

3D Writing on Photosensitive Glass-Ceramics

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Abstract : Optical lithography is a key technique in the development of sub-5 nm patterns for the semiconductor industry. We have already reported that the best results obtained with respect to direct laser writing process on active media, such as glass-ceramics, are achieved only when the energy of the laser radiation is absorbed in discrete quantities. Further, we need to clarify the role of active centers concentration in silver nanocrystals natural generation, as well as in fluorescent rare-earth nanostructures formation. As a consequence, samples with different compositions were prepared. SEM, AFM, TEM and STEM investigations were employed in order to demonstrate that few nm width lines can be written on fluorescent photosensitive glass-ceramics, these being efficient absorbers. Moreover, we believe that the experimental data will lead to the best choice in terms of active centers amount, laser power and glass-ceramic matrix.

Keywords : glass-ceramics, 3D laser writing, optical disks, data storage

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