MegaPhase

With the right connections, anything is possible.

# GrooveTube® Cables to 50 GHz

## Rugged, Low Loss Performance for Severe Environments

- Low insertion loss
- Phase and amplitude stable
- Stable under vibration and severe conditions
- Rugged GrooveTube® Technology
- Boundless™ PTFE Dielectric
- Proprietary Pull-Resistant Connector Design

MegaPhase offers these cables with rugged GrooveTube® Technology, a crush-proof convoluted copper armor and outer conductor. GrooveTube® features low insertion loss, phase and amplitude stability, and low VSWR through 32 GHz. Applications include phased array radar, electronic warfare radar systems, and applications where high reliability interconnects are critical. Available with phase matching, delay matching, and custom configurations.

## Electrical Data

**Maximum Frequency:**
135: 18.0 GHz
120: 32.0 GHz
620: 26.5 GHz
520: 50.0 GHz

**Impedance:**
50 Ω nominal

**Propagation Velocity:**
135: 84% nominal
120: 86.5% nominal
520: 69% nominal
620: 80% nominal

**Time Delay:**
120: 1.17 ns/ft (3.84 ns/m)
135: 1.21 ns/ft (3.97 ns/m)
620: 1.27 ns/ft (4.17 ns/m)
520: 1.47 ns/ft (4.82 ns/m)

**Shielding Effectiveness:**
-110 dB minimum (cable only)

**Dielectric Withstanding Voltage:**
120, 520: 10 kV at 60 Hz
135: 15 kV at 60 Hz
620: 7.5 kV at 60 Hz

**Capacitance:**
520: 29.0 pF/ft (95.1 pF/m)
620: 26.7 pF/ft (87.6 pF/m)
120 Series: 24.5 pF/ft (80.4 pF/m)
135 Series: 15.8 pF/ft (51.8 pF/m)

## Mechanical Data

**Finished Outer Diameter:**
120, 520, 620: 0.285 in (0.724 cm)
135: 0.400 in (1.016 cm)

**Static Bend Radius:**
120, 520, 620: 1.5 in (3.81 cm)
135: 3.0 in (7.62 cm)

**Weight with Standard Jacket/Armor:**
120, 520, 620: 0.05 lbs/ft (0.067 kg/m)
135: 0.14 lbs/ft (0.209 kg/m)

**Crush Resistance:**
250 lbs/linear in (44.6 kg/linear cm)

**Operating Temp. Range:**
120, 135: -67 to 275° F (-55 to 135° C)
520: -67 to 275° F (-55 to 135° C)
620: -40 to 185° F (-40 to 85° C)

For all series except 620:
Above 185° F (85° C) use "T" designation

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# GrooveTube® Cables to 50 GHz (continued)

## Cable Construction

Inner Conductor:
1, 5 & 6 Series: Solid Ag-plated Cu
Dielectric:
135: Boundless PTFE
520: PTFE
620: Foam PE
Outer Conductor: GrooveTube® Cu
Standard Finish:
520, 120, 620: Polyolefin over Metallic Braid

## Available Connectors

120, 620: 2.4mm, 2.92mm, 3.5mm, 7mm, BNC, SMA, TNC, Type N

135: 3.5mm, SMA, N Series, TNC, 7-16 DIN

520: 1.85mm, 2.4mm, 2.92mm, 3.5mm, 7mm, 7-16 DIN, BNC, SMA, TNC, Type N, ZMA, ZN

(maximum frequency dependent on cable; other connectors available)

