



LC260WXN

## Product Specification

# SPECIFICATION FOR APPROVAL

( ) Preliminary Specification

( ● ) Final Specification

|       |                    |
|-------|--------------------|
| Title | 26.0" WXGA TFT LCD |
|-------|--------------------|

|       |         |
|-------|---------|
| BUYER | General |
| MODEL |         |

|          |                      |
|----------|----------------------|
| SUPPLIER | LG Display Co., Ltd. |
| *MODEL   | LC260WXN             |
| SUFFIX   | SBA3(RoHS Verified)  |

\*When you obtain standard approval,  
please use the above model name without suffix

| APPROVED BY | SIGNATURE<br>DATE |
|-------------|-------------------|
| /           | _____             |
| /           | _____             |
| /           | _____             |

Please return 1 copy for your confirmation with  
your signature and comments.

| APPROVED BY               | SIGNATURE<br>DATE |
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| H.S.SONG / Team Leader    | _____             |
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| Y.J. KIM / Engineer       | _____             |

**TV Product Development Dept.**  
**LG Display Co., Ltd**



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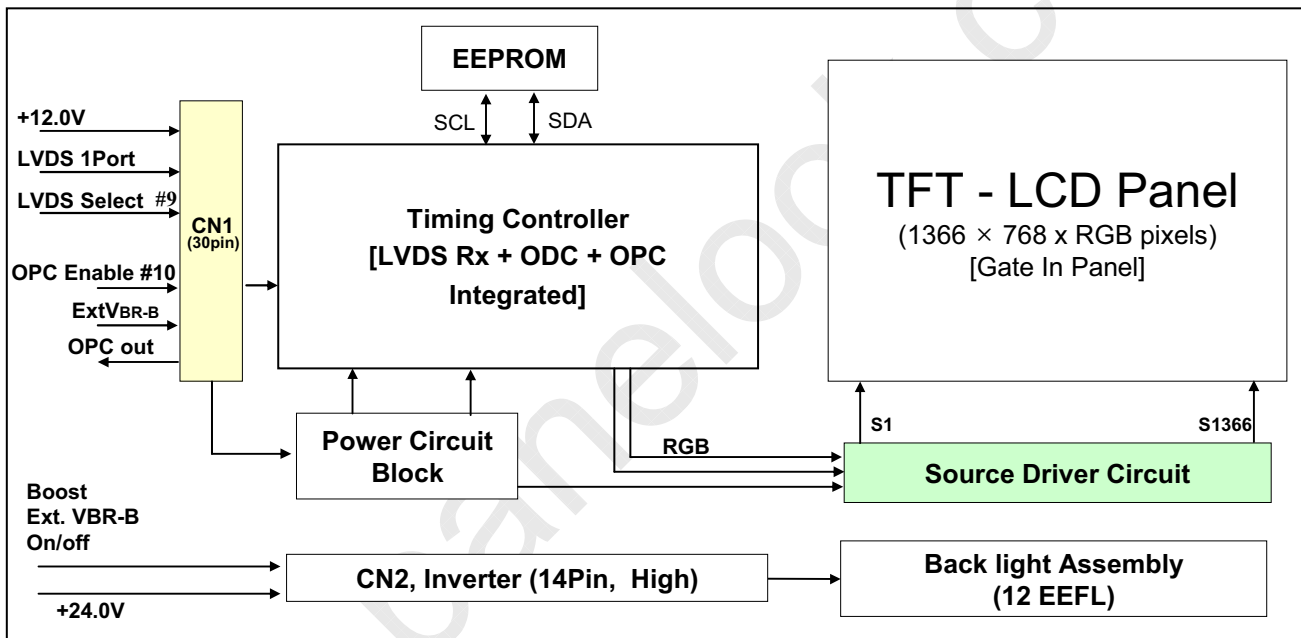
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## 1. General Description

The LC260WXN is a Color Active Matrix Liquid Crystal Display with an integral External Electrode Fluorescent Lamp (EEFL) backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive display type which is operating in the normally black mode. It has a 26.01 inch diagonally measured active display area with WXGA resolution (768 vertical by 1366 horizontal pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in Horizontal stripes. Gray scale or the luminance of the sub-pixel color is determined with a 8-bit gray scale signal for each dot, thus presenting a palette of more than 16.7M(true) colors.

It has been designed to apply the 8-bit 1-port LVDS interface.

It is intended to support LCD TV, PCTV where high brightness, super wide viewing angle, high color gamut, high color depth and fast response time are important.



## General Features

|                        |  |
|------------------------|--|
| Active Screen Size     | 26.01 inches(660.6mm) diagonal   |
| Outline Dimension      | 626 mm(H) x 373 mm(V) x 47.1 mm(D) (Typ.)                                |
| Pixel Pitch            | 421.5 $\mu$ m x 140.5 $\mu$ m x RGB                                      |
| Pixel Format           | 1366 horiz. by 768 vert. pixels RGB stripe arrangement                   |
| Color Depth            | 8bit, 16,7 M colors  |
| Luminance, White       | 450 cd/m <sup>2</sup> (Center 1 point) (Typ.)                            |
| Viewing Angle (CR>10)  | Viewing angle free ( R/L 178(Min.), U/D 178(Min.))                       |
| Power Consumption      | Total 78.36 Watt (Logic=3.36 W, Inverter= 75W @ [VBR-A=1.65V] )          |
| Weight                 | 4,100g(Typ.)   |
| Display Operating Mode | Transmissive mode, normally black  |
| Surface Treatment      | Hard coating(3H), Anti-glare treatment of the front polarizer (Haze 10%) |

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## 2. Absolute Maximum Ratings

The following items are maximum values which, if exceeded, may cause faulty operation or damage to the LCD module.

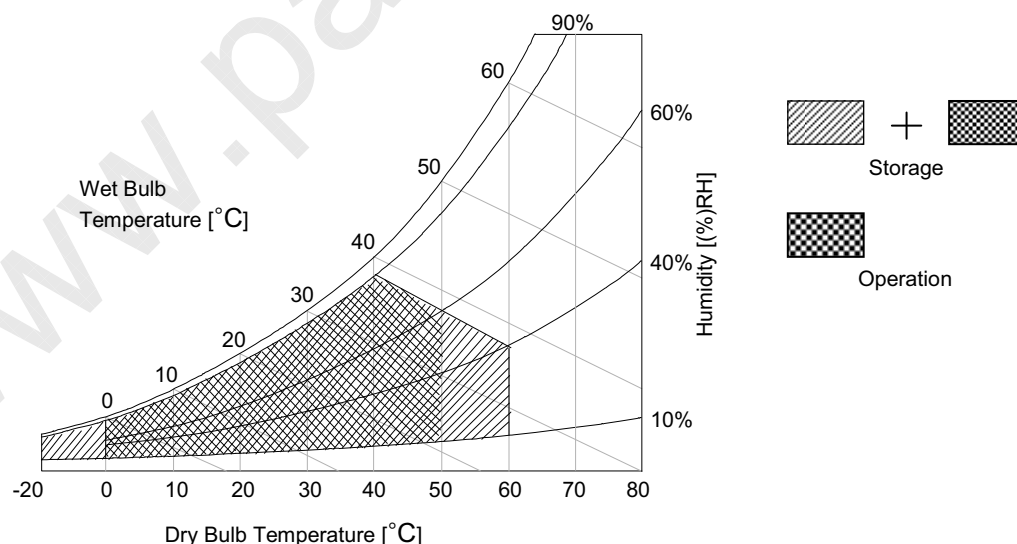
**Table 1. ABSOLUTE MAXIMUM RATINGS**

| Parameter                  |                    | Symbol  | Value |       | Unit | Remark       |
|----------------------------|--------------------|---------|-------|-------|------|--------------|
|                            |                    |         | Min   | Max   |      |              |
| Power Input Voltage        | LCM                | VLCD    | -0.3  | +14.0 | Vdc  | at 25 ± 2 °C |
|                            | Backlight inverter | VBL     | -0.3  | +27.0 | Vdc  |              |
| ON/OFF Control Voltage     |                    | VON/OFF | -0.3  | +5.5  | Vdc  |              |
| Brightness Control Voltage |                    | VBR     | 0     | +5.0  | Vdc  |              |
| Operating Temperature      |                    | TOP     | 0     | +50   | °C   | Note 1,2     |
| Storage Temperature        |                    | TST     | -20   | +60   | °C   |              |
| Operating Ambient Humidity |                    | HOP     | 10    | 90    | %RH  |              |
| Storage Humidity           |                    | HST     | 10    | 90    | %RH  |              |

Notes : 1. Temperature and relative humidity range are shown in the figure below.

