

LED광원을 이용한 초박형 백라이트에 대한 광학설계기법의 연구

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Study of Optical Design Method for Ultra Slim Backlight System Using LED Light Source

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Abstract : We studied optical simulation method for ultra slim backlight system. We designed 0.7mm thickness light guide plate and combined 48 white color LEDs for 12 inch wide size TFT-LCD. We designed flat shape PMMA light guide plate with both side patterned. It have vertical prism shape on upper side and ellipse dot pattern on the other side. We targeted 4500 nit brightness and uniform emission characteristic without hot spot or dark area. At first, we designed uniform emission area with more high brightness in center area and then, debugged light entering hot spot zone and direction of outgoing light flux. Although it was designing step, we obtained good result with reverse prism optical sheet and it had good repeatability because it was based on the stamper method in injection process without laser engraving or micro groove engraving method.

Key Words : LED Backlight, Slim Backlight, TFT-LCD, LED, Prism, Reverse Prism