DIGITAL WE DAYS 2024

RIGID.FLEX
PCB - TECHNOLOGY FOR SYSTEM

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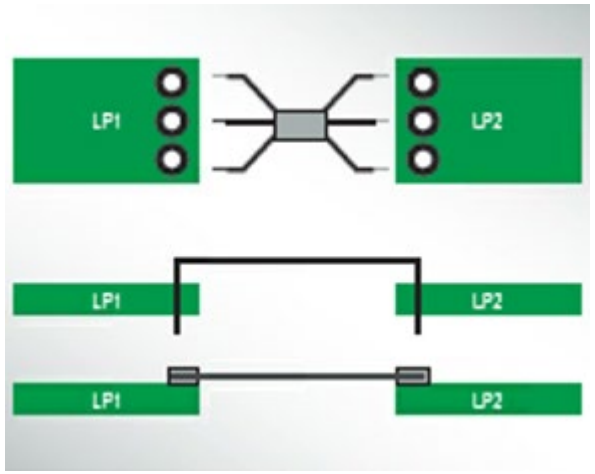
EVOLUTION OF PCB'S

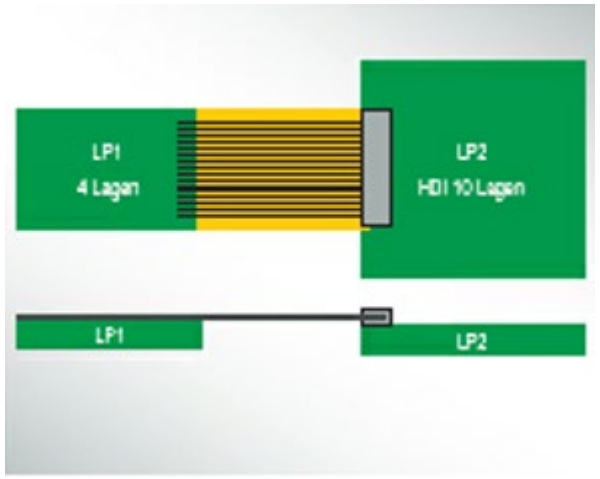
Used systems

Inhomogeneous system



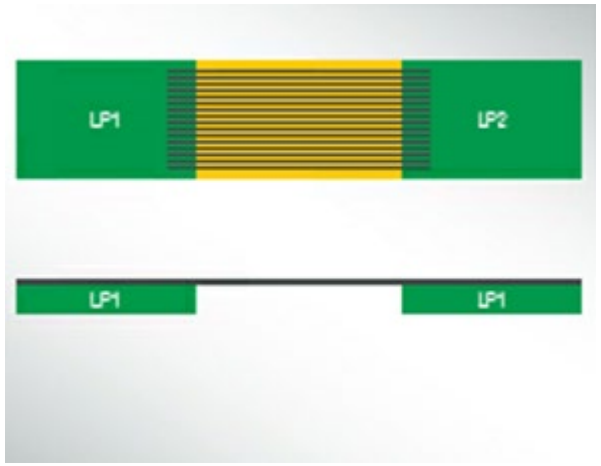
- Rigid PCB
- soldered or plugged-in wiring harness / flex jumper

Partially homogeneous system



- Sub-systems differ mainly in terms of technology and size, e.g. rigid-flex connector combination

Homogeneous system



- Identical stack-up in all rigid parts.
- Integrated, continuous flex layer(s).

EVOLUTION OF PCB'S

POLL

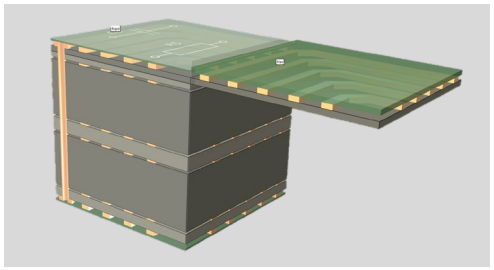
What types of printed circuit board systems do you currently use?

