

## 10.4" XGA DUAL MODE (DAY & NVIS) ENHANCED LED BACKLIT DISPLAY SOLUTION

*Sunlight Readability/MIL-STD-3009 NVIS White Operation/Very Wide Range Dimming*

### GENERAL DESCRIPTION

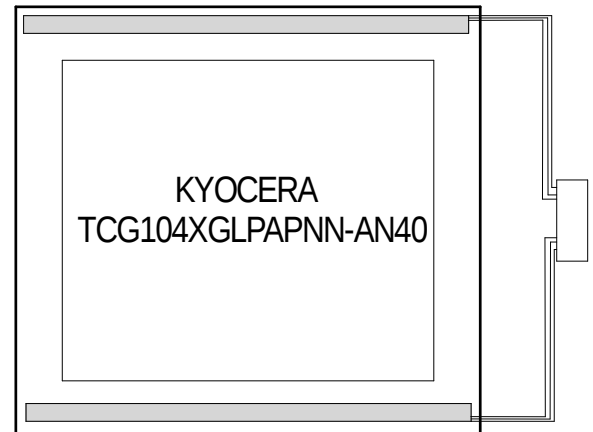
9/12/2023

The ACD-2833 consists of the Kyocera TCG104XGLPAPNN-AN40 10.4" XGA TFT display, modified with a high performance LED backlight capable of Day and NVIS White Operation.

#### Performance at given luminance levels

1200 cd/m<sup>2</sup> with 12.2 watts LED power (Day)  
5.2 cd/m<sup>2</sup> with 1.9 watts LED power (NVIS)

The "NVIS White" enhancement portion of this display solution, is intended to be capable of compliance per MIL-STD-3009 for Electronic and electro-optical displays (multi-color), Type 1, Class A or Class B. Other post enhancements placed in front of the LCD glass, can have an affect on the final Luminance & Chromaticity results.



### LED BACKLIGHT FEATURES

Dual Edge Day and NVIS LED rails

Single connector allows simple interconnect with LED driver<sup>1</sup>

Projected lifetime > 75,000 hours

Designed to be driven by constant current, selectable dual output LED backlight driver <sup>1</sup>

<sup>1</sup> For best power transfer and control, use ACI ID3 Dual Mode LED Driver ACI-3251.

### LCD PANEL HIGHLIGHTS

10.4" TFT Active Matrix Color

157.824mm(H) x 210.432mm(V) viewable area

230.0mm(W) x 180.2mm(H) x 10.5mm(D) physical size

XGA 1024 x 768 pixels, 16.7M colors

700:1 typical contrast ratio

Display Mode, Normally Black

Surface Treatment: Anti-Glare

*For complete LCD specification (standard panel), refer to the datasheet Kyocera TCG104XGLPAPNN-AN40*

### MAXIMUM RATINGS\*

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| Symbol            | Parameter                                                    | Value      | Unit  |
|-------------------|--------------------------------------------------------------|------------|-------|
| Top <sup>1</sup>  | Operating temperature of display (center of panel surface)   | -30 to +80 | Deg-C |
| Tled              | Operating temperature of LED edge light (light rail contact) | -30 to +95 | Deg-C |
| Tstg <sup>1</sup> | Display storage temperature                                  | -30 to +80 | Deg-C |
| IfwdD             | LED forward current (Day)                                    | 115        | mA    |
| IfwdN             | LED forward current (NVIS)                                   | 18         | mA    |

\*Maximum Ratings are those values beyond which damage may occur

<sup>1</sup>Per Manufacturer's Specification

### PANEL/BACKLIGHT OPTICAL CHARACTERISTICS

Ifwd(Day) = 95mA per bank, 1 bank per rail, 2 rails per display, Ifwd(NVIS) = 15mA per bank, 1 bank per rail, 2 rails per display, LED rails: ACR-2831, Ta = +25 Deg-C moving air (36 CFM), LCD displaying full-white image, minimum 2 hour soak.

