
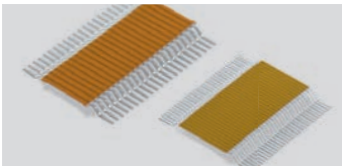
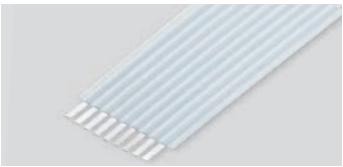







SUMIDA FLEXIBLE CONNECTIONS

CONTENT

Flexible Board Connections  PANTA® FIX Through Hole Technology  PANTA® SMD  PANTA® FLL SMT – Surface-Mount Technology  PANTA® ZIF  PANTA® FIX CRIMP  PANTA® FIX POWER Mateable Connection Technology	Flexible Flat Cables 	Flexible Modules 
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COMPANY



SUMIDA - Since 1956, we stand for competence and specialization in the areas of manufacturing technologies for the electrical industry. Our quality requirement has made us the **market leader** for flexible connection technologies. Our customers trust us in our production technologies of „milling of copper wires“ and „laminating“ for the production of high-tech products.

Our core technologies, such as special contacting processes, injection molding and other assembly steps, form the basis for products from the fields of flexible flat cable (FFC) and flexible modules. With our technologies, we supply our customers in particular with modules for climate sensors, airbag applications and lighting technology.

SUMIDA stands for **flexibility, speed, quality and reliability**. With these attributes and a specialized know-how, we meet the requirements of our products and the competition.

Through a **global positioning** of the SUMIDA Group, we have the possibility to serve international customers and implement products. The global positioning in the **SUMIDA Group** and the utilization of synergies in the areas of technology, production and logistics also support our activities and development. SUMIDA flexible connections GmbH is **certified** according to ISO TS 16949 and ISO 14001. We provide you with documentation on topics such as: Such as PPAP, IMDS, ROHS / REACH, UL, etc. upon request.

The sale and delivery of the products specified in the catalog is subject to our general terms and conditions. The current version of these terms can be found at www.sumida-flexcon.com.

This printed matter is not subject to any change management. No claims can be delivered from it unless there is the evidence of intent or gross negligence. The product characteristics are not guaranteed and do not replace our expert's advice.



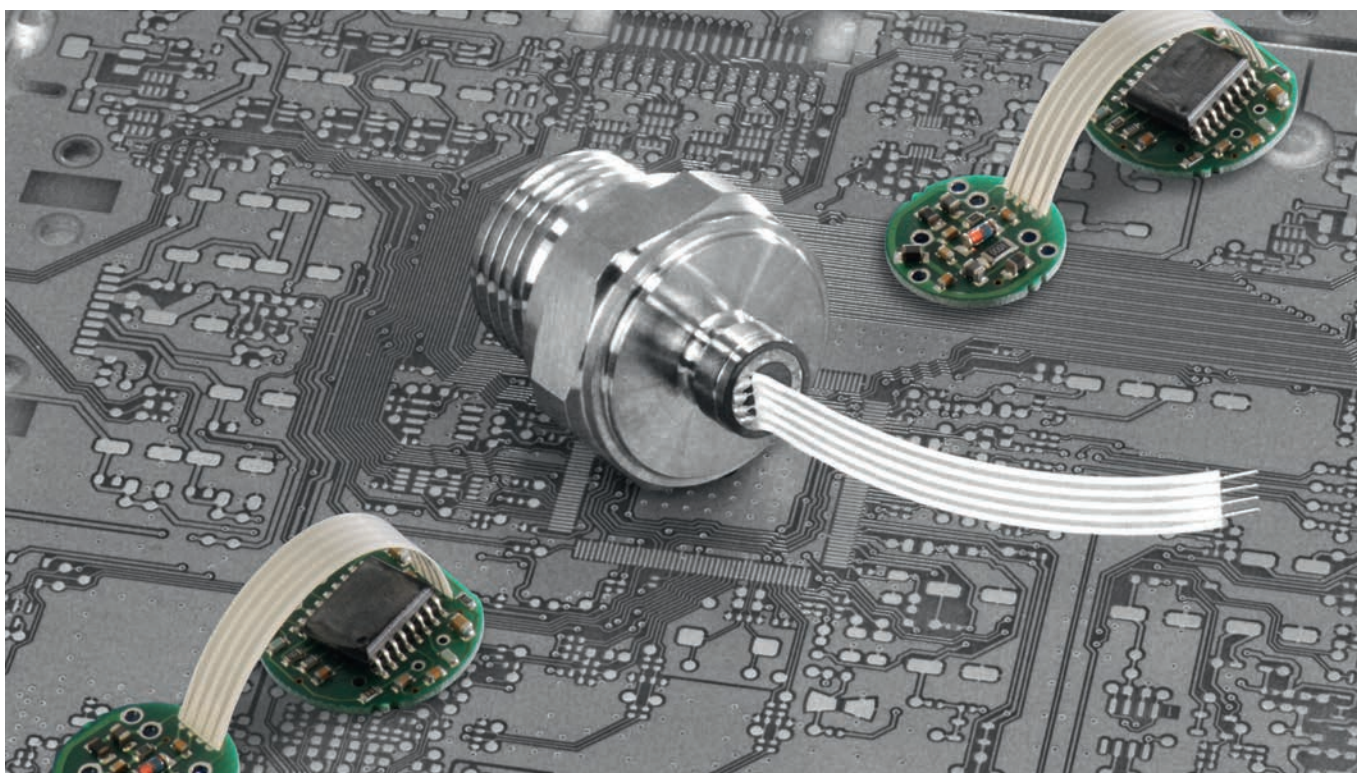
FLEXIBLE BOARD CONNECTIONS (FBC)

PANTA® FIX JUMPER



PANTA® FIX JUMPERS are highly flexible flat conductor connectors to circuit boards (PCBs). Solid round conductors ensure a fast and safe assembly. The PANTA® round-flat-round technology combines both. The copper conductors are rolled flat to a defined geometry in the insulating area. Ensuring the highest standards

of vibration and bending resistance. The smooth notch-free transition from round to flat guarantees fracture-safe connection points. The following materials can be used for the insulation: Polyester, Aramid fiber, PEN (Polyethylenaphthalat) or Polyimide.



CHARACTERISTICS

- Through Hole Technology (THT)
- High vibration and bending resistance Reliable and fracture-safe connection Very easy handling
- Immediately ready for installation
- Economizes working time and assembly costs
- Minimum space required
- Wiring errors are avoided
- Choice of various termination styles
- Allows combination with male connectors
- High-quality insulation materials (-40°C to +125°C)
Different pitches within one jumper available (MIX)
Short insulation lengths also available as wire jumpers (without the flat rolled copper section)

BENEFITS

- Smooth notch-free transition from flat to round
- Fracture-safe connection point Compensation of intrinsic vibrations Reduction of tension in the soldering area Avoidance of vibration resonances

Please do not hesitate to ask for our processing instructions for PANTA® FIX JUMPER.



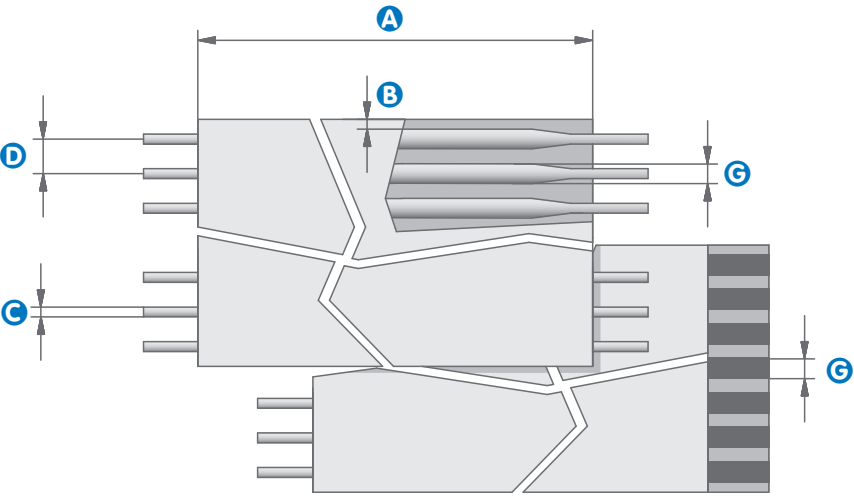
Abb.: Bending stress

Customer specials on request.

