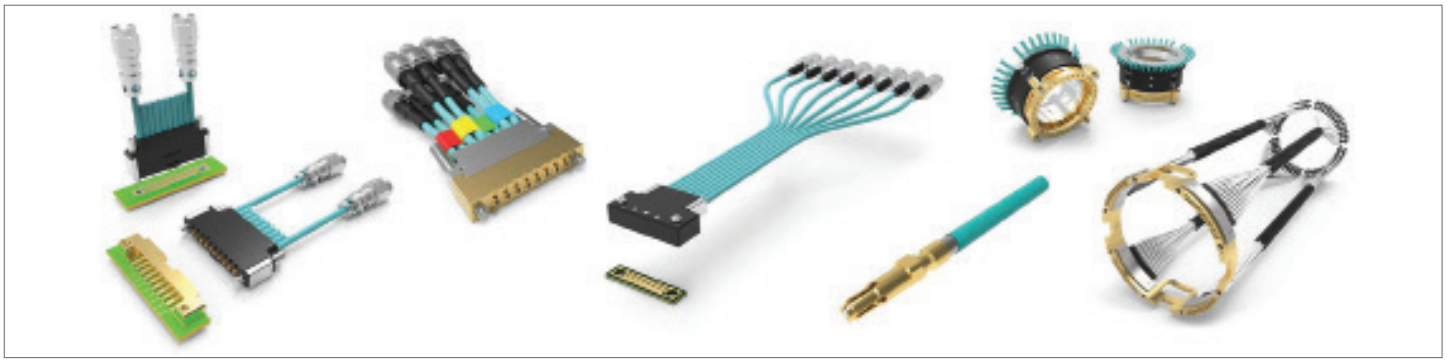
CoreHC™ Ganged Interconnect System



WHEN SIGNAL INTEGRITY & DENSITY MATTER

Our 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 and precision RF-type connectors. On average, there is 4x higher available bandwidth for signals in the same real estate as SMA connectors.

Our unique compression force design results in easy and rapid connectivity of high-frequency signals on the board. The 2.5 mm solution is designed for demanding bandwidths up to 65 GHz. Standard products are available in single and dual row 2-, 4-, 6-, 8-, 10-, and 16-channel configurations. Since there are configurations using single or multiple channels, board size can be optimized accordingly.

Vertical Mount
The vertical mount attachment 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.

Edge Mount
A board-side interposer is required for an edge-mount-type solution. Optimized footprints and layouts are available upon request.

Right Angle
With a maximum connector height of only 9.08 mm, the right-angle CoreHC cable assemblies are very useful to transmit and receive high-frequency signals up to 65 GHz to and from low-profile-height printed circuit boards to analyzers and other sub-systems. Similar to edge-mount and vertical-mount configurations, the right-angle CoreHC solution is offered with 3.5 mm, 2.92 mm, 2.40 mm, or 1.85 mm precision RF connectors on the cable side, depending on the required frequency of operation. The right-angle CoreHC solution is available in 2-, 4-, 6-, and 8-channel configurations.

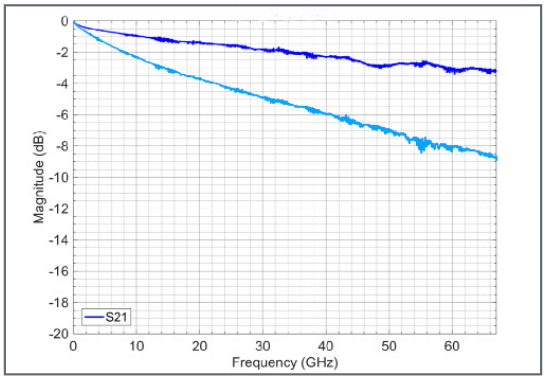
FEATURES	BENEFITS
DC to 65 GHz frequency range	• Supports a variety of current and emerging applications, reducing overall cost
Board footprint compatibility	• Can be used with Coplanar Wave Guide (CPW) and strip line PCB traces
Multiple board-to-board solutions	• 8 mm to 20 mm stack-up height in 2 mm 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
Single piece right-angle configuration	• Suitable for low-profile height ~9 mm PCBs • Suitable to probe signals close to DUT and away from PCB Edges
Zero force to disengage	• Eliminates damage to PCB solder joints and footprints
10,000 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 and dual 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 mismating
No custom tooling required	• Interconnect mounts on board with standard tools
Solder-free installation	• Interposer-less design, no solder on PCB required
Field-replaceable	• Can be moved, reconfigured, and replaced in the field with standard tools

