VIA electronic GmbH

„The Smart LTCC Foundry“

Robert-Friese-Strasse 3
D-07629 Hermsdorf, Germany
Contact: Franz Bechtold
www.via-electronic.de

.

Company Profile

Content

- Background Information
- Company Services
- Company Datas
- Arguments for LTCC
- Innovation Capability of LTCC
- R&D activities
- Advanced Processes and Materials
- Advanced applications
- Fanimat Network activities

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Informations

VIA electronic GmbH is located in Hermsdorf/Germany

Embedded in a network of SMEs and Research Institutes

Reputated as a „SMART LTCC Foundry“

Specialised in the realisation of innovative solutions in LTCC Technology.

On the market since 1997 with 18 Employees per today

Certified according to ISO 9001:2000

VIA electronic

Company Profile

Background

VIA electronic is a Management buy out of the LTCC activity from Siegert electronic in Nürnberg

The founder gained reputation in Thickfilm hybrids and LTCC from 1987 bis 1997 in Siegert electronic /Nürnberg

In October 1997 VIA electronic was founded in the Industry Park Tridelta in Hermsdorf/Thuringia

Core competence: customer taylored solutions in innovative LTCC mulitlayer ceramics from the development stage until series production

Products: Mulilayer substrates, Multichip Modules, 3-D Packages, Multilayer components

VIA electronic

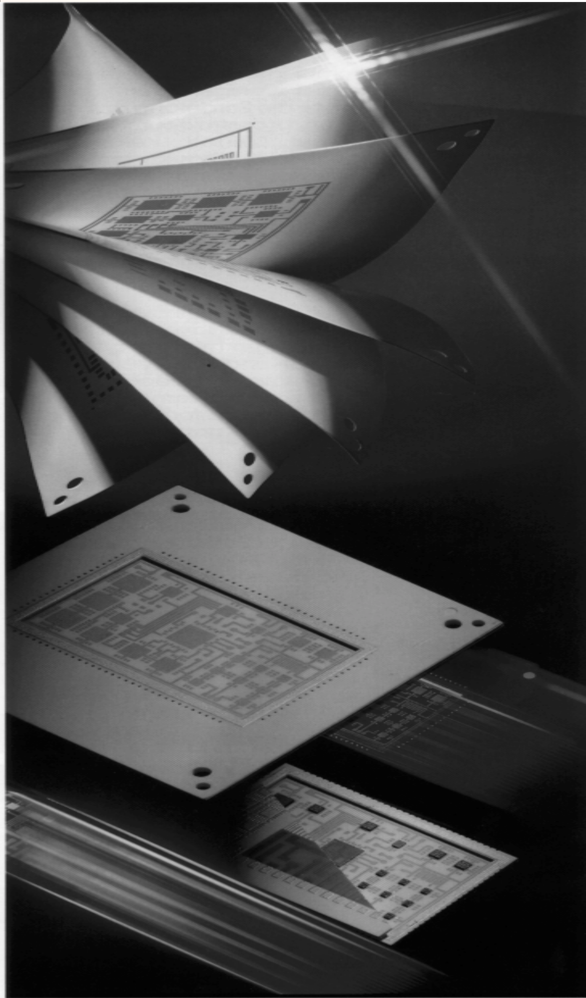
Background: Historical Bricks

Region:	**Hermsdorf is a center for Technical Ceramics since 1910.**
	Up to 1989 The „Ceramic Plants“ of Hermsdorf were a 7.000 people company
Company:	**VIA electroncic was found in Hermsdorf in 1997 as a management buy out from Siegert electronic, a German Hybrid manufacturer dealing with LTCC since 1986**

VIA electronic

Company Profile

LTCC Technology



Unsintered ceramic foils (ceramic) are mechanical shaped

Vertical conductive paths (Vias) are punched as very small holes and filled with metal paste afterwards.

The lateral conductive pattern is screenprinted in advanced thickfilm technology

The seperate layers are positioned accurately and laminated together by hot pressing.

