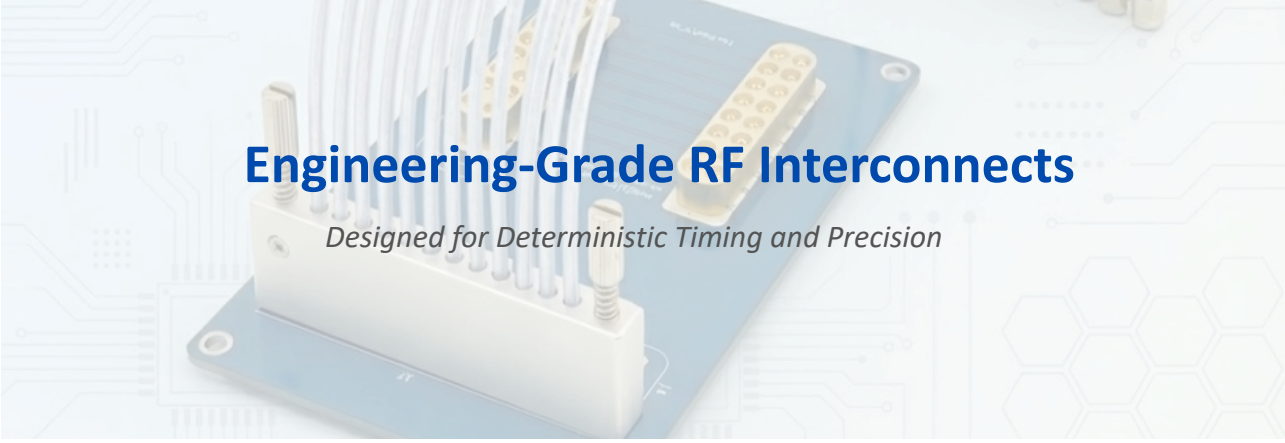
Vinstronics

Multi-Coax Cable Assemblies

Phase-Matched High-Density Interconnects | DC to 110 GHz



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Engineering-Grade RF Interconnects

Designed for Deterministic Timing and Precision

About Us

Vinstronics focuses on high-frequency RF and microwave interconnect solutions for demanding test, measurement, and communication environments. We specialize in high-density multi-port connectors, cable assemblies, and customized interconnect modules, where stable signal paths, mechanical repeatability, and long-term reliability are critical.

Our engineering philosophy emphasizes **measurable performance rather than marketing language**: controlled tolerances, consistent processes, and transparent technical data that engineers can evaluate and trust.

Typical Applications

- 224G PAM4 SerDes & Chipset Validation
- AI Accelerator GPU Load Boards
- Automated Test Equipment (ATE)
- PCIe 6.0 Compliance Testing
- Quantum Computing & High-Speed Digital Instrumentation

Precision — Meticulous phase-matching techniques achieving **≤ ±2ps** pair-to-pair skew, supporting ultra-wide bandwidths up to **110 GHz**.
Reliability — Advanced raw cable construction and robust strain relief, maintaining stringent phase and amplitude stability even under repetitive laboratory flexure.
Integrity — High-density ganged architectures engineered to preserve pristine differential signal quality from the evaluation board directly to the test instrument.

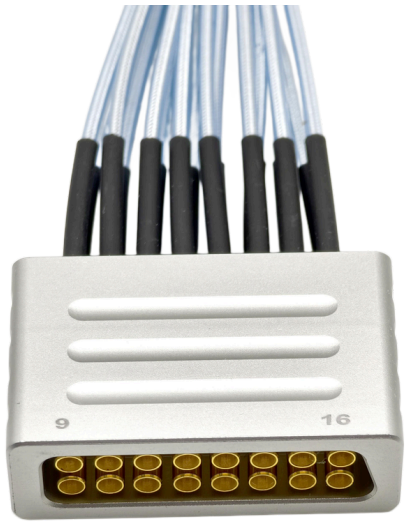
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MULTI-COAX CABLE ASSEMBLY OVERVIEW

Phase-Matched High-Density Interconnects | DC to 110 GHz

Product Overview

As digital systems scale beyond 224G, managing channel-to-channel timing errors is paramount. The Vinstronics Multi-Coax Cable Assembly series provides the optimal balance between ultra-high density and exact phase-matching. These assemblies route high-fidelity signals directly from the DUT to high-bandwidth instruments.