CoreHC™ Ganged Interconnect System

SPECIFICATIONS & PERFORMANCE

Parameter	Specification		
Frequency Range	DC to 65 GHz		
Impedance	50 Ω ± 2.5 Ω		
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	10,000 mating/de-mating 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 125 °C		
Environmental	Meets MIL-STD-202 for corrosion, vibration moisture resistance, thermal, and mechanical shock		

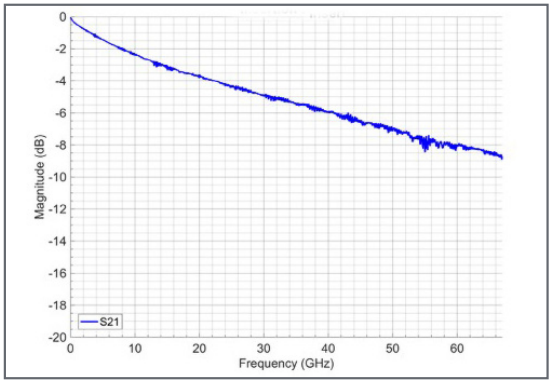
Insertion Loss of 0.079" Single-Ended Coax



*Data shown is measured for 28 cm 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.

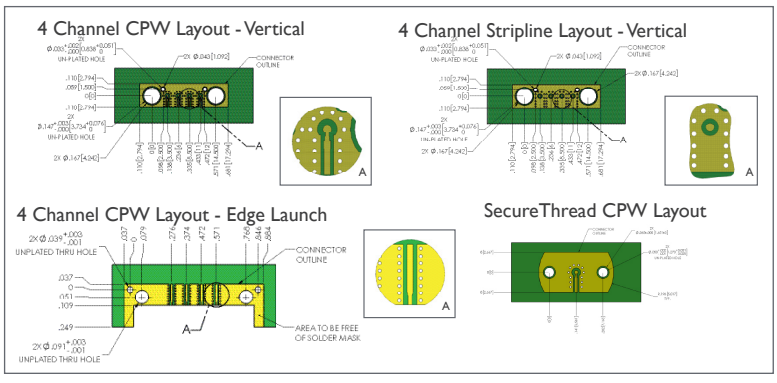
Differential Insertion Loss (SDD21)



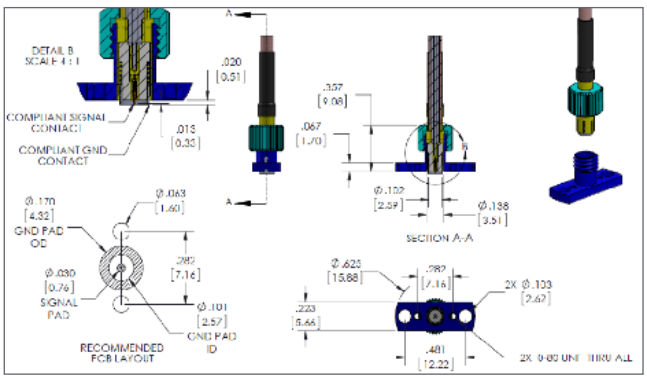
Differential insertion loss of CoreHC interconnect using .079" coax cable

