

A B S T R A C TLIQUID CRYSTAL DISPLAY WITH
NONSPECULAR REFLECTORS

The present invention deals with liquid crystal displays where the incident light and reflected light going through the display are not specularly related. The incident light can be at a range of angles to the display while the reflected light, i.e. the viewing direction is at or nearly normal to the display. For such nonspecular liquid crystal displays, the polarizer angles, the input/output directors of the liquid crystal cell, and the liquid crystal cell retardation have to be specially optimized to obtain the best viewing effects. Conventional liquid crystal display modes do not work optimally in this nonspecular situation. We also disclose the new image-mode and shadow-mode nonspecular liquid crystal displays. Such displays have very bright background and are free from viewing glare common in most liquid crystal displays. The present invention applies to all twist angles, e.g. the 90° TN, the 120° and 150° HTN, the 180°, 240° and 270° STN displays.

FIGURE 1 IS SUGGESTED FOR PUBLICATION