Why Choose Vinstronics Multi-Coax

- **Precision Phase Tracking:** Factory-trimmed to achieve absolute pair-to-pair skew of ≤ ±2ps for deterministic differential timing.
- **High-Density Integration:** Ganged 4, 8, and 16-channel blocks dramatically shrink routing footprints on crowded evaluation boards.
- **Flex Stability:** Engineered to maintain stable VSWR and insertion loss profiles under repetitive laboratory flexure.
- **End-to-End Integrity:** Seamlessly mates with Vinstronics board connectors, terminating in precision instrument-grade interfaces.

Key Technical Features

- **Impedance:** 50 Ω for consistent signal integrity.
- **Frequency:** Ultra-wideband performance from DC up to 110 GHz.
- **Skew Control:** ≤ ±2ps pair-to-pair phase matching.
- **Configurations:** 4, 8, and 16-port high-density blocks.
- **Instrument Interfaces:** 1.0mm, 1.85mm, 2.4mm, or 2.92mm precision connectors.
- **Verification:** 100% VNA S-Parameter & TDR Impedance validation.
- **Temperature:** Stable operation from -40°C to +125°C.

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PERFORMANCE SPECIFICATIONS

Phase & Amplitude Stability Under Flexure

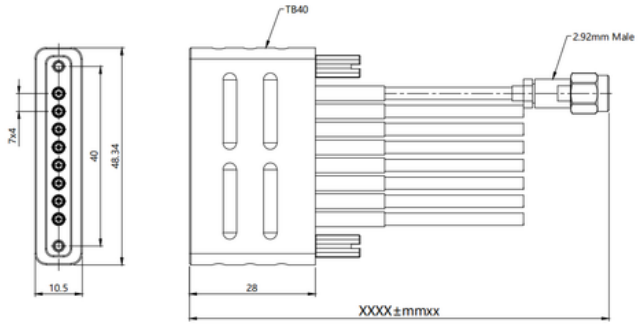
RF Performance & Stability

Vinstronics phase-matched assemblies are built with high-performance raw cables designed to maintain pristine signal integrity, even in dynamic laboratory environments.

- **Dynamic Phase Stability**: Engineered to minimize phase shift and amplitude variations during repetitive routing and flexure on the test bench.
- **Precision Skew Control**: Absolute pair-to-pair skew is factory-trimmed to **≤ ±2ps**, crucial for multi-lane **224G PAM4 and PCIe 6.0** validation.

Mechanical Durability

- **Optimized Bend Radius**: Highly flexible cable construction allows for tight routing without compromising impedance (TDR) or insertion loss (S21).
- **Robust Strain Relief**: Each channel features reinforced strain relief at the block transition, preventing cable pull-out and ensuring longevity across **≥ 500 mating cycles**.
- **Instrument-Grade Terminations**: Precision 1.0mm, 1.85mm, 2.4mm, or 2.92mm interfaces guarantee seamless, low-VSWR connections to VNAs and oscilloscopes.



Representative drawing based on model: VST-L-TB40MF308LY-XXXX.

Cable Configuration Matrix

Series	Max Frequency	Instrument Interface	Channel Pitch	Board Connector Match
TW90	110 GHz	1.0mm (Male/Female)	2.54 mm	VST-TWS90 (SMPS)
TW70 / TB70	67 GHz	1.85mm (Male/Female)	2.54 mm / 4.0 mm	VST-TWS / VST-TBS
TB50	50 GHz	2.4mm (Male/Female)	4.0 mm	VST-TBS50 (SMPM)
TB40	40 GHz	2.92mm (Male/Female)	4.0 mm	VST-TBS40 (SMPM)