TYPICAL APPLICATION: SMALL FOOTPRINT & DENSE CONFIGURATION

Footprint Examples for Vertical & Edge Launch Assemblies



Single-Channel CoreHC-Based Secure Interconnect Solution



CoreHC™ Ganged Interconnect System

SPECIFICATIONS & PERFORMANCE

Minimizing crosstalk in high-density and extremely small board designs is important. With low crosstalk at high frequencies, excellent signal integrity can be assured with maximum layout flexibility and the 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:

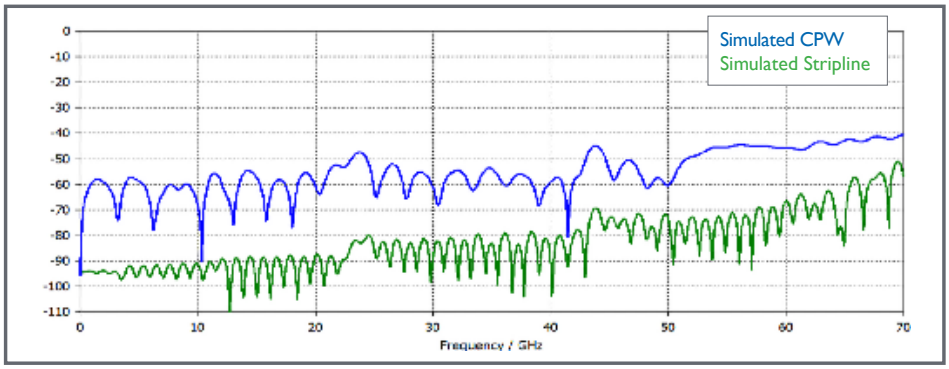


Fig. 1: Comparing near-end crosstalk for CoreHC interconnect in strip line and CPW designs

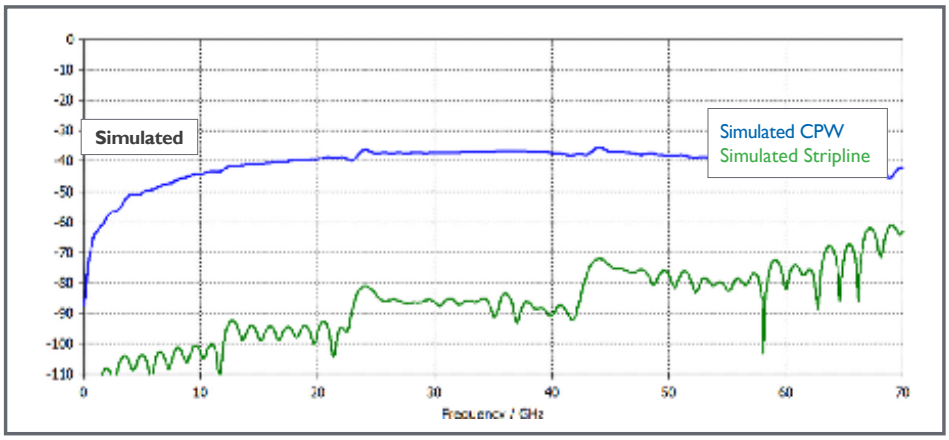


Fig. 2: Comparing far-end crosstalk for CoreHC interconnect in strip line and CPW designs