FLAT-ROUND-180° – ANALYSIS

- Shifting of the bending stress into the flexible area
- Reduction of the bending stress at the solder joint
- High durability

PANTA® FIX JUMPER




TECHNICAL DATA

Order code	E	G	B	L	D	F	A	Z	P	R	C
D Pitch (mm)	1,00	1,25	1,27	1,90	2,00	2,50	2,54	3,18	3,50	3,81	5,08
Max. number of pins	32	32	32	32	32	32	32	25	23	20	16
A Length (mm)	15-5000										
B Min. margin (mm)	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,5	0,5
C Pin diameter (mm)	0,32	0,32	0,32	0,40	0,40	0,51	0,51	0,51	0,51	0,51	0,51
American Wire Gauge (AWG)	28	28	28	26	26	24	24	24	24	24	24
G Flat conductor width (mm)	0,7	0,75	0,75	1,35	1,35	1,5	1,5	1,5	1,5	1,5	1,5
Flat conductor thickness (µm)	80	90	90	110	110	110	110	110	110	110	110
Conductor material	Cu-ETP (E-Cu); min 1,5 µm tin-plated					min 2-3 µm tin-plated					
Current rating at 20°C (A)	1,0	1,5	1,5	2,0	2,0	3,5	3,5	3,5	3,5	3,5	3,5
Voltage rating (V _{DC})	200	200	200	200	200	300	300	300	300	300	300
Dielectric strength (V _{DC/min})	700	700	700	1500	1500	1500	1500	1500	1500	1500	1500

Insulation	Polyester	Aramid fiber	PEN	Polyimide
Insulation resistance (Ω - GRD-SIG-GRD)	>10 ¹⁰			
Operation temperature (°C)	-40 ... +105	-40 ... +125	-40 ... +125	-40 ... +125
Soldering temperature* (°C/ sec.)	250/4	260/5	260/5	260/5

Customer specials on request.

	Pitch e.g. A= 2,54 mm see pitch code	Insulation material e.g. P = Polyester N = Aramid fiber E = PEN K = Polyimide	Termination Style e.g. A = identical ends AN = different see chart, combinations on request
	A 05	N 051	A - 
	Number of pins	Insulation length from 15-5000 mm Special lengths on request	Special designs on request, drawing required

TERMINATION STYLES

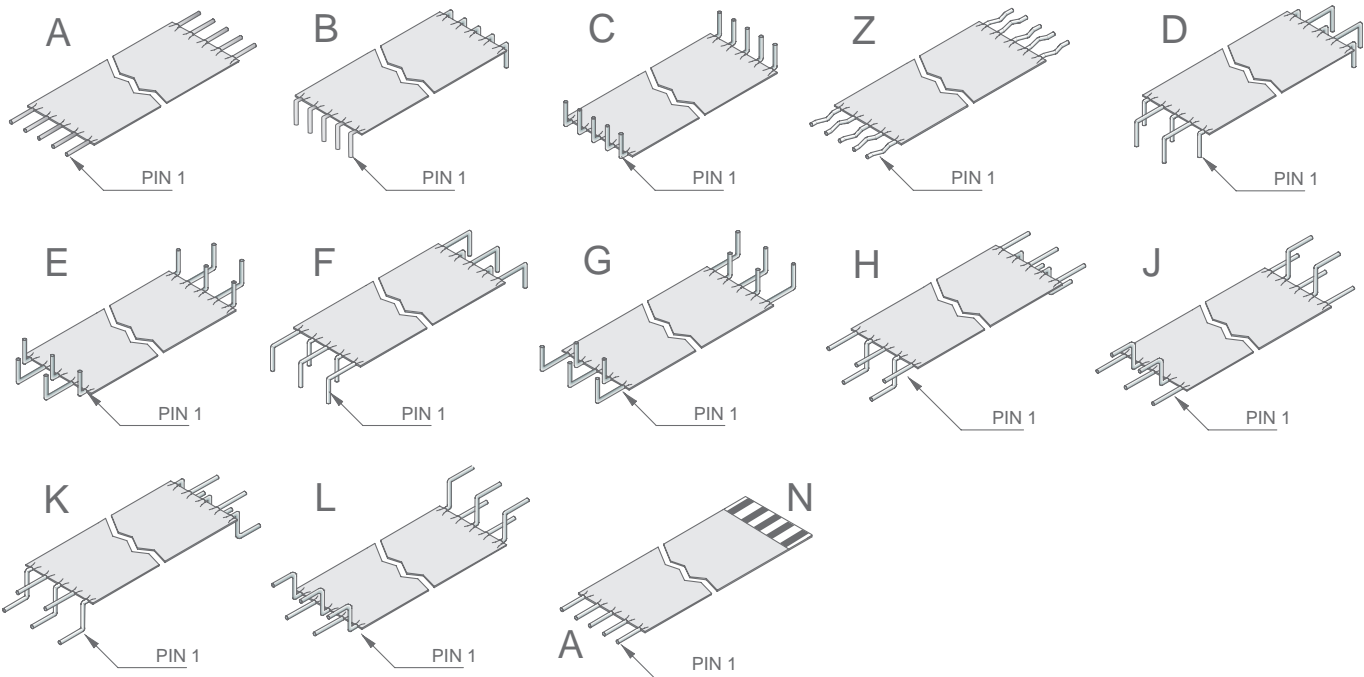


Fig.: The respective termination styles can be chosen separately for each side and can also be combined with PANTA FLL-, PANTA FIX CRIMP and PANTA ZIF-terminations.

Use the order key to configure your request online.



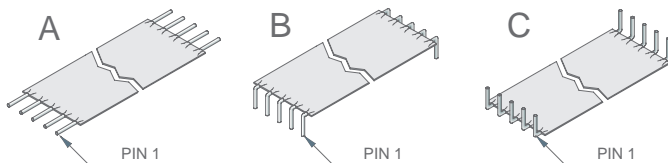
PANTA® HT JUMPER



PANTA® JUMPER for permanent operation temperature of 150°C e.g. gearbox application, motor application, white goods.

CHARACTERISTICS

- Economic alternative compared to Flex-rigid or Flex PCB
- Connection of electronic component
 - board to board
 - board to sensors
- Temperature range: -40°C to 150°C
- Insulating material: Polyimide
- Length: max. 25 – 200 mm
- Wire diameter: 0,32 – 0,51 mm
- Pitch: A = 2,54 mm, B = 1,27 mm, D = 2,00 mm
- Number of pins: max. 32



BENEFITS

- Smooth notch-free transition from flat to round
- Fracture-safe connection point Compensation of intrinsic vibrations Reduction of tension in the soldering area Avoidance of vibration resonances

Please do not hesitate to ask for our processing instructions for PANTA® HT Jumper.

ANALYSIS TESTS

Durability tests

- Temperature test (1000 h @ 170°C)
- Pressure-Cooker-test (96h @ 140°C)
- Humidity test (pre condition + 14 days @ 32°C & 85 % rH)
- Temperature shock (1000 cycles -40°C - 150°C)

UL758

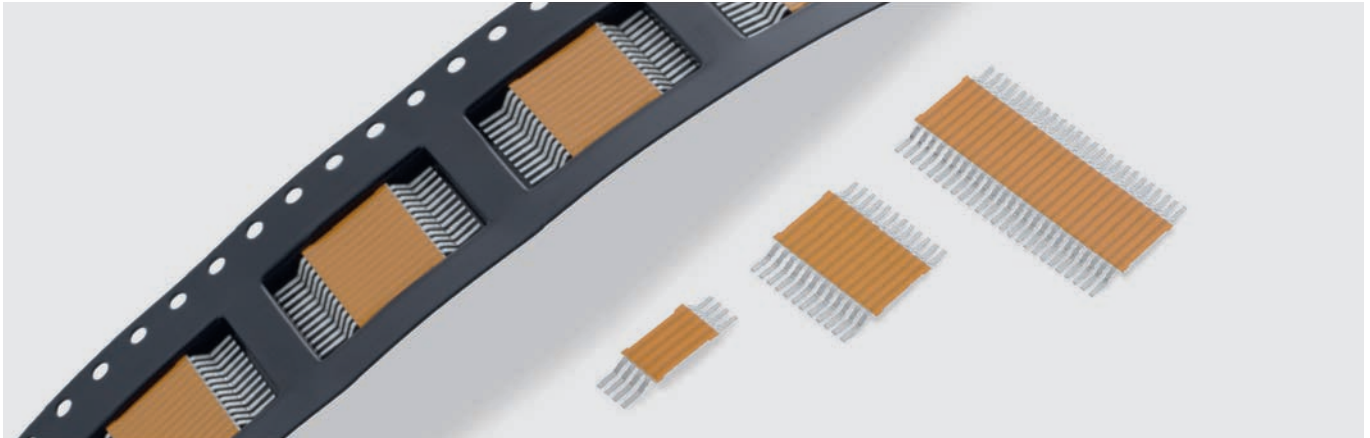
- Temperature shock @ 180°C
- Dielectrical-test with pre-aged specimen (7 days @ 180° C)
- Solder-test
- Cold-bend-test (4h @ -10°C)
- Bending-test after 7 days @ 180°C

