



NITRO[®]
WAVE
C A B L E

PRODUCT
OVERVIEW



©2026 Samtec Inc.

DC TO
130
GHz

448
Gbps



HIGH-PERFORMANCE MICROWAVE CABLE ASSEMBLIES | PHASE & AMPLITUDE STABLE

Samtec's next generation RF coaxial cable improves stability with flexure - recognizable by the **distinctive Samtec orange** outer jacket. During product development, frequency capability was purposefully designed to go beyond traditional industry targets in support of advancing applications and spectrum allocations.

18 GHz, 32 GHz, 43.5 GHz, 71 GHz, 95 GHz, 110 GHz, 130 GHz

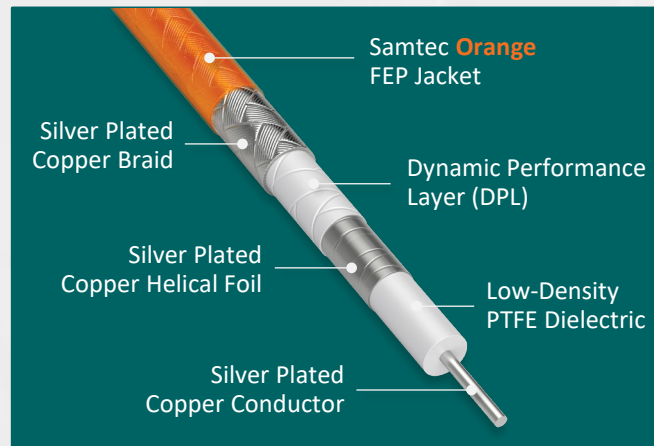
DC TO	448 G b p s
130 GHz	



Nitrowave[®] Cable Technology

- **Rugged, Lightweight Construction**

- Dynamic Performance Layer
- Consistent contact resistance between layers
- Lower density dielectric minimizes loss
- State-of-the-art shielding techniques
- Silver plating enhancements mitigate corrosion potential
- Mechanical and environmental robustness
- Electrical performance optimized at next gen frequencies (GHz): 130, 110, 95, 71, 43.5, 32, 18
- Phase vs. Bending = $< 0.2^\circ \times F(\text{GHz})$
- Armored versions available

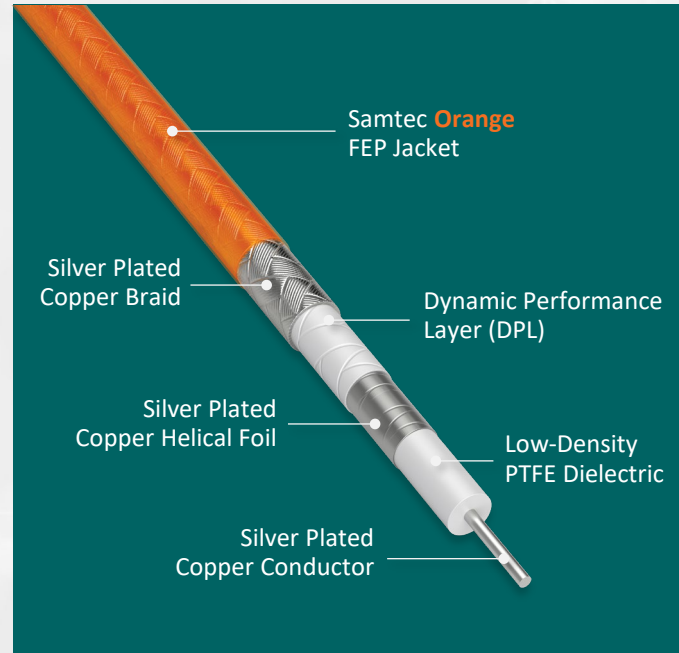


"We challenged every assumption about what makes great cable and did not rest until we optimized every element. We invested in new technologies, and new materials, allowing for better process controls and ultimately better overall performance and stability."

- Microwave Cable Engineering Manager, Samtec

- **Dynamic Performance Layer**

- Prevents damage during flexing
- Improves structural integrity, strengthening the cable during movement (phase and amplitude)
- Increases flex cycle life
- Accurate, dependable performance throughout the service life of the cable, even when subjected to consistent movement and bending



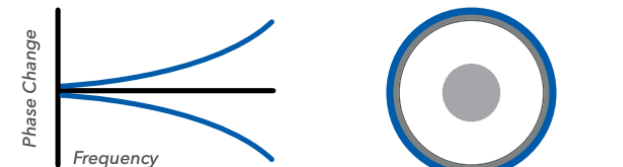
DYNAMIC PERFORMANCE LAYER IMPROVES STABILITY

The addition of a DPL improves stability resulting in more accurate, dependable performance.



Good Stability vs Flexure

With DPL



Poor Stability vs Flexure

Without DPL

"We challenged every assumption about what makes great cable and did not rest until we optimized every element. We invested in new technologies, and new materials, allowing for better process controls and ultimately better overall performance and stability."

- Microwave Cable Engineering Manager, Samtec

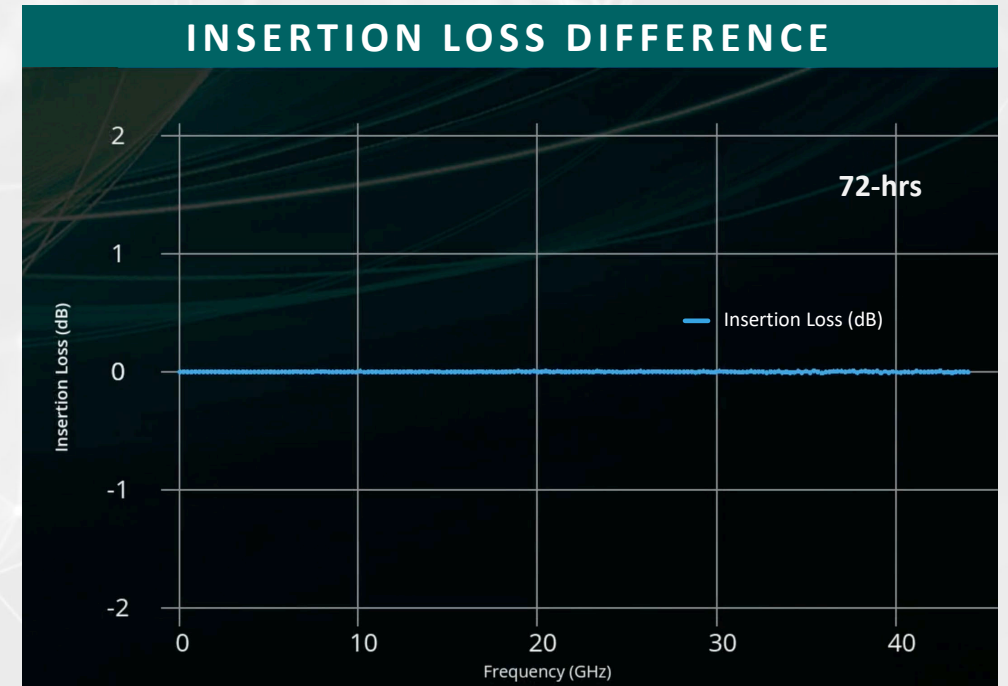
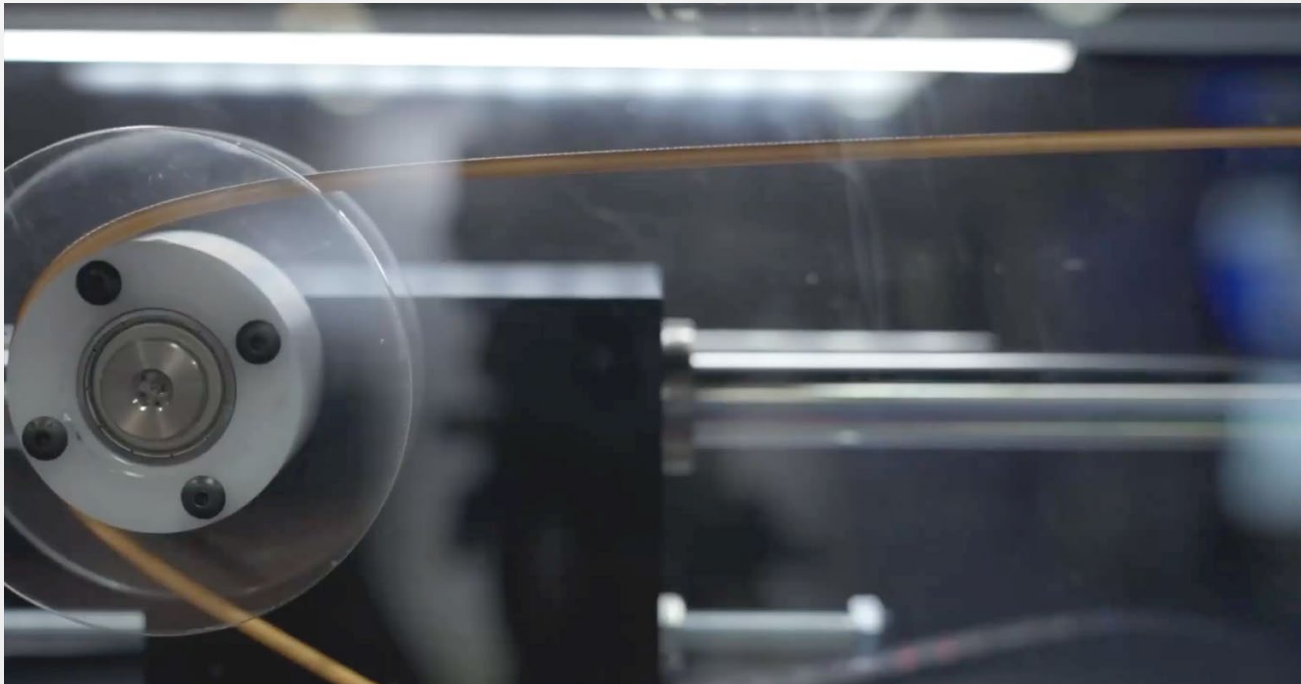
Unmatched Phase & Amplitude Stability

- **Over Flexure**

- Highly accurate, repeatable results
- Reduces downtime



[WATCH THE DEMONSTRATION](#)



Longer Cable Flex Life

Nitrowave[®] cable is specifically designed for applications where cables are bent and repositioned frequently; enabled by the Dynamic Performance Layer.

