Coax cable for low temperature applications

Type 1: Brass central conductor

Number and type of conductors:
This cable is available with:
- one single central conductor, varnish insulated, with no outer insulation
- one central conductor, two strands, uninsulated, with no outer insulation
- one central conductor, two strands, uninsulated, low noise PE sleeve, with no outer insulation
- two central conductors, varnish insulated, in twisted pair, with no outer insulation
- two central conductors, varnish insulated, each in Teflon sleeve, in twisted pair, no outer insul.
- two central conductors, bare, each in a Teflon sleeve, in twisted pair, with no outer insulation
- two central conductors, varnish insulated, in twisted pair, with outer insulation
- four central conductors, varnish insulated, with four twisted wires, with no outer insulation

Single wire, single strand GVLZ036

Dimensions:
outer diameter: ϕ0.65mm
Typical composition:
central wire: brass Ms63, ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none
Electrical properties at room temperature:
Central wire resistance: 8.1Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (single wire): 63 pF/m
Bandwidth: [±3dB, 50Ω Termination]: 0 - 300MHz

Single wire, double strand GVLZ034

Dimensions:
outer diameter: ϕ0.8mm
Typical composition:
central wire: brass Ms63, 2x ϕ0.1mm, uninsulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none
Electrical properties at room temperature:
Central wire resistance: 4Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (single wire): 70 pF/m
Bandwidth: [±3dB, 50Ω Termination]: 0 – 300MHz

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Single wire, double strand, low noise GVLZ189

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wire: brass Ms63, 2x ϕ0.1mm, uninsulated
core insulation: Polyethylene (PE)
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature:

Central wire resistance: 4Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (single wire): 84 pF/m
Bandwidth: [±3dB, 50Ω Termination]: 0 – 300MHz

Double wire - twisted pair GVLZ033

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wires: brass Ms63, 2x ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature:

Central wire resistance: 8.1Ω/m
Shielding resistance: 5.5 Ω/m (some batches present 4.4 Ω/m)
Capacity between one central wire and shielding: 70 pF/m
Capacity between both central wires: 145 pF/m

Double wire - twisted pair with individual insulation GVLZ141

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wires: brass Ms63, 2x ϕ0.1mm, varnish insulated
core insulation for each wire separately: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature:

Central wire resistance: 8.1Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between one central wire and shielding: 62 pF/m
Capacity between both central wires: 36 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Double wire - twisted pair with individual insulation GVLZ286

Dimensions:

outer diameter: ϕ0.85mm

Typical composition:

central wires: brass Ms63, 2x ϕ0.13mm, uninsulated
core insulation for each wire separately: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature (tentative):

Central wire resistance: 5.2Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between one central wire and shielding: 62 pF/m
Capacity between both central wires: 36 pF/m

Double wire - twisted pair with outer insulation GVLZ282

Dimensions:

outer diameter: ϕ1.1mm

Typical composition:

central wires: brass Ms63, 2x ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: Teflon

Electrical properties at room temperature:

Central wire resistance: 8.8Ω/m
Shielding resistance: 6.0 Ω/m
Capacity between one central wire and shielding: 70 pF/m
Capacity between both central wires: 145 pF/m

Quad wire – double twisted pair high coverage GVLZ224

Dimensions:

outer diameter: approx. ϕ0.9mm

Typical composition:

central wires: 4x ϕ0.1mm metal, polyimid insulated to ϕ0.13mm
core insulation: Teflon, approx. ϕ0.65mm od
outer shielding: Constantan (55% Cu, 44% Ni, 1% Mn) braid made of 50µm bare wires
outer insulation: none

Electrical properties at room temperature:

Central wire resistance: 8.4Ω/m
Shielding resistance: 4.3 Ω/m
Capacity between central wire and shielding: 127 pF/m
Capacity between two central wires: 151 pF/m

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Type 2: Superconducting central conductor

Number and type of conductors:
This cable with no outer insulation is available with:
- one single central conductor NbTi/CuNi, varnish insulated
- one single central conductor NbTi/CuNi, uninsulated
- two central conductors NbTi/CuNi in twisted pair, varnish insulated
- two central conductors NbTi in twisted pair, varnish insulated
- two central conductors NbTi in twisted pair, high coverage, varnish insulated
- two central conductors, NbTi/CuNi bare, each in a Teflon sleeve, in twisted pair
- two central conductors, NbTi/Cu varnish insulated, each in Teflon sleeve, in twisted pair
- three central conductors, twisted together, varnish insulated

