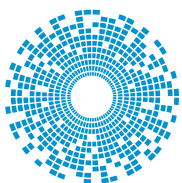
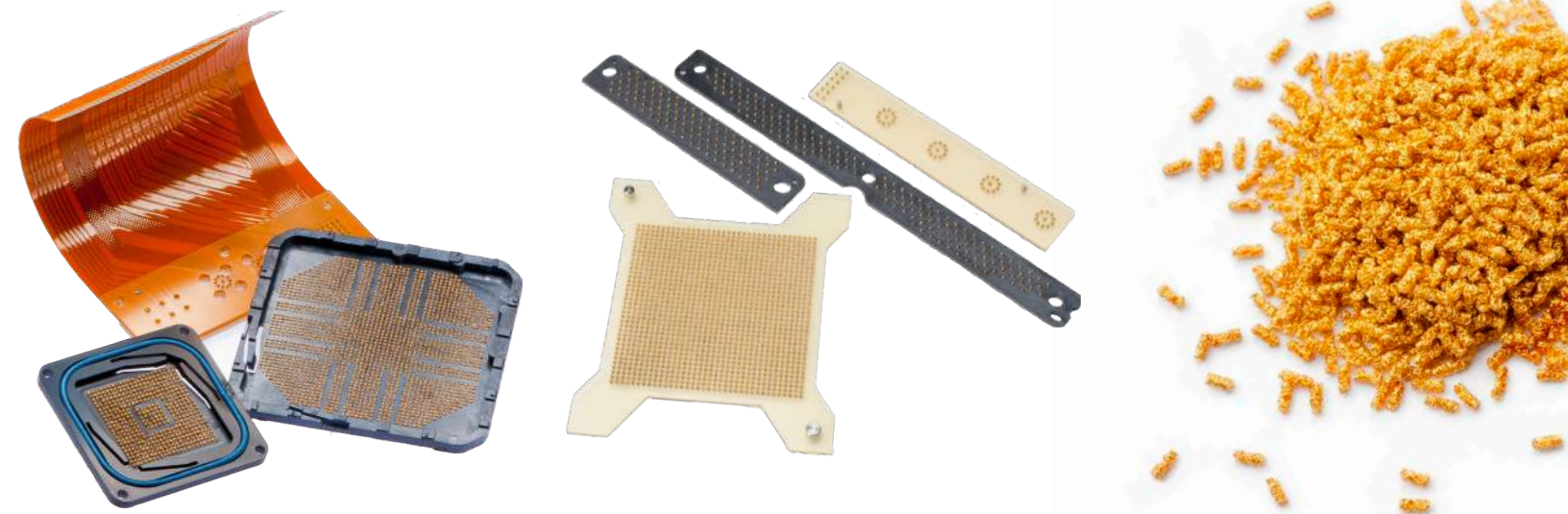


CIN::APSE®

CIN::APSE® Compression Technology Enabling technology for the most demanding interconnect applications

Innovative Compression Mount Technology

If you have an interconnect challenge and need to overcome the restrictions of ordinary connector devices, CIN::APSE® can provide the versatile, reliable and compliant interconnect solution you need.



cinch
CONNECTIVITY SOLUTIONS
a bel group

belfuse.com/cinch

CIN::APSE®

It takes more than an ordinary connector to support advanced performance interconnect applications. It takes CIN::APSE®, a proven solderless Z-axis connector technology that offers exceptional mechanical and electrical performance at signals well above 50GHz.

Innovative Compression-Mount Technology

CIN::APSE® is a unique, Z-Axis compression interconnect which provides superior mechanical and electrical performance. The contact construction consists of randomly wound gold plated molybdenum wire, formed into a cylindrical shape (Figure 1). Standard contact diameters are 0.50mm (0.020”) and 1.0mm (0.040”). The basic CIN::APSE® contact configuration consists of a contact installed into a customised plastic insulator with the patented Cinch contact retention design (Figure 2). Once in place, the contact extends to both sides of the insulator, creating an unmatched electrical connection.

Custom made to your specifications, CIN::APSE® utilises a multi-point contact that can handle signals above 50 GHz, while offering a superior combination of small size, low inductance and exceptional resistance to shock, vibration and thermal cycling.

