Claims

1. A method of optical device fabrication, comprising:

identifying a graytone mask profile of a mask substrate;

generating a graytone mask pattern of the mask substrate, wherein mask structures are disposed on a surface of the mask substrate that correspond to the graytone mask pattern;

exposing an optical device resist by projecting a light through a graytone mask comprising the graytone mask pattern, the optical device resist is disposed over an optical device substrate; and

wherein the optical device resist has a varying thickness corresponding to the graytone mask pattern after developing the optical device resist.

2. The method of claim 1, wherein the graytone mask pattern comprises a resist thickness profile.

3. The method of claim 1, wherein the graytone mask is patterned based on a certain pattern density of the graytone mask profile.

4. The method of claim 1, wherein the graytone mask pattern is generated by a design target or a previous optical device profile.

5. The method of claim 1, wherein a diffuser is added on the graytone mask.

6. The method of claim 1, wherein the optical device resist corresponds to a thickness to be formed in the optical device substrate upon etching of the optical device resist and the optical device substrate.

7. The method of claim 1, wherein projecting the light through the graytone mask further comprises projecting the light through a hardmask.

8. The method of claim 1, wherein the mask structures are disposed on a bottom surface of the mask substrate.

9. The method of claim 1, further comprising adjusting the graytone mask pattern by adjusting a critical dimension or by adjusting a pitch of the graytone mask.

10. The method of claim 1, wherein the mask structures comprise an absorption material or a reflective material.

11. A method of optical device fabrication, comprising:

identifying a graytone mask profile of a mask substrate;

generating a graytone mask pattern of the mask substrate, wherein print structures are disposed on a diffuser coupled to a surface of the mask substrate that correspond to the graytone mask pattern;

exposing an optical device resist by projecting a light through a graytone mask comprising the graytone mask pattern, the graytone mask disposed over the optical device resist is disposed over an optical device substrate; and

wherein the optical device resist has a varying thickness corresponding to the graytone mask pattern after developing the optical device resist.

12. The method of claim 11, wherein projecting the light through the graytone mask further comprises projecting the light through a hardmask.

13. The method of claim 11, wherein the print structures are disposed on a top surface of the diffuser or on a bottom surface of the diffuser.

14. The method of claim 11, wherein the print structures on the diffuser are disposed on the diffuser corresponding to the graytone mask profile.

15. The method of claim 11, wherein the print structures comprise an intensity map.

16. The method of claim 11, wherein the optical device resist corresponds to a thickness to be formed in the optical device substrate upon etching of the optical device resist and the optical device substrate.

17. A method of optical device fabrication, comprising:

identifying a graytone mask profile of a mask substrate;

generating a graytone mask pattern of the mask substrate, wherein print structures are disposed on a dose adjustment layer coupled to a diffuser and a surface of the mask substrate that correspond to the graytone mask pattern;

exposing an optical device resist by projecting a light through a graytone mask comprising the graytone mask pattern, the optical device resist is disposed over an optical device substrate; and

wherein the optical device resist has a varying thickness corresponding to the graytone mask pattern after developing the optical device resist.

18. The method of claim 17, wherein the dose adjustment layer comprises a transparent substrate.

19. The method of claim 17, wherein the print structures are disposed on a top surface of the dose adjustment layer or on a bottom surface of the dose adjustment layer.

20. The method of claim 17, wherein the print structures on the dose adjustment layer are disposed on the dose adjustment layer corresponding to the graytone mask profile.