	Raster e.g. A= 2,54 mm see pitch code	Insulation material e.g. P = Polyester N = Aramid fiber E = PEN K = Polyimide	Special designs on request, drawing required
HT –	A 05 –	P 051 –	001
	Number of pins	Insulation length from 30-999 mm Special lengths on request	

TECHNICAL DATA

Order code	B	D	A
Pitch (mm)	1,27	2,0	2,54
Max. number of pins	32	32	32
Lenght (mm)	30 - 200	30 - 200	30 - 200
Min. Margin (mm)	0,8	0,8	0,8
Pin diameter (mm)	0,32	0,4	0,51
Americcan Wire Gauge (AWG)	28	26	24
Flat conductor width (mm)	0,75	1,35	1,27
Flat conductor thickness (µm)	100	110	110
Conductor materials (µm)	Cu-ETP (E-Cu); tin-plated	Cu-ETP (E-Cu); tin-plated	Cu-ETP (E-Cu); tin-plated
Current rating at 20°C (A)	1,5	2,0	3,5
Voltage rating (V _{DC})	200	200	300
Dielectric strenght (V _{DC/min})	700	1500	1500
Isolation	Polyimid	Polyimid	Polyimid
Operation temperature (°C)	-40 ... +150	-40 ... +150	-40 ... +150
Soldering temperature (°C/sec)	260/5	260/5	260/5

PANTA[®] SMD 0,93 mm pitch



The **PANTA[®] SMD** System allows a flexible connection of PCBs. These products can be automatically placed with standard equipment. An additional mounting and soldering process of the components is not necessary.

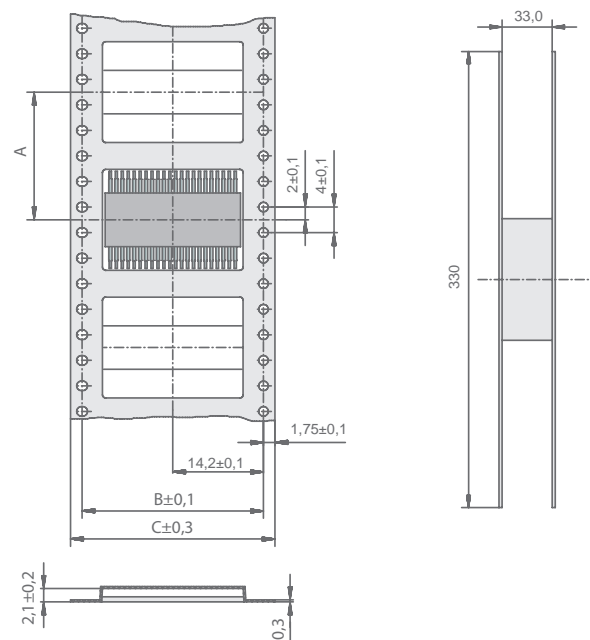
ADVANTAGES


- Automatic placement by SMD assembly machines (Pick&Place capability) Can be re-flow soldered
- The SMD connection can be bended up to 180° after the soldering process (fig. 2) Use on single and multilayer printed circuit boards
- Operating temperature up to 125°C
- No additional assembly and soldering process necessary
- Cost effective alternative to e.g. flex-rigid printed circuit boards
- Higher flexibility and break resistance compared to step milled PCBs

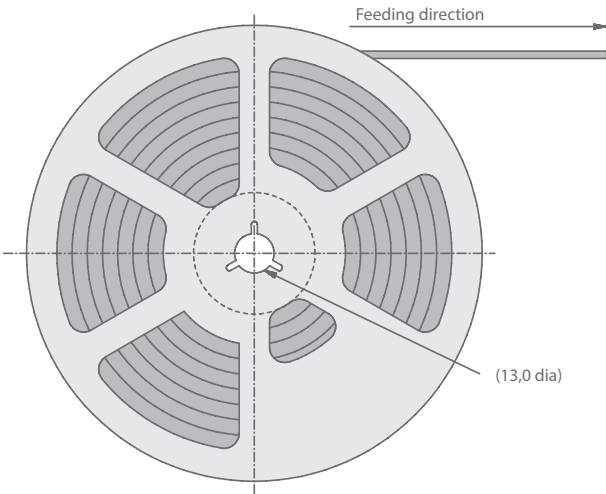
CHARACTERISTICS

- Pitch: **0.93 mm**
- Bridge length: 11.2 mm
- Total length: 15.2 mm
- Number of pins: 4-25 of 0,93 mm pitch Packaging unit: 1500 pcs. on returnable reel Special pitches and other pin counts on request Customized SMD solutions available.

Please do not hesitate to ask for our processing instructions for **PANTA[®] SMD**.



		Pitch e.g. 0,93 mm	Insulation length e.g. 8,3 mm		
SMD – 22 – 093 – K – 083 –					
Number of pins		Insulation material K = Polyimid N = Aramid fiber		Special designs on request, drawing required	



TECHNICAL DATA

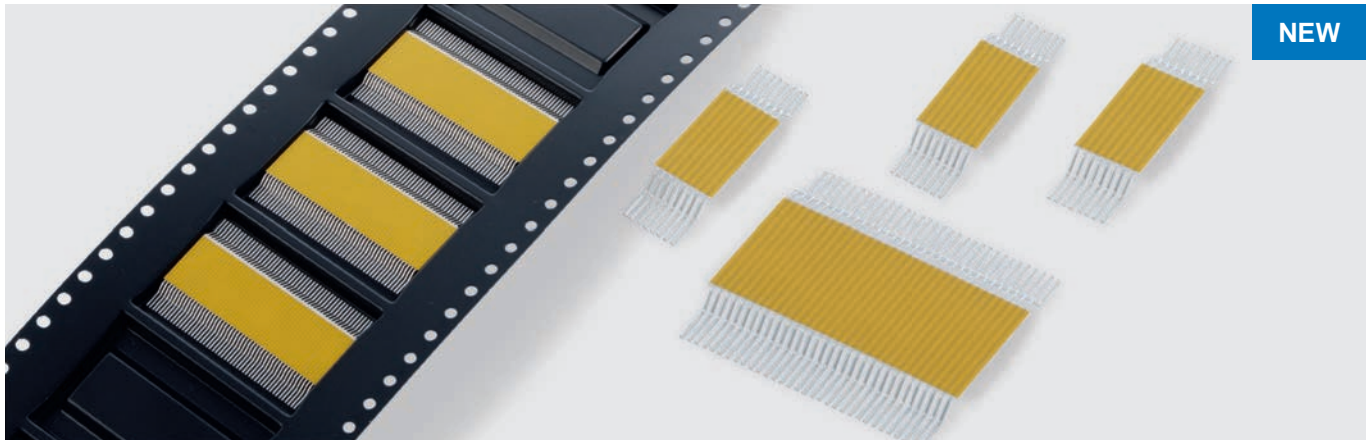
Pitch (mm)	0,93
Max. number of pins	4 - 25pol
Insulation material	Polyimide-Folie 25 µm + Kleber
Insulation resistance (Ω)	10 ⁸
Complanarity (mm)	0,15
min. bending radius (mm)	2,0
max. bending cycle	5 x 135°
Conductor material	Cu 150 µm Sn
Current rating at 20° (A)	2 (nach DIN EN 60512-5-2)
Recommended Reflow Profil	DIN EN 61760
Operation temperature (°C)	-40°C bis +125°C

Customer specials on request.

Use the order key to configure
your request online.



PANTA® SMD 0,50 mm pitch



PANTA® SMD-JUMPER in pitch 0,5 mm are used as a high density flexible board connection for the usage on PCB in sandwich-configuration or for electronic connections from PCB's to various assembly positions.

