

ELVIA PCB GROUP

elvia
PRINTED CIRCUIT BOARDS
GROUP

Advanced PCB technology solutions

TECHSHOW Presentation 29/06/2021



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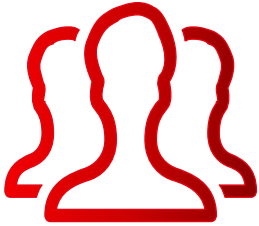
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ELVIA PCB GROUP



N°1 in France
N°5 in Europe



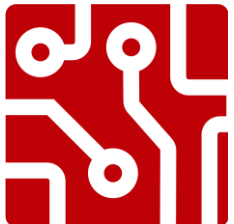
460 employees
Including 106 engineers



49M€ of turnover
in 2020



6 TARGET MARKETS



2 000 new products/year



5 production facilities



Technology solutions for PCBs

ELVIA PCB GROUP

2 STRATEGIC DIVISIONS



DEFENCE

AERO

SPACE

DAS division efforts are focused on industrial mastery improvement to secure and expand its position of leader in defence, aero and space markets.



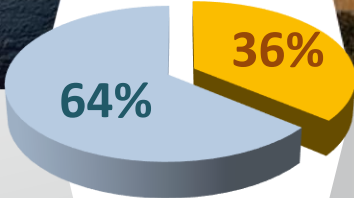
3 production facilities



European Leader in its sectors



Complex & High Tech PCBs Specialist



INDUSTRIAL

TELECOM

AUTOMOTIVE

ITA division targets an innovative position, essential to prepare for the future and seize the numerous opportunities, starting with the French market.



2 production facilities



Automotive and embedded R&D and recovery programs



PCBs solutions for electromobility applications

➤ International development

➤ Diversification & Innovation



Technology solutions for PCBs

OUR AUTOMOTIVE HISTORY AND VISION

25 years
Of automotive
experience

Dashboard applications

Radio applications

SMI PCB mass-production for :

- Engine - Power steering
- Power LED boards
- DC/DC Convertor (Renault Zoé)
- Supercharged PCB



2 Production facilities
IATF16949 qualified



OUR AUTOMOTIVE HISTORY AND VISION



elvia PCB Group is incorporated within the framework of recovery plans in relation to electromobility and invests in R&D projects with well-known partners, ST Microelectronics and Vitesco, to develop leading-edge technologies : «The Wide Band Gap embedded components. »

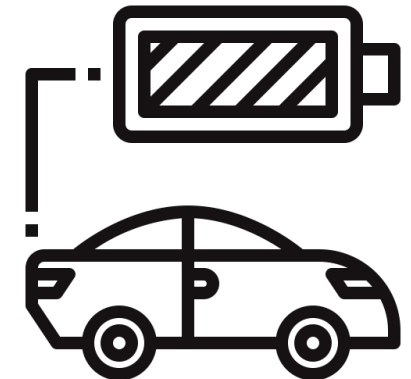


In this context, the Group has begun an industrial project : a new pilot line building to answer advanced packaging mass production for 2024.