Wet bulb temperature should be Max. 39 °C and no condensation of water.

2. Gravity mura can be guaranteed below 40°C condition.



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**3. Electrical Specifications****3-1. Electrical Characteristics**

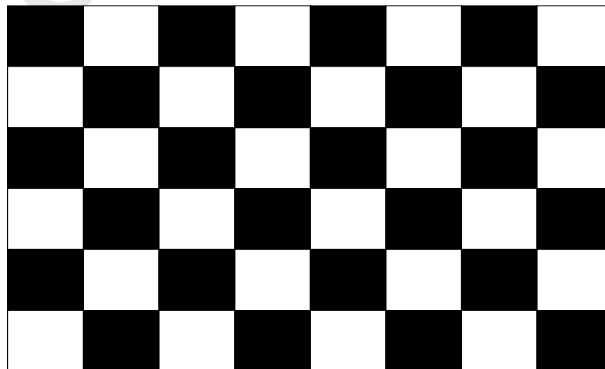
It requires two power inputs. One is employed to power for the LCD circuit.  
The other is used for the EEFL backlight circuit.

**Table 2. ELECTRICAL CHARACTERISTICS**

| Parameter           | Symbol     | Value |      |      | Unit     | Note |
|---------------------|------------|-------|------|------|----------|------|
|                     |            | Min   | Typ  | Max  |          |      |
| <b>Circuit :</b>    |            |       |      |      |          |      |
| Power Input Voltage | $V_{LCD}$  | 10.8  | 12.0 | 13.2 | $V_{DC}$ |      |
| Power Input Current | $I_{LCD}$  | -     | 280  | 364  | mA       | 1    |
|                     |            | -     | 360  | 468  | mA       | 2    |
| Power Consumption   | $P_{LCD}$  | -     | 3.36 | 4.37 | Watt     | 1    |
| Rush current        | $I_{RUSH}$ | -     | -    | 3.0  | A        | 3    |

- Notes : 1. The specified current and power consumption are under the  $V_{LCD}=12.0V$ ,  $25 \pm 2^{\circ}C$ ,  $f_V=60Hz$  condition whereas mosaic pattern(8 x 6) is displayed and  $f_V$  is the frame frequency.  
2. The current is specified at maximum current pattern (Vertical 2 line).  
3. The duration of rush current is about 2ms and rising time of power input is 0.5ms (min.).

White : 255 Gray  
Black : 0 Gray



Mosaic Pattern(8 x 6)

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Table 3. ELECTRICAL CHARACTERISTICS (Continue)

| Parameter                                |                              | Symbol     | Values   |      |       | Unit | Notes  |         |
|--|------------------------------|------------|----------|------|-------|------|--|---------|
|  |                              |            | Min      | Typ  | Max   |      |  |         |
| Inverter :                               |                              |            |          |      |       |      |  |         |
| Power Supply Input Voltage               |                              | VBL        | 22.8     | 24.0 | 25.2  | Vdc  | 1  |         |
| Power Supply Input Current               | After Aging                  | IBL_A      | -        | 3.12 | 3.62  | A    | V <sub>BR-A</sub> = 1.65V ... 1                  |         |
|  |                              |            | -        | 3.30 | 3.80  | A    | V <sub>BR-A</sub> = 3.3V ... 1                   |         |
|  | Before Aging                 | IBL_B      | -        | 3.20 | 3.70  | A    | V <sub>BR-A</sub> = 1.65V ... 2                  |         |
|  |                              |            | -        | 3.50 | 4.00  | A    | V <sub>BR-A</sub> = 3.3V ... 2                   |         |
| Power Supply Input Current (In-Rush)     |                              | Irush      | -        | -    | 6.12  | A    | VBL = 22.8V<br>Ext VBR-B = 100%<br>VBR-A = 1.65V |         |
| Power Consumption                        |                              | PBL        | -        | 75   | 86.88 | W    | V <sub>BR-A</sub> = 1.65V ... 1                  |         |
| Input Voltage for Control System Signals | Brightness Adjust            |            | VBR-A    | 0.0  | 1.65  | 3.3  | Vdc  |         |
|  | On/Off                       | On         | V on     | 2.5  | -     | 5.0  | Vdc  |         |
|  |                              | Off        | V off    | -0.3 | 0.0   | 0.8  | Vdc  |         |
|  | Brightness Adjust            |            | ExtVBR-B | 25   | -     | 100  | %  | On Duty |
|  | PWM Frequency for NTSC & PAL |            | PAL      |      | 100   |      | Hz   | 5       |
|  |                              |            | NTSC     |      | 120   |      | Hz   | 5       |
| Pulse Duty Level(PWM) (Burst mode)       |                              | High Level | 2.5      | -    | 5.0   | Vdc  | HIGH: Lamp on<br>LOW:Lamp off                    |         |
|  |                              | Low Level  | 0.0      | -    | 0.8   | Vdc  |  |         |
| Lamp:                                    |                              |            |          |      |       |      |  |         |
| Discharge Stabilization Time             |                              | Ts         |          |      | 3     | min  | 3  |         |
| Life Time                                |                              |            | 50,000   |      |       | Hrs  | 4  |         |

## Notes :

- Electrical characteristics are determined after the unit has been 'ON' and stable for approximately 120 minutes at 25±2°C. The specified current and power consumption are under the typical supply Input voltage 24V and VBR (VBR-A : 1.65V & ExtVBR-B : 100%), it is total power consumption.
- Electrical characteristics are determined within 30 minutes at 25±2°C.  
The specified currents are under the typical supply Input voltage 24V.
- The brightness of the lamp after lighted for 5minutes is defined as 100%.  
TS is the time required for the brightness of the center of the lamp to be not less than 95% at typical current.  
The screen of LCD module may be partially dark by the time the brightness of lamp is stable after turn on.
- Specified Values are for a single lamp which is aligned horizontally.  
The life time is determined as the time which luminance of the lamp is 50% compared to that of initial value at the typical lamp current (VBR-A : 1.65V & ExtVBR-B : 100%), on condition of continuous operating at 25± 2°C
- LGD recommend that the PWM freq. is synchronized with Two times harmonic of Vsync signal of system.
- The duration of rush current is about 10ms.

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**3-2. Interface Connections**

This LCD module employs two kinds of interface connection, a 30-pin connector is used for the module electronics and One connectors are used for the integral backlight system.