## Specifications - 5 Series

| Frequency | | 520 Attenuation | | VSWR | Conn. Loss dB |
|---|---|---|---|---|---|
| GHz | Band | dB/ft | dB/m | | |
| 0.3 | UHF | 0.062 | 0.203 | 1.10 | 0.006 |
| 0.5 | | 0.082 | 0.268 | | 0.009 |
| 0.8 | | 0.106 | 0.348 | | 0.012 |
| 1.0 | L | 0.120 | 0.394 | | 0.014 |
| 2.0 | S | 0.178 | 0.585 | 1.15 | 0.024 |
| 2.4 | | 0.199 | 0.652 | | 0.027 |
| 3.0 | | 0.227 | 0.744 | | 0.032 |
| 4.0 | C | 0.270 | 0.885 | 1.20 | 0.040 |
| 6.0 | | 0.347 | 1.138 | | 0.055 |
| 8.0 | X | 0.417 | 1.367 | | 0.070 |
| 10.0 | | 0.482 | 1.580 | 1.25 | 0.084 |
| 12.4 | | 0.555 | 1.822 | 1.30 | 0.101 |
| 15.0 | Ku | 0.631 | 2.070 | | 0.118 |
| 18.0 | | 0.715 | 2.345 | | 0.139 |
| 20.0 | K | 0.769 | 2.522 | | 0.152 |
| 22.0 | | 0.821 | 2.695 | | 0.165 |
| 24.0 | | 0.873 | 2.865 | | 0.178 |
| 26.5 | | 0.937 | 3.073 | 1.35 | 0.194 |
| 28.0 | Ka | 0.974 | 3.196 | | 0.204 |
| 30.0 | | 1.024 | 3.358 | | 0.217 |
| 32.0 | | 1.072 | 3.518 | | 0.230 |
| 34.0 | | 1.121 | 3.676 | 1.40 | 0.243 |
| 36.0 | | 1.168 | 3.833 | | 0.256 |
| 40.0 | | 1.262 | 4.141 | 1.45 | 0.281 |
| 45.0 | Q | 1.377 | 4.518 | | 0.313 |
| 50.0 | V | 1.490 | 4.888 | 1.50 | 0.344 |

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# GrooveTube® Cables to 50 GHz (continued)

## Specifications

| Frequency | | 135 Attenuation | | VSWR | Conn. Loss dB |
|---|---|---|---|---|---|
| GHz | Band | dB/ft | dB/m | | |
| 0.3 | UHF | 0.032 | 0.106 | 1.10 | 0.006 |
| 0.5 | | 0.042 | 0.137 | | 0.009 |
| 0.8 | | 0.053 | 0.175 | | 0.012 |
| 1.0 | L | 0.060 | 0.196 | | 0.014 |
| 2.0 | S | 0.086 | 0.283 | 1.15 | 0.024 |
| 2.4 | | 0.096 | 0.311 | | 0.027 |
| 3.0 | | 0.107 | 0.351 | | 0.032 |
| 4.0 | C | 0.125 | 0.410 | 1.20 | 0.040 |
| 6.0 | | 0.156 | 0.511 | | 0.055 |
| 8.0 | X | 0.183 | 0.599 | | 0.070 |
| 10.0 | | 0.207 | 0.678 | 1.25 | 0.084 |
| 12.4 | | 0.223 | 0.766 | 1.30 | 0.101 |
| 15.0 | Ku | 0.260 | 0.853 | | 0.118 |
| 18.0 | | 0.289 | 0.948 | | 0.139 |

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# GrooveTube® Cables to 50 GHz (continued)

## Specifications

| Frequency | | 120 | | 620 | | VSWR | Conn. Loss dB |
|---|---|---|---|---|---|---|---|
| | | Attenuation | | | | | |
| GHz | Band | dB/ft | dB/m | dB/ft | dB/m | | |
| 0.3 | UHF | 0.053 | 0.173 | 0.054 | 0.179 | 1.10 | 0.006 |
| 0.5 | | 0.068 | 0.225 | 0.071 | 0.234 | | 0.009 |
| 0.8 | | 0.087 | 0.287 | 0.092 | 0.301 | | 0.012 |
| 1.0 | L | 0.098 | 0.322 | 0.103 | 0.339 | | 0.014 |
| 2.0 | S | 0.141 | 0.463 | 0.151 | 0.497 | 1.15 | 0.024 |
| 2.4 | | 0.155 | 0.510 | 0.168 | 0.550 | | 0.027 |
| 3.0 | | 0.175 | 0.575 | 0.190 | 0.625 | | 0.032 |
| 4.0 | C | 0.204 | 0.671 | 0.225 | 0.737 | 1.20 | 0.040 |
| 6.0 | | 0.255 | 0.836 | 0.285 | 0.935 | | 0.055 |
| 8.0 | X | 0.299 | 0.980 | 0.338 | 1.111 | | 0.070 |
| 10.0 | | 0.338 | 1.110 | 0.388 | 1.272 | 1.25 | 0.084 |
| 12.4 | | 0.382 | 1.253 | 0.443 | 1.454 | | 0.101 |
| 15.0 | Ku | 0.426 | 1.397 | 0.499 | 1.639 | | 0.118 |
| 18.0 | | 0.473 | 1.552 | 0.561 | 1.841 | 1.30 | 0.139 |
| 20.0 | K | 0.503 | 1.649 | 0.601 | 1.971 | | 0.152 |
| 22.0 | | 0.532 | 1.744 | 0.639 | 2.097 | | 0.165 |
| 24.0 | | 0.559 | 1.835 | 0.677 | 2.220 | | 0.178 |
| 26.5 | | 0.593 | 1.946 | 0.722 | 2.370 | 1.35 | 0.194 |
| 28.0 | Ka | 0.613 | 2.010 | - | - | | 0.204 |
| 30.0 | | 0.638 | 2.095 | - | - | | 0.217 |
| 32.0 | | 0.664 | 2.177 | - | - | 1.40 | 0.230 |

