

SECONDARY CONSTANTS OF LOADED CABLE
19 GAUGE CNB, ENB, FNB
D88 LOADING

AT 68° F.*

Freq. Hertz	Propagation Constant Per Mile			Mid-Section Impedance			
	Attenuation		Phase Shift β Radians	R Ohms	X Ohms (Neg.)	Z Ohms	Angle Degrees (Neg.)
	α Nepers	dB					
1	.00544	.047	.00468	10185	8639	13355	40.3
50	.03021	.262	.04210	1593	1135	1956	35.5
100	.03670	.319	.06934	1311	690	1482	27.8
200	.04087	.355	.1247	1179	384	1240	18.1
300	.04214	.366	.1817	1148	264	1177	13.0
500	.04301	.374	.2981	1134	162	1145	8.1
800	.04353	.378	.4757	1141	102	1146	5.1
1000	.04378	.380	.5959	1153	83	1156	4.1
1200	.04402	.382	.7177	1169	70	1171	3.4
1400	.04427	.384	.8416	1190	61	1191	2.9
1600	.04454	.387	.9680	1215	54	1217	2.6
1800	.04486	.390	1.097	1247	49	1248	2.3
2000	.04524	.393	1.230	1285	46	1286	2.1
2200	.04572	.397	1.368	1332	44	1333	1.9
2400	.04634	.402	1.511	1389	43	1390	1.8
2500	.04671	.406	1.585	1424	44	1424	1.8
2600	.04715	.410	1.660	1462	44	1462	1.7
2700	.04767	.414	1.738	1505	45	1506	1.7
2750	.04796	.417	1.778	1529	46	1529	1.7
2800	.04827	.419	1.819	1554	47	1555	1.7
3000	.04988	.433	1.988	1676	52	1677	1.8
3200	.05230	.454	2.173	1844	63	1845	1.9
3500	.05926	.515	2.493	2273	104	2275	2.6
3900	.1061	.922	3.129	4550	832	4626	10.4

* Temperature Variation per Degree F.

Hz	dB	Rad.	R	X
300	.0008	.00006	-.019	-.505
1000	.0008	.00013	-.102	-.179
3000	.0005	.00053	.226	-.117

Notes: Nominal cutoff frequency = 4000 Hz.
Phase delay = 94.84×10^{-6} seconds/mile at 1000 Hz.
Velocity of propagation = 10.54×10^3 miles/second at 1000 Hz.

END-SECTION IMPEDANCE

End Section \ Frequency (Hz)	300		1000		1600		2000	
	R	X	R	X	R	X	R	X
0 (Full Coil)	1145	-179	1086	+200	1027	+400	971	+ 523
.1	1147	-196	1111	+149	1090	+331	1069	+ 453
.2	1148	-213	1130	+ 93	1144	+248	1157	+ 357
.3	1149	-230	1144	+ 36	1184	+153	1228	+ 237
.4	1149	-247	1152	- 23	1209	+ 52	1274	+ 100
.5 (Mid Section)	1148	-264	1153	- 83	1215	- 54	1285	- 46
.6	1147	-281	1149	-141	1204	-158	1265	- 190
.7	1145	-297	1138	-198	1175	-256	1214	- 322
.8	1143	-313	1123	-253	1132	-344	1141	- 433
.9	1140	-329	1102	-304	1079	-421	1054	- 519
1.0 (Full Section)	1137	-345	1077	-352	1018	-484	961	- 582

End Section \ Frequency (Hz)	2500		2750		3000		3500	
	R	X	R	X	R	X	R	X
0 (Full Coil)	877	+674	817	+748	745	+823	551	+ 976
.1	1024	+621	989	+717	941	+821	771	+1075
.2	1173	+523	1178	+630	1174	+756	1102	+1133
.3	1305	+374	1358	+469	1420	+593	1569	+1047
.4	1397	+178	1490	+234	1614	+310	2074	+ 641
.5 (Mid Section)	1424	- 44	1529	- 46	1676	- 52	2273	- 104
.6	1382	-262	1467	-319	1580	-404	1964	- 789
.7	1282	-446	1324	-536	1372	-658	1451	-1097
.8	1148	-580	1145	-676	1132	-794	1024	-1132
.9	1004	-665	965	-748	913	-841	732	-1059
1.0 (Full Section)	866	-708	806	-771	735	-835	539	- 959