LTCC for Micro- and Millimetre-Wave Applications

Date & Time: Sunday September 14, 14:00-18:00

Location: (To be assigned)

Topics:

- **LTCC Process**
- **3D-Simulation and Test Methods**
- **Applications in Telecommunication and Sensor Electronics**

Speakers:

IMST GmbH:
Reinhard Kulke
Peter Uhlig

Abstract:

LTCC as a ceramic multilayer technology has a great potential for micro- and millimetre-wave applications. The dielectric tapes as well as the gold and silver conductors have the appropriate physical and electrical performance. In spite of being a very mature technology, LTCC has recently gone through large improvements in material development and has become available for communication equipment manufacturers through LTCC foundries. The competitive price of materials and production make LTCC an ideal basis for System in a Package (SiP) and Multi Chip Modules (MCM). LTCC circuits can consist of a nearly arbitrary number of layers. Components can be integrated in cavities. LTCC substrates are rugged, hermetic and environmentally stable. These features and further favourable characteristics are utilized to develop compact and efficient modules for communication and sensor applications.

Who Should Attend?

The course is dedicated to scientists and engineers working in research and development of RF, micro- and millimetre-wave modules. The participants should have a basic knowledge in RF- and/or microwave design. It will give managers an understanding of this technology.

Learning Objectives / Outcome

At the end of the day the audience will have a basic overview and knowledge about LTCC substrate and conductor materials, process steps and design rules. A specific focus will lie upon the design of micro- and millimetre-wave circuits and antennas. This includes typical waveguides in LTCC as well as transitions, housing, filters and other passive components. Solutions for entire transceiver modules will be discussed to give the participants an insight into the design and development of basic and complex circuits. Keywords for typical applications are ISM-Band and Frontend Modules, Radar and sensor technology.

About IMST GmbH:

IMST GmbH provides radio communication solutions for mobile applications, industrial automation, and medical technologies. Our clients count on us for comprehensive technology solutions. The LTCC team at IMST designs your RF circuits and antennas from MHz to high GHz frequencies. Our experts also provide real 3D electromagnetic modelling and simulation to meet the challenges of highly integrated multilayer RF circuits. A group of specialists in LTCC manufacturing and characterization are available at our sophisticated facilities. Our team puts more than 10 years of industry-related and application-driven R&D experience at your service. Though IMST GmbH maintains excellent relationship to LTCC material suppliers as well as LTCC foundries it acts completely independent from these organizations.

About the Speakers:

Dipl.-Ing. Reinhard Kulke: Electrical engineer since 1991; Head of unit "RF Modules"; Responsible for R&D in RF and microwave circuit design in LTCC; More than 30 publications with focus on ceramic applications; Organizer of several seminars and workshops.

Dipl.-Ing. Peter Uhlig: Electrical engineer since 1984. Responsible for the Hybrid Microelectronics Laboratory which includes the LTCC prototyping line; Expert in RF and microwave packaging, thin film, PCB, LTCC, assembly and integration techniques.