Litho Circuits EST. 1986
Portal House,
Raheen Business Park,
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Engineering Chart

CONVERSION TABLE OF INCHES TO MM							
inches	MM	inches	MM	inches	MM	inches	MM
0.001	0.0254	0.026	0.6604	0.051	1.2954	0.076	1.9304
0.002	0.0508	0.027	0.6858	0.052	1.3208	0.077	1.9558
0.003	0.0762	0.028	0.7112	0.053	1.3462	0.078	1.9812
0.004	0.1016	0.029	0.7366	0.054	1.3716	0.079	2.0066
0.005	0.1270	0.030	0.7620	0.055	1.3970	0.080	2.0320
0.006	0.1524	0.031	0.7874	0.056	1.4224	0.081	2.0574
0.007	0.1778	0.032	0.8128	0.057	1.4478	0.082	2.0828
0.008	0.2032	0.033	0.8382	0.058	1.4732	0.083	2.0182
0.009	0.2286	0.034	0.8636	0.059	1.4986	0.084	2.1336
0.010	0.2540	0.035	0.8890	0.060	1.5240	0.085	2.1590
0.011	0.2794	0.036	0.9144	0.061	1.5494	0.086	2.1844
0.012	0.3048	0.037	0.9398	0.062	1.5748	0.087	2.2098
0.013	0.3302	0.038	0.9652	0.063	1.6002	0.088	2.2352
0.014	0.3556	0.039	0.9906	0.064	1.6256	0.089	2.2606
0.015	0.3810	0.040	1.0160	0.065	1.6510	0.090	2.2860
0.016	0.4064	0.041	1.0414	0.066	1.6764	0.091	2.3114
0.017	0.4318	0.042	1.0668	0.067	1.7018	0.092	2.3368
0.018	0.4572	0.043	1.0922	0.068	1.7272	0.093	2.3622
0.019	0.4826	0.044	1.1176	0.069	1.7526	0.094	2.3876
0.020	0.5080	0.045	1.1430	0.070	1.7780	0.095	2.4130
0.021	0.5334	0.046	1.1684	0.071	1.8034	0.096	2.4384
0.022	0.5588	0.047	1.1938	0.072	1.8288	0.097	2.4638
0.023	0.5842	0.048	1.2192	0.073	1.8542	0.098	2.4892
0.024	0.6096	0.049	1.2446	0.074	1.8796	0.099	2.5146
0.025	0.6350	0.050	1.2700	0.075	1.9050	0.100	2.5400

LAMINATETHICKNESS AND RELATEDMANUFACTURING TOLERANCE REF BS.45m

(including conductor or conductors)

Nominal thickness of laminate		Paper base tolerance +/-		Glass Fibre base (close) tolerance +/-	
MM	inches	MM	inches	MM	inches
0.8	0.031 (1/32)	0.09	0.0036	0.10	0.0040
1.6	0.062 (1/16)	0.14	0.0056	0.14	0.0056
2.4	0.093 (3/32)	0.18	0.0072	0.18	0.0072
3.2	0.125 (1/8)	0.20	0.0080	0.20	0.0080

Note 1. For 'plated up' printed boards, tolerances may be exceeded.
Note 2. Allowances should be made for additional finishes.

RELATIONSHIP BETWEEN HOLE DIAMETER AND SMALLEST PRACTICAL PAD SIZE FOR EFFECTIVE PRODUCTION

Hole		Pad		Hole		Pad	
MM	inches	MM	inches	MM	inches	MM	inches
0.4	0.016	1.2	0.047	1.4	0.055	2.2	0.086
0.5	0.019	1.3	0.051	1.5	0.059	2.3	0.090
0.6	0.023	1.4	0.055	1.6	0.063	2.4	0.094
0.7	0.027	1.5	0.059	1.7	0.066	2.5	0.098
0.8	0.031	1.6	0.063	1.8	0.070	2.6	0.102
0.9	0.035	1.7	0.066	1.9	0.074	2.7	0.106
1.0	0.039	1.8	0.070	2.0	0.078	2.8	0.110
1.1	0.043	1.9	0.074	2.1	0.083	2.9	0.114
1.2	0.047	2.0	0.078	2.2	0.087	3.0	0.118
1.3	0.051	2.1	0.082			1	