Quick, Solderless Installation

CIN::APSE® is easily installed in two basic steps, without soldering. First, using alignment features, the CIN::APSE® interconnect is positioned between two components - for example PCBs, flexible circuits, ceramic devices etc - with matching connection footprints. Secondly, the two components are compressed and fastened together (Figure 3).

Low Compression Force, Low Contact Resistance

The CIN::APSE® contact offers one of the best force / deflection ratios in the industry. An average compression force of typically 2 ounces (approx. 0.55 N) will yield a contact resistance of less than 15 mΩ. This means high I / O count applications can achieve excellent electrical performance with only minimal Z-Axis compression force (Figure 4).



Figure 1

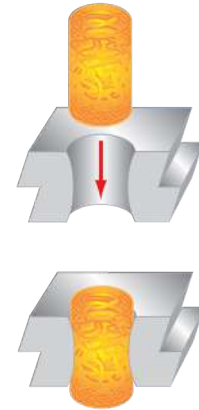


Figure 2

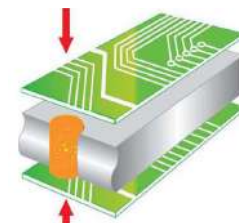
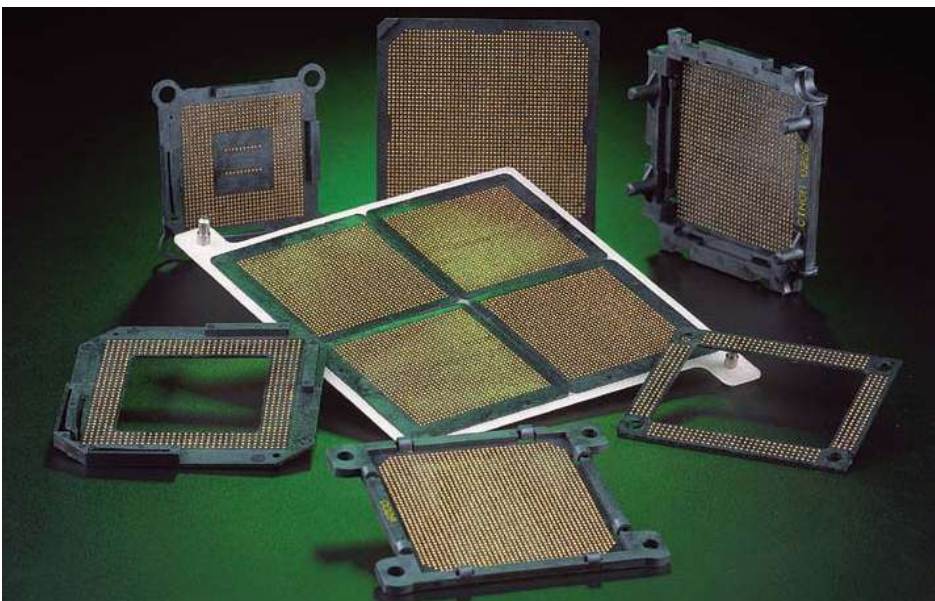


Figure 3



Figure 4



Connector Performance Specifications

Property	Requirement	Result
Electrical		
Contact Resistance	20mV open circuit @ 100mA	<15 mΩ typical
Current-Carrying Capacity	Maximum current for 30°C temperature rise	3A on Ø 1.0mm Contact
Inductance		<0.5 nH
Insulation Resistance	@ 500 VDC	>1,000 mΩ
Dielectric Withstanding	500 VAC (sea level)	No breakdown
Mechanical		
Durability	Room temperature	>25,000 cycles
Vibration	20 Gs; 10 - 2,000 Hz; no discontinuity greater than 2 nanoseconds	No discontinuity
Shock	100 Gs; 6 milliseconds; no discontinuity greater than 2 nanoseconds	No discontinuity
Environmental		
Temperature Life	1,000 hours @ 200°C	<5% resistance change
	5,000 hours @ 170°C	<5% resistance change
Thermal Shock	100 cycles -55°C to +85°C	<5mΩ change
	2,000 cycles -20°C to +110°C	<5mΩ change
Low Temperature	Liquid Nitrogen (-200°C)	<5mΩ change
Humidity	5,000 hours @ 30°C to 80°C, 85% relative humidity	<5mΩ change
Salt Spray	96 hours	<5mΩ change
Outgassing	1.0% Total Mass Loss (TML)	<1.0% TML
	0.1% CVCM	
	ASTM E595 (NASA)	
Material		
Contact Material	Molybdenum with 20 - 30µin, gold plating	
Insulator Housing	Liquid Crystal Polymer / Polyetherimide / Composites / Ceramics	
Packaging Material	Anti-static ABS (example)	

