

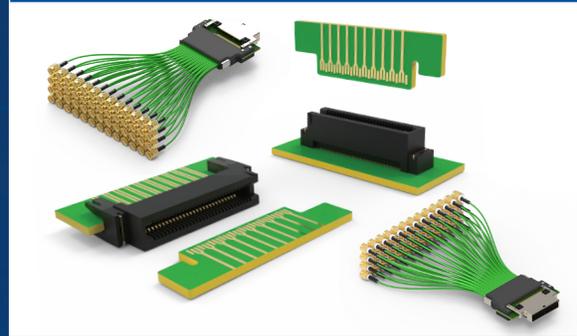
# CARLISLE<sup>®</sup>

INTERCONNECT TECHNOLOGIES

High-Performance Cable



Digital



RF Products



Probes



Test & Measurement  
Products & Services

# High-Performance Wire & Cable

Carlisle Interconnect Technologies (CarlisleIT) offers a complete line of high-performance, flexible microwave cables with excellent loss characteristics, outstanding phase stability, and unsurpassed flexibility, compared to standard flexible cables—all without sacrificing mechanical integrity. CarlisleIT has greatly increased connector reliability through a unique connector attachment that withstands mechanical and thermal stresses far better than standard connectors.

Features and benefits of RF cables typically used in Test and Measurement applications are summarized in the table below:



*Flexible Microwave Cables*

Product Type	Features and Benefits
Flexible Cables	<ul style="list-style-type: none"> <li>• Versatile low-loss cables operating up to 70 GHz</li> <li>• Excellent shielding effectiveness and precision phase matching</li> </ul>
Semi-Flex/Conformable Cables	<ul style="list-style-type: none"> <li>• Hand-formable cables with lower leakage and superior bending radius to semi-rigid types</li> </ul>
Semi-Rigid Cables	<ul style="list-style-type: none"> <li>• Benchmark by which all other RF cables are measured</li> <li>• Highest RF shielding and lowest attenuation</li> </ul>
RG Cables	<ul style="list-style-type: none"> <li>• Higher reliability with excellent crush, torque, and kink resistance for rugged use</li> </ul>
Armor Braid	<ul style="list-style-type: none"> <li>• Excellent crush, torque, and kink resistance for use in rugged environment</li> </ul>
Twinax	<ul style="list-style-type: none"> <li>• Suitable for 100 Ω differential signaling</li> <li>• Low-loss and phase matching guaranteed by design</li> </ul>



*Double Shielded Coax Cables*

# RF Products

## HIGH-DENSITY RF GANGED INTERCONNECTS

Carlisle Interconnect Technologies offers high-density CoreHC™ and CoreGD™ multichannel, test-point systems targeted for high-density boards where space is limited. These products result in reduced trace lengths and higher signal integrity, compared to boards using traditional SMA-type connectors.

CoreHC is a compression force interconnect system with 2.5 mm channel spacing that can be attached directly to a board without a connector. CoreGD is a typical male, female mate/demate type interface using SSMP (SMPM) and WMP (SMPS) connectors.

CoreHC™	CoreGD™
Compression force-type board interface	SSMP and WMP-type board interface
1.85 mm and 2.92 mm cable-side connectors; 2.5 mm pitch	1.85, 2.4, and 2.92 mm cable-side connectors; 4 mm pitch
Vertical, edge mount, and board-to-board options	Vertical, edge mount, and board-to-board options



## PRECISION CONNECTORS

CarlisleIT offers a wide portfolio of low-loss, high-frequency precision RF connectors in various configurations for design flexibility and multiple applications.

The following table shows featured board mount connectors with key specifications and ordering information.

- » 50 Ω impedance
- » Frequencies ranging from 26.5 to 65 GHz
- » 1.85 mm, 2.40 mm, 2.92 mm, and 3.50 mm mating interfaces
- » Field-replaceable options available