Note: FOR CIRCUIT BOARDS **IN EXCESS** OF 152mm **(6** in) **LONG ADD** 0.025mm (0.001 in) to **PAD SIZE FOR EVERY 25.4mm** (1.00 in) **of ADDITIONAL CIRCUIT LENGTH.**

Conductor Current Ratings (D.C. and Low frequency A.C.)

1 oz. (0.035mm thick) copper conductors							
Line width Temp Rise	0.50mm 0.015in	0.70mm 0.028in	1.00mm 0.039in	1.50mm 0.059in	2.00mm 0.078in	2.50mm 0.098in	3.00mm 0.120in
10 °C	1.30A	1.75A	2.25A	3.10A	4.00A	4.30A	5.00A
20 °C	1.80A	2.30A	3.00A	4.10A	5.00A	6.00A	7.00A
30 °C	2.30A	3.50A	3.80A	5.00A	6.60A	7.50A	9.00A
45 °C	2.70A	3.80A	4.30A	6.00A	8.00A	9.00A	10.50A
60 °C	3.00A	4.50A	5.00A	7.00A	9.00A	10.00A	12.00A
Max permissible current for temperature rise shown							
2 oz. (0.071 mm thick) copper conductors							
Line width Temp Rise	0.50mm 0.015in	0.70mm 0.028in	1.00mm 0.039in	1.50mm 0.059in	2.00mm 0.078in	2.50mm 0.098in	3.00mm 0.120in
10 °C	2.25A	2.85A	3.90A	5.00A	6.00A	7.00A	8.00A
20 °C	3.00A	3.60A	5.00A	7.00A	8.50A	10.00A	11.50A
30 °C	3.80A	4.40A	6.50A	8.90A	10.70A	12.20A	14.50A
40 °C	4.30A	5.00A	7.70A	10.30A	13.00A	14.20A	17.00A
50 °C	5.00A	6.00A	9.00A	12.00A	14.50A	16.00A	18.50A
Max permissible current for temperature rise shown							

DRILL SIZES WITH NEAREST STANDARD METRIC EQUIVALENTS

Size	Inches	Mm	**Size**	Inches	
80	0.0135	0.34	**56**	0.0465	
79	**0.0145**	0.37	3/64"	0.0469	
1/64 "	**0.0156**	0.39	55	0.0520	
78	**0.0160**	0.40	54	0.0550	
77	0.0180	0.46	53	0.0595	
76	0.0200	0.51	**1/16"**	0.0625	
75	0.0210	0.53	52	0.0635	
74	0.0225	0.57	51	0.0678	
73	0.0240	0.61	50	0.0700	
72	0.0250	0.63	49	0.0730	
71	0.0260	0.66	48	0.0760	
70	0.0280	0.71	5/64"	0.0781	
69	0.0292	0.74	47	0.0785	
68	0.0310	0.79	46	0.0810	
1/32"	0.0312	0.79	45	0.0820	
67	0.0320	0.81	44	0.0860	
66	0.0330	0.84	43	0.0890	
65	0.0350	0.89	42	0.0935	
64	0.0360	0.91	3/32"	0.0938	
63	0.0370	0.94	41	0.0960	
62	0.0380	0.97	40	0.0980	
61	0.0390	0.99	39	0.0995	
60	0.0400	1.00	38	0.1015	
59	0.0410	1.04	37	**0.1040**	
58	0.0420	1.07	36	0.1065	
57	0.0430	1.09	7/64"	0.1094	
35	0.1100	2.79	13	0.1850	
34	0.1110	2.82	3/16"	0.1875	
33	0.1130	2.87	12	0.1890	
32	0.1160	2.94	11	0.1910	
31	0.1200	3.05	10	0.1935	
1/8"	0.1250	3.17	9	0.1960	
30	0.1285	3.26	8	0.1990	
29	0.1360	3.45	7	0.2010	
28	0.1405	3.57	13/64"	0.2031	
9/64"	0.1406	3.57	6	0.2040	
27	0.1440	3.66	5	0.2055	
26	0.1470	3.73	4	0.2090	
25	0.1495	3.80	3	0.2130	
24	0.1520	3.86	7/32"	0.2188	
23	0.1540	3.91	2	0.2210	
5/32"	0.1562	3.97	1	0-2280	
22	0.1570	3.99	A	0.2340	
21	0.1590	4.04	15/64"	0.2344	
20	0.1610	4.09	B	0.2380	
19	0.1660	4.22	C	0.2420	
18	0.1695	4.30	D	0.2460	
11/64"	0.1719	4.37	E 1/4"	0.2500	
17	0.1730	4.39	F	0.2570	
16	0.1770	4.49			
15	0.1800	4 57			
14	0.1820	4.62			

