

EPIC Members Event Report

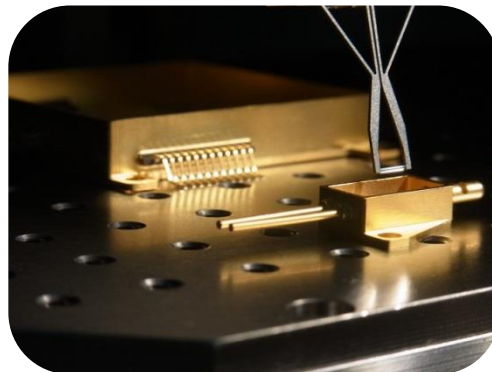
PHOTONIC PACKAGING WORKSHOP

“Effective Manufacturing in Europe”



Berlin, Germany
10-11 September 2014

In cooperation with:



Event organized and report prepared by Fraunhofer IZM:

- Dr. V. Zamora, Research Associate
- Dr. H. Schröder, Head of Optical Interconnection Group

About the EPIC Members Event Reports

Initiated by the founder of EPIC Dr. Thomas Pearsall in 2003, these reports are prepared by members of EPIC to the benefit of the wider community. If you did not have a chance to attend the event but would like to know some key highlight, this report is for you. Emphasis is placed on exploring technical and business opportunities for the members of EPIC.



The workshop “Photonic Packaging” organized by the Fraunhofer Institute for Reliability and Microintegration (IZM) took place on 10-11 September 2014 at Fraunhofer-Forum Berlin, Germany housed more than 50 participants with 70% industry participants. The event was focused on effective manufacturing strategies in Europe and automated assembly technologies for optoelectronic and photonic integration on board, package and device level. Trends and challenges in photonic packaging were intensively discussed at the workshop where the current status of photonic integration was compared with the status of electronic integration in the 70’s. However, the demand of bandwidth in data- and telecommunication is pushing on the integration of optoelectronic devices, micro-optical elements and optical interconnects to develop systems with high level of miniaturization, low cost and high reliability.



The workshop was organized by Fraunhofer IZM and attended by more than 50 participants.



The participants represented OEM manufacturers, suppliers, services assemblers and academics.



EPIC promoted collaboration along the value chain to develop standards that will benefit the industry at large.

Assembly technology related to light sources for photonic modules – such as VCSELs and LEDs - was one of the main topics. In VCSELs, a resonance cavity is created by a mirror and an active layer deposited perpendicular to the wafer surface, so that light is vertically emitted. It makes easy to provide the multi-channel array of light sources. Despite of this advantage, there is a huge work behind the assembly of such modules. Thereby, several aspects related to the standardization process of VCSEL containing modules were discussed leading to questions as: Can the active alignment be avoided? What type of adhesive is the best option? Can a large number of VCSELs be automatically integrated in several minutes?

Most of the participants agreed that the usage of passive alignment reduces efforts and packaging costs but many micro optic elements require active alignment to cover the desired accuracy. Regarding to the standardization in photonics, it is far from the level observed in electronic assembly technologies due to the diversity of components with different shape, size and material present in photonic systems. However, participants from assembly companies are really motivated to manufacture automated tools with high speed and sub-micron precision.

The realization of smart systems for printed circuit boards (PCBs) was also presented. With optical coupling interfaces, the coupling efficiency has been drastically improved in PCBs using automated active alignment. Moreover a cost reduction can be reached by panel level technologies.

Another topic was addressed to the hetero- and hybrid integration (silicon, III-V semiconductors and TriPLex) of optoelectronic and photonic components via photonic wire bonding technology. With this technology, chip-chip connections can be developed achieving a high degree of integration.

This event has promoted to find solutions that cover the current demands in photonic packaging. For this, the formation of networks integrated by OEM manufacturers, suppliers and service assemblers will help to face to the specific challenges.

