

EuPac '98

**Lectures and poster show contributions of
3rd European Conference on
Electronic Packaging Technology
& 9th International Conference on
Interconnection Technology in Electronics**

Nuremberg/D, June 15 – 17, 1998

Organizer:

German Welding Society, Düsseldorf

Table of contents¹⁾

Multichip modules

Passive RF-systems integrated in MCM-D	1
P. Pieters, S. Brebels, E. Beyne	
Processing of Teflon AF 1601 for applications as dielectric in high frequency multilayer metallizations for MCM-D	4
H. Kiesbye, T. Strunskus, P. Gulde, G. Neumann	
Design and fabrication of a two layer thin film interconnection system on glass for use in a parallel free-space optical interconnection demonstrator	7
J. Lernout, J. Vanfleteren, A. Van Calster, L. Vanwassenhove, P. Van Daele	
A versatile pick & place tool for ultraprecise placement – demonstrated by the application in an advanced MCM-D technology	10
O. Bornholdt, P. Gulde, G. Neumann, S. Muehlmann	

Area array and chip scale packaging (BGA, CSP)

The development of a LTCC top-bottom-BGA (TB-BGA)	13
F. Bechtold, R. Leutenbauer, V. Großer, E. K. Polzer	
Reliability aspects of molded BGA's related to material properties	16
R. Ehrlich, K.-F. Becker, H. Badri Ghavifekr, F. Ansorge, R. Aschenbrenner, H. Reichl, K. Sawai, A. Tanaka, K. Kumano, Y. Tenya, M. Cichon, H. Hosokawa	
Manufacturing a BGA multi-chip-module	23
V. Thor, J. Engbring, M. Nover, P. Sommerfeld	

Chip interconnection technology

Gold and gold-tin wafer bumping by electrochemical deposition for flip chip and TAB	28
L. Dietrich, G. Engelmann, O. Ehrmann, H. Reichl	
Quality and yield of ultra fine pitch stencil printing for flip chip assembly	32
K. Heinrich, J. Kloeser, L. Lauter, A. Ostmann, H. Reichl, A. Wolter	
A low cost mounting process for flip chips on FR-4 substrates	37
F. Feustel, B. Lauterwald, P. Grätz, E. Meusel	
A new approach to fluxless flip-chip soldering	40
E. H. Pedersen, J. F. Kuhmann	
First investigations of Au/Sn alloys on different end-metallizations	43
S. Anhöck, H. Oppermann, C. Kallmayer, R. Aschenbrenner, L. Thomas, H. Reichl	

¹⁾ The lectures and poster contributions which did not reach the publisher's house in time are listed at the end of the table of contents.

Underfilling and plastic encapsulation

Realistic finite element modeling of underfill effects in flip chip modules	47
S. Rzepka, E. Meusel	
Reliability and high frequency behaviour of flip chip assemblies with	52
low cost encapsulation	
H. Richter, F. Buchali, M. Florjancic, W. Heck, B. Robin, G. Baumann, E. Müller	

New packaging materials

Direct chip interconnection: Is the printed circuit board coming to the end of its useful life?	57
M. Anstey, D. M. Holburn, D. S. Jordan	
A new thermoset microwave material	60
C. Drevon, E. Evangelinos, N. Jones, A. Wood, R. Day, D. Hall, M. Williams, M. Gonzalez, A. Ibarra	
The realisation of photo-via technology using multilayer as a photo imageable dielectric	62
S. Zhang, M. Vereeken, J. De Baets, A. Van Calster, J. Peeters, K. Allaert	
Strength properties for temperatures between -196 and 100°C and different strain rates	65
and creep of lead free SnBi-solders	
J. Villain, G. Amann, O. Brüller	
Contacting fine pitch SMT components with anisotropic or non-filled adhesives	66
T. Gesang, H. Schäfer, O.-D. Hennemann, T. Harder, O. Bornholdt, A. Bauer	
New conductive adhesives for microelectronic applications	69
B. Günther, H. Schäfer, A. Battermann	

Power electronic packaging and thermal management

Thermal management for PCBs	72
P. L. Straub, T. Mehlhorn	
Optimization of cooling systems for power electronics by means of FEM/CFD-simulations	75
W. Staiger, H. Baumann, P. Heinemeyer	
Aluminium thick wire bonding for high temperature applications	79
H. Fritzsche, E. Meusel, T. Gessner, K. Gottfried, J. Kriz	

Applications in automotive, telecommunication, etc.

