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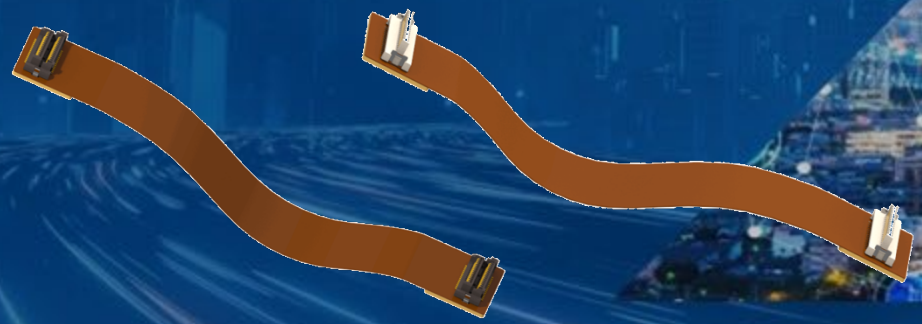
Flexible Printed Circuit Assembly Product Presentation



FCi Basics

Agenda: Flexible Printed Circuit Assembly

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- Value Proposition
- Solution Overview
- New Products
- Product Specifications
- Features & Benefits
- Part Numbers
- Markets & Application

Flexible Printed Circuit, Value Proposition

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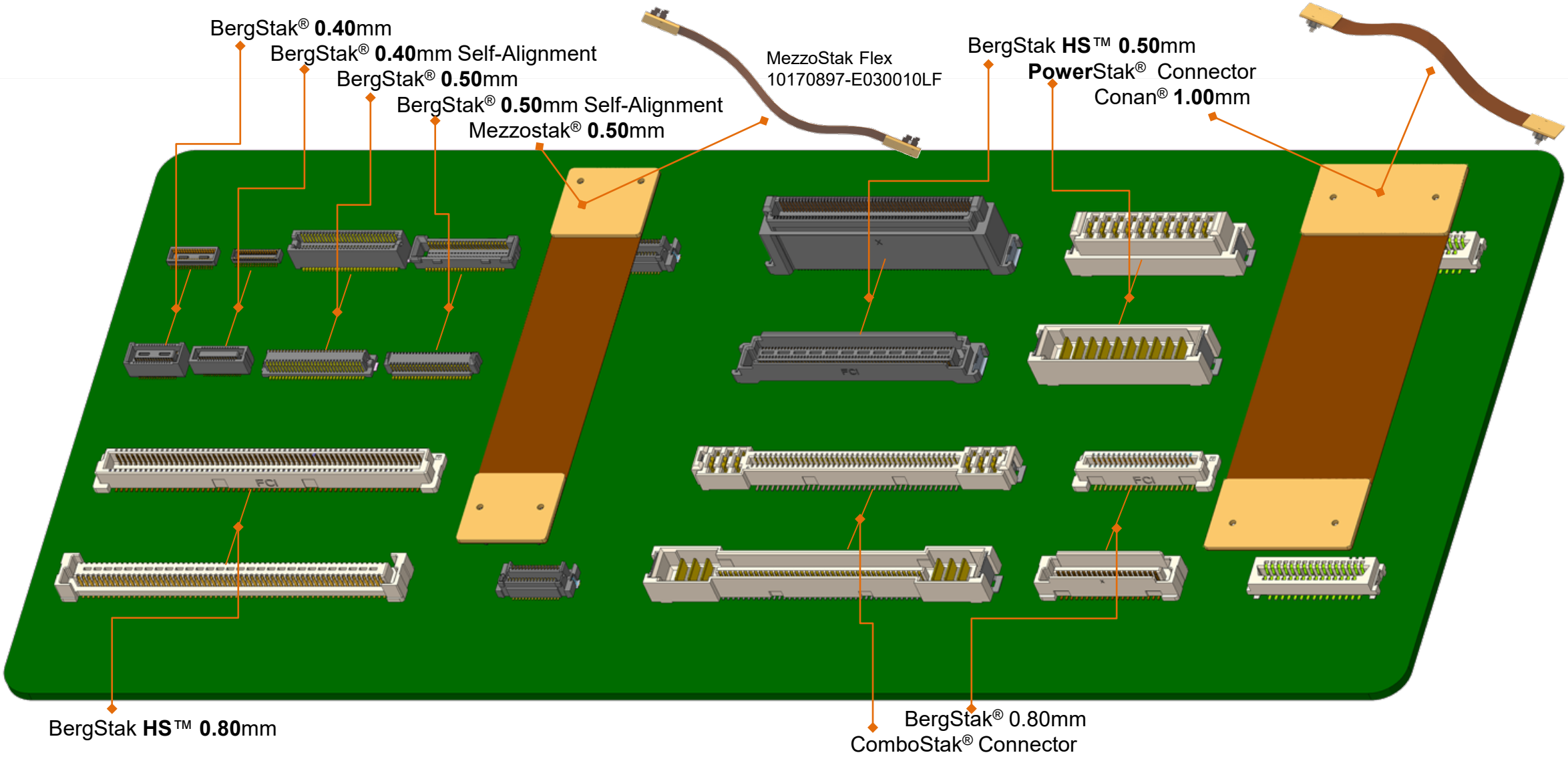
- Amphenol's BergStak®, MezzoStak®, Conan®, ComboStak® and PowerStak® are **industry proven board-to-board solutions**. To enlarge the advantages of these recognized board-to-board solutions, we have **expanded our offering with Flexible Printed Circuit (FPC) assemblies**, which provide **design flexibility** to customers.
- **Comprehensive** range of **pitch** sizes, **positions** and **stack heights** to satisfy all needs.
- **High-speed** performance up to 16Gb/s.
- **SMT process** with **higher process consistency**, and **lower assembly cost**.
- Flexible Printed Cable **uses all advantages** of board-to-board connectors.

