2003

Field Deployable

Antenna Feeder Cables

TIMES MICROWAVE SYSTEMS

ISO 9001

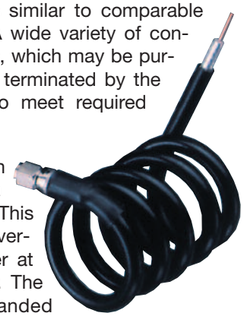
Field Deployable Antenna Feeder Cable Properties

	LMR-400	LMR-400-UF	LMR-600	LMR-600-UF	LMR-900	LMR-1200	TCOM-400-UF	TCOM-400-FS	TCOM-600-UF	TCOM-600-FS	QEAM-400	QEAM-500	QEAM-810
Loss (dB/100ft) @30 MHz	0.68	0.77	0.42	0.51	0.29	0.21	0.7	0.8	0.4	0.5	1.0	0.64	0.38
50 MHz	0.88	1.0	0.55	0.66	0.37	0.27	0.9	1.0	0.5	0.6	1.3	0.83	0.50
150 MHz	1.54	1.7	0.96	1.2	0.66	0.48	1.5	1.8	1.0	1.1	2.3	1.45	0.87
450 MHz	2.71	3.1	1.72	2.1	1.17	0.86	2.7	3.2	1.7	2.0	4.1	2.53	1.53
900 MHz	3.90	4.5	2.50	3.0	1.70	1.27	3.9	4.6	2.5	2.9	5.8	3.62	2.20
1800 MHz	5.66	6.5	3.67	4.4	2.48	1.87	5.7	6.7	3.7	4.3	8.3	5.19	3.19
2500 MHz	6.76	7.8	4.43	5.3	2.99	2.27	6.8	8.0	4.4	5.2	9.9	6.17	3.81
6000 MHz	11.03	12.9	7.41	8.9	4.97	-	11.0	13.0	7.4	8.8	15.6	9.86	6.20
10000 MHz	-	-	-	-	-	-	14.8	17.5	10.2	12.0	20.5	13.04	-
16000 MHz	-	-	-	-	-	-	19.6	23.1	-	-	26.4	-	-
18000 MHz	-	-	-	-	-	-	-	-	-	-	28.1	-	-
K1	0.12229	0.13767	0.07555	0.09066	0.05177	0.03737	0.12229	0.14369	0.07555	0.08888	0.18950	0.11644	0.06926
K2	0.00026	0.00037	0.00026	0.00031	0.00016	0.00016	0.00026	0.00031	0.00026	0.00031	0.00015	0.00014	0.00014
	Loss at other Frequencies = [K1 x $\sqrt{F}$] + [K2 x F] F = Frequency in MHz												
CW Power(kW) @ 30 MHz	3.3	2.9	5.5	4.6	8.9	13.0	3.3	2.9	5.5	5.0	4.0	6.0	14.0
50 MHz	2.6	2.3	4.2	3.5	6.9	9.7	2.6	2.2	4.2	3.6	2.8	4.9	11.2
150 MHz	1.5	1.3	2.4	2.0	3.9	5.5	1.5	1.3	2.4	2.0	1.6	2.8	6.4
450 MHz	0.8	0.7	1.3	1.1	2.2	3.1	0.8	0.73	1.3	1.1	0.9	1.6	3.6
900 MHz	0.6	0.5	0.9	0.8	1.5	2.1	0.58	0.50	0.93	0.8	0.7	1.1	2.5
1800 MHz	0.4	0.3	0.6	0.5	1.0	1.4	0.40	0.35	0.63	0.53	0.5	0.8	1.7
2500 MHz	0.3	0.3	0.5	0.4	0.9	1.2	0.33	0.29	0.52	0.44	0.4	0.7	1.4
6000 MHz	0.2	0.3	0.3	0.5	-	0.20	0.18	0.31	0.26	0.2	0.4	0.9	0.2
10000 MHz	-	-	-	-	-	-	0.15	0.13	0.23	0.19	0.2	0.3	-
16000 MHz	-	-	-	-	-	-	0.11	0.10	-	-	0.1	-	-
18000 MHz	-	-	-	-	-	-	-	-	-	-	0.1	-	-
Passive Intermod (dBc)	>-120						>-150				>-150		
Impedance (ohms)	50						50				50		
Capacitance (pF/ft)	23.9	23.9	23.4	23.4	23.4	23.1	23.9	23.9	23.4	23.4	26.4	25.4	24.7
Velocity of Propagation (%) 35	85	87	87	87	88	85	85	87	87	76	80	82	
Dielectric Constant	1.38	1.38	1.32	1.32	1.32	1.29	1.38	1.38	1.32	1.32	1.73	1.56	1.49
DC Voltage (kV)	3	3	4	4	5	6	2.5	2.5	4	4	2	3	5
Dimensions (in) & Material													
center conductor	0.108 BCCAL	0.108 STBC	0.176 BCCAL	0.176 STBC	0.262 BCTube	0.349 BCTube	0.108 BCCAL	0.108 STBC	0.176 BCCAL	0.176 STSC	0.0755 STSC	0.131 STSC	0.230 STSC
dielectric	0.285 FPE	0.285 FPE	0.455 FPE	0.455 FPE	0.680 FPE	0.920 FPE	0.285 FPE	0.285 FPE	0.455 FPE	0.455 FPE	0.217 LDTFE	0.360 LDTFE	0.620 LDTFE
outer conductor	0.291 ALT	0.291 ALT	0.461 ALT	0.461 ALT	0.686 ALT	0.926 ALT	0.295 FSC	0.295 FSC	0.465 FSC	0.465 FSC	0.231 FSC	0.371 FSC	0.630 FSC
outer braid	0.320 TC	0.320 TC	0.490 TC	0.490 TC	0.732 TC	0.972 TC	0.330 TC	0.320 TC	0.500 TC	0.500 TC	0.267 TC	0.407 TC	0.665 TC
jacket	0.405 PE	0.405 TPE	0.590 PE	0.590 TPE	0.870 PE	1.200 PE	0.405 PUR	0.405 PUR	0.590 PUR	0.590 PUR	0.470 PUR	0.500 PUR	0.810 PUR
Operating Temp Range (°C)	-40° to +85°						-40° to +90°				-40° to +90°		
Bend Radius (in)	4	4	6	6	9	11	4	4	6	6	5	5	8
Bending Moment (ft/lb)	1.75	1.25	2.75	1.75	9	15	1.75	1.25	9	7	1	1.3	6
Weight (lb/ft)	0.068	0.090	0.131	0.165	0.266	0.448	0.089	0.120	0.160	0.220	0.152	0.193	0.442
Connectors: field installable	Yes						Yes				No		
: factory installed	Yes						Yes				Yes		