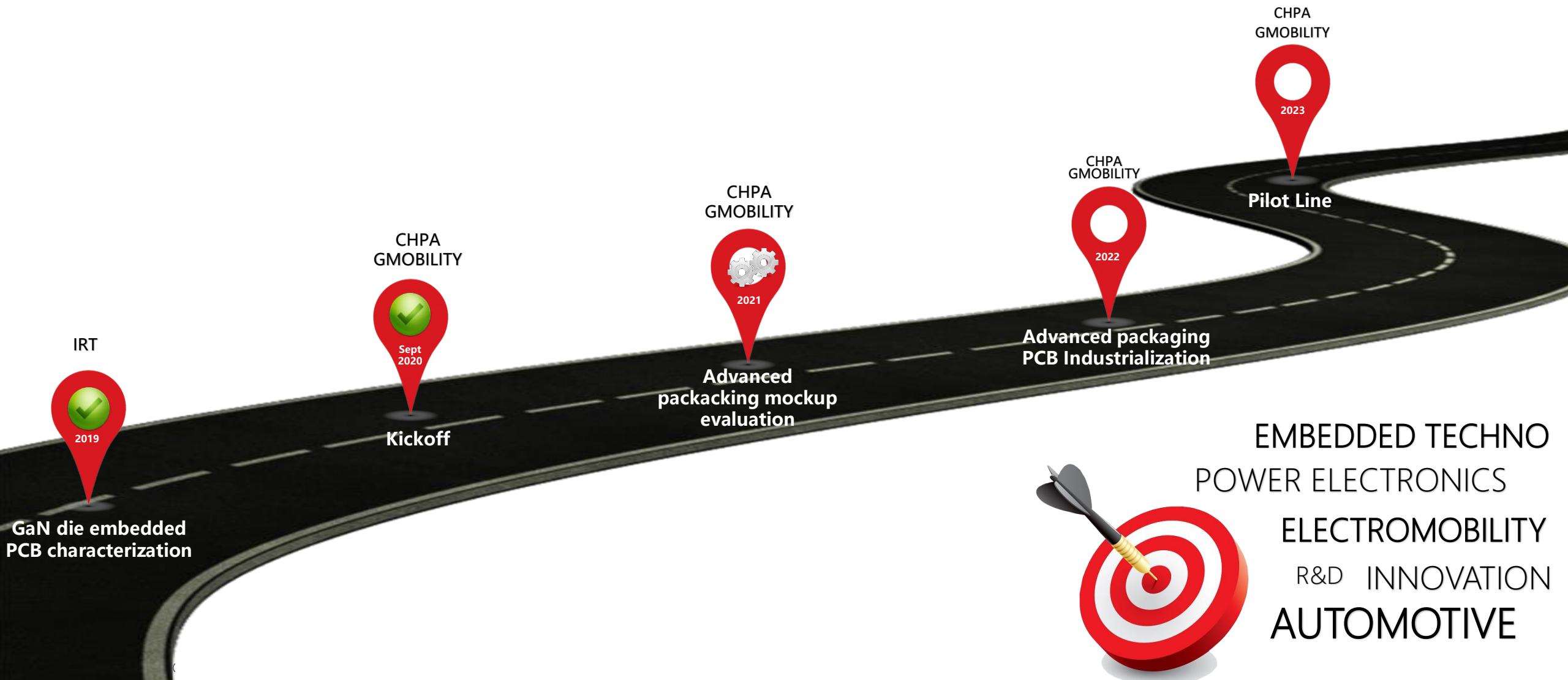
OUR AUTOMOTIVE HISTORY AND VISION

Our mid-term ambitions :

- Design and implementation of a pilot line specially adapted to Embedded PCBs mass production.
- Embedded PCBs mass production mastery.
- Set up a new line thanks to competitive industrial solutions in order to insure the electromobility industry sovereignty in France.
- Offer « design to spec » solutions.