BENEFITS

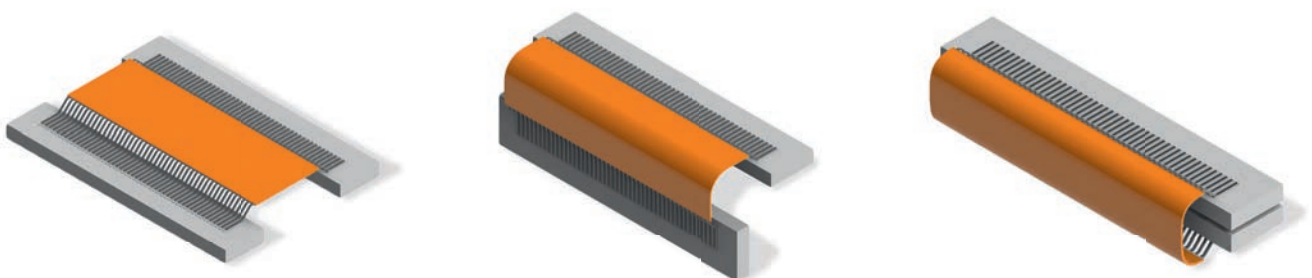
- Variety of possible applications in electronic modules
- High flexibility and bending durability
- Economic alternative compared to e.g. milled and rigid-flexible PCB's
- High temperature resistance
- Automatic assembly by SMD-Pick & Place process
- Reflow soldering (recommended reflow profile DIN EN 61760)
- Subsequent bending of the connected PCB's of up to 180 ° are possible


CHARACTERISTICS

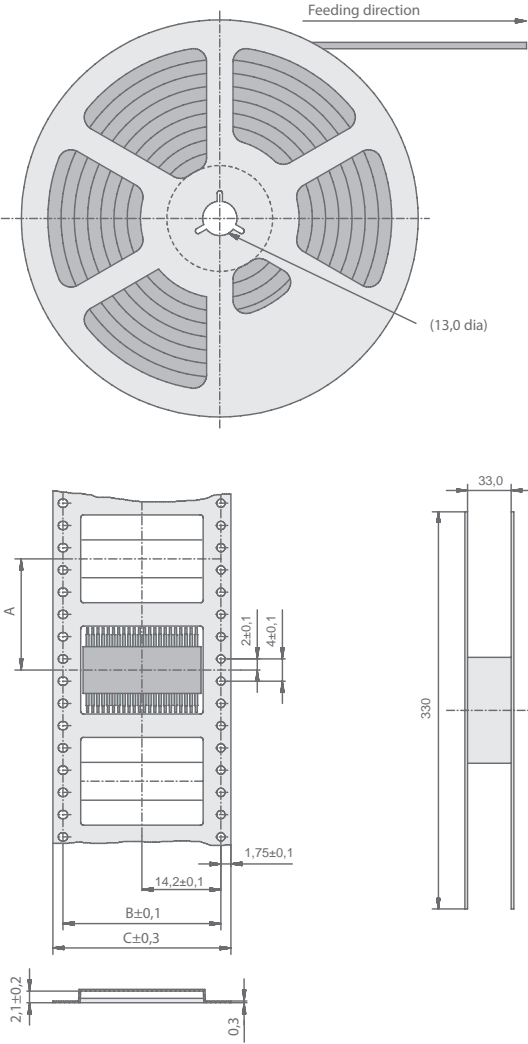
- Pitch: **0,5 mm**
- Number of pins: 8 to 32
- Bridging length 10,8 mm
- Total length: 15,2 mm
- Application: - 40 °C to + 125 °C
- Current rating: 1A @ 20°C (according DIN EN 60512-5-2)
- Package unity: 1.500 pcs. on tape & reel

Please do not hesitate to ask for our processing instructions for PANTA® SMD.

DESIGN EXAMPLE



		Pitch e.g. 0,50 mm	Insulation length e.g. 8,3 mm	
SMD – 22 – 050 – K – 081 –				
Number of pins		Insulation material K = Polyimid		Special designs on request, drawing required

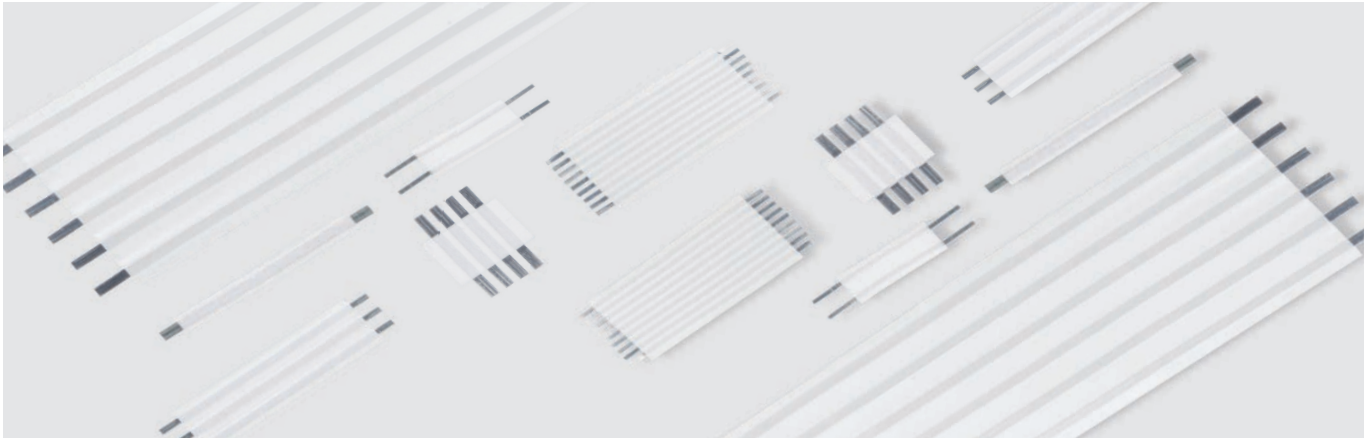


TECHNICAL DATA

Pitch (mm)	0,50
Max. number of pins	8 - 32
Insulation resistance (Ω)	50 ⁸
Complanarity (mm)	0,15
Min. bending radius (mm)	2,0
Max. bending cycle	5 x 135°
Conductor material	Cu 100 μ m + NiSn
Current rating at 20° (A)	1 A (DIN EN 60512-5-2)
Recommended Reflow Profil	DIN EN 61760
Operation temperature (°C)	-40°C to +125°C

Customer specials on request.

PANTA® FLL



PANTA® FLL connectors are highly flexible flat conductor connectors. Small pitches and minute dimensions allow connections in very small spaces.

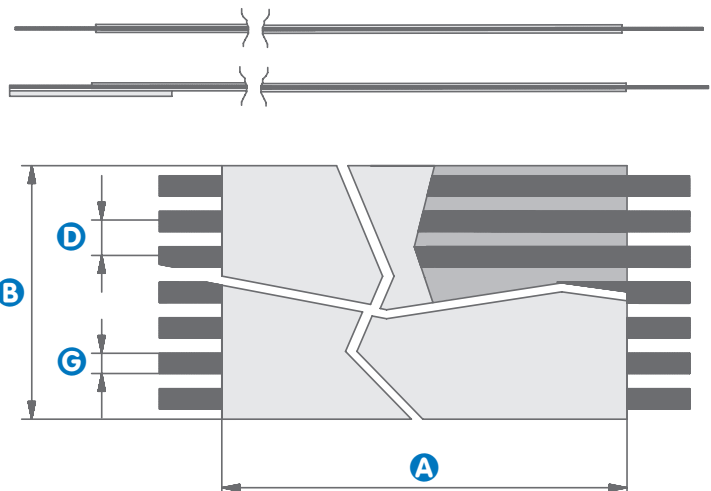
BENEFITS

- Immediately ready for installation
- Suitable for SMT (e.g. thermode soldering / hot bar soldering)
- High-quality insulation materials (-40°C to +125°C)
- High flexibility through thin foils and small pitches
- Standard contact zone 2.5 mm

CHARACTERISTICS

- FLL combinable with Panta® Fix termination (THT)
- FLL combinable with Panta® ZIF termination (ZIF connector)
- Special versions of insulation foil (punching of holes or trenches)
- Insulation material (e.g. Aramid fiber) suitable for thermode soldering/hot bar soldering
- FLL termination compatible with hot bar solder technology

Please do not hesitate to ask for our processing instructions for PANTA® FLL.



