Fraunhofer EMFT

Failure analysis & authenticity checks

on package and IC level

Chip mounted on chipscanning stage.
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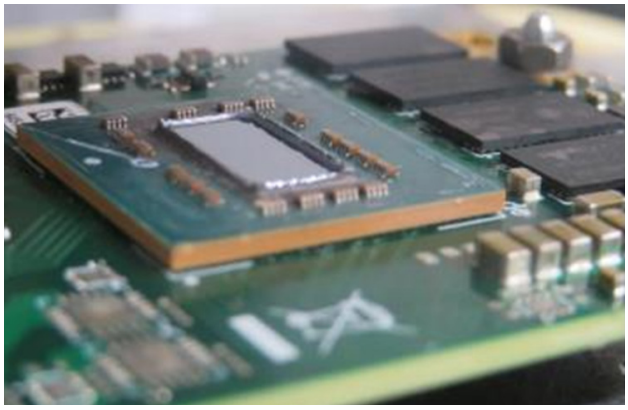
Applications

Continious miniaturization of microelectronics and semiconductors drives the demand for reliability and authenticity of electronic components and systems, also with respect to hardware security. Malfunctions, failures and counterfeits pose a great challenge due to a high range of possible failure root causes and questions regarding trusted electronics, in particular for small and medium-sized enterprises.
Based on this background, Fraunhofer EMFT's scientist and engineers offer their knowledge and expertise on different kinds of services regarding failure analysis, quality management and authenticity checks of electronics, as well as process analysis and process development support. Moreover, our CC-EAL6 certified analysis lab also offers the opportunity to analyze secure items.



PCB after CNC-preparation. The IC has been fully exposed and backthinned for successive analyses.
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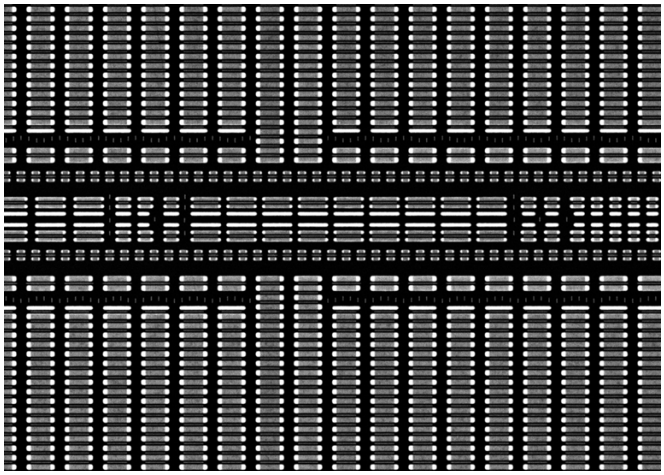
Technical Innovation

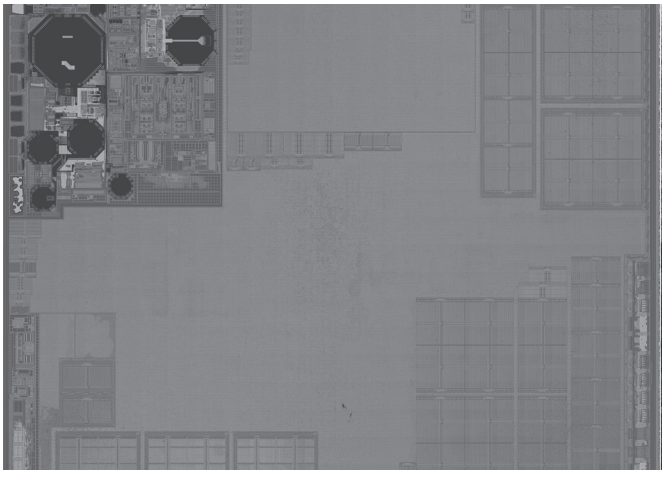
Starting from the failure PCB, our lab offers analyses techniques from PCB/system level down to the individual components, e.g. an isolated IC. The IC's can be decapsulated from their packages for additional electrical analysis and physical de-processing. The individual metal layers inside the IC can be homogeneously de-processed for successive full-size chipscanning.



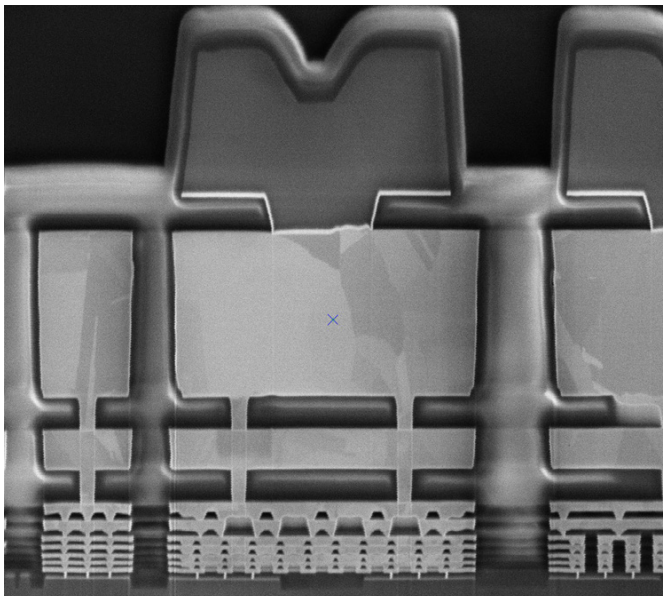
SEM image of a 7nm IC metal layer. ©Fraunhofer EMFT

Technical Data

Both non-destructive and destructive tests, analyses and imaging of PCB and single component level can identify the failure root cause of assemblies. Our lab offers the most advanced techniques and machines, among them: 2D/3D x-ray microscopy, chemical-mechanical processing techniques, high resolution optical microscopy, scanning electron microscopy (SEM), as well as full-sized chipscanning inside a SEM. A dual beam FIB/SEM allows for modification and analyses of IC's.



Chipscan image. ©Fraunhofer EMFT



Cross-section of an IC's metal stack. ©Fraunhofer EMFT

Outlook

Do you have further questions regarding robustness and electro-static discharge effects (ESD)? Our colleagues can offer you qualified support!

Funding

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