanical operation	IEC 60512 test 9a	500 mat	ing cycles
Insertion and withdrawal force max.	IEC 60512 test 13b	0.5 N per contact	
Gauge retention force	IEC 60512 test 16e	> (D.1 N
Processing Conditions			
Hand soldering temperature max.	IEC 60068-2-20	3.5 s at 350 °C	
Dip soldering temperature max.	IEC 60068-2-20	10 s at 260 °C	
Reflow soldering temperature max.	JEDEC J-STD-020	20 - 40 s at 260 °C	
Coplanarity		< 0.1 mm	

ELECTRICAL AND MECHANICAL CHARACTERISTICS

Technical Data

Description	Standard	PCB Connectors, Cable Assemblies, B-to-B Adapter	Board-on IDC (Ribbon Cable AWG 30, 250 mm)	
Housing Material	Jundara	Assembles, 5 to 5 Adapter	(Kibboli Gubic Avvo 30, 230 hilli)	
Insulation body			LCP	
CTI value	IEC 112		175	
UL flame rating		1	UL 94 V-0	
UL file plastic material			E83005	
Contact Material		,		
Base material			Cu alloy	
Mating area		gold plating	-	
Termination area			Sn	
Environment Compatibi	lity			
Recycling		no flame-retardant additives,	no flame-retardant additives, no toxic additives allow easy recycling	
Product Approval	,			
UL/CSA			E84703	

Partial LV214 testing for selected SMC configurations done. If you want to know more, please contact TE/ERNI. In general, testings are done according to connector standards. No liability for usage of connectors in the application.

ELECTRICAL AND MECHANICAL CABLE CHARACTERISTICS

Technical Data Flat Ribbon Cables

Description	Standard cable (PVC)	High Temperature Cable (TPE-S)	Halogen-free Cable (Polyolefin TPE-O)
Cross section	AWG-30/ 7/ 0.06 mm ²		
Conductor	strar	nded Cu wire, tinned, 7x0.102 / C	0.06 mm ²
Coded wire		available	
Insulation	PVC gray (similar to RAL 78032)	TPE-S gray (similar to RAL 78032)	TPE-O gray (similar to RAL 78032)
Insulation thickness		min. 0.1mm	
Shore hardness	04.12.(6h	F2 +7 (Chaus D)	94 ±2 (Shore A) resp.
Snore nardness	94 ±2 (Shore A)	52 ±3 (Shore D)	50 ±3 (Shore D)
Technical Data			
T	-20/105 °C (fixed)	-60/125 °C (fixed)	-40/105 °C (fixed)
Temperature range	-10/105 °C (mobile)	-40/125 °C (mobile)	-20/105 °C (mobile)
Dielectric strength	1500 V _{rms}	1000 V _{rms}	1200 V _{rms}
Conductor resistance		≤ 350 Ω/km at 20 °C	·
Insulation resistance		≥ 20 MΩ x km at 20 °C	
	125 Ω (wire-wire)	4-0.0 / / / /	110 Ω (wire-wire)
Impedance	80 Ω (Ground-Signal-Ground)	136 Ω (wire-wire)	75 Ω (Ground-Signal-Ground)
Bending cycles (typical)	min. 1 million at 20 x cable diameter		
RoHS	compliant		
Flame rating	UL 94 VW-1	IEC 60332-1-2	UL 1581 (Horizontal Flame Test)



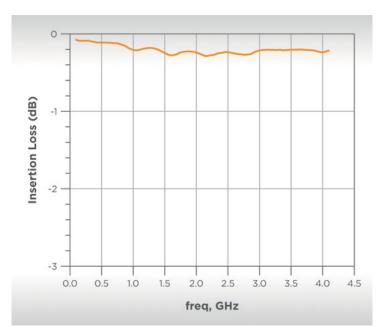
HIGH FREQUENCY CHARACTERISTICS

High-Speed Data Transmission

SMC connectors as solution for unshielded high-speed applications. The practically continuous impedance profile allows for more secure data transmission rates of up to 3 Gbit/s (differential) if the system is suitably designed.

