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Conference Report

I.S.H.M. INTERNATIONAL MICROELECTRONICS SYMPOSIUM

October 21st–23rd, 1974. Boston, Mass., U.S.A.

The Annual Symposium of the International Society for Hybrid Microelectronics (U.S. Division), this year adopted the theme of "The Realisation of Promises" and it was noticeable that a large percentage of the papers dealt with process and quality control in production environments, suggesting that indeed some of the promises of earlier years had been fulfilled.

The technical papers were presented in eleven half-day sessions with approximately 6 papers per session and since the Symposium only lasted for three days, there was often a good deal of indecision as to which of the concurrent sessions demanded one's presence.

In addition, there was an evening panel discussion on the "Qualification of Polymers for Hybrid Use — A Vendor or User Problem", which provoked some lively discussion on the advantages and pitfalls of polymers, but which unfortunately tended to pre-empt the technical session devoted to polymers on the following day.

Two sessions were devoted to process and in-line quality control. The effect of such variables as the quality and physical parameters of the screen and image when printing fine-line thick film conductor patterns was discussed.

Other papers described the evaluation and subsequent control of process variables using equipment ranging from a scanning electron microscope (and how many of the audience would have loved to be able to call on such an instrument as a process control tool?!), to an analytical balance (controlling the deposition weight of resistors instead of thickness). Further papers discussed other detailed aspects of quality control such as the measurement of the solderability of thick film conductors whilst an overall quality control plan for thick film processing and the use of sampling techniques for testing, were the subjects of other papers.

The ageing problems associated with ultrasonic aluminium wire bonds to thick film conductors dominated the session devoted to "Bonding and Interconnections". Other topics dealt with in this session were mechanical thermal pulse bonding for component packaging and a method of removing beam-lead devices from hybrid circuits without damaging either the device or substrate metallisation.

Add-on devices for hybrid circuits were the topics under discussion in another session, which included a very interesting description of the manufacturing process for monolithic multilayer ceramic capacitor chips. (Perhaps if the user understands some of the details and problems of manufacture he may use the devices more intelligently?!). Also described in this session were low value chip resistors and new data on the manufacture and use of Solder Bump Flip Chips.

Further sessions were devoted to the various approaches to and the problems associated with hybrid packaging (whether glass-to-metal seals or ceramic packages, and the measurement and control of the atmosphere in hermetically sealed packages), and the aspect of reliability analysis (with papers ranging from the problems of specific areas such as solder joints, to methods of ensuring the overall reliability of hybrid circuits).

Though the Symposium theme was "The Realisation of Promises", the future was not forgotten and new "promises" were made in two sessions devoted to "Advances in Thick and Thin Film Materials" and "New Applications for Hybrids".

In the new materials session, the use of titanium nitroxide as a buried-layer thin film passivation was described, whilst two papers described new or improved thick film paste compositions; a new approach to multilayer dielectric materials and a modification to a high silver content silver-palladium conductor composition to reduce the geometry dependence of resistors terminated with this composition. Other papers in this section reviewed the new commercially available "fritless" or reactively-bonded conductor compositions, and materials suitable for use at 6 GHz. Both of these papers, however, lost much of their value due to a reluctance of the authors to positively identify the materials evaluated. The use of the scanning electron microscope to study thick film microstructure formed the basis of another

paper in this session, and this caused much discussion as many conclusions were in disagreement with previously published data.

The session devoted to new applications was a little disappointing, as only three papers truly lived up to the title of the session. Of these, perhaps the most fascinating was the description of a thick film hybrid electronic watch.

The final session of the Symposium discussed "Advances in Microelectronics at the University Level", and the six papers presented reflect the growing participation of educational establishments in the hybrid field and in I.S.H.M. itself.

Running parallel with the Symposium was an exhibition at which over seventy companies displayed their latest products, many of which were announced at the exhibition, and since the stands were manned for a good deal of the time by engineers and research staff attending the Symposium, the exhibition was well worth a visit.

The combination of technical papers, exhibition stands and hospitality suites (where the free flowing alcoholic drinks reduced the reticence displayed in the conference hall) provided the 850 or so delegates with an excellent opportunity of sampling the up-to-date activity in all aspects of hybrid technology.

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Proceedings

All enquiries regarding obtaining copies of the Proceedings of this Symposium should be sent to: Glenn H. Dowler, Executive Secretary, I.S.H.M., P.O. Box 3255, Montgomery, Alabama 36109, U.S.A. The approximate cost of these Proceedings will be £6.00 ($15), but exact cost is not yet known.