This laminate is sintered in a singulare process (cofiring) at low temperatures (low temperature) at about 900°C to the completely wired substrate or package.

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

Services

- **State of the art CAD design and layout**
- **Flexible manufacturing line**
- **All lot sizes**
- **Installed capacity of 5 Mn circuits per year**
- **High precision processing**
- **Experienced in different material systems**

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Products

- RF modules
- 3D packages
- Multichip modules
- Multilayer ceramic boards
- Multilayer components
- Thinfilm substrates

Company Profile
Capital Structure

Stock capital	410.000 €	
Shareholders	43,5 %	Franz Bechtold
	37,5 %	Microtel s.p.a.
	19,0%	Siegert TFT

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile
Development

	Employees	Turnover K€
1997	Foundation in October	
1998	7	300
2001	15	1000
2004	14	1.000
2006	16	1.150
2008	18	1.250

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

Milestones

1997	Foundation
1999	Cleanroom Operation 150m2
2000	Completion of the Investments First business year without losses
2002	Certification ISO 9001:2000 Expansion manufacuting room 150m2
2003	Set up of a European Sales Network
2005	Expansion Laboratory room 250m2
2007	Participation of 25% in VIA optronics

Customers

Siegert electronic
Siemens
Askion
Ketek

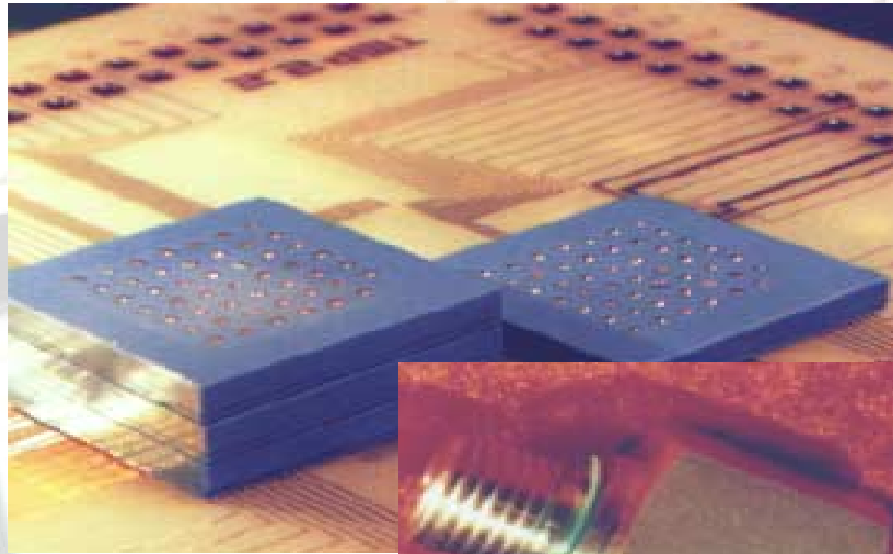
Ericsson
EADS
CEA-Leti
Thales

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile
Markets and Marketshares

- Telecom: 40%
- Medical: 20%
- Industry: 20%
- Avionic: 10%
- Automotive: 10%



VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Quality Management

DIN ISO 9000:2000 certified since 2002

Thüringen Quality Award 2003

Company Profile

Arguments for LTCC

Highest Integration Capability

< 150 µm lines and spaces

< 150 µm via diameter

integrated passive components: resistors, capacitors, inductors, filters

integrated fluidic components: channels, chambers

Cavities and windows for active compontens

Integrated sensor components

Integrated heater

Arguments for LTCC

- **Superior Reliability**
    - Life Time of more then 50 Years
    - Operating Temperature up to 250°C
    - Temperature Cycling Stability from -55 to 150 °C

