MINIATURIZATION, MECHATRONICS, MICROVIA:

SLIM.FLEX PCB SAMPLE WE.SCOPE!

Michael Kress / December 2023

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

INTRODUCTION

Speaker

Michael Kress

- Technical Projekt Management
  - Technical customer support
  - Project management

- Würth Würth Elektronik since 1996

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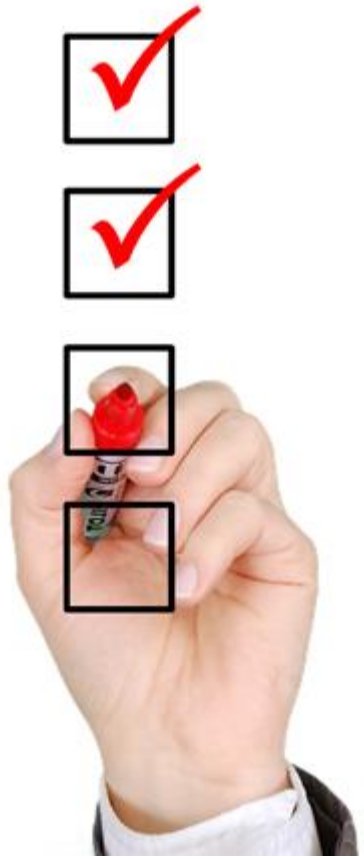
Michael Kress
Head of TP

SLIM.FLEX PCB SAMPLE WE.SCOPE

Agenda

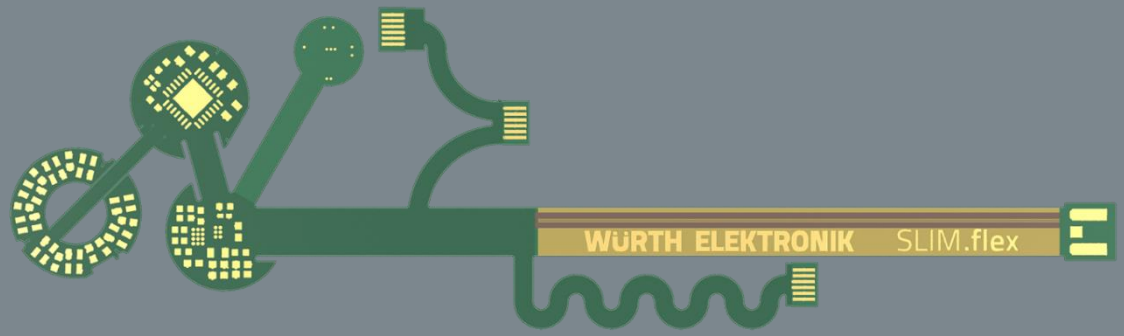
1. SLIM**.flex** physical PCB sample
   - What do we see?
   - Materials, Stackup
2. SLIM**.flex** design
   - Design parameters
   - Via connections
3. Handling options during the assembly process
   - Option FR4 solder carrier
   - Variants

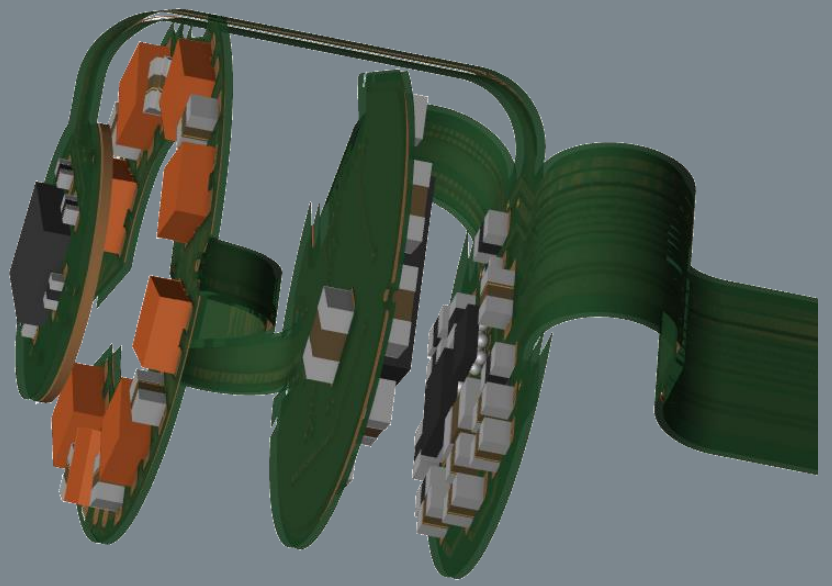


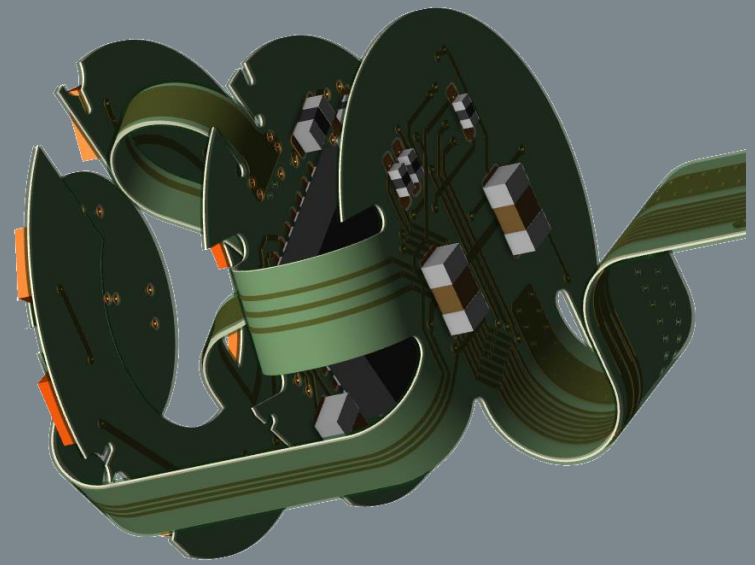
WHAT DO WE SEE?

