Introducing Purion H, a Scanned Spot Beam High Current Ion Implanter

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***Abstract*—As a member of the Purion ion implanter family, Purion H is Axcelis' next generation high current implanter. Purion H provides customers with an unprecedented level of process flexibility and yield-enabling technology, and features the platform's four common differentiators: Purion Contamination Shield™, Purion Vector™ Dose and Angle Control System, Purion 500 wafer/hour endstation and the Eterna™ ELS source. Like Purion M and Xe, Purion H uses a hybrid scan architecture. Its scanned spot beam technology delivers precise dosage, angle and dose rate on all points of the wafer, by permitting simultaneous and independent implant uniformity and angle control. Purion H high also comprises a five-filter beamline to deliver beam purity for low variability and defects: a series of dipole magnets and a deflecting energy filter separate unwanted contaminants from the ion beam. Magnetic beam scanning permits space-charge neutralization of high beam currents, resulting in high productivity via high beam currents in combination with short tune times and a fast 500 wafer/hour end station. Other new features include a maintenance friendly, integrated source extraction system; a novel uniformity correction algorithm; a new, higher output microwave PEF powered by a solid-state amplifier for metals-free charge neutralization of high current beams; and advanced beam diagnostics to quantify average angles and spread of the scanned spot beam. Finally, the dosimetry system, which is common to the Purion M medium current implanter, extends the application space of Purion H beyond the traditional coverage of high current implanters down to doses < 2e11 /cm2, enabling new applications while maintaining productivity.**

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Constant focal length scan ensures that all points on the wafer see the same spot beam.

The common process chamber houses beam diagnostics to control both horizontal and vertical beam angles [3].

III. Process results

Like any qualified implanter, Purion H has to deliver simultaneous compliance to specifications of productivity,

SUMMARY

Purion H is Axcelis' next generation ion implanter, combining high productivity and yield enabling technology. Commonality of control system, wafer handling and dosimetry enables an extension of the application space beyond the traditional coverage of high current implanters down to doses < 2e11 /cm^2. While maintaining productivity, this could prove enabling