

INTEGRATION OF REMOTE PLASMA GENERATOR WITH SEMICONDUCTOR PROCESSING CHAMBER

ABSTRACT OF THE DISCLOSURE

5 A compact, self-contained remote plasma generator is mounted on the lid of a semiconductor processing chamber to form an integrated substrate processing system. The remote plasma generator is activated in a clean operation to generate cleaning plasma species to provide better cleaning of the chamber and lower perfluorocarbon emissions than *in situ* plasma clean processes. A three-way valve is adjustable to control gas flow to the chamber.

10 During the clean operation, the three-way valve directs a cleaning plasma precursor from a first gas line to the remote plasma generator to generate cleaning plasma species which are flowed to the chamber for cleaning deposits therein. During a deposition process, the three-way valve directs a first process gas from the first gas line to the chamber, bypassing the remote plasma generator. The first process gas is typically mixed with a second process gas

15 supplied from a second gas line in a mixing device prior to entering the chamber for depositing a layer on a substrate disposed therein.

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