SLIM.flex physical PCB sample Idee: Scope

- Meaning of „SCOPE“ here:
  - The possibilities
  - Abbreviation for "oscilloscope„



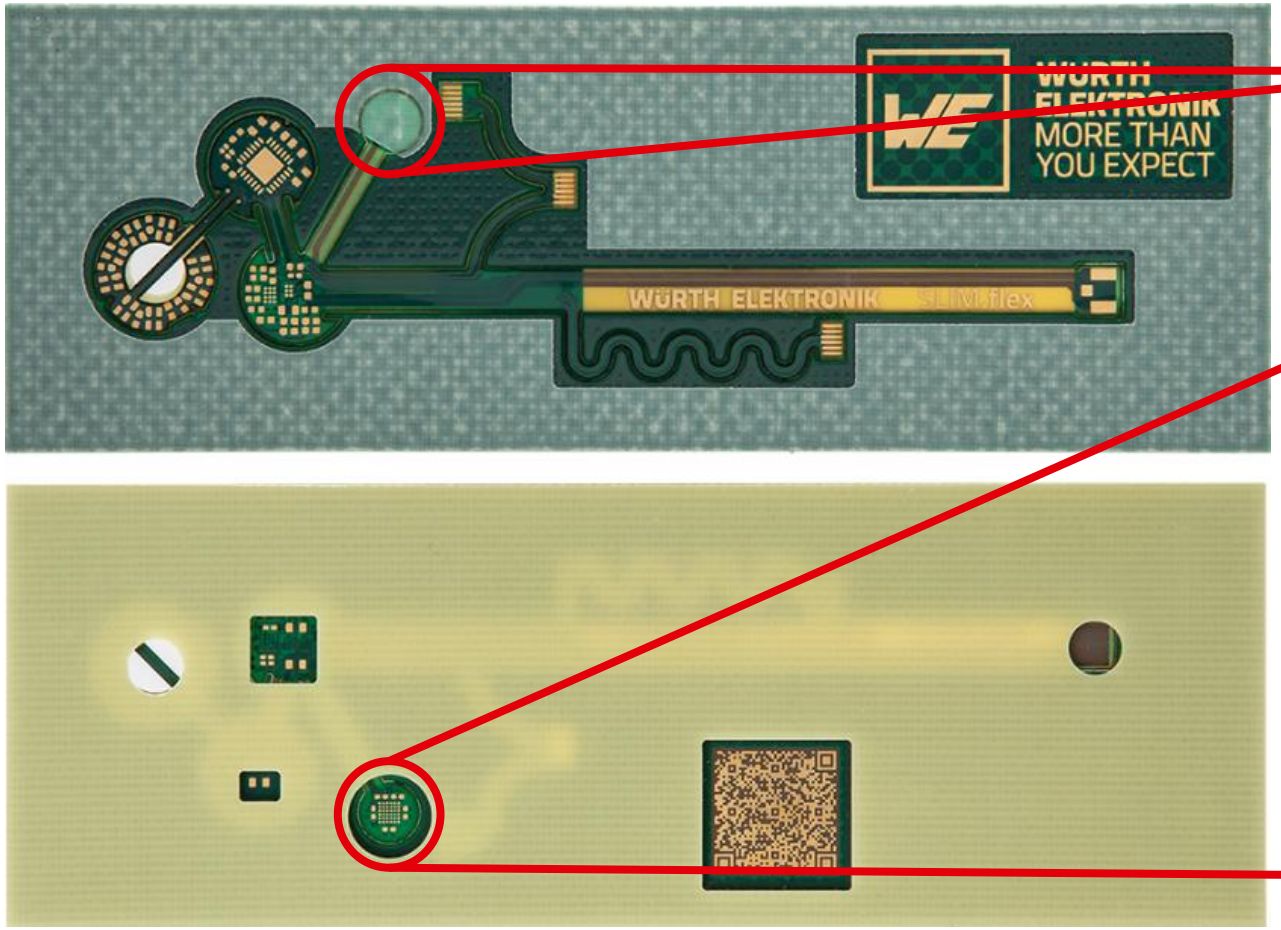




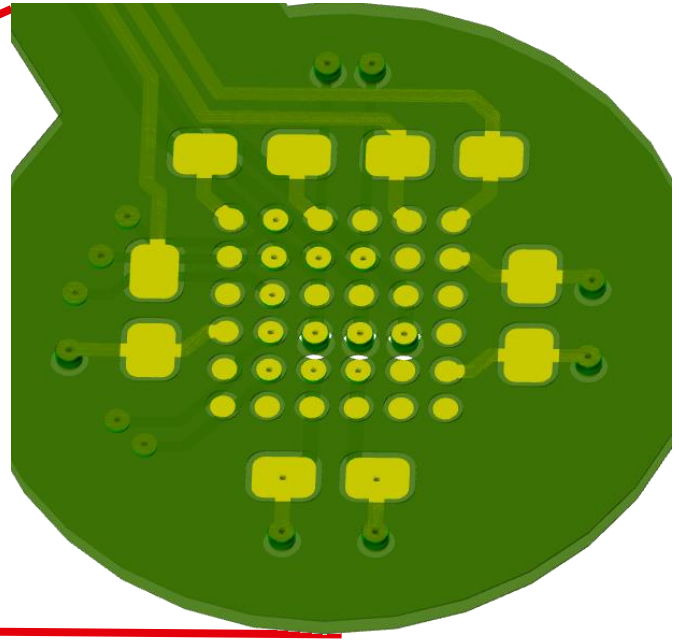
- Sensor, image processing and lighting, including various interfaces
- Optimized mechatronics with minimal space consumption in 2D (production, price)

WHAT DO WE SEE?

