SERMA
MICROELECTRONICS

SERMA MICROELECTRONICS

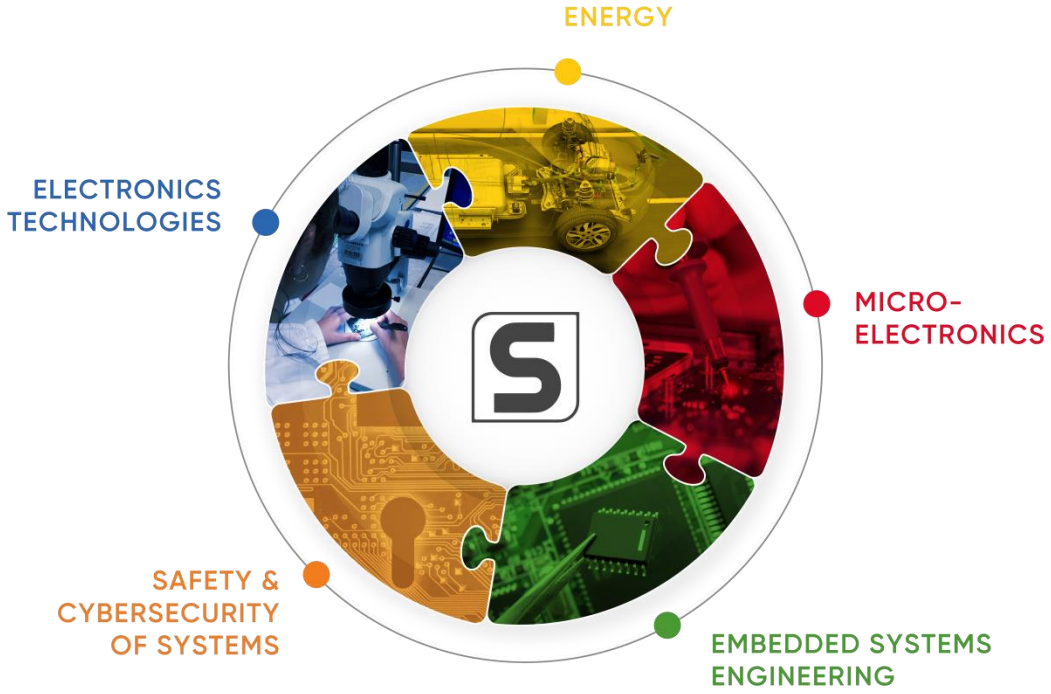
From QFN & µBGA to complex SiP – A turnkey solution to your plastic encapsulation

ESCCON 2021 – Thursday, Match 11th

Summary

- Introduction to SERMA
- SME history in plastic housing
- From prototyping to industrialization
- Ongoing development
- Some achievements

An offer serving 5 core electronics segments

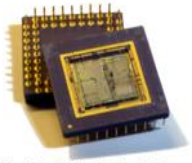


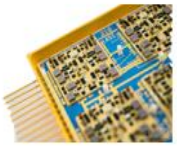
Types of Services

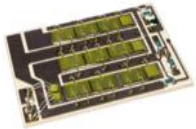
- Expertise
- Consulting
- R&D
- Engineering support
- Testing and qualification
- Products development and production upon Customer specification
- Formal evaluation

SERMA MICROELECTRONICS

- Process engineering ➔ Semiconductor integration process development
- Wafer treatment ➔ Wafer sawing, Pick & Place, Dice visual inspection
- Assembly & Test of hirel hermetic components / plastic / Hybrids / System In Package
- Definition of special process and mixed technology integration (SMT / Microelectronics)
- Ceramics substrate production (thick film & thin film technology)


Single Chip Modules


MCM / Hybrids


Power modules

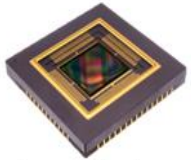
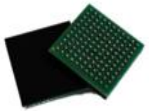
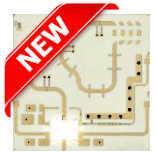


