

# Optiprint

 Innovative PCB Solutions

Win time and flexibility  
benefit from Swiss quality



## THE PCB CHALLENGE

Doing it together

# INDIVIDUAL CUSTOMER SOLUTIONS

from a reliable partner



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**Optiprint offers** consulting, development and manufacturing at its production facility in Eastern Switzerland. We guarantee the legendary Swiss quality and precision for our printed circuit boards utilized all over the world.

**Optiprint has**

- the technological capability
- an enthusiastic and well-trained staff
- own research and development department
- a high-end technology machining department
- a very experienced consulting and service team
- the competence of a controlled cost and management system
- self-financing



Be it telecommunication, medical technology, the automotive industry, the sensor sector, military and security technology, or space technology – Optiprint offers consulting, development and production for printed circuit boards in most diverse constructions.

**Benefit from**

- more than 25-years experience and our extensive knowledge
- technical leadership, owing to our creative ideas in performance
- our ISO-certified production for prototypes and series production
- our reliable lead times and deliveries
- our efficient material procurement system
- the continuity and dependability of a family business

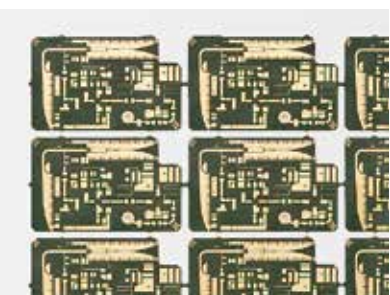


# PRINTED CIRCUIT BOARDS

High frequency – flexible and flex-rigid – special constructions

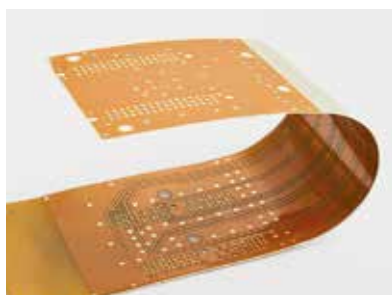
The focus of our services is always on the optimal solution for our customer's requirements. This involves you in close cooperation with our engineers. That means that you profit from our wealth of knowledge and our multi-faceted experience, from prototype right through to production runs.

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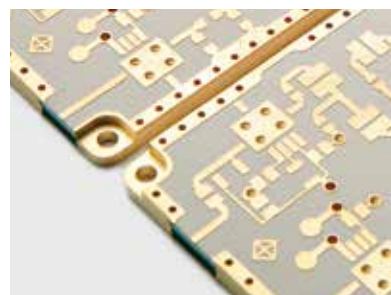
#### PTFE circuit boards

- RF and microwave applications
- Highspeed-digital applications
- defined dielectric constant
- low loss factor
- antennas with reduced passive intermodulation (PIM)
- up to 96 GHz