**3-2-1. LCD Module**

- LCD Connector(CN1) : KDF71G-30S-1H(Hirose) or FI-X30SSL-HF(JAE)
- Mating Connector : : FI-X30C2L (Manufactured by JAE) or Equivalent

**Table 4. MODULE CONNECTOR(CN1) PIN CONFIGURATION**

| Pin No. | Symbol      | Description                                    | Note                                   |
|---------|-------------|--|--|
| 1       | VLCD        | Power Supply +12.0V                            |  |
| 2       | VLCD        | Power Supply +12.0V                            |  |
| 3       | VLCD        | Power Supply +12.0V                            |  |
| 4       | VLCD        | Power Supply +12.0V                            |  |
| 5       | GND         | Ground   |  |
| 6       | GND         | Ground   |  |
| 7       | GND         | Ground   |  |
| 8       | GND         | Ground   |  |
| 9       | LVDS Select | 'H' = JEIDA , 'L' or NC = VESA                 | <b>Appendix IX<br/>Appendix V, VII</b> |
| 10      | OPC_Enable  | 'H' = Enable , 'L' = Disable                   |  |
| 11      | GND         | Ground   |  |
| 12      | RA-         | LVDS Receiver Signal(-)                        |  |
| 13      | RA+         | LVDS Receiver Signal(+)                        |  |
| 14      | GND         | Ground   |  |
| 15      | RB-         | LVDS Receiver Signal(-)                        |  |
| 16      | RB+         | LVDS Receiver Signal(+)                        |  |
| 17      | GND         | Ground   |  |
| 18      | RC-         | LVDS Receiver Signal(-)                        |  |
| 19      | RC+         | LVDS Receiver Signal(+)                        |  |
| 20      | GND         | Ground   |  |
| 21      | RCLK-       | LVDS Receiver Clock Signal(-)                  |  |
| 22      | RCLK+       | LVDS Receiver Clock Signal(+)                  |  |
| 23      | GND         | Ground   |  |
| 24      | RD-         | LVDS Receiver Signal(-)                        |  |
| 25      | RD+         | LVDS Receiver Signal(+)                        |  |
| 26      | GND         | Ground   |  |
| 27      | OPC OUT     | OPC output (From LCM)                          |  |
| 28      | Ext VBR-B   | External VBR (From System)                     |  |
| 29      | Reserved    | H : Interlace Free Mode , L : Normal Operation |  |
| 30      | GND         | Ground   |  |

- Notes :
1. All GND (Ground) pins should be connected together to the LCD module's metal frame.
  2. All VLCD (power input) pins should be connected together.
  3. All Input levels of LVDS signals are based on the EIA 644 Standard.
  4. Specific pins (Pin No. #10, #27~#28) are used for OPC function of the LCD module.  
If not used, these pins are no connection.
  5. Specific pin No. #30 is used for "No signal detection" of system signal interface.  
It should be GND for NSB (No Signal Black) during the system interface signal is not.  
If this pin is "H", LCD Module displays AGP (Auto Generation Pattern).



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**3-2-2. Backlight Inverter**

- Inverter Connector : 20022WR-14B1(Yeonho)  
or Equivalent
- Mating Connector : 20022HS-14 or Equivalent

**Table 5. INVERTER CONNECTOR PIN CONFIGURATION**

| Pin No | Symbol    | Description              | Master   | Note |
|--------|-----------|--------------------------|----------|------|
| 1      | VBL       | Power Supply +24.0V      | VBL      |      |
| 2      | VBL       | Power Supply +24.0V      | VBL      |      |
| 3      | VBL       | Power Supply +24.0V      | VBL      |      |
| 4      | VBL       | Power Supply +24.0V      | VBL      |      |
| 5      | VBL       | Power Supply +24.0V      | VBL      |      |
| 6      | GND       | Backlight Ground         | GND      |      |
| 7      | GND       | Backlight Ground         | GND      |      |
| 8      | GND       | Backlight Ground         | GND      | 1    |
| 9      | GND       | Backlight Ground         | GND      |      |
| 10     | GND       | Backlight Ground         | GND      |      |
| 11     | VBR-A     | Analog Dimming           | VBR-A    | 2    |
| 12     | VON/OFF   | Backlight ON/OFF control | On/Off   | 3    |
| 13     | Ext VBR-B | External PWM             | EXTVBR-B | 4    |
| 14     | GND       | Lamp Status              | Status   | 5    |

Notes : 1. GND should be connected to the LCD module's metal frame.

2. Minimum Brightness : 0.0V / Maximum Brightness : 3.3V / "OPEN" : 1.65V

3. ON : 2.5 ~ 5.0V / OFF : 0.0 ~ 0.8V . Open or 'H' for B/L On is default status.

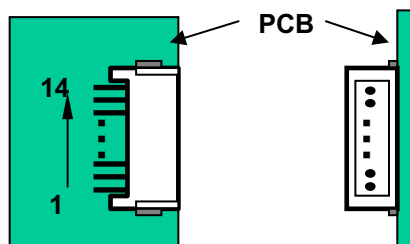
4. High : Lamp ON/ Low : Lamp OFF, Pin#13 can be opened. ( if Pin #13 is open , EXTVBR-B is 100% )

Please see Appendix VI for more information.

5. Normal : Low (under 0.7V) / Abnormal : High (upper 3.0V)

Please see Appendix VI for more information.

6. Each impedance of pin #11, 12 and 13 is over 200[K $\Omega$ ] , over 80[K $\Omega$ ] and over 55[K $\Omega$ ].

**◆ Rear view of LCM**

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**3-3. Signal Timing Specifications**

Table 6 shows the signal timing required at the input of the LVDS transmitter. All of the interface signal timings should be satisfied with the following specification for normal operation.

**Table 6. TIMING TABLE for NTSC & PAL****[ DE (Data Enable) Only ]**

| ITEM  | Symbol                 |      | Min          | Typ          | Max            | Unit | Note   |
|-------|------------------------|------|--------------|--------------|----------------|------|--|
| DCLK  | Period                 | tCLK | 12.5         | 13.8         | 15.8           | ns   |  |
|       | Frequency              | -    | 63           | 72.4         | 80             | MHz  |  |
| Hsync | Period                 | tHT  | 1456         | 1528         | 1920           | tCLK |  |
|       | Horizontal Valid       | tHV  | 1366         | 1366         | 1366           | tCLK |  |
|       | Horizontal Blank       | -    | tHP- tHV     | 162          | tHP- tHV       |      |  |
|       | Frequency              | fH   | 45           | 47.4         | 50             | KHz  |  |
|       | Width                  | tWH  | -            | 32           | -              | tCLK |  |
|       | Horizontal Back Porch  | tHBP | 24           | 48           | -              |      |  |
|       | Horizontal Front Porch | tHFP | 40           | 80           | -              |      |  |
| Vsync | Period                 | tVT  | 776<br>(894) | 790<br>(948) | 1063<br>(1008) | tHP  | Note 1)<br>NTSC : 57~63Hz<br>(PAL : 47~53Hz) |
|       | Vertical Valid         | tVV  | 768          | 768          | 768            | tHP  |  |
|       | Vertical Blank         | -    | tVP- tVV     | 22           | tVP- tVV       | tHP  |  |
|       | Frequency              | fV   | 57<br>(47)   | 60<br>(50)   | 63<br>(53)     | Hz   |  |
|       | Width                  | tWV  | -            | 5<br>(12)    | -              | tHP  |  |
|       | Vertical Back Porch    | tVBP | 5            | 15<br>(128)  | -              | Hz   |  |
|       | Vertical Front Porch   | tVFP | 1            | 2<br>(40)    | -              | tHP  |  |

