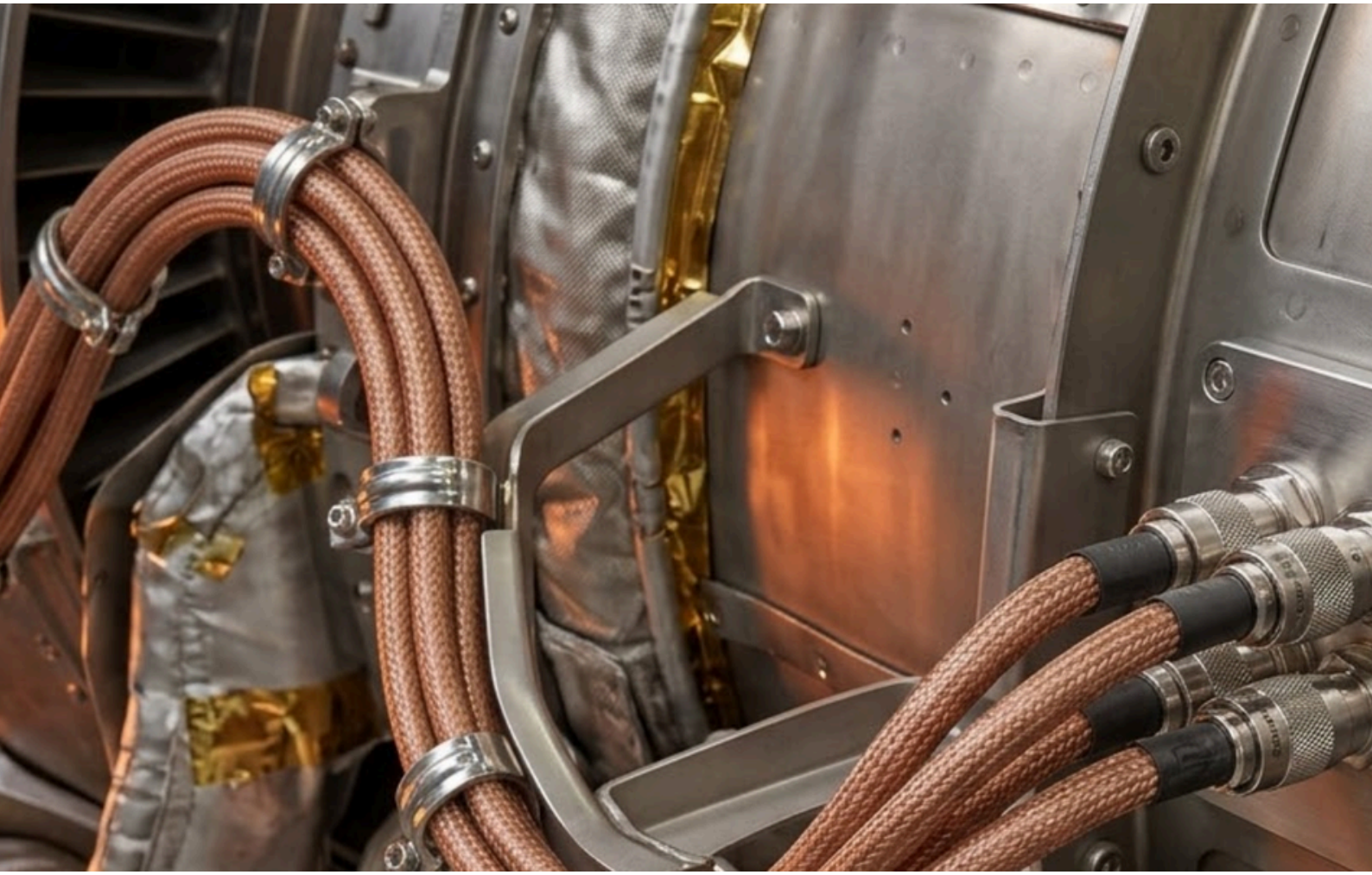


SELECTION GUIDE

High-Temperature Phase-Stable **RF Cables**

High-temperature phase-stable RF cable assemblies for harsh-environment interconnect applications, with short-term exposure capability up to **400°C @ 400 s**.