Field Replaceable Precision RF Connectors



Solder Mount Precision RF Connectors

Size	Part No.	Description	Termination Style	Orientation	Freq.
1.85 mm	TMB-V8F2-3LC	1.85 mm Female, 2 Hole Flange, CPW	Field Replaceable	Vertical	DC - 65 GHz
	TMB-E8FS-1S1	1.85 mm Female Straight, Solder Mount	Manual Solder	Edge Mount	
	TMB-V8FS-3SM	1.85 mm Female Straight, Solder Mount	Mixed Technology Solder	Vertical	
	TMB-E8F2-1L1	1.85 mm Female Straight	Field Replaceable	Edge Mount	
	TM14-0089-00	1.85 mm Angled Connector Jack	Field Replaceable	Vertical	
	TMB-V8F2-3L1	1.85 mm Female 2 hole Flange, Stripline	Field Replaceable	Vertical	
2.40 mm	TMB-E8FS-1ST	1.85 mm Straight Jack, Shielded	Solder Mount	Edge	DC - 50 GHz
	TMB-V4F2-3LC	2.40 mm Female, 2 Hole Flange, CPW	Field Replaceable	Vertical	
	TMB-E4FS-1S1	2.40 mm Female Straight	Manual Solder	Edge Mount	
	TMB-V4FS-3SM	2.40 mm Female Straight, Solder Mount	Mixed Technology Solder	Vertical	
	TMB-E4F2-1L1	2.40 mm Female Straight	Field Replaceable	Edge Mount	
2.92 mm	TMB-E4FS-1ST	2.4 mm Straight Jack, Shielded	Solder Mount	Edge	DC - 40 GHz
	TMB-V9F2-3LC	2.92 mm Female, 2 Hole Flange, CPW	Field Replaceable	Vertical	
	TMB-E9FS-1S1	2.92 mm Female Straight	Manual Solder	Edge Mount	
	TMB-V9FS-3SM	2.92 mm Female Straight, Solder Mount	Mixed Technology Solder	Vertical	
	TMB-E9F2-1L1	2.92 mm Female Straight	Field Replaceable	Edge Mount	
	TMB-V9F2-3L1	2.92 mm Female, 2 Hole Flange, Stripline	Field Replaceable	Vertical	
3.50 mm	TMB-E9FS-1ST	2.92 mm Straight Jack, Shielded	Solder Mount	Edge	DC - 34 GHz
	TMB-V5F2-3LC	3.50 mm Female, 2 Hole Flange, CPW	Field Replaceable	Vertical	
	TMB-E5FS-1S1	3.50 mm Female Straight	Manual Solder	Edge Mount	
	TMB-V5FS-3SM	3.50 mm Female Straight, Solder Mount	Mixed Technology Solder	Vertical	
	TMB-E5F2-1L1	3.50 mm Female Straight	Field Replaceable	Edge Mount	
	TMB-V5F2-3L1	3.50 mm Female 2 Hole Flange, Stripline	Field Replaceable	Vertical	
	TMB-E5FS-1ST	3.5 mm Straight Jack, Shielded	Solder Mount	Edge	
TMB-V5FS-3SM-01	3.50 mm Female Straight, Long Leads	Manual Solder	Vertical		

# RF Products

## RF ADAPTERS

With the introduction of the industry's first swept right-angle microwave adapter in the 1970s, the Carlisle Interconnect Technologies (CarlisleIT) name has become synonymous with precision RF and microwave adapters.

We offer a full-gender family of precision RF adapters in different connector options to cover applications ranging from DC – 65 GHz. These adapters come standard in a passivated stainless steel body with a captivated beryllium copper center conductor to ensure mating repeatability. In addition, options such as gold-plated housing or non-captivated center conductor are also available to fit the desired application. All of our adapters are 100% tested to ensure optimum performance over their respective frequency range.

- » Complete family of in-series and inter-series adapters
- » These adapters come standard in a passivated stainless steel body with a captivated beryllium copper center conductor to ensure mating reliability
- » 50 Ω impedance, low VSWR and insertion loss for high signal integrity

Series	Type	Series	Type	Series	Type	Series	Type
1.85 mm	Male to Male	2.4 mm	Male to Male	2.92 mm	Male to Male	3.5 mm	Male to Male
	Female to Male		Female to Male		Female to Male		Female to Male
	Female to Female		Female to Female		Female to Female		Female to Female
1.85 mm to 2.4 mm	Female to female	1.85 mm to 2.92 mm	Female to female	1.85 mm to 3.5 mm	Female to female	2.4 mm to 2.92 mm	Female to female
	Male to Female		Male to Female		Male to Female		Male to Female
	Female to Male		Female to Male		Female to Male		Female to Male
		2.4 mm to 3.5 mm	Female to female	2.92 mm to 3.5 mm	Female to female		
			Male to Female		Male to Female		
			Female to Male		Female to Male		
			Male to Male		Male to Male		