OUR ADVANCED PACKAGING ROADMAP

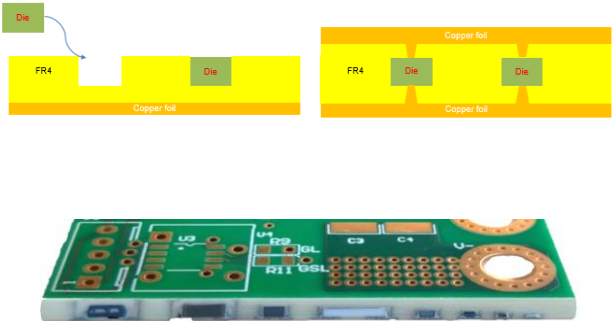


EMBEDDED TECHNO
POWER ELECTRONICS
ELECTROMOBILITY
R&D INNOVATION
AUTOMOTIVE

OUR POWER MANAGEMENT SOLUTIONS

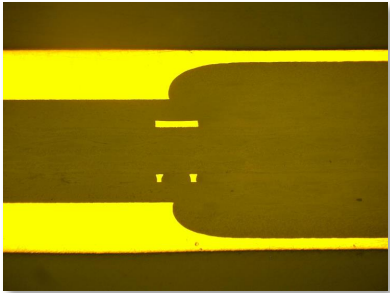
ADVANCED PACKAGING

- Passive & active Die
- Heavy copper
- Laser drill or soldering connection



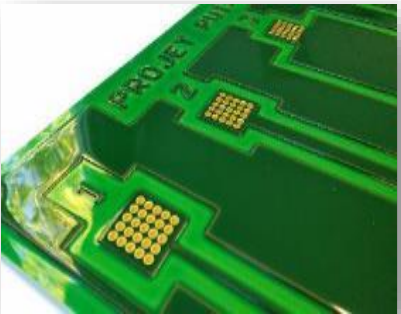
SCULPTURED COPPER

- External design
- Hybrid solution
- Cu 100 µm & 400 µm



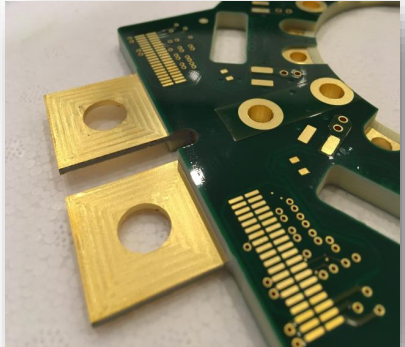
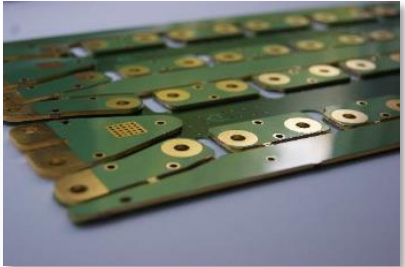
HEAVY COPPER

- Outer & Inner design
- Cu thk until 400 µm
- Current density : 5 A/mm²



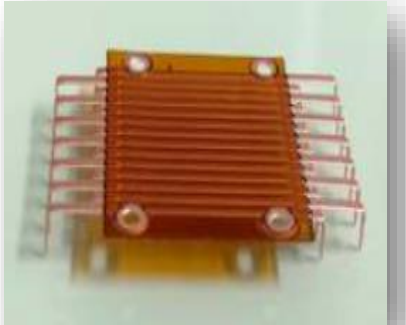
BUSBAR

- Outer & embedded
- Cu thk until 2.5 mm
- Cu machining



AVIFLEX

- Polyimide insulators
- Cu thk until 200 µm
- Post forming



OUR POWER MANAGEMENT SOLUTIONS

Evaluation
technology
in progress

ADVANCED PACKAGING

Die embedding.

Pick & place on laser cutting cavity.

Cu >5 μm on top & back side mandatory for μvia connection.



BENEFITS

- ✓ Easy implementation
- ✓ Symetrical stackup
- ✓ Thermal management
- ✓ Electrical performance

LIMITS

- Die Copper finishing
- Electrical test
- Rework assembly

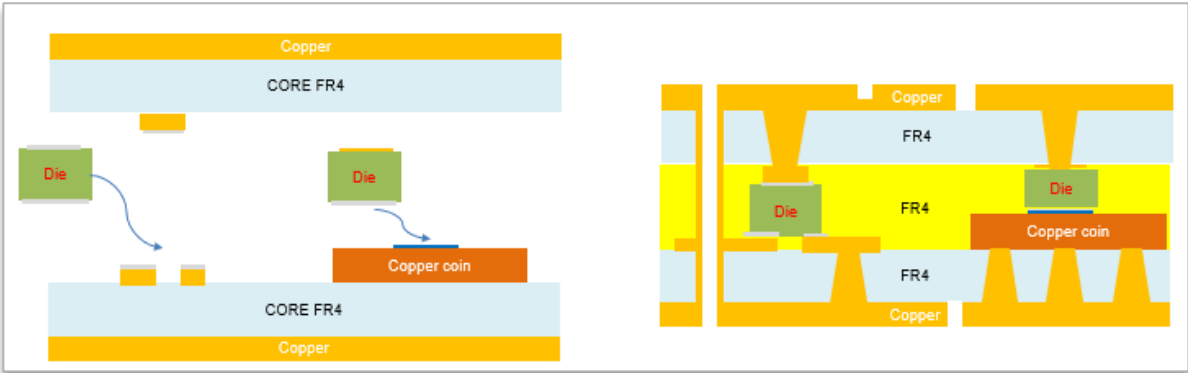


OUR POWER MANAGEMENT SOLUTIONS

Evaluation
technology
in progress

ADVANCED PACKAGING

- Die or component package embedding.
- Pick & place report.
- Soldering or sintering connection.
- Die report on copper inlet.