Key Features

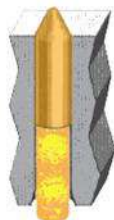
- High Reliability
- High Density
- Low Mating Force
- Low Resistance and Inductance
- RoHS and REACH Compliant
- Solderless
- Custom configured to meet your interface pitch requirements
- Quick turn around for machined prototypes
- EMI Protection



Contact Configurations



1. Contact Only



2. Plunger - Contact



3. Plunger - Contact - Plunger



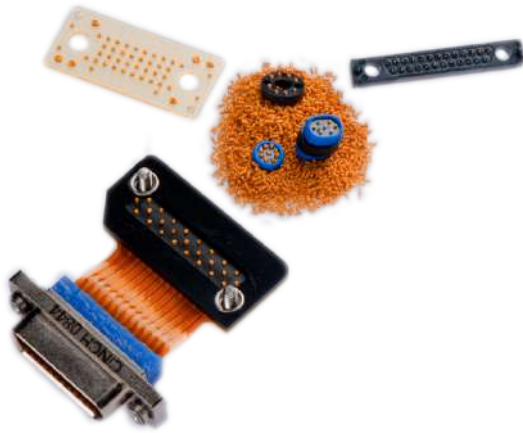
4. Contact - Spacer - Contact

Versatile Configurations

In addition to standard configurations, CIN::APSE® can be custom configured to meet your exact footprint and mated heights.

- Quick-turn machined prototypes (direct comparison with production parts)
- Typical heights ranging from 0.5 - 38mm (0.020" - 1.5") - maximum height not limited
- Multiple insulator materials
- Compression system design on request

CIN::APSE® can be used in almost any application where you need to connect two surfaces



Your Need

CIN::APSE® Solution

Solderless	CIN::APSE® provides the advantages of a solderless connection Easy repairs and upgrades in plant or in the field No risk of damaging expensive boards or components Allows for large mismatches in CTE between surfaces
Signal Speed and Integrity	CIN::APSE® can easily handle signal speeds over 50 GHz Low inductance of <0.5 nH Low crosstalk and EMI Low signal loss Low circuit resistance of $\leq 15 - 20 \text{ m}\Omega$
High Density High I/O Low Profile Light Weight Low Mass	CIN::APSE® is the leader in high I / O and miniaturisation I / O counts in production exceeding 5,000 Standard pitch as small as 1mm (linear pitch); 0.8mm on staggered pitch Mated height as low as 1.5mm (0.020") or up to 38mm (1.5") Contacts are 75-85% air when fully compressed
Reliability	7 to 11 points of contact per contact Mechanical wiping action Extremely stable over time and temperature High contact normal force
Extreme Environments	Temperature range -200°C to +300°C Low mass contact withstands extreme shock and vibration

CIN::APSE® Applications

High Speed Digital devices

Chip/Device - PCB (LGA)

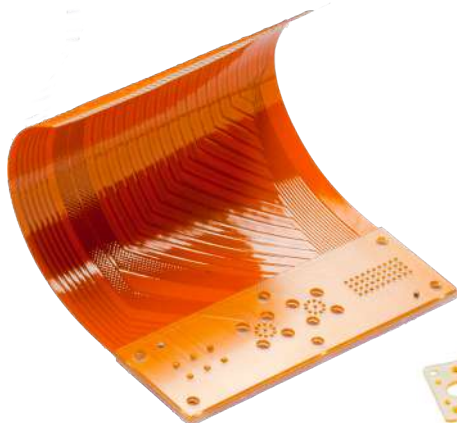
PCB - PCB (Interposers)

Flex Circuit - PCB / Flex Circuit (Interposers)

LCD - PCB / Flex Circuit (Interconnect)

Connectors - CIN::APSE (Solutions)

- Hermetic Sealing
- IP Rated
- EMI Shielding



Military & Aerospace

CIN::APSE® provides the ability to create innovative connector solutions to meet a new generation of interconnect challenges.