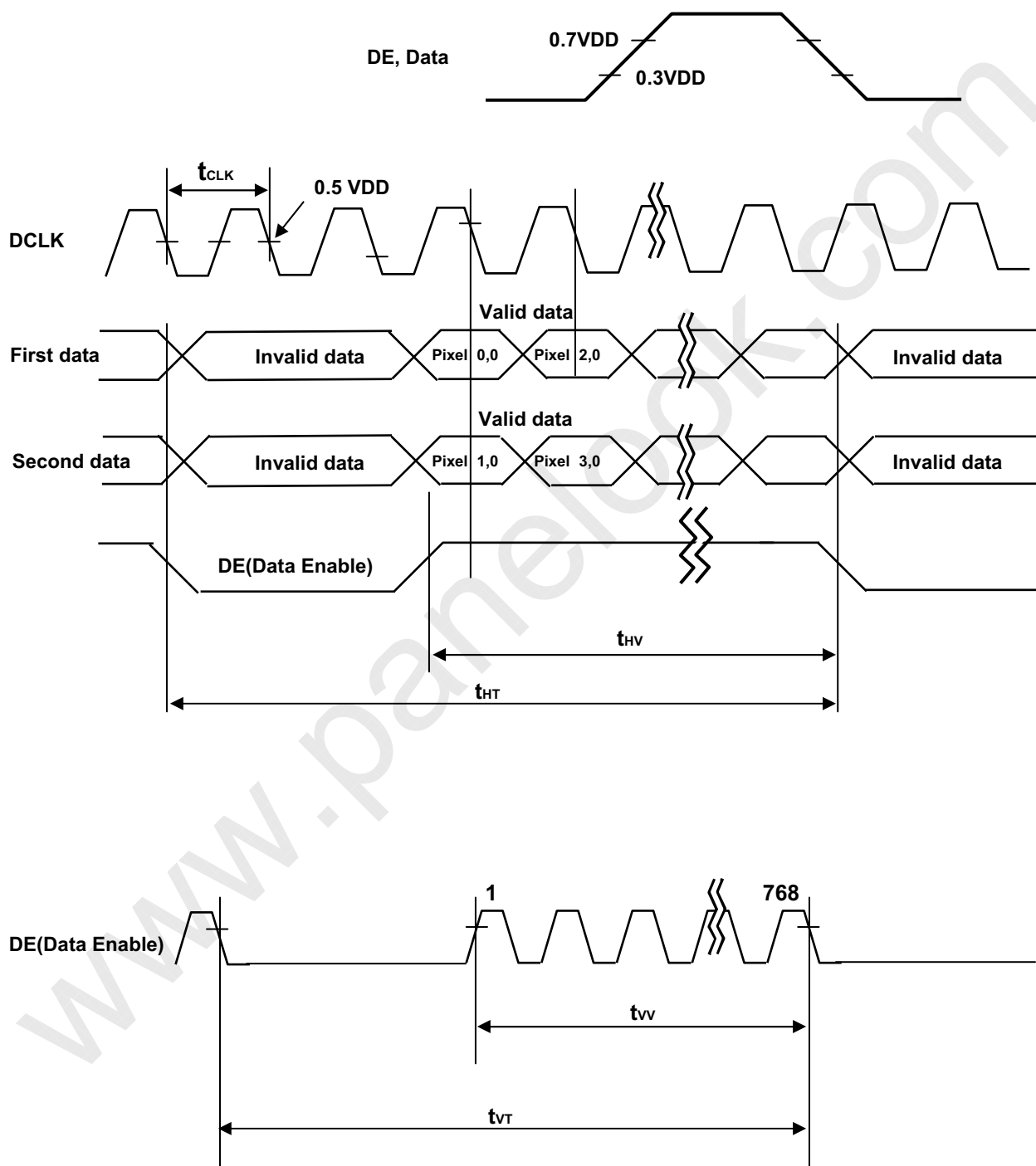
Note :

1. The input of HSYNC & VSYNC signal does not have an effect on normal operation (DE Only Mode). If you use spread spectrum of EMI, add some additional clock to minimum value for clock margin.
2. The performance of the electro-optical characteristics may be influenced by variance of the vertical refresh rate and the horizontal frequency
3. Timing should be set based on clock frequency.

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## 3-4. Signal Timing Waveforms



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3-5. Color Data Reference

The brightness of each primary color (Red, Green, Blue) is based on the 8-bit gray scale data input for the color. The higher binary input, the brighter the color. Table 7 provides a reference for color versus data input.

Table 7. COLOR DATA REFERENCE

| Color       |                  | Input Color Data |    |    |    |    |    |    |     |       |    |    |    |    |    |    |     |      |    |    |    |    |    |    |     |
|-------------|------------------|------------------|----|----|----|----|----|----|-----|-------|----|----|----|----|----|----|-----|------|----|----|----|----|----|----|-----|
|             |                  | RED              |    |    |    |    |    |    |     | GREEN |    |    |    |    |    |    |     | BLUE |    |    |    |    |    |    |     |
|             |                  | MSB              |    |    |    |    |    |    | LSB | MSB   |    |    |    |    |    |    | LSB | MSB  |    |    |    |    |    |    | LSB |
|             |                  | R7               | R6 | R5 | R4 | R3 | R2 | R1 | R0  | G7    | G6 | G5 | G4 | G3 | G2 | G1 | G0  | B7   | B6 | B5 | B4 | B3 | B2 | B1 | B0  |
| Basic Color | Black            | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | Red (255)        | 1                | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | Green (255)      | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1     | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | Blue (255)       | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1   |
|             | Cyan             | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1     | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1   |
|             | Magenta          | 1                | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1   |
|             | Yellow           | 1                | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 1     | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | White            | 1                | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 1     | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1   |
| RED         | RED (000) Dark   | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | RED (001)        | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 1   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | ...              | ...              |    |    |    |    |    |    |     | ...   |    |    |    |    |    |    |     | ...  |    |    |    |    |    |    |     |
|             | RED (254)        | 1                | 1  | 1  | 1  | 1  | 1  | 1  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | RED (255)        | 1                | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
| GREEN       | GREEN (000) Dark | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | GREEN (001)      | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 1   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | ...              | ...              |    |    |    |    |    |    |     | ...   |    |    |    |    |    |    |     | ...  |    |    |    |    |    |    |     |
|             | GREEN (254)      | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1     | 1  | 1  | 1  | 1  | 1  | 1  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | GREEN (255)      | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1     | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
| BLUE        | BLUE (000) Dark  | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0   |
|             | BLUE (001)       | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 1   |
|             | ...              | ...              |    |    |    |    |    |    |     | ...   |    |    |    |    |    |    |     | ...  |    |    |    |    |    |    |     |
|             | BLUE (254)       | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 0   |
|             | BLUE (255)       | 0                | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0     | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1   |