| Symbol | Parameter                  | Test Conditions | Min  | Typ   | Max   | Unit              |
|--------|----------------------------|-----------------|------|-------|-------|-------------------|
| Bpd    | Panel Luminance (Day)      |                 | 1000 | 1200  |       | cd/m <sup>2</sup> |
| Bpn    | Panel Luminance (NVIS)     |                 |      | 5.2   |       | cd/m <sup>2</sup> |
| u'd    | White u' coordinate (DAY)  |                 |      | 0.201 |       | -                 |
| v'd    | White v' coordinate (DAY)  |                 |      | 0.503 |       | -                 |
| Rd     | White radius error (DAY)   |                 |      |       | 0.040 | -                 |
| u'n    | White u' coordinate (NVIS) |                 |      | 0.190 |       | -                 |
| v'n    | White v' coordinate (NVIS) |                 |      | 0.490 |       | -                 |
| Rn     | White radius error (NVIS)  |                 |      |       | 0.040 | -                 |

### LED EDGE-LIGHT ELECTRICAL CHARACTERISTICS

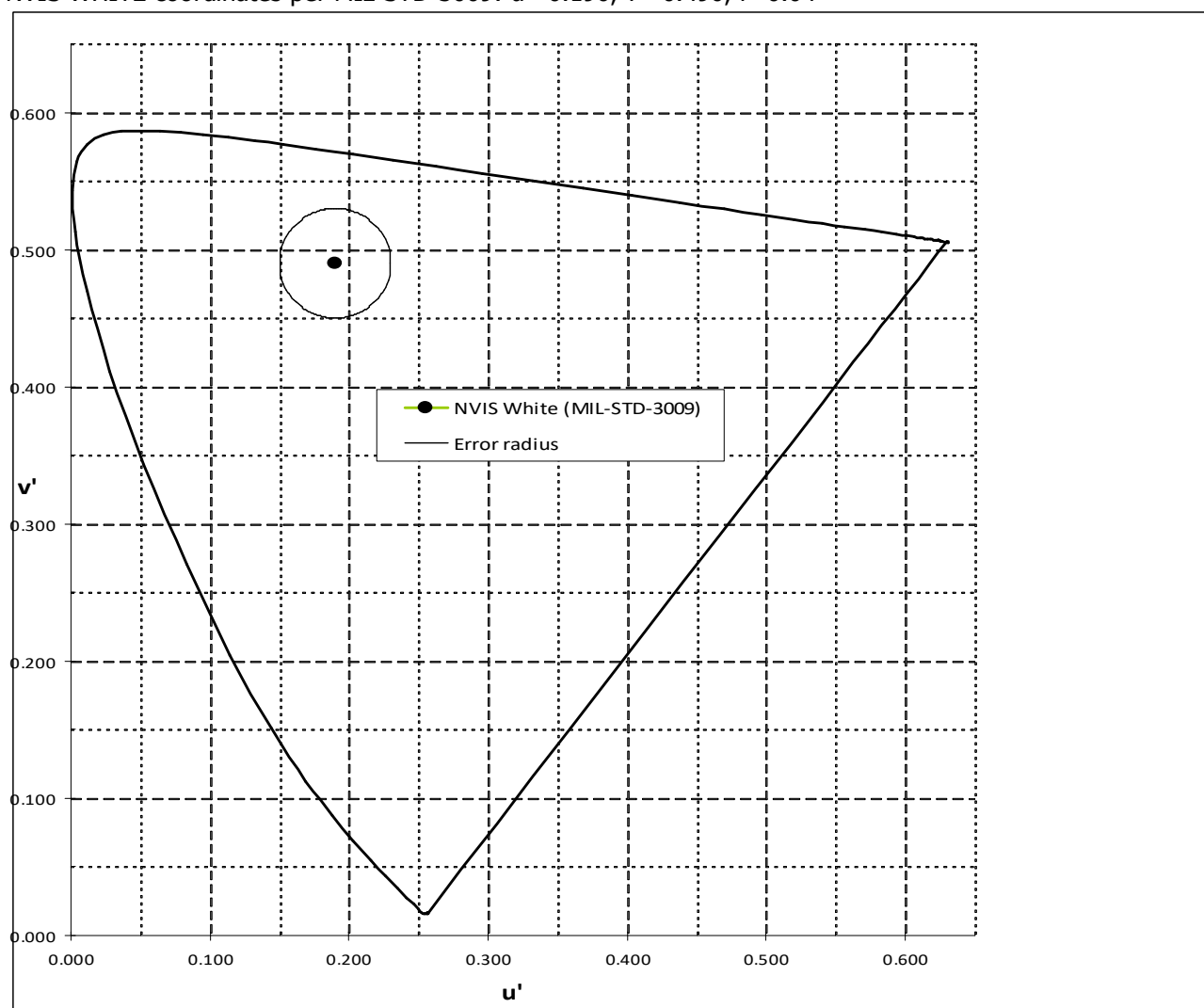
Ifwd(Day) = 95mA, Ifwd(NVIS) = 15mA, Top = +25Deg-C