Construction & **Material Logic**

VXIR series cable construction is engineered for short-term high-temperature exposure and stationary phase-stable RF performance in harsh-environment interconnect applications. This page explains the material stack, shielding architecture, and insulation logic behind the VXIR360, VXIR400, and VXIR500 families.

TYPICAL CABLE CONSTRUCTION



1. Center Conductor— Silver-plated copper
2. Dielectric— LD PTFE
3. Inner Shield— Silver-plated copper tape
4. Interlayer— LD PTFE
5. Outer Shield— Silver-plated copper braid
6. Outer Jacket— PI + PTFE outer jacket

MATERIAL SELECTION LOGIC

PI + PTFE Outer Jacket

Provides short-term high-temperature survivability and outer-layer protection in harsh environments. The jacket system helps preserve mechanical integrity under thermal stress.

LD PTFE Dielectric

Supports stable dielectric behavior and low-loss RF transmission. It is a key contributor to stationary phase stability.

Silver-Plated Copper Conductor

Selected for high conductivity and efficient RF signal transmission. The conductor structure supports reliable high-frequency performance.

Multilayer Shielding Architecture

Enhances shielding effectiveness and protects signal integrity. The multilayer structure supports stable RF performance in electrically demanding environments.

QUICK CORE SPECIFICATIONS

PARAMETER	VXIR360	VXIR400	VXIR500
Outer Diameter (mm)	3.60	4.00	5.40
Working Frequency (GHz)	40	40	26.5
Cutoff Frequency (GHz)	50	56	31
Velocity (%)	76	82	83
Static Bend Radius (mm)	18	20	27
Dynamic Bend Radius (mm)	36	40	54
Weight (kg/m)	0.028	0.029	0.060
High-Temp Endurance	400°C @ 400 s	400°C @ 400 s	400°C @ 400 s

VXIR Series **Selection Guide**

This guide details the core physical and electrical properties of the VXIR family. Compare the VXIR360, VXIR400, and VXIR500 across cable size, bend performance, frequency range, and thermal endurance to identify the most suitable cable platform for extreme-environment applications.

VXIR360

COMPACT FORMAT

Smaller 3.60 mm footprint optimized for dense packaging and high-frequency routing up to 40 GHz.

VXIR400

BALANCED FORMAT

The 4.00 mm option provides an optimal midpoint between mechanical flexibility and electrical capability for versatile harsh-environment integration.

VXIR500

LARGER FORMAT

Larger 5.40 mm cable format engineered to support robust signal integrity in lower-frequency applications up to 26.5 GHz.

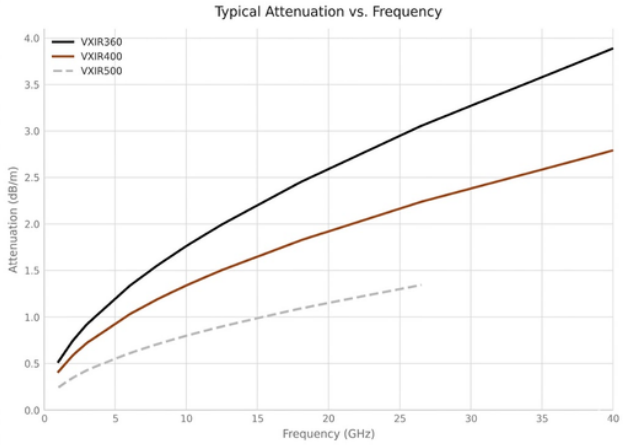
PARAMETER	VXIR360	VXIR400	VXIR500
DIMENSIONAL & MECHANICAL			
Outer Diameter (mm)	3.60	4.00	5.40
Min. Static Bend Radius (mm)	18	20	27
Min. Dynamic Bend Radius (mm)	36	40	54
Weight (kg/m)	0.028	0.029	0.060
ELECTRICAL CAPABILITY			
Max. Working Frequency (GHz)	40	40	26.5
Cutoff Frequency (GHz)	50	56	31
Impedance (Ω)	50	50	50
Velocity of Propagation (%)	76	82	83
Shielding Effectiveness (dB)	> 90	> 90	> 90
Capacitance (pF/m)	87	81	80
THERMAL ENDURANCE			
Operating Temperature (°C)	-55 to +200	-55 to +200	-55 to +200
Short-Term Exposure Limit	**400°C for 400 s**	**400°C for 400 s**	**400°C for 400 s**

