LTCC Substrates

- High frequency low loss packages
- Sensor packages
- Multi-chip modules
- High reliability substrates
LTCC (Low Temperature Co-fired Ceramic) is a multilayer capable substrate technology offering excellent RF and microwave performance characteristics. Its low sintering temperature (approximately 900°C) allows co-firing with highly conductive metals such as silver and gold. The excellent mechanical and electrical properties of LTCC substrates, combined with the ability to embed passive components, offer superior RF performance and device miniaturization for high frequency applications.

**LTCC TECHNOLOGY**

- Multilayer technology up to more than 20 layers
- Gold and silver based metallization systems
- Fine line patterning (< 50 μm in selected areas)
- Embedded resistors, capacitors, inductors and strip lines
- Integrated fluidic channels and 3D structures (stepped cavities, windows)

**PACKAGES**

- RF interconnect
- Embedded decoupling capacitor
- Hermetic sealed
- Thin film pattern
- Buried resistor
- Braided frame and lid
- SMD

**FEATURES**

- High frequency performance up to 90 GHz by use of low loss ceramic
- Adjusted thermal expansion coefficient to Si and GaAs
- Short wire bonds due to capability of precise cavity generation
- Thermal vias for heat dissipation
- Application of heat sinks, frames and nail head pins by brazing

**SUBSTRATE CHARACTERISTICS**

- Maximum substrate size: 4" x 5"
- Tape thickness: 95 μm, 135 μm, 204 μm
- Flexural strength: 320 MPa
- Thermal coefficient of expansion: 5.8 ppm/K
- Thermal conductivity: 3 W/mK

**CAVITIES, LINES / SPACES**

- Dielectric constant @10 MHz: 7.8
- Dielectric loss @10 MHz: < 0.0015
- Breakdown voltage: > 1000 VDC / 25 μm
- Insulation resistance @100 VDC: > 1012 Ω
- Substrate flatness: < 0.002 mm/mm

**FEATURES**

- Multilayer technology up to more than 20 layers
- Gold and silver based metallization systems
- Fine line patterning (< 50 μm in selected areas)
- Embedded resistors, capacitors, inductors and strip lines
- Integrated fluidic channels and 3D structures (stepped cavities, windows)

**PACKAGES**

- RF interconnect
- Embedded decoupling capacitor
- Hermetic sealed
- Thin film pattern
- Buried resistor
- Braided frame and lid
- SMD

**SUBSTRATE CHARACTERISTICS**

- Maximum substrate size: 4" x 5"
- Tape thickness: 95 μm, 135 μm, 204 μm
- Flexural strength: 320 MPa
- Thermal coefficient of expansion: 5.8 ppm/K
- Thermal conductivity: 3 W/mK

**CAVITIES, LINES / SPACES**

- Dielectric constant @10 MHz: 7.8
- Dielectric loss @10 MHz: < 0.0015
- Breakdown voltage: > 1000 VDC / 25 μm
- Insulation resistance @100 VDC: > 1012 Ω
- Substrate flatness: < 0.002 mm/mm

* Depends on number of vias and vias per row
# Smaller sizes on request

For the complete DESIGN GUIDELINES please contact MSE.

Micro Systems Engineering GmbH (MSE) specializes in customized solutions for advanced microelectronics. MSE has experienced continuous growth for more than 30 years, and today the company is among Europe’s leading suppliers of complex LTCC substrates as well as board assembly and semiconductor packaging technologies for both ceramic and organic substrates.


Micro Systems Engineering GmbH is a company of the MST Group.

Micro Systems Engineering GmbH
Schlegelweg 17
DE-95180 Berg (Oberfranken)
Germany
Phone +49 (9293) 78-0
Fax +49 (9293) 78-41
info.msegmbh@mst.com
www.mst.com/msegmbh

MSE is a company of the MST Group.

Micro Systems Technologies
engineering for life

Micro Systems Technologies
Neuhofstrasse 4
CH–6340 Baar, Switzerland
Phone +41 (44) 804 63 00
Fax +41 (44) 804 63 01
info@mst.com
www.mst.com