| Symbol | Parameter                                | Test Conditions | Min | Typ | Max | Unit |
|--------|------------------------------------------|-----------------|-----|-----|-----|------|
| Vfwd   | LED rail forward voltage drop (Day mode) |                 | 61  | 68  | 75  | Vdc  |
| Vfwd   | LED rail forward voltage drop (NVIS)     |                 | 58  | 64  | 70  | Vdc  |

**CIE 1976 UCS CHROMATICITY DIAGRAM**

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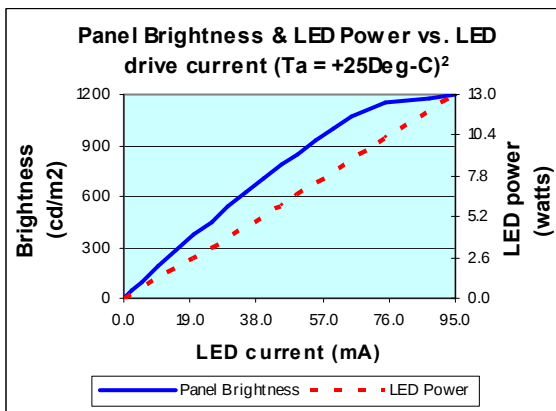
NVIS WHITE coordinates per MIL-STD-3009:  $u'=0.190$ ,  $v'=0.490$ ,  $r=0.04$



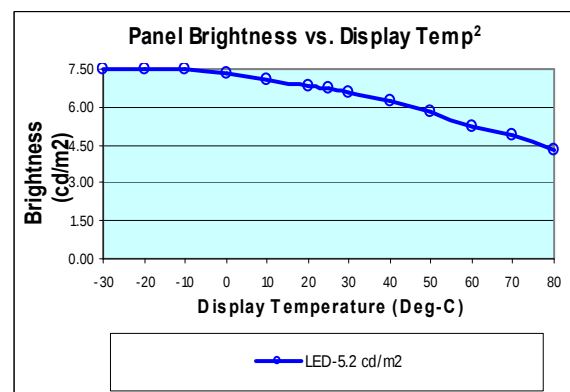
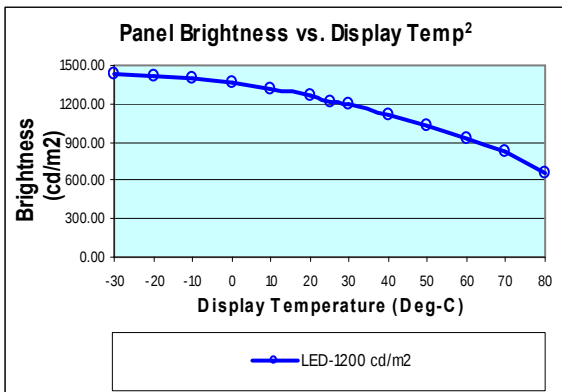
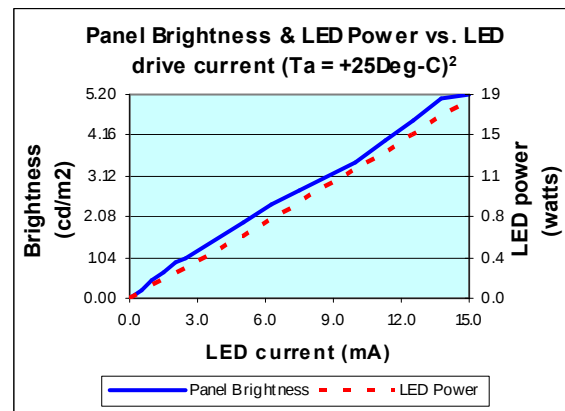
TYPICAL LCD/LED BACKLIGHT PERFORMANCE GRAPHS

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Day



NVIS



<sup>2</sup> Moving air (36.0 CFM)