- Inhomogeneous System
- Partially Homogeneous System
- Homogeneous System

THE WE FLEX SOLUTION

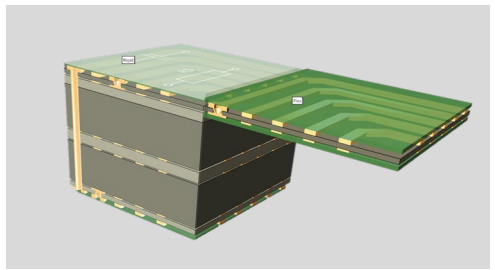
Selection notes

RIGID.flex 1F-xRi



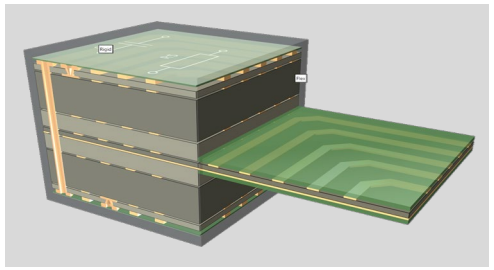
- Cost- effective option
- ZIF contacts

RIGID.flex 2F-xRi



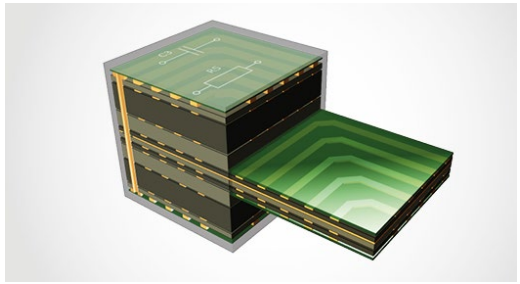
- Micro vias in flex area
- Use B with single-layer on L2
- Flex with one reference layer
- ZIF contacts

RIGID.flex xRi-2F-xRi



- Suitable for dynamic bending
- Fully symmetrical
- Use B
- Impedance design with 75µm/100µm PI cores

RIGID.flex xRi-4F-xRi



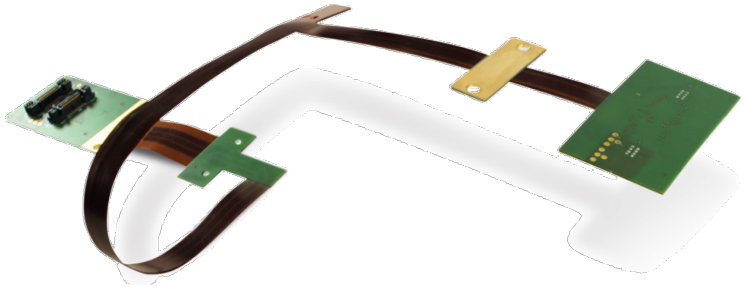
- Flex area with four laminated copper layers
- Impedance design with two reference layers possible