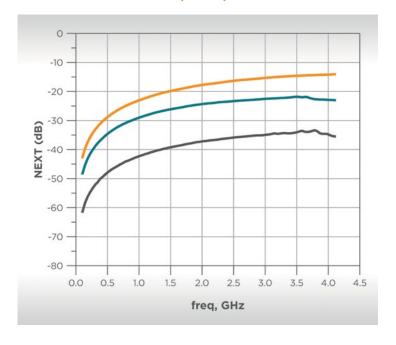
- de-embedded measurement results for the micro backplane/daughter card application
- 50-pin SMC, angled female connector, straight male connector (low profile)
- · differential signal transmission

Insertion Loss





Near End Crosstalk (Next)





 Agressor / Victim
 A2_3 / B2_3
A2_3 / A4_5
A2_3 / B4_5 (shown above)

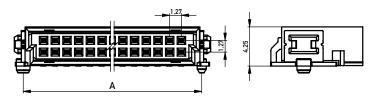
RIGHT ANGLE MALE

Product Specification

- Surface mount technology (SMT) termination
- dual row connector
- data rates up to 3 Gbit/s
- location pegs for exact board placement
- black insulation body for fast and reliable visual recognition
- automated board assembly
- for available part numbers please refer to our website

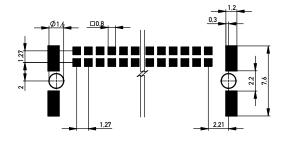


Dimensional Drawings



-	В	-	
F	PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP		1
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		_	

Recommended Layout



No. of Contacts	Α	В	С
12	10.77	12.70	10.35
16	13.31	15.24	12.91
20	15.85	17.78	15.45
26	19.66	21.59	19.26
32	23.47	25.40	23.07
40	28.55	30.48	28.15
50	34.90	36.83	34.50
68	46.33	48.26	45.93
80	53.95	55.88	53.55

All dimensions in mm.

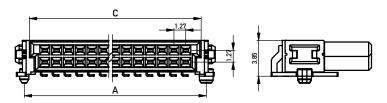
RIGHT ANGLE FEMALE

Product Specification

- SMT termination
- dual row connector
- data rates up to 3 Gbit/s
- location pegs for exact board placement
- black insulation body for fast and reliable visual recognition
- automated board assembly
- for available part numbers please refer to our website



Dimensional Drawings



-	В	-	
<u> РРРРРР</u>	ррррррр	\Box	4
		M	
			10.8
			_

12 10.77 12.70 9.37 16 13.31 15.24 11.91 20 15.85 17.78 14.45 26 19.66 21.59 18.26 32 23.47 25.40 22.07 40 28.55 30.48 27.15 50 34.90 36.83 33.50 68 46.33 48.26 44.93 55.88 80 53.95 52.55

Α

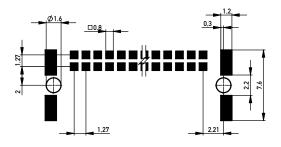
В

С

All dimensions in mm.

No. of Contacts

Recommended Layout



VERTICAL MALE

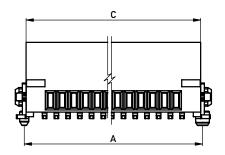
Product Specification

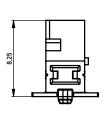
- SMT termination
- dual row connector
- data rates up to 3 Gbit/s
- location pegs for exact board placement
- black insulation body for fast and reliable visual recognition
- automated board assembly
- 3 stacking heights (1.75, 3.25, 4.85 mm)
- for available part numbers please refer to our website

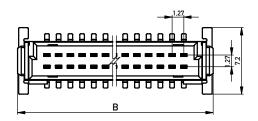


Dimensional Drawings

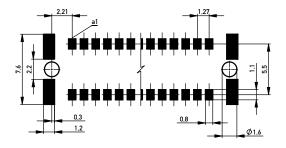
Unmated Stacking Height 3.25 mm







Recommended Layout



No. of Contacts	Α	В	С
12	10.77	12.70	10.37
16	13.31	15.24	12.91
20	15.85	17.78	15.45
26	19.66	21.59	19.26
32	23.47	25.40	23.07
40	28.55	30.48	28.15
50	34.90	36.83	34.50
68	46.33	48.26	45.93
80	53.95	55.88	53.55

All dimensions in mm.

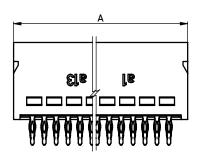
VERTICAL MALE PRESSFIT

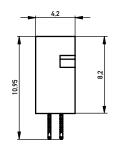
Product Specification

- pressfit termination
- dual row connector
- data rates up to 3 Gbit/s
- black insulation body for fast and reliable visual recognition
- virtually automated board assembly
- stacking height 3.25 mm
- press-in tools and toggle presses available from ERNI
- for available part numbers please refer to our website



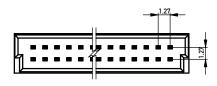
Dimensional Drawings



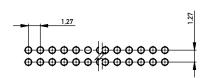


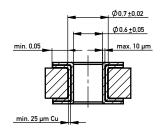
No. of		
Contacts	Α	
12	10.35	
26	19.24	
50	34.48	
68	45.91	
80	53.53	

All dimensions in mm.