Single wire GVLZ032
Dimensions:
outer diameter: ϕ0.65mm
Typical composition:
central wire: superconducting NbTi in CuNi matrix (90% Cu, 10% Ni),
ratio NbTi/CuNi : 1/1.5, ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none
Electrical properties at room temperature:
Central wire resistance: 39 Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (single wire): 61 pF/m

Single wire GVLZ137
Dimensions:
outer diameter: ϕ0.65mm
Typical composition:
central wire: superconducting NbTi in CuNi matrix (90% Cu, 10% Ni),
ratio NbTi/CuNi : 1/1.5, ϕ0.1mm, uninsulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none
Electrical properties at room temperature:
Central wire resistance: 40 Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (single wire): 61 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Double wire - twisted pair GVLZ031

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wire: superconducting NbTi in CuNi matrix (90% Cu, 10% Ni),
ratio NbTi/CuNi : 1/1.5, 2x ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature:

Central wire resistance: 41 Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (double wire): 60 pF/m
Capacity between both central wires (double wire): 90 pF/m

Triple wire - twisted triplet GVLZ030

Dimensions:

outer diameter: ϕ0.85mm

Typical composition:

central wire: superconducting NbTi in CuNi matrix (90% Cu, 10% Ni),
ratio NbTi/CuNi : 1/1.5, 3x ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature:

Central wire resistance: 67 Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (triple wire): 60 pF/m
Capacity between two central wires (triple wire): 90 pF/m

Double wire - twisted pair GVLZ217

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wire: superconducting NbTi without matrix, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature (tentative):

Central wire resistance: 85 Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (double wire): 60 pF/m
Capacity between both central wires (double wire): 90 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Double wire - twisted pair – high coverage shielding GVLZ223

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wire: superconducting NbTi without matrix, varnish insulated

core insulation: Teflon

outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn) high coverage braid made of 50µm bare wires

outer insulation: none

Electrical properties at room temperature (tentative):

Central wire resistance: 87 Ω/m

Shielding resistance: 6.3 Ω/m

Capacity between central wire and shielding (double wire): 64 pF/m

Capacity between both central wires (double wire): 93 pF/m

Double wire - twisted pair – high coverage shielding GVLZ241

Dimensions:

outer diameter: ϕ0.8mm

Typical composition:

central wire: superconducting NbTi with **thin CuNi matrix**, varnish insulated,

ratio NbTi/CuNi : 1/.23, core insulation: Teflon

outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn) high coverage braid made of 50µm bare wires

outer insulation: none

Electrical properties at room temperature (tentative):

Central wire resistance: 87 Ω/m

Shielding resistance: 6.3 Ω/m

Capacity between central wire and shielding (double wire): 64 pF/m

Capacity between both central wires (double wire): 93 pF/m

Double wire - twisted pair GVLZ289

Dimensions:

outer diameter: ϕ0.85mm

Typical composition:

central wire: superconducting NbTi in thin CuNi matrix (90% Cu, 10% Ni),

ratio NbTi/CuNi : 1/.23, 2x ϕ0.13mm, uninsulated

core insulation for each wire separately: Teflon

outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)

outer insulation: none

Electrical properties at room temperature (tentative):

Central wire resistance: 41 Ω/m

Shielding resistance: 5.5 Ω/m

Capacity between one central wire and shielding: 62 pF/m

Capacity between both central wires: 36 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Double wire - twisted pair GVLZ291

Dimensions:

outer diameter: ϕ0.85mm

Typical composition:

central wire: superconducting NbTi in **Cu matrix**,
ratio NbTi/Cu : 1/1.5, 2x ϕ0.13mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none

Electrical properties at room temperature (tentative):

Central wire resistance: 2.5 Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (double wire): 60 pF/m
Capacity between both central wires (double wire): 90 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Type 3: Copper central conductor

Number and type of conductors:
This cable with outer insulation is available with:
- two central conductors in twisted pair, varnish insulated

Double wire - twisted pair GVLZ081

Dimensions:
outer diameter: ϕ1.2mm
Typical composition:
central wires: Copper, 2x ϕ0.15mm, varnish insulated
core insulation: Teflon
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: Teflon
Electrical properties at room temperature:
Central wire resistance: 1.1Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (double wire): 70 pF/m
Capacity between both central wires (double wire): 130 pF/m

Type 4: Non-magnetic, brass central conductor

Number and type of conductors:
This cable with no outer insulation is available with:
- two central conductors in twisted pair, varnish insulated

