

MICROCHAMBER LASER PROCESSING SYSTEMS AND METHODS USING LOCALIZED PROCESS-GAS ATMOSPHERE

ABSTRACT

Microchamber laser processing systems and methods that use a localized process-gas atmosphere are disclosed. The method includes processing a substrate with a surface by providing a process gas to a central region of the microchamber that includes the surface of the substrate and providing a curtain gas to a peripheral region of the chamber that includes the surface of the substrate. The method also includes providing a vacuum to a region of the chamber between its central and peripheral regions of the chamber, wherein the vacuum removes the process gas and curtain gas, thereby forming a localized process-gas atmosphere at the surface of the substrate in the central region of the chamber and a gas curtain of the curtain gas in the peripheral region of the chamber. The method also includes irradiating the surface of the substrate through the localized process-gas atmosphere with a laser beam that forms a laser line to perform a laser process on the surface of the substrate.

Fig. 4