- Small bend radius
- Can be fixed in an S-shape
- S-shape helps reduce spring-back stress on the cable and test fixture preventing measurement errors
- Can continually move, swing cable under tight bending conditions: Amplitude variation kept within ± 0.1 dB

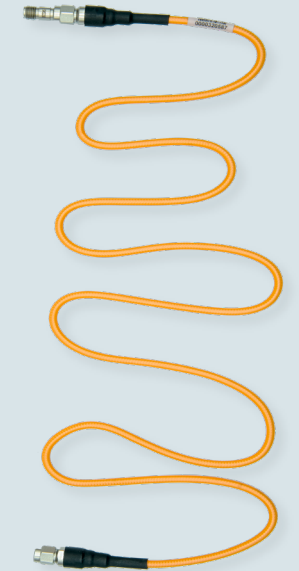
FLEX LIFE

CYCLES

Unrestrained (Snake)	400,000
S-Bend	22,500
Tic-Toc	7,000

TORQUE LIFE

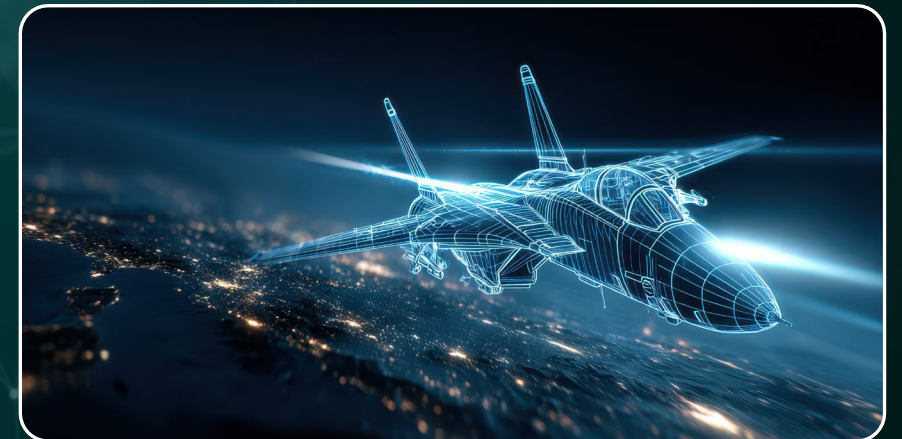
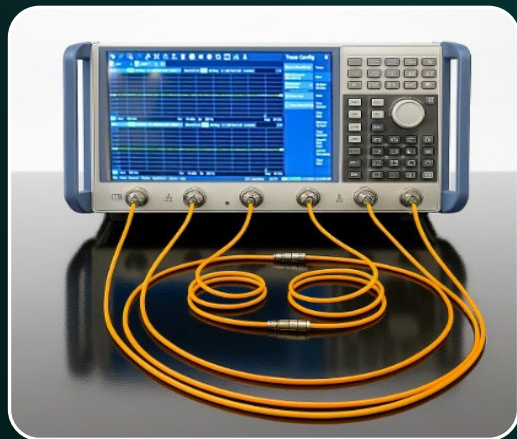
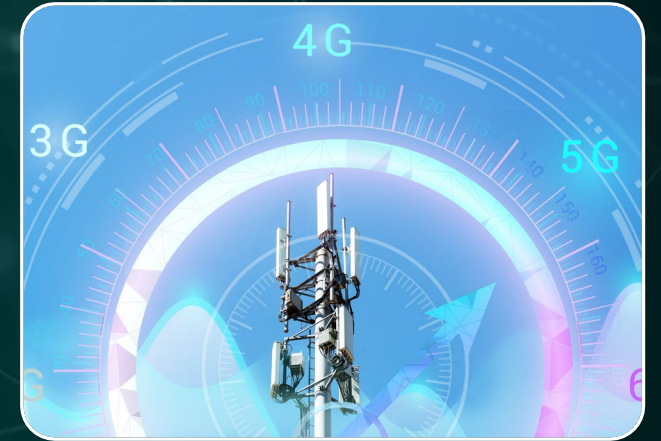
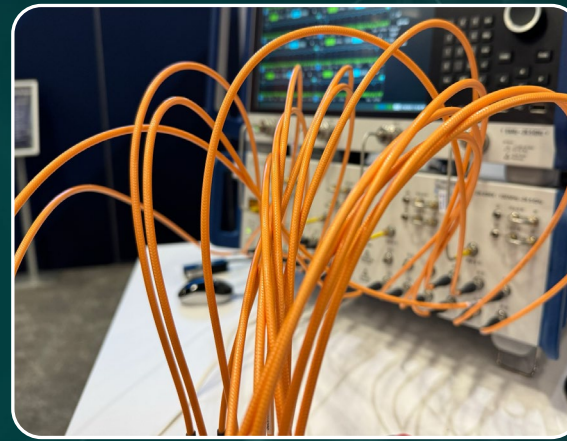
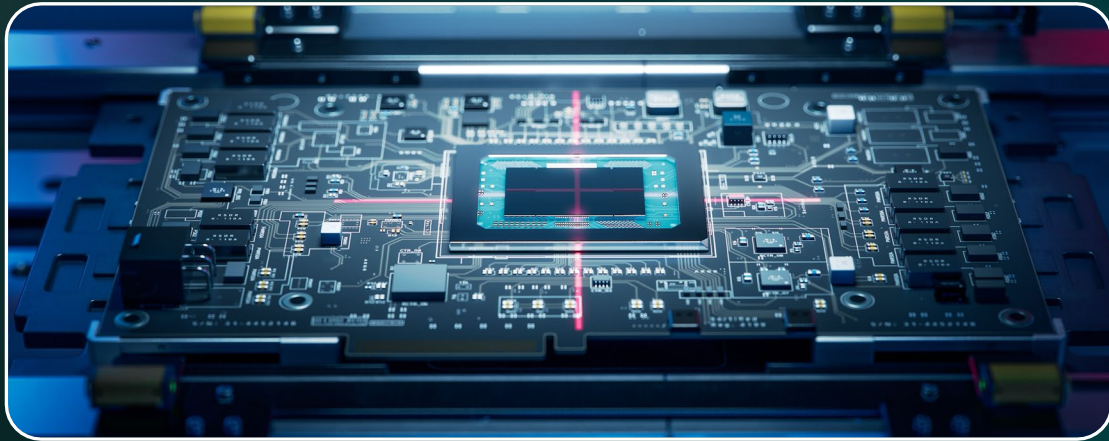
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**LL043 data shown. Reference Product Spec Sheets for details by Series.*

Applications

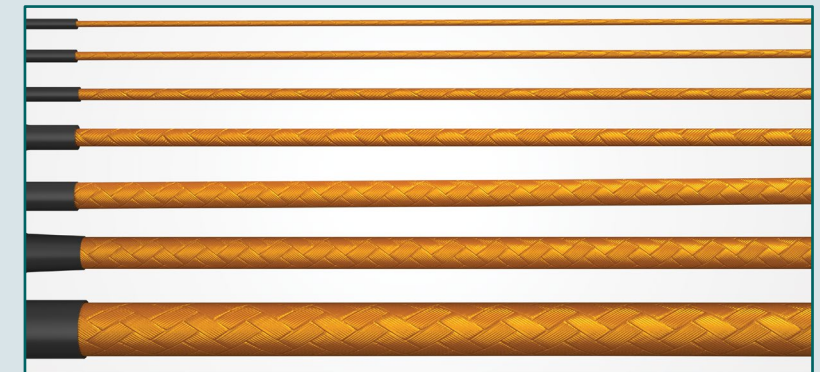
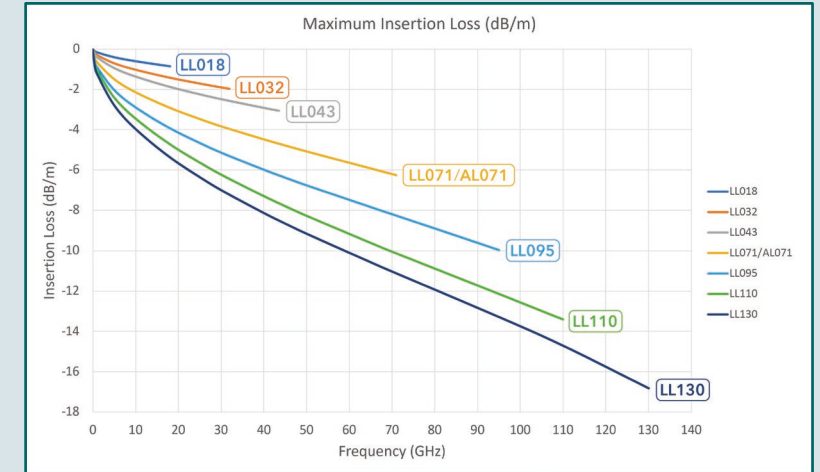
Computer & Semiconductor | Datacom | Instrumentation | Military & Aerospace | Test and Measurement



Cable Assembly Selector

Series	LL018	LL032	LL043	LL071	AL071 (armored)	LL095	LL110	LL130
Impedance (Ω)	50							
Max Frequency (GHz)	18	32	43.5	71		95	110	130
Outer Dia. (inches)	0.309	0.182	0.141	0.094	0.207	0.076	0.068	0.060
Min Static Bend Radius (inches)	1.25	0.375	0.25	0.125	0.625	0.156	0.125	0.125
Velocity of Propagation (%)	77							
Min Shielding Effectiveness (dB)	-90							
Temp Range ($^{\circ}\text{C}$)	-65 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$							
Insertion Loss	See Maximum IL Chart							
Phase Stability with Flexure (+/- $^{\circ}$)*	In Development	10.0	5.0	5.0		10.0	12.5	In Development
Amplitude Stability with Flexure (+/-dB)*	In Development	0.10						In Development
End 1 / End 2	1.00 mm, 1.35 mm, 1.85 mm, 2.40 mm, 2.92 mm, SMPM, SMP, SMA, N Type, TNCA							

*Values are representative. Reference test data for details. Test method: 4.5 in dia. mandrel, 90 $^{\circ}$ bend, 3 ft. cable.