LC260WXN

## Product Specification

## 3-6. Power Sequence

## 3-6-1. LCD Driving circuit

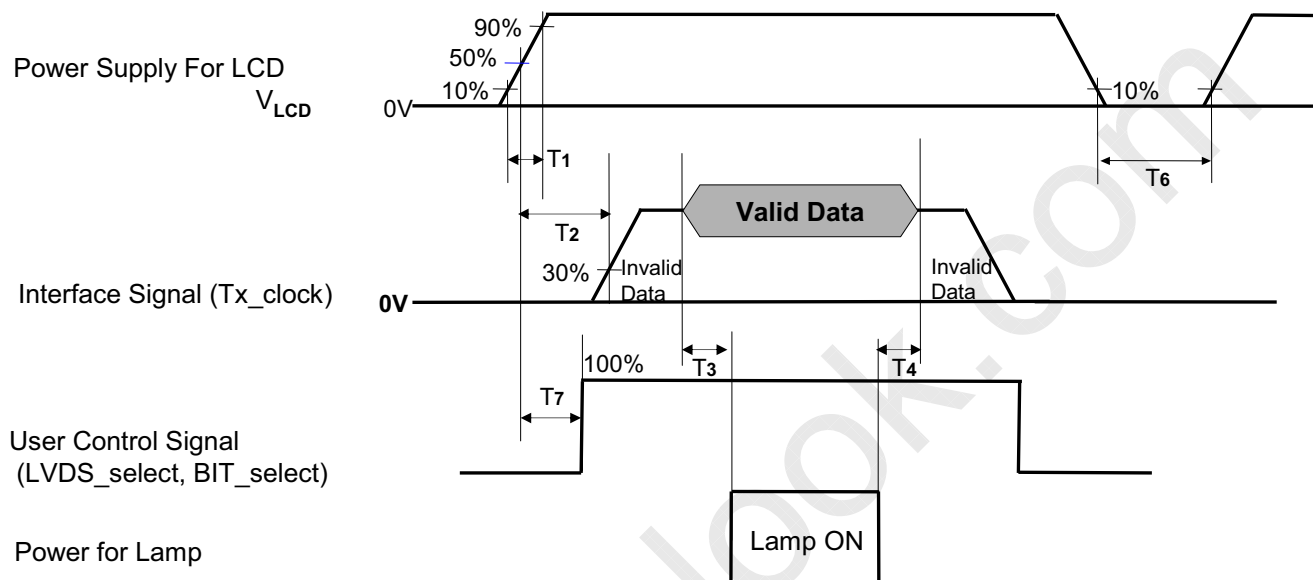


Table 9. POWER SEQUENCE

| Parameter | Value |     |     | Unit | Notes |
|-----------|-------|-----|-----|------|-------|
|           | Min   | Typ | Max |      |       |
| T1        | 0.5   | -   | 20  | ms   |       |
| T2        | 0     | -   | -   | ms   | 4     |
| T3        | 200   | -   | -   | ms   | 3     |
| T4        | 200   | -   | -   | ms   | 3     |
| T6        | 1.0   | -   | -   | s    | 5     |
| T7        | 0     | -   | T2  | ms   | 4     |

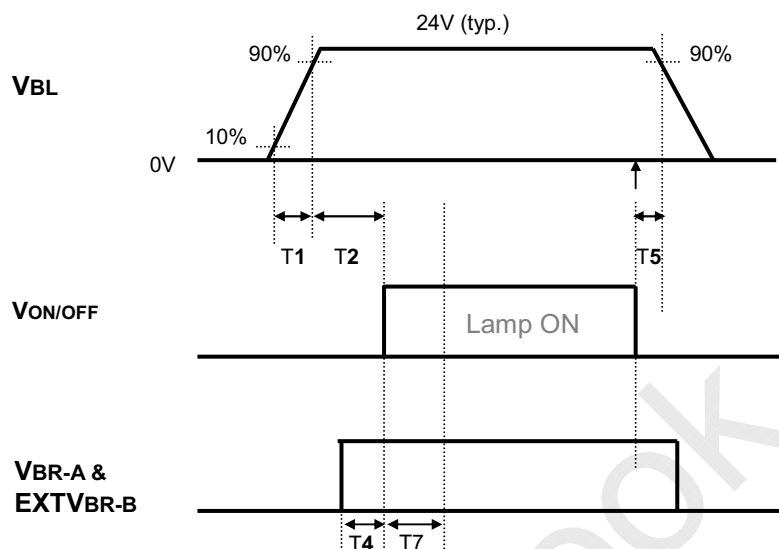
- Note :1. Please avoid floating state of interface signal at invalid period.  
 2. When the power supply for LCD ( $V_{LCD}$ ) is off, be sure to pull down the valid and invalid data to 0V.  
 3. The T3/T4 is recommended value, the case when failed to meet a minimum specification, abnormal display would be shown. There is no reliability problem.  
 4. If the on time of signals (Interface signal and user control signals) precedes the on time of Power ( $V_{LCD}$ ), it will be happened abnormal display. When T7 is NC status, T7 doesn't need to be measured.  
 5. T6 should be measured after the Module has been fully discharged between power off and on period.

LC260WXN

## Product Specification

## 3-6-2. Sequence for Inverter

## Power Supply For Inverter



## 3-6-3. Dip condition for Inverter

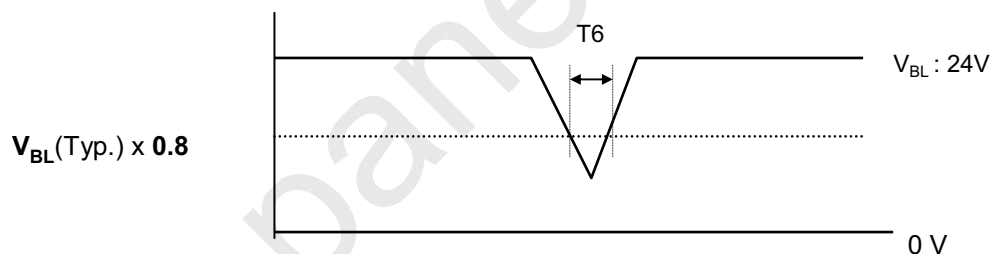


Table 10. Power Sequence for Inverter

| Parameter | Values |     |     | Units | Remarks                  |
|-----------|--------|-----|-----|-------|--------------------------|
|           | Min    | Typ | Max |       |                          |
| T1        | 20     | -   | -   | ms    | 1                        |
| T2        | 500    | -   | -   | ms    |                          |
| T4        | 0      | -   | -   | ms    | 2                        |
| T5        | 10     | -   | -   | ms    |                          |
| T6        | -      | -   | 10  | ms    | $V_{BL}(Typ) \times 0.8$ |
| T7        | 1000   | -   | -   | ms    | 2                        |

- Notes :
1. T1 describes rising time of 0V to 24V and this parameter does not applied at restarting time. Even though T1 is over the specified value, there is no problem if I2T spec of fuse is satisfied.
  2. In T4 section, ExtVBR-B is not recommend 100%, but in T7 section, ExtVBR-B is certainly recommend 100%,

LC260WXN

## Product Specification

#### 4. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable in a dark environment at  $25\pm 2^{\circ}\text{C}$ . The values are specified at an approximate distance 50cm from the LCD surface at a viewing angle of  $\Phi$  and  $\theta$  equal to  $0^{\circ}$ .

FIG. 1 shows additional information concerning the measurement equipment and method.

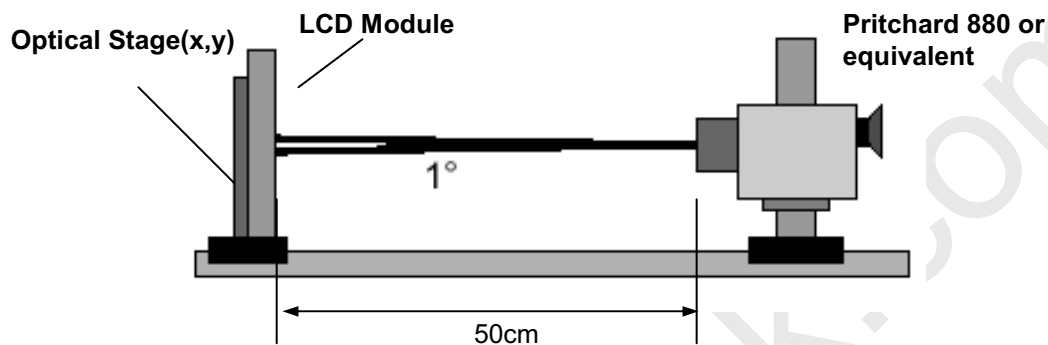


FIG. 1 Optical Characteristic Measurement Equipment and Method

Table 10. OPTICAL CHARACTERISTICS

$T_a = 25\pm 2^{\circ}\text{C}$ ,  $V_{\text{LCD}} = 12.0\text{V}$ ,  $f_v = 60\text{Hz}$ ,  $D_{\text{clk}} = 72.4\text{MHz}$ ,  
 $V_{\text{BR}_A} = 1.65\text{V}$ ,  $\text{EXTVBR}_B = 100\%$