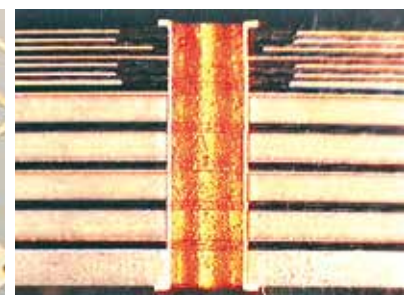
#### LCP

- bendable applications
- low absorption of humidity



#### RF multilayer

- digital multilayer
- mixed material
- high-layered



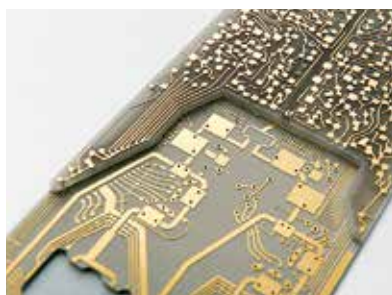
#### Many-layered RF multilayer

- 8-layer PTFE
- 8-layer FR4



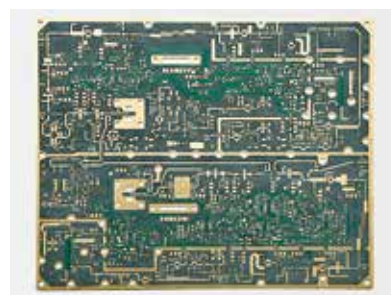
#### Deep milling/waveguide

- precise depth tolerances



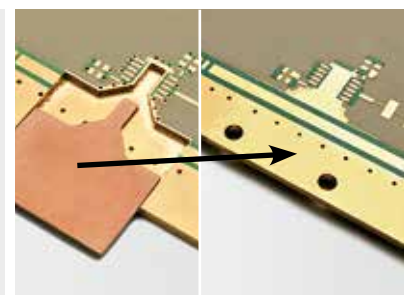
#### RF multilayer

- 2 different assembly levels



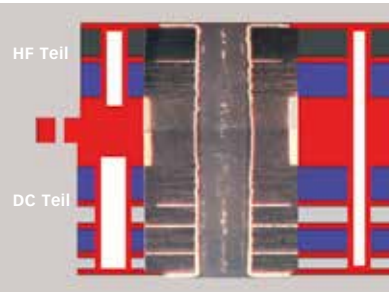
#### Brass PTFE circuit boards

- series production over 200 000 items
- flatness of the deep milling  $\pm 50 \mu\text{m}$



#### Metal insert

- integrated heat sink
- optimal heat dissipation
- variable solution



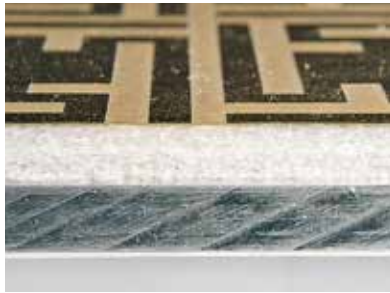
**Metal-core multilayer**

- isolated holes
- up to 8 mm overall thickness



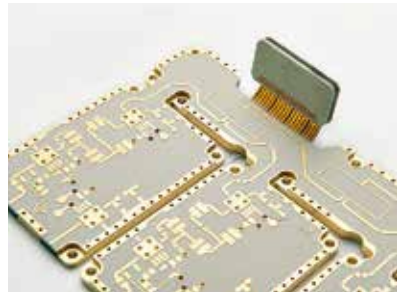
**Heat sink solution**

- 6-layer PTFE/FR4
- conductive adhesive CF 3350-004
- aluminium heat sink goldplated
- optimal heat dissipation



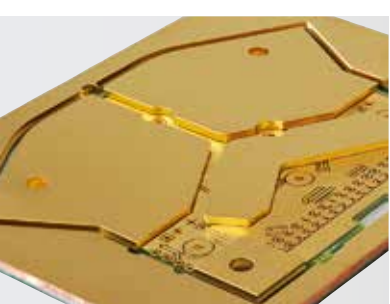
**RF foam constructions**

- low dielectric constants



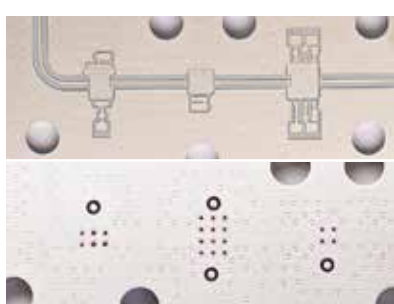
**16-layer flex-rigid multilayer**

- 6-layer PTFE
- 10-layer polyimide



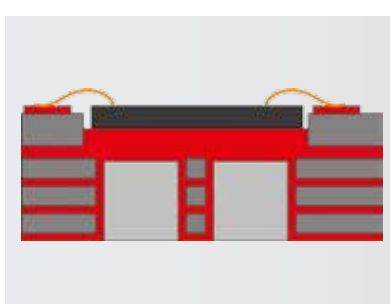
**High-Tg FR4 multilayer with copper back**