Connector Interfaces & Custom Assemblies:
VXIR series cables are available with selected SMA, 2.92 mm, 3.5 mm, and N-type terminations. Realizing the 400°C short-term endurance capability necessitates specialized high-temperature connectors and rigorous termination protocols. Final interface selection depends on cable size, target frequency, and the specific thermal exposure profile of the application.

Electrical **Performance Data**

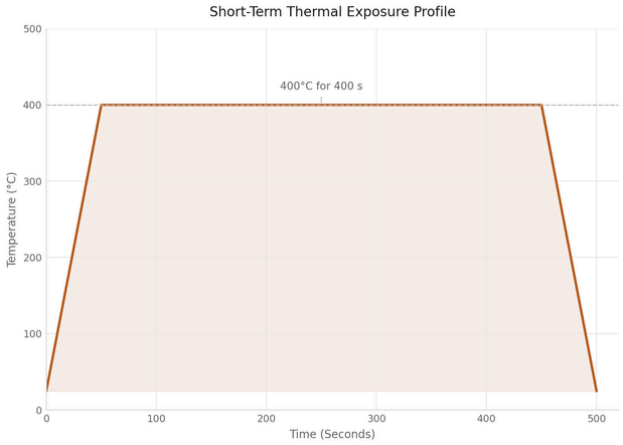
This section provides representative attenuation data and a short-term thermal exposure reference for the VXIR cable family. The data supports preliminary RF loss estimation and thermal capability assessment in extreme environments.

TYPICAL ATTENUATION



Illustrative attenuation trend based on typical source data at 25°C. Final assembly loss will depend on connector selection and total cable length.

SHORT-TERM THERMAL EXPOSURE REFERENCE



Illustrative short-term thermal exposure reference profile. The plateau represents the referenced 400°C for 400 s exposure condition.

TYPICAL ATTENUATION (DB/M) @ 25°C

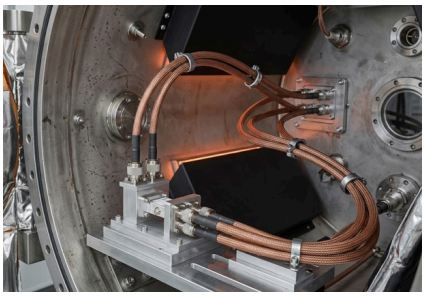
Frequency (GHz)	VXIR360	VXIR400	VXIR500
1.0	0.519	0.412	0.243
2.0	0.744	0.586	0.346
3.0	0.921	0.720	0.427
6.0	1.334	1.029	0.611
8.0	1.560	1.194	0.710
10.0	1.764	1.340	0.799
12.4	1.987	1.499	0.895
18.0	2.449	1.823	1.092
26.5	3.055	2.238	1.345
40.0	3.888	2.791	—

** VXIR500 attenuation data is specified through 26.5 GHz.*

Application Scenarios & **Environmental Reference**

The VXIR series is engineered to maintain consistent electrical characteristics in demanding operational environments. This section outlines typical deployment scenarios and core environmental design baselines for the cable family.

