

# CoreHC™ 2.5 mm Pitch Interconnect Solutions

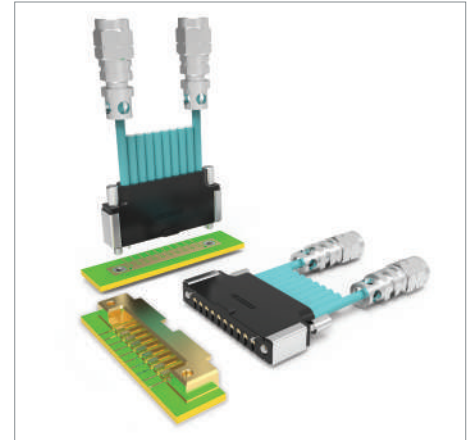
## WHEN SIGNAL INTEGRITY & DENSITY MATTER

Carlisle Interconnect Technologies' CoreHC 2.5 mm pitch direct attach cable assembly is a multichannel, test-point system targeted for high-density boards where space is limited. It offers reduced trace lengths and higher signal integrity compared to boards using traditional SMA-type connectors. On average, there is 4-times higher available bandwidth for signals in the same real estate as SMA connectors.

CarlisleIT's unique compression force design results in easier and rapid connectivity of high-frequency signals on the board. Since there are configurations using single or multiple channels, board size can be optimized accordingly.

The vertical mount-attach solution eliminates the board-side connector or interposer by offering a direct connection of signals between the traces and pads on the PCB footprint and the compression pins on the cable assembly. A board-side interposer is required for edge mount-type solution. Optimized footprints and layouts are available upon request.

The 2.5 mm solution is designed for demanding bandwidths up to 65 GHz. Standard products are available in single, 2, 4, 6, 8, and 10-channel configurations.



## FEATURES & BENEFITS

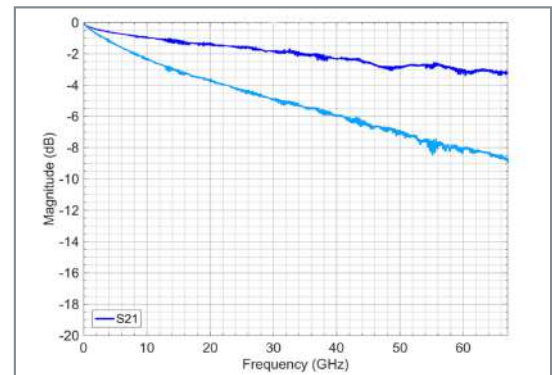
Feature	Customer Benefit
DC to 65 GHz frequency range	Supports a variety of current and emerging applications, reducing overall cost
Board footprint compatibility	Can be used with Coplanar Wave Guide (CPW) and strip line PCB traces
Multiple board-to-board solutions	8 mm to 20 mm stack-up height in 2 mm increments to meet certain height restrictions
One-piece interface for vertical-mount type	Saves time and reduces costs because no soldering to the board is required; only PEM nuts are used for installation and removal
Zero force to disengage	Eliminates damage to PCB solder joints and footprints
20,000 mate/demate cycles	High signal integrity in a long-life package provides high performance and lower cost of ownership
Smaller overall footprint size	2.5 mm pitch to access signals in dense environments and save PCB space
2 picosecond phase matching	High signal integrity
2.92 mm and 1.85 mm cable-side connectors	Supports frequencies up to 65 GHz
0.047 and 0.079 coax cables are available	High-performance, microwave-grade, flexible coaxial cables offer high density, high frequency, and low losses
Cable length options	Standard lengths offered in cm increments (custom lengths available upon request)
Edge launch/mount option	Design flexibility for complex board layouts
Multiple channels	Standard products available in single row, 2, 4, 6, 8, and 10 channels (custom configurations upon request)
Multiple signal probing	Probing is possible on single-ended or differential signals
Flexible cables	Offers high electrical and mechanical stability
Tilt protection	Shape of housings ensures high mechanical stability
Keying	Eliminates mismatching
No custom tooling required	Interconnect mounts on board with standard tools
Solder-free installation	Interposer-less design, requires no solder on PCB
Field-replaceable	Can be moved, reconfigured, and replaced in the field with standard tools

