

ASML and TBP team up through early involvement

TBP is a partner in assessing the testability, manufacturability and reliability of printed circuit board assemblies. The EMS company makes quantified commitments to ASML and other customers from the very beginning of the design phase.

Rona Kousoureta

To best serve the client, we invest in the entire development and production process on an ongoing basis,' explains Marcel Swinnen, the managing director of testing and DFX at electronic manufacturing services company TBP. 'We prevent faults that may negatively affect product quality and send production chain costs soar-

ing – the cost of rectifying faults in each subsequent production process grows by a factor of ten. So our policy is: no fault forward. Our early involvement services enable us to detect potential abnormalities at an early stage.'

The basis for TBP's work is DFX: design for excellence. 'During the idea or block diagram phase, the designer selects the system's key

components,' Swinnen explains. 'Our engineers provide input and recommend using category A components wherever possible. We always have these available and they positively affect the manufacturability, testability and reliability of the printed circuit board assemblies. What's more, they're fully traceable.' TBP conducts further DFX analyses at a

RENESAS SYNERGY™ PLATFORM

Spend your time innovating!

BIG IDEAS FOR EVERY SPACE

- Scalable ARM® Cortex®-M MCU families
- Comprehensive production grade software
- IAR Systems/e² studio toolchains included
- Warranted and maintained
- Single point of support

DOWNLOAD THE SOFTWARE AND EXPERIENCE THE VALUE TODAY!
www.renesas.com/getsynergy

RENESAS Synergy™
Accelerate. Innovate. Differentiate.

RENESAS



Fully self-managing and self-correcting production lines can further reduce the likelihood of faults.

later stage using DFT (design for test), DFM (design for manufacturing), DFC (design for cost) and DFL (design for logistics).

Testing options

During DFT, TBP analyzes the draft electrical diagram for testability and test accessibility. DFM is all about the design's manufacturability: specifically, TBP checks whether the footprints on the printed circuit board correspond with the physical components and whether all of the components can be reliably placed and soldered. DFL and DFC involve partnerships with suppliers to enable TBP to minimize component cost and guarantee reliable supply. In the final phase, TBP checks the manufacturability and testability of the entire printed circuit board assembly and calculates the final percentages for production yield (first pass yield) and product quality (zero hour defect rate). TBP is the only EMS supplier that includes these metrics as deliverables in its proposals.

Swinen's DFX engineering team in Eersel is responsible for DFT, DFM and the development and construction of testing equipment. '3D solder paste inspection, automated placement measurement and 3D automatic optical inspection all form part of our standard production process,' Swinen explains. 'Other testing options include in-circuit testing and flying probes. The extended boundary scan test, which we developed in conjunction with JTAG Technologies, considerably improves delivery quality and production yield. This mixed-signal test avoids the need for the client to invest in separate functional testing solutions.'

Excellent results

'ASML applies defective parts per million quality standards to PCBAs,' says Frans Geerts, TBP's business development executive. 'These standards express the likelihood that PCBAs contain errors that cannot be detected using the selected test strategy. We achieve results of 400 and even 200 DPPM, which ASML recognizes as excellent results. During every design phase, we meet to analyze and optimize the PCBA design, so that together we achieve the required product results. We quantify *and* commit to the requested delivery quality and production yield right during the design phase.'

Iede Wiersma, a supply chain engineer at ASML, adds: 'We're always striving to meet our customers' demands. We rely on a network of suppliers to help us achieve higher quality at a lower cost, so it's



The extended boundary scan test considerably improves delivery quality and production yield.

crucial to work together closely and transparently. Our partnership with TBP is an excellent example of this strategy.'

Fully automated

'We're constantly striving to improve the quality of our products, shorten our lead times, reduce costs and supply fully customized services,' says Ton Plooy, TBP's CEO. 'We continually invest in making the production process smart. Smart industry isn't a hype; it's an objective that's always been there. Now the internet has been added as an extra dimension to connect objects and exchange data. Process automation is essential, and the whole chain is responsible for making it happen. We continuously optimize our machine park and strive to halve our changeover times. Fully self-managing and self-correcting production lines can further reduce the likelihood of faults.'

Swinen agrees. 'Our ultimate goal is fully automated manufacturing in accordance with smart industry principles. Then, through our early involvement services, we'll be able to achieve the required quality even more efficiently and exceed quality standards even further.'

Rona Kousoureta is a copywriter at Scribo'nea.

Edited by Nieke Roos