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

The nanotechnology approach

Gradient material properties

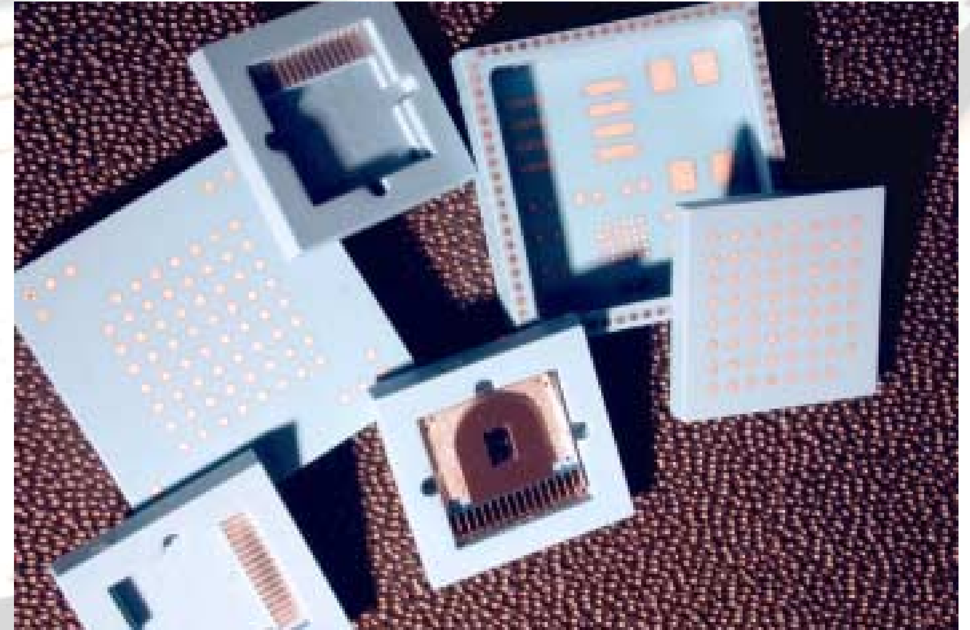
Surface properties

Mechanical properties

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

Innovation Capability for LTCC

- **High innovation force**
  - High temperature electronics
  - Sensors
  - Microsystems
  - Optoelectronical systems



Innovation Capability for LTCC

- **High innovation speed**
  - Material development
  - Process integration
  - Component integration
  - Hybrid microsystem integration

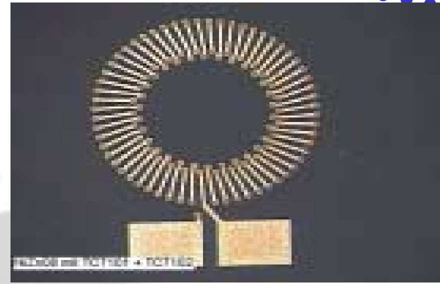
VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

R&D: Smart LTCC Components with integrated passives

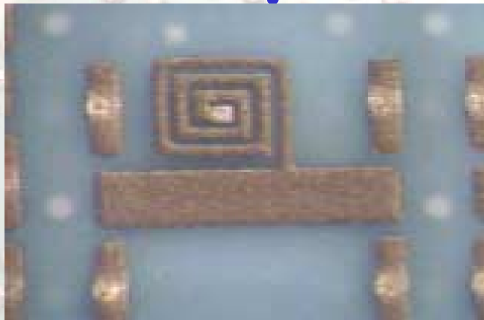
Power transformer



L/C Bandpass

Ferritic ltcc inductor

SMT compatible LTCC Integrated Passive components for low power, high power, low frequency and high frequency applications using new dielectric materials and new manufacturing processes