| Parameter                      | Symbol                              | Value                    |              |       | Unit                   | Note   |   |
|--------------------------------|-------------------------------------|--------------------------|--------------|-------|------------------------|--------|---|
|                                |                                     | Min                      | Typ          | Max   |                        |        |   |
| Contrast Ratio                 | CR                                  | 700                      | 1000         | -     |                        | 1      |   |
| Surface Luminance, white       | $L_{\text{WH}}$                     | 360                      | 450          |       | $\text{cd}/\text{m}^2$ | 2      |   |
| Luminance Variation            | $\delta_{\text{WHITE}}$ 5P          | -                        | -            | 1.3   |                        | 3      |   |
| Response Time                  | Gray-to-Gray                        | G to G                   | -            | 8     | 12                     | ms     | 4 |
|                                | Uniformity                          | $\delta_{\text{G TO G}}$ | -            | -     | 1                      |        | 5 |
| Color Coordinates<br>[CIE1931] | RED                                 | Rx                       | Typ<br>-0.03 | 0.637 | Typ<br>+0.03           |        |   |
|                                |                                     | Ry                       |              | 0.333 |                        |        |   |
|                                | GREEN                               | Gx                       |              | 0.290 |                        |        |   |
|                                |                                     | Gy                       |              | 0.607 |                        |        |   |
|                                | BLUE                                | Bx                       |              | 0.145 |                        |        |   |
|                                |                                     | By                       |              | 0.061 |                        |        |   |
|                                | WHITE                               | Wx                       |              | 0.279 |                        |        |   |
|                                |                                     | Wy                       |              | 0.292 |                        |        |   |
| Viewing Angle (CR>10)          |                                     |                          |              |       |                        |        |   |
|                                | x axis, right( $\phi=0^{\circ}$ )   | $\theta_r$               | 89           | -     | -                      | degree | 6 |
|                                | x axis, left ( $\phi=180^{\circ}$ ) | $\theta_l$               | 89           | -     | -                      |        |   |
|                                | y axis, up ( $\phi=90^{\circ}$ )    | $\theta_u$               | 89           | -     | -                      |        |   |
|                                | y axis, down ( $\phi=270^{\circ}$ ) | $\theta_d$               | 89           | -     | -                      |        |   |
| Gray Scale                     |                                     |                          | -            |       |                        |        | 7 |

## Product Specification

Notes : 1. Contrast Ratio (CR) is defined mathematically as :

$$CR = \frac{\text{Surface Luminance at all white pixels}}{\text{Surface Luminance at all black pixels}}$$

It is measured at center 1-point.

2. Surface luminance is determined after the unit has been 'ON' and 1Hour after lighting the backlight in a dark environment at  $25 \pm 2^\circ\text{C}$ . Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying white.

For more information see the FIG. 2.

3. The variation in surface luminance,  $\delta$  WHITE is defined as :

$$\delta \text{ WHITE}(5P) = \text{Maximum}(L_{on1}, L_{on2}, L_{on3}, L_{on4}, L_{on5}) / \text{Minimum}(L_{on1}, L_{on2}, L_{on3}, L_{on4}, L_{on5})$$

Where  $L_{on1}$  to  $L_{on5}$  are the luminance with all pixels displaying white at 5 locations .

For more information, see the FIG. 2.

4. Response time is the time required for the display to transit from G(N) to G(M) (Rise Time,  $Tr_R$ ) and from G(M) to G(N) (Decay Time,  $Tr_D$ ). For additional information see the FIG. 3. ( $N < M$ )

※ G to G Spec stands for average value of all measured points.

Photo Detector : RD-80S / Field :  $2^\circ$

5. Gray to Gray Response time uniformity is Reference data. Please see Appendix XI.

6. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD module surface. For more information, see the FIG. 4.

7. Gray scale specification

Gamma Value is approximately 2.2. For more information, see the Table 11.

**Table 11. GRAY SCALE SPECIFICATION**

| Gray Level | Luminance [%] (Typ.) |
|------------|----------------------|
| L0         | 0.10                 |
| L15        | 0.27                 |
| L31        | 1.04                 |
| L47        | 2.49                 |
| L63        | 4.68                 |
| L79        | 7.66                 |
| L95        | 11.5                 |
| L111       | 16.1                 |
| L127       | 21.6                 |
| L143       | 28.1                 |
| L159       | 35.4                 |
| L175       | 43.7                 |
| L191       | 53.0                 |
| L207       | 63.2                 |
| L223       | 74.5                 |
| L239       | 86.7                 |
| L255       | 100                  |



LC260WXN

## Product Specification

Measuring point for surface luminance & measuring point for luminance variation.

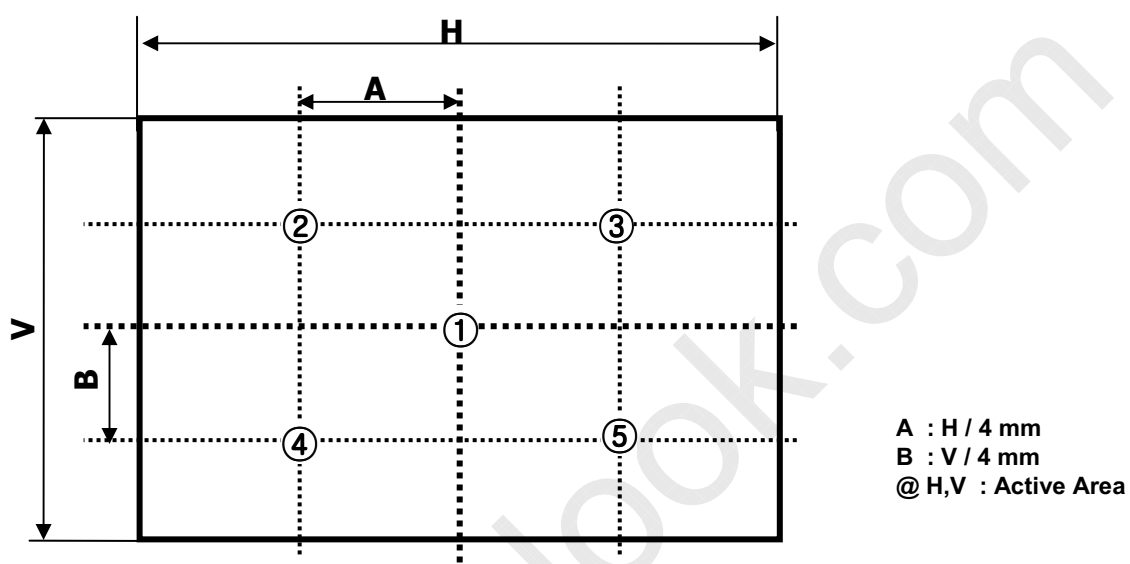


FIG. 2 5 Points for Luminance Measure

Response time is defined as the following figure and shall be measured by switching the input signal for "Gray(N)" and "Gray(M)".