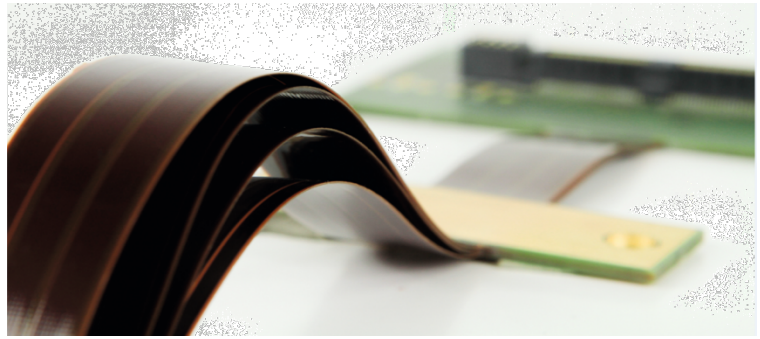
RIGID.FLEX XRI->2F-XRI

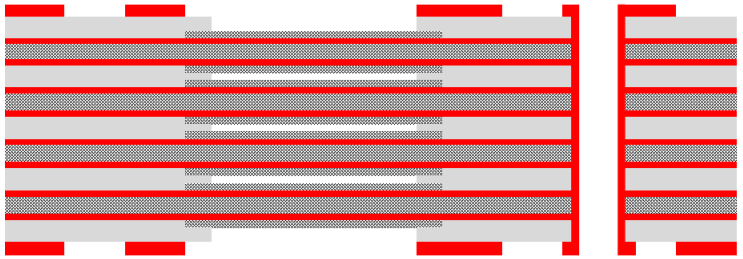
Medical | APPLICATION

- Stack-up RIGID.flex 10layer 1Ri-8F-1Ri
- Circular movement
  → Dynamic bending
  → Application class: IPC2223 use B
- Long lifetime and high reliability
  → Qualified for 20 years use
- Smaller bending radius due to airgap

→ Reliability
→ Dynamic bending





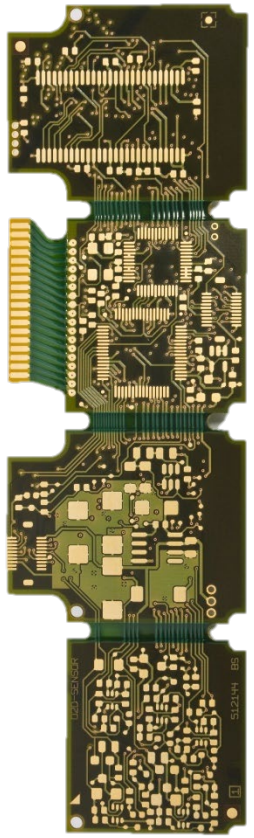


RIGID.FLEX 1F-XRI

Smart Sensor | APPLICATION

- Stack-up Rigid-flex 4layers, 1F-3Ri
- Replacing pure flex PCB – full standard SMT assembly
- Perfect fit around an optical sensor
- Integration of the processing electronics not possible without flex-rigid
- Improved reliability
- Reduced system costs

