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(71) Applicant *(for all designated States except US)*: **APPLIED MATERIALS, INC.** [US/US]; 3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors; and

(71) Applicants *(for US only)*: **PAN, Heng** [CN/US]; 2420 Ruth Cabral Way, Santa Clara, California 95050 (US). **ROGERS, Matthew Scott** [US/US]; 248 Pamela Drive, Apt. 30, Mountain View, California 94040 (US). **HUNTER, Aaron Muir** [US/US]; 430 Emeline Avenue, Santa Cruz, California 95060 (US). **MOFFATT, Stephen** [GB/GB]; The Barn, Ville Court, Rue de la Corbiere, Channel Islands, St. Brelade JERSEY JE3 8QA (GB).

(74) Agents: **PATTERSON, B. Todd** et al.; Patterson & Sheridan, LLP, 3040 Post Oak Boulevard, Suite 1500, Houston, Texas 77056-6582 (US).

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(54) **Title**: APPARATUS AND METHOD TO MEASURE TEMPERATURE OF 3D SEMICONDUCTOR STRUCTURES VIA LASER DIFFRACTION

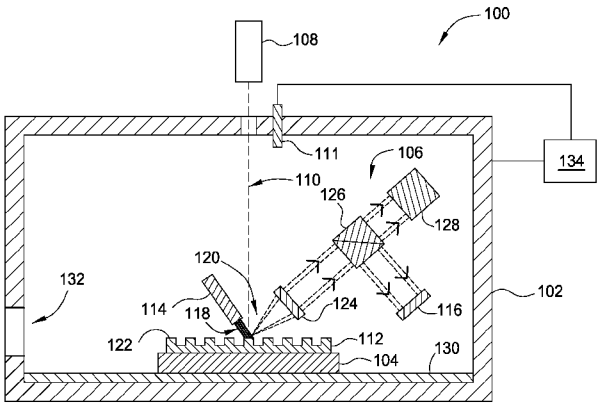


FIG. 1

(57) **Abstract**: Embodiments of the present invention generally relate to apparatus for and methods of measuring and monitoring the temperature of a substrate having a 3D feature thereon. The apparatus include a light source for irradiating a substrate having a 3D feature thereon, a focus lens for gathering and focusing reflected light, and an emissometer for detecting the emissivity of the focused reflected light. The apparatus may also include a beam splitter and an imaging device. The imaging device provides a magnified image of the diffraction pattern of the reflected light. The method includes irradiating a substrate having a 3D feature thereon with light, and focusing reflected light with a focusing lens. The focused light is then directed to a sensor and the emissivity of the substrate is measured. The reflected light may also impinge upon an imaging device to generate a magnified image of the diffraction pattern of the reflected light.

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