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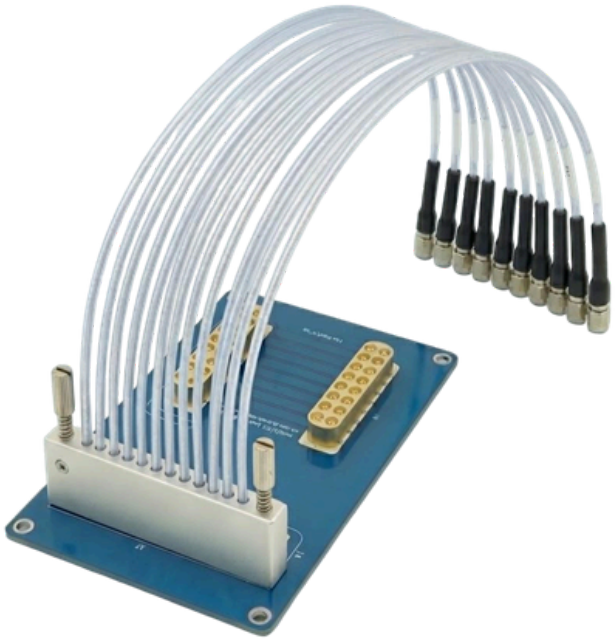
APPLICATIONS & SOLUTIONS

Phase-Matched Interconnects for Next-Gen Environments

Phase-Matched Signal Routing for Next-Gen Environments

Semiconductor Validation & 224G PAM4

- **DC to 110 GHz Performance**: Ultra-wideband signal routing designed for high-fidelity 5G-Advanced, 6G, and PCIe 6.0 research.
- **Deterministic Timing**: **≤ ±2ps** pair-to-pair skew control ensures absolute raw data accuracy for differential signaling analysis.



ATE & Production Platforms

- **High-Density Footprint**: Ganged 16-channel architecture maximizes valuable real estate on complex GPU and AI Accelerator Load Boards.
- **Extreme Durability**: Robust strain relief and flexible raw cable construction ensure reliable VSWR and phase stability across **≥ 500 flexure cycles** in automated testing.

High-Speed Digital Instrumentation

- **End-to-End Integrity**: Preserves pristine signal quality directly from the evaluation board to VNA and oscilloscope ports.
- **Mechanical Stability**: Phase and amplitude stability maintained even during dynamic laboratory bench routing and manipulation.

TECHNICAL FOOTNOTE *Specifications vary by specific raw cable type and channel configuration. Custom jacketing and armoring options are available for harsh laboratory environments.*

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ORDERING INFORMATION & SELECTION GUIDE

Part Numbering System & Standard Configurations

Part Numbering System

Build your specific Cable Assembly code: **VST - L - [Series] [Gender] [OD] [Ports] - [Length]**

Code Segment	Description	Available Options	Notes
VST-L	Brand Prefix	Vinstronics Cable Assembly	"L" denotes Link/Line interconnects.
[Series]	Frequency Range	TW90: 110 GHz TW70 / TB70: 67 GHz TB50: 50 GHz TB40: 40 GHz	Choose based on max frequency requirement.
[Gender]	Mating Interface	MF: Male (Block) to Female (Inst.) FF: Female (Block) to Female (Inst.)	Defines block and instrument end genders.
[OD]	Cable Diameter	1: Type 1 Flex Cable 3: Type 3 Flex Cable	Represents raw cable thickness.
[Ports]	Channel Count	04: 4 Ports 08: 8 Ports 16: 16 Ports	Contact factory for custom channel counts.
[Length]	Assembly Length	150: 150 mm 300: 300 mm 600: 600 mm XXXX: Custom Length	Standard lengths optimized for test benches.

