

SpectraCD-XT

Preventing pattern-limited yield with inline dedicated CD metrology

SpectraCD-XT Benefits

Delivers 2x faster throughput while meeting all performance requirements

Dramatically reduces MAM time, to <2 seconds, enabling more measurement sites for process control

Specifically targets high-volume CD/profile production applications—an essential addition to KLA-Tencor's patterning-control offerings

Improves measurement of yield-impacting parameters via 2D/3D profiling

Offers highest possible sensitivity to small profile variations, enabling greater process control

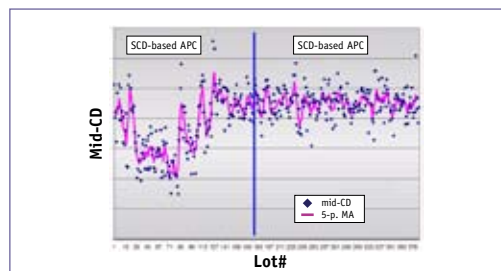
Improved algorithms and computing hardware ensure that library generation time is no longer a concern

Technology innovations and shrinking design rules reduce process tolerances, not only lot-to-lot and wafer-to-wafer, but also intra-wafer and intra-field. To accommodate tight tolerances and rising device complexity, sampling must dramatically increase, along with greater measurement precision and accuracy at higher speeds. Moreover, production line monitoring of profile is now especially yield critical. Chipmakers thus need a long-term solution that fulfills these tough measurement requirements while lowering production and advanced process control (APC) costs. Offering industry leading reliability, cost of ownership (CoO), and time to yield-relevant data, SpectraCD-XT meets this critical demand for the 65nm node and below.

The SpectraCD-XT dedicated CD/profile metrology tool delivers optimal precision, stability, and matching at a throughput rate 2x that of traditional CDSEM metrology. This performance has consistently proven to improve CD APC in customer fabs over CDSEM-based systems. More importantly, the tool enables cost-effective 3D inline profile measurements for the complete range of critical layer structures.

Built using KLA-Tencor's benchmark Archer overlay metrology platform with patented spectroscopic ellipsometry (SE) optics and a 50% reduction in move-acquire-measure (MAM) time, SpectraCD-XT effectively allows chipmakers to predict performance and yield on their most complex 65nm production devices, as well as anticipate issues for 45nm products in development. As these benefits ultimately optimize fab productivity and yield, SpectraCD-XT is gaining rapid adoption by semiconductor manufacturers worldwide, often replacing CDSEM metrology in mass production.

Questions about how the SpectraCD-XT can address a tough CD/profile measurement challenge? Please contact Matt Hankinson at matt.hankinson@kla-tencor.com



After-develop-inspect mid-CD lot trend data before and after switching to SpectraCD-based APC shows a dramatic improvement in the lot-to-lot 3σ of 53%.

Reference: W. Lin et al. Feasibility of improving SE-based APC system for exposure tool by spectroscopic-ellipsometry-based APC system, SPIE Microlithography 2005



The STI model used on SpectraCD enabled six parameters to be reported at once. Footing (bottom) and rounding (top) of the silicon trenches were detected prior to cross-section results.

Reference: V. Vachellier et al. Correlating end-of-line electrical measurements to STI trench CD, K-T YMS, 8/2005, Munich, Germany