	Pitch e.g. A = 2,54 mm see pitch code	Insulationsmaterial e.g. P = Polyester N = Aramid fiber E = PEN K = Polyimide	Special Drawing required
FLL – A 05 – N 051 – 001			
	Number of pins	Insulation Length from 15-999 mm Special Lengthn on request	

TECHNICAL DATA

Order code	I	U	E	G	B	D	F	A
D Pitch (mm)	0,50	0,80	1,00	1,25	1,27	2,00	2,50	2,54
Number of pins	6-50	4-30	4-30	2-30	2-30	2-16	2-16	2-16
A Length (mm)	12 - 999; SonderLengthn bis 5000							
B Total width (mm)	(number of pins +1) x pitch							
G Flat conductor width (mm)	0,3	0,5	0,7	0,8	0,7	1,35	1,5	1,5
Flat conductor thickness (µm)	100							
Conductor material	Cu-ETP (E-Cu) ; tin-plated µm min. 1,0							
Current rating at 20°C (A)	0,5	1,0	1,0	1,5	1,5	2,0	3,0	3,0
Voltage rating (V_{DC})	60	100	200	200	200	200	300	300

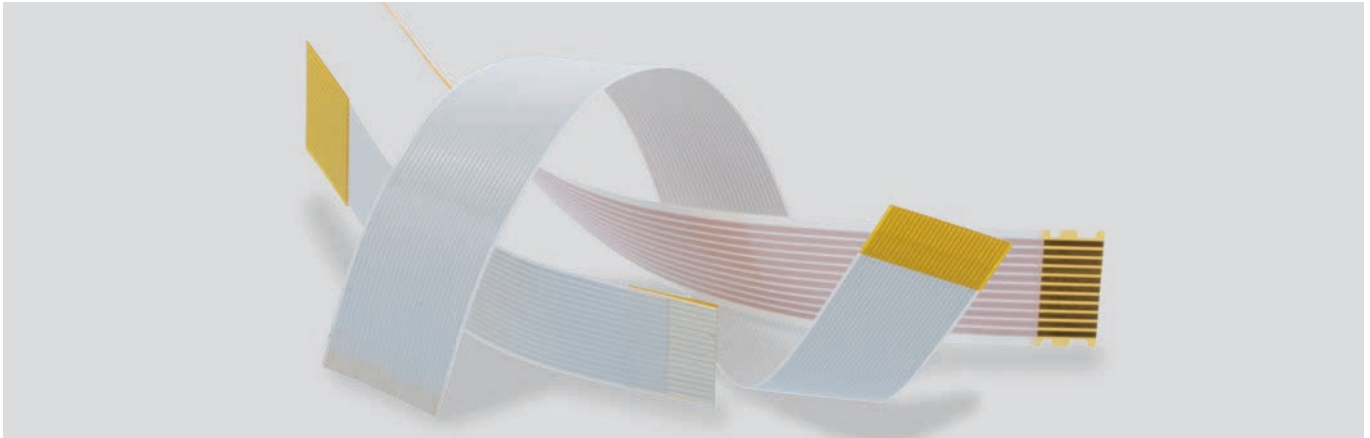
Insulation	Polyester	Aramid fiber	PEN	Polyimide
Insulation resistance (Ω) (GRD-SIG-GRD)	>10 ¹⁰			
Operation temperature (°C)	-40 ... +105	-40 ... +125	-40 ... +125	-40 ... +125
Soldering temperature (°C/sec)	250/4	260/5	260/5	260/5

Customer specials on request.

Use the order key to configure
your request online.



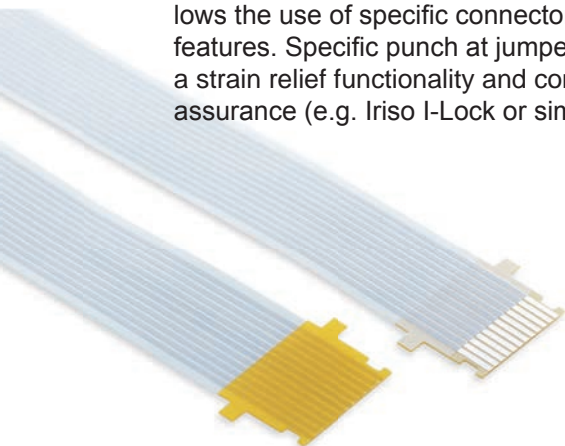
PANTA® ZIF JUMPER



PANTA® ZIF JUMPERS (FFC-Cable) are used for connecting printed circuit boards (PCBs). Compatible with ZIF-connectors (Zero Insertion Force) or LIF-connectors (Low Insertion Force). The cable can be delivered with a gold plated surface to prevent whisker-growths.

BENEFITS

- Defined stripping of insulation and application of stiffener in the contact area provides secure connection to all conventional connection systems (e.g. Iriso, FCI, Molex, Tyco, JST etc.)
- small dimensions due to thin foils and small pitches possible
- Fast assembly by simple insertion
- High flexibility and bending resistance
- Special versions available, e.g. LIF/ZIF
- pins can be combined with round solder pins
- (Panta® FIX) or SMD solderable flat conductors (Panta® FLL)
- Optional custom design of jumper mating area allows the use of specific connectors with additional features. Specific punch at jumper ends provides a strain relief functionality and connector position assurance (e.g. Iriso I-Lock or similar)



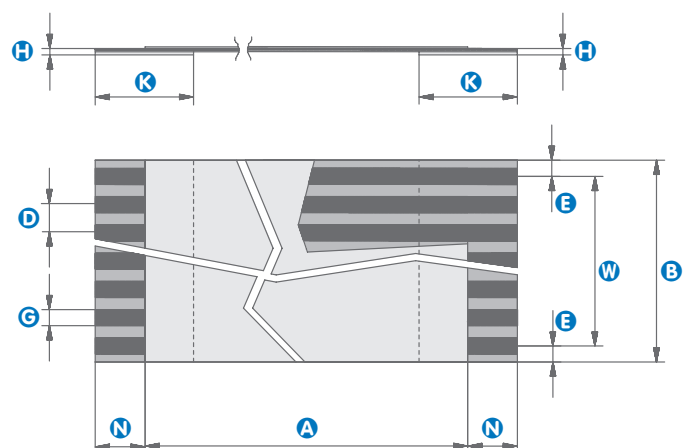
CHARACTERISTICS

- Available pitches 0,5; 1,0; 1,25 and 2,54 mm
- Temperature range -40°C ... 105°C
- Copper wire can be bladed with tin or gold
- Customer specific design for contact area and reinforcements

BENEFITS OF THE GOLD PLATING


- Low contact resistance
- Increased number of mating cycles
- Low current voltages
- Prevention of whisker effect for small centerlines
- Connection with NiAu-plated connectors

Please do not hesitate to ask for our processing instructions for PANTA® ZIF Jumper.





Use the order key to configure your request online.

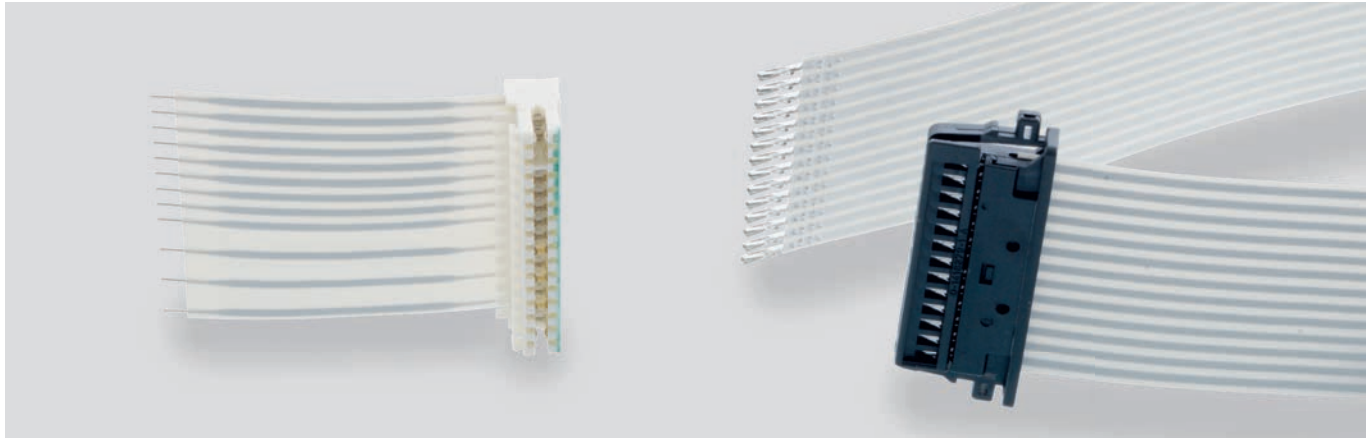
	Pitch e.g. E =1,00 mm see pitch code	Insulation material e.g. P = Polyester E = PEN K = Polyimide	Termination Style e.g. N = identical ends NW = different	
ZIF – E 10 – P 100 – N –				
	Number of pins	Insulation length from 20-5000 mm Special lengths on request	Special designs on request, drawing required	

TECHNICAL DATA

D	Order code	I	E	G	A
	Pitch (mm)	0,5	1,00	1,25	2,54
A	number of pins (n)	6-50	4-30	4-30	24
	Insulation Length (mm)	15-1000			
E	Margin (mm)	0,5	1,0	1,25	2,54
N	Length of stripped insulation (mm), Nominal size (standard)	3-5 (4)	3-5 (5)		
K	Length of reinforcement (mm), nominal (standard)	6-10 (8)	6-10 (10)		
	Conductor material	Cu tin-plated - Optional Ni/AuCo			
G	Wire dimension (mm)	0,30 x 0,10/0,05	0,70 x 0,10/0,05*	0,80 x 0,10	1,50 x 0,10
	Insulation	Polyester, PEN			
	Reinforce insulation	Polyester			
B	Total width (mm)	(Number of pins + 1) x Pitch			
W	Pitch width (mm)	(Number of pins - 1) x Pitch			
H	Total thickness of contact area (mm)	0,3			
	Insulation resistance (Ω) (GRD-SIG-GRD)	>10 ¹⁰			
	Current rating at 20°C (A)	0,5	1,0	1,5	3,0
	Voltage rating (V _{dc})	60	200	200	300
	Operation temperature (°C)	-40 bis +105			

Customer specials on request.