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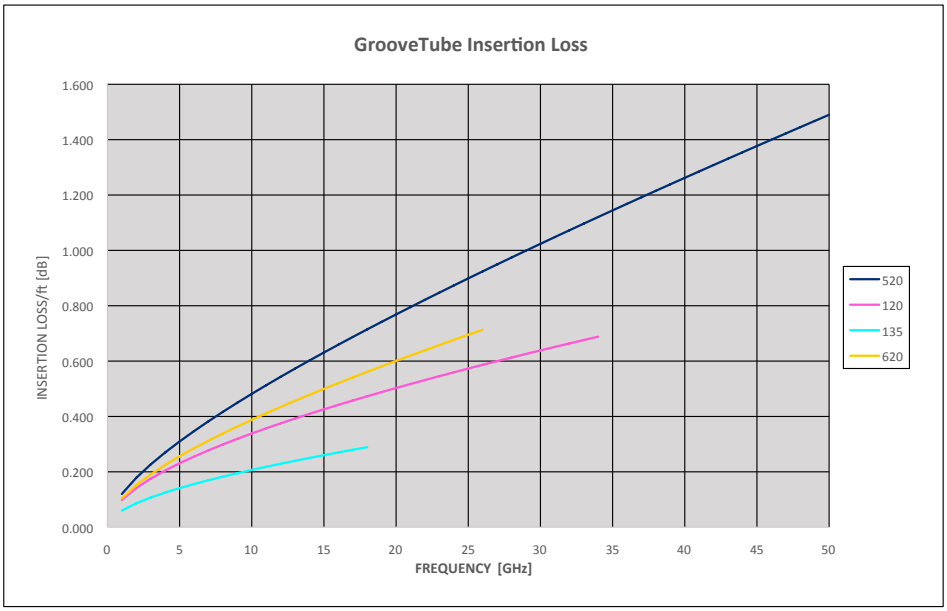
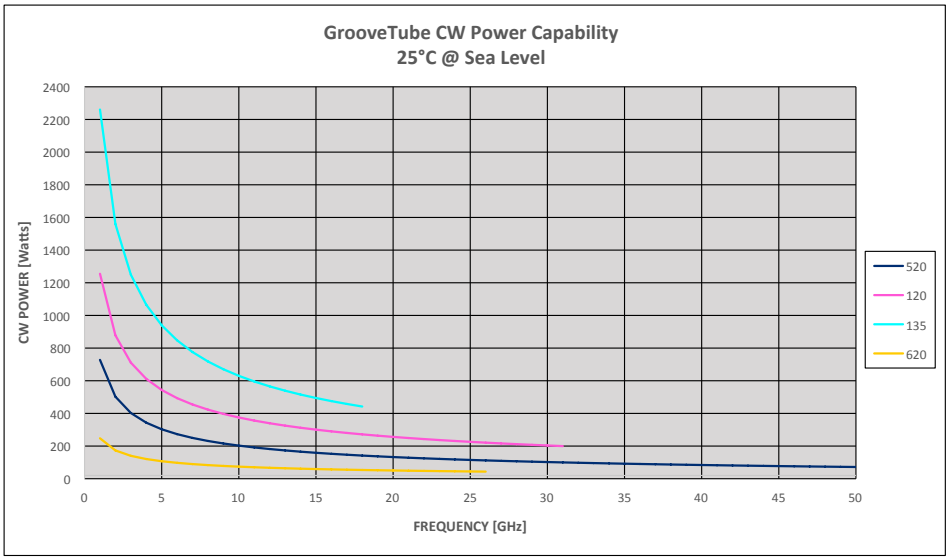
## Insertion Loss




## Cable CW Power Handling

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