LC phase shifter

Integrated resistor

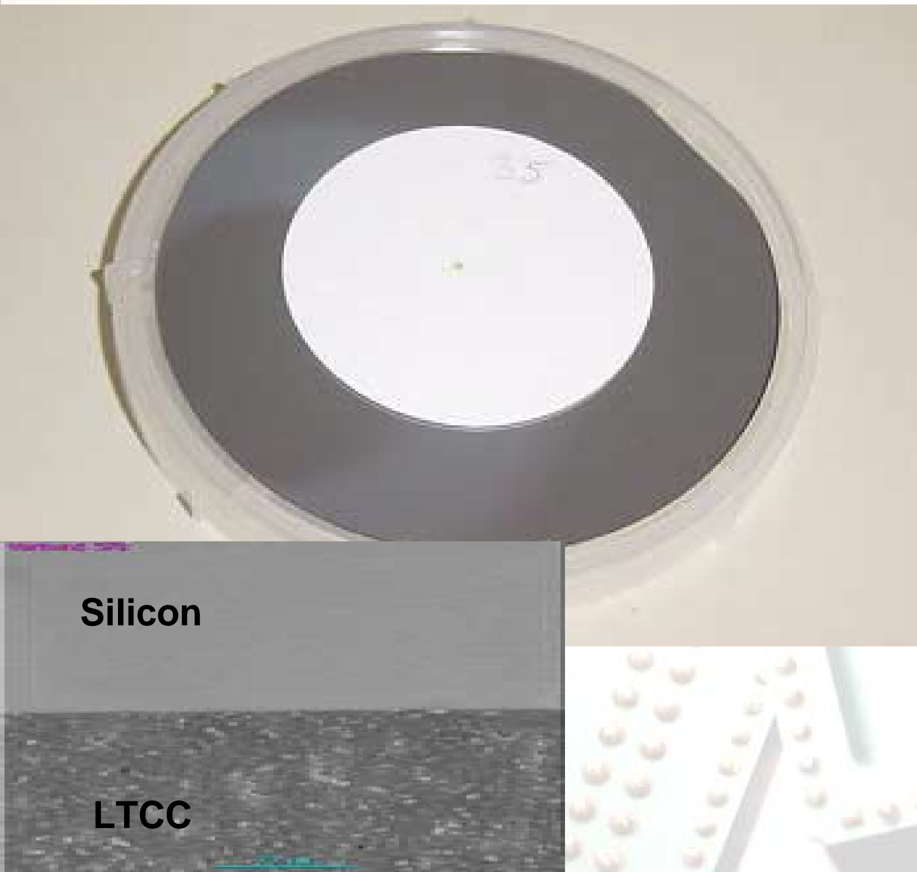
VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

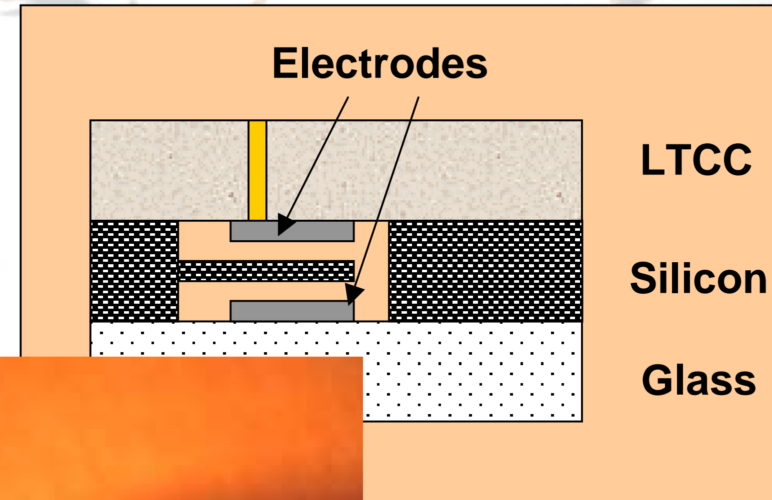
Company Profile

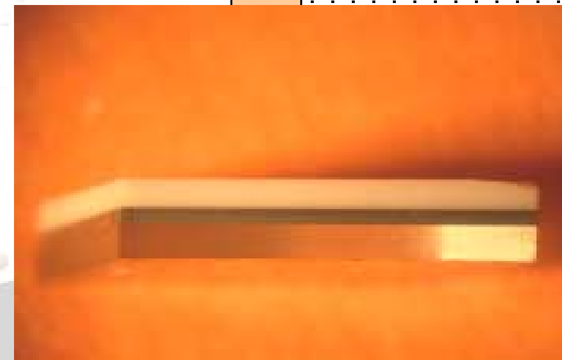
R&D : Wafer Level Packaging by anodic bonding to LTCC

