

Abstract Submitted
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Study of a capacitive discharge driven by three frequencies using inline RF metrology STEVEN SHANNON, Applied Materials Incorporated, JOEL BLACKBURN, Advanced Energy Incorporated, DANIEL HOFFMAN, VALERY GODYAK, JANG GYOO YANG, Applied Materials Incorporated, STEPHEN ROSENBLUM, Advanced Energy Incorporated — A capacitive discharge driven by a combination of 2MHz, 13.56MHz, and 60MHz is analyzed using voltage, current, and phase measurements taken at the interface between the electrode and the matching network. The electrode measurements are taken at 2MHz and 13.56MHz using an Advanced Energy Z-ScanTM RF sensor. Using these measurements and combining rigorous RF characterization of the process chamber, discharge impedances are calculated. These impedances are input into a discharge model to calculate electron density and time averaged sheath thickness above the electrode. Over 450 combinations of pressure and power were measured to study the interaction of these three frequencies with regard to plasma parameters. Trends in electron density and sheath parameters over this experiment matrix, with particular attention to the impact of mixing of the 2MHz and 13.56MHz, will be presented.

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