COPPER WIRE CURRENT CARRYING CAPACITIES

The following chart is a guideline of ampacity or copper wire current carrying capacity following the *Handbook of Electronic Tables and Formulas*. As you might guess, the rated ampacities are just a rule of thumb. In careful engineering the insulation temperature limit, thickness, thermal conductivity, and air convection and temperature should all be taken into account. The Maximum Amps for Power Transmission uses the 700 circular mils per amp rule, which is very very conservative. The Maximum Amps for Chassis Wiring is also a conservative rating, but is meant for wiring in air, and not in a bundle. For short lengths of wire, such as is used in battery packs you should trade off the resistance and load with size, weight, and flexibility.

AWG gauge	Diameter mm	Wire Area mm^2	(OHM/km) (mOHM/m)	Ta=30oC Single insulated Wire Amp @ 60oC	750 cir. Mil/A	375 cir. Mil/A	Maximum amps for chassis wiring	Maximum amps for power transmission 700 cir. Mil/A
2000				1155				
1750				1070				
1500				980				
1250				890				
1000				780				
900				730				
800				680				
750				655				
700				630				
600				575				
500				515				
400				455				
350				420				
300				375				
250				340				
4/0	11.684		0.16072	300			380	302
3/0	10.40384		0.202704	260			328	239
2/0	9.26592		0.255512	225			283	190
1/0	8.25246		0.322424	195			245	150
1	7.34822		0.406392	165			211	119
2	6.54304		0.512664	140			181	94
3	5.82676		0.64616	120			158	75
4	5.18922		0.81508	105			135	60
5	4.62026		1.027624				118	47
6	4.1148		1.295928	80			101	37
7	3.66522		1.634096				89	30
8	3.2639	9.12	2.060496	60	22.0	44.0	73	24
9	2.90576	7.27	2.598088		17.5	35.0	64	19
10	2.58826	5.82	3.276392	40	13.8	27.6	55	15
11	2.30378	4.64	4.1328		11.0	22.0	47	12
12	2.05232	3.70	5.20864	30	8.71	17.4	41	9.3

13	1.8288	2.96	6.56984		6.91	13.8	35	7.4
14	1.62814	2.37	8.282	25	5.48	10.9	32	5.9
15	1.45034	1.91	10.44352		4.35	8.70	28	4.7
16	1.29032	1.52	13.17248		3.44	6.88	22	3.7
17	1.15062	1.22	16.60992		2.74	5.48	19	2.9
18	1.02362	0.983	20.9428		2.17	4.34	16	2.3
19	0.91186	0.791	26.40728		1.72	3.44	14	1.8
20	0.8128	0.634	33.292		1.37	2.74	11	1.5
21	0.7239	0.507	41.984		1.08	2.17	9	1.2
22	0.64516	0.411	52.9392		0.853	1.71	7	0.92
23	0.57404	0.329	66.7808		0.681	1.36	4.7	0.729
24	0.51054	0.266	84.1976		0.539	1.08	3.5	0.577
25	0.45466	0.215	106.1736		0.427	0.854	2.7	0.457
26	0.40386	0.172	133.8568		0.337	0.674	2.2	0.361
27	0.36068	0.137	168.8216		0.269	0.538	1.7	0.288
28	0.32004	0.111	212.872		0.212	0.424	1.4	0.226
29	0.28702	0.0912	268.4024		0.170	0.340	1.2	0.182
30	0.254	0.0730	338.496		0.133	0.266	0.86	0.142
31	0.22606	0.0593	426.728		0.106	0.211	0.7	0.113
32	0.2032	0.0487	538.248		0.085	0.171	0.53	0.091
Metric 2.0	0.200	0.0392	555.61		0.0672	0.134	0.51	0.088
33	0.18034	0.0308	678.632		0.0530	0.106	0.43	0.072
Metric 1.8	0.180	0.0248	680.55		0.0418	0.0836	0.43	0.072
34	0.16002	0.0201	855.752		0.0333	0.0666	0.33	0.056
Metric 1.6	0.16002	0.0165	855.752		0.0270	0.0540	0.33	0.056
35	0.14224	0.0132	1079.12		0.0213	0.0426	0.27	0.044
Metric 1.4	.140	0.0102	1114		0.0163	0.0326	0.26	0.043
36	0.127	0.0081	1360		0.0128	0.0256	0.21	0.035
Metric 1.25	0.125	0.0066	1404		0.0105	0.0210	0.20	0.034
37	0.1143	0.0052	1715		0.0083	0.0166	0.17	0.0289
Metric 1.12	0.112	0.0043	1750		0.00645	0.0129	0.163	0.0277
38	0.1016	0.0037	2163		0.00533	0.0107	0.13	0.0228
Metric 1	0.1000	0.0027	2198		0.00412	0.00824	0.126	0.0225
39	0.0889	0.0022	2728		0.00330	0.00660	0.11	0.0175
40	0.07874	0.0018	3440		0.00259	0.00518	0.09	0.0137