# CoreHC™ 2.5 mm Pitch Interconnect Solutions

## SPECIFICATIONS & PERFORMANCE

Parameter	Specification		
Frequency Range	DC to 65 GHz		
Impedance	50 Ohms ± 2.5 Ohms		
VSWR	Frequency Range	VSWR	Return Loss
	DC–20 GHz	1.2:1	≥ 26 dB at DC to 65 GHz
	20 GHz–30 GHz	1.25:1	≥ 17 dB at 26.5 GHz to 50 GHz
	30 GHz–65 GHz	1.40:1	≥ 14 dB from 50 GHz to 65 GHz
Insertion Loss	047 type cable: -2.2 dB (max) at 20 GHz	079 type cable: -0.7 dB (max) at 20 GHz	
Working Voltage	335 VRMS max @ sea level		
DWV (Dielectric Withstand Voltage)	500 VRMS (min)		
Insulation Resistance	5000 MΩ (min)		
RF High Potential	100 VRMS @ 5 MHz		
Force to Engage	60 g (typical per channel)		
Force to disengage	0 (max per channel)		
Insertion Life	20,000 mating/demating cycles		
Phase Matching	2 picoseconds		
Pitch	2.5 mm		
Form Factor	Compression mounts directly to board		
Interface (Cable End to Equipment)	Female or male 1.85 mm, 2.4 mm, 2.92 mm & 3.5 mm		
Temperature Range	-65°C to 150°C		
Environmental	Meets MIL-STD-202 for corrosion, vibration moisture resistance, thermal, and mechanical shock		

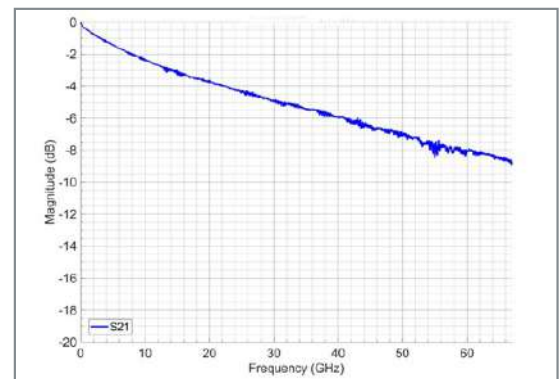
Insertion Loss of .079-inch Single-Ended Coax



\*Data shown is measured for 28cm length Cable Assembly  
 — Cable assembly losses only  
 — Cable assembly and PCB trace loss

The measured differential insertion loss for a CoreHC cable assembly is shown below. Note the smoothing of the insertion loss curve in the graph with no spikes.

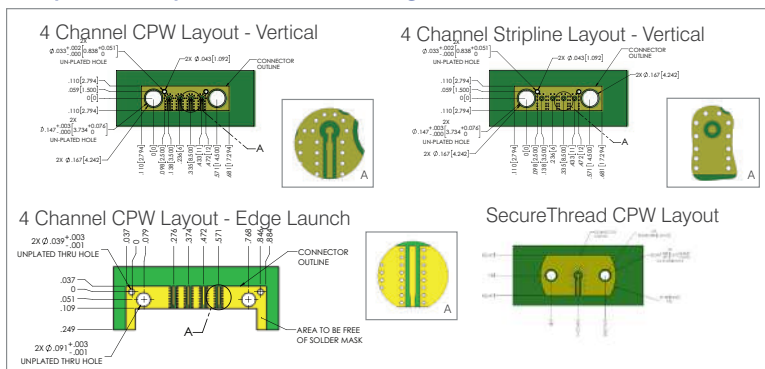
Differential Insertion Loss (SDD21)



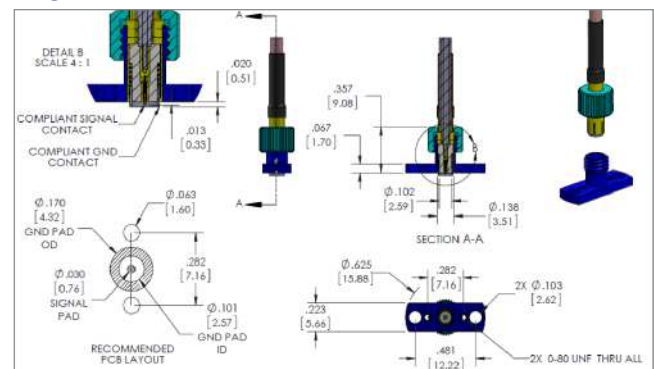
Differential insertion loss of CoreHC interconnect using .079-inch coax cable

