Microtech 2019: “POWER IN PACKAGING”

The theme of Microtech 2019 was packaging for power. A timely topic, with the move to electrification of transport and the difficulties of packaging power devices. The conference took place at the excellent conference facilities of TWI, in Cambridge, who also provided some very good catering. Whilst the food kept the delegates content, they also feasted on a great agenda of talks.

The keynote presentation was given by Alec Gunner from TWI, who emphasised the changing nature of the UK electricity grid, from an “arterial” system around large power stations, to a much more devolved system using small power sources such as solar farms, thus increasing control complexity. Like many presenters, he then moved onto the challenges of battery power sources and the interconnection of Lithium Ion cells.

Neil Sellars from CRC introduced the audience to the challenges of high power electric motor controllers. These have a specialist complex packaging structure, designed to deal with high current, voltages and heat dissipation. CRC are investigating moving away from wire bonding to direct solder attach and double sided cooling.

Will Drury from Ricardo gave a very interesting market eye view of the automotive and commercial transport market. A thought-provoking perspective was the difficulty of removing fuel powered motors from vehicles, particularly long haul heavy goods vehicles. Nevertheless, he recommended moving into SiC, cooling and computer modelling technologies for electric vehicle power packaging.

The conference then moved on to the intricacies of novel packaging. Harry Cronin of DZP Technologies discussed a feasibility study of a package with a power die interconnected by silver ink rather than wire bonds. David Hutt from Loughborough University discussed ACUSINT, a project using copper powder based inks and adhesives to model a prototype system in a package. There seems to be a lot of work needed to successfully sinter copper powder to realise the full potential of Copper conductivity. Do these two technologies provide possible routes to rapid prototyping power packages?

The audience were then voluntarily “held ransom” before lunch by a brief interlude for the IMAPS-UK annual general meeting. The meeting was well attended and underlined benefits of being a member and the voluntary nature of the society. Officers and committee duly elected, everyone dispersed for networking and an excellent lunch provided by TWI.

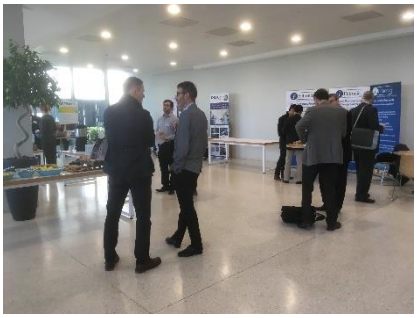
While enjoying the food, the delegates were able to meet with the table top exhibitors and discuss aspects of packaging services, equipment and materials all related to the microelectronics assembly industry that is represented by IMAPS-UK members. Alongside the exhibition was the technology research poster display area. Here there were presentations from Loughborough

University, NPL, STFC Rutherford Labs and Besi, covering a wide range of new developments in bonding technology and reliability aspects.

After lunch, the conference audience heard presentations on materials. Adam Cerek from Scheugenpflug presented on thermal greases and provided a lovely pictorial representation of viscosity. Thomas Seldrum from Dow Chemicals presented the results of trial of a new higher temperature self-healing silicone gel, an essential component of power modules.

Franz Bechtold of VIA electronic discussed the KAIROS project, which uses an LTCC ceramic substrate for the control circuit, mounted on an HTCC substrate with integrated cooling channels under IGBT die.

The final afternoon presentations were on processes and equipment. Matt Vorona from STS Vacuum Reflow Systems travelled from the US to outline a study into ceramic module to base plate soldering using a formic acid atmosphere to flux the soldering operation. Christian Kersting from K&S discussed a study into new aluminium wire types for high power applications. This is the conventional and current material for power modules. In contrast, Michael Brökelmann from Hesse extensively discussed battery interconnection and, alongside TWI, came down in favour of copper wire interconnects.



This concluded a well structured, well fed and very informative Microtech 2019. Thanks very much to the committee members and Secretariat who organised this enlightening and well run event.