Microwave Cable Assemblies

Mix & Match RF Cable Assembly Flexibility

Samtec offers a variety of end options for each product series. This blends application-specific customization with the simplicity and lead-time efficiencies of an off-the-shelf assembly.

Quickly and easily build RF cable assemblies using Samtec's innovative online RF Cable Solutionator[®]. Choose a connector and cable type and create a final part number in under a minute. Results include product specifications, pricing and availability, models and prints.

Solutionator[®] **RF**
DESIGN IN A MINUTE[®] CABLE
samtec.com/rf-cablebuilder



**Cable + connector determine overall frequency capability*

LL018 Series, DC to 18 GHz (In-Development)

- 50 Ohm impedance
- Max frequency: **18 GHz**
- Outer Diameter: **0.309"**
- Minimum static bend radius: **1.25"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)



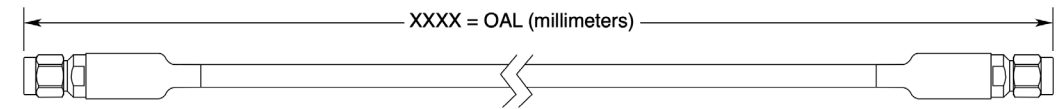
XXXX = OAL (millimeters)

SHOWN: LL018-01SP-01SP-XXXX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-01SP	SMA	PLUG	22.51	1.162	DC TO 18 GHz

LL032 Series, DC to 32 GHz

- 50 Ohm impedance
- Max frequency: **32 GHz**
- Outer diameter: **0.182"**
- Minimum static bend radius: **0.375"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)

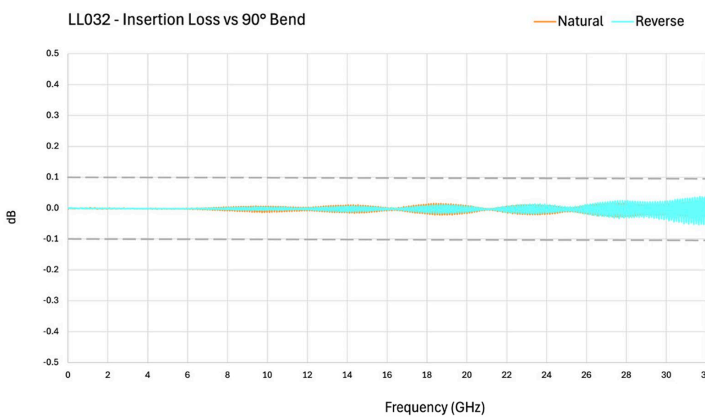
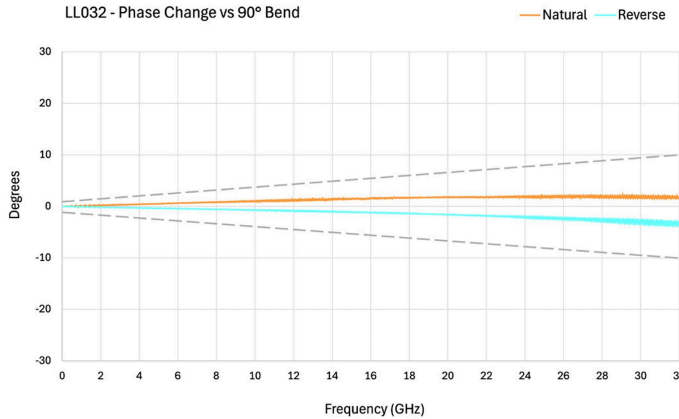


SHOWN: LL032-92SP-92SP-XXXX-X-XX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-92SP	2.92 mm	PLUG	22.51	1.162	DC TO 32 GHz

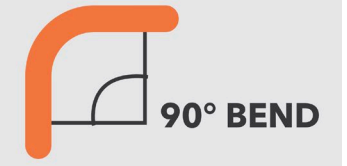
LL032 Series, DC to 32 GHz

CABLE STABILITY



TEST METHOD:

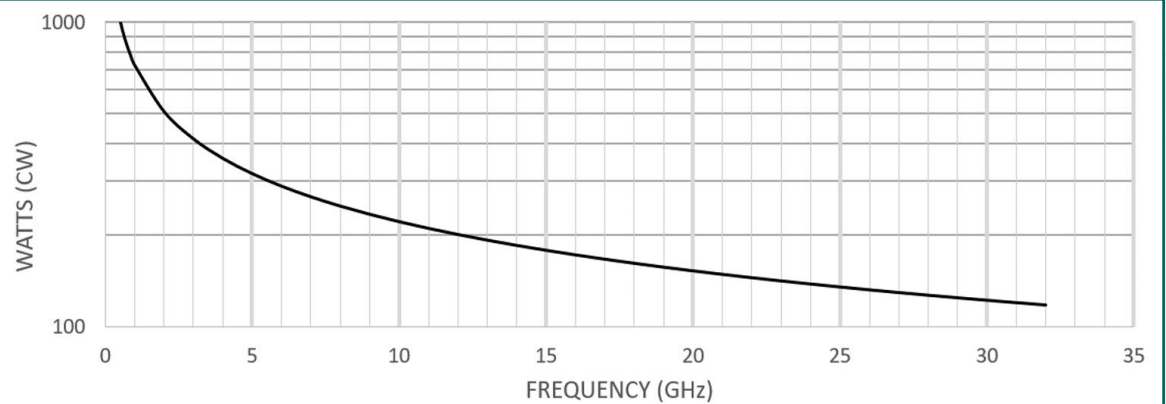
4.5 in diameter mandrel
3 ft (0.914 m) cable length



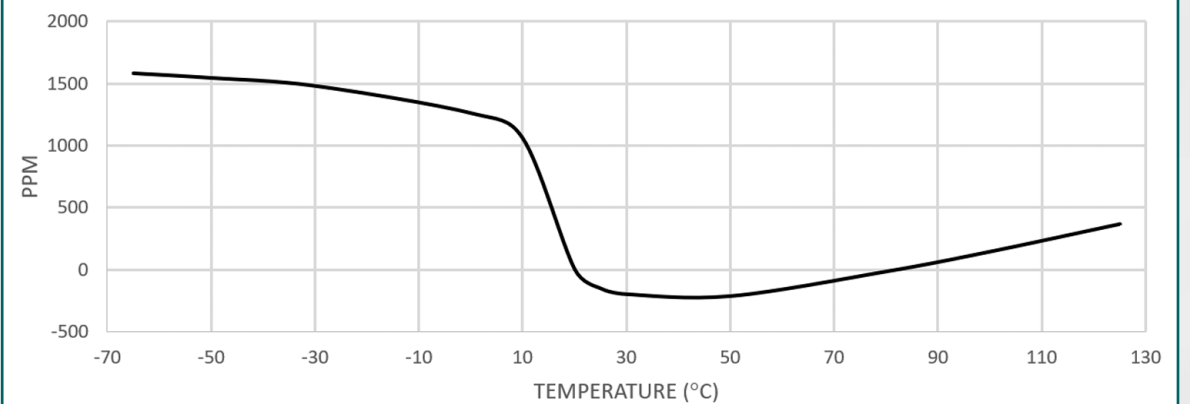
Natural: Inherent, typical curvature

Reverse: Forcing the cable to bend opposite of its natural curvature

TYPICAL POWER HANDLING @ T=25°C, SEA LEVEL¹⁰



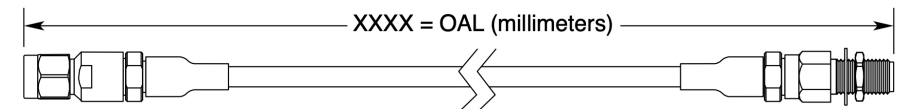
TYPICAL PHASE VS. TEMPERATURE



*Power Handling should be further derated for higher altitudes and temperatures

LL043 Series, DC to 43.5 GHz

- 50 Ohm impedance
- Max frequency: **43.5 GHz**
- Outer diameter: **0.141"**
- Minimum static bend radius: **0.25"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)

