



Condensed Thick Film Hybrid Design Information

For Printed Thick Film Circuits

(Contact factory for exceptions to these rules and capabilities for etched thick film)

<u>Dimensional Constraints</u>	<u>Min.</u>	<u>Nominal</u>
	(Inches)	(Inches)
Conductor to Conductor Spacing - Same Layer		
Standard	0.005	0.010
Special	0.004	-
Conductor Widths -		
Standard	0.005	0.010
Special	0.003	-
Conductor to Edge of Substrate	0.005	0.010
Conductor spacing - different metals On same layer	0.006	0.010
Wire Bonding Pad (Width / Length)	0.010	-
Conductor to Resistor Spacing	0.008	0.015
Upper & Lower Conductor to Connecting Conductor Overlap Length	0.005	0.012
Upper & Lower Conductor Width at Crossover	0.008	0.015
Dielectric to Resistor (Active Part) Spacing (for resistors on lower level)	0.020	>0.030
Via and Corresponding Via Fill Spacing (Edge to Edge)	0.008	0.012
Via to Adjacent Via Spacing Edge to Edge	0.010	0.015
Via to Adjacent Conductor Spacing	0.008	0.010
Via to Edge of Dielectric Spacing	0.015	-
Via to Edge of Substrate Spacing	0.025	-
Via to Via Spacing for Step Configuration	0.005	0.010
Via Hole Diameter - in Ceramic	0.006	0.008 0.035 Max.
Via Hole Size - in Dielectric	0.008 sq.	0.012 sq.
Via Hole Annulus (for via in ceramic)	0.005	-

Condensed Design Guidelines

1. On parts with metalized pads around non-plated-through holes a min. clearance of 0.005" is needed around hole to keep paste out of holes,
2. Make sure the solder mask extends 0.005" beyond edge of feature it is intended to cover.
3. If possible, design all resistors to be printed with the same resistivity paste (i.e. on the same artwork layer) and to have their current flow in the same direction - e.g. parallel to x-axis or y-axis of substrate.
4. For resistors of 50 Ohms and below specify probe points to allow for trace resistance.
5. For best economics, specify 0.008" via in ceramic, covered with solder mask for side-to-side continuity rather than wrap around edges.
6. For best economics, specify parts to be shipped in full array form rather than strips or singles
7. Specify part number and artwork revisions on each layer of gerber files.
8. If text is to be printed in solder mask or metal, ensure minimum font line width of 0.007" for printability.
9. Avoid openings in printed features of less than 0.015" dia., and square corners in such openings.
10. Keep trace widths ≥ 0.010 " if possible for best economics.
11. For best economics design array parts to fit on 3.900" X 3.900" printed area using 0.025" thick unannealed 96% Alumina.
12. Avoid metallization crossing snap lines if possible. Keep traces and printed features 0.010" from snap lines.
13. Keep solder mask minimum 0.005" away from features to be kept free of solder mask. E.G., windows for solder pads should be 0.010" larger than minimum exposed solder pad to allow paste spreading alignment and screen distortion.

TABLE A
 DIMENSIONAL CONSTRAINTS FOR THICK FILM CONDUCTORS AND PADS
 (See also Table B for Component Mounting)

Conductor and Pad Sizes and Spacing			Minimum	Nominal	See
(Inch)	(Inch)	1 & 2	Dimension	Dimension	Figures
Conductor to edge of substrate			.005	.010	1
Exit bonding pads (width and length)			.015 x .020		2
Wire bonding pads (width and length) for one or two wires on same pad			.005	.010	3
Conductor Width (power and ground)			.010	.015*	4
(signal)			.005	.010	
(special)			.003		
Conductor-to-Conductor Spacing			.010	.015	5
(power to ground)			.005	.010*	
(signal to power and ground)			.005	.010	
(signal to signal)			.005	.010	
(special)			.003	.010	
Conductor-to-Resistor Spacing (on untrimmed side of resistor)			.010	.015	6
Conductor-to-Resistor Spacing (on trimmed side of resistor)			.010	.015	7
Conductor-to-Resistor Spacing, top hat configuration (trimmed side of resistor)			.010	.015	8
Upper & Lower Conductor Width at Crossover Junction			.005	.010	9
Crossover Conductor-to-Connecting Conductor Overlap Length			.005	.012	10
Conductor Crossover Dielectric Overlap Printed Wire			.005	.015	11
Dielectric to Resistor (active part) Spacing			.010	.020	12
Wire Bond Clearance at Crossover			.015	.020	13
Wire Bond Clearance at Resistor			.015	.020	14
Probe Areas (sq.)			.015	.020	15

*Dimension will also depend upon power and other circuit requirements.