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Brunner

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(54) **ON-PRODUCT FOCUS OFFSET METROLOGY FOR USE IN SEMICONDUCTOR CHIP MANUFACTURING**

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See application file for complete search history.

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(57) **ABSTRACT**

A focus monitor structure on a reticle includes a lithographic feature region, a horizontal grating region including a horizontal grating located on one side of the lithographic feature region, and a vertical grating region including a vertical grating located on the opposite side of the lithographic feature region. A polarized illumination beam causes a printed image of the lithographic feature region to shift either toward the direction of the horizontal grating region or toward the direction of the vertical grating region in a manner that depends on the sign of the focus offset of the photoresist layer relative to the lens of an exposure tool. The magnitude and sign of the focus offset can be monitored to provide a real-time feedback on the focus offset of the exposure tool by measuring the shift of the printed image of the lithographic feature region.

22 Claims, 17 Drawing Sheets