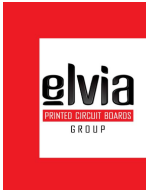
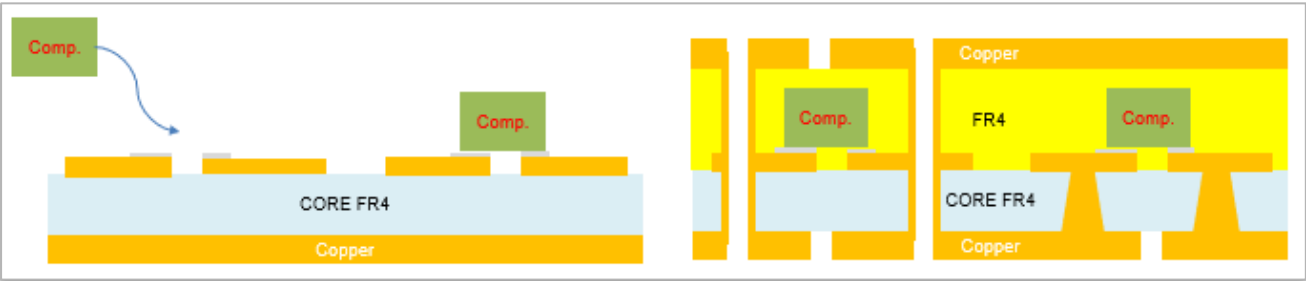


BENEFITS

- ✓ Wide package range
- ✓ Thermal management
- ✓ Electrical performance

LIMITS

- Component height up to 3 mm
- Additional processes (Coating, finishing, soldering)
- Electrical test
- Rework assembly

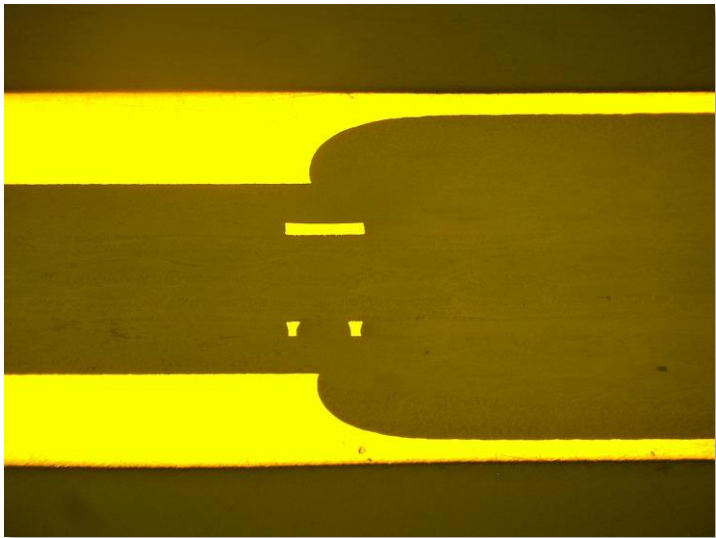


OUR POWER MANAGEMENT SOLUTIONS

SCULPTURED COPPER

Copper thickness reduced from 400 to 105 μm .

Etching capabilities of 105 μm copper combined with 400 μm thick copper on the same PCB.



BENEFITS

- ✓ Power & control part on same layer
- ✓ Thermal management
- ✓ Compact System, wire connexion removal
- ✓ Integration cost reduction

LIMITS

- PCB weight
- HDI compliant
- Specific design rules

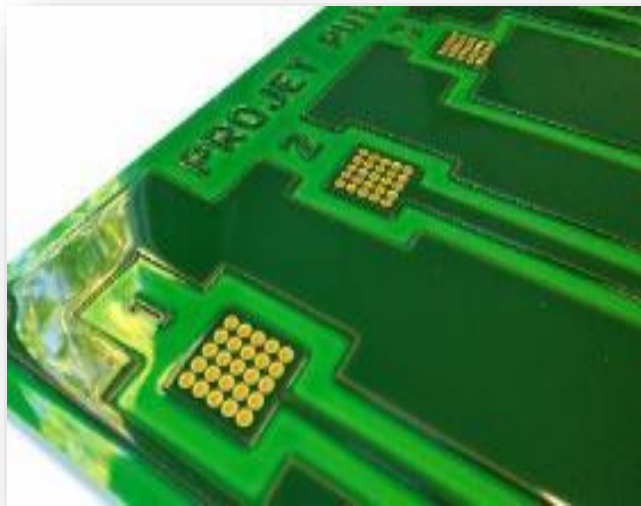
OUR POWER MANAGEMENT SOLUTIONS

HEAVY COPPER

Outer layer copper base: 70, 105, 210 et 400 μm .