Recommended Layout | Hole Design

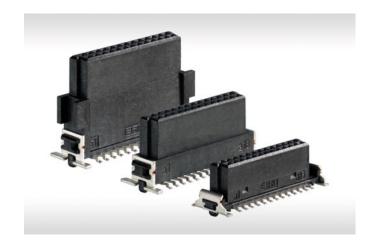




VERTICAL FEMALE

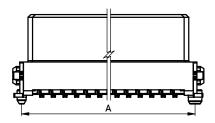
Product Specification

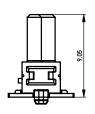
- SMT termination
- dual row connector
- data rates up to 3 Gbit/s
- location pegs for exact board placement
- black insulation body for fast and reliable visual recognition
- automated board assembly
- 3 stacking heights (6.25, 9.05, 13.65 mm)
- for available part numbers please refer to our website

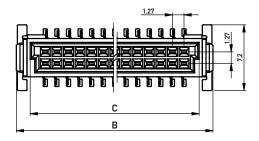


Dimensional Drawings

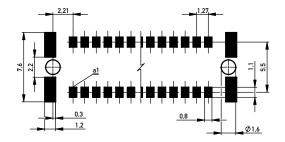
Unmated Stacking Height 9.05 mm







Recommended Layout



No. of Contacts	Α	В	С
12	10.77	12.70	9.37
16	13.31	15.24	11.91
20	15.85	17.78	14.45
26	19.66	21.60	18.26
32	23.47	25.40	22.07
40	28.55	30.48	27.15
50	34.90	36.80	33.50
68	46.33	48.20	44.93
80	53.95	55.80	52.55

All dimensions in mm.

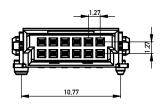
RIGHT ANGLE MALE WITH LOCKING SYSTEM

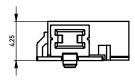
Product Specification

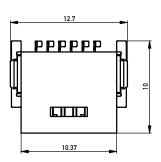
- two types of interlocking:
 - positive lock (blue colored): unlockable i.e. by tool, tip of pen
 - friction lock (black colored): unlockable without any tool
- SMT termination
- data rates up to 3 Gbit/s
- location pegs for exact board placement
- automated board assembly
- for available part numbers please refer to our website



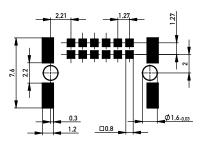
Dimensional Drawings







Recommended Layout



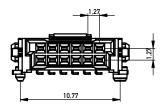
RIGHT ANGLE FEMALE WITH LOCKING SYSTEM

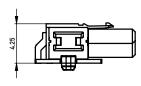
Product Specification

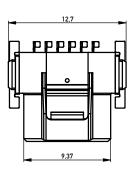
- two types of interlocking:
 - positive lock (blue colored): unlockable i.e. by tool, tip of pen
 - friction lock (black colored): unlockable without any tool
- SMT termination
- data rates up to 3 Gbit/s
- location pegs for exact board placement
- automated board assembly
- for available part numbers please refer to our website



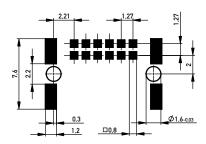
Dimensional Drawings







Recommended Layout



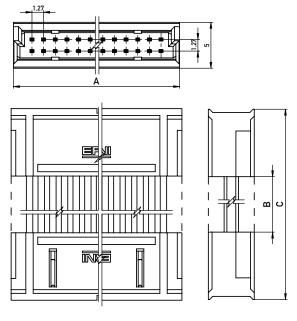
BOARD-TO-BOARD ADAPTER

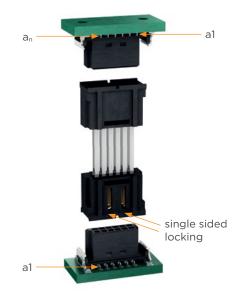
Product Specification

- Board-to-Board adapter for parallel PCB distances of 20-40 mm
- moulded (hotmelt) versions for improved environmental resistance and finger safe protection
- single-sided locking of Board-to-Board adapters on low-profile female connectors
- enables the mating and release of two boards always on one specified side
- for available part numbers please refer to our website



Dimensional Drawings





No. of Contacts A

12 10.37

26 19.26

50 34.50

68 45.93

80 53.55

All dimensions in mm.

