

Performance of over 100W HVM LPP-EUV light source.

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Abstracts: *We have been developing CO₂-Sn-LPP(Laser Produced Plasma) light source for HVM. By the use of Gigaphoton's original and unique Sn droplet shooting procedure, we have demonstrated 3 hours operation of 133W at intermediate focus(IF) position and 24 hours operation of 108W at IF position. We also attained conversion efficiency(CE) of 5.5% by the use of experimental set up. Based on these results, We are developing the first practical light source for HVM named "GL 200E". The system will use more than 20kW CO₂ pulsed laser in corporation with Mitasubishi Electric Coraporation.*

EUV Lithography is the most promising technology for the fabrication of ULSIs at the 10 nm and further Nodes. The most critical issue for the practical use of EUV lithography is the availability of high power output and high reliability. According to this situation, we have been developing CO₂-Sn-Laser Produced Plasma (LPP) EUV light source for HVM use. Unique and original technologies such as ; the combination of pulsed CO₂ laser irradiation on Sn targets, dual wavelength laser pulses shooting and Sn mitigation with magnetic field, have been developed in Gigaphoton Inc.. The theoretical results and experimental data clearly showed the advantages of the proposed strategy. So far we have been reporting the highest output power of 133W average clean power at 100kHz with 3 hours operation and 108W average power at 80kHz with 24 hours operation. Based on these data, we are developing the first practical source for HVM named "GL200E". The source will use 20kW level CO₂ pulsed laser corporate with Mitsubishi Electric Corporation to obtain over 250W. We also obtained the highest conversion efficiency (CE) of 5.5 % in the experimental set up. Further improvements are underway. We will report the newest experimental results at the conference.