- high current application 200 A



**Thermal vias and adjusted pocket depth**

- short thermal path through back-drilled thermal vias



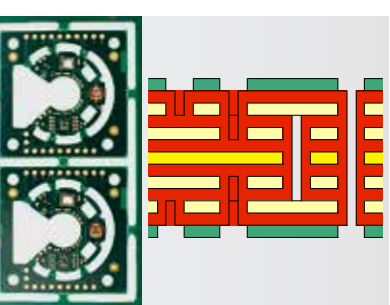
**Thermal vias and adjusted pocket depth**

- plate up of pocket to adjust to chip's height
- advantage: short bonding wires



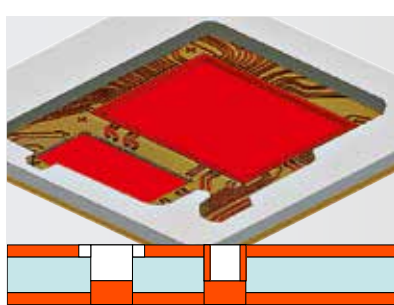
**Flexible and flex-rigid with heat sink**

- copper heat sink
- sheet steel reinforcement



**6-layer High-Tg FR4 multilayer**

- buried vias
- blind vias
- stacked vias



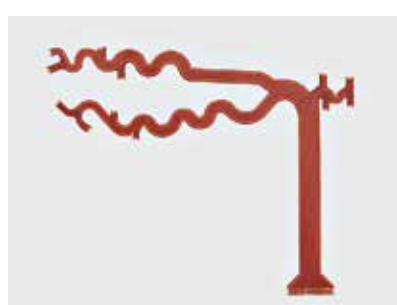
**Packaging solution**

- copper inlays with and without edge plating
- inlay thicknesses 30–300 µm



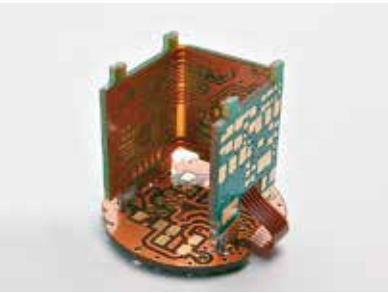
**Flexible with coverlay foils**

- for dynamic movements
- tightest bending radii



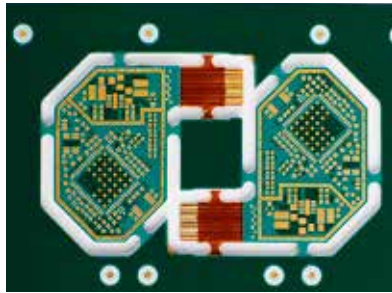
**Laser cut contours**

- perforated contour to break out
- tolerance of pattern to contour ± 25 µm



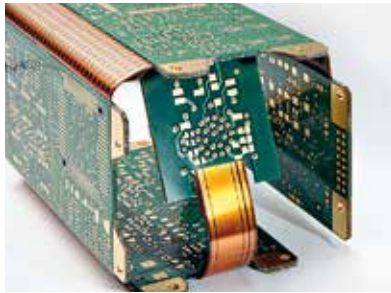
**2-layer flex-rigid**

- with flexible solder resist
- for build-in applications



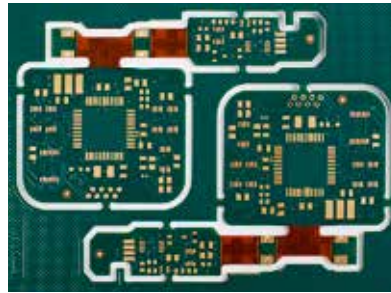
**8-layer flex-rigid multilayer**

- with low-cost RF material



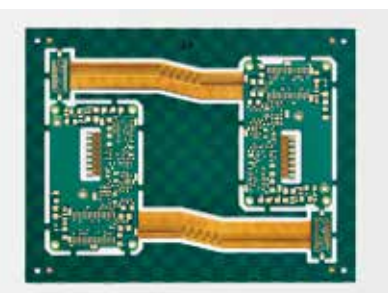
**Flex-rigid multilayer**

- inner layers separated into multiple layers, pressed with coverlay
- tight bending radii



