Open-Wire Impedance, Attenuation, Phase

104, 128, 165-MIL COPPER-6" AND 8" SPACING - S

104-Mil Side - 8"

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	α	db/mi	β	B
200	821	549	988	33.8	.0063	.0547	.0094	.0030
300	742	408	847	28.8	.0070	.0606	.0123	.0039
500	668	270	721	22.0	.0077	.0673	.0191	.0061
1000	628	144	644	12.9	.0083	.0718	.0359	.0114
1500	619	98	627	9.0	.0084	.0733	.0531	.0169
2000	615	74	619	6.9	.0085	.0741	.0705	.0225
2200	615	67	618	6.2	.0086	.0746	.0775	.0247
2500	614	60	617	5.6	.0086	.0749	.0879	.0280
2600	614	57	616	5.3	.0086	.0750	.0914	.0291
2750	614	55	616	5.1	.0087	.0752	.0969	.0309
3000	613	50	615	4.7	.0087	.0758	.1050	.0334
3200	613	47	615	4.4	.0087	.0759	.1120	.0357
3400	612	45	614	4.2	.0088	.0761	.1190	.0379

104-Mil Side - 6"

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	α	db/mi	β	B
200	789	538	955	34.3	.0066	.0569	.0096	.0031
300	710	415	823	30.3	.0072	.0627	.0125	.0040
500	636	268	690	22.8	.0081	.0707	.0193	.0061
1000	594	143	611	13.6	.0087	.0759	.0361	.0115
1500	585	97	593	9.4	.0089	.0775	.0532	.0169
2000	581	74	586	7.2	.0090	.0786	.0706	.0225
2200	580	67	584	6.6	.0091	.0790	.0776	.0247
2500	579	60	582	5.9	.0091	.0793	.0880	.0280
2600	578	58	581	5.7	.0092	.0796	.0915	.0291
2750	578	55	580	5.4	.0092	.0799	.0970	.0309
3000	578	50	580	5.0	.0092	.0802	.1050	.0334
3200	577	47	579	4.7	.0093	.0805	.1120	.0357
3400	576	45	578	4.5	.0093	.0810	.1190	.0379

128-Mil Side - 8"

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	α	db/mi	β	B
200	711	402	817	29.5	.0048	.0417	.0084	.0027
300	662	285	721	23.3	.0052	.0449	.0119	.0038
500	615	186	643	16.8	.0056	.0483	.0183	.0058
1000	594	97	602	9.3	.0058	.0504	.0354	.0113
1500	590	65	594	6.3	.0059	.0512	.0528	.0168
2000	588	50	590	4.9	.0060	.0521	.0702	.0224
2200	587	47	589	4.6	.0060	.0523	.0771	.0246
2500	587	40	588	3.9	.0061	.0530	.0876	.0279
2600	587	39	588	3.8	.0061	.0531	.0909	.0289
2750	587	36	588	3.5	.0061	.0533	.0960	.0306
3000	587	34	588	3.3	.0062	.0540	.1050	.0334
3200	587	33	588	3.2	.0062	.0542	.1120	.0357
3400	586	30	587	3.0	.0063	.0549	.1190	.0379

128-Mil Side - 6"

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	α	db/mi	β	B
200	679	395	786	30.2	.0050	.0436	.0085	.0027
300	629	283	690	24.2	.0054	.0470	.0120	.0038
500	582	185	611	17.6	.0059	.0510	.0184	.0059
1000	561	96	569	9.7	.0061	.0554	.0355	.0113
1500	556	65	560	6.7	.0063	.0543	.0529	.0168
2000	554	50	556	5.2	.0064	.0553	.0703	.0224
2200	554	46	556	4.7	.0064	.0558	.0772	.0246
2500	553	40	554	4.1	.0065	.0561	.0877	.0279
2600	553	39	554	4.0	.0065	.0568	.0910	.0290
2750	553	37	554	3.8	.0065	.0567	.0961	.0306
3000	553	34	554	3.5	.0066	.0573	.1050	.0334
3200	552	32	553	3.3	.0066	.0577	.1120	.0357
3400	552	30	553	3.1	.0067	.0580	.1190	.0379

165-Mil Side - 8"

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	α	db/mi	β	B
200	616	265	671	23.3	.0033	.0290	.0077	.0025
300	590	190	620	17.8	.0035	.0305	.0111	.0035
500	568	115	580	11.5	.0036	.0315	.0179	.0057
1000	560	59	563	6.0	.0038	.0326	.0352	.0112
1500	558	40	560	4.1	.0039	.0336	.0527	.0168
2000	557	31	558	3.2	.0040	.0348	.0701	.0223
2200	557	29	558	3.0	.0040	.0350	.0771	.0246
2500	556	26	556	2.7	.0042	.0361	.0876	.0279
2600	556	25	556	2.6	.0042	.0363	.0911	.0290
2750	556	23	556	2.4	.0042	.0369	.0964	.0307
3000	556	22	556	2.3	.0043	.0377	.1050	.0334
3200	555	22	555	2.2	.0044	.0380	.1120	.0357
3400	555	21	555	2.2	.0045	.0387	.1190	.0379

165-Mil Side - 6"

Freq.	Impedance				Attenuation		Phase Shift	
	R	X	Z	Angle	α	db/mi	β	B
200	584	262	641	24.2	.0035	.0306	.0078	.0025
300	567	188	597	18.3	.0037	.0322	.0112	.0036
500	535	115	547	12.1	.0039	.0335	.0180	.0057
1000	526	59	529	6.4	.0040	.0347	.0353	.0112
1500	524	40	526	4.4	.0041	.0357	.0528	.0168
2000	523	31	524	3.4	.0043	.0370	.0702	.0224
2200	523	29	524	3.2	.0043	.0376	.0772	.0246
2500	522	26	523	2.9	.0044	.0384	.0877	.0279
2600	522	25	523	2.8	.0045	.0388	.0912	.0290
2750	522	24	523	2.6	.0045	.0390	.0965	.0307
3000	522	22	523	2.4	.0046	.0399	.1050	.0334
3200	522	20	523	2.2	.0047	.0405	.1120	.0357
3400	522	19	523	2.1	.0047	.0410	.1190	.0379

Note: All reactances are negative. Angles are in degrees and negative. Data are for dry weather average temperature.

β = Phase shift in radians per circuit mile.

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