

A study of the high-quality image of LCDs by improving moving picture quality and wide color gamut reproduction technology

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This study aims to lower the cost of overdrive circuits that are used to improve the response time of liquid crystal displays (LCD), to verify the validity of the moving picture response time (MPRT) technique for evaluating the performance of displaying moving pictures, and to develop a technology which can reproduce a wide color gamut using a first response LCD. To reduce the cost of overdrive circuits, we used fixed block truncation coding (FBTC) to slash the amount of image data stored in the frame memory to one third (8 bits/pixel). We could also improve the peak signal to noise ratio (PSNR) by 10 dB compared with quantization.

The image data of high-definition and industrial LCDs was reduced to 4 bits/pixel by using a technique of reducing the errors that occur in dither signals and an encoding method that changes the bit rate of the luminance signals and the color difference signals.

A subjective evaluation of the motion blurs on LCD monitors was conducted. It was confirmed that a strong correlation exists between the results of MPRT measurement and the results of subjective evaluation, and it was demonstrated that MPRT can evaluate the motion blurs in a performance.

A six primary color LCD monitor using an LCD with a first response has been developed, and its color gamut is 175% that of sRGB, and it covers 95% or more of the Munsell color cascade, which is a chart of surface colors.