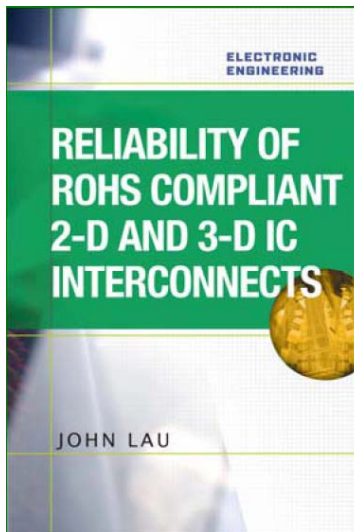


*A comprehensive guide to 2D & 3D lead-free interconnect reliability methods & solutions...*



## Reliability of RoHS Compliant 2D and 3D IC Interconnects

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Written by the expert in the field, *Reliability of RoHS Compliant 2D & 3D IC Interconnects* serves as a valuable reference for those faced with the challenging problems created by the ever-increasing interests in lead-free interconnects for PCB assembly, conventional IC packaging, 3D IC packaging, and 3D IC integration. This authoritative guide presents the latest cutting-edge reliability methods, solutions and data for EMS on the second-level interconnects, packaging assembly on the first-level interconnects, and 3D IC integration on the TSV and microbumps.

Ideal for anyone who encountered practical lead-free interconnect reliability problems and wish to understand and learn more methods for solving such problems. This book will also aid in stimulating further research and development on optical, electrical, thermal, and mechanical designs, as well as materials, process, manufacturing, testing, and reliability, and more sound use of 2D and 3D IC interconnects in RoHS compliant products.

### *Among the topics explored:*

- Updates and Trends in 3D IC packaging and 3D IC/Si integration
- Updates of EU RoHS and China RoHS
- Reliability definition, basic, and engineering
- Design for reliability of lead-free interconnects
- Reliability testing methods and data analyses
- Failure criteria and failure analyses
- Material properties of lead-free solders
- CCGA, PQFP, and BCC SAC solder joint reliability
- PBGA SAC solder joint reliability with and w/o underfills
- Flip chip and WLCSP SAC solder joint reliability
- Low temperature (SnBiAg) lead-free soldering and reliability
- Effects of X on SACX solder joint reliability
- Effects of high-strain rate (impact) on SAC solder joint reliability
- Effects of ramp-rate and dwell-time on SAC thermal cycling results
- Effects of voids on solder joint reliability
- VCSEL and LED lead-free solder joint reliability
- 3D CMOS image sensor with TSV
- 3D LED with TSV and 3D MEMS with TSV
- Electromigration of 3D IC microbumps
- 3D hybrid IC integration SiP reliability
- C2W (AuSn) bonding process and reliability
- C2W (SnAg) bonding reliability
- Low-Temperature C2W (AuSnIn) bonding reliability
- 3D IC memory chip stacking with low-temperature bonding
- Low-Temperature W2W (SnIn) bonding reliability
- W2W (with TSV and microchannel) bonding reliability
- TSV interposer reliability due to local thermal expansion mismatch
- TSV interposer reliability due to global thermal expansion mismatch

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