Image detectors


CCGA


Thick films

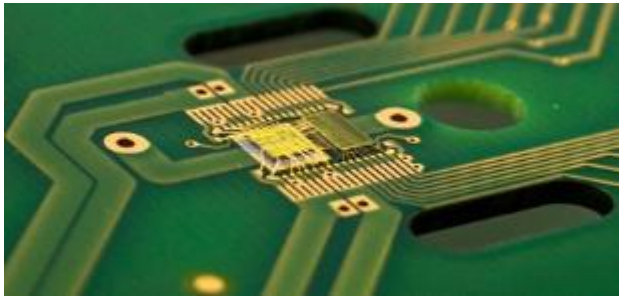

Enhanced plastic

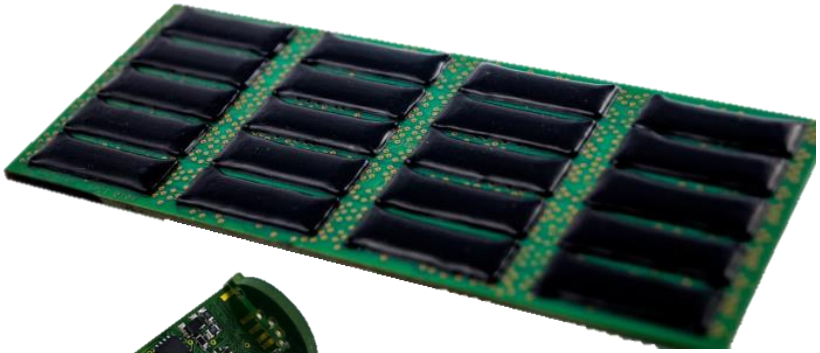


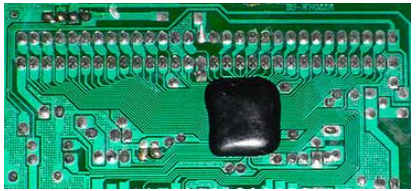
Thin film

- French manufacturing facilities (2 clean rooms in La Rochelle and Toulouse) – 80 people

HISTORY IN PLASTIC HOUSING





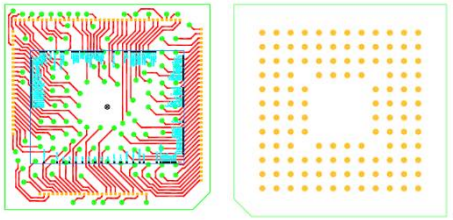


<u>Since mid 90's</u>:

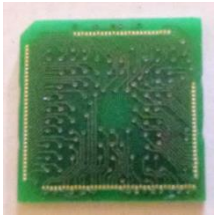
- Assembly of dies onto PCB
- Chip on board
- Dam & Fill resin dispensing
- Various markets (Automotive / railway / industrial)

Interest started to grow in space and defence industry in mid 2010's for plastic encapsulation