**Flex-rigid multilayer**

- inner layer with coverlay foil
- dynamic bending cycles
- health care applications



**Flex-rigid multilayer**

- 4 inner layers
- medium bending radii



**Oversized flexible up to 8 m**

- polyimide or FR4 material
- partial reinforcements
- medical applications, e.g. endoscopes



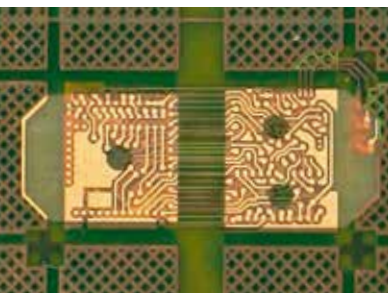
**8-layer flex-rigid multilayer**

- filled blind holes in rigid- and flexible areas
- separated flex layers with coverlay foil



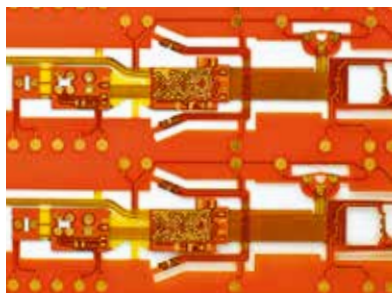
**8-layer flex-rigid multilayer**

- assembled with coils



**3-layer flexible multilayer**

- laserdrilled blind holes
- 100  $\mu\text{m}$  line, 45  $\mu\text{m}$  space structure
- flexible solder resist



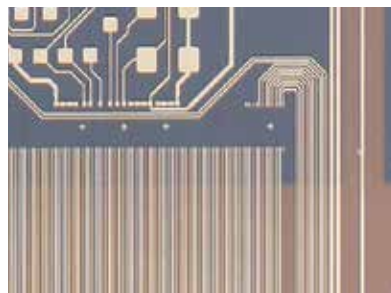
**4-layer flexible multilayer**

- buried vias
- blind holes laser-drilled
- 70  $\mu\text{m}$  line, 30  $\mu\text{m}$  space structure
- contour laser-cut



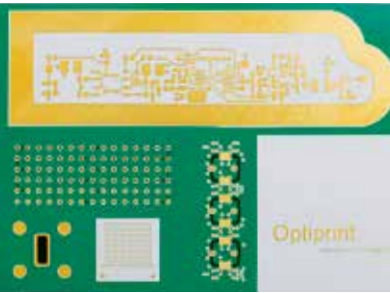
**Ultra-fine line structures**

- 3-layer flexible multilayer
- 60  $\mu\text{m}$  line, 50  $\mu\text{m}$  space structure



**Ultra-fine line structures**

- 25  $\mu\text{m}$  line-space structure



#### Demonstrator board

- RF structures
- pockets for MMIC technologies
- heat sink solutions
- via hole-filling
- fine structures