## TYPICAL APPLICATION: SMALL FOOTPRINT & DENSE CONFIGURATION

### Footprint Examples for Vertical & Edge Launch Assemblies



### Single-Channel CoreHC-Based Secure Interconnect Solution



Learn more: [CarlisleIT.com/products](http://CarlisleIT.com/products)

# CoreHC™ 2.5 mm Pitch Interconnect Solutions

## SPECIFICATIONS & PERFORMANCE

Minimizing crosstalk in high density and extremely small board design is important. With low crosstalk at high frequencies, excellent signal integrity can be assured with maximum flexibility in layout and routing of traces on the board. Figures 1 and 2 compare the crosstalk performance seen for both strip line and CPW boards across the frequency range of DC to 70 GHz for reference:

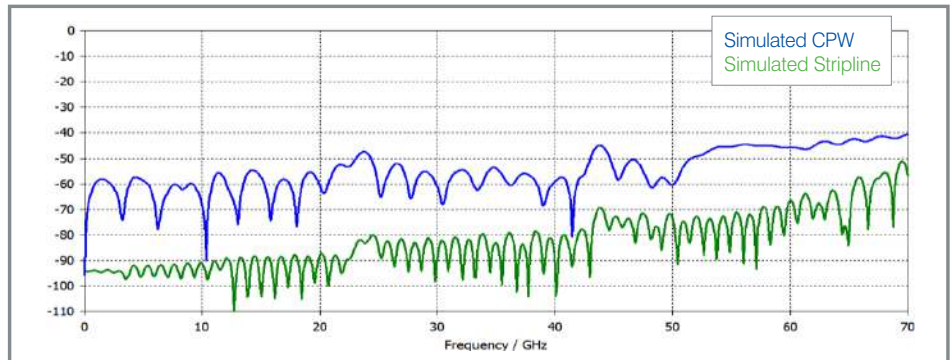


Fig. 1: Comparing near-end crosstalk for CoreHC interconnect in strip line and CPW designs

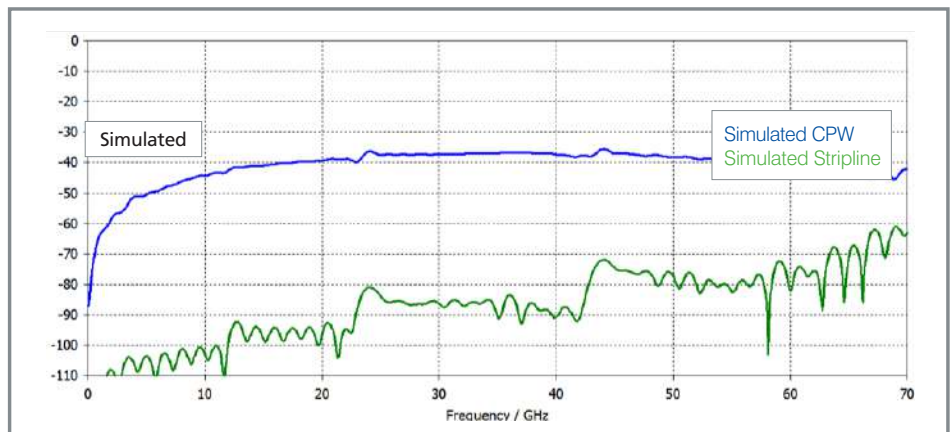


Fig. 2: Comparing far-end crosstalk for CoreHC interconnect in strip line and CPW designs

When it comes to return losses, it can be seen from Figure 3 that less reflections from the load and source side are seen travelling on the differential channel. In the case of single ended PCB traces, there are more reflections, resulting in higher insertion loss.