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

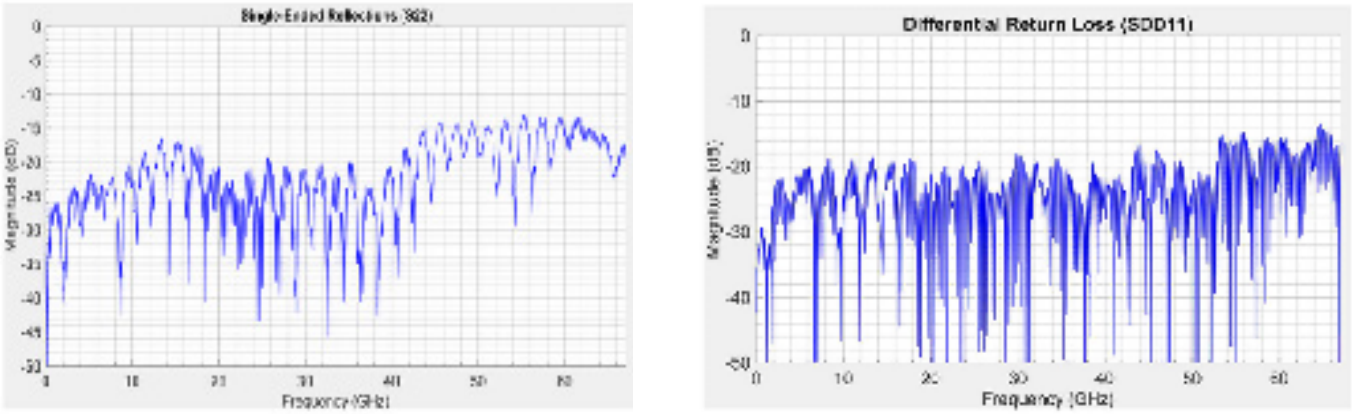


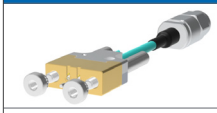
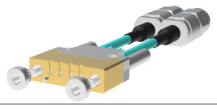
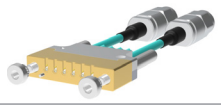
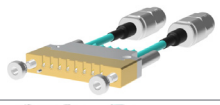
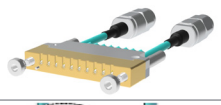
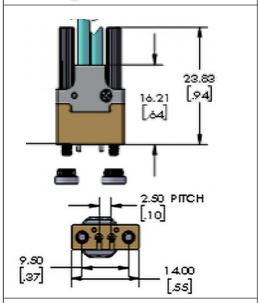
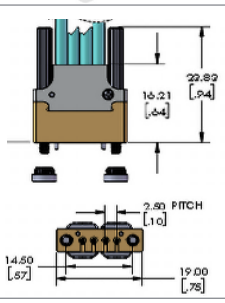
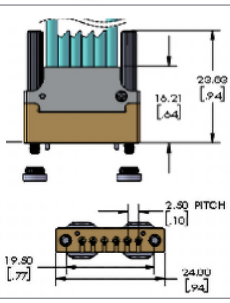
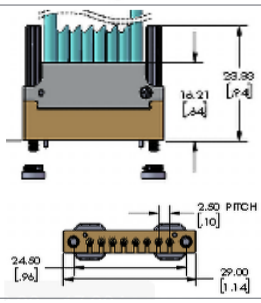
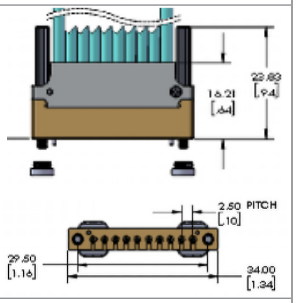
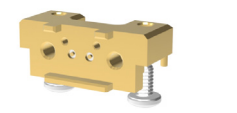
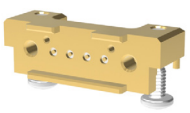
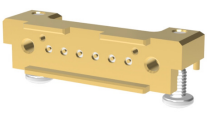
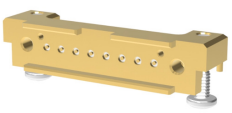
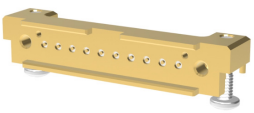
Fig. 3: Comparison of single-ended & differential return losses for the CoreHC assembly