LTCC substrate bonded with Si- wafer and cross section of bonded area



LTCC metallized wafer bonded with the Si- and glass-wafer simultaneously by anodic bonding at 400°C, 1500 V, Schematic and Demonstrator



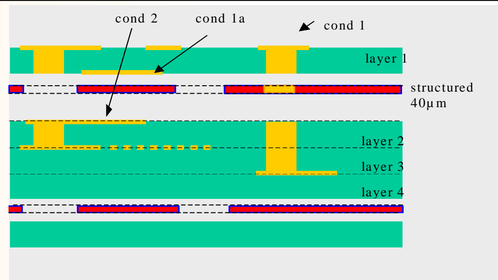


VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

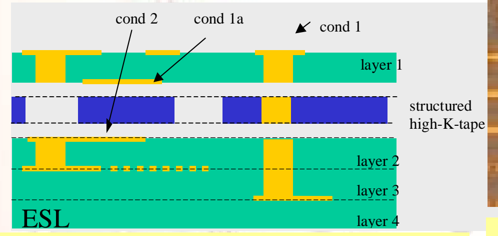
VIA electronic

Company Profile

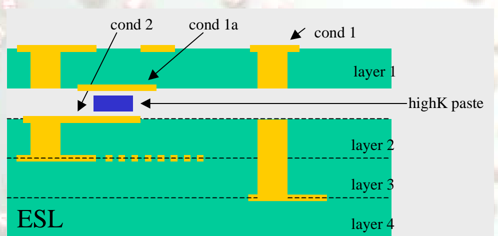
R&D: Integrated Passives for MEMS switch modules



