What is claimed is:

1. A method of annealing a photoresist layer supported by a surface of a semiconductor wafer, comprising:

forming an image on the surface of the semiconductor wafer using a laser beam having a wavelength in the range from about 300 nm to about 1000 nm; and

scanning the image over the surface of the semiconductor wafer with a dwell time of between 100 μs and 1 ms, thereby heating the surface of the semiconductor wafer and causing the photoresist layer supported by the surface to reach a peak annealing temperature T_{AP} between ~~about~~ 300 °C and ~~about~~ 400 °C.

2. The method according to claim 1, wherein the laser beam and semiconductor wafer define a thermal diffusion length L_{DIFF} and an associated optical absorption depth D_{AD} in the semiconductor wafer, and wherein the image scanning is carried out such that $D_{AD} < L_{DIFF}$.

3. The method according to claim 1, wherein the photoresist layer comprises either extreme ultraviolet (EUV) photoresist or deep ultraviolet (DUV) photoresist.

4. The method according to claim 1, wherein the surface of the semiconductor wafer has a surface temperature and the laser beam has an amount of power, and further comprising:

measuring the surface temperature by measuring a thermal emission from the surface of the semiconductor wafer; and

using the measured thermal emission to control the amount of power in the laser beam to maintain the uniformity of the surface temperature of the semiconductor wafer to within +/- 3°C.