→ Reliability
→ Miniaturisation

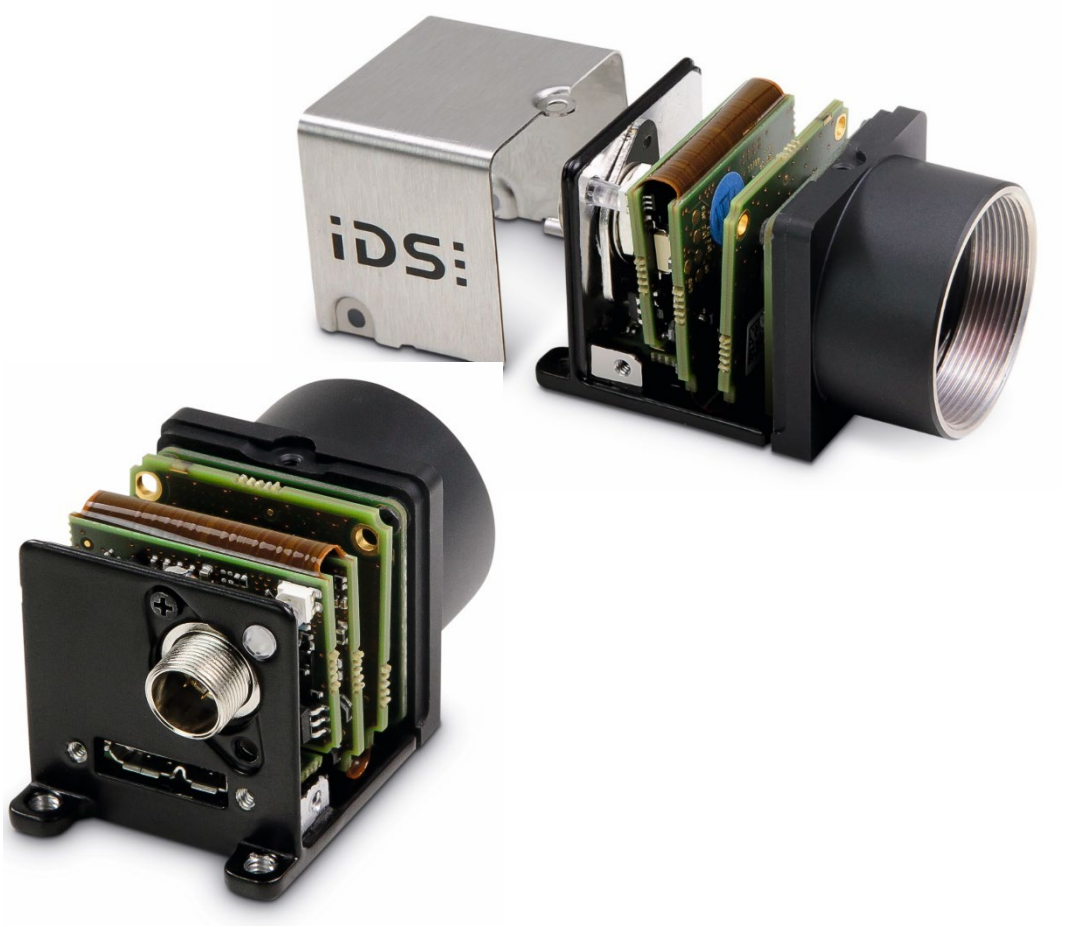


RIGID.FLEX XRI-2F-XRI

Industrial imaging | APPLICATION

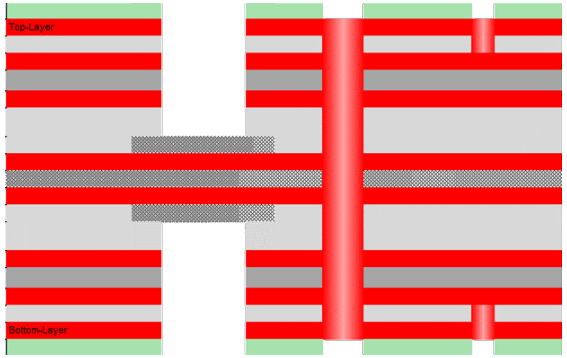
- Stack-up Rigid-flex 8layer, 3Ri-2F-3Ri
- Impedance matched connected with flex part
- Avoiding connectors, saving footprint areas
- Price-optimized form factor

