

Cable Impedance, Attenuation, Phase

N.L. 19, 16, 13, and 10 ga. Cable (.062 mf/mile)

19-Gauge Side

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	$\alpha$	db/mi	$\beta$	B
200	746	731	1045	44.4	.0565	.491	.0570	.0182
300	608	575	836	43.4	.0693	.602	.0690	.0220
500	478	457	661	43.7	.0883	.767	.0920	.0293
1000	345	317	469	42.6	.1220	1.060	.1330	.0424
1500	282	254	304	41.4	.1462	1.270	.1660	.0529
2000	255	215	333	40.1	.1668	1.440	.1950	.0621
2200	245	204	319	39.8	.1681	1.460	.2050	.0653
2500	234	190	302	39.1	.1807	1.570	.2200	.0700
2600	230	185	295	38.8	.1831	1.590	.2270	.0723
2750	225	179	287	38.3	.1877	1.630	.2350	.0748
3000	217	169	275	37.9	.1934	1.680	.2490	.0793
3200	210	162	265	37.7	.1980	1.720	.2590	.0825
3400	205	155	257	37.1	.2038	1.770	.2700	.0859

19-Gauge Phantom

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	$\alpha$	db/mi	$\beta$	B
200	414	401	576	44.1	.0505	.439	.0519	.0165
300	341	325	471	43.6	.0614	.533	.0641	.0204
500	268	248	365	42.8	.0780	.678	.0840	.0267
1000	197	169	259	40.6	.1063	.923	.1233	.0393
1500	187	133	213	38.6	.1256	1.090	.1567	.0500
2000	150	111	186	36.6	.1398	1.214	.1876	.0597
2200	146	105	180	35.7	.1446	1.255	.1996	.0635
2500	139	96	168	34.6	.1508	1.310	.2174	.0692
2600	138	94	167	34.3	.1529	1.328	.2233	.0711
2750	136	90	162	33.7	.1554	1.350	.2320	.0739
3000	131	84	156	32.9	.1595	1.385	.2466	.0785
3200	129	82	153	32.4	.1627	1.413	.2581	.0822
3400	126	77	148	31.4	.1654	1.437	.2699	.0859

16-Gauge Side

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	$\alpha$	db/mi	$\beta$	B
200	531	511	736	43.9	.0380	.330	.0390	.0124
300	447	405	603	42.2	.0459	.399	.0500	.0159
500	345	315	467	42.4	.0681	.505	.0640	.0203
1000	254	214	332	40.1	.0796	.691	.0920	.0292
1500	225	173	284	37.6	.0910	.790	.1160	.0369
2000	205	148	253	35.8	.1002	.870	.1400	.0446
2200	199	140	243	35.1	.1056	.900	.1500	.0478
2500	190	130	230	34.4	.1082	.940	.1650	.0525
2600	188	126	226	33.8	.1096	.952	.1700	.0541
2750	184	120	220	33.1	.1117	.970	.1780	.0567
3000	178	113	211	32.4	.1146	.995	.1890	.0602
3200	175	107	205	31.4	.1174	1.020	.2000	.0637
3400	170	102	198	31.0	.1197	1.040	.2100	.0669

16-Gauge Phantom

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	$\alpha$	db/mi	$\beta$	B
200	298	280	408	43.2	.0352	.306	.0373	.0119
300	247	225	334	42.4	.0425	.369	.0464	.0148
500	197	169	259	40.1	.0532	.463	.0617	.0196
1000	150	111	186	36.5	.0700	.608	.0939	.0299
1500	131	85	156	33.0	.0799	.694	.1234	.0393
2000	121	69	139	29.5	.0864	.750	.1523	.0485
2200	119	64	135	28.3	.0883	.767	.1648	.0525
2500	116	58	130	26.6	.0907	.788	.1812	.0577
2600	115	56	128	25.9	.0914	.794	.1870	.0596
2750	113	53	125	25.1	.0924	.803	.1958	.0623
3000	112	50	122	23.9	.0938	.815	.2104	.0670
3200	111	47	120	23.0	.0948	.824	.2220	.0707
3400	110	46	119	22.5	.0958	.832	.2338	.0744

13-Gauge Side

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	$\alpha$	db/mi	$\beta$	B
200	379	352	517	42.9	.0273	.237	.0290	.0092
300	327	283	433	40.9	.0330	.287	.0350	.0111
500	252	212	329	40.1	.0410	.356	.0480	.0153
1000	193	139	238	35.8	.0538	.467	.0740	.0236
1500	170	106	200	31.9	.0614	.533	.0970	.0309
2000	158	86	180	28.6	.0664	.577	.1200	.0382
2200	155	79	174	27.0	.0679	.590	.1320	.0420
2500	152	72	168	25.4	.0699	.607	.1450	.0462
2600	150	70	166	25.0	.0707	.614	.1500	.0478
2750	149	67	163	24.2	.0716	.622	.1570	.0500
3000	146	63	159	23.3	.0729	.633	.1670	.0532
3200	144	60	156	22.6	.0738	.641	.1780	.0567
3400	143	57	154	21.7	.0748	.650	.1880	.0599

10-Gauge Side

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	$\alpha$	db/mi	$\beta$	B
200	275	241	366	41.3	.0187	.162	.0210	.0067
300	228	187	295	39.4	.0225	.195	.0260	.0083
500	191	140	237	36.2	.0274	.238	.0370	.0118
1000	156	88	179	29.4	.0342	.297	.0600	.0191
1500	145	66	159	24.5	.0381	.331	.0840	.0268
2000	140	53	150	20.8	.0410	.366	.1080	.0344
2200	138	49	146	19.5	.0419	.364	.1180	.0376
2500	136	45	143	18.3	.0431	.374	.1340	.0427
2600	136	44	143	17.9	.0434	.377	.1390	.0443
2750	135	42	141	17.3	.0440	.382	.1450	.0462
3000	134	38	139	15.9	.0447	.388	.1560	.0497
3200	133	36	138	15.1	.0455	.395	.1670	.0532
3400	132	35	137	14.9	.0461	.400	.1780	.0567

Note: All reactances are negative. Angles are in degrees and negative.

$\beta$  = Phase shift in radians per circuit mile

B = Phase shift in cycles per circuit mile out and back =  $\frac{2\beta}{2\pi}$