SLIM.flex 4 layers

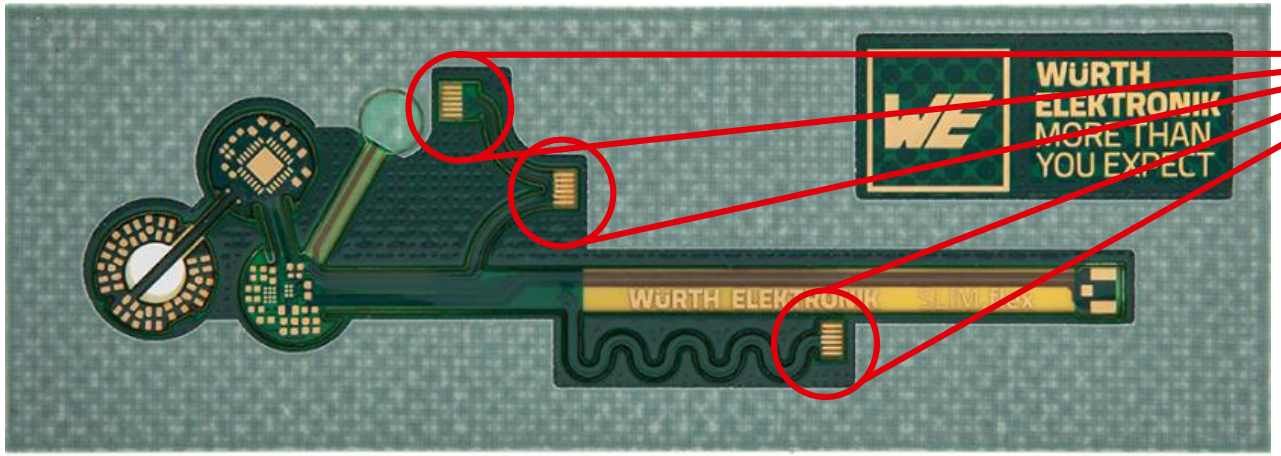


Component area BGA Pitch 0.35 mm
with FR4 stiffener

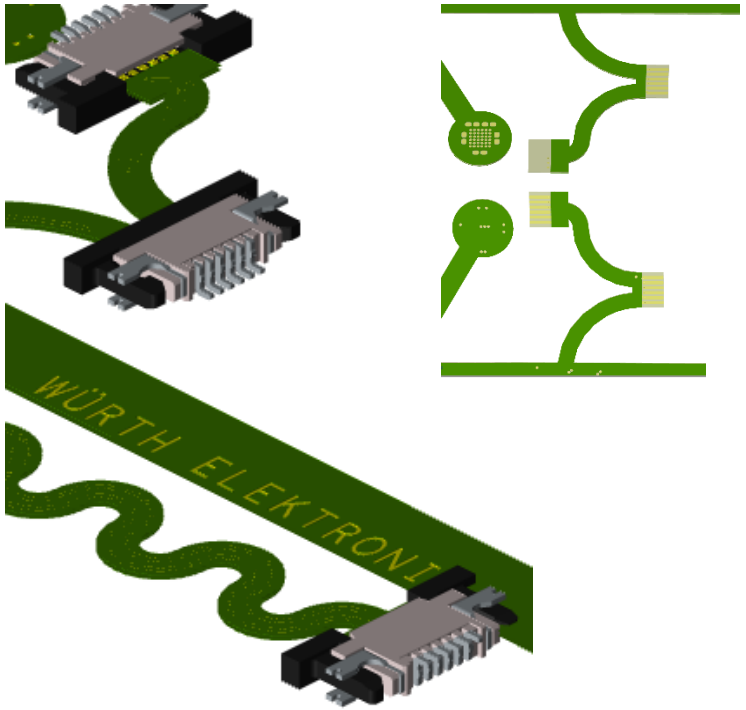


WHAT DO WE SEE?