Flexible Printed Circuit, Solution overview

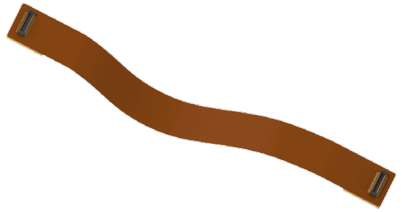


Broad offering of Board to Board Connectors to support various customer needs for Flexible Printed Circuit assembly.

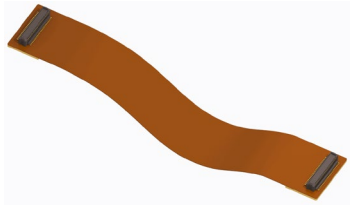
Flexible Printed Circuit, New products

Products
BergStak® 0.40mm ✓
BergStak® 0.40mm SA ✓
BergStak® 0.50mm SA ✓
BergStak HS™ 0.50mm
MezzoStak® 0.50mm ✓
BergStak® 0.80mm
BergStak HS™ 0.80mm
Conan® 1.00mm ✓
ComboStak® PowerStak®

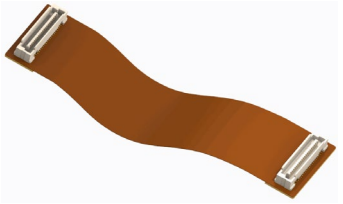
Bergstak 0.40mm SA® flex cable
10170897-B030010LF



Bergstak 0.50mm SA® flex cable
10170897-C050010LF



Bergstak 0.80mm® flex cable
10170897-F040010LF



9 product families with different lengths and positions according to customer needs.
5 products launched

Flexible Printed Circuit, Product Specifications

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Product Facts

- Pitch range:0.4/0.5/0.8/1.0/2.0mm
- Position range: 2-200pos
- Height range:1.5mm-20mm
- Length range:100mm-500mm(customer defined)
- Supports speed performance up to 16Gb/s

Basic Specifications

Pitch	0.4/0.5/0.8/1.0/2.0mm
Pin Count	2-200pos
PCB Termination	SMT
Conn Direction	Right Angle, Vertical
Plating	Gold / GXT on contact area, and tin plating on soldering tail

Technical Documents

- Product Spec.: refer to product spec of connector

Performance Characteristics

- Durability: 30-200 cycles
- Temperature Range: -55°C to +125°C
- Insulation Resistance: $1x10^{10}$ Ω min.
- Contact Resistance: <50 mΩ max.
- Signal Integrity
  - Data rate: up to 16Gbps

Materials

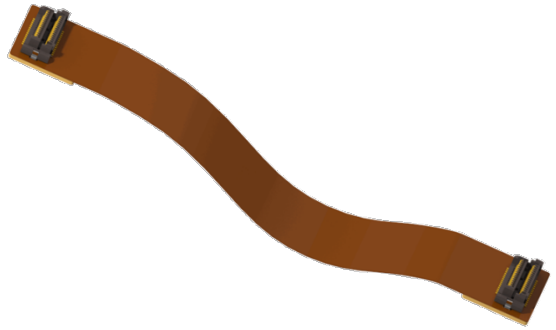
- Housing: Glass filled LCP (UL94V-0, MSL level 1)
- Contact Base Metal
  - Receptacles: Copper Alloy, high spring
  - Headers: Copper Alloy, high spring
- Shell: Copper Alloy, high spring