CIN::APSE® advanced interconnect solutions include high performance Gyroscopes for in-flight control and stabilisation systems, combined with the next generation of packages connected through CIN::APSE® LGAs and CIN::APSE® Interposers in Digital Instrumentation and Control systems.

CIN::APSE® direct connections provide an innovative yet reliable method of signal routing for commercial in-flight entertainment visual display units, counter measure protection systems, guidance, tracking seeker radars, and electronic control units.

Satellite & Space

CIN::APSE® multi-configuration custom connectors provide a new dimension for planet and deep space exploration, together with the addition of environmental seals for hostile environments.

CIN::APSE® LGAs are lightweight, high contact density and have excellent electrical & mechanical signal properties providing exceptional performance for multipurpose Geostationary Communication Platforms.

CIN::APSE® PCB interposers enable simple routing options for complex multilayer PCB and flex circuits in confined spaces within electronic system units

Radar & Surveillance

CIN::APSE® multipoint compression contact technology provides ideal connector solutions for Advanced Transmitter and Receiver modules on air, land and sea radar platforms. Systems include CEMS / AESA, UAV and lightweight, compact digital surveillance systems.

Telecommunications

Advanced telecommunications for next generation mobile networks and internet access through the use of CIN::APSE® reliability and high speed component technology

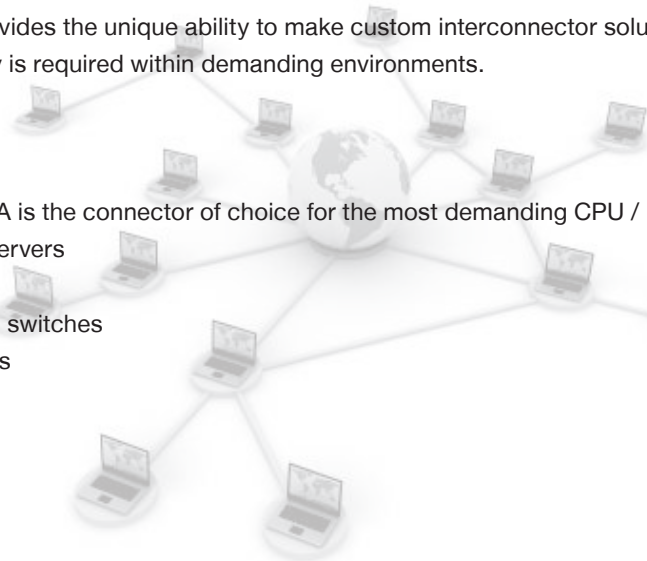
Transport

CIN::APSE® provides the unique ability to make custom interconnector solutions available for electronic displays and sensors where crucial reliability is required within demanding environments.

Computer

CIN::APSE® LGA is the connector of choice for the most demanding CPU / MCM and ASIC-to-board applications in leading:

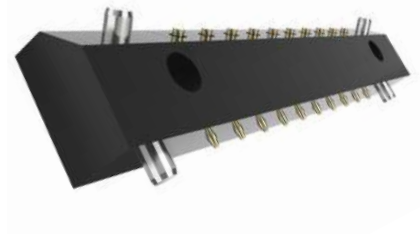
- High-end servers
- Routers
- High speed switches
- Main frames



360° CIN::APSE® Termination

CIN::APSE® technology provides a method of termination from 0 and 360 degrees to solve the most complex of routing in ECU designs.