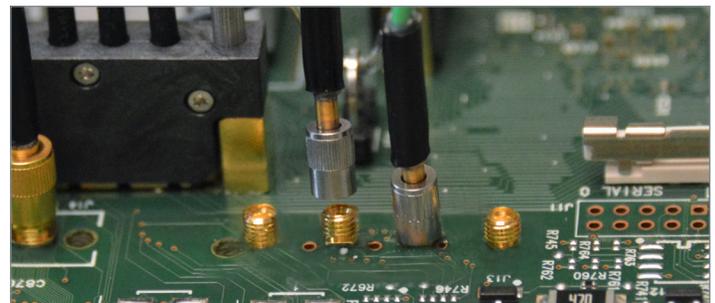


In-Series RF Adapters

## SecureThread™



SecureThread SSMP (SMPM) Cable Assemblies



SecureThread WMP (SMPS)

SecureThread™, Carlisle Interconnect Technologies' (CarlisleIT) high-performance interconnect system, uses a blind-mateable push-on interface with a threaded coupling nut that prevents the cable assembly from moving once the connection is made. Available as solderless direct-attach or solderable SSMP (SMPM)-type, SecureThread supports frequencies in the range of DC – 65 GHz with excellent signal integrity. The solderless system uses a compression mount-type connector on the cable side and a hollow plastic housing that is mounted on the standard SMA connector footprint on-board, using screws on the bottom side. The board-side connector can be moved on the PCB as long as the footprint is there.

The SSMP (SMPM)-based SecureThread Interconnect System consists of a coaxial cable assembly with a male SSMP (SMPM) connector and a threaded coupling nut, with a female SSMP (SMPM) board-mount connector on the board side that requires soldering. SecureThread cable assemblies are available as CoreHC™ to CoreHC-type; CoreHC to Precision Connector-type (1.85 mm, 2.4 mm, 2.92 mm, and 3.5 mm); Secure SSMP (SMPM) to Secure SSMP (SMPM); and Secure SSMP (SMPM) to Precision Connector-type configurations (1.85 mm, 2.4 mm, 2.92 mm, and 3.5 mm).

- » Easily and repeatedly configurable into applications, significantly reducing time and cost
- » Compatible with several of CarlisleIT's cables, including the AccuPhase®, IntegraPhase, Semi-Rigid, and Semi-Flexible cables
- » Phase matching up to 2 ps for cable pairs
- » Surface mount-type and field-replacement board-side connectors
- » Compression pin mount solderless secure CoreHC solution

# Digital Products

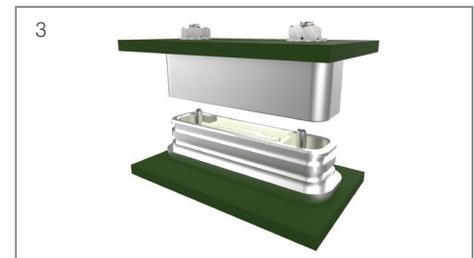
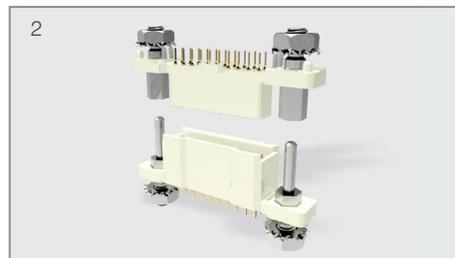
## ALTAVEL™ HIGH-SPEED DIGITAL CONNECTOR FAMILY

Carlisle Interconnect Technologies' (CarlisleIT) AltaVel™ family of open pin field High Speed Digital Interconnect Solutions is optimized to provide scalability and reliability in dense, high-mate/de-mate cycle applications with data rates greater than 25 Gbps.

The broad family of connectors are available in the following configurations: Board-to-Board, Board-to-Cable, Cable-to-Cable and Cable-to-Panel. All configurations are available in the following styles: Vertical-to-Vertical, Right-Angle-to-Vertical and Right-Angle-to-Right-Angle.

These standard connectors are part of CarlisleIT's full lineup of cost-effective, off-the-shelf, and customizable interconnect solutions delivering superior signal integrity performance and value.