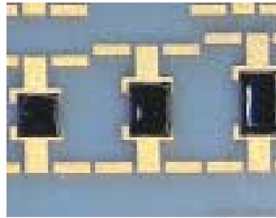
951C2/ 37µ layer



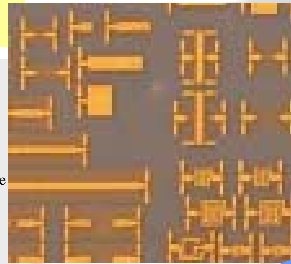
Integrated high-k-tape



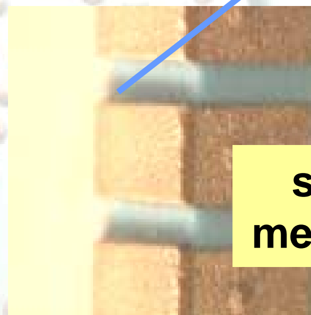
Integrated high-k ink



resistors

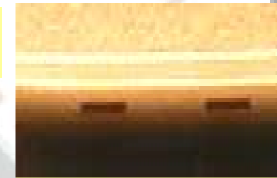


RF-structures

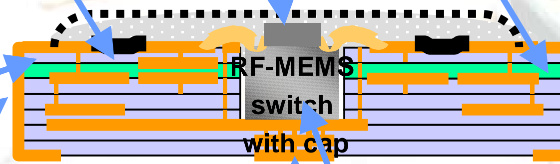


sidewall metallization

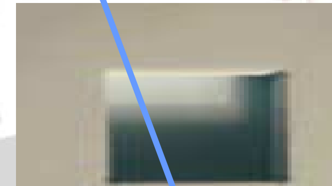
sealing



high k layer



thermal vias / spreader



cavities for RF-MEMS

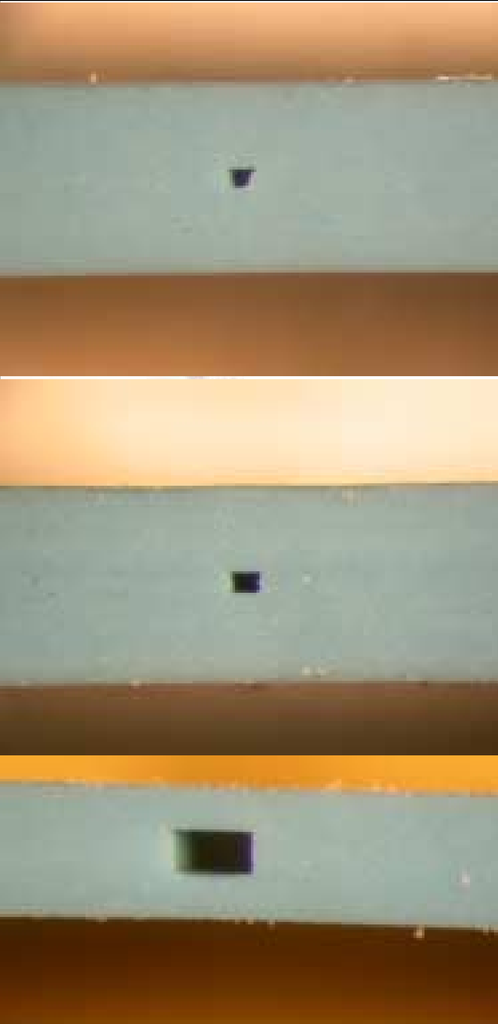
Source: Daimler Chrysler Research

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

R&D: Integrated Fluidics



Fluidic channel

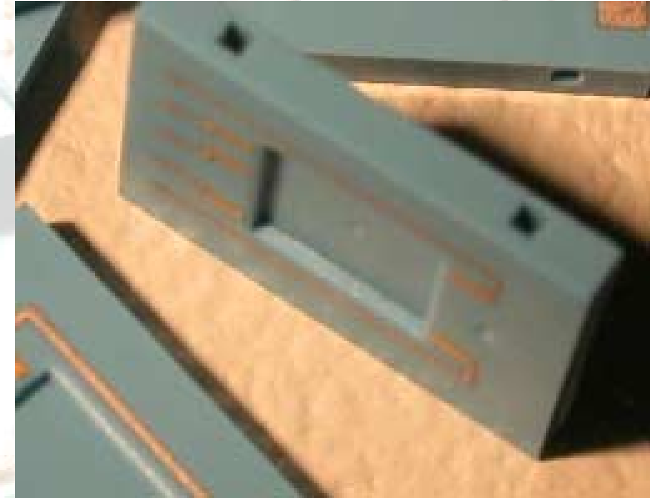
0,1 x 0,1 mm

Fluidic channel

0,2 x 0,2 mm

Fluidic channel

0,4 x 0,6 mm



Sensorpackage with integrated Fluidic

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

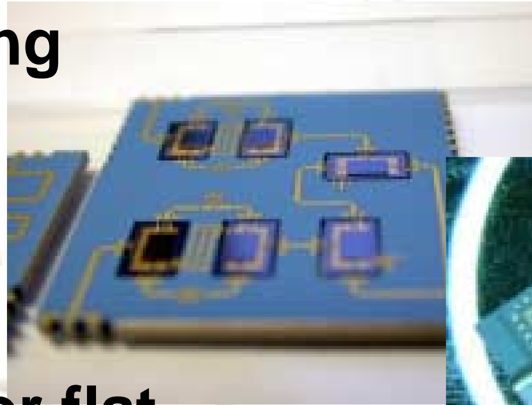
