



## 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. 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: 10.0 GHz  
620: 26.5 GHz  
520: 32.0 GHz  
520x: 50.0 GHz

##### Impedance:

50  $\Omega$  nominal

##### Propagation Velocity:

135: 84% nominal  
520: 69% nominal  
520x: 80% nominal  
620: 80% nominal

##### Time Delay:

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)  
520x: 1.27 ns/ft (4.17 ns/m)

##### Shielding Effectiveness:

-110 dB minimum (cable only)

##### Dielectric Withstanding Voltage:

135: 15 kV at 60 Hz  
620: 7.5 kV at 60 Hz  
520x: 1.2 kV at 60 Hz

##### Capacitance:

520: 29.0 pF/ft (95.1 pF/m)  
620: 26.7 pF/ft (87.6 pF/m)  
135 Series: 15.8 pF/ft (51.8 pF/m)

#### Mechanical Data

##### Finished Outer Diameter:

520, 520x, 620: 0.285 in (0.724 cm)  
135: 0.400 in (1.016 cm)

##### Static Bend Radius:

520, 520x, 620: 1.5 in (3.81 cm)  
135: 3.0 in (7.62 cm)

##### Weight with Standard Jacket/Armor:

520, 520x, 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:

520, 520x, 135: -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

## GrooveTube® Cables to 50 GHz (continued)

### Specifications - 5 Series

Frequency		520 Series		520x Series		Conn Loss dB	VSWR
Band	GHz	Attenuation dB/ft	Attenuation dB/m	Attenuation dB/ft	Attenuation dB/m		
UHF	0.3	0.062	0.203	0.104	0.341	0.006	1.10
	0.5	0.082	0.268	0.135	0.443	0.009	
	0.8	0.106	0.348	0.172	0.566	0.012	
L	1.0	0.120	0.394	0.194	0.635	0.014	1.15
S	2.0	0.178	0.585	0.279	0.915	0.024	
	2.4	0.199	0.652	0.307	1.009	0.027	
	3.0	0.227	0.744	0.347	1.137	0.032	
C	4.0	0.270	0.885	0.405	1.328	0.040	
	6.0	0.347	1.138	0.505	1.658	0.055	
X	8.0	0.417	1.367	0.593	1.945	0.070	1.20
	10.0	0.482	1.580	0.672	2.205	0.084	1.25
	12.4	0.555	1.822	0.759	2.491	0.101	1.30
Ku	15.0	0.631	2.070	0.847	2.779	0.118	1.35
	18.0	0.715	2.345	0.941	3.089	0.139	
K	20.0	0.769	2.522	1.001	3.285	0.152	
	22.0	0.821	2.695	1.059	3.475	0.165	
	24.0	0.873	2.865	1.115	3.659	0.178	
	26.5	0.937	3.073	1.183	3.881	0.194	
Ka	28.0	0.974	3.196	1.223	4.011	0.204	1.40
	30.0	1.024	3.358	1.274	4.181	0.217	
	32.0	1.072	3.518	1.325	4.347	0.230	
	34.0			1.375	4.510	0.243	1.45
	36.0			1.423	4.669	0.256	
V	40.0			1.518	4.980	0.281	1.50
	45.0			1.633	5.356	0.313	
	50.0			1.743	5.719	0.344	1.55

### Cable Construction

Inner Conductor:

1, 5 & 6 Series: Solid Ag-plated Cu

Dielectric:

135: Boundless PTFE

520: PTFE

520x: Foamed FEP

620: Foam PE

Outer Conductor: 520, 620, 135, GrooveTube® Cu  
520x Ag plated Cu Foil/Braid

Standard Finish:

520, 520x, 620, 135: Polyolefin over Metallic Braid

### Available Connectors

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

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

520: 520x 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)

## GrooveTube® Cables to 50 GHz (continued)

### Specifications

Frequency		135		VSWR	Conn. Loss dB
		Attenuation			
GHz	Band	dB/ft	dB/m		
0.3	UHF	0.032	0.106	1.15:1	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	1.20:1	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	1.30:1	0.040
6.0		0.156	0.511		0.055
8.0	X	0.183	0.599	1.35:1	0.070
10.0		0.207	0.678		0.084



## GrooveTube® Cables to 50 GHz (continued)

### Specifications

Frequency		620		VSWR	Conn. Loss dB
		Attenuation			
GHz	Band	dB/ft	dB/m		
0.3	UHF	0.054	0.179	1.10	0.006
0.5		0.071	0.234		0.009
0.8		0.092	0.301		0.012
1.0	L	0.103	0.339		0.014
2.0	S	0.151	0.497	1.15	0.024
2.4		0.168	0.550		0.027
3.0		0.190	0.625		0.032
4.0	C	0.225	0.737		0.04
6.0		0.285	0.935	1.20	0.055
8.0	X	0.338	1.111	1.25	0.07
10.0		0.388	1.272		0.084
12.4		0.443	1.454	1.30	0.101
15.0	Ku	0.499	1.639	1.35	0.118
18.0		0.561	1.841	1.40	0.139
20.0	K	0.601	1.971		0.152
22.0		0.639	2.097		0.165
24.0		0.677	2.220	0.178	
26.5		0.722	2.370		0.194
28.0	Ka	-	-	1.45	0.204
30.0		-	-		0.217
32.0		-	-		0.23