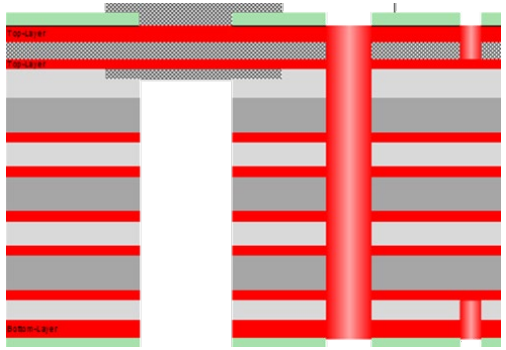
→ Miniaturisation
→ Signal Integrity

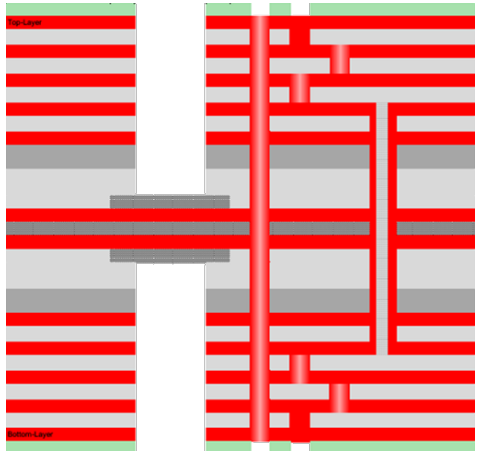


HDI & RIGID.FLEX - A STRONG COMBINATION

Micro vias and buried vias







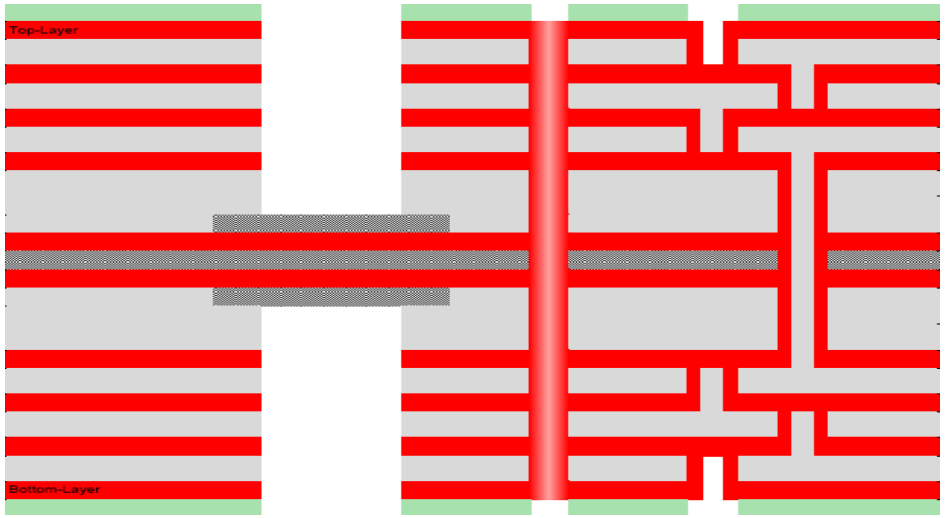
- Stack-ups of RIGID.flex solutions enable to use microvias as HDI 1-x-1 without changes to the structure.
- Special stack-ups are possible for:
  - Several microvia layers (staggered or stacked)
  - Buried vias

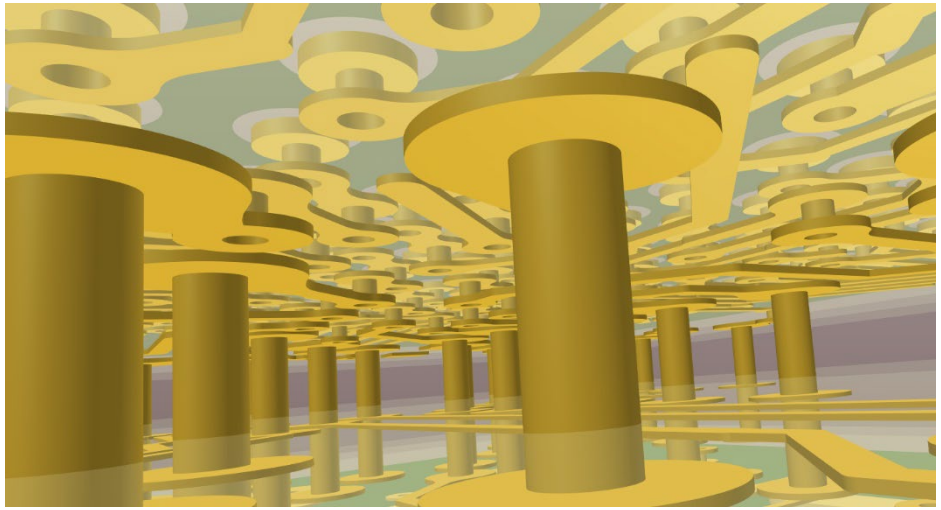
HDI-RIGID.FLEX - A STRONG COMBINATION

Communication | APPLICATION

- Stack-up RIGID.flex 10layer 4Ri-2F-4Ri / HDI 3-4b-3
- Staggered instead of stacked microvias
- Buried via offset to microvias