CoreHC™ Ganged Interconnect System

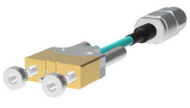
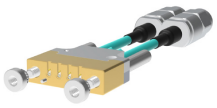
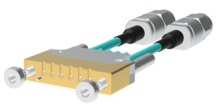
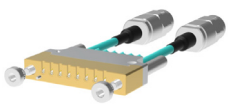
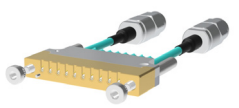
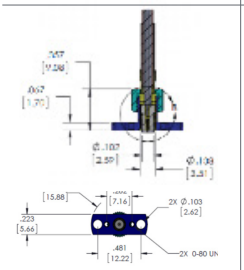
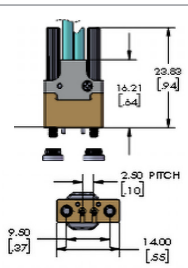
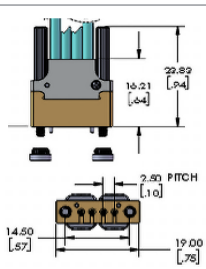
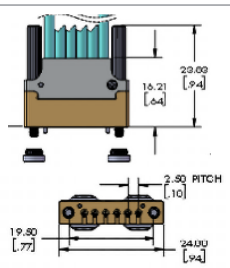
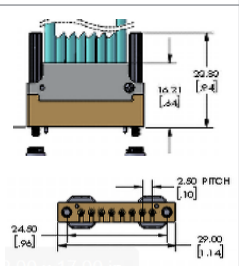
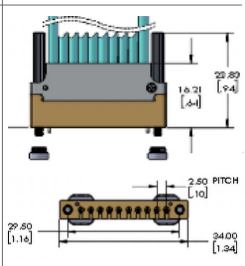
GANGED RF HIGH-DENSITY INTERCONNECTS

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

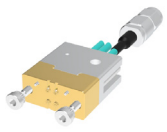
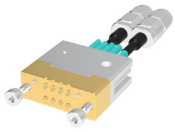
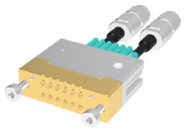
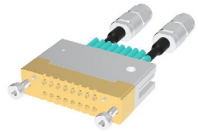
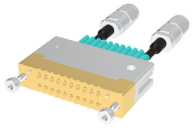
EDGE LAUNCH

2 Channel	4 Channel	6 Channel	8 Channel	10 Channel
				
				
				

VERTICAL MOUNT

1 Channel	2 Channel	4 Channel	6 Channel	8 Channel	10 Channel
					
					

(DUAL ROW)

4 Channel	8 Channel	12 Channel	16 Channel	20 Channel
					

RIGHT-ANGLE MOUNT

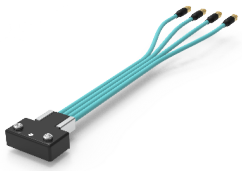
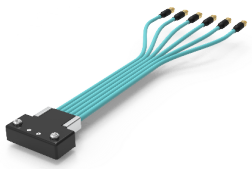
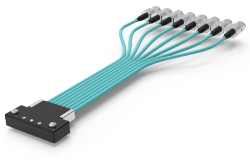
2 Channel	4 Channel	6 Channel	8 Channel
			

Fig. 4: Configurations and outlines of CoreHC interconnect

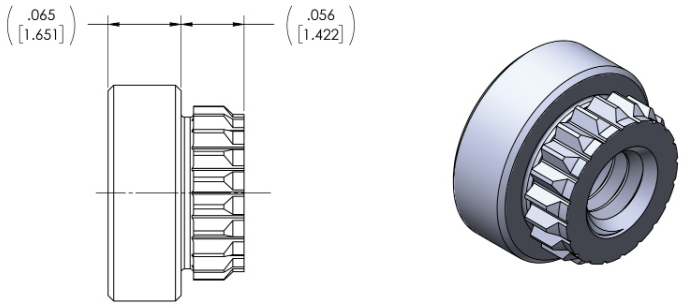
CoreHC™ Ganged Interconnect System

MOUNTING COREHC INTERCONNECT ASSEMBLY

PEM nuts need to be installed on the back of the PCB to mount the CoreHC interconnect cable assembly firmly in place. We offer six types of PEM nuts in both unplated/machined and plated finishes for different board thickness profiles as follows:

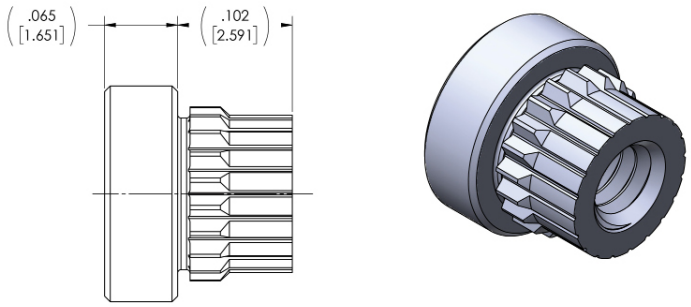
-2 CONFIGURATION

Recommended for Board Thickness Profile: 0.062" (1.57 mm)



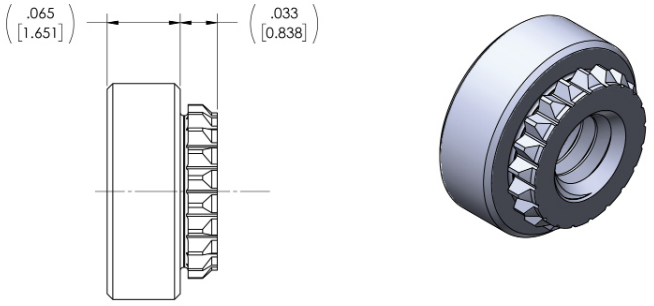
-4 CONFIGURATION

Recommended for Board Thickness Profile: 0.125" (3.18 mm)



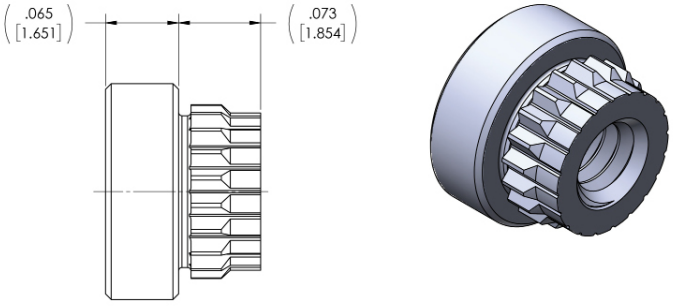
-6 CONFIGURATION

Recommended for Board Thickness Profile: 0.0394" (1.00 mm)



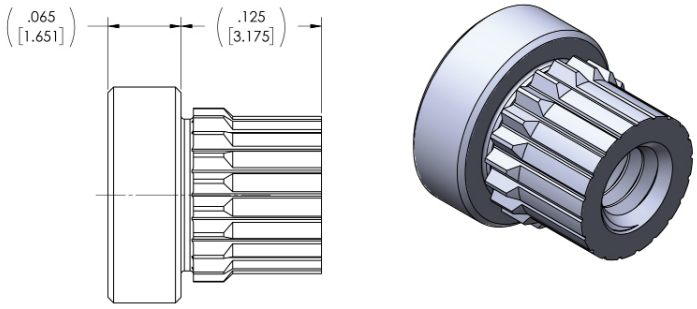
-8 CONFIGURATION

Recommended for Board Thickness Profile: 0.093" (2.36 mm)



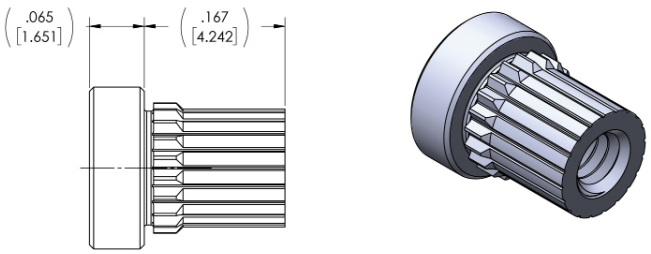
-10 CONFIGURATION

Recommended for Board Thickness Profile: 0.15" (3.81 mm)



-12 CONFIGURATION

Recommended for Board Thickness Profile: 0.197" (5.00 mm)



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