PATENT
Attorney Docket No. EGQ-005CP3C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Smith	CONFIRMATION NO.:	1022
APPLICATION NO.:	13/964,938	GROUP NO.:	2881
FILING DATE:	August 12, 2013	EXAMINER :	McCormack, Jason L.
TITLE:	High Brightness Laser-Driven Light Source		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION

Madam:

This paper is submitted in response to the final Office Action mailed from the Patent Office on July 17, 2014. Applicant submits herewith a Request for Prioritized Examination, a Request for Continued Examination (RCE), a Petition for Extension of Time, and related fees. In the event any additional fees are due, the Commissioner is hereby authorized to charge them to Attorney's Deposit Account No. 50-3081.

Applicant respectfully requests entry of this Amendment and Response, in which:

Amendments to the Claims begin on page 2, and

Applicant's **Remarks** begin on page 7.

ASML 1211

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Amendments to the Claims

Please amend the claims as follows, in compliance with 37 C.F.R. § 1.121(c). This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

1. (Currently amended) A method for illuminating features of a semiconductor wafer, comprising:

ionizing a gas within a sealed pressurized plasma chamber having an operating pressure of at least 10 atmospheres;

providing substantially continuous laser energy having a wavelength range of up to about 2000 nm through a region of material of the sealed pressurized chamber that is transparent to the substantially continuous laser energy to the ionized gas to sustain a plasma within the sealed pressurized plasma chamber to produce plasma-generated light having wavelengths greater than 50 nm; and

illuminating the wafer with ~~the~~ plasma-generated light having wavelengths greater than 50 nm that exits the sealed pressurized chamber.

2. (Original) The method of claim 1, further comprising using the plasma-generated light to measure the features of the wafer.

3. (Currently amended) The method of claim 1, ~~further comprising using an optical element to focus and modify a property of the laser energy directed to the ionized gas~~ wherein a magnitude of the brightness of the light does not vary by more than 90% during operation.

4. (Previously presented) The method of claim 1, further comprising using an optical element to deliver the plasma-generated light from the pressurized plasma chamber to a wafer inspection system.

5. (Canceled)

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6. (Currently amended) The method of claim 1 5, wherein the at least one laser emits electromagnetic energy at a wavelength of 823.2 nm, 881.9 nm, 980 nm, 992.3 nm, or 1473.3 nm.

7. (Canceled)

8. (Currently amended) The method of claim 7 1, wherein the laser source comprises a continuous wave (CW) laser.

9. (Original) The method of claim 1, wherein the plasma-generated light comprises ultraviolet light.

10-12. (Canceled)

13. (Currently amended) A system laser driven light source comprising:

a sealed pressurized plasma chamber having an ignition source for ionizing a ionized gas within the chamber and a sapphire window for maintaining a pressure therein;

a laser for providing at least substantially continuous energy through the sapphire window to the ionized gas within the pressurized plasma chamber to sustain a plasma and produce plasma-generated light having wavelengths greater than 50 nm, the pressure of the plasma chamber during operation is greater than 10 atmospheres; and

a means for allowing the plasma-generated light to exit the pressurized plasma chamber a tool optically coupled to the pressurized plasma chamber that uses the plasma generated light to illuminate a wafer.

14. (Currently amended) The system laser-driven light source of claim 13, wherein the pressurized plasma chamber contains one or more of a noble gas, Xe, Ar, Ne, or Kr, He, D2, H2, O2, F2, a metal halide, a halogen, Hg, Cd, Zn, Sn, Ga, Fe, Li, Na, an excimer forming gas, air, a vapor, a metal oxide, an aerosol, a flowing media, or a recycled media.

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15. (Currently amended) The ~~system~~ laser-driven light source of claim ~~14~~13, wherein the ignition source comprises or includes an electrode, an ultraviolet ignition source, a capacitive ignition source, an inductive ignition source, an RF ignition source, a microwave ignition source, a flash lamp, a pulsed laser, or a pulsed lamp ~~further comprising means for igniting the gas to generate the ionized gas without an ignition electrode and a laser source to ionize or excite the gas~~.

16. (Currently amended) The ~~system~~ laser-driven light source of claim 15, wherein the laser source comprises a continuous wave (CW) laser.

17. (Currently amended) The ~~system~~ laser-driven light source of claim 13, wherein the laser comprises at least one laser selected from the group consisting of an IR laser, a diode laser, a fiber laser, an ytterbium laser, a CO_2 laser, a YAG laser, and a gas discharge laser.

18. (Currently amended) The ~~system~~ laser-driven light source of claim 13, further comprising at least one optical element to focus and modify a property of the energy of the laser, the property selected from the group consisting of diameter, direction, divergence, convergence, orientation, and wavelength.

19. (Currently amended) The ~~system~~ laser-driven light source of claim 13, further comprising at least one optical element to modify a property of the plasma-generated light emitted by the ionized gas as the plasma- generated light is delivered to the tool.

20. (Currently amended) The ~~system~~ laser-driven light source of claim 13, wherein the tool is selected from the group consisting of a wafer inspection tool, a microscope, a metrology tool, and a lithography tool.

21-25. (Canceled)

26. (Currently amended) A method for producing light comprising:

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ionizing with an ignition source a gas within a pressurized plasma chamber, the pressure of the plasma chamber during operation is greater than 10 atmospheres;

providing (i) laser energy having a wavelength range up to about 2000 nm and (ii) energy from the ignition source to the ionized gas within the pressurized plasma chamber to generate or sustain a plasma in the chamber to produce a plasma-generated light having wavelengths greater than 50 nm; and

directing the plasma-generated light out of the pressurized plasma chamber through a transparent region of the pressurized plasma chamber

~~providing energy from the ignition source to the plasma in the plasma chamber~~.

27. (Currently amended) The method of claim 26 further comprising providing sufficient energy from the ignition source to the plasma to maintain a desired temperature of the plasma chamber or to maintain a desired pressure of gas or vapor within the plasma chamber.

28. (Previously presented) The method of claim 26 further comprising operating the ignition source during operation of the laser.

29-30. (Canceled)

31. (New) The method of claim 1 wherein the pressure of the plasma chamber during operation is greater than 10 atmospheres.

32. (New) A light source, comprising:

a sealed pressurized chamber comprising a window and a curved reflective surface, the pressurized chamber having an operating pressure greater than atmospheric pressure;

an ignition source for ionizing a gas within the pressurized chamber;

at least one laser external to the pressurized chamber for providing electromagnetic energy to produce a plasma that generates plasma-generated light having wavelengths greater than 50 nm, ; and

a curved reflective surface receiving at least a portion of the plasma-generated light emitted by the plasma and reflecting the plasma-generated light toward the window, wherein the emitted light and laser energy pass through the window.

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