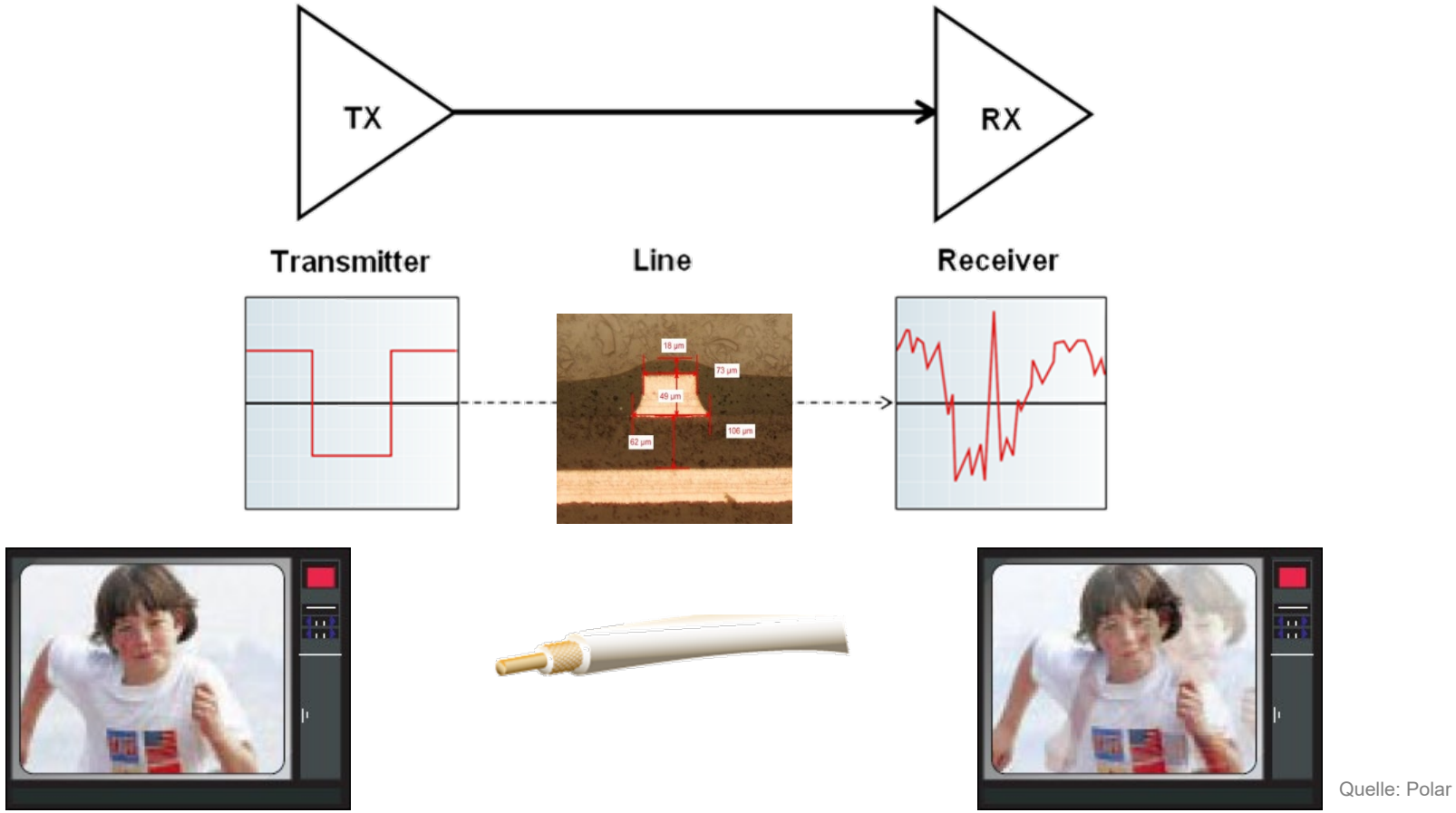
→ Reliability
→ Miniaturisation





NEED FOR SPEED

Impedance on Rigd.Flex Pcb

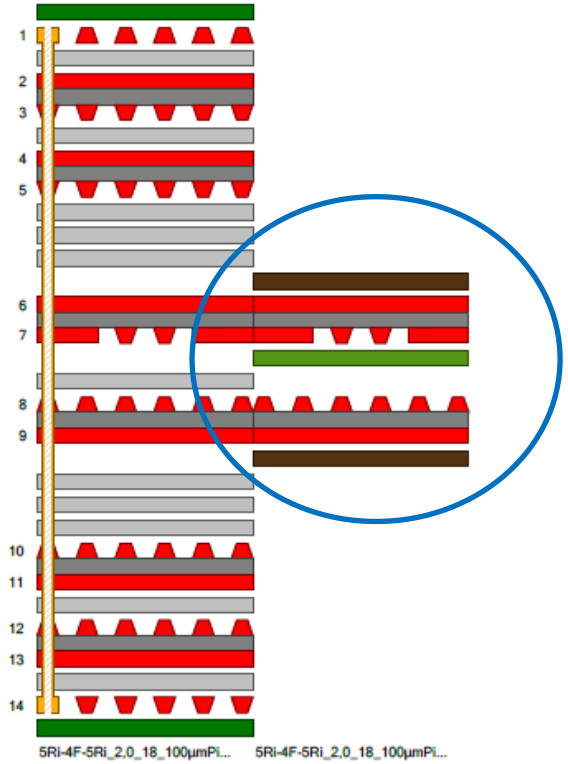


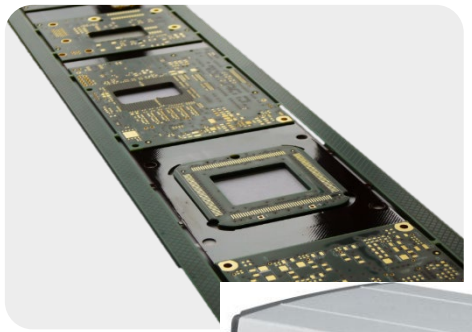
Quelle: Polar