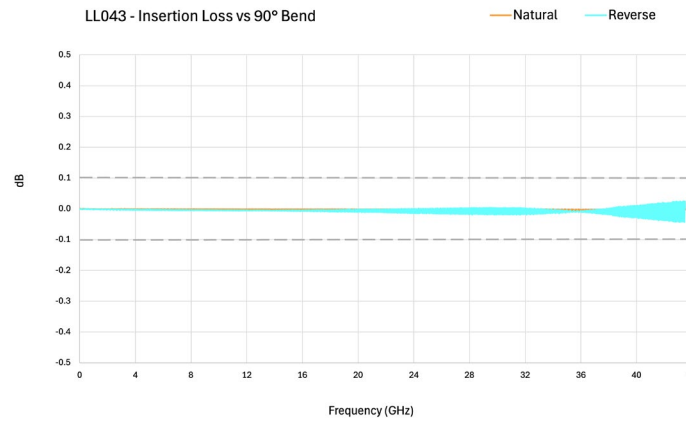
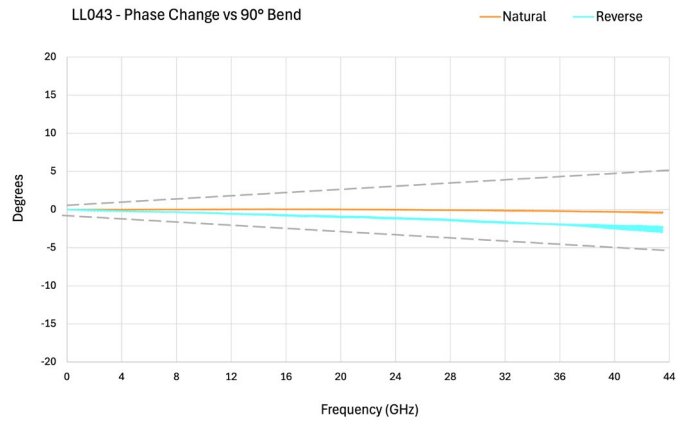


SHOWN: LL043-92SP-92BJ-XXXX-X-XX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-92SP	2.92 mm	PLUG	21.53	1.183	DC TO 43.5 GHz
-92BJ	2.92 mm	BULKHEAD JACK	21.53	1.183	
-24SP	2.40 mm	PLUG	21.53	1.183	DC TO 43.5 GHz
-24BJ	2.40 mm	BULKHEAD JACK	21.53	1.183	
-01SP	SMA	PLUG	22.51	1.162	DC TO 26.5 GHz
-01BJ	SMA	BULKHEAD JACK	22.51	1.162	

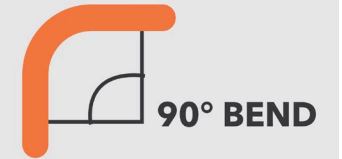
LL043 Series, DC to 43.5 GHz

CABLE STABILITY



TEST METHOD:

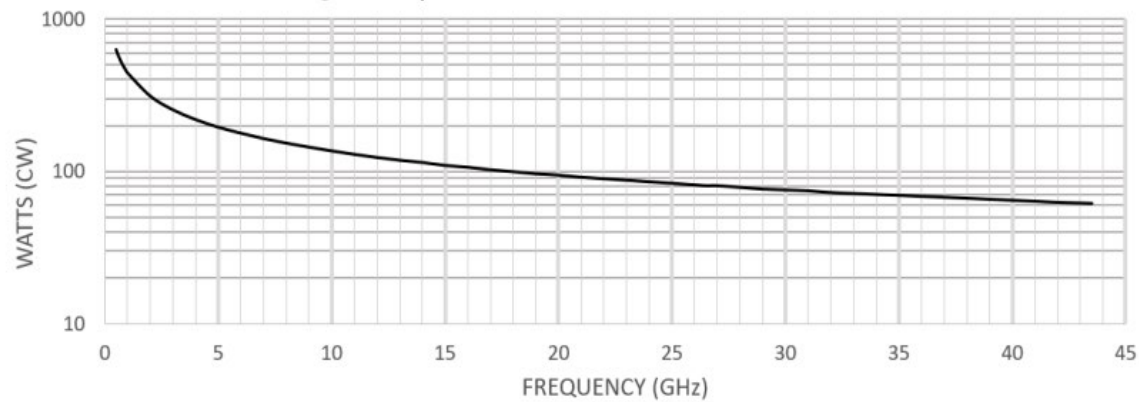
4.5 in diameter mandrel
3 ft (0.914 m) cable length



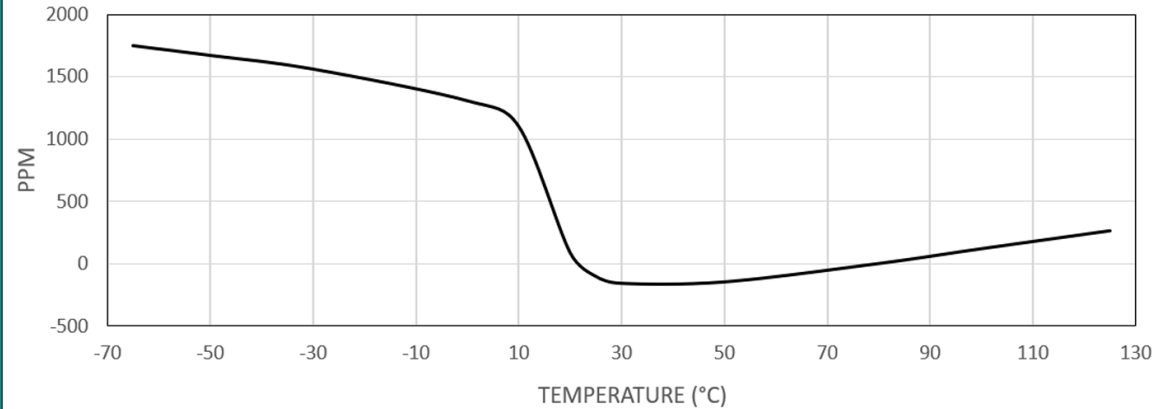
Natural: Inherent, typical curvature

Reverse: Forcing the cable to bend opposite of its natural curvature

TYPICAL POWER HANDLING @ T=25°C, SEA LEVEL¹⁰



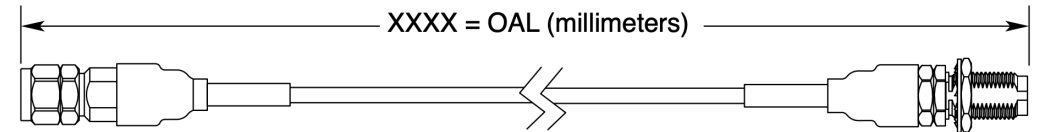
TYPICAL PHASE VS. TEMPERATURE



*Power Handling should be further derated for higher altitudes and temperatures

LL071 Series, DC to 71 GHz

- 50 Ohm impedance
- Max frequency: **71 GHz**
- Outer diameter: **0.094"**
- Minimum static bend radius: **0.125"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)

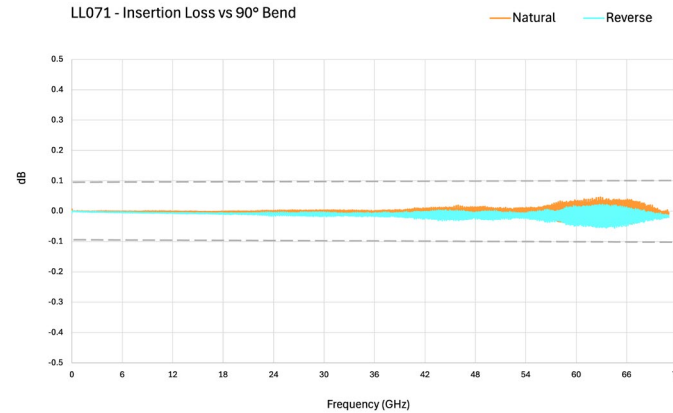
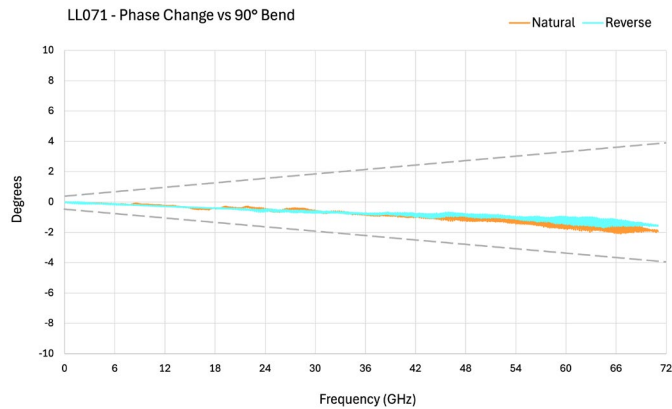


SHOWN: LL071-18SP-18BJ-XXXX-X-XX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-18SP	1.85 mm	PLUG	21.53	1.183	DC TO 71 GHz
-18BJ	1.85 mm	BULKHEAD JACK	21.53	1.183	DC TO 71 GHz
-92SP	2.92 mm	PLUG	21.53	1.183	DC TO 43.5 GHz

LL071 Series, DC to 71 GHz

CABLE STABILITY



TEST METHOD:

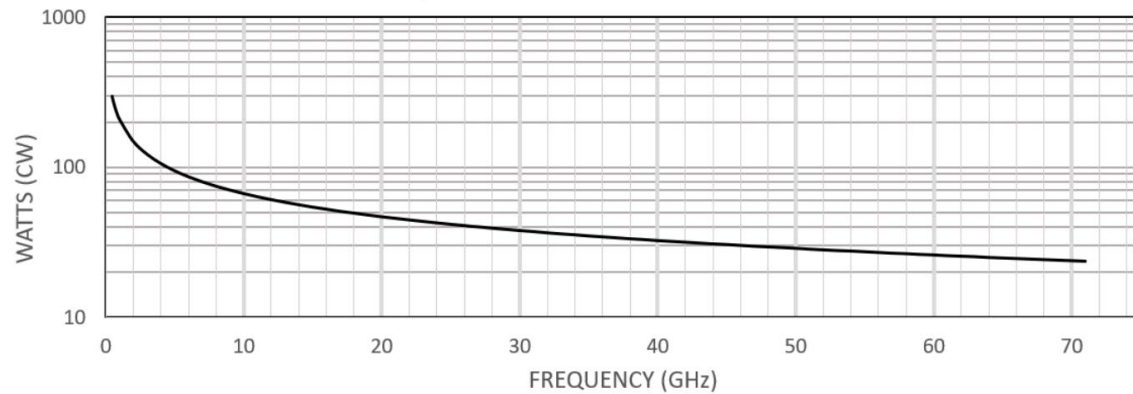
4.5 in diameter mandrel
3 ft (0.914 m) cable length



Natural: Inherent, typical curvature

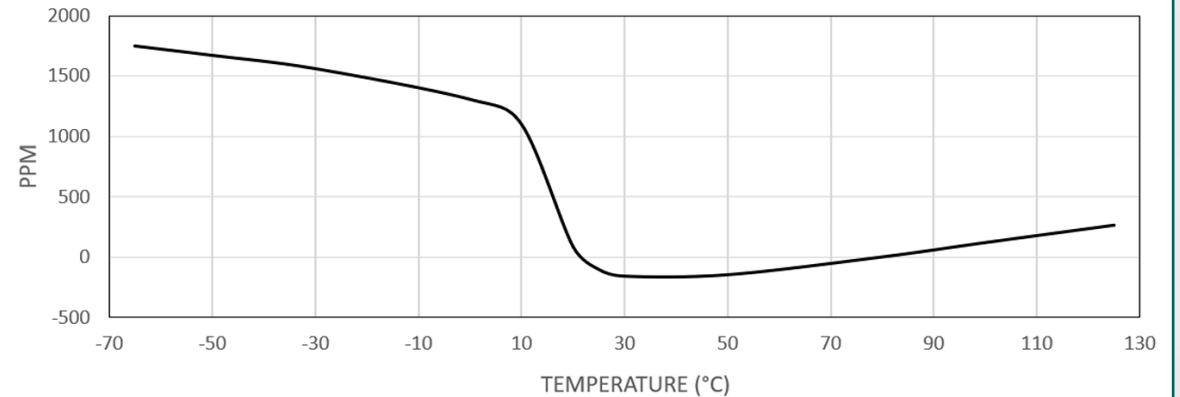
Reverse: Forcing the cable to bend opposite of its natural curvature

TYPICAL POWER HANDLING @ T=25°C, SEA LEVEL¹⁰



*Power Handling should be further derated for higher altitudes and temperatures

TYPICAL PHASE VS. TEMPERATURE



Armored Cables

- Crush, abrasion, kink, and torque resistant
- Enhanced tensile strength
- **Series:** AL071, DC to 71 GHz with 1.85 mm end options
- Outer diameter: 0.207"
- Minimum static bend radius: 0.625"
- More in development, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)

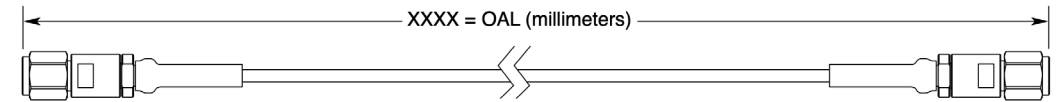
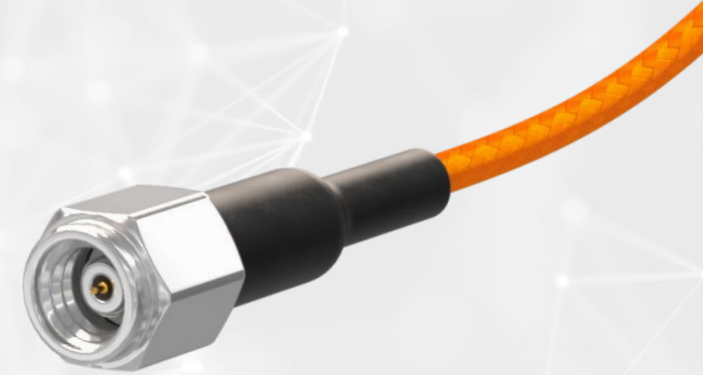
Armoring
over LL071
(AL071 Series)

LL071



LL095 Series, DC to 95 GHz

- 50 Ohm impedance
- Max frequency: **95 GHz**
- Outer diameter: **0.076"**
- Minimum static bend radius: **0.156"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)

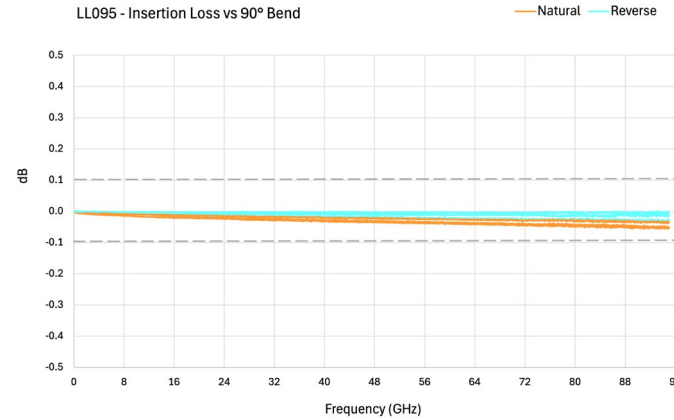
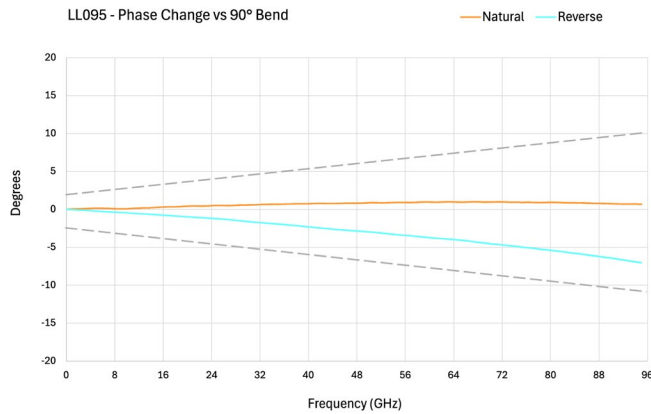


SHOWN: LL095-10SP-10SP-XXXX-X-XX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-10SP	1.00 mm	PLUG	19.90	1.225	DC TO 95 GHz
-M0SJ	SMPM	JACK	19.90	1.225	DC TO 65 GHz

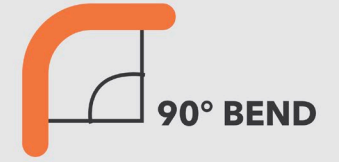
LL095 Series, DC to 95 GHz

CABLE STABILITY



TEST METHOD:

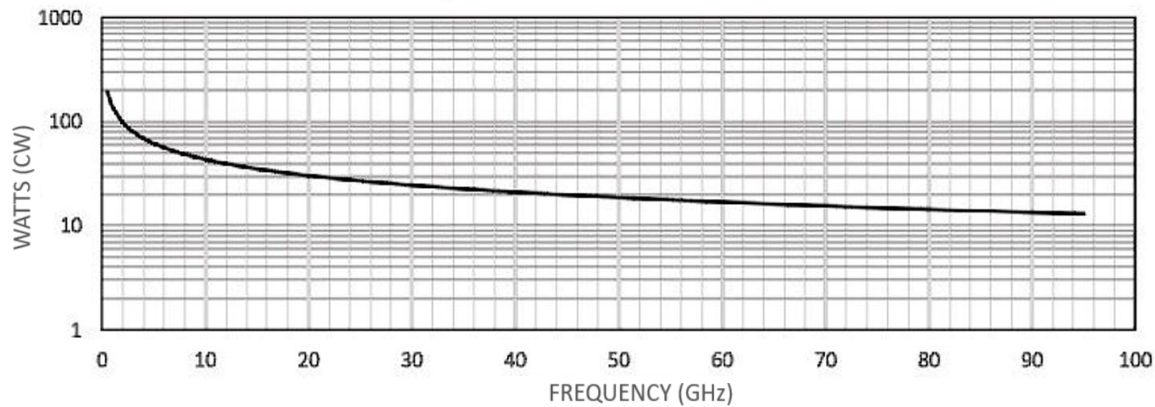
4.5 in diameter mandrel
3 ft (0.914 m) cable length