Flexible Printed Circuit, Features and Benefits

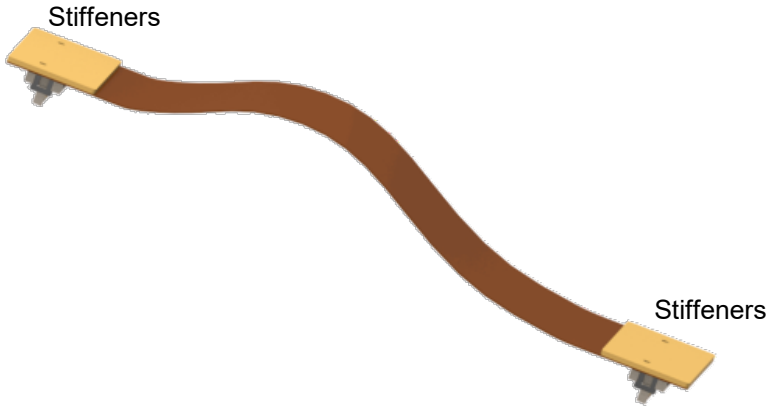
Features	Benefits
Broad offering of: > Pitch range:0.4mm-2.0mm > Position range:2-200pos. > Height range:1.5mm-20mm > Custom lengths:100mm-500mm > Supporting custom FPC shapes	Comprehensive range of sizes and profile heights to satisfy all needs when board-to-board or wire-to-board connections are not an option
High Speed signal capability up to 16Gbps.	Suitable for high data transmission applications
FPC cable with SMT process	Space, cost and weight saving and higher process consistency, compared to CTW cable assembly or PCB-to-board connections
Flexible Printed Cable utilizing all advantages of board-to-board connectors >Conan® (lock feature on contact to meet USCAR spec) >ComboStak® (hybrid solution to support signals and power transmission together) >MezzoStak® (dual point contact, hermaphrodite solution) >so on..	Wide choice of mating interfaces; current rating capability; vibration resistance (USCAR spec) and locking features available

Flexible Printed Circuit, Advanced Features

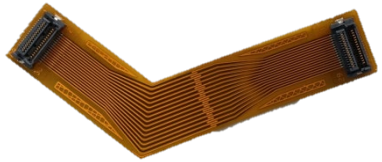
Broad offering of position, height and pitch to support different requirements from customer.



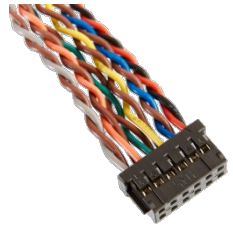
Stiffeners on each ends to enhance robustness for mating/unmating.process.



Flexible, three-dimensional wiring, to satisfy space constraints, can be folded without affecting the function of signal transmission.

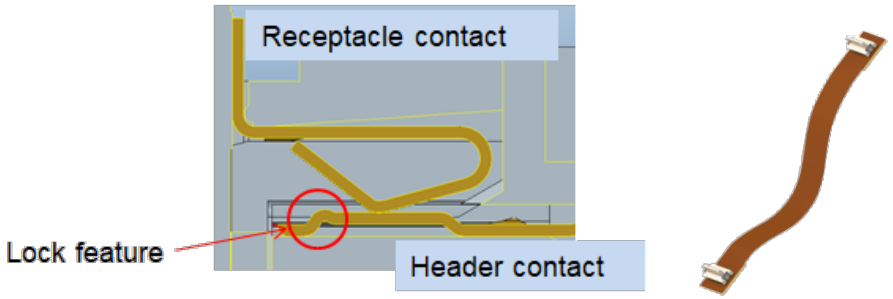


Fully customer defined lengths and **customized shapes** of the FPC Cable.



SMT process with lower assembly cost than Crimp to Wire cable assembly.
Smaller size, lower weight, less material.

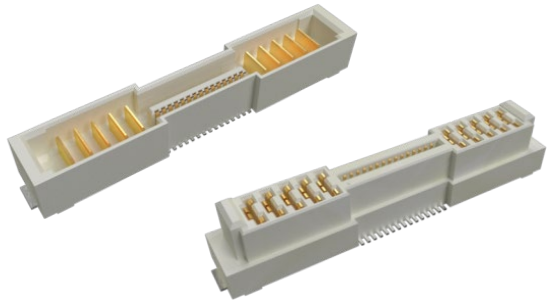
Flexible Printed Circuit, Advanced Features



Lock feature on contacts make **Conan**® flex cable pass USCAR2 V2 shock and vibration test.

