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Autore	Sinzinger Stefan
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3.3.5 Through-wafer alignment3.4 Pattern transfer; 3.4.1 Etching; 3.4.2 Laser micromachining - laser initiated ablation; 3.4.3 Mechanical micromachining - diamond turning of microoptical components; 3.4.4 Replication of microrelief structures; 3.4.5 Diffusion - ion-exchange processes; 3.5 Bonding of planar structures; 3.5.1 Flip-chip bonding; 3.5.2 Thermo-anodic bonding; 3.6 List of new symbols; 3.7 Exercises; References; 4 Measurement and characterization of microoptics; 4.1 Physical probing-profilometry; 4.2 Interferometry; 4.2.1 Types of interferometers; 4.2.2 Phase-shifting interferometry
4.2.3 Evaluation of interferometric measurements4.3 Imaging experiments; 4.4 Array testing; 4.5 List of new symbols; 4.6 Exercises; References; 5 Refractive microoptics; 5.1 Surface profile microlenses; 5.1.1 Melted photoresist lenses - reflow lenses; 5.1.2 Microlens fabrication by mass transport mechanisms in semiconductors; 5.1.3 Microlenses formed by volume change of a substrate material; 5.1.4 Lithographically initiated volume growth in PMMA for microlens fabrication; 5.1.5 Dispensed or droplet microlenses; 5.1.6 Direct writing techniques for refractive microoptics
5.1.7 Grey-scale lithography for ROE fabrication5.2 Gradient-index (GRIN) optics; 5.2.1 GRIN rod lenses; 5.2.2 Planar GRIN lenses; 5.3 Microprisms and micromirrors; 5.3.1 Lithography for the fabrication of microprisms; 5.3.2 Micromachining of microprisms using single point diamond turning or embossing; 5.3.3 Anisotropic etching of mirror structures in crystalline materials; 5.4 List of new symbols; 5.5 Exercises; References; 6 Diffractive microoptics; 6.1 Trading spatial resolution for reduced phase thickness; 6.1.1 Blazing and phase quantization
6.1.2 Alternative quantization schemes for microlenses

Sommario/riassunto

Microoptics is an important enabling technology for many areas of application. In this updated second edition of their modern text and reference book, Stefan Sinzinger and J?rgen Jahns expertly and comprehensively present the basics and applications in microoptics, while incorporating the most important developments in recent years. An absolute must for physicists and electrical engineers, from advanced students right up to designers working in the field.