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Characterization of an RF Power Splitter for Multi-Tile PECVD Systems Application ALBERT R. ELLINGBOE, PRL, School of Physical Sciences, Dublin City University, Dublin 9, Ireland, TOMASZ MICHNA, Phive Plasma Technologies Ltd., Invent, DCU, Dublin 9, Ireland — Increasing the excitation frequency is known to enable higher deposition rates of Si films while maintaining solar cell efficiency. To circumvent wavelength effects, multi-tile systems are being developed. This technology requires more consideration be given to the power distribution, as all electrodes should be fed coherently. In particular, use of reliable, high-Q, low crosstalk, multi-port power dividers is critical. In multi-tile systems, feedback from the plasma load to the RF splitter can result in an uneven power distribution that leads to spatial inhomogeneities in plasma creation. For this reason, the PSTLD was introduced. It is a novel, coaxial, divide-by-N power splitter with differential outputs, operational in VHF/UHF bands. A comprehensive RF characterization of the splitter, along with detailed design considerations will be reported. Effects of dispersion as well as dependence on plasma load impedance will be presented. The proceeds of extensive EM modeling are going to be weighed against measurement results.

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