GROUP M TEST RESULTS

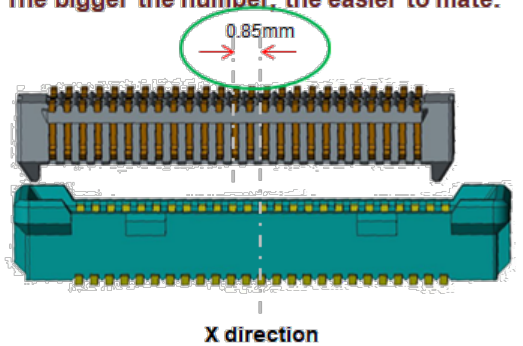
Step	Test	Requirement	Step Description	Result	Comments
1	Visual Examination	No detrimental condition	Initial Exam.	No detriment	Pass
2	Connector/ Terminal Cycling	No damage	Connector/ Terminal cycling	No damage	Pass
3	Dry Circuit Resistance	30mΩ Max	Initial dry circuit resistance	≤29.91mΩ Detail See Table-1	Pass
4	Mechanical Shock	No damage No discontinuity >1μs	Mechanical shock	No damage No discontinuity >1μs	Pass
5	Vibration	No damage No discontinuity >1μs	Vibration	No damage No discontinuity >1μs	Pass
6	Dry Circuit Resistance	ΔR≤10mΩ	Final dry circuit resistance	ΔR≤9.74mΩ Detail See Table-1	Pass
7	Voltage Drop	≤50mV	Voltage Drop	Total Voltage drop for 69pins in series ≤2,785mV, Average Voltage Drop ≤40.4mV Details See Table-2	Pass
8	Visual Examination	No detrimental condition	Final Exam.	No degradation Detail See Figure5&6	Pass

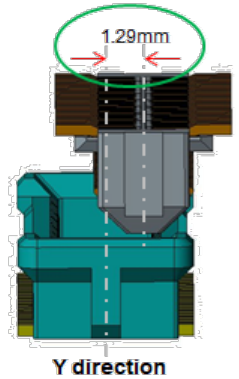


ComboStak® combines **power and signal** in one single connector, its flex cable also keeps the advantage.

- Misalignment analysis by X/Y direction (Pitch and Width)

The bigger the number, the easier to mate.

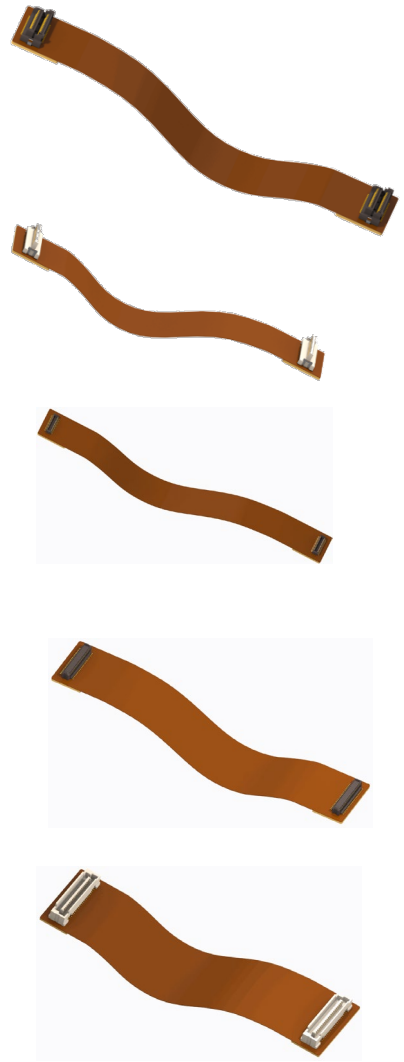




BergStak® 0.50mm Self-Alignment supports **high misalignment tolerance** which benefit for Flex cable mating process.

Flexible Printed Circuit, Part numbers

Description	Part numbers
MezzoStak® Flex cable, 30 positions, 100mm	10170897-E030010LF
Conan® Flex cable, 31 positions, 200mm	10170897-H031020LF
Bergstak® 0.40mm SA, Flex cable, 30pos, 100mm	10170897-B030010LF
Bergstak® 0.50mm SA Flex cable, 50pos, 100mm	10170897-C050010LF
Bergstak® 0.80mm Flex cable, 40pos, 100mm	10170897-F040010LF



Part numbers available on the web with all relevant information

Flexible Printed Circuit, Markets and Applications

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Industrial

Automotive

IT Datacom

Mobile Devices

Mobile Networks

Thank You

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