Company Profile

Innovativ Processes and Materials

AuSn brazing of Ring frames and heat sinks

Si Matched LTCC and anodic bonding at wafer lever

High performance LTCC for the Integration optical components



Ferritic LTCC for flat inductors and transformers

Direct bonded thinfilm on LTCC

Fine pitch Technology for high frequences

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

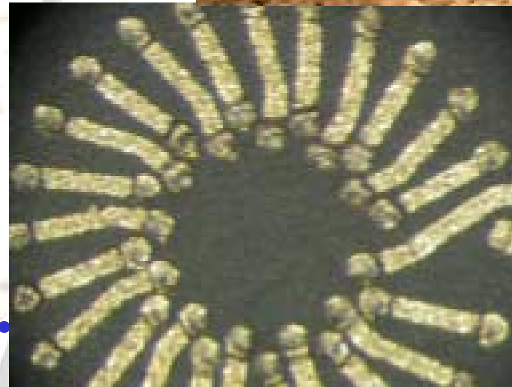
Company Profile

Innovativ Processes and Materials

Integrated Microreactors

Integrated microembossing technology for high power

0- Shrink Technology wiht highest precision



Integrated Sensors in thickfilm and thinfilm technology

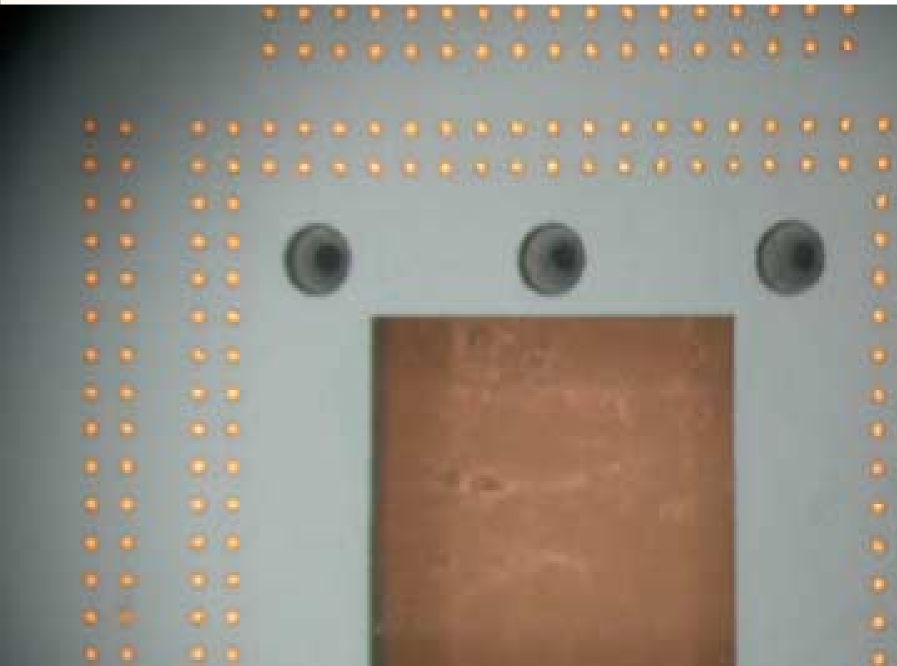
Monolithic integrated R-C-L components

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Advanced applications : Integrated Optoelectronics

