# CRYOGENIC RF Cables

## Why Develop a Cryogenic RF Cable?

In response to the rapidly growing demand for ultra-reliable RF cabling in advanced AI and quantum system environments, HASCO is proud to announce the development of a next-generation RF cryogenic cable—engineered specifically to support qubit activation and maintain system-wide stability across the full quantum stack.

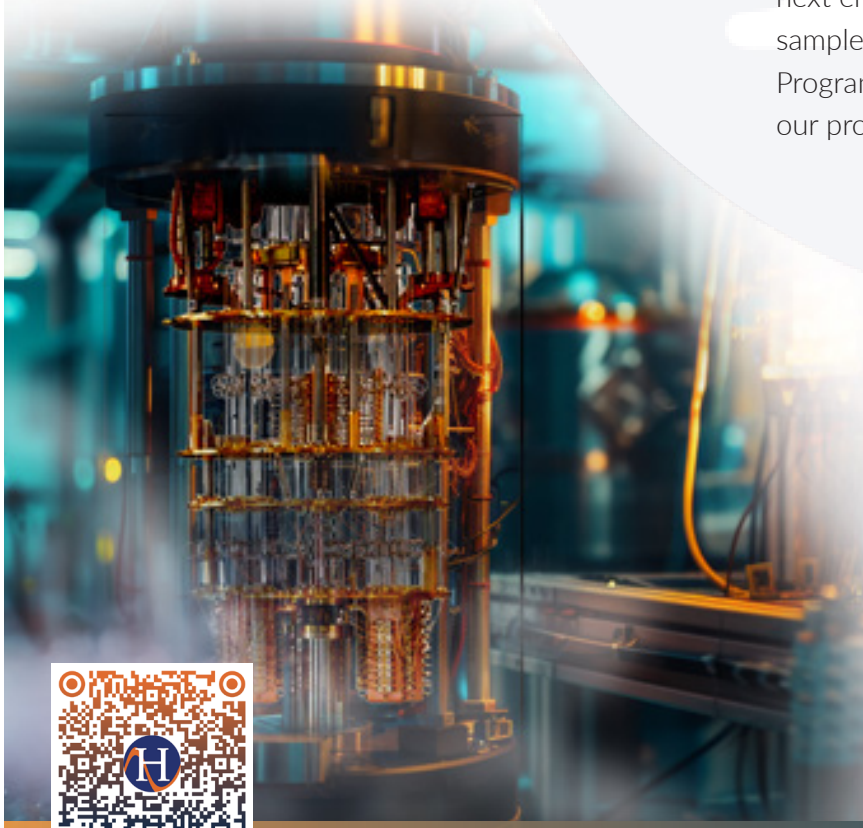
Driven by customer feedback and grounded in decades of industry expertise, our team has embarked on a mission to create a cable that exceeds the rigorous demands of cryogenic operation, offering best-in-class electrical performance while minimizing thermal load and maintaining ultra-low insertion loss. We've collaborated closely with leading research institutions, material scientists, and RF engineers to source the most respected, high-integrity materials available in the market.

This isn't just a cable. It's a precision-engineered, performance-validated platform for enabling the future of AI, quantum computing, and advanced signal measurement at cryogenic temperatures. From quantum labs to superconducting R&D, HASCO's cable is designed to set a new industry benchmark.

## Sneak Peek & Next Steps

Though still in final qualification stages, we are offering an exclusive sneak peek at the technical architecture behind our cryogenic RF cable solution. From optimized velocity factor profiles to best-in-class stainless steel shielding and matched impedance terminations—every detail has been intentionally crafted.

We look forward to working with you to pioneer the next era of RF performance. For additional details, sample availability, or to join the HASCO Early Validation Program, please contact your regional rep or reach out to our product lead team directly.



**This datasheet** outlines the technical specifications and features of a cryogenic RF cable designed specifically for use in AI-controlled dilution refrigerator systems. The cable is optimized for ultra-low temperature operation, high RF signal fidelity, minimal thermal loading, and integration into quantum computing or superconducting detector platforms.

HASCO | RF

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5214 Bonsai Street • Moorpark, CA 93021 • (805) 529-5085 • hasco-inc.com • info@hasco-inc.com

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## Raw Cable Specifications

| | |
|---|---|
| **Temperature** | 90°C MAX |
| **Impedance** | 50 Ω ± 3 |
| **Operating Frequency** | 61 GHz Max |
| **Velocity of Propogation** | 69.5% |
| **Shielding Effectiveness** | >165 dB |
| **Capacitance** | 29 pf/ft |
| **Working Voltage** | 1000 VRMS Max |
| **Voltage Withstanding** | 2000 VRMS @ 60 Hz |
| **Weight** | 4.53 g/1ft |
| **Dielectric Material** | PTFE |
| **Center Conductor** | Nb-47% Ti Wire** |
| **Outer Conductor** | Nb-47% Ti Tubing* |
| **Minimum Bend Radius** | 10.16mm Min. (0.4 in.) |