SLIM.flex 4 layers



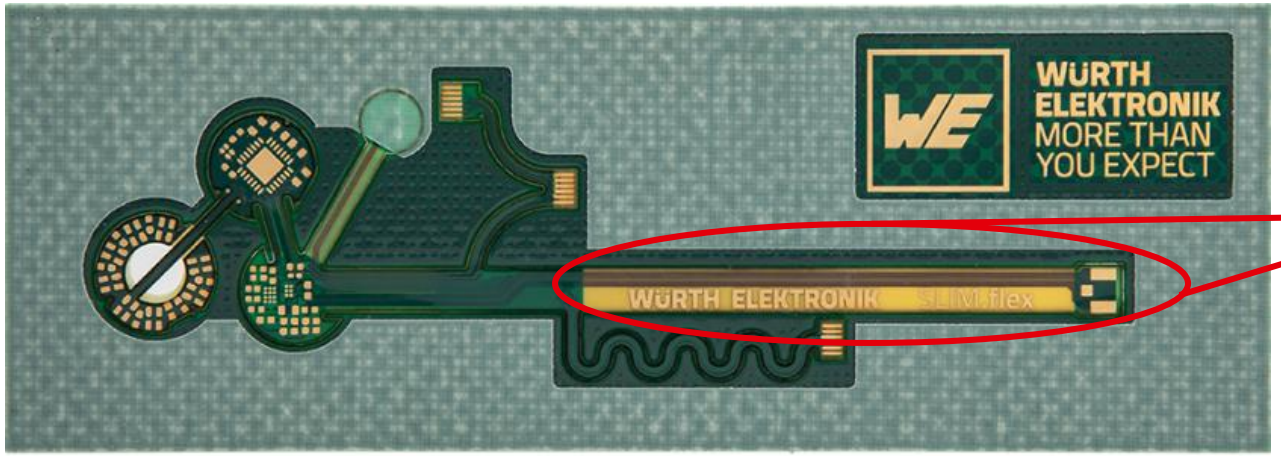
ZIF contacts: 1-sided or both sides
0.20 mm ± 0.03 mm thick



Snake flex with ZIF contact

WHAT DO WE SEE?

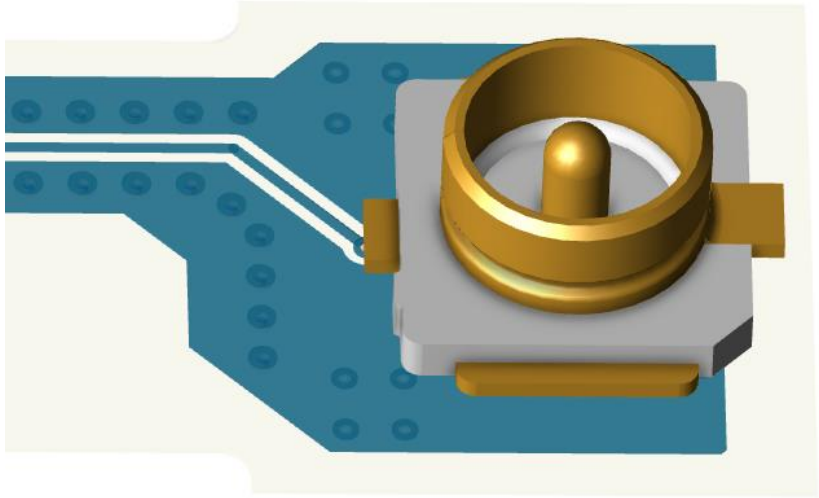
SLIM.flex 4 layers



Embedded Coplanar Strips 1B1A
Zo = 50 Ohms ± 10 %

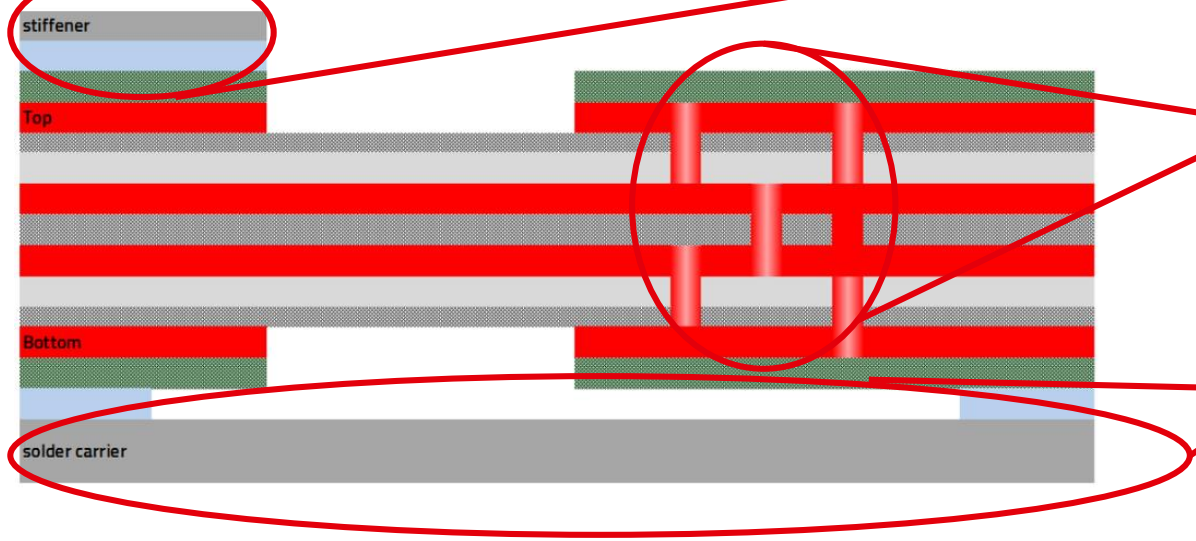
Top and bottom side without reference layer and without solder resist!

ADVANTAGE: highly flexible



MATERIAL STACKUP

Variant SLIM.flex Ri-4F-Ri, 4 copper layers with stiffener



Design 1: Local stiffener out of FR4 material

Design 3: laser drilled µVia connections, copper filing for via stacking

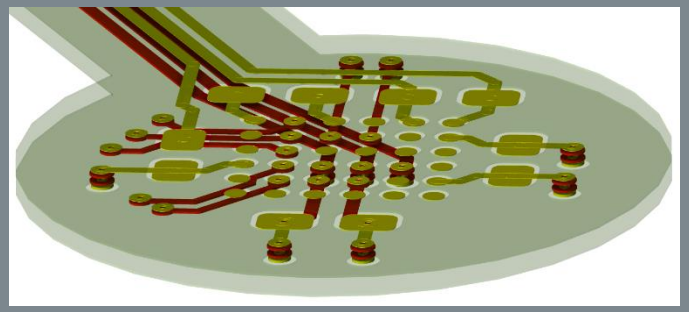
Design 2: Supplied on a 0.80 mm thick FR4 solder carrier. PCB not glued to carrier!