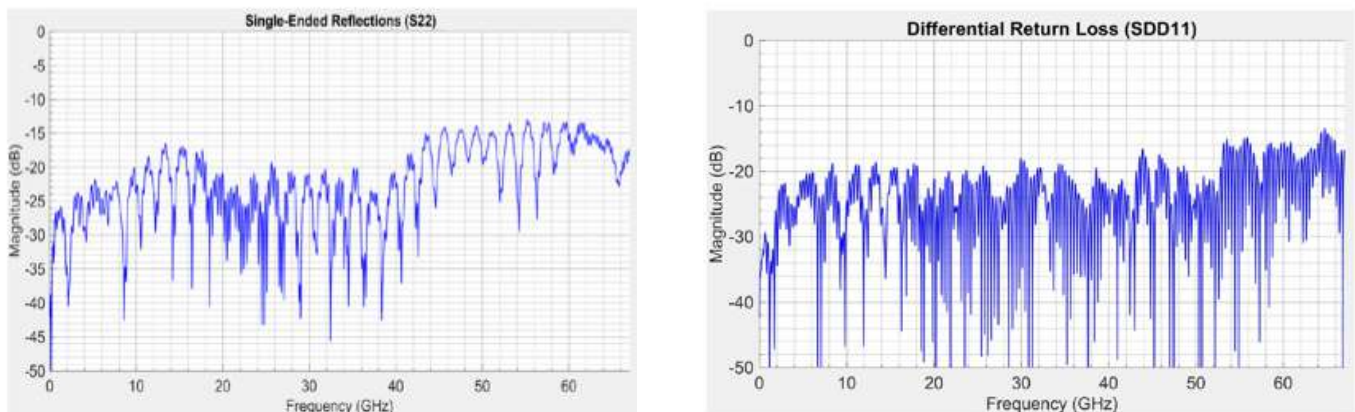


Fig. 3: Comparison of single-ended & differential return losses for the CoreHC assembly

# CoreHC™ 2.5 mm Pitch Interconnect Solutions

## GANGED RF HIGH DENSITY INTERCONNECTS

Figure 4 shows different configurations, outline and dimensions of standard CoreHC interconnect solutions

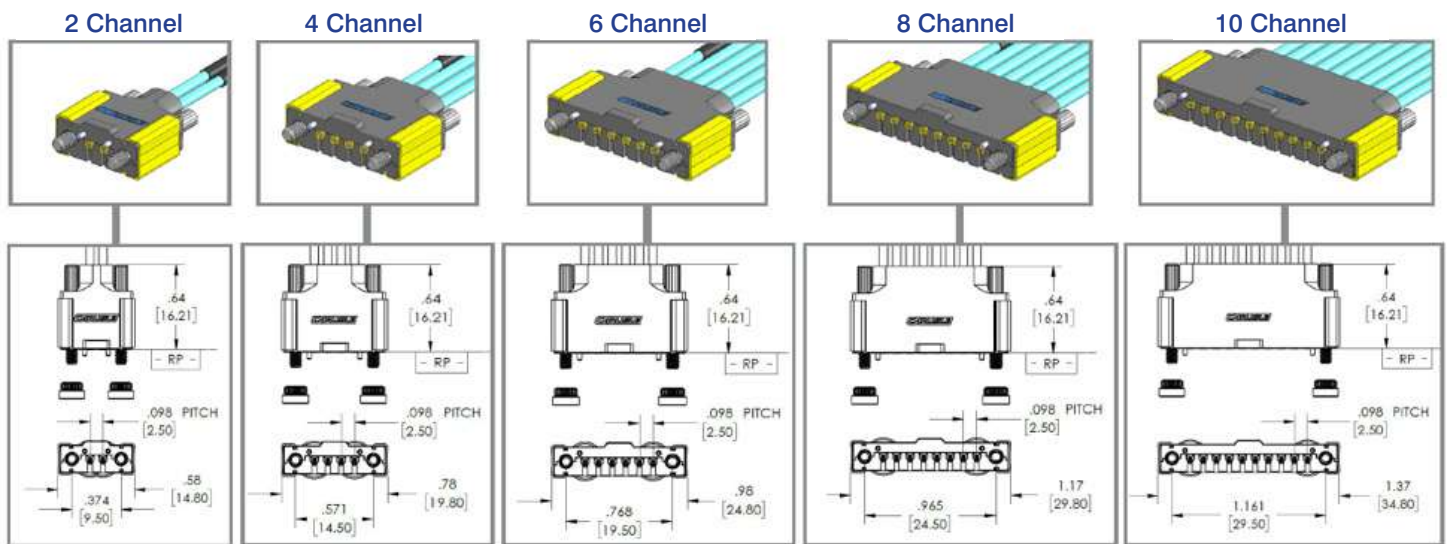
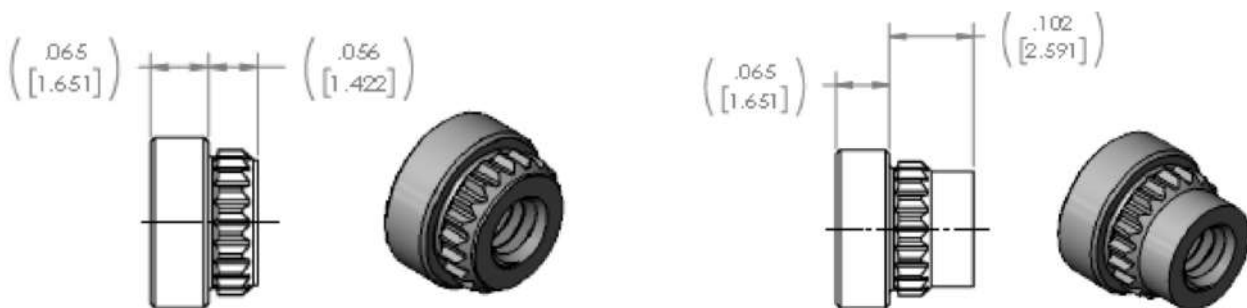