Inner layer copper base: 70, 105 et 210 μm .

PCB thickness up to 4.5 mm.



BENEFITS

- ✓ High current application
- ✓ Thermal management
- ✓ Easy implementation
- ✓ Mix build up with thin & thick copper

LIMITS

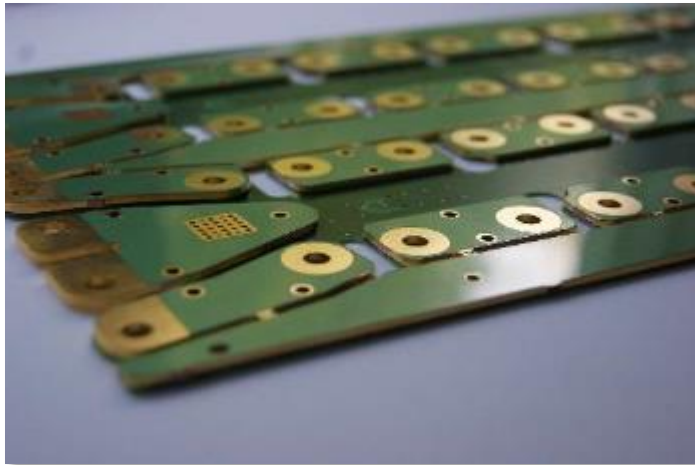
- Specific design rules
- Materials compliant : FR4 Htg & polyimide
- HDI compliant
- PCB weight

OUR POWER MANAGEMENT SOLUTIONS

OUTER BUSBAR

Thick copper >1 mm laminated over multilayer PCB.

Solution for very high current application. Control part on multilayer PCB.



BENEFITS

- ✓ Very high current
- ✓ Copper base from 1 to 2.5 mm
- ✓ HDI compliant

LIMITS

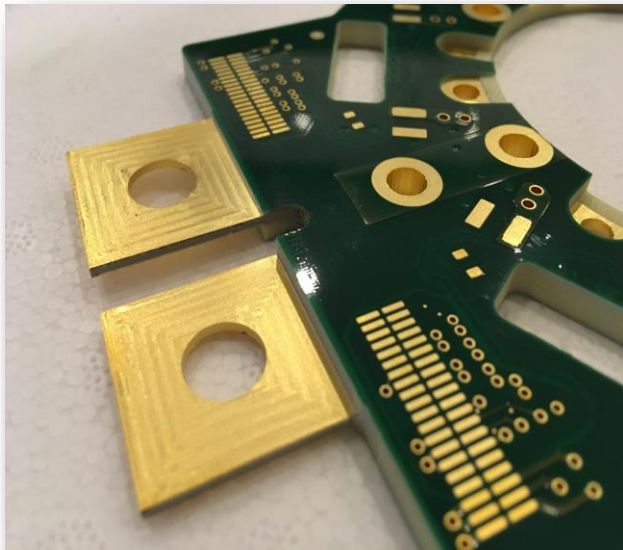
- Busbar side not soldering
- PCB weight
- Connexion between Busbar & PCB

OUR POWER MANAGEMENT SOLUTIONS

INNER BUSBAR

Thick copper >1 mm laminated into multilayer PCB.

Solution for very high current application. Control part on multilayer PCB.



