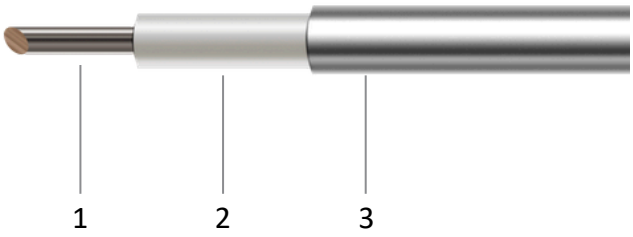
NbTi Superconducting Cryogenic Coaxial Cable

G12E-NT

1.22 mm OD NbTi superconducting cryogenic RF coaxial cable for ultra-low-temperature RF routing up to 18 GHz.



Product definition: G12E-NT is an NbTi superconducting cryogenic RF coaxial cable for ultra-low-temperature RF routing where superconducting behavior and thermal conduction must be evaluated together.

OUTER DIAMETER	OPERATING FREQUENCY	CABLE-LEVEL CUTOFF	MATERIAL FAMILY
1.22 mm	**18 GHz**	**108 GHz**	**NbTi**

CORE FEATURES

- 1.22 mm OD NbTi superconducting cryogenic coaxial construction
- Niobium titanium wire inner conductor, PTFE dielectric, niobium titanium alloy outer conductor
- Superconducting NbTi conductor system for ultra-low-temperature RF routing
- DC–18 GHz operating frequency with 108 GHz cable-level cutoff

TARGET APPLICATIONS

- Superconducting cryogenic RF interconnects
- Quantum processor control and readout lines
- Ultra-low-temperature non-magnetic RF systems
- Dilution refrigerator RF routing with minimized thermal load

CONSTRUCTION SPECIFICATION

NO.	COMPONENT	MATERIAL & PROCESS	DIAMETER MM [IN]
1	Inner Conductor	Niobium titanium wire	**0.290 [0.011]**
2	Dielectric	PTFE	**0.940 [0.037]**
3	Outer Conductor	Niobium titanium alloy	**1.220 [0.048]**

ELECTRICAL PROPERTIES

Parameter	Value
Operating Frequency	**18 GHz**
Cable-Level Cutoff Frequency	**108 GHz**
Characteristic Impedance	**50 ± 2.5 Ω**
Shielding Effectiveness	**>165 dB**
Dielectric Withstand Voltage	**100 V DC**
Velocity of Propagation	**70%**

MECHANICAL & ENVIRONMENTAL

Parameter	Value
Min. Bending Radius, Static	**6.40 mm**
Weight	**0.0047 kg/m**
Temperature Range	**-269°C to 200°C**

CABLE ATTENUATION

CONDITION	500 MHZ	1000 MHZ	5000 MHZ	10000 MHZ	18000 MHZ
Attenuation @300K (dB/m)	5.3	7.5	16.9	24.0	32.3
Attenuation @4K (dB/m)	<0.4	<0.4	<0.4	<0.4	<0.4

Interpolation reference: A = K1 × √F(MHz) + K2 × F(MHz). Tabulated attenuation values are shown in dB/m. K1 = 0.288617, K2 = 0.000518.

CRYOGENIC DESIGN NOTE

Thermal conductivity is used for preliminary heat-load estimation only. Final cable assembly performance depends on cable length, connector interfaces, thermal anchoring, routing geometry, and operating temperature stages.

4K THERMAL CONDUCTIVITY

7.54 $\times 10^{-6}$ W·cm/K

Typical design data for preliminary thermal-load estimation; not a final assembly guarantee.

DESIGN NOTES AND DATA BOUNDARY

Operating frequency	18 GHz is the operating frequency rating for preliminary cable selection.
Cable-level cutoff	108 GHz is a cable-level construction parameter; final assembly operating frequency may be limited by connector interface and configuration.
Thermal data	4K thermal conductivity is typical design data for preliminary heat-load estimation.
Final assembly	Connector interface, cable length, routing form, and thermal anchoring may affect final performance.

CONFIGURATION INFORMATION REQUIRED FOR CABLE ASSEMBLY QUOTE

CABLE MODEL	**ASSEMBLY LENGTH**	**CONNECTOR INTERFACE**	**QUANTITY**
ROUTING FORM	**TEMPERATURE STAGE**	**MAGNETIC / NON-MAGNETIC REQUIREMENT**	**SPECIAL NOTES**