Double wire - twisted pair GVLZ169

Dimensions:
outer diameter: ϕ0.8mm
Typical composition:
central wires: brass Ms63, 2x ϕ0.1mm, varnish insulated
core insulation: Teflon
outer shielding: brass Ms63
outer insulation: none
Electrical properties at room temperature:
Central wire resistance: 8.1Ω/m
Shielding resistance: 0.56 Ω/m
Capacity between central wire and shielding (double wire): 70 pF/m
Capacity between both central wires (double wire): 145 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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Type 5: Low-noise, CuNi central conductor

Number and type of conductors:
This cable with no outer insulation is available with:
- one central conductor

This cable is made with a special process leading to differences in batch properties. We have it currently in two versions, indicated B2 and B3.

Single wire, single strand GVLZ185

Dimensions:
outer diameter: ϕ0.60mm
Typical composition:
central wire: CuNi (70% Cu, 30% Ni) ϕ0.09mm (B2) or ϕ0.12mm (B3)
core insulation: Graphite loaded
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn) high coverage
outer insulation: none
Electrical properties at room temperature:
Central wire resistance: 60Ω/m (B2) or 32Ω/m (B3)
Shielding resistance: 2.8 Ω/m
Capacity between central wire and shielding: 105 pF/m (B2) or 81 pF/m (B3)

Type 6: Manganin central conductor

Number and type of conductors:
This cable with no outer insulation is available with:
- two central conductors in twisted pair, varnish insulated

Double wire - twisted pair low noise GVLZ215

Dimensions:
outer diameter: ϕ0.8mm
Typical composition:
central wires: Manganin, 2x ϕ0.127mm, varnish insulated
core insulation: Polyethylene (PE)
outer shielding: CuNi (55% Cu, 44% Ni, 1% Mn)
outer insulation: none
Electrical properties at room temperature (tentative):
Central wire resistance: 34Ω/m
Shielding resistance: 5.5 Ω/m
Capacity between central wire and shielding (double wire): 84 pF/m
Capacity between both central wires (double wire): 148 pF/m

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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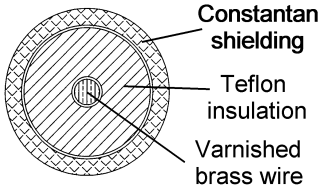
Coax cables for low temperature - Summary

GVLZ036



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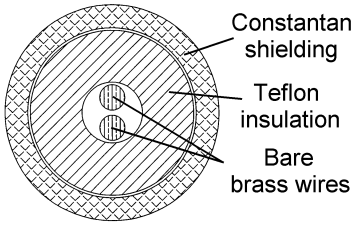

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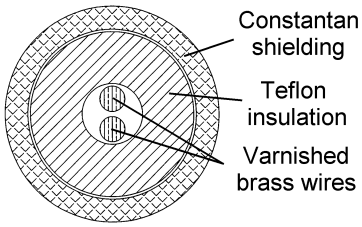

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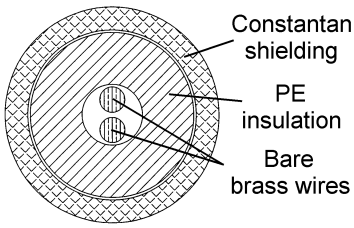

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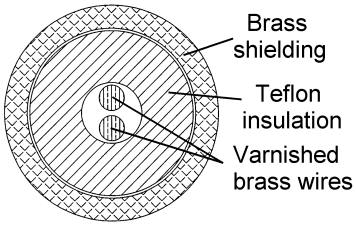

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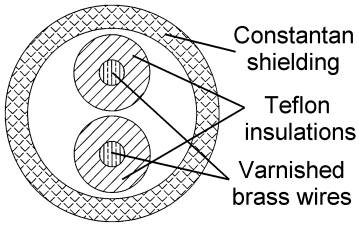

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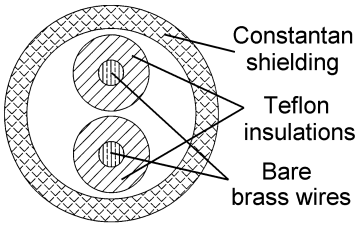

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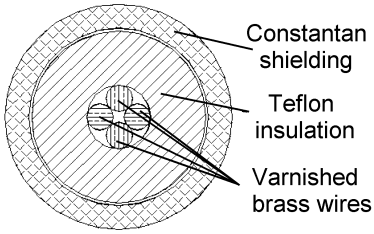

