WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

FLEX SOLUTIONS AVANT-GARDE

TECHNOLOGY POSTER

Technology variants

PURE.flex

PURE.flex 2F

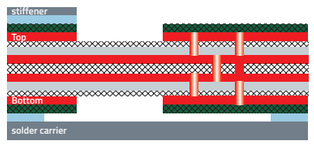
PURE.flex 2F-Ri (with stiffener)

- Very thin flex film polyimide
- Up to two copper layers
- Partially reinforced by „stiffener"
- Photosensitive solder mask or cover foil (Polyimide Coverlay)
- Delivered individually or as panel array

Number of copper layers: 1 to 2

SLIM.flex

SLIM.flex 4F-Ri in Anylayer microvia technology



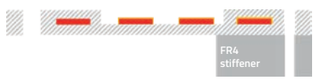
- Anylayer microvia flex technology
- Very thin
- Highly resilient, robust
- Flexible and reliable
- Impedance-defined structure possible
- Optionally with solder carrier and stiffener

Applications
- Vision technologies
- Medical technologies
- Sensor technologies
- High-tech cable harness

Number of copper layers: 3 to 8

STRETCH.flex

STRETCH.flex 1S-Ri



- Stretchable circuit carriers made of thermoplastic polyurethane
- Conductors in e.g. meander or snake shape for extreme flexibility
- Dynamic extensibility depending on design from 5 – 20%.
- Almost any shape can be realized
- Skin friendly
- Can be combined with textiles
- Thermoformable

Number of copper layers: 1 to 2

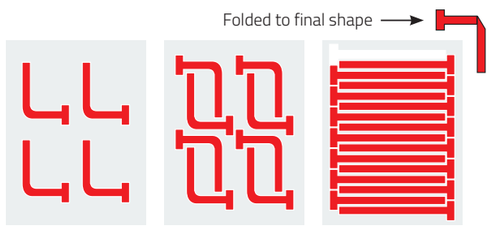
Design Chain

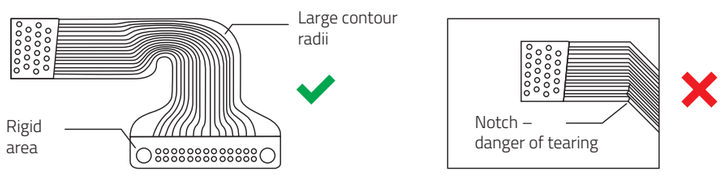
Idea Concept → Specification → Mechanics development → Software development → Electronics development → PCB design

Projects with Flex solutions: Interdisciplinary collaboration during development is essential!

MECHANICS

- Always provide large contour radii (inner and outer radii) in the flex areas (design suitable for plastics)
- If necessary, provide registration holes for bonding reinforcements or heatsinks
- Arrange flex extensions to save space, combine several extensions if possible, use folding technology





Standard Stackups

PURE.flex
https://www.we-online.com/pureflex-stackups

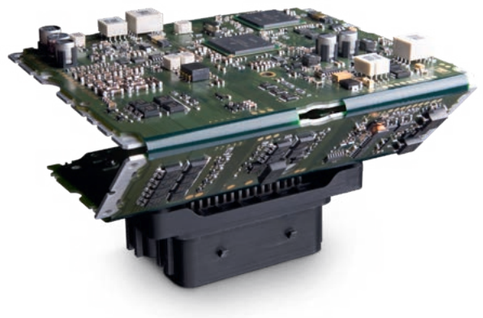
SLIM.flex
https://www.we-online.com/slimflex-stackups

STRETCH.flex
https://www.we-online.com/stretchflex-stackups_en

Combination with other technologies

It is possible to combine flex solutions with other technologies, for example with
- High Density Interconnect MICROVIA.hdi
- DEVICE.embedding
- Printed Polymer
- Heatsink

Adaptation of the individual design rules is usually necessary for this purpose.



www.we-online.com/pcb

PCB Design

Design Rules

In our Design Guide for Flex Solutions you will find an overview of all variants of our flex solutions plus some valuable design tips to bring your application to success, reliably and safely.

Our Design Rules cover all the important parameters you need to make your project successful. Basically, the rules for conductor widths, distances, via and pad sizes as well as for the solder mask apply, which you can find in our BASIC Design Rules.

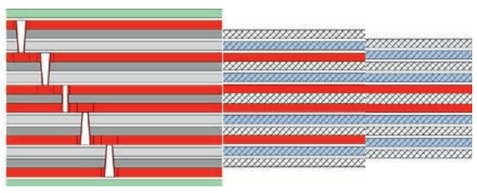
https://www.we-online.com/designrulesbasic_en

Based on this, the sectional design rules apply tor
- PURE.flex **(https://www.we-online.com/designrulespureflex_en)**
- SLIM.flex **(https://www.we-online.com/designrulesslimflex_en)**
- STRETCH.flex **(https://www.we-online.com/designrulesstretchflex_en)**

https://www.we-online.com/designguideflex_en

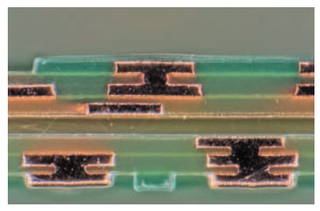
SLIM.flex – Any layer microvia technology

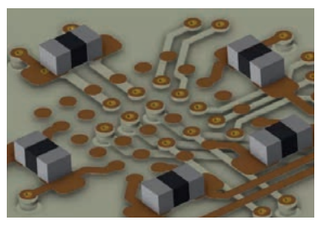
Example: SLIM.flex 6F



left
schematic stackup
0.30 mm thick

right
cross sectional picture
from a product





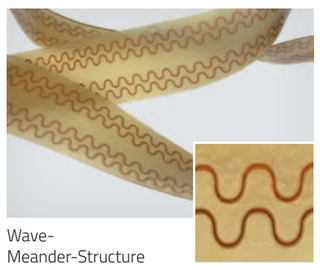
left
BGA pitch 0.40 mm
with microvia-in-pad,
flat surface

right
BGA pitch 0.35 mm in
the EDA tool

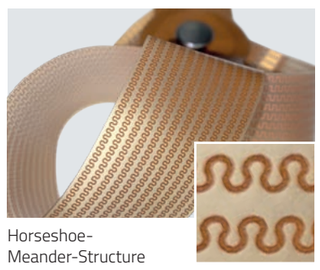
STRETCH.flex – Stretchable PCB Substrate

Meander-Structure

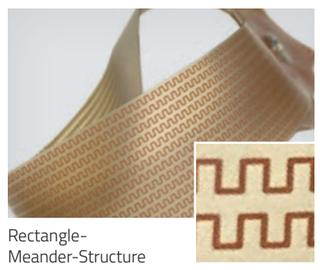
Different meander structures lead to extreme flexibility of the printed circuit board.
A combination of meander structure and layout allows dynamic stretchability between 5 – 20 %.



Wave-
Meander-Structure



Horseshoe-
Meander-Structure



Rectangle-
Meander-Structure

Dynamic stretch and FR4 Stiffener

FR4 Stiffener
(shown on an
1S-0Ri)

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STRETCH.flex
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