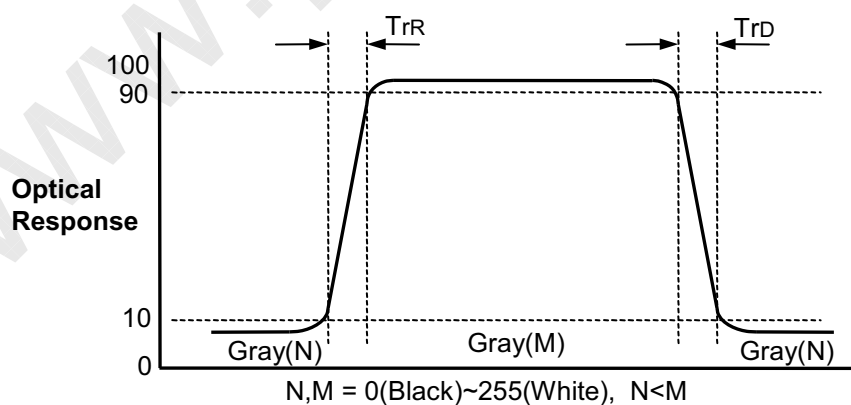


FIG. 3 Response Time

LC260WXN

## Product Specification

Dimension of viewing angle range

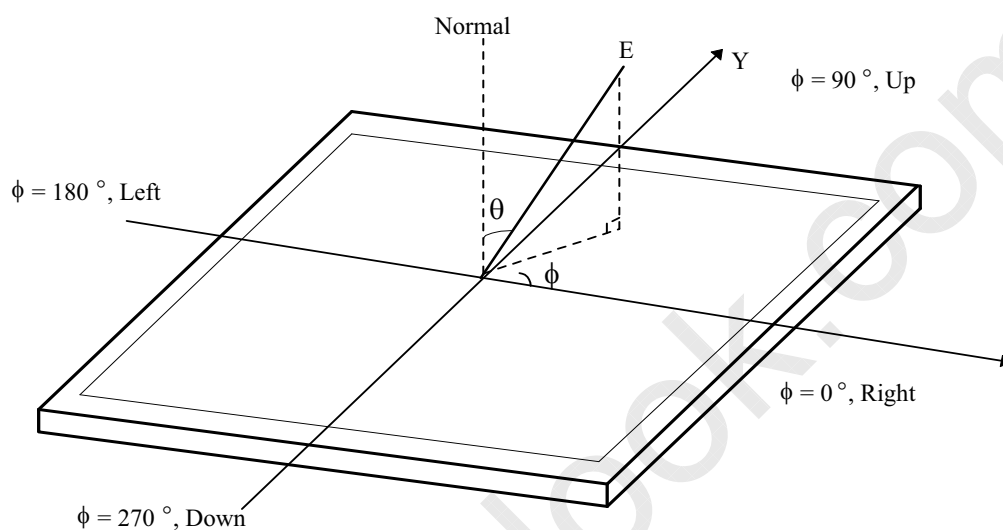


FIG. 4 Viewing Angle

LC260WXN

## Product Specification

**5. Mechanical Characteristics**

Table 12 provides general mechanical characteristics.

**Table 12. MECHANICAL CHARACTERISTICS**

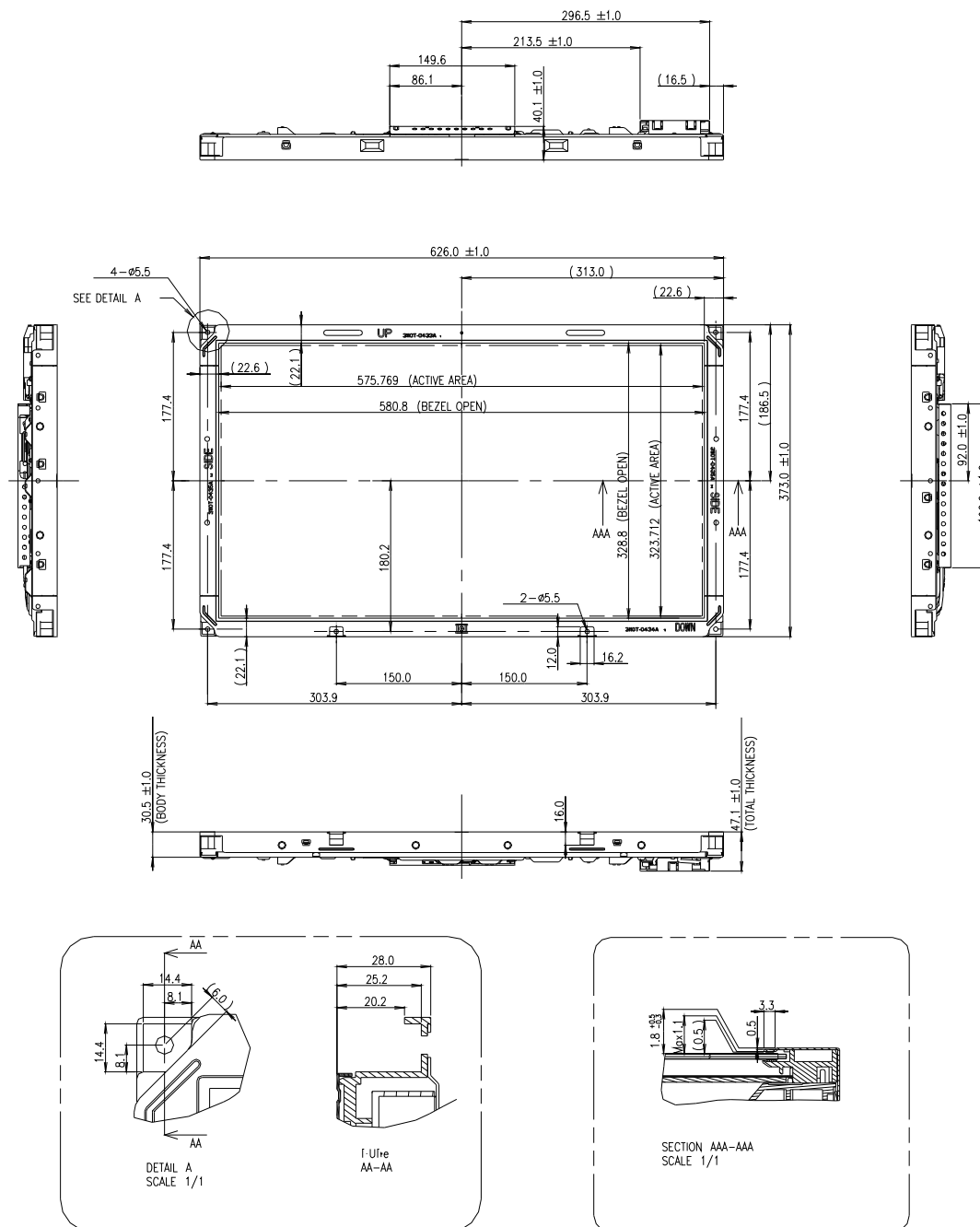
| Item                | Value                         |           |
|---------------------|-------------------------------|-----------|
| Outline Dimension   | Horizontal                    | 626.0mm   |
|                     | Vertical                      | 373.0 mm  |
|                     | Depth                         | 47.1 mm   |
| Bezel Area          | Horizontal                    | 580.8mm   |
|                     | Vertical                      | 328.8mm   |
| Active Display Area | Horizontal                    | 575.769mm |
|                     | Vertical                      | 323.712mm |
| Weight              | 4,100 g (Typ.), 4,300g (Max.) |           |

Note : 1.Please refer to a mechanical drawing in terms of tolerance at the next page.