PANTA® FIX CRIMP



Optimized connection with pin, socket or solderpin

PANTA® FIX JUMPER and **PANTA® FFC-cable** provides a huge variety of configurations. **FIX JUMPER** can be combined with CRIMP contacts which provide the possibility of removable connections. It ensures a safe and stable connection on both sides. That gives the opportunity of customer specific design.

BENEFITS

- Solution to connect flat cable to round cable applications or header devices
- Assembly of foil crimp contacts from different manufacturers (e.g. Tyco, Nicomatic) with Panta® FIX JUMPER or Panta® FLEX cables
- Available pitches: 1.27 and 2.54 mm
- Secure connection (e.g. housings with locking mechanism and coding)
- Mate / unmateable space-saving connection
- Socket, pin and solder pin contact versions are available
- Available with tin- or gold-plated surfaces.

CHARACTERISTICS

PANTA® Crimp with TYCO contacts

- TYCO pin contacts
 - 88117-x (gold-plated or tin-plated) on request
 - 88976-x (gold-plated or tin-plated) on request
- TYCO socket contacts
 - 2-487406-4 (tin-plated) PREFERRED TYPE
 - 487406-X (gold-plated or tin-plated) on request
- TYCO solder pin
 - 88997-2 (tin-plated) on request

PANTA® Crimp with Nicomatic contacts

- Nicomatic socket contacts series 14106
 - 14106-12 (tin-plated) PREFERRED TYPE
 - 14106-3210 (partially gold-plated) on request
- Nicomatic Rectangular terminal series 12410
 - 12410-12 (tin-plated) PREFERRED TYPE
 - 12410-32 (partially gold-plated) on request

Different HOUSINGS are available on request.

Please do not hesitate to ask for our processing instructions for PANTA® FIX CRIMP.

	Pitch e.g. A = 2,54 mm see pitch code	Insulation material e.g. P = Polyester N = Aramid fiber E = PEN K = Polyimide	Special Drawing required
CRP – A 05 – P 051 – 001			
	Number of pins	Insulation Length from 15-999 mm Special length on request	

TECHNICAL DATA

Order code	B	A		
Pitch (mm)	1,27	2,54		
Compatible crimp contacts	Tyco	Tyco	Tyco MQS	Nicomatic
Preferred type	1-487547-1 (vergoldet)	2-487406-4 (tin-plated)	929387-1 (tin-plated)	14106-12 (tin-plated)
Max. number of pins	32	20	32	32
Length (mm)	30- 999 in Stufen a 1; SonderLengthn bis 5000			
Min. margin (mm)	0,8			
Pin diameter (mm)	0,32	0,40	0,40	0,51
American Wire Gauge (AWG)	28	26	26	24
Flat conductor width (mm)	0,75	1,27	1,27	1,5
Flat conductor thickness (µm)	50 - 80	50 - 130		
Current rating at 20°C (A)	0,5	2,0	2,0	3,0
Voltage rating VDC	80	300		
Dielectric strength (V _{DC/min})	200	1500		

Customer specials on request.

Use the order key to configure
your request online.



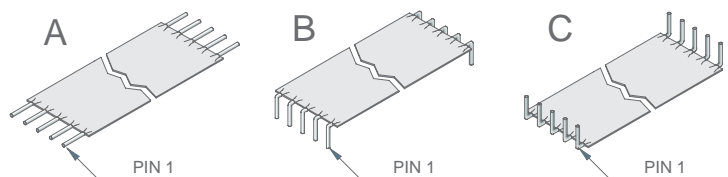
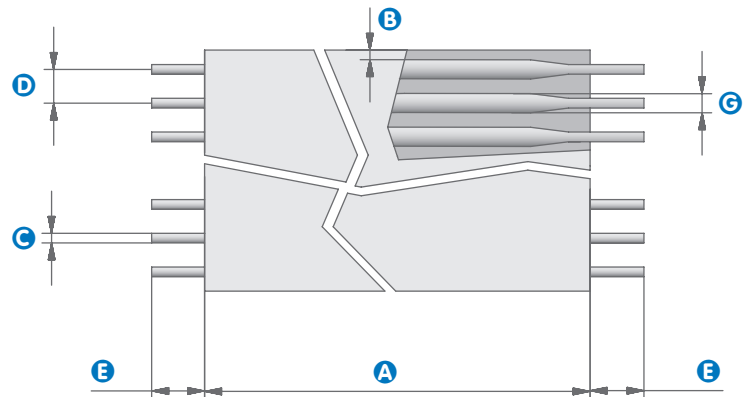
PANTA® FIX POWER



PANTA® FIX POWER JUMPERS are flexible flat conductor connectors, especially for applications with a current rating of 12 amperes. Solid round conductors ensure fast and secure assembly. In the PANTA® round-flat-round technology, the copper conductors are rolled flat to a defined geometry in the insulating area, ensuring the highest standards of vibration and bending resistance. The smooth notch-free transition from round to flat guarantees fracture-safe connection points.

BENEFITS

- High vibration and bending resistance
- Reliable and fracture-safe connection
- Ready for installation
- Economizes working time and assembly costs
- Simultaneous soldering of all connection points in the solder bath
- Up to 12 amperes (soldered power jumper)
- Available as THT capable JUMPER
- Can be combined with several connectors





Use the order key to configure your request online.

	Pitch e.g. A = 2,54 mm see pitch code	Insulation material e.g. P = Polyester N = Aramid fiber E = PEN K = Polyimide	Termination styles e.g. A = identical ends AB = different see chart
POW – A 05 – N 051 – A – 001			
	Number of pins	Insulation Length from 15-999 mm Special length on request	Special designs on request, drawing required

TECHNICAL DATA

PANTA® FIX POWER JUMPER

Order code	F	A	P	N	M	C	K	J
D Pitch (mm)	2,5	2,54	3,5	3,96	5,0	5,08	7,0	7,5
Max. number of pins	15	15	8	8	8	8	8	8
A Length (mm)	25-999 in 0,1 steps; special lengths up to 5000							
B Max. margin (mm)	selectable up to 10							
B Min. margin (mm)	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
C Pin diameter (mm)	0,72	0,72	0,91	0,91	0,91	0,91	0,91	0,91
American Wire Gauge (AWG)	21	21	19	19	19	19	19	19
G Flat conductor width (mm)	2,0	2,0	3,0	3,0	3,0	3,0	3,0	3,0
Flat conductor thickness (µm)	200							
Conductor material	min 2-3 µm tin-plated							
Current rating at 20°C (A)	8	8	12	12	12	12	12	12
Voltage rating (V _{DC})	300							

Customer specials on request.

POWER Jumper - Insulation materials

Insulation	Polyester	Aramid fiber	PEN	Polyimide
Insulation resistance (Ω) (GRD-SIG-GRD)	>10 ¹⁰			
Operation temperature (°C)	-40 ... +105	-40 ... +125	-40 ... +125	-40 ... +125
Soldering temperature (°C/sec)	250/4	260/5	260/5	260/5

Customer specials on request.

PANTA® FIX POWER MIT MAS-CON® IDC



CHARACTERISTICS

MAS-CON® series, Type CEH

- **Pitch 3.96 mm**, high power
- Number of pins: 2-8
- IDC termination (insulation displacement contact)
- Wire gauge AWG 19
- Solid wires
- Built-in polarization
- Coding with coding pin
- Current rating 6.0 A
- Operating voltage acc. to VDE 0110-1/04.97
- Operating temperature -40°C to 105°C

Please do not hesitate to ask for our processing instructions for Panta® FIX POWER with MAS-CON® IDC.