DESIGN PARAMETERS

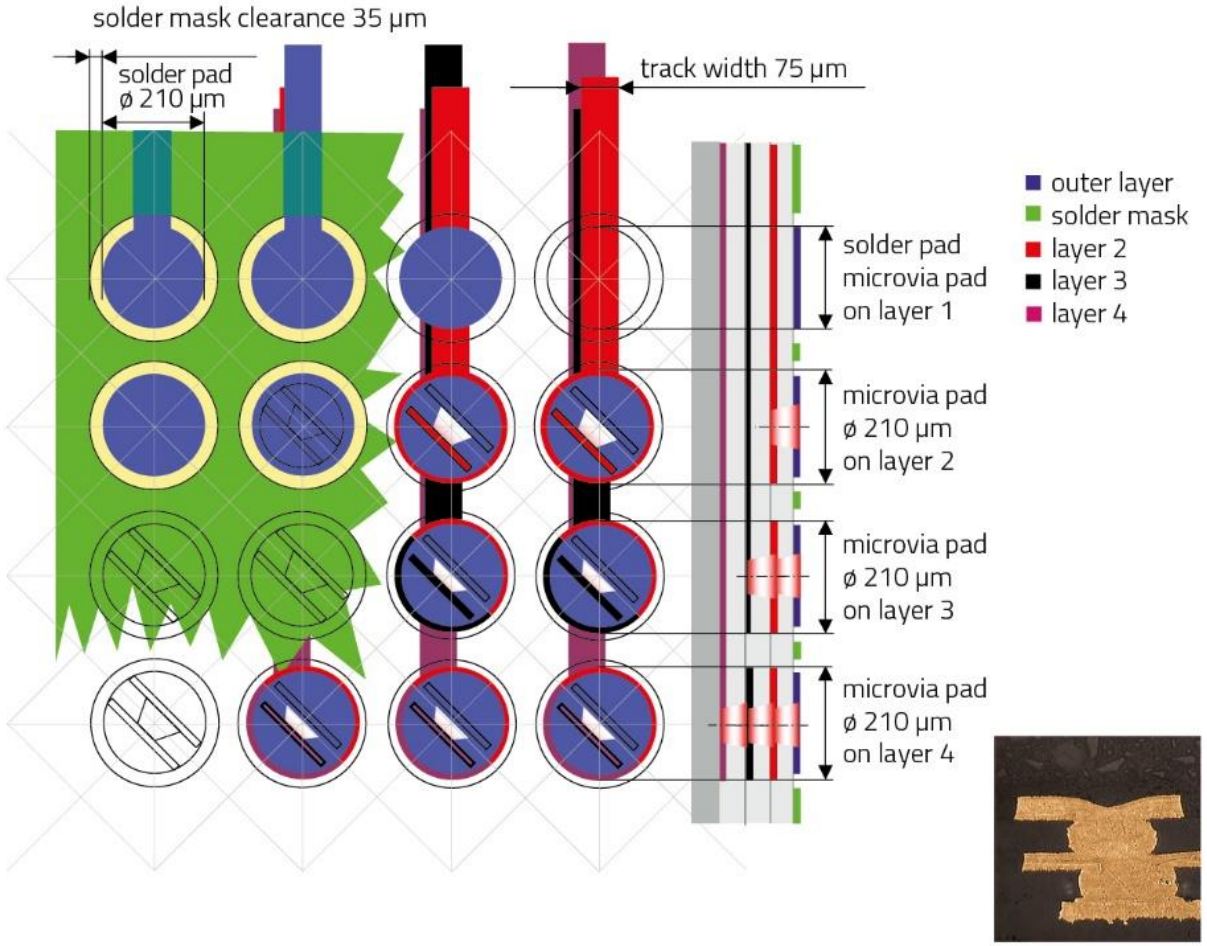
BGA pitch 0.35 mm with soldermask webs

Design Rules SLIM.flex- or SLIM.hdi-Technology	
BGA pad diameter	Ø 210 µm
Solder mask web	70 µm
Solder mask clearance	35 µm
Laser drilled µVia	Ø 85 µm
Lines and spacing	75 µm

Any layer Microvia Technology without PTHs!
Only µVia in Pad Technology with copper filling allowed!