BENEFITS

- ✓ Very high current
- ✓ Copper base from 1 to 2.5 mm
- ✓ 2 soldering layers

LIMITS

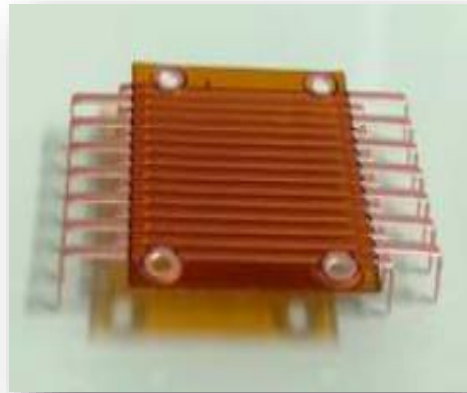
- PCB weight
- PCB thickness
- Busbar shape
- Specific design rules

OUR POWER MANAGEMENT SOLUTIONS

AVIFLEX

Sculptured copper flex AVIFLEX[®] are flexible circuits composed of 1 base thick layer of copper which can be locally reduced from 250 µm to 100 µm.

Encapsulated between 2 layers of polyimide insulators.



BENEFITS

- ✓ Copper thickness
- ✓ Heavy copper compliant
- ✓ High volume capacity
- ✓ Wire / flex-rigid alternative