Natural: Inherent, typical curvature

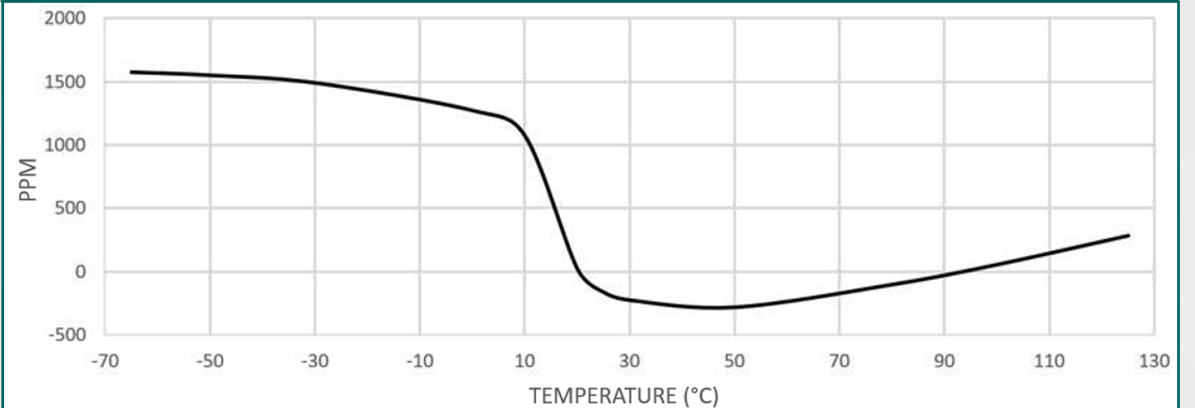
Reverse: Forcing the cable to bend opposite of its natural curvature

TYPICAL POWER HANDLING @ T=25°C, SEA LEVEL¹⁰



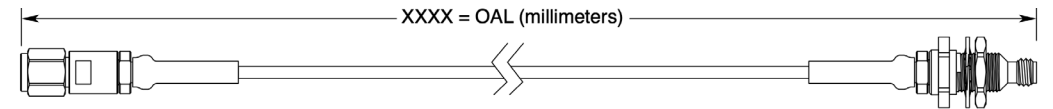
*Power Handling should be further derated for higher altitudes and temperatures

TYPICAL PHASE VS. TEMPERATURE @ 5GHz



LL110 Series, DC to 110 GHz

- 50 Ohm impedance
- Max frequency: **110 GHz**
- Outer diameter: **0.068"**
- Minimum static bend radius: **0.125"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)

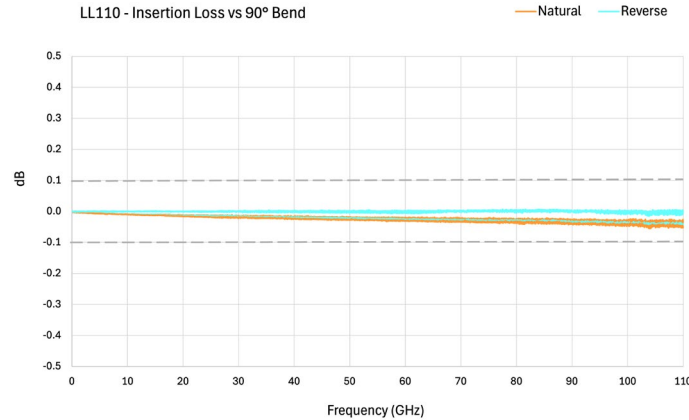
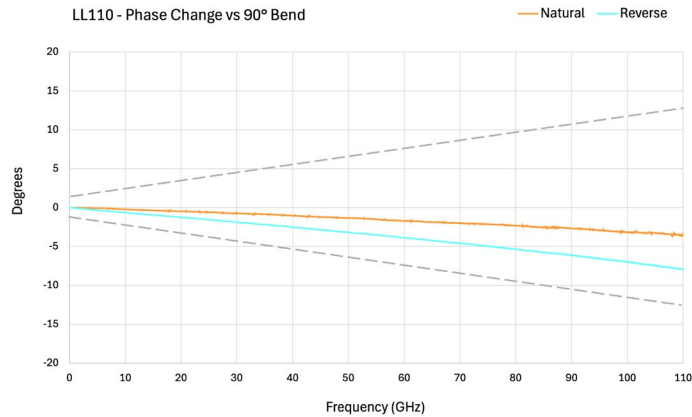


SHOWN: LL110-10SP-10BJ-XXXX-X-XX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-10SP	1.00 mm	PLUG	19.90	1.225	<div style="border: 1px solid black; padding: 2px; text-align: center;"> DC TO 110 GHz </div>
-10BJ	1.00 mm	BULKHEAD JACK	19.90	1.225	

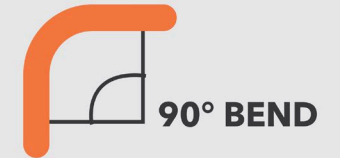
LL110 Series, DC to 110 GHz

CABLE STABILITY



TEST METHOD:

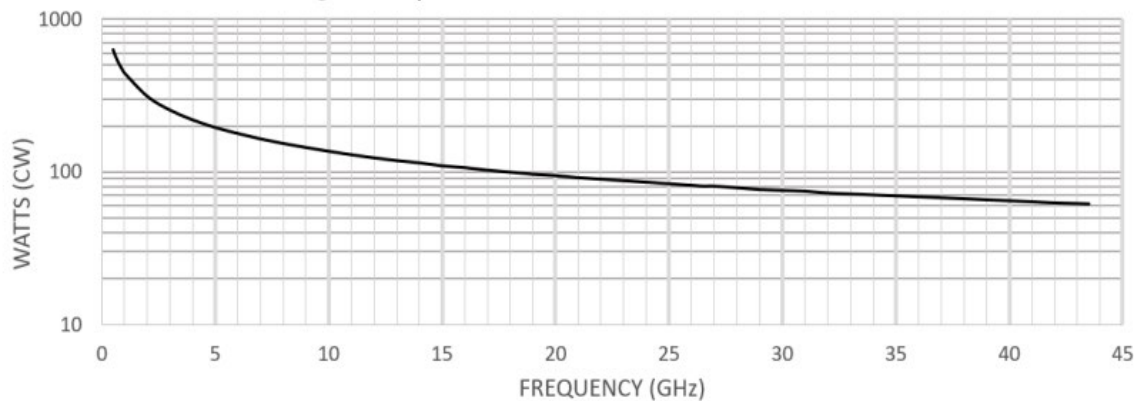
4.5 in diameter mandrel
3 ft (0.914 m) cable length



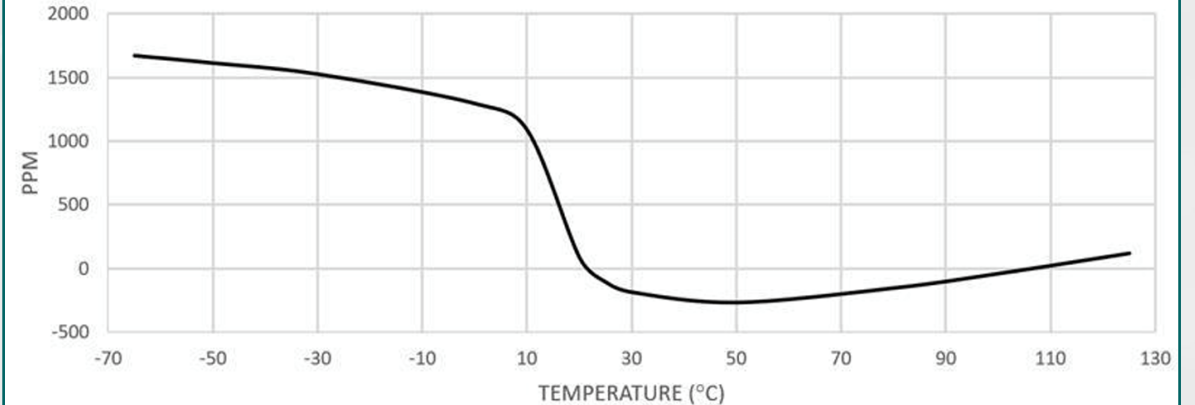
Natural: Inherent, typical curvature

Reverse: Forcing the cable to bend opposite of its natural curvature

TYPICAL POWER HANDLING @ T=25°C, SEA LEVEL¹⁰



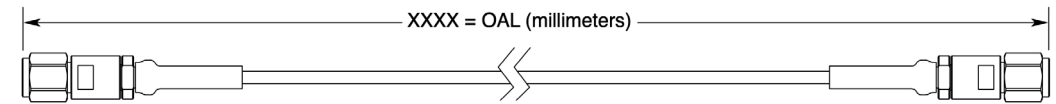
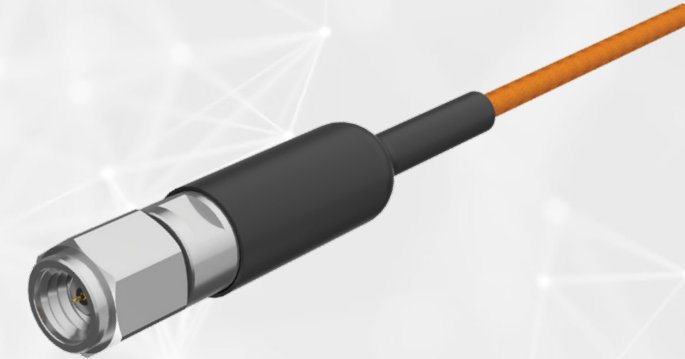
TYPICAL PHASE VS. TEMPERATURE @ 5GHz



*Power Handling should be further derated for higher altitudes and temperatures

LL130 Series, DC to 130 GHz (In-Development)

- 50 Ohm impedance
- Max frequency: **130 GHz**
- Outer diameter: **0.060"**
- Minimum static bend radius: **0.125"**
- Velocity of propagation: **77%**
- Minimum shielding effectiveness: **-90 dB**
- Temperature range: **-65 °C to +125 °C**
- Phase matching option: **1, 2 or 5 ps**
- Cable lengths: **100 mm to 10 m (> 10 m as custom RSP)**
- To learn more, visit: [Samtec.com/Nitrowave](https://www.samtec.com/Nitrowave)



SHOWN: LL130-10SP-10SP-XXXX-X-XX

END OPTION	INTERFACE TYPE	GENDER	MAXIMUM RETURN LOSS (PER END)	MAXIMUM VSWR (PER END)	FREQUENCY
-10SP	1.00 mm	PLUG	19.90	1.225	<div style="border: 1px solid black; padding: 2px; text-align: center;"> DC TO 130 GHz </div>
-10SJ	1.00 mm	JACK	19.90	1.225	

PRECISION RF INTERCONNECT SOLUTIONS

Samtec's RF product line includes 18 to 130 GHz High Frequency, Precision RF solutions for microwave and mmWave applications, including full cable assemblies, cable connectors and board level interconnects.