Pressure assisted sintering



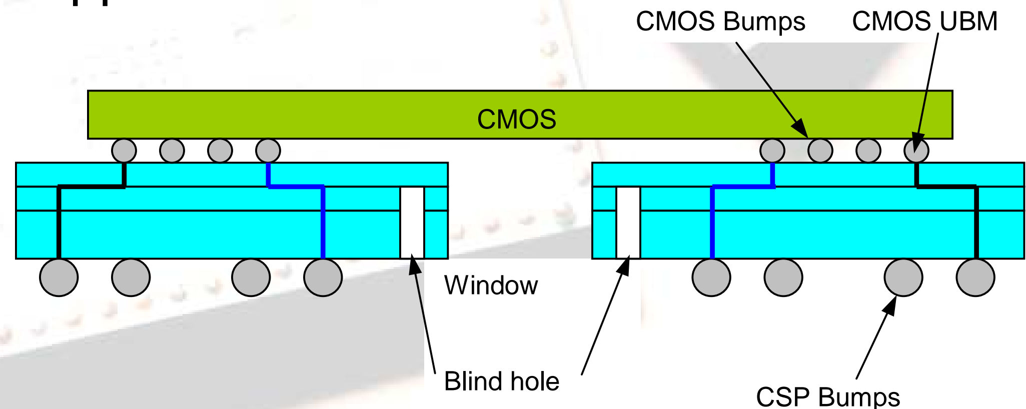
Material DuPont 951

Cavities, postfire laser cut

Blind holes, postfire laser drilled +-25µ

Vias 90µm, position +-50µm

Application: CSP for Si optical bench

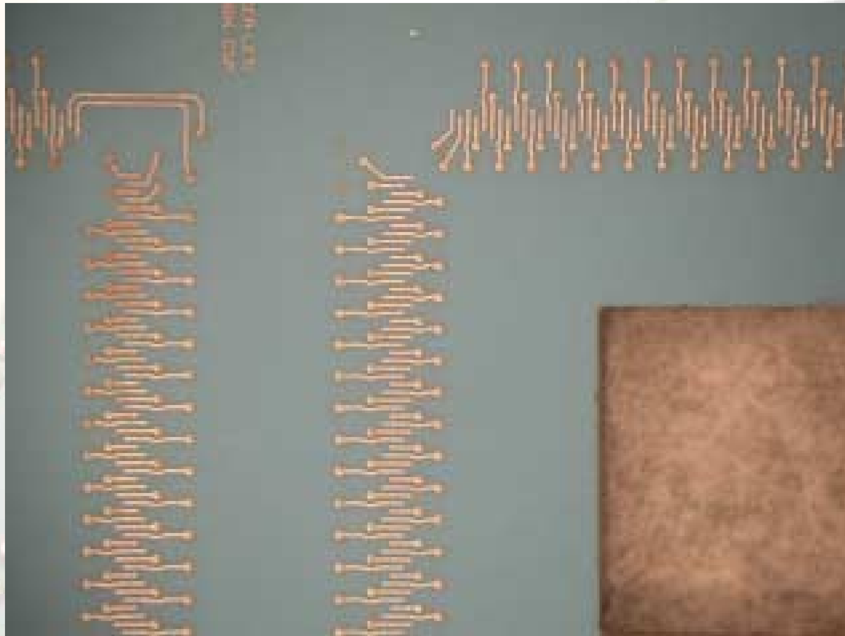


VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Advanced Applications : Integrated Optoelectronics

Pressure assisted sintering



Lapped
ra<0,2µm

Thickness 1,5mm +/- 5µm

Vias Interconnection: Thinfilm

Interconnect: BGA Backside

Oprating speed up 10Gbit

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

Company Profile

Advanced applications: Automotive

- Connection Electronic-Mechanics
- 25 Interconnections per cm^2
- Thermal Conductivity through thermal Vias
- Operating Temperature up to 125 °C

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

Advanced Applications : Biotechnology and Biosensors

Fluidic Chip with integrated high voltage conductors

Fluidic interconnection at 100µm channel

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

Company Profile

Advanced applications: Optoelectronics

Fraunhofer Institut Angewandte Optik und Feinmechanik

ASKION

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

Cooperation: Full R&D Chain from materials to products

From ceramic powders to ceramic based Microsystems and devices

Dedicated to Grow:

A local Network of Industries, R&D Institutes and Universities, for the Development and Realisation of Ceramic Based Microelelectronic Devices and Microsystems

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile

VIA Network

•VIA electronic

•R&D Chain	•Cooperative Research	•Sales Cooperations	Supply Chain
From •Materials To •Microsystems • •RF Support	Reputated •Research Institutes •And Universities	•Padar, Italy •Novapack, France •Soltec, Italy •Swildens, Benelux •Panda, UK •N-Tec, Swizz •Arrows, Israel	•Lust •Microtel •Siegert electronic •Amic Sistemi •Micro-Hybrid

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic

Company Profile
other regular activities

Exhibitions: SMT in Nürnberg, Micronora in Besancon

Memberships: ZVEI, Imaps Germany, MTT Thüringen, Eurimus

Research cooperations: 6th FP, Eureka, BMBF R&D Programms

Partnerships: Microtel S.p.a. Milano, Siegert TFT Hermsdorf

VIA electronic

Company Profile

news

Streamlining of the shareholder structure

Expansion of the manufacturing capabilities

Hermetic Packages

VIA electronic GmbH
Robert-Friese-Strasse 3
D-07629 Hermsdorf
www.via-electronic.de

VIA electronic