Fig. 4: Configurations and outline of CoreHC interconnect

## MOUNTING COREHC INTERCONNECT ASSEMBLY

PEM Nuts need to be installed on the back of the PCB to mount to secure the CoreHC interconnect cable assembly firmly in place. CarlisleIT offers two types of PEM nuts: One for .056-inch and the other for .102-inch-thick boards.



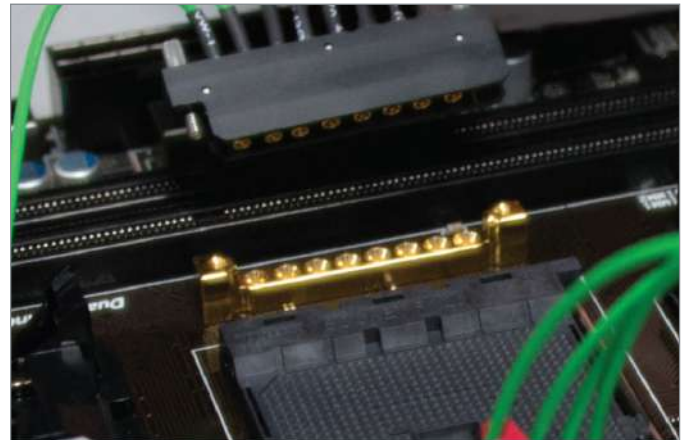
# CoreGD™ High-Performance Ganged Interconnect System

## WHEN SIGNAL INTEGRITY AND DENSITY MATTER

Carlisle Interconnect Technologies' (CarlisleIT) CoreGD™ is a high-performance, multi-port, interconnect system that offers excellent signal integrity for complex layouts and crowded PCBs used in a variety of applications.

It is a low-cost solution optimized for applications with demanding bandwidth up to 65 GHz, pushing the envelope up to 100 GHz.

- » Commercial off-the-shelf interconnect system available today
- » Designed into evaluation and validation test systems to analyze key parameters like insertion loss, crosstalk and frequency response
- » High-performance interconnect solution, at a significantly lower cost compared to similar competitive solutions
- » CoreGD technology can be readily integrated into custom, hybrid RF + Digital + Power interconnect solutions to meet uniquely demanding requirements



CoreGD™ cable assembly and connector in dense PCB application



CoreGD™ 8-position connector



CoreGD™ 2-position connector

- » Multiple position offerings available (2, 4, 6, 8, 10). Learn more: [www.carlisleit.com/prod-info/coregd](http://www.carlisleit.com/prod-info/coregd)

