DigiKey Amphenol

Non-Magnetic Wiring Solutions Ensure Reliable Qubit Operations

As the fundamental component of quantum computing, qubits are very sensitive to magnetic fields. Every section of the quantum computer must be shielded from magnetic interference, which compromises the reliability of quantum operation.

To avoid decoherence and preserve the delicate stability and signal integrity of the quantum system, Amphenol SV Microwave and Amphenol CDI have developed non-magnetic RF interconnects and wiring solutions, from PCB to cable attachment, using specialized non-magnetic materials, plating, and manufacturing techniques.

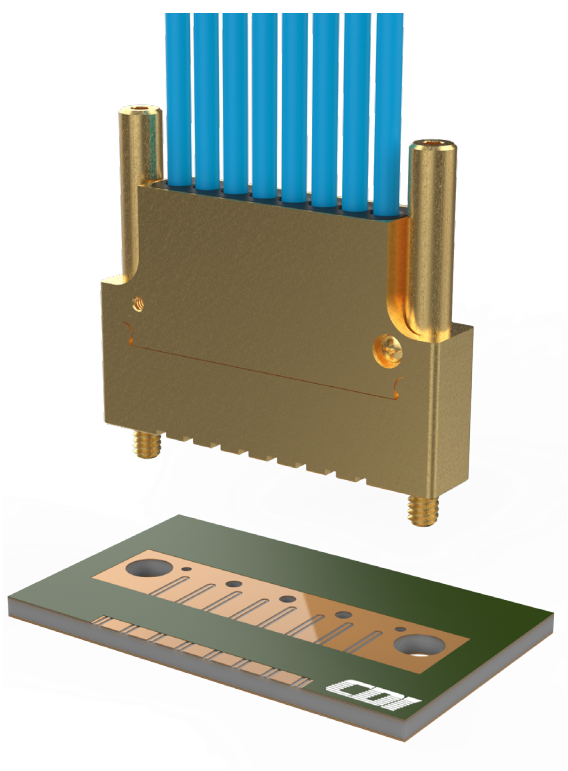
What Carefully Designed and Processed Interconnects Achieve

- **<0.1 mG** magnetic field strength rating
- **Successful field testing** at mK mixing chamber temperatures
- Port-to-port spacing **up to 2.5-mm pitch**
- Hermetic seal leak **rate of 10^{-8} cc/sec**

More Merits and Advantages

STANDARD FEATURES	BENEFITS
20 GHz, 56G PAM4 support	High-speed data transfer
Rugged connector, 1,000-cycle durability	Reliable in harsh environments
2.5 mm signal-to-signal density	Space-saving compact design
Quick attach for RF/Digital connections	Fast, flexible installation
Reusable, field-replacable	Quantum-ready for cryogenic environments
Non-magnetic materials, defined specs	Simplifies mixed-signal integration

CoreCryo™ Interconnects

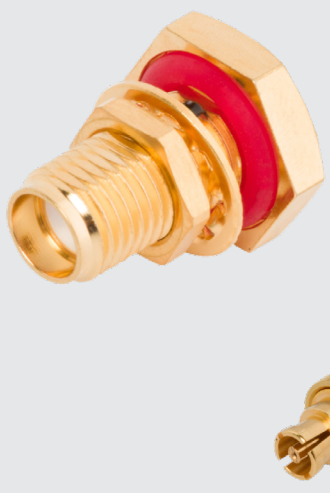


The Amphenol CDI CoreCryo interconnect has been engineered to deliver high-density, multi-coax solution from the top of a quantum fridge all the way to the qubit. Fabricated from non-magnetic materials, it employs a ganged solution to enable higher channel counts while meeting the requirements of highly sensitive cryogenic environments.

CoreCryo products are designed to support exceptional signal integrity at ultra-low temperatures. In fact, these compact, precision-engineered interfaces are helping engineers reduce system size while improving overall electrical performance, making them an attractive option for customers seeking scalable, high-performance cryogenic connectivity.

Non-Magnetic RF Connectors

Amphenol SV Microwave has carefully combined non-magnetic materials, such as beryllium copper and titanium, with plating and manufacturing techniques to develop a suite of RF interconnects that are ideal for applications requiring low magnetic susceptibility (10^{-5} max) and no electric field distortion.



These non-magnetic interconnect offerings include threaded (SMA series) connectors for a robust, reliable connection, as well as blind-mate (SMPM series) connectors for high-density, high-frequency applications where a push-on interconnect is preferred.

Cryogenic Wiring Solutions

External magnetic disruption adds noise and compromises the reliability of quantum operations. Even trace amounts of magnetic material can cause interference, which leads to qubit decoherence, reduced stability, and degraded signal integrity. Manufacturers like Amphenol CDI and Amphenol SV Microwave, who have designed and developed reliable cryogenic wiring solutions for quantum computing applications, can deliver excellent performance in ultra-low temperature environments with

1,000-cycle durability and maximum frequency operation of 20 GHz for CoreCryo cable assemblies and 65 GHz for non-magnetic RF interconnects.

Learn More With DigiKey