

ABSTRACT

A blank mask and the like are disclosed, which comprises a transparent substrate, a phase shift film disposed on the transparent substrate, and a light shielding film disposed on the phase shift film. The blank mask has a TFT1 value of 0.25 $\mu\text{m}/100\text{ }^{\circ}\text{C}$ or less expressed by Equation 1 below. It can help manufacture a semiconductor device having a minute line width easily.

[Equation 1]

$$TFT1 = \frac{\Delta PM}{T2 - T1}$$

where, when the thermal variation of a processed blank mask, which is processed with a method described in the Specification, is analyzed in a thermomechanical analyzer at increasing temperature from T1 to T2, and ΔPM is a position change of the upper surface of the phase shift film in the thickness direction at T2, based on a position of the upper surface of the phase shift film at T1.

FIG. 1