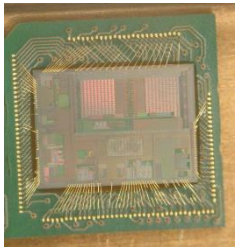
2016: First prototypes of PBGA at SERMA



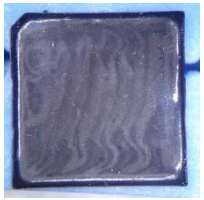
Design

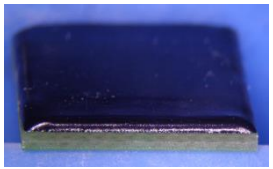


PCB manufacturing

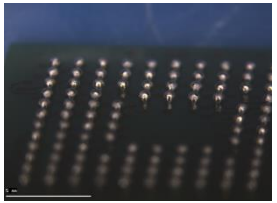


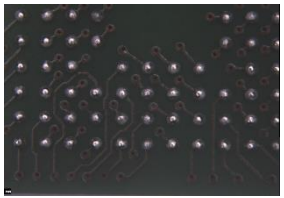
Die attach
Wirebonding





Glob top



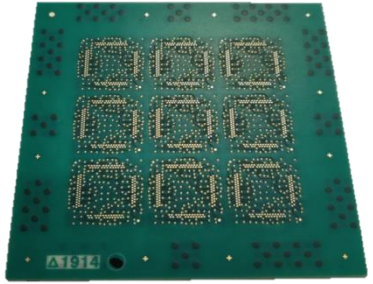


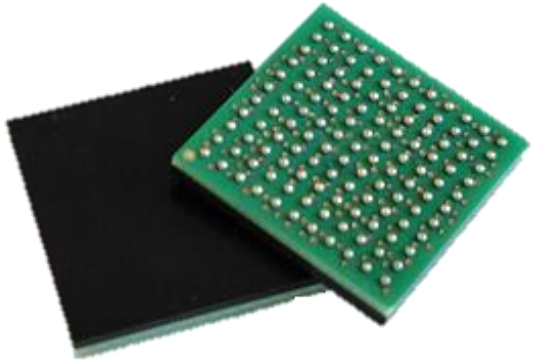
Balling

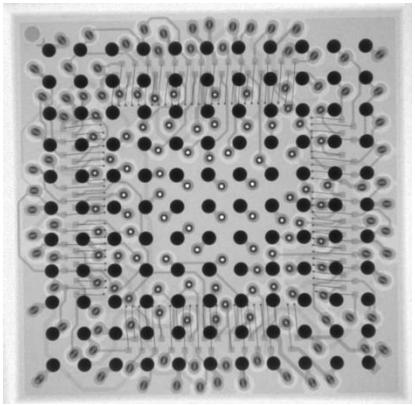
Not industrial, but very instructive !!!

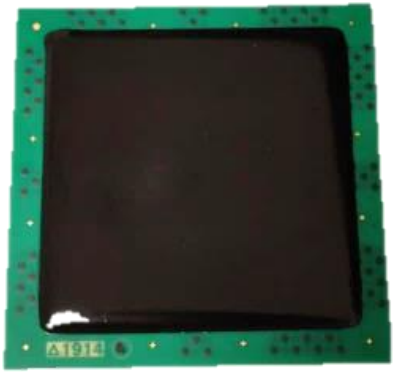
2019: First industrial application

- BGA121 12 x 12 mm² for military application – 256 pads on die :
  - Development process according to EN9100
  - Assembly according to MIL STD 883
  - Manufacturing in 3 x 3 matrixes
  - Customer qualification PASS