B-to-B Adapter

(Board-Distance)	В	С
20	3.5	18.2
22	5.5	20.2
24	7.5	22.2
26	9.5	24.2
28	11.5	26.2
30	13.5	28.2
32	15.5	30.2
34	17.5	32.2
36	19.5	34.2
38	21.5	36.2

BOARD-ON IDC

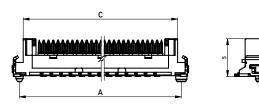
Product Specification

- permanent wire-to-board connection
- SMT and IDC termination
- · dual row connector
- data rates up to 3 Gbit/s
- · location pegs for exact board placement
- black insulation body for fast and reliable visual recognition
- flat ribbon cables AWG 30
- easy assembly with standard toggle press
- for available part numbers please refer to our website



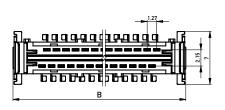
Dimensional Drawings | Recommended Layout

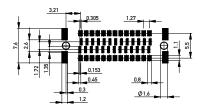
Board-on Connectors



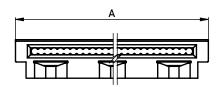
No. of Contacts	Α	В	С
12	12.77	14.70	11.78
26	21.66	23.59	20.67
50	36.90	38.83	35.91

All dimensions in mm.





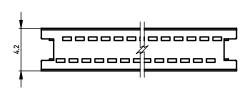
Board-on Cable Guide





No. of Contacts	Α	В
12	10.78	6.98
26	19.67	15.87
50	34.91	31.11

All dimensions in mm.



SMC Product Selection

	Vertical Male (Type Q)		Vertical Female (Type Q)			
		· state of the sta				AND DESCRIPTION OF THE PARTY OF
Positions	1.75mm Height	3.25mm Height	4.85mm Height	13.65mm Height	9.05mm Height	6.25mm Height
12 pin	244836-E	244854-E	234206-E	234198-E	154717-E	154805-E
16 pin	254587-E	254536-E	254414-E	354070-E	354062-E	354055-E
20 pin	254588-E	254537-E	254415-E	354071-E	354063-E	354056-E
26 pin	244837-E	244855-E	234207-E	204763-E	154718-E	154806-E
32 pin	254589-E	254538-E	254416-E	354072-E	354064-E	354057-E
40 pin	254590-E	254539-E	254417-E	354073-E	354065-E	204632-E
50 pin	244838-E	244856-E	234208-E	234199-E	154719-E	154807-E
68 pin	244839-E	244857-E	234209-E	234200-E	154720-E	154808-E
80 pin	244840-E	244858-E	234210-E	234201-E	154721-E	154809-E

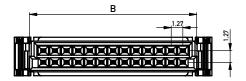
	Right Angle Male (Type B)	Right Angle Female (Type B)	IDC Female (Type B)
Positions			
12 pin	154763-E	154740-E	214345-E
16 pin	354094-E	354078-E	294813-E
20 pin	354095-E	354079-E	294814-E
26 pin	154764-E	154741-E	214346-E
32 pin	354096-E	354080-E	294815-E
40 pin	354097-E	354081-E	294816-E
50 pin	154765-E	154742-E	214347-E
68 pin	154766-E	154743-E	214348-E
80 pin	154767-E	154744-E	214349-E

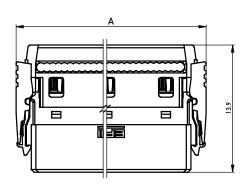
Product Specification

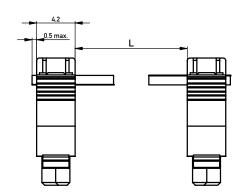
- cable assemblies with IDC female connectors
- ribbon cable AWG 30/7
- three different cable types
- for available part numbers please refer to our website









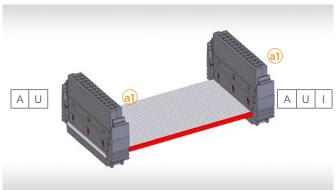


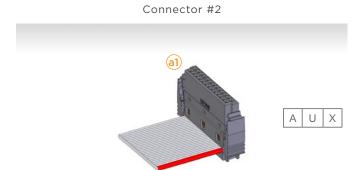
No. of Contacts	Α	В
12	12.69	9.37
16	15.23	11.91
20	17.77	14.45
26	21.58	18.26
32	25.39	22.07
40	32.53	27.15
50	38.88	33.50
68	50.31	44.93
80	57.93	52.55

All dimensions in mm.