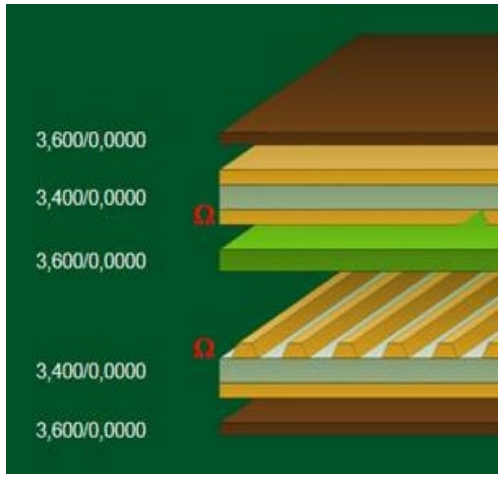
NEED FOR SPEED

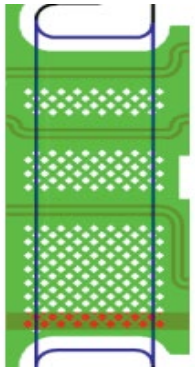
Impedance calculation

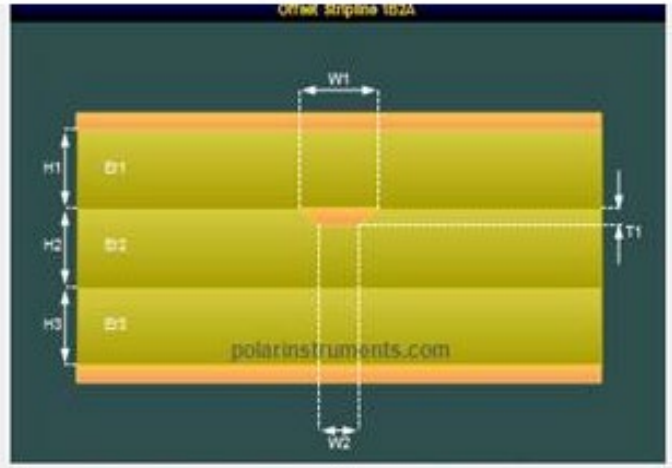
- Stack-up flex-rigid 14layers 5Ri-4F-5R
- Calculation, simulation and documentation