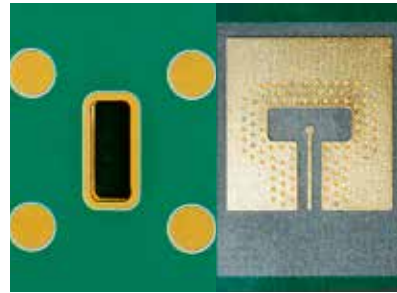
#### RF pattern

- fine structures
- exact etching tolerances  $\pm 15 \mu\text{m}$



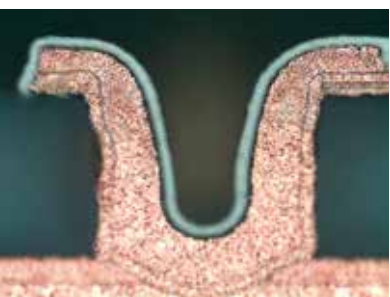
#### Plugged vias

- plugged and overplated vias
- for plated and unplated vias



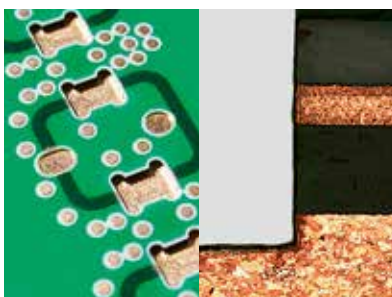
#### Waveguide

- depth-controlled routing into RF material
- controlled dimensions of RF feed



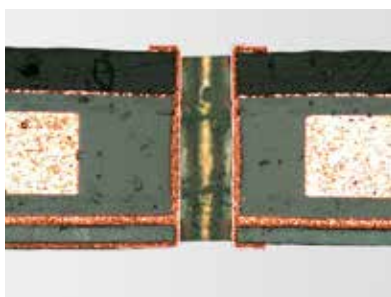
#### Blind vias

- laser-drilled  $> 40 \mu\text{m}$
- drilled with tools  $> 75 \mu\text{m}$



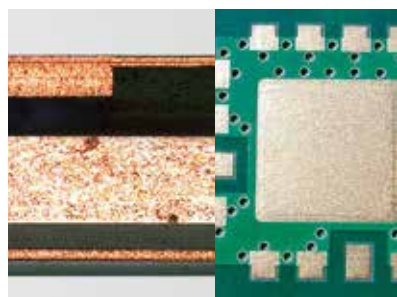
#### Chip pockets

- contact routing into layers of 30- $\mu\text{m}$  copper only
- smooth surface suitable for chips and MMICs
- dimension tolerance  $\pm 25 \mu\text{m}$



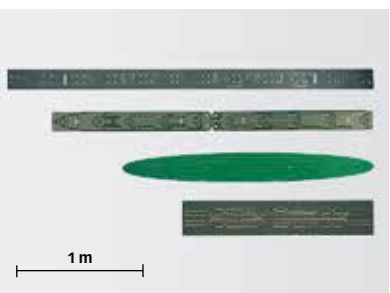
#### Isolated vias

- predrilled copper core
- isolation with prepreg or plugging paste



#### Copper inlay

- better heat dissipation
- alternative to copper core



#### Oversized printed circuit boards

- up to 8000 mm x 600 mm
- standard etching tolerance



#### Filled microvias

- up to 200  $\mu\text{m}$  copper-filled microvias
- very good heat dissipation
- Via-in-Pad (BGA /  $\mu\text{BGA}$ )



#### Galvanic equipment

- in-house copper galvanic
- thickness tolerances on copper plane at 25  $\mu\text{m}$  plating:  $\pm 2 \mu\text{m}$



#### Surface treatment in-house

- electroless nickel/gold
- electroless nickel/palladium/gold
- electroless thick gold

# CONSULTING AND SERVICE

Challenge us

 [www.optiprint.ch](http://www.optiprint.ch)



#### **Optiprint stands for**

- quality and precision
- meeting deadlines
- reliability
- innovative developments and new products
- flexibility and speed
- best price-performance ratio
- financial stability

**Looking for new solutions together:** Tell us what you would like and your expectations of us. In discussion we can show our capabilities and products. We are looking forward to your call.

#### **Top technology for market leaders**

Come to us with your ideas and establish your influence on the design and manufacture of your products right from the start. We like a stimulating collaboration to generate a leading technical advantage with you. Our products are used worldwide by leading companies in telecommunications, medical technology, the automotive industry, the sensor sector, military and security technology and space technology.

#### **Exceptional product range**

We are amongst the world leaders in the areas of:

- high-frequency printed circuit boards
- metal-cored printed circuit boards
- flexible and flex-rigid printed circuit boards
- ultra-fine line and space > 25  $\mu\text{m}$
- oversized printed circuit boards