Our focus is on delivering high-quality RF products that meet precision and performance expectations, along with industry-leading system-level signal integrity expertise.

VERTICAL INTEGRATION
ENABLES
FULL SYSTEM SUPPORT



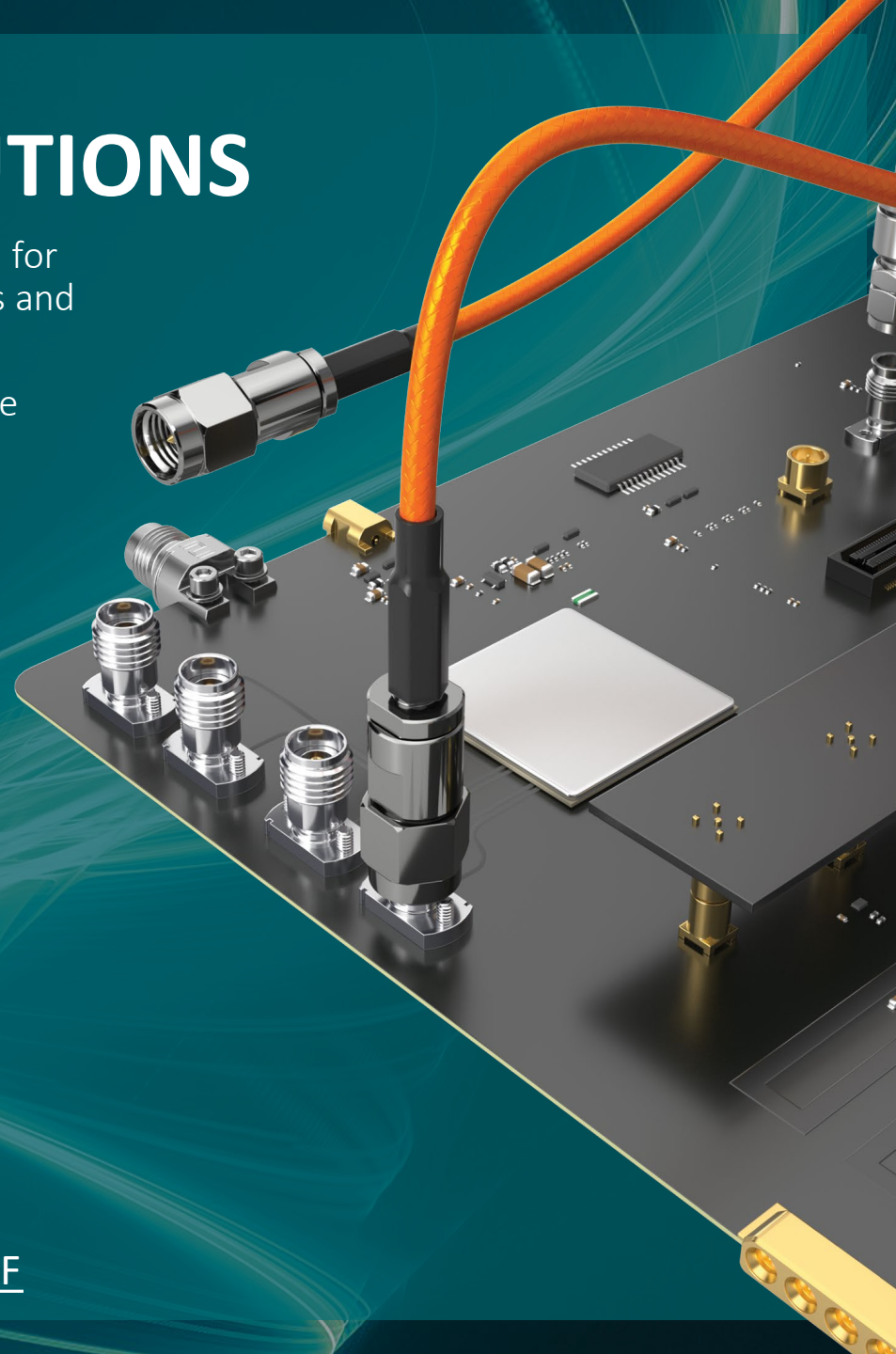
CABLES
Design & Fabrication of Raw Cable
Cable Assemblies

CONNECTORS
Design & Fabrication
Cable Connectors
Board Connectors

TECH SUPPORT
Launch Optimization
Simulation & Testing
Full System Optimization

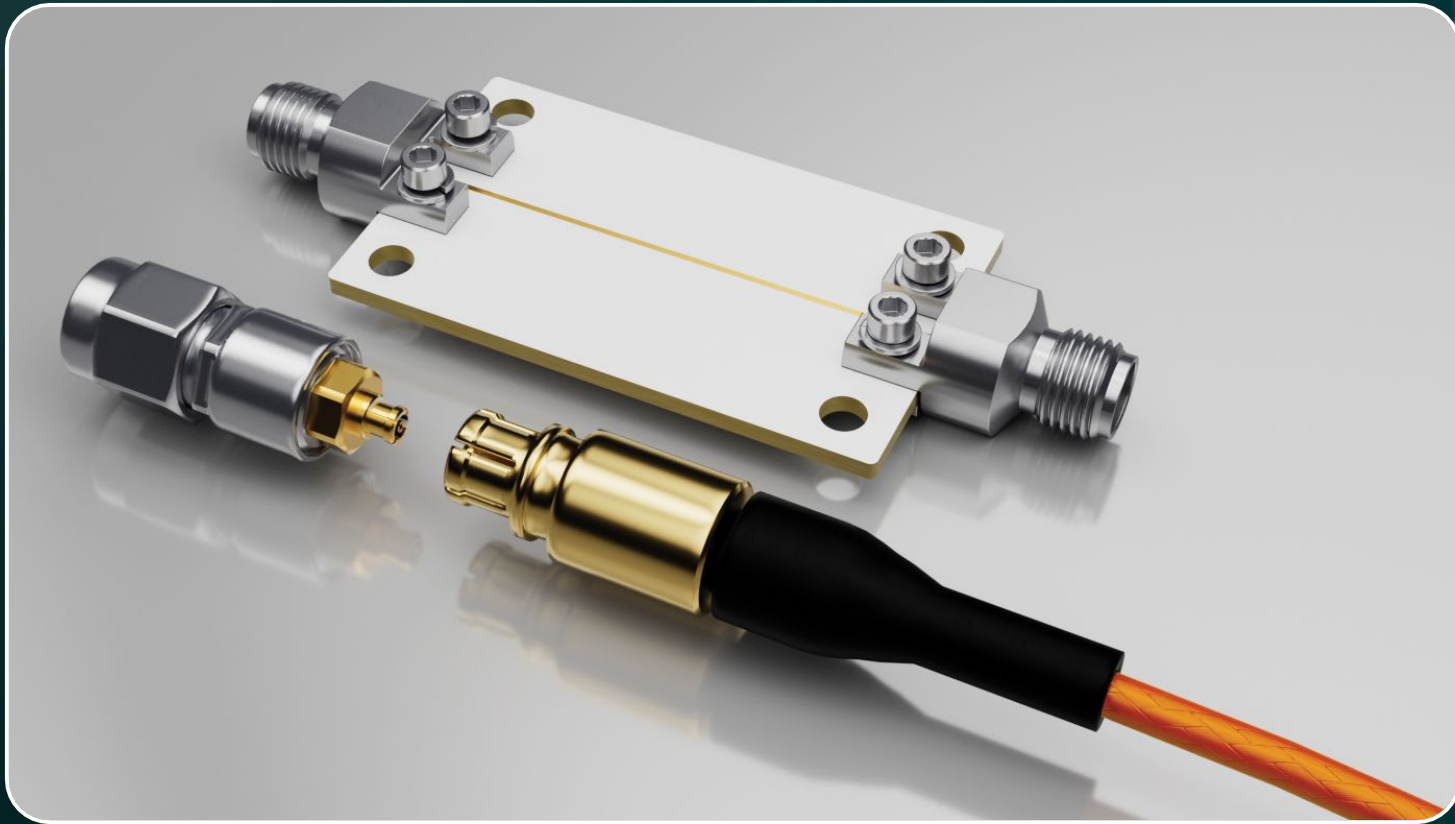


RFGroup@samtec.com | samtec.com/RF





Mating Board Connectors & Adaptors



Precision, High Frequency Test & Measurement
Visit [samtec.com/RF-connectors](https://www.samtec.com/RF-connectors) for more information