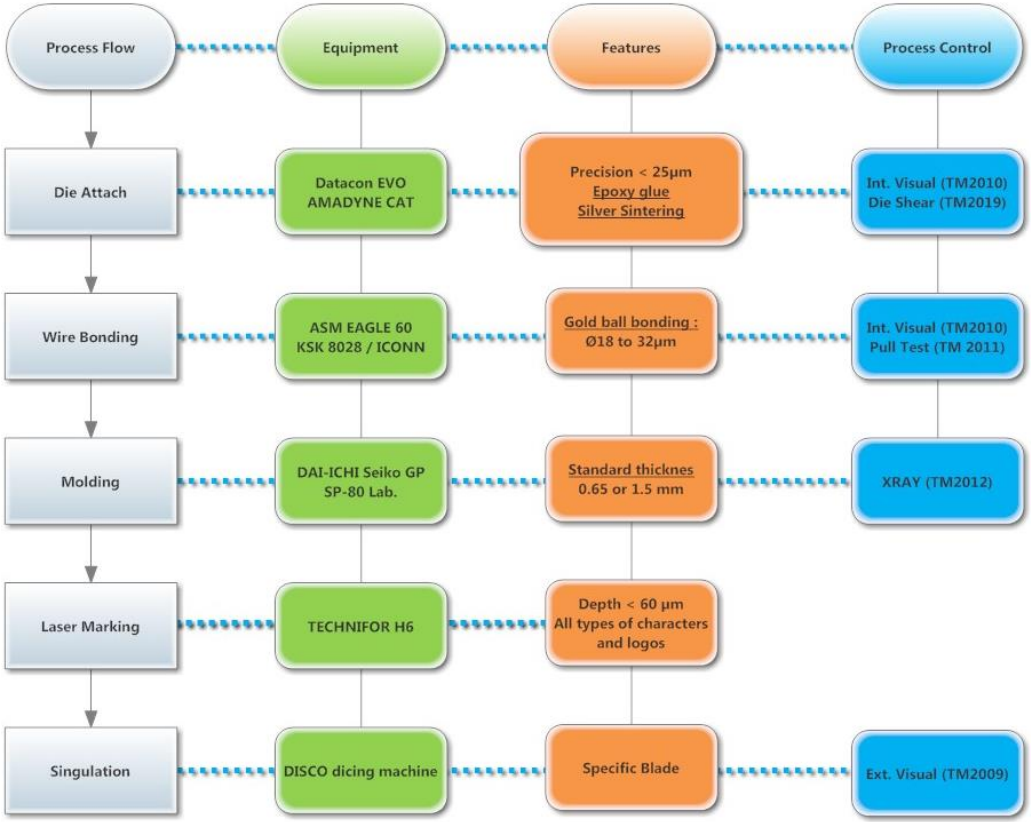








2020: Dispensing to Molding, introduction of QFN



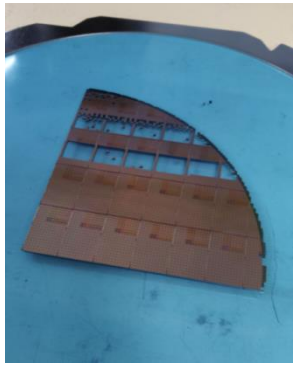
Leadframes in stock for fast prototyping

Reference	I/O	Pad Size (mm)	Size (mm)
HVQFN32	32	3,3 x 3,3	5 x 5
HVQFN40	40	4,3 x 4,3	6 x 6
HVQFN48	48	5,3 X 5,3	7 x 7
HVQFN56	56	5,45 x 5,45	8 x 8
HVQFN64	64	5,0 x 7,5	9 x 9

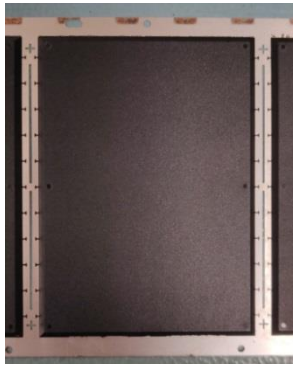
+ any custom design possible according to customer requirements

QFN assembly : from wafer to test board

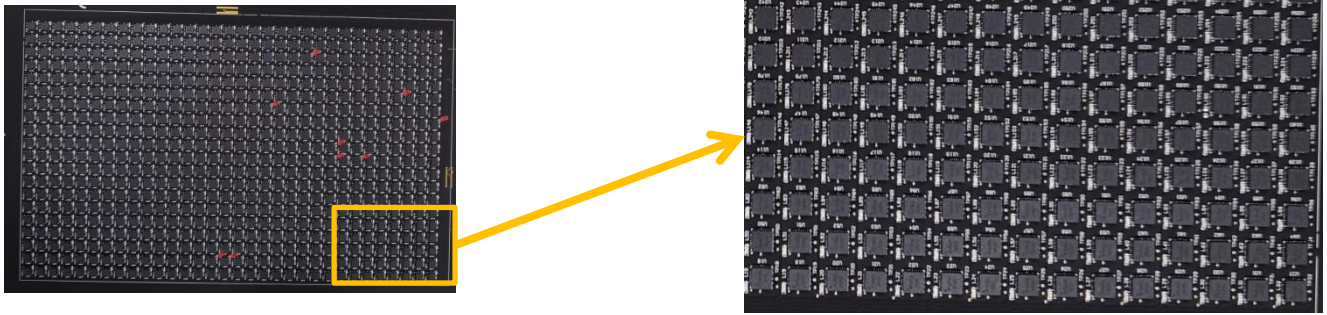
Pick&Place from wafer to Leadframe :



