JVC

White Paper

Effectiveness of the Turbo Luminance

Preface

The medical monitor with high brightness and high contrast expands the visible difference in between high to low brightness. It greatly enhances the identifiable grayscale gradation and makes it possible to find lesions with low contrast, which is especially effective in mammography diagnosis.

However, color monitors can't achieve as high brightness as monochrome monitors due to the structure of the LCD panel. Therefore, the maximum brightness of a color monitor is usually set to about 600 cd/m^2 in consideration of the overtime deterioration of the LCD panel.

For improving diagnostic efficiency, JVC has developed Turbo Luminance function that boosts the brightness to about 1000 cd/m^2, which is close to the maximum value of LCD panel performance, for a certain period of time, even though it is a color monitor.

Features

- Boost the luminance
- Stay compliant with DICOM GSDF

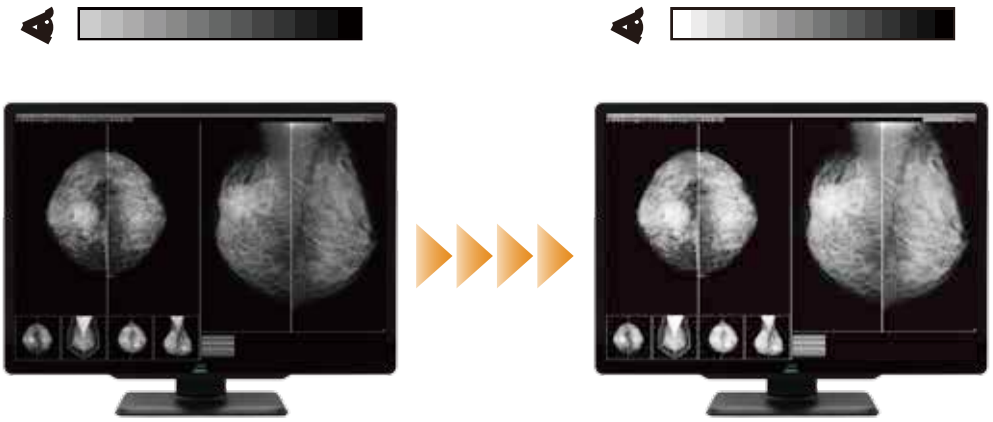

Fig.1 Turbo Luminance function

The comparison results on 3 settings

To verify the effect of Turbo Luminance function, we measured the contrast response time in 3 different settings:

i. the normal setting (Fig.2)

ii. only the brightness is maximized (Fig.3)

iii. Turbo Luminance function is ON (Fig.4)

In the normal setting, the DICOM GSDF curve is nearly flawlessly reproduced, while in the setting where only the brightness is maximized, the deviation gradually become larger as the brightness increases. In other words, it deviates from the DICOM GSDF curve, resulting in deterioration of gamma characteristics.

On the other hand, when Turbo Luminance function is ON, the DICOM GSDF curve is maintained as same as in the normal setting and the brightness is maximized.

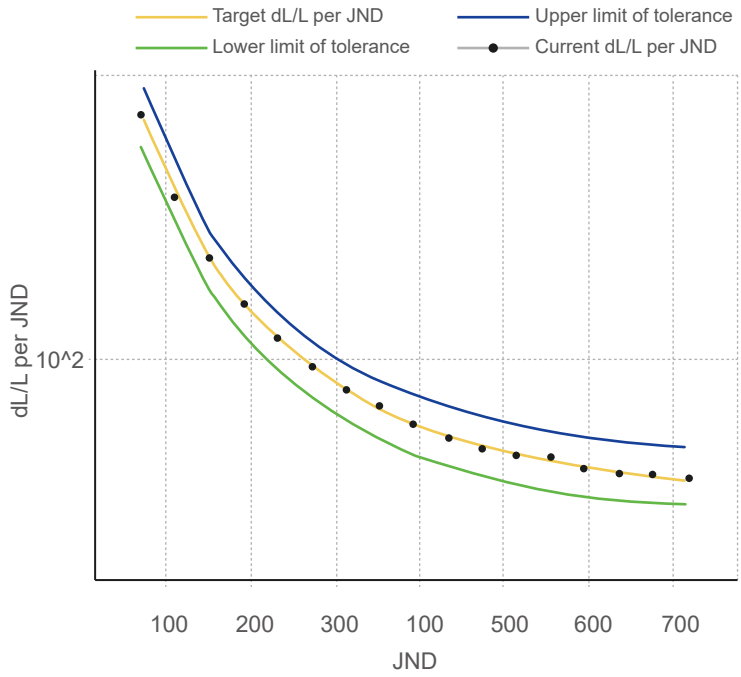

Fig.2 The normal setting

There is almost no deviation in the measurement result "●" with the target yellow line gamma curve.

