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Phosphine Dopant Profile Control and Optimization Using Advanced Plasma Implantation LUDOVIC GODET, DEVEN RAJ, NICHOLAS CHAMBERLAIN, SVETLANA RADOVANOV, GEORGE D. PAPASOULIOTIS, VSEA — Plasma implantation enables new fabrication options for advanced CMOS and non-planar devices. Detailed understanding of plasma-surface interactions during plasma implantation is a critical element for successful development of new applications. In the course of plasma ion implantation, ionized species present in the plasma are extracted and implanted into the wafer, and several other physical mechanisms, such as deposition, etching, and sputtering, proceed in parallel. The dopant depth profile into the substrate results from contributions of all these processes. In this study, phosphorus dopant profiles are optimized by characterizing the plasma composition and properties, and using the advanced process control features available in VIISTA PLAD^{TM}.

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