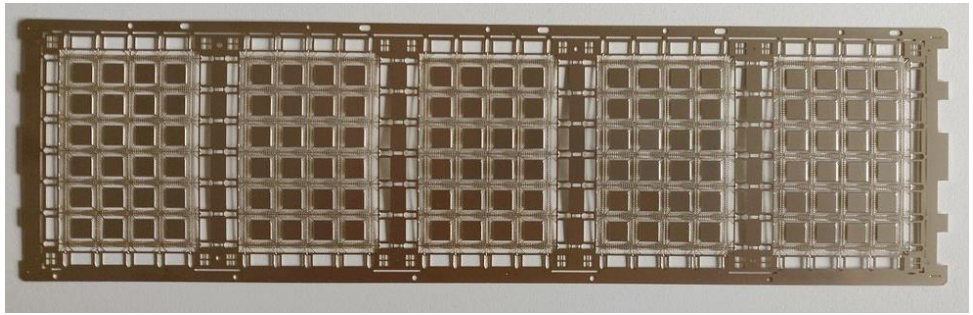
Molding and laser marking :

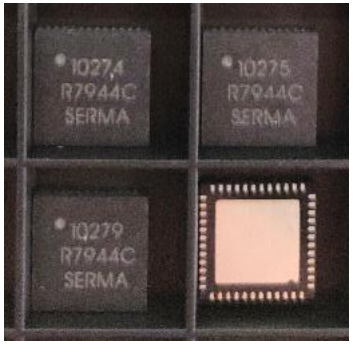


SMD mounting on PCB (35x20cm²) :



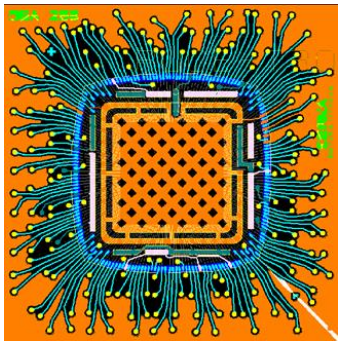
From leadframe to organic panel → final phase of industrialization ongoing !





Panel design must fit our molding equipment to offer industrial volume production

<u>BGA in house</u> design according to customer inputs and manufacturing constraints:



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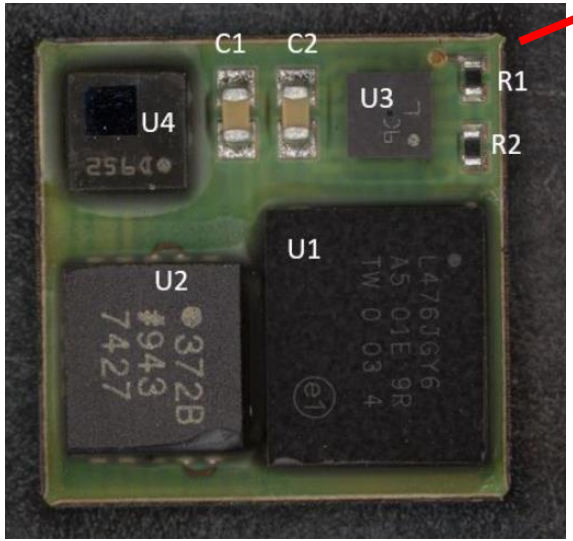
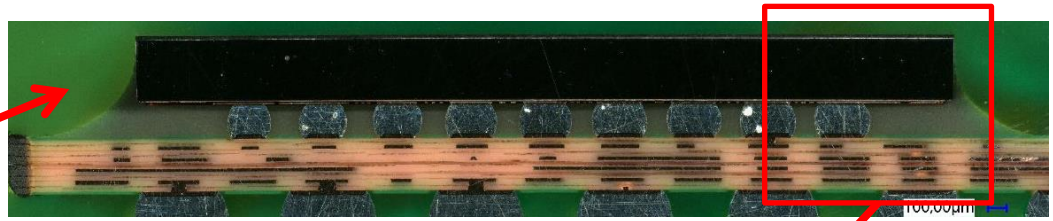
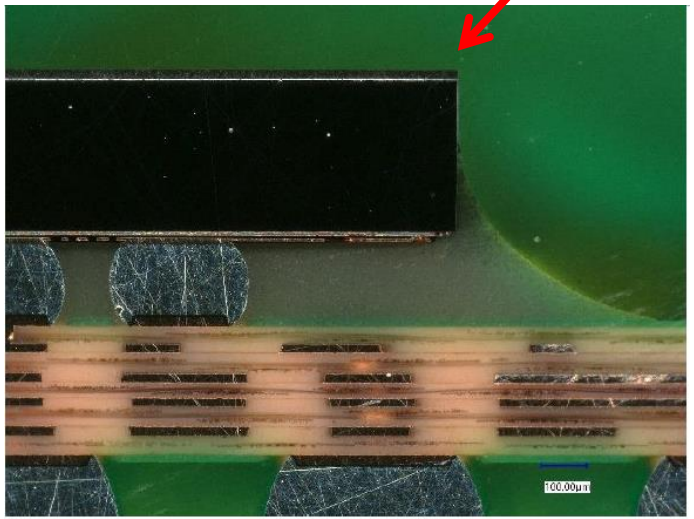
Some achievements

