Flex-Rigid, Semiflex & Flex Design Guide

Technology variants

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<th>Flex / TWINflex®</th>
<th>Flex-Rigid</th>
<th>FR4 Semiflex</th>
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<td>1F-3Ri</td>
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<td>1F-2Ri</td>
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<td>3Ri-2F-3Ri</td>
<td>3Ri-8F-3Ri</td>
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In comparison:

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Flex / TWINflex®

- 2F (flex)
- 2F (TWINflex)
- 4F with microvias 1/2/3/4

In comparison:

- 1F (TWINflex)
- 1F-0Ri (flex-rigid)

Please respect the Basic Design Guide of Würth Elektronik for design rules regarding structures, via sizes and soldermask.

Regard distances of drill holes and SMD pads to flex-rigid transition, see Würth Elektronik design rules.

Layout / routing in the bending area

- No vias in flexible area with flex-rigid
- Use tear drops
- Round routing in flexible area
- Preserve NFP (Non-Functional Pads) on flexible layers (reliability risk)

NOTE:

- Often more affordable than a connector-cable-connector solution
- Definitely better and cheaper compared to shielded connectors and cables

Calculation of flex length

Geometric conditions:

- L ≥ A + π · R + 2 (T – R)
- A + 2T ≥ 2R
- A ≥ 2R
- A + T ≥ 2R

Lift-off option

- No PTH in the lift-off area
- No copper design allowed on the layer adjacent to the lifted flex area
- Specification in drawing, i.e. “Lift-off area, not laminated”

ZIF contacts on outer layer by using vias

- ZIF contacts on outer layer by using vias

Please respect the Basic Design Guide of Würth Elektronik for design rules regarding structures, via sizes and soldermask.

Here you will find more information about the stack-ups:

www.we-online.com/flex-stackups

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