BGA 0.35 mm pitch



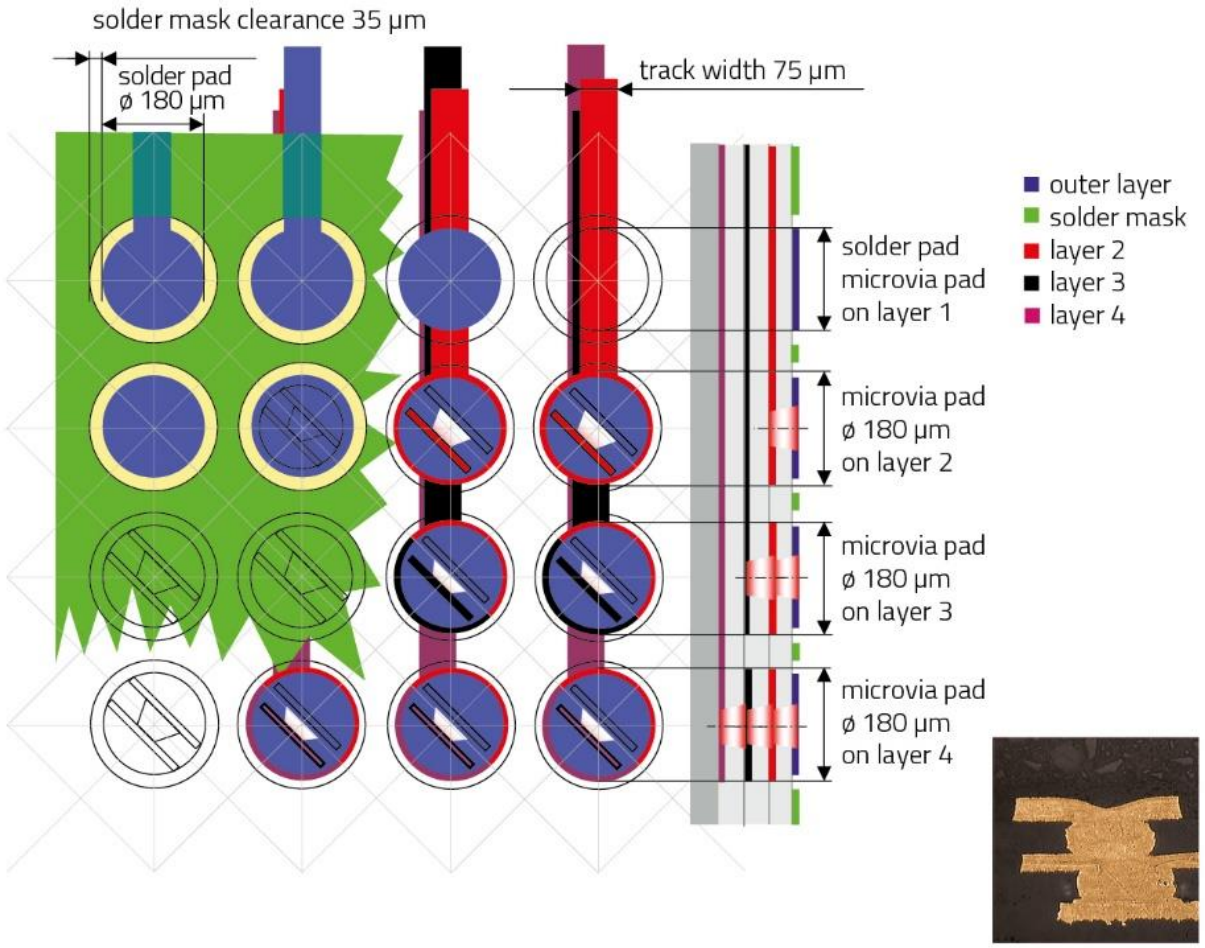
DESIGN PARAMETERS

BGA pitch 0.30 mm with soldermask webs

Design Rules only for SLIM.flex-Technology	
BGA pad diameter	Ø **180** µm
Solder mask web	**50** µm
Solder mask clearance	35 µm
Laser drilled µVia	Ø **60** µm
Lines and spacing	75 µm

Any layer Microvia Technology without PTHs!
Only µVia in Pad Technology with copper filling allowed!