For additional information, please contact the authors of this report and organizers of the event:

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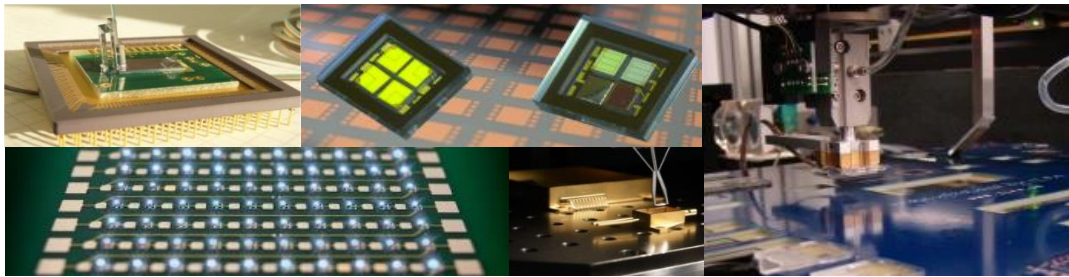
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Fraunhofer IZM develops packaging technologies for boards, modules, systems to meet the current and future challenges of photonic technology. We adapt established and new microelectronic techniques – wafer level packaging, PCB integration and surface mounting technologies – with available equipment to optoelectronics and other related, application-specific systems. Our approach places high value on reliability and maximizing the potential for cost-effective automation.



182 EPIC Members (1 July 2014)

ACREO, AFE, Advanced Packaging Center, Advanced Vacuum, AIFOTEC, AIM Infrarot-Module, AIXTRON, ALEDIA, ALPHA Route des Lasers, Alphanov, Alter Technology, AMO, Amplitude Systemes, AMS, art photonics, ASE, ASE, ANU, Avantes, Berlin Partner, Boschman, Bbright, Bright Photonics, CAILabs, CALIOPA, CD6, LETI, Centre for Nanophotonics, CPST, Chalmers University, CIP, CMC Microsystems, Cobolt, COBRA, CSEM, DAS Photonics, DELTA, DIAFIR, Dilas, DirectPhotonics, Dow Corning, DIT, eagleyard, EBARA, KIT, Mikrocentrum, Nanosystec, Photonics Cluster NL, SATRAX, SOFRADIR, TE Interconnect, FOTONIKA - LV, Fraunhofer, Fraunhofer, Fraunhofer, Fraunhofer, Fraunhofer, Fraunhofer, Glyndwr University, Hamamatsu, HE ARC , Heraeus, Hisilicon, Heriot-Watt University, Horiba, Huawei, ICFO, IDIL, IHP, IKO Science, Imagine Optic, IMT, INL, Innolume, IOGS, INTEC, International Laser Center, IPHT, IQE, IREC, ixFiber, JePPIX, KIT, Konica Minolta, LMDC, LayTec, LioniX, Lithuanian Laser Association, Luger Research, Laser World of Photonics, Microelectronics Institute of Barcelona, Mikrocentrum, Modulight, M Squared Lasers, MW Technologies, Multiphoton Optics, Multitel, Nanoscribe, Nanosystec, Nanovation, Next Scan Technology, nlight, NOVAE , Ocean Optics, Oclaro, Onefive, OPI Photonics, OpTecBB, Opticsvalley, PopSud, ORC, ORC, Phoenix, Photonics Bretagne, Photonics NL, Photon Lines, Photonics Marketplace, Pie Photonics, PI miCos, Plasma Therm, PNO, Politecnico di Torino, PolyPhotonix, Powerlase, Prima Electro, Quantel, Resolution Spectra Systems, Robert Bosch, Rofin Sinar Laser, SAES Getters, SAFC, SATRAX, Scuola Superiore Sant'Anna, See Fast Technologies, SensUp, SMART Photonics, Sofradir, SOITEC, SPI Lasers, SQS, STMICROELECTRONICS, Suss MicroOptics, SWISSPHOTONICS, TU Berlin , Technobis, Technobis IPPS, Technospark Nanocenter, TE, TEMATYS, Thorn, TBP, TNO, Tridonic, University of Nottingham, u2t Photonics, Umicore, UCL, University of Barcelona, University "Mediterranea" of Reggio Calabria, University of Nottingham, University of Roma Sapienza, University of Sheffield, University Paderborn, Vario Optics, Vertilas, VI Systems, VLC Photonics, VTT, WJA Electron, Wroclaw University of Technology, XiO, YELO, Yenista, Yole, Zumtobel. www.epic-assoc.com/membership