Chart Notes: 1) power based on 1:1 vswr, sea level and +40°C ambient
2) power values are approximations, generally conservative and based on the cable's heat transfer properties
3) BCCAL = bare copper covered aluminum, BC = bare copper, STBC = stranded BC, TC = tinned copper, SC = silver plated copper, STSC = stranded SC, FSC = flat silver plated copper strip, ALT = aluminum tape, PE = solid polyethylene, PTFE = solid polytetrafluoroethylene, LDTFE = low density PTFE, FPE = foam polyethylene, PE = polyethylene, PUR = polyurethane, TPE = thermoplastic elastomer
4) All standard connector interface types available

Feeder cables for field deployable antennas need to be rugged enough to withstand the rigors of repeated reeling, while still providing good electrical performance and resistance in a variety of harsh environments. While corrugated copper cables and other cables designed for fixed installations are frequently used for these applications, they generally do not provide reliable long term performance, due to their inability to withstand repeat bending. Times Microwave Systems manufactures several families of cables that provide superior flexing performance, while still providing excellent electrical performance.

LMR® The LMR® family is the most cost effective choice for field deployable applications. When LMR cables are reeled on a diameter at least 20 times their cable diameter, they will withstand a few hundred reelings — an order of magnitude more than is typical for corrugated copper cable. LMR Ultraflex (UF) cables with a stranded center conductor and thermoplastic rubber outer jacket have a lower bending moment and are even more flexible. LMR cables are much easier to terminate and have loss similar to comparable sized corrugated copper cables. A wide variety of connectors is available for LMR cables, which may be purchased either as bulk cable to be terminated by the user or as finished assemblies to meet required specifications.



T-COM® The T-COM family incorporates an outer conductor fabricated from a silver plated copper strip braid. This allows these cables to withstand several thousand reelings on a diameter at least 20 times the cable diameter. The flexstrand versions with a stranded center conductor have a lower bending moment and will have a somewhat longer bend life. These cables are also available either as assemblies or as bulk cable.

QEAM™ The ultimate cable design for field deployable applications is the QEAM cable. The use of a taped PTFE dielectric results in even lower bending moment and longer bend life. These cables are based on our MilTech aerospace cable assemblies. Qeam cables are sold only as finished and tested cable assemblies and provide the ultimate in reliability and performance.

Our proven track record in providing cables for both military and commercial field deployable antenna systems includes the military's MSE (Mobile Subscriber Equipment) program, various missile launching platforms and other mission critical systems for ground based military communications and control. On the commercial side, the LMR and T-COM products have gained broad acceptance for COW (Cell Site on Wheels) applications. Although these are the products that are most commonly used for field deployable antenna feeders, they represent only a small portion of our total product line. Our sales engineers can help you determine which of our products will best fit your requirements.

Our Mission

TIMES MICROWAVE SYSTEMS designs and manufactures high performance RF transmission line for the telecommunications industry. These products consist of flexible coaxial cable, connectors, accessories and cable assemblies.

We are committed to understanding the needs and requirements of our customers and providing highly engineered, cost effective products. TIMES MICROWAVE SYSTEMS is dedicated to total customer satisfaction and superior results for our shareholders in all we do.

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