High-Performance Test Assemblies



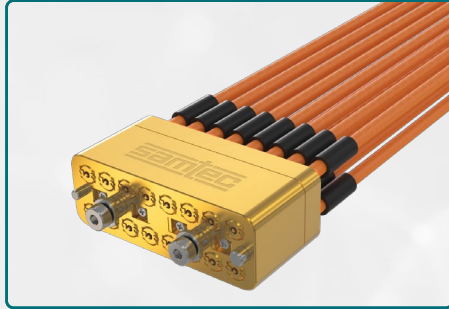
BE40A

- 50 GHz, 56 Gbps PAM4



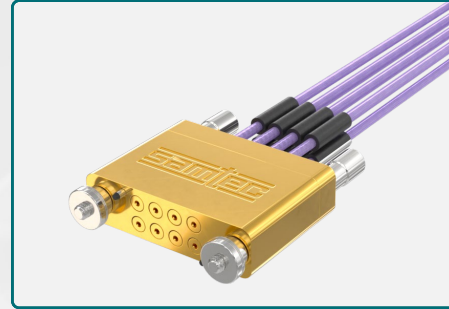
BE70A

- 70 GHz, 112 Gbps PAM4



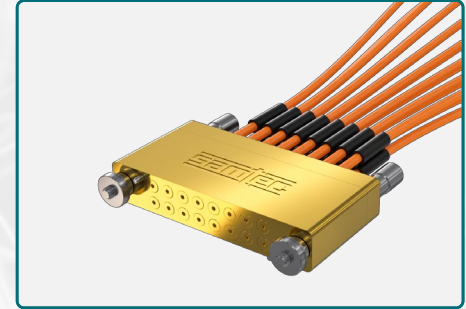
BE71A

- Best phase matching and lowest IL
- Nitrowave[®] cable technology
- 71 GHz, 224 Gbps PAM4



BE90A

- Smallest footprint and highest density
- 90+ GHz, 224 Gbps PAM4/448 Gbps



BE130

- (In Development)
- Next gen test solution
- 130 GHz, 448 Gbps

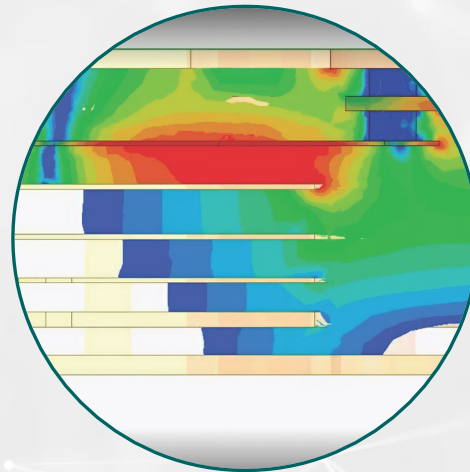
<p>PAM4</p> <p>56 Gbps</p>	<p>PAM4</p> <p>112 Gbps</p>	<p>PAM4</p> <p>224 Gbps</p>	<p>PAM4</p> <p>224 448 Gbps Gbps</p>	<p>448 Gbps</p>
<p>BE40A 50 GHz</p>	<p>BE70A 70 GHz</p>	<p>BE71A 71 GHz</p>	<p>BE90A 90+ GHz</p>	<p>BE130 130 GHz</p>
<p>2.40 mm & 2.92 mm</p>	<p>1.85 mm</p>	<p>1.85 mm + Nitrowave[®]</p>	<p>1.00 mm & 1.35 mm</p>	<p>1.00 mm + Nitrowave[®]</p>

Bulls Eye[®] + Nitrowave[®] Cable Technology

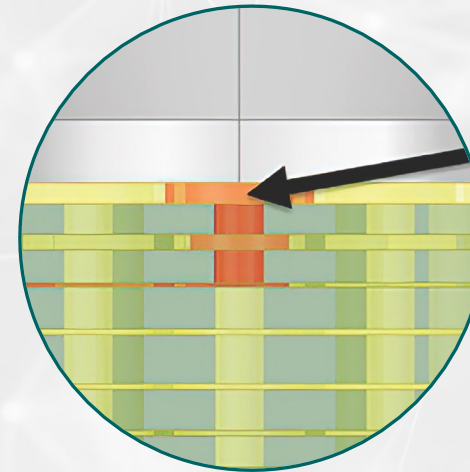
As repeatability and loss margins at millimeter wave frequencies continue to narrow, Bulls Eye[®] products are now incorporating Samtec's proprietary Nitrowave[®] cable technology (recognizable by its distinctive orange color) for improved electrical performance with lower IL and phase matching down to 0.5-picosecond.

- **Signal Integrity & RF Design Expertise & Support**

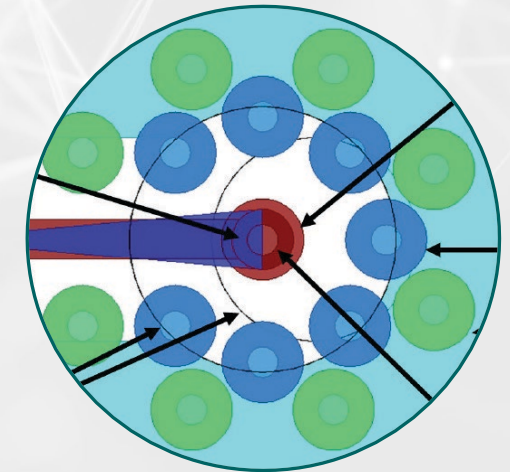
- Launch optimization & design services
- Simulation
- Prototyping
- Physical test and measurement verification
- Full channel analysis, system support
- Application specific design and development assistance
- To learn more, visit samtec.com/rf



**E-field
Simulation**



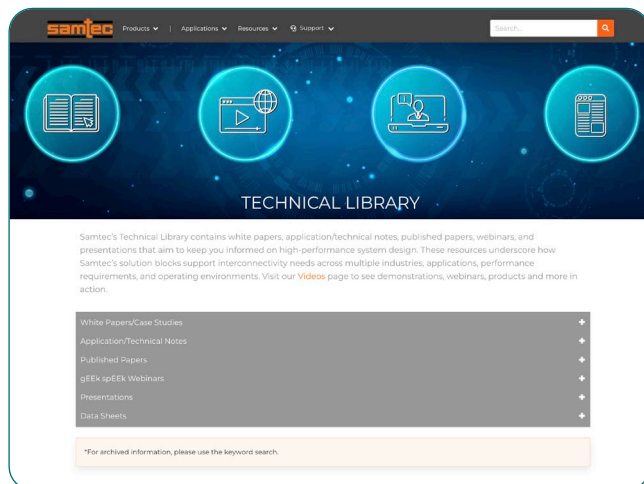
**3D
Modeling**



**Launch
Optimization**

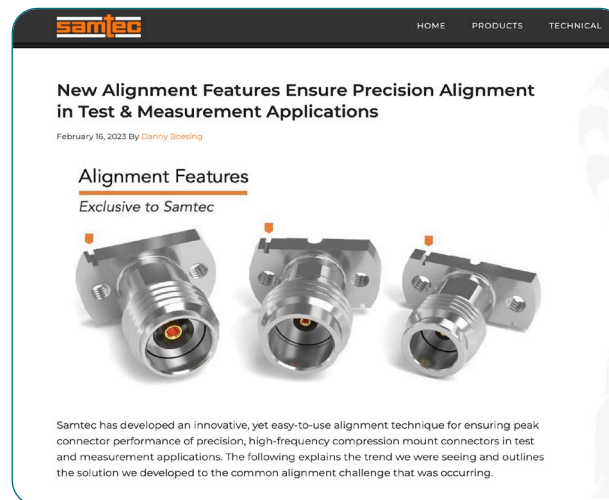
Samtec's Technical Library contains resources that underscore how Samtec supports interconnectivity needs across multiple industries, applications, performance requirements and operating environments.

White Papers



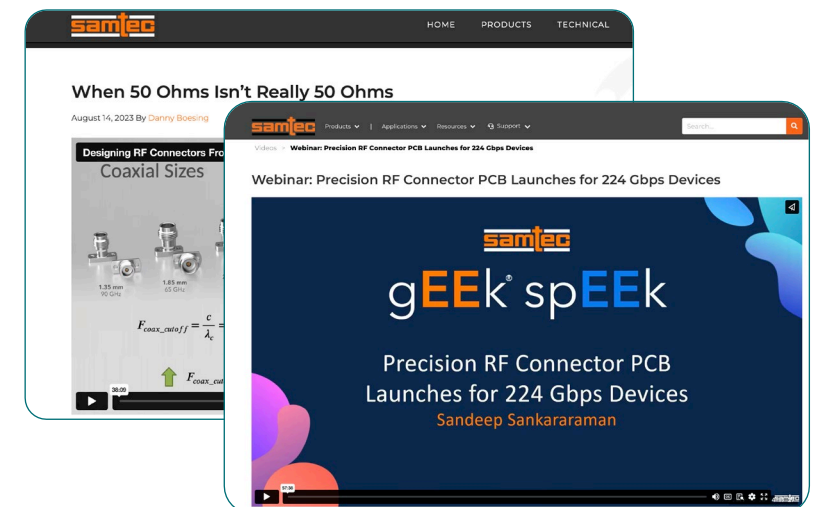
- Wideband RF Launches
- Impacts of Solder Reflow on RF Connectors
- Millimeter Wave Design
- Visit: [samtec.com/tech-library](https://www.samtec.com/tech-library)

Technical Reports



- Precision Alignment in Test and Measurement Applications: [samtec.com/alignment](https://www.samtec.com/alignment)
- Pathway to **448**

Presentations & Webinars



- Understanding Transmission Line Discontinuities: [samtec.com/system-impedance](https://www.samtec.com/system-impedance)
- Precision RF Connector PCB Launches for 224 Gbps Devices: [samtec.com/rf-launches-224](https://www.samtec.com/rf-launches-224)

NITRO[®]
WAVE
C A B L E

samtec.com/nitrowave