3D-HiPMAS

Pilot Factory for 3D High Precision MID Assemblies

3D-HiPMAS

Today's challenges

Due to the high potential of miniaturization and integration, with regard to the innovation degree, quality and sustainability requirements, the 21st century looks forward to the integration of new functions on plastic parts to produce smart plastic products, as markets are requiring traceability, security, communication as well as ergonomics.

So called "Molded Interconnected Devices" (MID) basically combine all the features of molded plastic parts with electrical conductive circuitry and electronic components assembly directly on the plastic packaging. MID lead finally to highly integrated multimaterial and multifunctional 3D compact systems.

With a 20% of growth per year since 2008, MID is tomorrow's converging technology for electronics and plastics.

Objectives

To achieve advanced high precision and high quality 3D micro systems, the EU industry is facing the following MID bottlenecks:

- to be able to manufacture high precision 3D micro-parts integrating plastics and electronics, including 3D plastic system carrier, 3D-conductive tracks and 3D electronics component assembly,
- to be able to significantly reduce the manufacturing cost in order for EU industry to be competitive with low-wage countries,
- to provide the industry with reliable, robust and in-line controlled manufacturing processes for plastics and electronics converging technologies.

The 3D HiPMAS project will offer the industry a pilot factory able to provide customized solutions in terms of technical and economical performances.

Pilot Factory for 3D High Precision MID Assemblies

3D-HiPMAS pilot line:

- 3D plastics micro-parts
- conductive tracks
- components assembly
- online monitoring / quality inspection

3D high precision parts	3D metal patterning	3D high precision assembling	3D advanced process control
• new plastic materials • new 2 shot molding	• finest 2 shot pitches • new LDS machine	• chip, SMD, LED, lens,... • new machinery	• xray, optical, electrical • software work bench

Project end	Project end + 1	Project end +3
3D-HiPMAS Pilot Factory HSG IMAT	+1 Additional Pilot Factory PEP	+2 Additional Pilot Factories Other locations

Case studies

The technology will be validated through 4 case studies.

DEMONSTRATOR 1: 3D FUEL CELL

Beyond SoA:
Improvement of system integration for mass manufacturing
- Integration of new low-level functions those were external to the fuel cell modules
- Reduction of parts of the overall fuel cell system
- Re-design of parts for mass manufacturing
- Progress toward "plug-and-play" fuel cell modules

DEMONSTRATOR 2: 3D MICRO HEARING AIDS

Beyond SoA:
- Improved FM receiver connector for BTE hearing aid
- Integration of structural contact elements
- 3D integration of electronic components
- Improved environmental reliability
- Cost reduction by integration of various mechanical and electrical components

Phonak BTE type hearing aid

DEMONSTRATOR 3:
3D MICRO SWITCHES

Beyond SoA:
New market opportunity
- Lower cost
- Improvement of assembly process
- Number of parts reduction

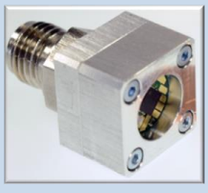
Existing Product

Improved RF performances
- By using MID liberty degree possibility
- New RF line design to increase the frequency level

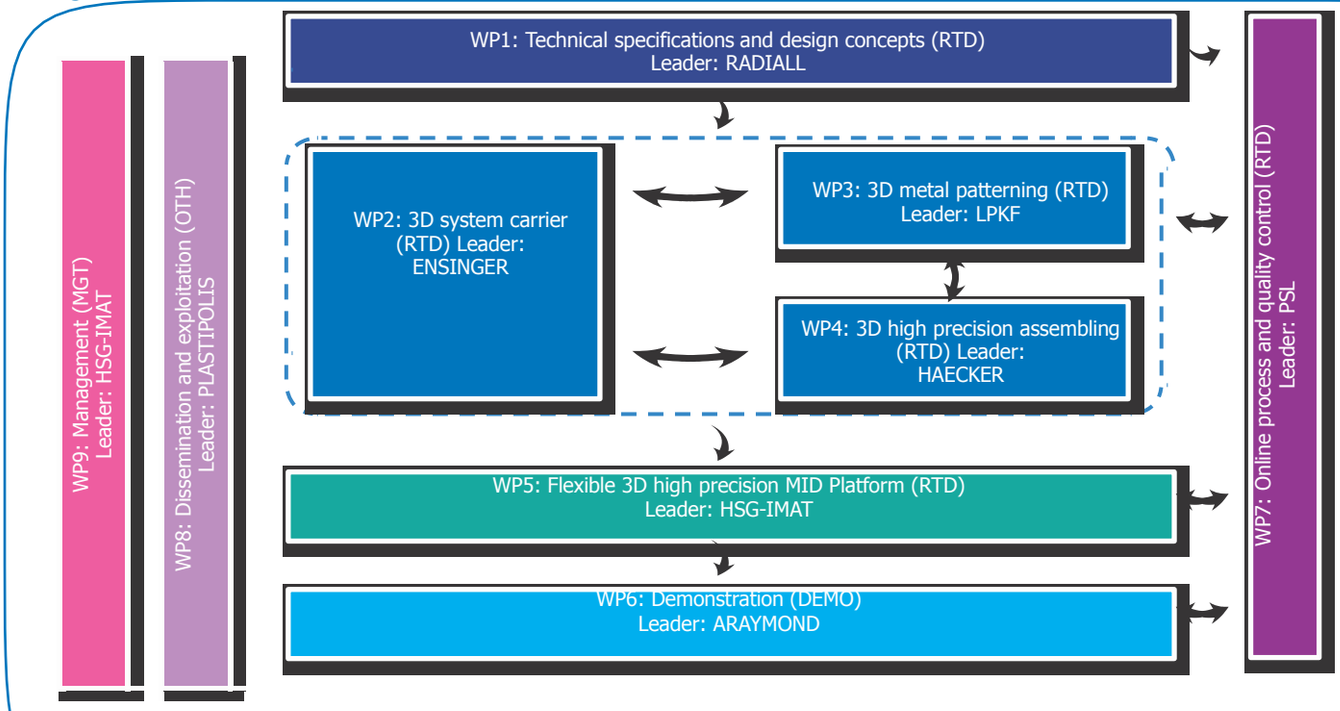
New Product

DEMONSTRATOR 4:
MID BASED PRESSURE SENSOR

Beyond SoA:
- Simple and robust sensor design
- Minimal current drain
- Cost reduction by using standard optic- electronic elements
- Low package volume by 3D MID circuit
- Temperature monitoring included
- Membrane system for harsh environments
- Long term stability



Project Organization



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