SiP for Oil&Gas application

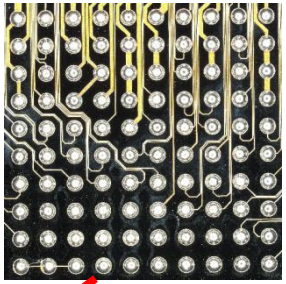


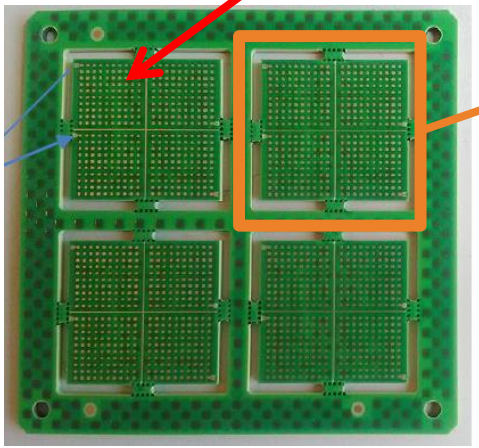




Flip Chip BGA100 (600µm diameters) – optical detectors

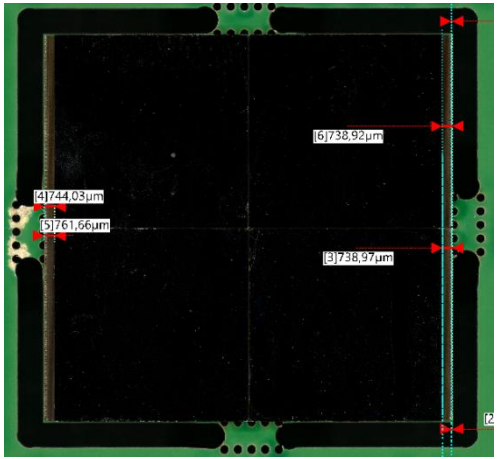
600µm bumping



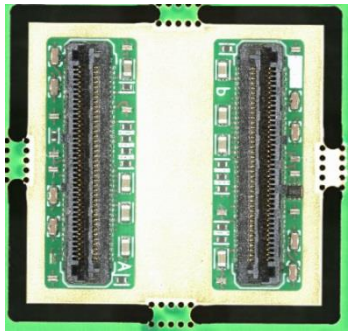


Flip chip

TOP



SMD on bottom



Thank you for your attention !

Technical : m.bini@serma.com

Commercial : SM_Adv@serma.com