HIGH POWER Connector

Pitch (mm)	3,96 HI-POWER
Number of pins	2-8
Type of connection	IDC
American Wire Gauge (AWG)	19
Conductor type	massive
Polarization	integrated
Coding	pins
Current rating (A)	6
Operation voltage	VDE 0110 b / 2,79 Tab. 4
Operation temperature (°C)	-40 bis + 105

MAS-CON® series, Type CEP (terminating connector)

- **Pitch 2.54 mm**
- Number of pins: 2-15
- IDC termination (insulation displacement contact)
- Wire gauge AWG 21
- Solid wires
- Coding with coding pin
- Current rating 4.0 A
- Operating voltage acc. to VDE 0110-1/04.97
- Operating temperature -40°C to 105°C

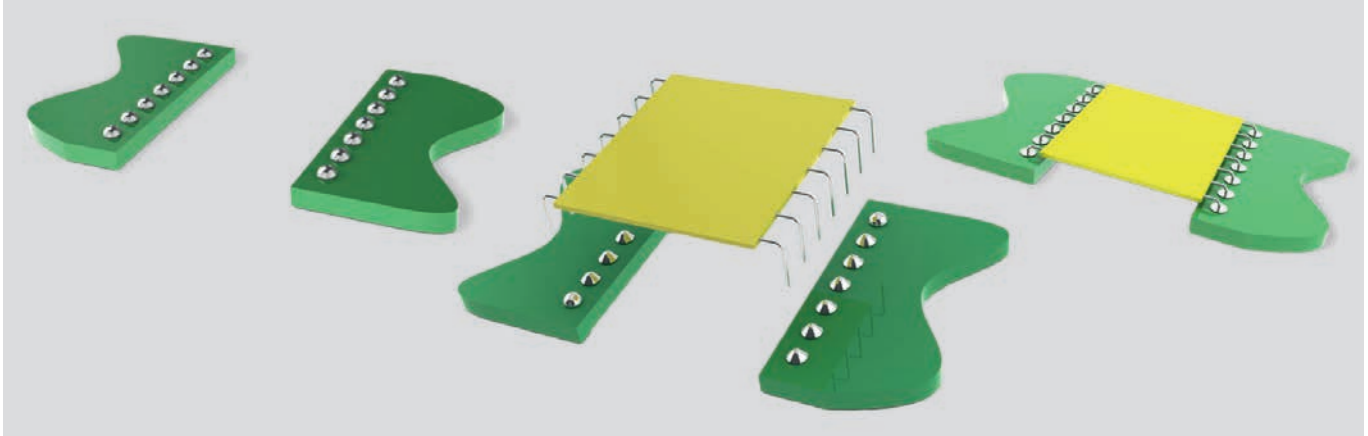
PANTA® FIX POWER SYSTEM

with insulation displacement connector (IDC)

D Pitch (mm)	2,54	3,96
Number of pins	2-15	2-8
A Length (mm)	25 - 9	99
E PinLength (mm)	2,5 -	10
Termination styles	A,B or C	
B Min. margin (mm)	1,0	1,0
C Pin diameter (mm)	0,72	0,912
American Wire Gauge (AWG)	21	19
G Flat conductor width (mm)	2,0/3,0	
Flat conductor thickness (µm)	200	
Conductor material	tin-plated 2-3 µm	
Current rating at 20°C (A)	4	6
Voltage rating (V _{DC})	300	

PANTA® PIP JUMPER

PICK AND PLACE & REFLOW-SOLDERING



Jumper for automated assembly processes in standard SMD-reflow soldering.

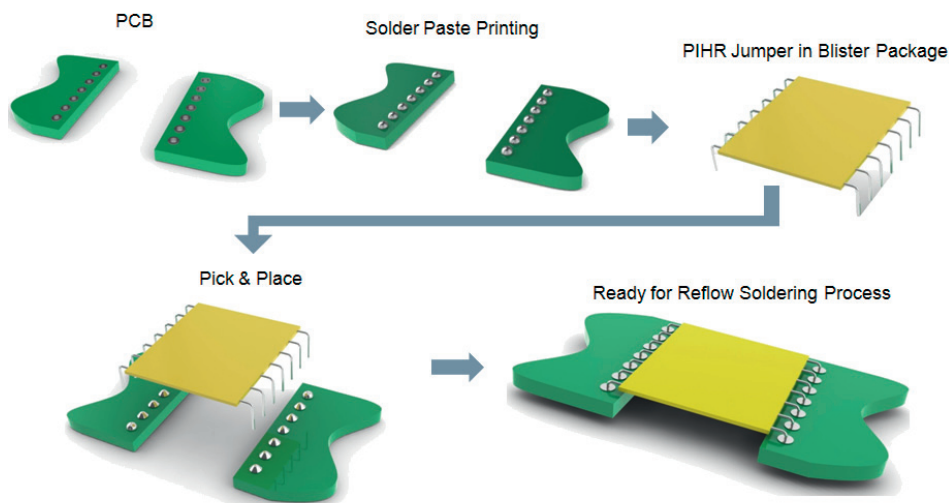
BENEFITS

- Elimination of manual insertion and selective soldering
- Cheaper alternative to flex-rigid PCB

CHARACTERISTICS

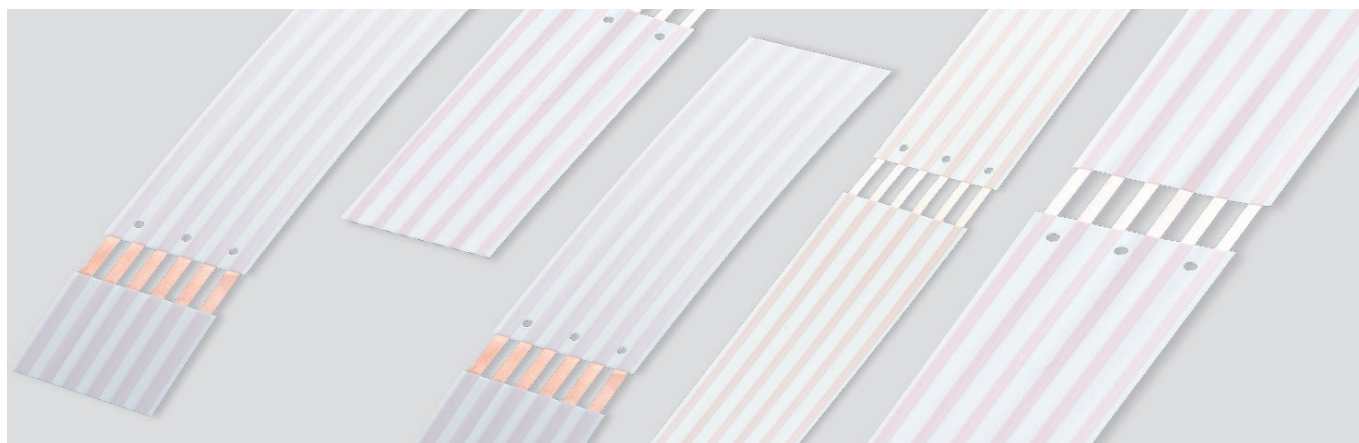
- Developed for use in automated SMD reflow process
- Insulation width between 20 mm and 60 mm (others on request)
- Requires special nozzles
- Qualification for humidity, temperature, voltage resistance, solderability and bending cycles for operating temperatures from -40°C to +125°C
- Delivery in blister on plastic reel
- Pitch 2.54 mm (others on request)

Please do not hesitate to ask for our processing instructions for PANTA® PIP JUMPER.



FLEXIBLE FLAT CABLES (FFC)

PANTA® FFC



PANTA® FFC Flexible Flat Fables are produced by lamination process. Conductors made from precise flat rolled copper tracks with different height and width dimensions. Adhesive coated foils are laminated with the copper tracks to a high flexible compound by pressure and temperature. This PANTA® FFC has excellent mechanical and electrical properties

CHARACTERISTICS

- Insulation material: PET, PEN, PI, Polyaramid
- Conductor: Copper Cu-ETP (E-Cu) and Cu-PHC (SE-Cu58), Al
- Highest no of bending cycles
- Suitable for different connection technologies
 - Soldering
 - Welding (US-welding, resistance-welding, Laser,...)
 - FFC crimping
 - IDC (Isolation displacement connector)
- Strain relieve holes could be stamped inline during lamination process.
- Delivery on reel or as single FFC.
- Exposed copper contact area are realized by cut window technology (Windows are stamped into foil before lamination process. Therefore no adhesive on contact area and no additional cleaning process necessary. Copper passivation layer preserved)
- Complex exposed geometries by laser processing.

- Best media resistance (Automotive compliant)
- Hydrolysis resistance
- Usable for signal and high current application (steering wheel heating,...)

