

Single device tracking for feed forward adaptive test

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Abstract

It is clear that new innovative manufacturing methodologies must be applied during the back-end wafer sort, final test, and assembly processes in order to reduce manufacturing costs while continuing to improve outgoing device quality.

While wafer sort is focused on testing device yield to specification, advanced statistical post processing methodologies compliment this process with testing yield based on wafer fabrication and assembly process performance. Combine the strengths of these data sets along with end to end single device traceability throughout the backend manufacturing process and you have an adaptive test opportunity to reduce device manufacturing costs and at the same time improve device quality.

Device Traceability throughout the back-end process from wafer parametric test through final test now provides a backbone to facilitate correlations between the advanced statistical post processing data and all subsequent process steps in order to optimize equipment utilization and improve device quality.

Without single device tracking, such correlation and process flow management rests on the historical analysis of wafer/lot based statistics and potentially complex dedicated algorithms which translate to both quality risks and unnecessary production cost overheads. When multi-flow device disposition analysis and single device tracking converge, advanced correlations between process flow steps enable real time correlated device disposition decisions based on substantiated analysis results at each process intercept.

Another important benefit offered by the single device tracking is the ability to pin-point the devices to be recalled in the case of a field failure (see "Intelligent not Total Recall" – KGD 2008).

This paper will show how adaptive test strategies can be deployed in conjunction with single device tracking to simultaneously drive down manufacturing costs and enable correlated device disposition analysis results to improve quality of shipped parts.