

EUV lithography in high volume manufacturing

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Optical lithography has supported multiple generations of scaling of integrated chip production, known as Moore's law: doubling of the amount of transistors on the chip about every 1.5-2 years. While state-of-art immersion lithography tools with a numerical aperture of 1.35 and throughput of > 200 wafers per hour are the main working horse of the semiconductor industry, multiple patterning is required to obtain ~10-16 nm half-pitch. Extreme Ultraviolet (EUV, corresponding to 13.5 nm light) scanners are being introduced in high volume manufacturing and will extend Moore's Law for the foreseeable future. After a short introduction of IC making in the past, we will discuss the present and future of lithography. This includes a demonstration of the EUV state-of-art systems capabilities, discussion of critical EUV technologies as well as a view of further extension in the future.