APPLICATION AREAS

Automotive

- Clockspring applications (Airbag, Multifunction, Steering Wheel heating)
- Torque sensors on Steering Columns
- Battery-sensing
- Sensor-applications
- Sliding door and Roof module applications
- Flexible component carrier

Industrial

- Sensor application
- Actuator application
- Flexible component carrier

Consumer:

- Flexible component carrier (LED, NTC,...)

Please do not hesitate to ask for our processing instructions for PANTA® FFC.



Abb.: Standard Clockspring FFC
Leiterbahn Cu-ETP (E-Cu)
50 µm – 200 µm



Abb.: Loop-back Clockspring Highflex,
Leiterbahn: Cu-PHC (SE-Cu58)
25 µm – 40 µm (Standard 35 µm);
Biegewechselfestigkeit > 10Mio Zyklen

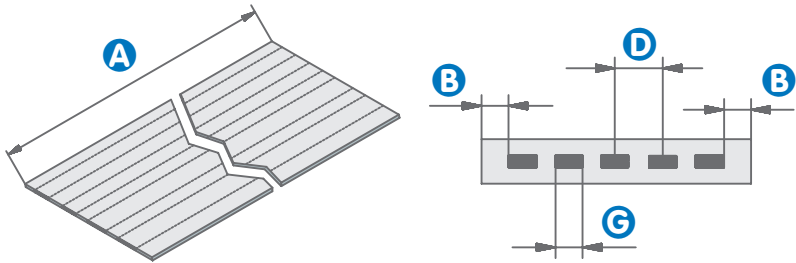
	Raster e.g. A = 2,54 mm see pitch code	Insulation material e.g. P = Polyester N = Aramid fiber E = PEN K = Polyimide	Special designs on request, drawing required
FFC – A 05 – P 1500 – 001			
	Number of pins	Insulation Length from 15 mm Special length on request	

TECHNICAL DATA

Order code	E	G	B	D	F	A	S	Z	P	R	N	M	C	K	J
D Pitch (mm)	1,00	1,25	1,27	2,00	2,50	2,54	2,70	3,18	3,50	3,81	3,96	5,00	5,08	7,00	7,50
Number of pins	on request														
A Length (mm)	selectable above 15 mm														
B Max. margin (mm)	selectable up to 4														
B Min. margin (mm)	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Flat conductor thickness	35 µm - 200 µm														
G Flat conductor width	> 0,6 mm														
Conductor material	Cu-ETP (E-Cu); Cu-PHC (SE-Cu58)														
Voltage rating (V_{dc})	200	200	200	200	300	300	300	300	300	300	300	300	300	300	300

Insulation	Polyester	Nomex	PEN	Polyimide
Insulation resistance (Ω) (GRD-SIG-GRD)	>10 ¹⁰			
Operation temperature (°C)	-40 ... +105	-40 ... +125	-40 ... +125	-40 ... +125

Customer specials on request.

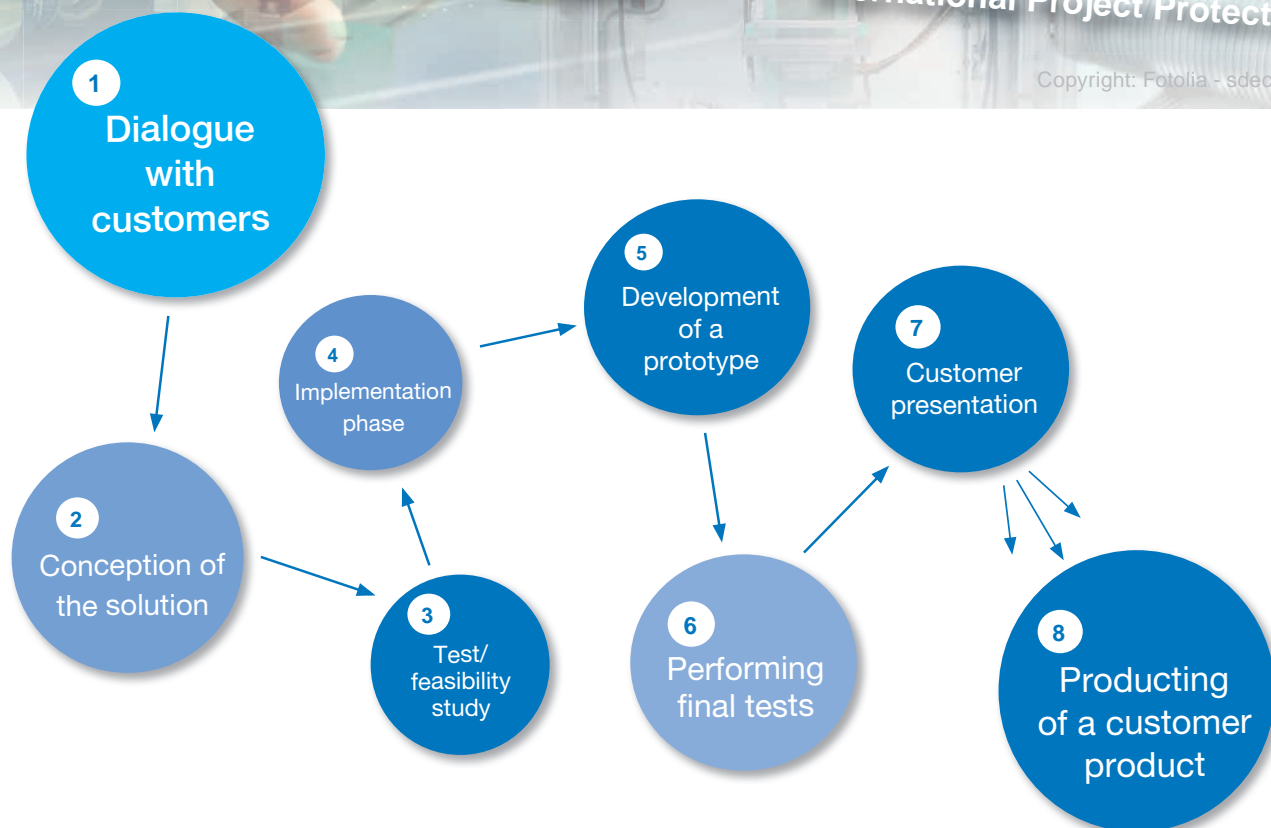




FLEXIBLE MODULES (FM)

PANTA® FLEXIBLE MODULES

WE ARE YOUR PARTNER



PROCESS KNOWHOW

Lamination

Laminating is the process used to embed the copper conductor in insulating foil by using pressure and heat. The foils are coated with adhesive on one side. The copper conductors are parallel to each other. Different pitches can be combined.

Cutters

The laminated rolls are slit to the final cable width. The lengths of the cables are produced by the cross cutting afterwards.

Stripping

The cable terminations are made in a stripping process. The insulation is stripped off the copper wires using a special cutter. The conductor ends can then be processed further to the required termination style with specific bending tools.

Crimp-Technology

Crimp connections to flat conductors of 1.27 mm and 2.54 mm pitch are possible with the crimping technology from Tyco and Nicomatic.

Overmolding

Fully hydraulic injection molding machines can be used to overmold the cable ends of FFCs or to assemble FLEXIBLE MODULES. The maximum injection volume is 15 cm³ with a projected area of max. 75 cm².

Potting with Macromelt®

Macromelt® allows clean processability and does not contain any solvents or other harmful substances. Macromelt® is particularly suitable for applications that require good adhesion to conductor or housing materials at low processing pressure. Macromelt® is injected with low pressure into the cavities. It spreads gently around even the tiniest components, seals and protects the components.

Stiffeners

Special equipment places adhesive tapes and reinforcements onto our FFCs and ZIF jumpers.

Laser Processing

A highly precise, powerful 300 W CO² laser implements fast and very flexible stripping modes.

Soldering

Selective soldering systems ensure optimum soldering while minimizing the heat stress for components. A reflow soldering system and placement systems are available for the assembly of SMD components.

Resistance Welding

The contact between the components and PANTA® cables by means of resistance welding ensures a safe interface of very high quality. Welded flexible modules are later potted or overmolded in order to secure the weld.

Assembly Lines

- FAS - Flexible assembly systems ensure high quality modules even for lower volumes.
- AAS - Automatic assembly systems produce high volumes of customized modules in fully automatic operation.

The optimal assembly line is selected after a technical and qualitative assessment of the customization.

MISSION

Our mission is to provide our customers with electronic solutions which enable them to develop products and technologies which improve our quality of life.

DEVELOPMENT
CUSTOMER SOLUTIONS

HIGH LEVEL PRODUCT
DEVELOPMENT

QUALITY AT A
HIGH LEVEL

FROM **PROTOTYPE**
TO SERIAL **PRODUCTION**

FLEXIBILITY
RELIABILITY





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