Packaging for millimeterwave communication modules	83
F. Rehme, U. Goebel, W. Hager	
Reliability of solder joints in "under the hood" automotive electronic packages – how	84
represent standard test profiles the effect of real use conditions	
S. Wiese, F. Feustel, L. Nitopi	

Quality and reliability of advanced microsystem packaging

Fracture problems in microelectronic packaging – crack evaluation and crack avoidance	88
B. Michel	
Bondability check using enhanced evolutionary strategy (EES)	91
J. Bremer, J. Herrmann, F. Osterwald, K.-D. Lang, H. Reichl	
Solder paste – optical classification of several pastes according to their behaviour	94
in the reflow soldering process	
J. Schurig, G. Niedermayer, R. Bergmann, S. Wege	
Thermal fatigue damages in SMC solder joints: SEM/EDS fractography observations	96
E. Glickman, J. Davidson, O. Ichilov	
Thermo-mechanical reliability optimization of small sized SMD components	100
B. Vandeveld, E. Beyne, J. Roggen, J. Caers, C. Van Veen	
High accurate measurement of micro-joints based on visual matching by correlative	103
variance value	
K. Fujimoto, T. Katayama, S. Nakata	

Poster contributions

New concepts for electronic manufacturing facilities by using semiconductor equipment	108
standards and models	
U. Gramann, F. Frauenhoffer, R. Sturm, P. Matuscheck, M. Suntrup, T. Kaufmann, W. Schäfer	
"Green methodology" - introduction of green requirements into the hardware design	112
of telecom products	
S. Criel, P. De Langhe, D. Ceuterick	
More environmental compatibility in electroless gold-coating with cyanide-free baths	117
J. Müller, H. Griese, M. Hannemann, R. Schmidt, K. H. Zuber	
Chemical analysis of printed circuit board base materials	120
M. Riess, T. Ernst, B. Müller, R. Popp, M. Wolf, R. van Eldik	
Silicon substrate multichip modules for innovative products (SUMMIT) – developments	122
in an EC funded project	
J. L. Contreras	
Laminate based multi chip modules for direct chip attachment	126
J. Römhild, S. Ehrler, R. Kohler	
Low cost high density multilayer interconnection technology	129
M. Vrana, J. De Baets, A. Van Calster, I. Born, D. Detemmermann	
Fine pitch ultrasonic wedge bonding with ultra thin wire and optimized tools	133
R. Bierwirth, H. Reichl, H.-P. Monser, E. Meusel, T. Harder, A. Heuberger, T. U. Trapp, U. Draugelates	

How to influence bondability of different metallization systems using methods of mechanical pretreatment	136
F. Osterwald, R. Schmidt, K.-D. Lang, B. Schilde, H. Reichl	
Manufacturing and characterization of surface metallizations for printed circuit boards	139
R. Schmidt, E. Auerswald, M. Hannemann, B. Kämpfe	
Reliability of bondcontacts in chip-in-board assemblies	141
H. Berek	
Development of corrosion- and degradation-resistant metallization systems for COB-technique	143
W. Schneider	
Investigation about application of auto-protection-gas soldering	145
W. Scheel, K. Wittke, M. Nowotnick, H.-G. Ulzhöfer	
Pastes for high temperature resistors in power hybrids and microwave circuits	147
P. Otschik, C. Kretzschmar, G. Reppe, A. Scheffel	
Al-sheet as substrate for one- or multilevel package consisting interconnections, VCAs and R-matrix	150
Ph. Philippov, R. Arnaudov, N. Yordanov, M. Gospodinova, V. Ianev	
Integration density and limits of insulating ability in electronics	155
V. Skocil	
Thermal measurements with liquid cooled microchannel heat sinks	157
V. Glaw, A. Ginolas, U. Hein, O. Ehrmann, H. Reichl	
Contact temperature measurements on chip surface for reliability investigations of high power IGBT modules in traction applications	160
A. Hamidi, G. Coquery	
Influences of flip chip layout on the underfilling process	163
K.-F. Becker, F. Ansorge, R. Aschenbrenner, H. Reichl, M. Schaub	
Controlling fillet size in underfill process	170
A. Lewis, C. Q. Ness, B. Verrilli	
Comparison of the thermal performance of plastic-encapsulated and hermetically sealed packages	175
J. Nicolics, L. Musiejovsky, G. Hanreich	
Metallized injection moulded polymers for microwave applications	178
R. Ostwald	
Local laser supported cleaning of microelectromechanical systems and components	181
G. Schwaab, R. Grimme, W. Schäfer	
Implementation of flip chip technology into volume manufacturing – demonstration of processes	184
E. Jung, K. Heinrich, K. Kutzner, J. Kloeser, R. Aschenbrenner, H. Reichl, A. Brömmelhaus	
High definition components manufactured by μ-screen technology	192
R. D. Shipton, C. J. Robertson, D. R. Gray	