Feature	Benefit
10,000 mate/de-mate cycles	<ul style="list-style-type: none"> <li>High signal integrity and reliability in a long life package ensures high performance and lower cost of ownership</li> </ul>
Flexible, scalable design	<ul style="list-style-type: none"> <li>High density, scalable design provides multiple configurations, enabling optimum performance at the lowest total cost. Size ranges from 10 to 200 pins; configurable in 1 to 4 rows by 10, 20, 30, 40, or 50 positions. Configurable by Pin/Spacer height, 8 mm, 12 mm, 16 mm, and 20 mm.</li> </ul>
With or without metal shells	<ul style="list-style-type: none"> <li>Rugged/EMI housing option is a readily available option for applications used in extreme environments</li> </ul>
Open pin field design	<ul style="list-style-type: none"> <li>Design allows for flexibility in routing and coding schemes, including: single-ended, differential pair, power, ground, and sideband signals</li> </ul>
Impedance: <ul style="list-style-type: none"> <li>Differential: 85 and 100 Ω</li> <li>Single-ended: 50 and 75 Ω</li> </ul>	<ul style="list-style-type: none"> <li>Multiple impedance options ensures a solution to meet your application</li> </ul>
Board mounting options	<ul style="list-style-type: none"> <li>Termination styles: Surface Mount (SMT), Paste-In-Hole (PIH), and Plated Through-Hole (PTH)</li> </ul>



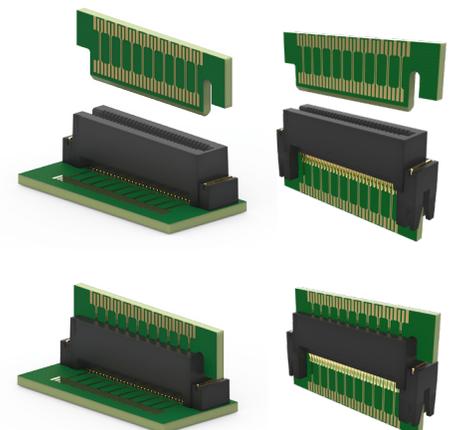
Available contact and connector systems: 1) High-reliability contact system featuring 3 points of contact. Available in Surface Mount (SMT), Paste-in-Hole (PIH), and Plated-Through-Hole (PTH) termination styles. 2) Connector without metal shell, 3) Connector with metal shell.

## CARD EDGE CONNECTORS

CarlisleIT's Card Edge Connectors Contact System is designed for high-speed, high-density applications. Card Edge Connectors have a smooth mating surface area, which reduces the wear and tear of contacts and increases the durability and cycle life of the contact system.

They also lower insertion and withdrawal forces while supporting data rates up to 32 Gbps with excellent signal integrity.

Feature	Benefit
High-speed differential data rate	<ul style="list-style-type: none"> <li>Offers excellent signal integrity and performance up to 32 Gbps</li> </ul>
Multiple PCB thicknesses (0.062" and 0.093")	<ul style="list-style-type: none"> <li>Allows for complex PCB designs</li> </ul>
Surface mount and edge mount options	<ul style="list-style-type: none"> <li>Enables high-speed, pick-and-place assembly</li> </ul>
0.8 mm pitch	<ul style="list-style-type: none"> <li>Access signals in dense environments and save PCB space</li> </ul>
8.5 mm max height	<ul style="list-style-type: none"> <li>Up to 60 pins for low-profile system designs</li> </ul>
500 mate/demate cycles	<ul style="list-style-type: none"> <li>High reliability and low cost of ownership</li> </ul>
Wide operating temperature	<ul style="list-style-type: none"> <li>-55 °C to 155 °C</li> </ul>



Card Edge Connectors Contact System

# Probes

## PASSIVE PROBES

CarlisleIT offers low-cost, high-performance, compact CATIII and CATIV rated probes in a UL-certified plastic body suitable for a variety of applications. The Passive Probe is a standard, commercial, off-the-shelf system engineered to deliver consistent, repeatable, and dependable results. The Passive Probe provides an industry-leading combination of high bandwidth and high voltage in a low-cost, rugged, general purpose probing solution.

Feature	Benefit
500 MHz bandwidth and 1,000 V Cat III, 600 V CAT IV	<ul style="list-style-type: none"> <li>A combination of high bandwidth and high voltage reduces the number of probes needed for a variety of applications, simplifying the toolkit and lowering costs</li> </ul>
1X, 10X, and 100X configurations	<ul style="list-style-type: none"> <li>Multiple configurations give the flexibility to choose the passive probe that fits your application</li> </ul>
Third-party certified, exceeds UL61010-31, IEC61010-31	<ul style="list-style-type: none"> <li>Superior product quality and safety greatly reduces risk in high voltage applications</li> </ul>
Small, compact probe head and body	<ul style="list-style-type: none"> <li>Enhanced visibility to small, dense geometry circuit elements within the contact device-under-test (DUT) ensures correct and accurate test point</li> </ul>