## FEATURES & BENEFITS

Feature	Customer Benefit
Frequency range: DC to 65 GHz (SSMP); DC to 100 GHz (WMP, preliminary)	Broad frequency range covers a variety of applications today, current and emerging needs of tomorrow, reducing overall cost
Pitch: 4mm (SSMP); 2.5mm (WMP, preliminary)	Test in dense environments and save PCB space with small pitch offerings
Field-replaceable	Save time and cost with quick and easy repair of damaged cable components in cable assembly
Simplified pre-tinned Surface Mount Technology (SMT)	Reduce mount install time of board connectors and associated costs
Innovative design overcomes push-on interface performance consistency	Eliminates electrical length or phase variation under vibration, shock, or other movement, ensuring stable and reliable signals
Multi-port offering (2, 4, 6, 8, 10) including stackable, side-to-side, and back-to-back	Selection of appropriate standard position loading reduces time to market and supports flexible designs driving to lowest cost solutions
Available Configurations: » Vertical-Mount and Board-to-Board Stack » Edge-Mount	Availability of multiple configurations enables optimum performance at the lowest total cost

Learn more: [CarlisleIT.com/products](http://CarlisleIT.com/products)

# CoreGD™ High-Performance Ganged Interconnect System

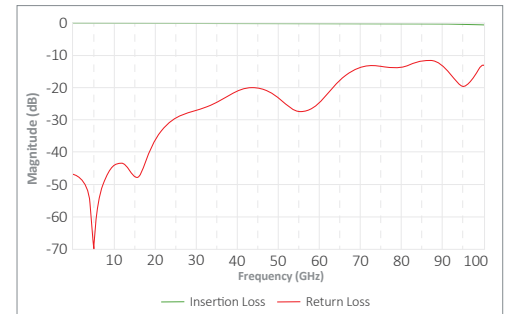
## SPECIFICATIONS & PERFORMANCE

Parameter	Specification				
	SSMP®		WMP® (preliminary)		
Impedance	50 Ω				
Frequency Range	DC to 65 GHz		DC to 100 GHz		
VSWR	Frequency Range	VSWR	Return Loss	VSWR	Return Loss
	DC - 26 GHz	1.11:1	26.00 dB	1.11:1	26.00 dB
	26 GHz - 40 GHz	1.20:1	19.00 dB	1.20:1	20.83 dB
	40 GHz - 50 GHz	1.25:1	17.69 dB	1.25:1	19.09 dB
	50 GHz - 65 GHz	1.4	15.56 dB	1.35:1	16.54 dB
65 GHz - 100 GHz*	n/A	N/A	1.45:1	14.72 dB	
Insertion Loss	0.10 x √F (GHz) dB		0.12 x √F (GHz) dB		
Crosstalk at PCB Transition	-50 dB to 30 GHz, -40 dB to 40 GHz				
Working Voltage	335 VRMS max @ Sea Level				
DWV (Dielectric Withstand Voltage)	500 VRMS (min)				
Insulation Resistance	5,000 MΩ (min)				
RF High Pot	325 VRMS @ 5 MHz				
Corona Level	125 VRMS at 70,000 ft.				
Force to Engage	Smooth Bore	0.5 lbs (max per channel)			
Force to Disengage	Smooth Bore	0.5 lbs (max per channel)			
Insertion Life	1,000 mating/de-mating cycles (repairable components)				
RF Leakage	-90dB min.		-65dB min.		
Pitch	4mm (SSMP), 2.5 mm (WMP)				
Form Factor	Standard SSMP male cable side, female SSMP surface-mount board side connector				
Cabling	0.047" diameter				
Interface (Cable End to Equipment)	Female or Male 2.92 mm or 1.85 mm connector				
Phase Matching	2.5 pS				
Temperature Range	-55 C to +165 C				
Environmental	Meets MIL-STD-202 for corrosion, vibration, moisture resistance, thermal and mechanical shock				