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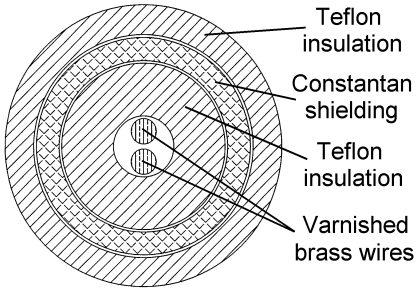

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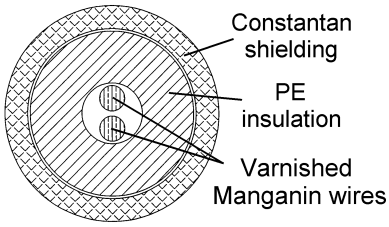

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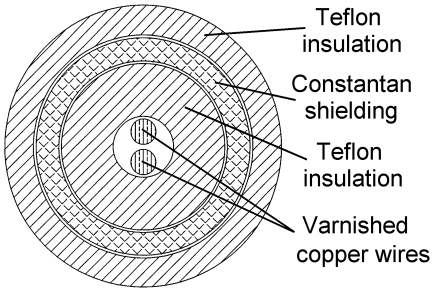

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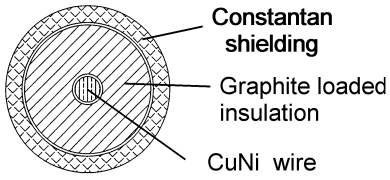

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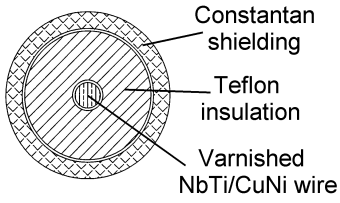
Superconducting coax cables – Summary

GVLZ032



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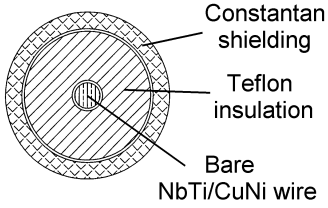

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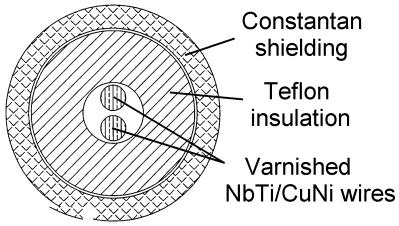

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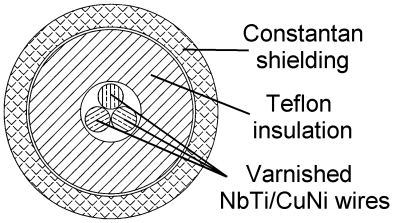

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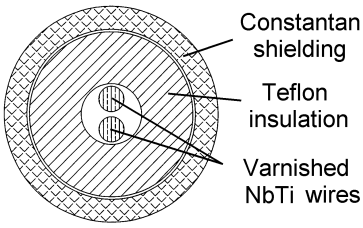

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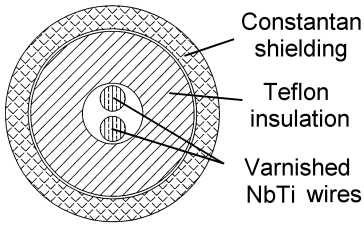

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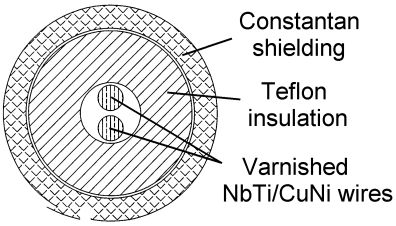

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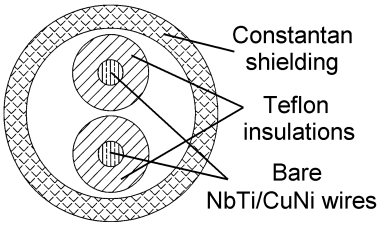

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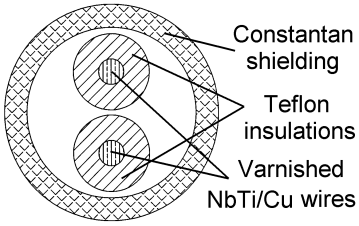

REV9.1 - 13Mar24

Note: *All values are typical. They can vary from batch to batch depending on the manufacturing details.*

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