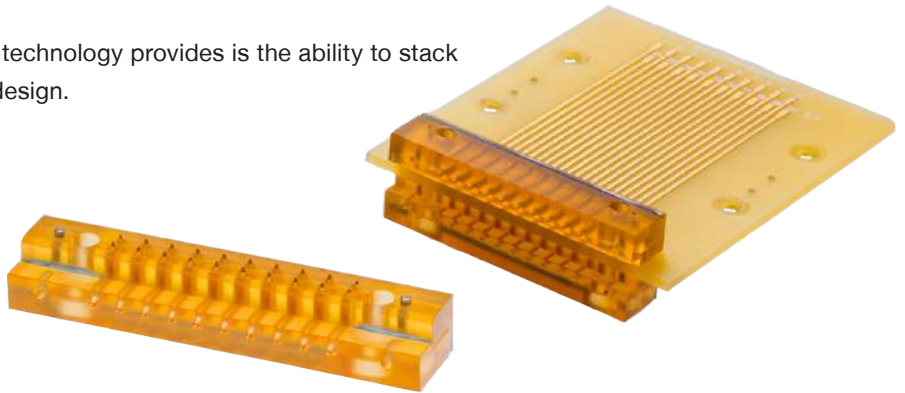
The unique method of connector construction enables the designer to vary the angle of termination to aid routing direction of flexible circuits and PCBs within the system.



90° CIN::APSE® Termination

The advantage of the low profile that CIN::APSE® technology provides is the ability to stack daughter boards closer together within a system design.

- Single or multiple row configuration
- Dual sided PCB interconnection
- High density
- Low profile saving space
- Compression technology
- Allows for tolerance and CTE mismatch



Dual Technology

CIN::APSE® flexible termination method allows the compression technology to be incorporated within a traditional connector frame to provide a high performing Surface Mount Solutions.

Cinch contact technology withstands extreme shock and vibration, and is extremely stable over time and temperature to provide a viable alternative to the press fit connector technology for demanding environments.



0.8mm CIN::APSE®

For Small Pitch Applications

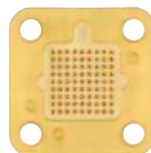
The proven performance of CIN::APSE® technology in a reduced size ideal for high density applications that require pitches down to 0.8mm

For Low Voltage Drop Applications

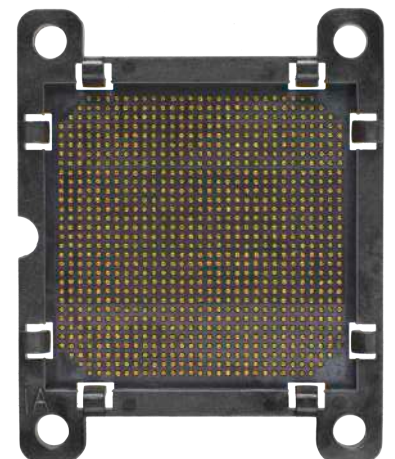
The introduction of the Ø0.8mm contact provides a lower line resistance whilst remaining on the standard 1.0mm CIN::APSE® pitch.

CIN::APSE® technology provides the ability to reduce interconnection voltage drops within a power sensitive system.

- Electronic control units
- Remote power sources
- Weight and Size reduction of power supplies



Reduced size CIN::APSE®
Contact on 0.8mm pitch



Standard size CIN::APSE®
Contact on 1.0mm pitch

CIN::APSE® Extended Compliant Contact (ECC)

The CIN::APSE® ECC fits almost all application requirements where an electrical connection is required between two surfaces, even in the most extreme conditions and environments where dirt and dust have the potential to cause interference. Its versatile configurations will provide exact footprints and mated heights in order to meet your custom needs.