\*Data beyond 65 GHz is simulated

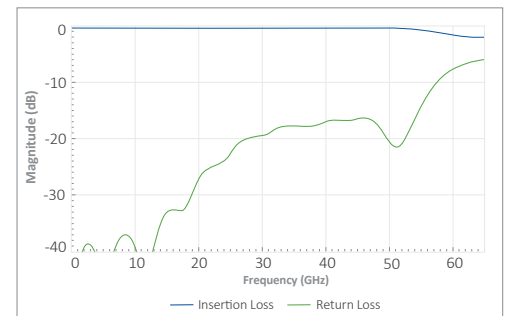
### CoreGD™ WMP Interconnect

Insertion Loss and Return Loss (gated) Performance

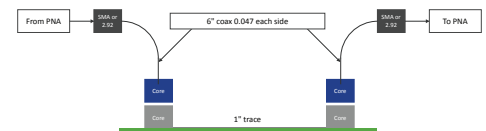


### CoreGD™ SSMP Interconnect

Insertion Loss and Return Loss (gated) Performance



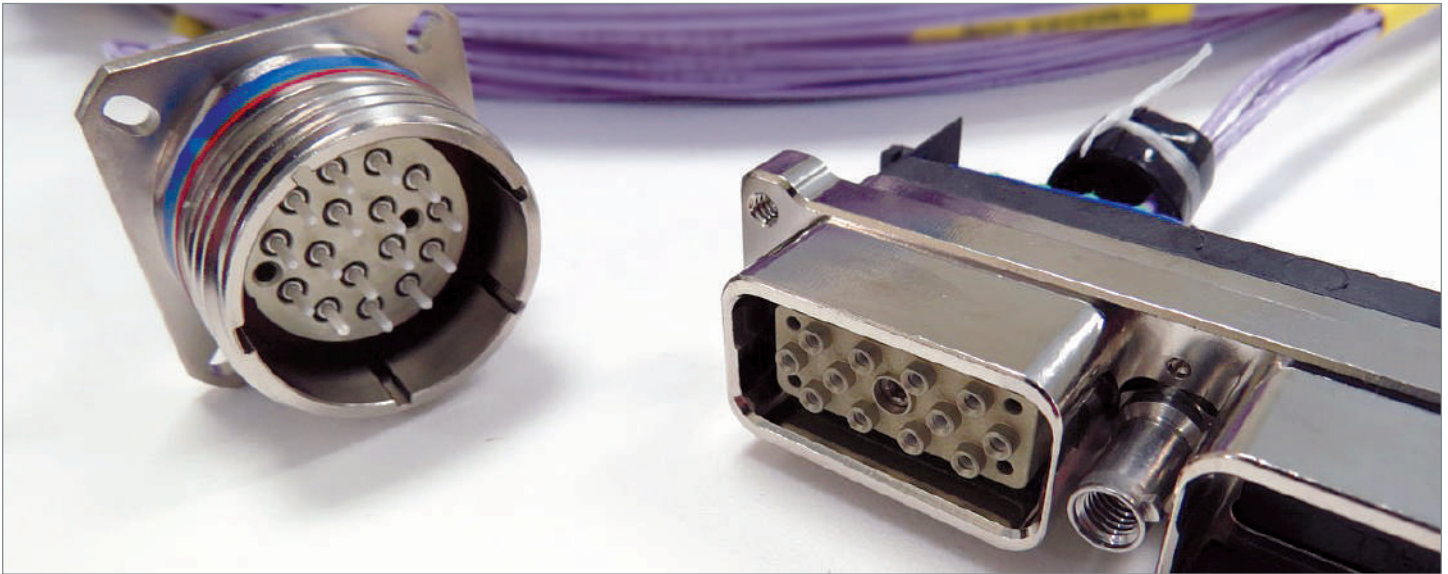
### Test Setup for Interconnect Performance



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)

## Fiber Optic Assemblies



### INTRODUCTION

Carlisle Interconnect Technologies (CarlisleIT) offers a full range of fiber optic cable assemblies including fiber jumpers, connectorized assemblies, highly complex breakout assemblies, long length assemblies and fiber harnessing on racks, trays or other structures and terminates all common connector and termini designs.

Designed to perform in the harshest installation and operating environments such as aerospace, defense and industrial applications, CarlisleIT's fiber optic assemblies offer unmatched performance in temperature extremes with immunity to electromagnetic inference (EMI).