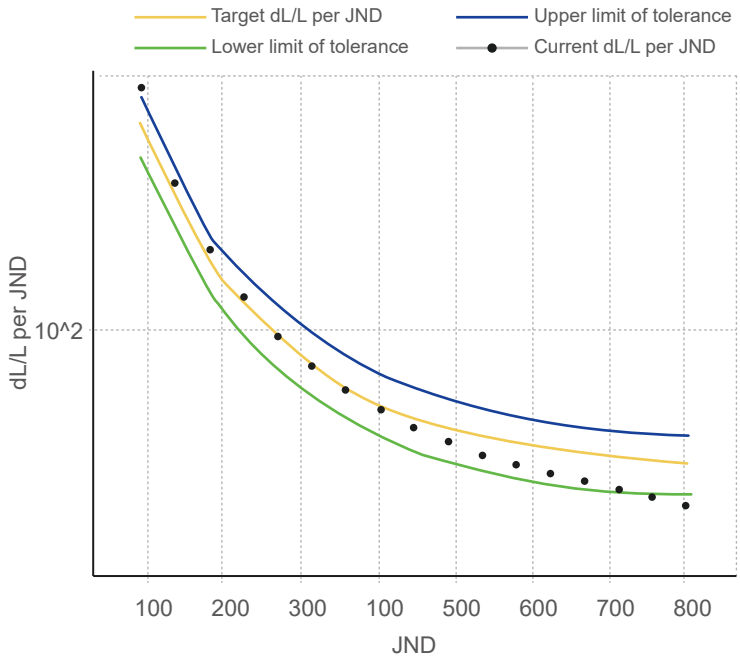

Fig.3 Only the brightness is maximized

There is deviation in the measurement result "●" with the target yellow line gamma curve.

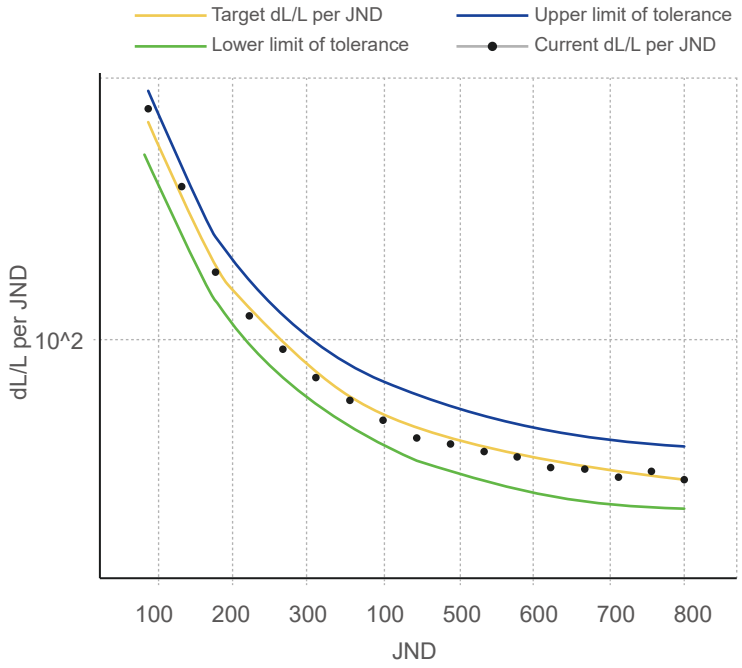

Fig.4 Turbo Luminance function is ON

There is almost no deviation in the measurement result "●" with the target yellow line gamma curve.

*JND: Just Noticeable Difference, is the minimum luminance that a person can detect.

Conclusion

Turbo Luminance function can significantly improve the visibility for diagnostic imaging. It greatly extends recognizable grayscale gradation while retaining the DICOM GSDF gamma curve which required for the characteristics of diagnostic images. That assists for initial pick-up for the lesions, furthermore it improves the reading workflow.

JVCKENWOOD Corporation

Healthcare Business Division
3-12, Moriya-cho, Kanagawa-ku, Yokohama-shi, Kanagawa, 221-0022 Japan
http://healthcare.jvc.com/