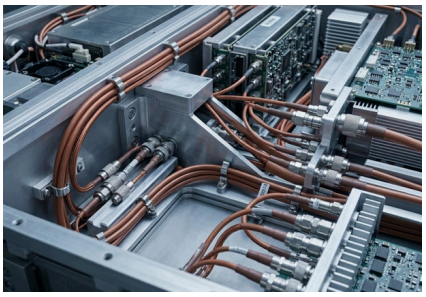
TYPICAL DEPLOYMENT SCENARIOS



Extreme Temperature Testing

Thermal vacuum (TVAC) chambers and high-stress thermal cycling require interconnects that maintain reliable structural and electrical performance during extended testing cycles.

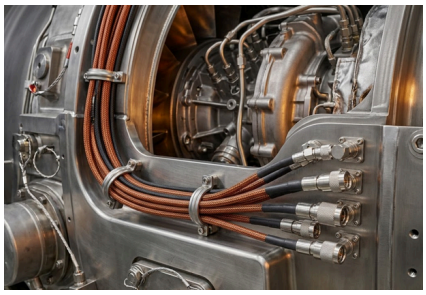
Key Characteristic
400°C short-term endurance capability.



High-Density Aerospace Routing

Complex aerospace platforms require strict dimensional and mass management. The flexible, lightweight construction facilitates compact routing within space-restricted airframes while preserving specified shielding effectiveness.

Key Characteristic
Low weight (from 0.028 kg/m) and tight dynamic bend radius.



High-Temperature Onboard Links

RF interconnects routed near high-heat boundary zones experience severe thermal stress. The PI+PTFE outer jacket sustains mechanical baseline properties, supporting continuous transmission under elevated ambient temperatures.

Key Characteristic
PI+PTFE jacket system and > 90 dB shielding.

ENVIRONMENTAL & MECHANICAL DESIGN REFERENCE

DESIGN PARAMETER	OPERATIONAL CONTEXT	VXIR SERIES BASELINE
Operating Temperature	Continuous operational exposure	-55°C to +200°C
Short-Term Thermal Limit	Transient thermal peaks	400°C for 400 s
Shielding Effectiveness	High-EMI environments	> 90 dB
Cable Weight Range	Weight-restricted airframes	0.028 to 0.060 kg/m
Dynamic Bend Radius	Confined system routing	36 mm to 54 mm

CONFIGURATION REFERENCE

Part Number **Construction**

Vinstronics utilizes a standardized part numbering system to ensure accuracy in configuration and production. Please refer to the structure below when defining the full assembly part number for VXIR series cable configurations.

CONFIGURATION EXAMPLE

VST-L-292M292F-IR40-1000

VST	-	L	-	292M	292F	-	IR40	-	1000
PREFIX		ASSEMBLY TYPE		CONNECTOR A	CONNECTOR B		CABLE CODE		LENGTH (MM)

** Illustrative assembly configuration reference only. Final quotation may specify formal orderable part numbers.*

ASSEMBLY CABLE CODES

Cable Model	Abbreviation Code
VXIR360	IR36
VXIR400	IR40
VXIR500	IR54

PART NUMBER ELEMENTS

Assembly Type	**L** = Cable assembly; **SPL** = Custom assembly designation
Connector Sequence	Side A followed directly by Side B
Gender & Form	**M** = Male / Plug; **F** = Female / Jack; interface suffixes such as **RF** = Right Angle and **PM** = Panel Mount may apply
Length	Overall assembly length in millimeters (mm)

SPL Designation

Assemblies involving non-standard connector configurations, specific phase matching requirements, stringent routing constraints, or specialized armor options may be designated under the SPL coding structure following technical engineering review.

ENGINEERING RFQ CHECKLIST

- Desired part number or assembly configuration (e.g., VST-L-292M292F-IR40-1000)
- Target Operating Frequency (GHz)
- Expected Maximum Thermal Exposure (°C)
- Static / Dynamic Bend Requirements
- Special Environmental or Armor Requirements (if any)

Precision RF Interconnect Solutions

Vinstronics

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