### ASSEMBLY TESTING PROTOCOLS

- » High definition video visual inspection of fiber connector interfaces at high magnification, with digital capture, complete test reporting and archiving of termination endface quality
- » Multiple channel IL/RL testing at 660/850/1310/1550 nanometer wavelengths with full test results reporting
- » Advanced interferometer testing for precise endface geometry control

# Fiber Optic Assemblies

## How to Order:

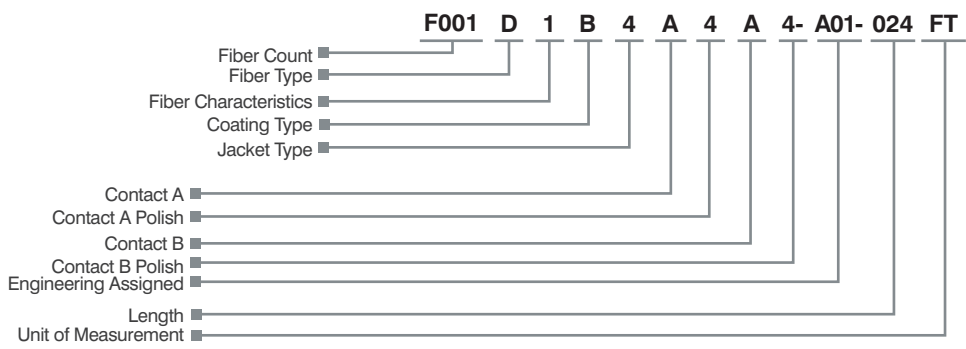
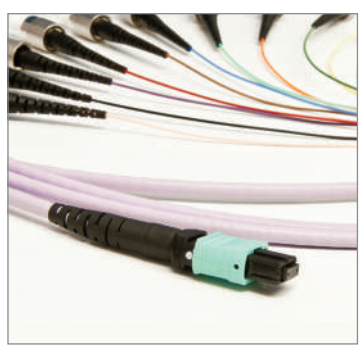
- » 1) Choose your cable codes from the Cable Information table.
- » 2) Choose your connector codes from the Connector Codes table (consult factory if your connector is not shown).
- » 3) Build your assembly part number from the Part Number Guide.

Fiber Count	Fiber Type				Fiber Characteristic	Coating Type			Jacket Type	
001	A	OM1 (62.5/125)	H	105/125 (MM)	1	N/A	A	Standard (-40°C to +65°C)	1	Coated Fiber
002	B	OM2 (50/125)	I	110/125 (MM)	2	Bend Insensitive	B	Mid Temp (-65°C to +125°C)	2	900um Acrylate Buffered
003	C	OM3 (50/125)	J	200/240 (MM)	3	Polarization Maintaining	C	High Temp (-65°C to +150°C)	3	900um Fluoropolymer Buffered
...	D	OM4 (50/125)	K	PM (SM)	4	Radiation Hardened	D	Extreme Temp (-65°C to +260°C)	4	Fluoropolymer Jacketed
999	E	OS1 (SM)	L	POF (MM)	5	Custom/Other	E	Custom/Other	5	Custom/Other
	F	OS2 (SM)	M	Custom/Other						
	G	100/140 (MM)								

Contact A				Contact A Polish		Contact B				Contact B Polish		Engineering Assigned	Length	Unit of Measure
A	ARINC 801	K	FC	1	Flat	A	ARINC 801	K	FC	1	Flat	XXX	001	IN
B	Elio®	L	MTP (M)	2	PC	B	Elio®	L	MTP (M)	2	PC		002	FT
C	M29504/4	M	MTP (F)	3	SPC	C	M29504/4	M	MTP (F)	3	SPC		003	MT
D	M29504/5	N	MT-RJ (M)	4	UPC	D	M29504/5	N	MT-RJ (M)	4	UPC		...	MM
E	M29504/14	O	MT-RJ (F)	5	APC(8°)	E	M29504/14	O	MT-RJ (F)	5	APC (8°)		999	CM
F	M29504/15	P	LX-5	6	Optical Lens	F	M29504/15	P	LX-5	6	Optical Lens			KM
G	Pro-Beam®	Q	MU	7	Custom/Other	G	Pro-Beam®	Q	MU	7	Custom/Other			
H	LC	R	SMA 905			H	LC	R	SMA 905					
I	SC	S	D4			I	SC	S	D4					
J	ST	T	Custom/Other			J	ST	T	Custom/Other					

Elio® is a Registered Trademark of Souriau.  
PRO Beam® is a Registered Trademark of TE Connectivity.

## PART NUMBER GUIDE



See CarlisleIT's line of Cable Assemblies & Harnesses at:  
[CarlisleIT.com/products/cable-assemblies-harnesses](http://CarlisleIT.com/products/cable-assemblies-harnesses)

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