Hole Size Tolerances.			
Nominal Hole Diameter		Tolerance	
Mm	Inches	Mm	Inches
0.6	0.024	+0.02 -0.08	+0.001 -0.003
0.8	0.032	+0.02 -0.08	+0.001 -0.003
1.0	0.040	+/-0.1	+/-0.004
1.3	0.052	+/-0.1	+/-0.004
1.6	0.063	+/-0.1	+/-0.004
2.0	0.079	+/-0.1	+/-0.004
2.4	0.094	+/-0.1	+/-0.004

CONDUCTOR SPACING LIMITATIONS.		
Voltage differences between conductors	Minimum spacing of conductors	
	Mm	Inches
Very low Voltages	Down to 0.25	1/10 (0.010)
Up to 150V	0.80	1/32 (0.031)
151-250V	1.20	3/64 (0.047)
251-300V	1.55	1/16 (0.062)
301-350V	2.00	5/64 (0.078)
351-400V	2.40	3/32 (0.093)
401-450V	2.80	7/64 (0.109)
451-500V	3.15	1/8 (0.125)
Note 1. Printed circuits are not recommended when working voltages exceed 500V. Note 2. Conductor spacing below 0.25mm (0.010") can cause processing difficulties.		

Recommended Protective Finishes.

													Remarks
	Light Wear		Standard		Heavy Wear		Short Term		Standard		Heavy		
	Microns	Inches	Microns	Inches	Microns	Inches	Microns	Inches	Microns	Inches	Microns	Inches	
Hard Gold	2.54	0.0001	5.08	0.0002	6.35	0.00025	0.50	0.00002	2.54	0.0001	5.08	0.0002	Recommended for Edge Contacts
Hard Gold on 5.08 microns (0.0002") Nickel	1.27	0.00005	2.54	0.0001			1.27	0.00005	2.54	0.0001			Popular American Specification
Palladium	1.27	0.00005	2.54	0.0001	3.81	0.00015	0.25	0.00001 (flash)			3.81	0.00015	Non Solderable
Rhodium	1.27	0.00005	2.54	0.0001	3.81	0.00015					3.81	0.00015	Non Solderable
Silver	5.08	0.0002	12.70	0.0005	25.40	0.001	0.50	0.00002 (flash)	25.40	0.001	127.00	0.005	Not recommended for 'Released' work
Nickel-Tin	3.81	0.00015	5.08	0.0002					6.09	0.00024			
Lead-Tin							2.54	0.0001	12.7	0.0005	25.4 to 127.00	0.001 to 0.005	After re-flow
Tin							0.50	0.00002 (flash)	25.4	0.001			
Roller-Tin	12.7 (AV)	0.0005 (AV)							12.7 (AV)	0.0005 (AV)			On chemically cleaned surfaces
Flux Lacquer									12.7 (AV)	0.0005 (AV)			
1 Micron = 0.0000394" 0.0001 Inch = 2.54 Microns													