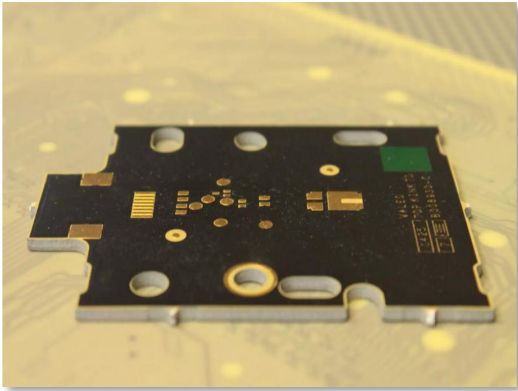
LIMITS

- Specific design rules
- Only 1 layer
- Bedding radius

OUR THERMAL MANAGEMENT SOLUTIONS

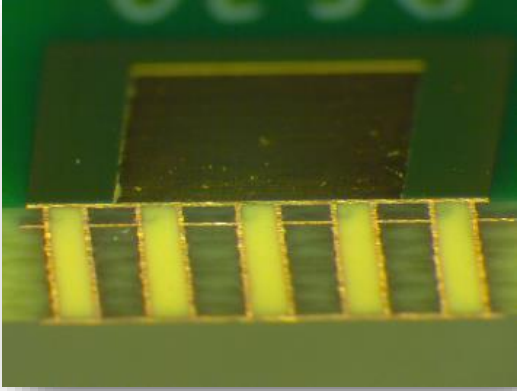
SMI

- Aluminum substrate
- All finishes
- Al thk until 2.5 mm



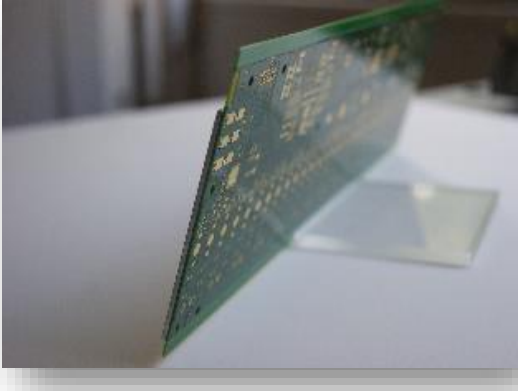
HEATSINK

- Aluminum or copper
- Al thk until 2.5 mm
- Anodized



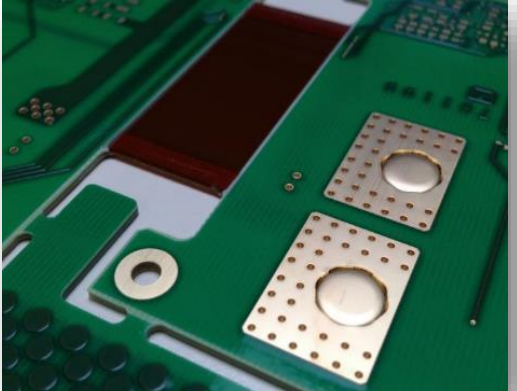
THERMAL VIAS

- Filled Htg resin
- Min Ø : 0.25 mm
- Cap copper plated



COPPER INLET

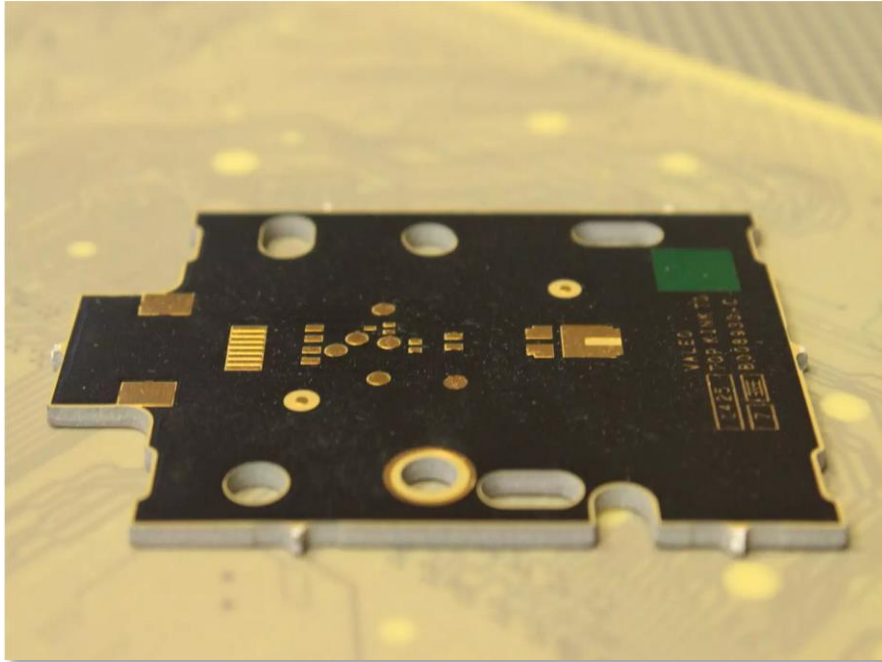
- Copper
- Different shapes
- Embedded



OUR THERMAL MANAGEMENT SOLUTIONS

SMI

Aluminium plate from 0.5 to 3 mm.



BENEFITS

- ✓ Low thermal resistance Al
- ✓ Cost
- ✓ High volume production

LIMITS

Aluminium not plating

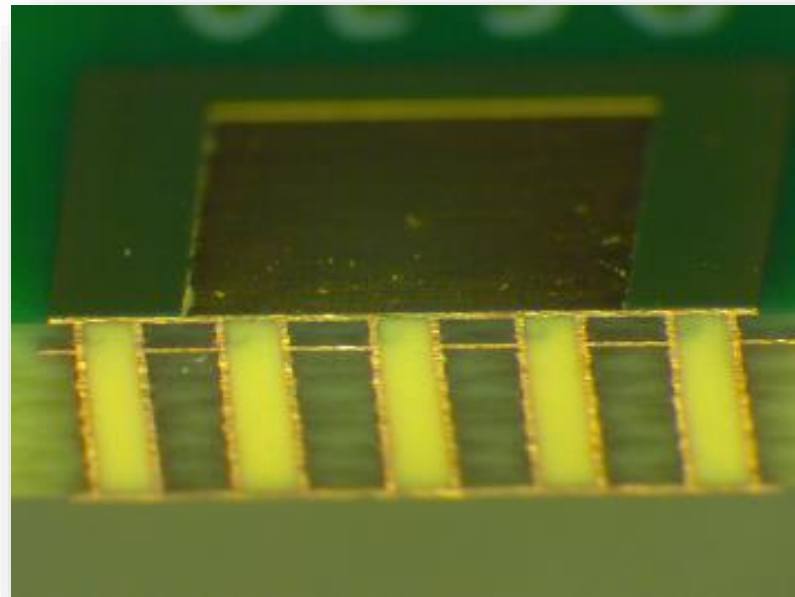
OUR THERMAL MANAGEMENT SOLUTIONS

THERMAL VIAS

Mechanical or laser vias array.

Plated through hole.

Copper filled laser vias.



BENEFITS

- ✓ Well-known technology & cost effective
- ✓ Via in pad
- ✓ Laser vias for miniaturization & densification
- ✓ Resin filled compliant

LIMITS

- Thermal dissipation lower than other solutions
- Via copper plated 50 μm max.