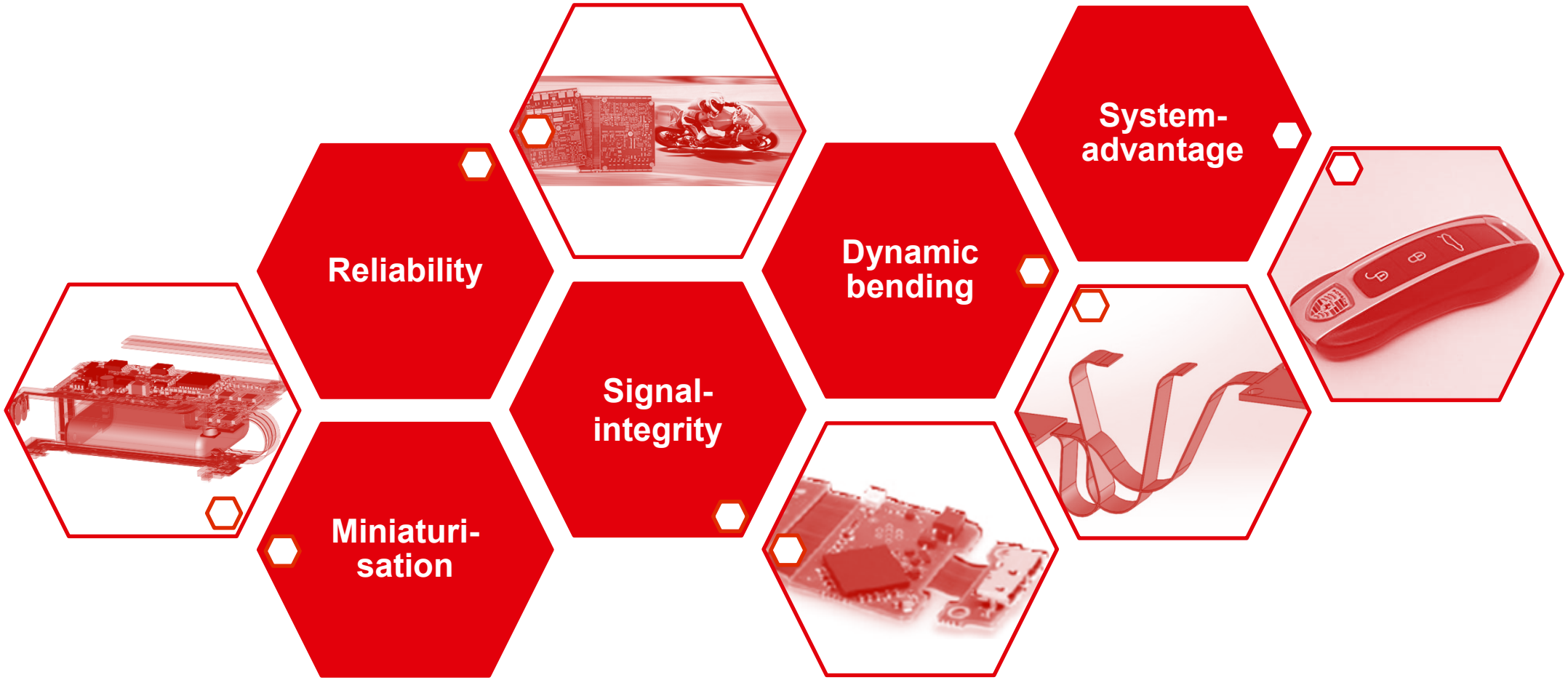




Substrate 1 Height	H1	100.00
Substrate 1 Dielectric	Er1	3,4000
Substrate 2 Height	H2	100.00
Substrate 2 Dielectric	Er2	3,6000
Substrate 3 Height	H3	100.00
Substrate 3 Dielectric	Er3	3,4000
Lower Trace Width	W1	125.00
Upper Trace Width	W2	118.00
Trace Thickness	T1	18.00
Impedance	Zo	49,74
Zielimpedanz		50,00
Zieltoleranz %		10,00

CONCLUSION

Advantages of RIGID.flex



Questions

& Answers

We are here for you now!
Ask us directly via our chat or via E-Mail.

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