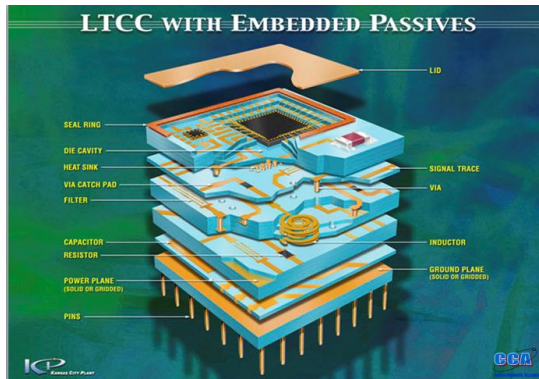


## LTCC Packaging Technology Course Outline (1 Day)



This course is intended as an intermediate level course for process engineers, designers, quality engineers, and managers responsible for design and manufacture of Low Temperature Cofired Ceramic (LTCC) substrates, mixed signal MCM's, modules and microwave hybrids.

This course examines the major aspects of LTCC packaging from a practical perspective. The instructors share valuable lessons learned from years of experience. Design issues, material trade-offs and process selection are all addressed and there is a special focus on integration of screen printed passive elements on green tape.

### Course Outline

Introduction to LTCC Technology

History

Terminology and product definitions

Why LTCC for RF Applications?

Embedding Passive Structures (R,C and L) into the LTCC

Attributes versus other ceramic substrate technologies (HTCC, thin film and thick film)

Attributes versus other organic (PWB) substrate technologies

Flow Diagram for LTCC substrate fabrication

LTCC Manufacturing Process and Materials Overview

Ceramic slurry and tape cast process and materials overview

Drying, Via Punching, Via filling, Screen Printing, Lamination, Co-Firing

Pre and Post Processing



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## **LUNCH**

### Thick Film Processes

- Screen printing machine variables and controls
- The drying and firing process
- Thickness measuring techniques

### LTCC Design Rules and Guidelines

#### Layout and RF Software Suppliers

Thermal analysis, simulated stack up and junction temp calculations

Basic hybrid microwave manufacturing process flows integrating LTCC substrates and Packages.

DFM (Design for Manufacturability) and Typical Problems in LTCC

### LTCC Applications

- LTCC Worldwide Market Segments
- LTCC Tape and thick film material suppliers
- LTCC Capital Equipment and Suppliers

Summary and Review Q&A Session