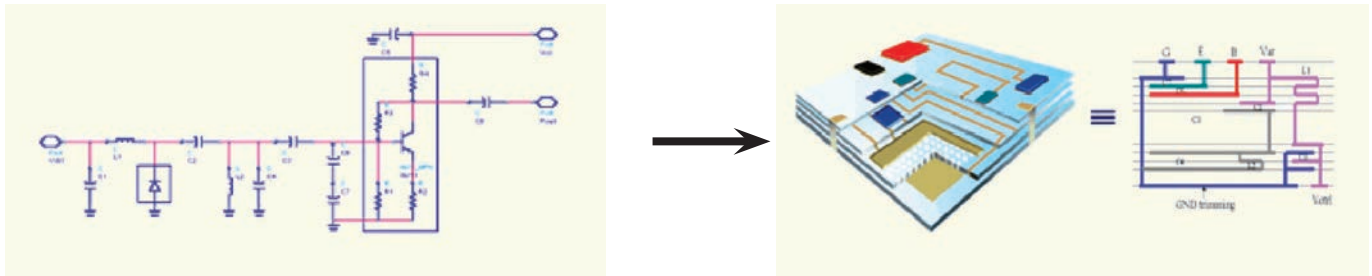
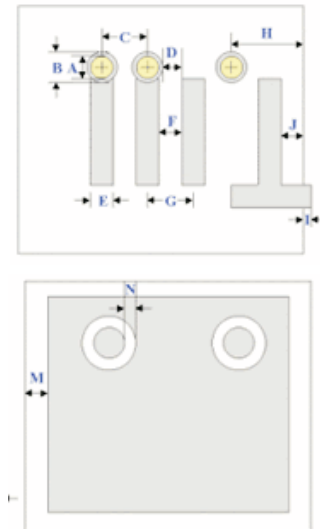


CUSTOM LTCC MODULE FOUNDRY SERVICE

Johanson Technology has the capability to produce a wide range of application specific components for wireless communication such as Diplexer Switch, VCO, PA and highly integrated RF modules using LTCC (Low Temperature Co-fired Ceramic) technology. We offer extensive expertise using an internally developed LTCC tape system.



Design Rules	Standard (mm)	Advanced (mm)
(A) Via Hole Dia	0.125, 0.180	0.06 (min.)
(B) Via Cover Dot Dia	$\geq \text{Via} + 0.03$	$\geq \text{Via} + 0.02$
(C) Via Center Spacing	≥ 0.20 (for 0.07 via)	≥ 0.18 (for 0.05 via)
(D) Via Cover Dot Edge to Line Edge	> 0.10	> 0.08
(E) Line Width	≥ 0.10	≥ 0.05
(F) Line to Line Spacing	≥ 0.10	≥ 0.08
(G) Line Center Spacing	≥ 0.18	≥ 0.13
(H) Outside Edge to Via Center	≥ 0.15	≥ 0.135
(I) Line Over Outside Edge for Cutting	> 0.05	> 0.05
(J) Outside Edge to Line Clearance	> 0.10	> 0.10
(M) Buried Ground Plane Spacing	0.10	0.10
(N) Feed Thru Spacing	0.15	0.10
Substrate Thickness	0.5 to 1.6	0.3 to 2.4
Number of Layers	Up to 20	Up to 30



LTCC Tape Characteristics	JTI
Dielectric Constant (@ 3GHz)	7.5
Dielectric Loss (@ 3GHz)	0.33%
TCE (25-300°C) (ppm/°C)	4.7