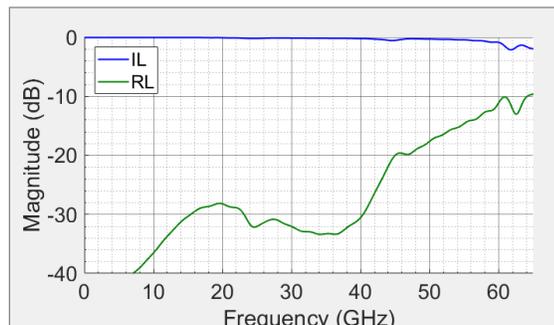
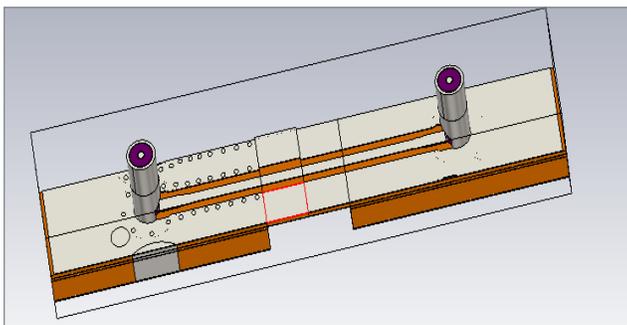


Passive Probes

## SIGNAL INTEGRITY

CarlisleIT offers signal integrity services to its customers in order to optimize the complex designs for best possible system performance. CST, Solidworks, and ProE are some of the tools used to simulate the customer's printed circuit board stack-ups integrated with CarlisleIT's RF connector footprints. Board designs are optimized for the lowest return loss, insertion loss, and crosstalk. PCB materials like Megtron, Nelco, Rogers, and High Speed FR4 affect the signal integrity including insertion loss, return loss, and board impedance. Additionally, the size and layout of signal traces, vias, and ground layers in the board stack-up need to be optimized for lowest losses and matched impedance in the required frequency range of operation.

VNA and Time Domain Reflectometry measurements are also performed to validate the simulations and characterize the designs.



# Global Manufacturing. Local Support.

Wherever you are, so are we. With manufacturing centers around the globe, our highly qualified team of engineers is up to any challenge. Our extensive worldwide manufacturing capabilities, coupled with end-to-end local project management and engineering support, allow us to design, build, test, and certify your product in-house, saving you the time and hassle of managing multiple vendors.



#### DIVISION HEADQUARTERS

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#### FACILITIES CERTIFICATIONS

- » AS9100
- » ISO 9001
- » ISO 13485
- » ISO 14001
- » ITAR registration
- » MIL-SPEC/SAE
- » RoHS compliance

## Performance with Purpose

# We Are Interconnect.

At Carlisle Interconnect Technologies, we do more than make interconnect technologies for a spectrum of industries. We deliver the critical connections and products that make amazing performances possible.



## Carlisle Operating System (COS)

### Driving the Industry Forward

We're leading the way with our Carlisle Operating System (COS). COS is our standardized methodology using the tools of Lean Manufacturing and Six Sigma to drive continuous improvement for our customers and our business. It promotes the systems and culture of safety, employee involvement, quality, and on-time delivery — all of this with our customers in mind.

The COS methodology is woven into our leadership fabric and everything we do. This thought process is both supported and driven by our top leadership and ensures the sustainability of our successes with our customers and our business. Every CarlisleIT location participates with the goal of continuous improvement at all facilities.

With COS, companies working with CarlisleIT know they're partnering with a world-class interconnect manufacturer dedicated to providing comprehensive, next-level solutions they can't get anywhere else.

### Nine Key Metrics

- » MDI - Managing for Daily Improvement
- » TPM - Total Preventative Maintenance
- » Culture
- » Supply Chain
- » Environment
- » Safety
- » Quality
- » Delivery
- » Cost

The COS Operational Excellence program recognizes and rewards facility performance with a specific and defined level of achievement, providing each facility a road map for continuous success. The program allows CarlisleIT to monitor and track performance to ensure we're achieving our performance goals.



People. Process. Productivity.



See CarlisleIT's line of Test & Measurement products at:  
[CarlisleIT.com/markets/test-measurement](http://CarlisleIT.com/markets/test-measurement)

+1 (800) 458.9960  
[TMSales@CarlisleIT.com](mailto:TMSales@CarlisleIT.com)