BGA 0.30 mm pitch

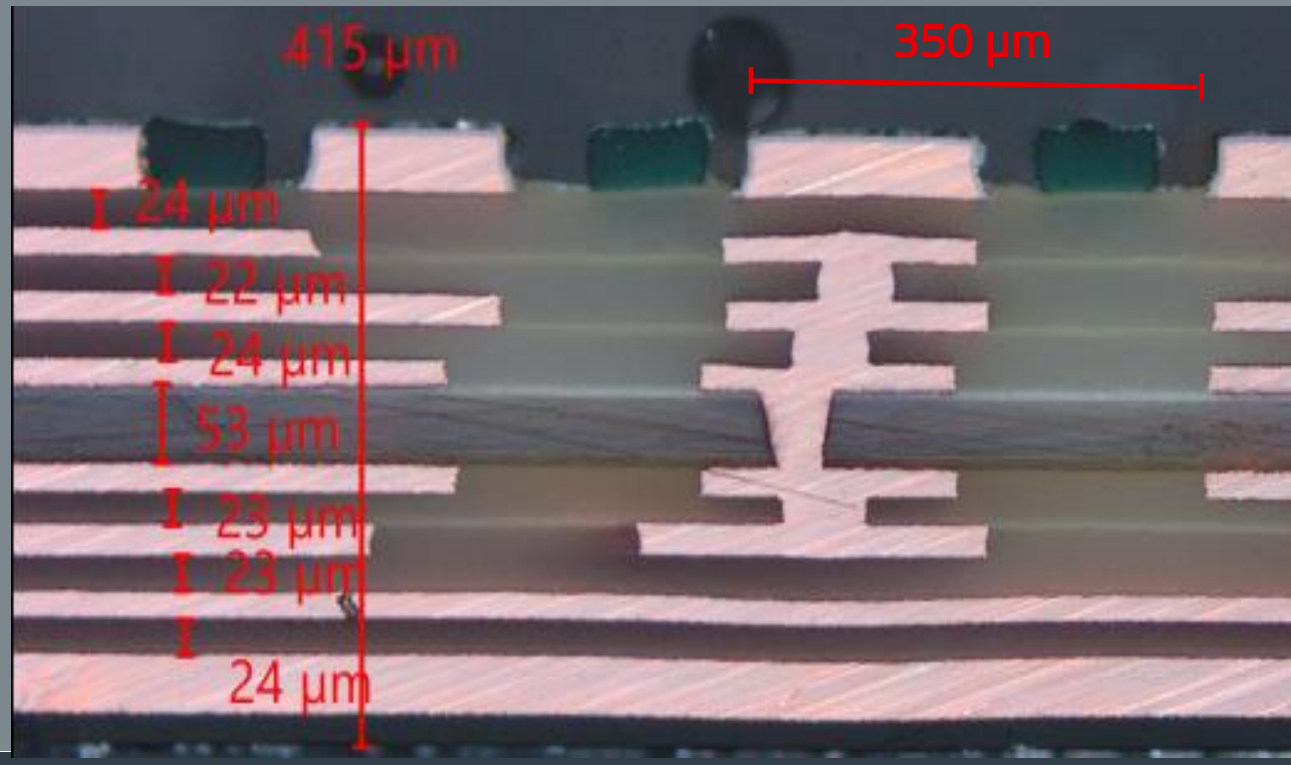


APPLICATIONS

A large number of customer projects produced in

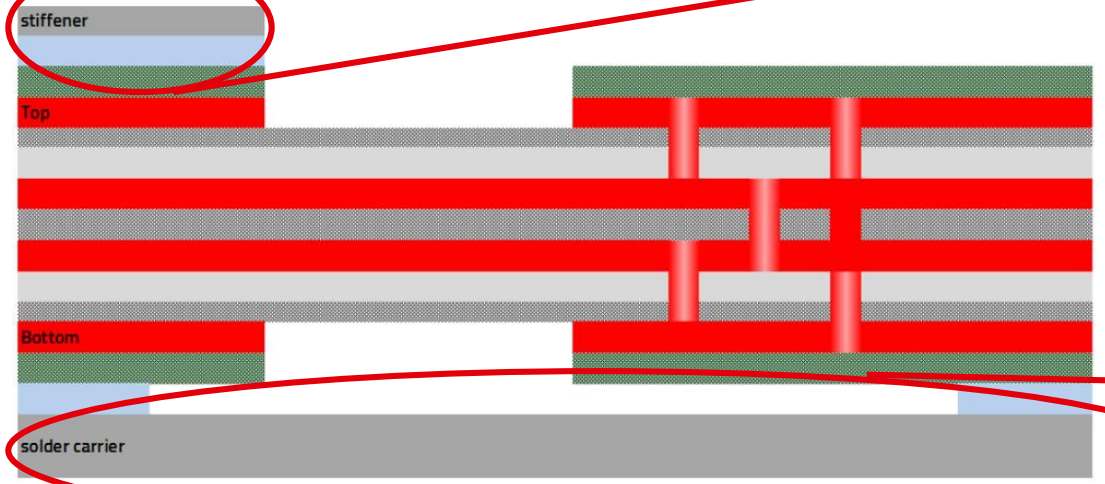
- Medical technology
- Camera technology
- Smart applications, such as glasses
- Sensor technology
- Research and development

- Cross sectional picture SLIM.flex 8F
  - 8 copper layers
  - Any layer microvia connections, no PTH
  - Solder mask webs



