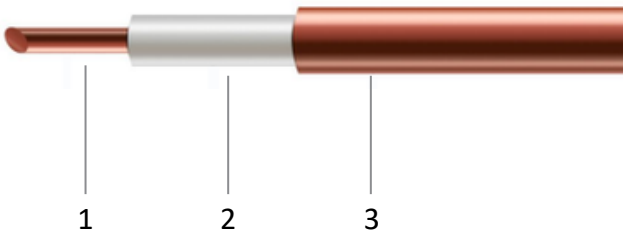
# Beryllium Copper Cryogenic Coaxial Cable

## G12E-BeCu

1.20 mm OD BeCu cryogenic RF coaxial cable for lower-loss cryogenic RF signal routing up to 18 GHz.

**Product definition:** G12E-BeCu is a beryllium copper cryogenic RF coaxial cable for lower-loss cryogenic RF signal paths where attenuation and thermal conduction must be evaluated together.




| OUTER DIAMETER | OPERATING FREQUENCY | CABLE-LEVEL CUTOFF | MATERIAL FAMILY |
|---|---|---|---|
| **1.20 mm** | **18 GHz** | **108 GHz** | **BeCu** |

### CORE FEATURES

- 1.20 mm OD BeCu cryogenic coaxial construction
- Beryllium copper inner conductor, PTFE dielectric, beryllium copper outer conductor
- Lower-loss conductor system for cryogenic RF signal paths
- DC–18 GHz operating frequency with 108 GHz cable-level cutoff

### TARGET APPLICATIONS

- Lower-loss cryogenic RF signal paths
- Quantum device readout and measurement lines
- Low-temperature microwave test interconnects
- Lower-loss RF paths where attenuation control is required

### CONSTRUCTION SPECIFICATION

| NO. | COMPONENT | MATERIAL & PROCESS | DIAMETER MM [IN] |
|---|---|---|---|
| **1** | Inner Conductor | Beryllium copper | **0.290 [0.011]** |
| **2** | Dielectric | PTFE | **0.940 [0.037]** |
| **3** | Outer Conductor | Beryllium copper | **1.200 [0.047]** |

## 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 | **3.20 mm** |
| Weight | **0.0055 kg/m** |
| Temperature Range | **-268°C to 150°C** |

## CABLE ATTENUATION

| CONDITION | 500 MHZ | 1000 MHZ | 5000 MHZ | 10000 MHZ | 18000 MHZ |
|---|---|---|---|---|---|
| **Attenuation @300K (dB/m)** | 1.6 | 2.3 | 5.2 | 7.3 | 9.9 |
| **Attenuation @4K (dB/m)** | 1.3 | 1.8 | 4.0 | 5.6 | 7.6 |

Interpolation reference: A = K1 × √F(MHz) + K2 × F(MHz). Tabulated attenuation values are shown in dB/m. K1 = 0.073200, K2 = 0.000003.

### 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

**91** $\times 10^{-6}$ 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** |