For example, a 110 GHz TW90 series, 16-port, Type 1 cable, Male-to-Female assembly at 150mm length would be: ***VST-L-TW90MF116-150***

Popular Standard Configurations

Model Number	Frequency	Channels	Instrument Interface	Description / Optimal Application
VST-L-TW90MF116-150	DC-110 GHz	1x16	1.0mm Female	Flagship 110GHz: 16-port ultra-high density assembly for 224G SerDes validation.
VST-L-TW90FF116-300	DC-110 GHz	1x16	1.0mm Female	Female-to-Female 110GHz: 300mm robust testing link for millimeter-wave lab setups.
VST-L-TW90MF104-300	DC-110 GHz	1x4	1.0mm Female	Precision 110GHz: 4-port assembly optimized for critical differential analysis.
VST-L-TW70MF116-150	DC-67 GHz	1x16	1.85mm Female	High-Density 67GHz: 16-port configuration ideal for standard ATE and Load Boards.
VST-L-TB70MF308-600	DC-67 GHz	1x8	1.85mm Female	Extended Reach 67GHz: 8-port Type 3 cable assembly; 600mm length for rack routing.
VST-L-TB50MF308-300	DC-50 GHz	1x8	2.4mm Female	High-Speed 50GHz: 8-port reliable interconnect for high-speed digital prototyping.
VST-L-TB40MF308-600	DC-40 GHz	1x8	2.92mm Female	Standard 40GHz: 8-port robust assembly for general PCIe and standard digital testing.
VST-L-TB40MF304-300	DC-40 GHz	1x4	2.92mm Female	Compact 40GHz: 4-port space-saving solution for modular test environments.

Note: The models listed above represent standard configurations. Custom armoring, jacketing, and specific phase-matching tolerances are available upon request.

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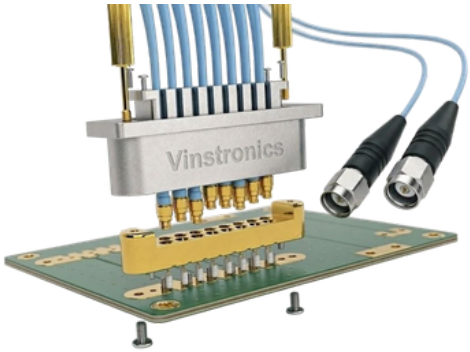
MATING RECEPTACLES & PCB GUIDELINES

Board-Level Ecosystem for Seamless Integration

COMPATIBLE BOARD-LEVEL CONNECTORS

Precision SMPS & SMPM Interfaces

- **Seamless Ecosystem**: Vinstronics multi-coax cable assemblies are engineered to mate perfectly with our proprietary series of board-level receptacles, guaranteeing end-to-end signal integrity.
- **Solderless Compression Mount**: Our vertical jacks utilize advanced compression technology, eliminating the thermal stress of soldering and protecting high-frequency PCB substrates (e.g., Rogers, Megtron).
- **High-Density Footprint**: Consolidate up to 16 channels into a single, precision-machined housing to significantly reduce evaluation board real estate.
- **Rapid Maintenance**: Non-destructive installation allows for quick replacement and minimal test platform downtime during rigorous validation cycles.



CALIBRATION & VERIFICATION

Rigorous Testing for Reliable Performance

100% Factory Tested & Validated

Every Vinstronics multi-coax cable assembly undergoes a strict quality control framework to guarantee immediate usability and stable performance upon arrival.

- **VNA S-Parameter Verification:** Each channel is fully tested using high-bandwidth Vector Network Analyzers to ensure stable Insertion Loss (S21) and Return Loss (S11) across the specified frequency band.
- **Precision Phase & Skew Control:** We verify absolute pair-to-pair skew to guarantee **≤ ±2ps** consistency, which is critical for deterministic differential timing.
- **TDR Impedance Profiling:** 100% Time Domain Reflectometry (TDR) testing ensures optimal **50 Ω** continuity from the block transition down to the instrument interface, preventing unwanted signal reflections.
- **Data Traceability:** Full serialization and S-parameter test data are archived within our manufacturing system, ensuring total traceability for every assembly shipped.

Shenzhen Weixintong Electronics Co., Ltd
Add： Room 212/213, 2/F, Block B, XinBaoSheng Building, No. 233 Xixiang Avenue, Hexi Community, Xixiang Sub-district, Bao'an District, Shenzhen
Email: sales@vinstronics.com
TEL/WhatsApp: 008618938647549

For more information refer to our website
https://vinstronics.com/multi-coax-series/