STIFFENER

Top und Bottom

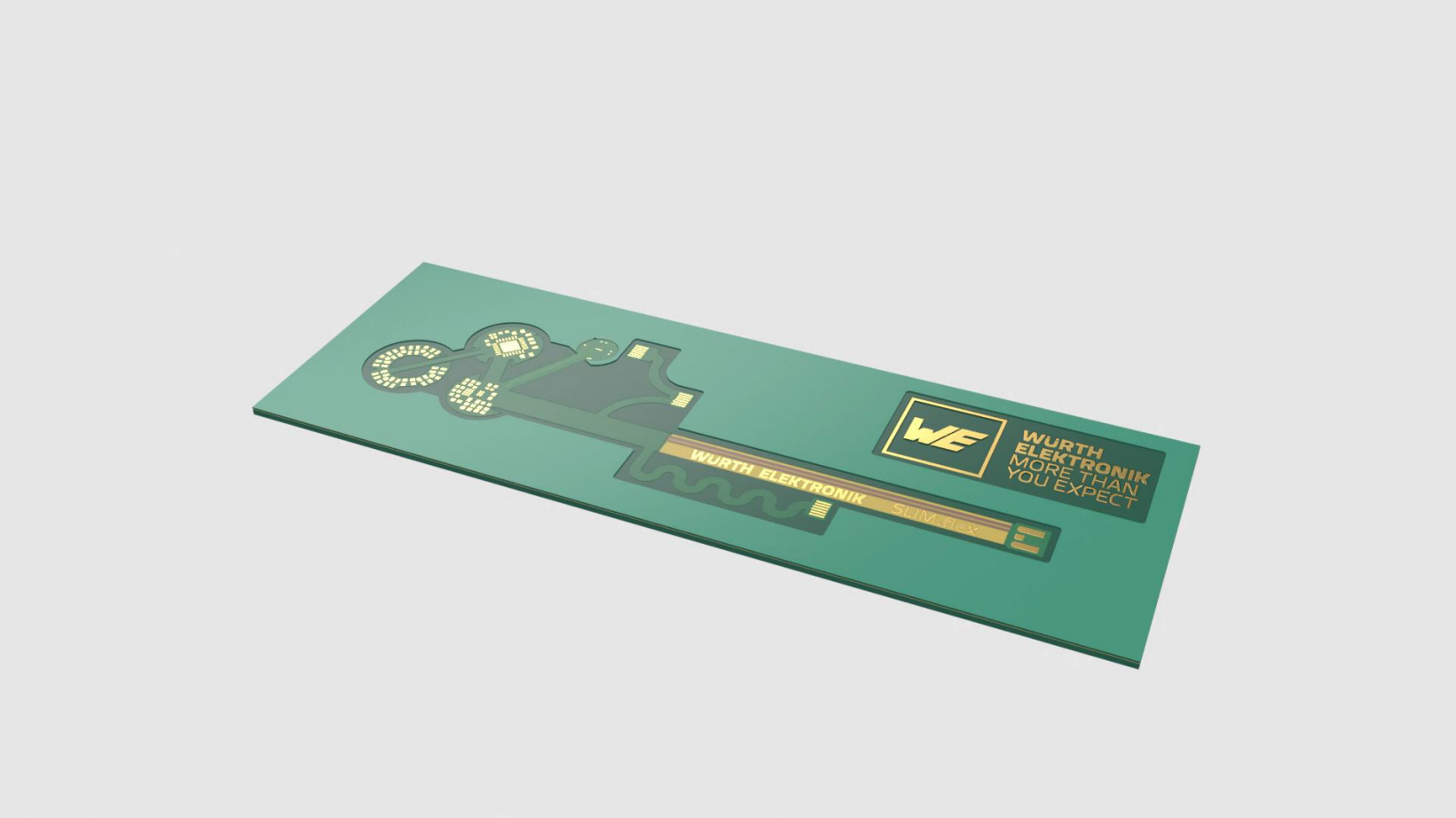


Option 1: Local reinforcement made of FR4 material as a quasi-rigid part

Option 2: Supplied on a 0.80 mm thick FR4 solder carrier. PCB not glued to carrier!

SOLDER CARRIER

Releasing the assembled PCB from the carrier



Solution:

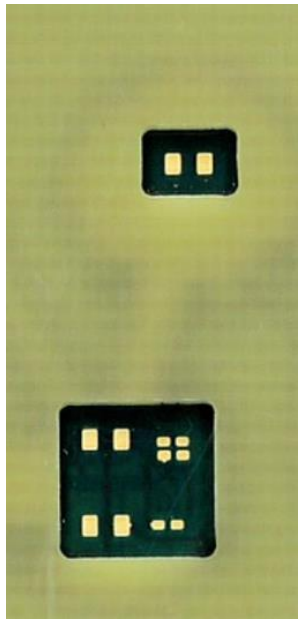
- On request, we can produce the PCB with an FR4 solder carrier, thickness 0.80 mm
- The contour is laser-cut with micro holding bars
- Lifting with pin and removal without additional tools

SOLDER CARRIER

Options

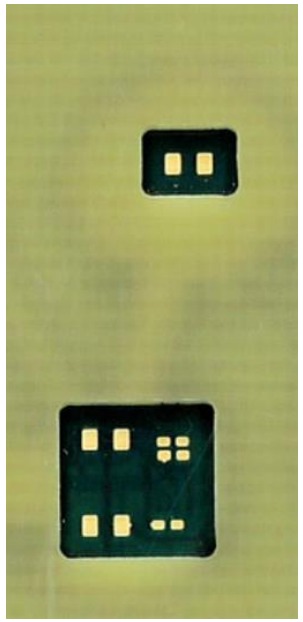
- Stepped stencils

Partial solder paste printing in a recessed SMD solder joint



- Dispenser processes

Partial solder paste printing in a recessed SMD solder joint



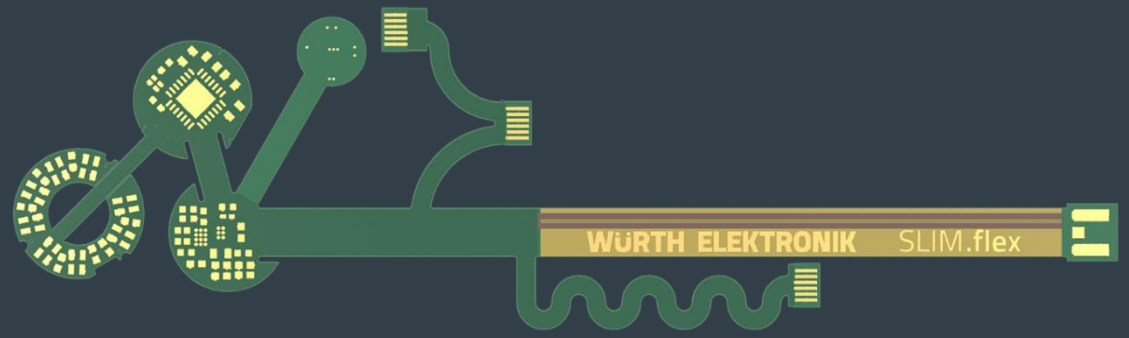
- Optimized frames

Delivery array panel optimized for clamping fixtures

SUMMARY

- SLIM.flex - PCB samples, many other possible applications
- SLIM.flex and SLIM.hdi technology offer a high degree of freedom in design and layout
- Versatile use of stiffeners for localized stiffening of the PCB
- FR4 solder carriers as a assembly process
- Further options for assembly processes, just talk to us, we will find a solution!
- More information about SLIM.flex technology see our website

- Here → https://www.we-online.com/we-scope
  - you will find the detailed PCB sample description
  - You can request your personal physical sample



THANK YOU FOR YOUR ATTENTION