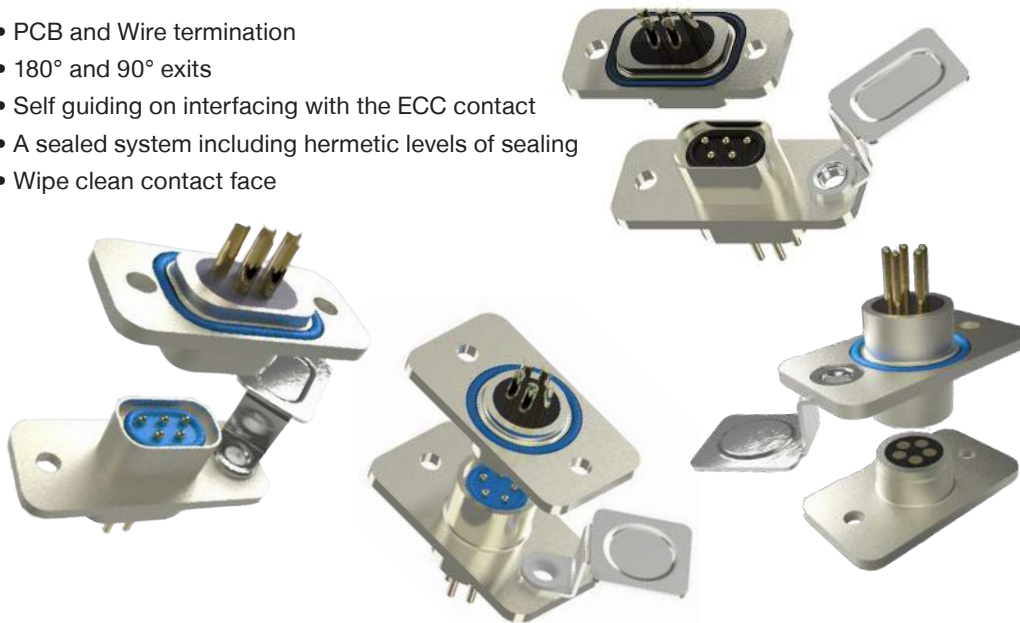
The fully enclosed, randomly wound CIN::APSE® contact provides the lowest contact resistance that can be terminated in all the standard methods.



- Durable Handling
- Low Contact Resistance
- Low Compression Force
- Simplified Installation
- Wipe-Clean Contact System
- High Current Handling
- High Contact Density
- Resistance to Shock and Vibration conditions

CIN::APSE® ECC Designed Within a Connector Housing

- PCB and Wire termination
- 180° and 90° exits
- Self guiding on interfacing with the ECC contact
- A sealed system including hermetic levels of sealing
- Wipe clean contact face



CIN::APSE® ECC Designed Within a Cable Systems

- Over moulded solutions
- Self latching system with push and pull release
- Sealed to IP ratings
- 360° Screened Cable terminations
- Coiled, multi strand cables to Mil-Std / Aerospace ratings
- Circular and rectangular arrangements
- Varying contact pitches and contact sizes - Ø0.5mm (0.020") & Ø1.0mm (0.040")



Crimp Contact Termination
24 to 30 AWG Stranded Wire



Compression Contact
Designed to provide a connector height to suit your requirements



Compression Contact
Extended working range option



Solder Cup
Custom wire termination
26 to 30 AWG range



Threaded Contact Probe
Extended working range option



Printed Circuit Board Tail
Soldering applications



Cinch Connectivity Solutions US Headquarters

1700 Finley Road
Lombard, IL 60148 USA
+1 630.705.6000
inquiry@us.cinch.com

Cinch Connectivity Solutions Ltd European Headquarters

11 Bilton Road
Chelmsford, Essex CM1 2UP UK
+44 (0) 1245 342060
CinchConnectivity@eu.cinch.com

Cinch Connectivity Solutions Asia Pacific Headquarters

Room 511-512, Building #2, No. 4855 Dushi Road
Minhang District, Shanghai 201199 CN
+86 21 5442 7668
ccs.asia.sales@as.cinch.com

Proven Excellence

In operation since 1917, Cinch supplies high quality, high performance connectors and cables globally to the Aerospace, Military/Defense, Commercial Transportation, Oil & Gas, High End Computer, and other markets. We provide custom solutions with our creative, hands on engineering and end to end approach.

Our diverse product offerings include: connectors, enclosures and cable assemblies utilizing multiple contact technologies including copper and fiber optics. Our product engineering and development activities employ cutting edge technologies for design and modeling, and our various technologies and expertise enable us to deliver custom solutions and products for our strategic partnerships. We also serve a broad range of commercial markets, largely through our highly efficient distribution network.

We aim to exceed our customer's expectations, and to continually provide innovative solutions to the rapidly changing needs of the markets, and customers, we serve.

For more information visit belfuse.com/cinch