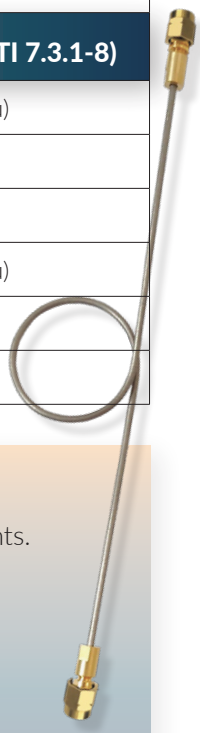
## Thermal Conductance

| | |
|---|---|
| **Thermal Conductance @ 1.5K** | G = 7.88 uW.cm/K |
| **Thermal Conductance @ 4K** | G = 21.0 uW.cm/K*** |

## SMA Connector Materials (Finishes - per STI 7.3.1-8)

| | |
|---|---|
| **Body Materials** | Ph Bronze (Au/Cu) |
| **Center Contact** | BeCu (Au/Cu) |
| **Dielectric** | PTFW |
| **Coupling Nut, Collar and Clamp Nut** | Ph Bronze (Au/Cu) |
| **Lock Ring** | BeCu (Unplated) |
| **Gasket** | SI Rubber |

* Nb-47%Ti Tubing IAW ASTM B884-2011 ** Nb-47%Ti Wire *** Data results extrapolated to 4k



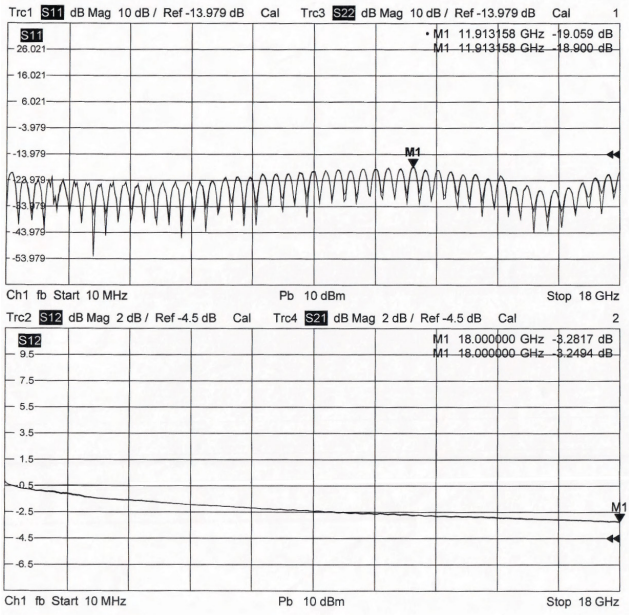
This cryogenic RF cable is engineered to support next-generation quantum and AI-enhanced test environments. By combining low insertion loss, exceptional phase stability, and cryo-mechanical robustness, it offers a turnkey interconnect solution for dilution refrigerators used in high-fidelity quantum signal chains.

## Application

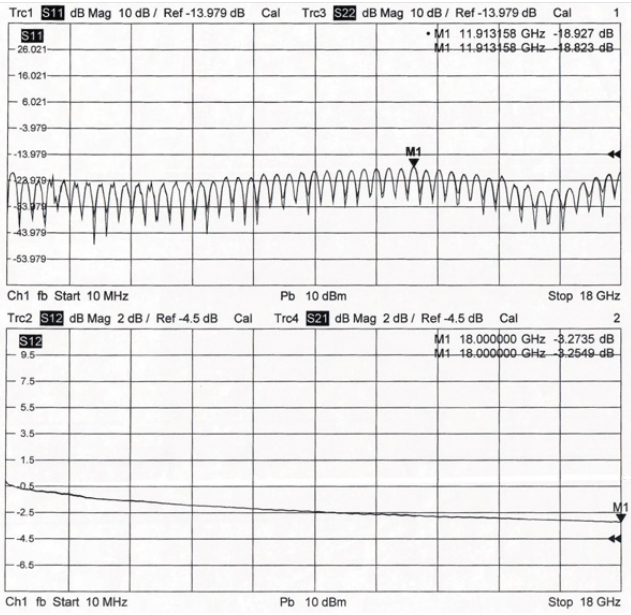
- Quantum computing interconnects
- Superconducting detector readout chains
- Qubit control and measurement
- Low-noise cryogenic amplification
- Microwave multiplexing in AI-optimized testbeds
- Time-critical signal routing within dilution refrigerators

## RF Performance Characteristics Examples

EXAMPLE #1




EXAMPLE #2







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