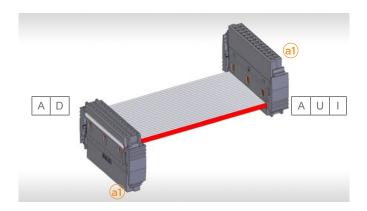
Configurations

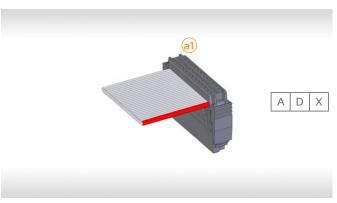
Standard Connector #2 Connector #1

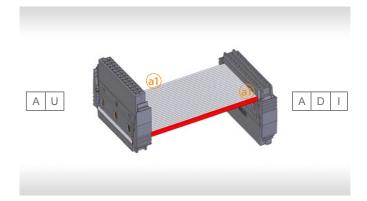


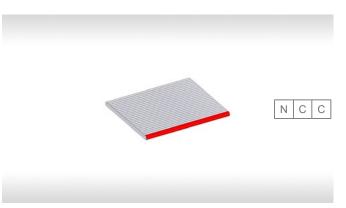


Crossed









Cable Types



Standard

- standard ribbon cable with PVC insulation
- AWG 30/7
- excellent abrasion and cut resistance
- temperature range: -10 °C to +105 °C
- UL2678

High Temperature

- high temperature resistant ribbon cable with TPE-S insulation
- AWG 30/7
- excellent abrasion and cut resistance
- temperature range: -40 °C to +125 °C

Halogen-free

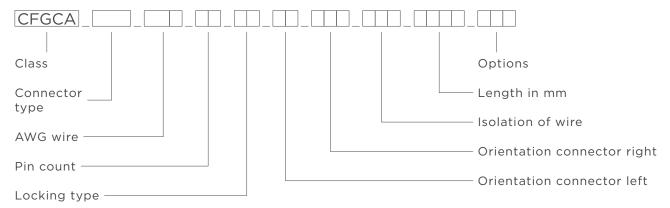
- halogen-free ribbon cable with TPE-O insulation
- AWG 30/7
- excellent abrasion and cut resistance
- oil-resistant (ASTM 2)
- temperature range: -20 °C to +105 °C
- UL22092







Ordering Information Standard Cable Assemblies



Example for a standard configuration:

CFGCA SMC 30R 112 LL AU AUI PVC 01175 ANN

Ordering code field	Number of digits	Example configuration	Composition of the confi	guration
Class	5	CFGCA	ConFiGurable Cable Ass	embly
Connector type	3	SMC	SMC	
AWG wire	3	700	1st and 2nd column:	30
AVVG WIFE	5	30R	3rd column:	Ribbon Cable
Pin count	2	12	12, 16, 20, 26, 32, 40, 50	, 68, 80
Landin or to one			Locking Latches	
Locking type	2	LL	Secure Lock	
			Angeled U p	
Orientation connector left	2	AU	Angeled Down	
			1st and 2nd column:	Angeled U p
		AUI		Angeled Down
Orientation connector right	3			Not ConneCted
rigit			3rd column:	I-connected (1:1)
				X-connected (1:N)
			PVC : -10 °C to +105 °C	
Isolation of wire	2 - 4	PVC	TPE : -40 °C to +125 °C	
			PO: -20 °C to +105 °C, ha	alogen free
Length in mm	4	0175	175 mm / 25 - 2500 mm	possible
			1st column:	A symmetric
				S ymmetric
- · ·	3	ANN	2nd and 3rd column:	custom PRint
Options				UL Label
				Print ad U L Label
				No print No UL labe

Product Specific Technical Notes

- intended use: the offered products, i.e. cable assemblies, are components used in devices for internal wiring in non-critical industrial applications
- not intended to be used in live-support applications, no safety-classified applications, not intended for automotive use, not intended for applications with danger to life and limb
- desired audience: (professional) company customers who assume the full responsibilty for their products including the ERNI cable assembly product under consideration
- customer has to carefully check the product's appropriateness for the desired use (application) with the help of its technical specifications and additionally verify that the operation of the product in said application is in agreement with all requirements that may be applicable under the scope of the actual application (applicable regulation, law, and whatever more)
- product solely ERNI-internally sampled and released customer FAI report will not be provided (also includes PPaPs, CofCs, acceptance test certificates and IMDS Data)
- ERNI may change suppliers or mix materials from various sources as long as the specification layed out here will be maintained (assumption of fit-form-function)
- · outside these product offerings customer-specific assemblies to be inquired separately

Connect With Us

We make it easy to connect with our experts and are ready to provide the support you need. Visit www.te.com/support to chat with a Product Information Specialist.

te.com

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AK 9/24 Original

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