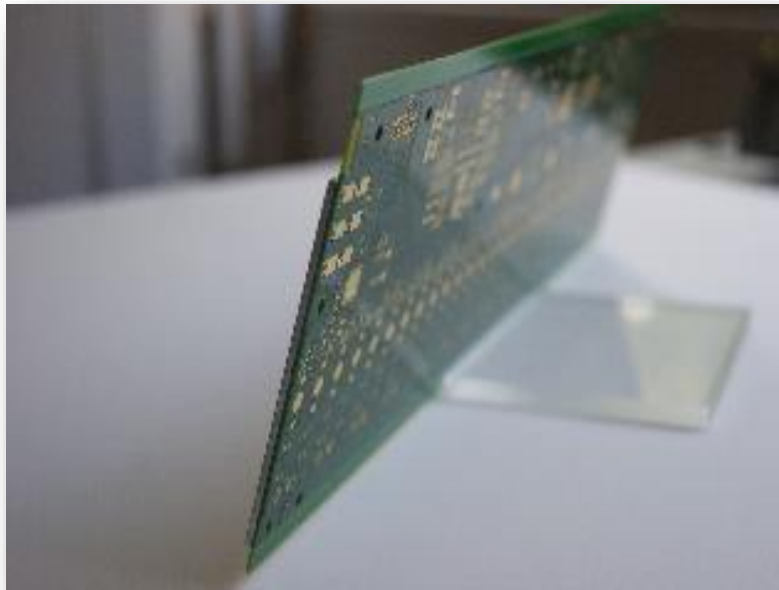
OUR THERMAL MANAGEMENT SOLUTIONS

HEATSINK

Metallic plate (copper or aluminium).

Metallic plate could be anodized.

Laminated with 3M[®], epoxy or acrylic sheet.



BENEFITS

- ✓ Low thermal resistance Cu, Al
- ✓ Mechanical machining
- ✓ Electrical insulation
- ✓ Multilayers compliant

LIMITS

- 1 side not soldering
- No symmetrical stack-up, wrap issue

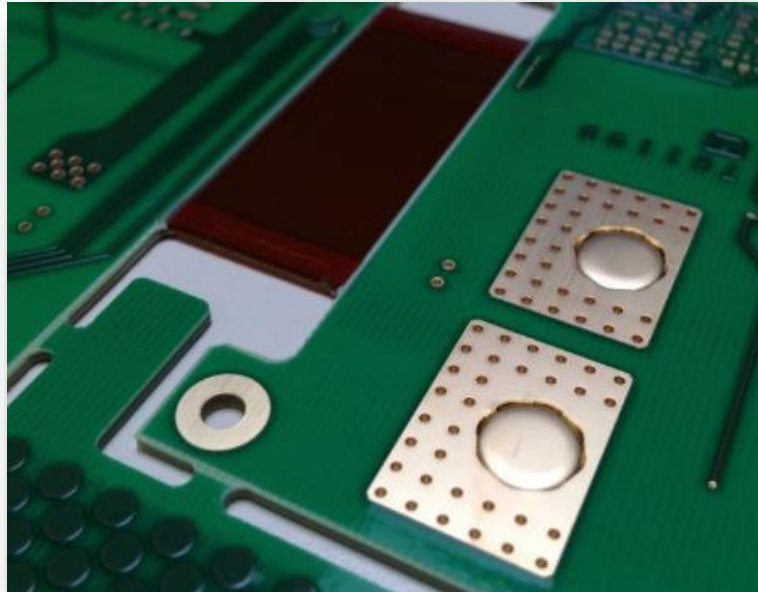
OUR THERMAL MANAGEMENT SOLUTIONS

COPPER INLET

Double or multilayers PCB.

Pressfited copper inlet.

Local thermal dissipation under component.



BENEFITS

- ✓ Compactness
- ✓ Density
- ✓ HDI, flex rigid compliant

LIMITS

- Specific design rules
- Inlet shape (circular preferred)
- Min. diameter 5 mm

CONCLUSION

PCBs'
advanced
packaging
and
solutions



- ✓ COST
- ✓ THERMAL MANAGEMENT
- ✓ PERFORMANCE
- ✓ MINIATURISATION

Alternative solutions with many advantages.



WE LOOK FORWARD TO A SUCCESSFUL CO-OPERATION.

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