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## Product Specification

&lt;FRONT VIEW&gt;



Ver. 1.0

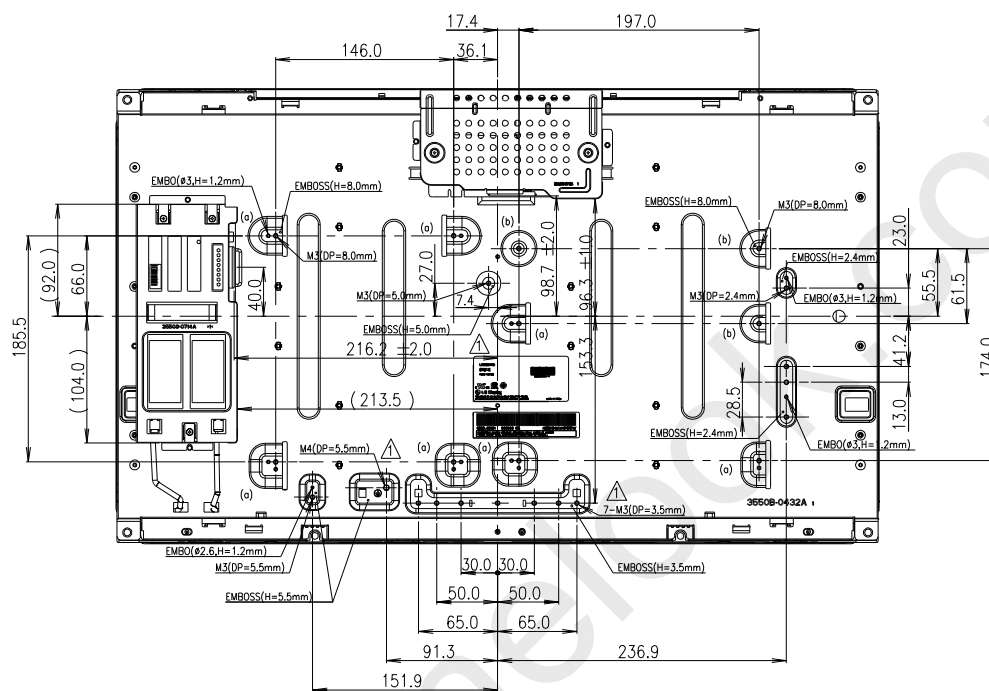
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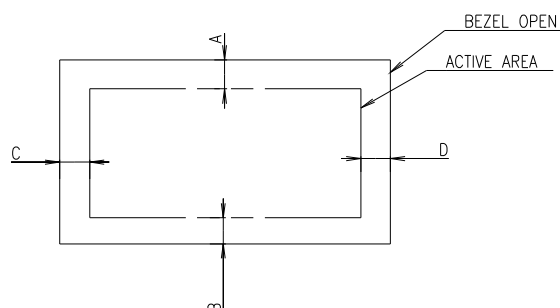
## Product Specification

&lt;REAR VIEW&gt;



## NOTES

1. UNSPECIFIED TOLERANCES TO BE  $\pm 0.5\text{mm}$
2. TILT AND PARTIAL DISPOSITION TOLERANCE OF DISPLAY AREA ARE AS FOLLOWING.
  - (1) Y-DIRECTION:  $|A-B| < 1.3$
  - (2) X-DIRECTION:  $|C-D| < 1.3$
3. TORQUE SPEC : 4~5kgf.cm



LC260WXN

## Product Specification

**6. Reliability****Table 13. ENVIRONMENT TEST CONDITION**

| No. | Test Item                                | Condition  |
|-----|--|--|
| 1   | High temperature storage test            | Ta= 60°C 240h  |
| 2   | Low temperature storage test             | Ta= -20°C 240h   |
| 3   | High temperature operation test          | Ta= 50°C 50%RH 240h  |
| 4   | Low temperature operation test           | Ta= 0°C 240h   |
| 5   | Vibration test<br>(non-operating)        | Wave form : random<br>Vibration level : 1.0G RMS<br>Bandwidth : 10-300Hz<br>Duration : X,Y,Z, axis<br>Each direction per 10min |
| 6   | Shock test<br>(non-operating)            | Shock level : 100G<br>Waveform : half sine wave, 2ms<br>Direction : ±X, ±Y, ±Z<br>One time each direction                      |
| 7   | Humidity condition Operation             | Ta= 40 °C ,90%RH   |
| 8   | Altitude operating<br>storage / shipment | 0 - 15,000 ft<br>0 - 40,000 ft   |

Note : Before and after Reliability test, LCM should be operated with normal function.

## Product Specification

## 7. International Standards

### 7-1. Safety

- a) UL 60065, 7<sup>th</sup> Edition, dated June 30, 2003, Underwriters Laboratories, Inc., Standard for Audio, Video and Similar Electronic Apparatus.
- b) CAN/CSA C22.2, No. 60065:03, Canadian Standards Association, Standard for Audio, Video and Similar Electronic Apparatus.
- c) IEC60065:2001, 7<sup>th</sup> Edition CB-scheme and EN 60065:2002, Safety requirements for Audio, Video and Similar Electronic Apparatus..

### 7-2. EMC

- a) ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electrical Equipment in the Range of 9kHz to 40GHz. "American National Standards Institute(ANSI), 1992
- b) CISPR13 "Limits and Methods of Measurement of Radio interference characteristics of Sound and Television broadcast receivers and associated equipment"  
CISPR22 "Limits and Methods of Measurement of Radio interference characteristics of Information Technology Equipment" International Special Committee on Radio Interference.
- c) EN55013 "Limits and Methods of Measurement of Radio interference characteristics of Sound and Television broadcast receivers and associated equipment"  
EN55022 "Limits and Methods of Measurement of Radio interference characteristics of Information Technology Equipment" European Committee for Electro Technical Standardization.(CENELEC), 1988(Including A1:2000)

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## Product Specification

**8. Packing****8-1. Information of LCM Label**

## a) Lot Mark

|   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

A,B,C : SIZE(INCH)  
E : MONTH

D : YEAR  
F ~ M : SERIAL NO.

## Note

## 1. YEAR

|      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|
| Year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| Mark | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    |

## 2. MONTH

|       |     |     |     |     |     |     |     |     |     |     |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Mark  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | A   | B   | C   |

## b) Location of Lot Mark

Serial No. is printed on the label. The label is attached to the backside of the LCD module.  
This is subject to change without prior notice.

**8-2. Packing Form**

- a) Package quantity in one box : 5 pcs
- b) Box size : 710mm(W) X 365mm(D) X 448mm(H)



## Product Specification

## 9. Precautions

Please pay attention to the followings when you use this TFT LCD module.

### 9-1. Mounting Precautions

- (1) You must mount a module using specified mounting holes (Details refer to the drawings).
- (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- (3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to resist external force.
- (4) You should adopt radiation structure to satisfy the temperature specification.
- (5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
- (6) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)
- (7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front / rear polarizers. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer. \* There is no problem of Panel crack under 5kgf /  $\phi$ 10mm
- (8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (9) Do not open the case because inside circuits do not have sufficient strength.

### 9-2. Operating Precautions

- (1) The spike noise causes the mis-operation of circuits. It should be lower than following voltage :  
 $V = \pm 200\text{mV}$  (Over and under shoot voltage)
- (2) Response time depends on the temperature. (In lower temperature, it becomes longer.)
- (3) Brightness depends on the temperature. (In lower temperature, it becomes lower.)  
And in lower temperature, response time (required time that brightness is stable after turned on) becomes longer.
- (4) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (5) When fixed patterns are displayed for a long time, remnant image is likely to occur.
- (6) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (7) Please do not give any mechanical and/or acoustical impact to LCM. Otherwise, LCM can't be operated its full characteristics perfectly.
- (8) A screw which is fastened up the steels should be a machine screw.  
(if not, it causes metallic foreign material and deal LCM a fatal blow)
- (9) Please do not set LCD on its edge.
- (10) It is recommended to avoid the signal cable and conductive material over the inverter transformer for it can cause the abnormal display and temperature rising.
- (11) Partial darkness may happen during 3~5 minutes when LCM is operated initially in condition that luminance is under 40% at low temperature (under 5°C). This phenomenon which disappears naturally after 3~5 minutes is not a problem about reliability but LCD characteristic.

## Product Specification

### 9-3. Electrostatic Discharge Control

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.

### 9-4. Precautions for Strong Light Exposure

Strong light exposure causes degradation of polarizer and color filter.

### 9-5. Storage

When storing modules as spares for a long time, the following precautions are necessary.

- (1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
- (2) The polarizer surface should not come in contact with any other object.  
It is recommended that they be stored in the container in which they were shipped.

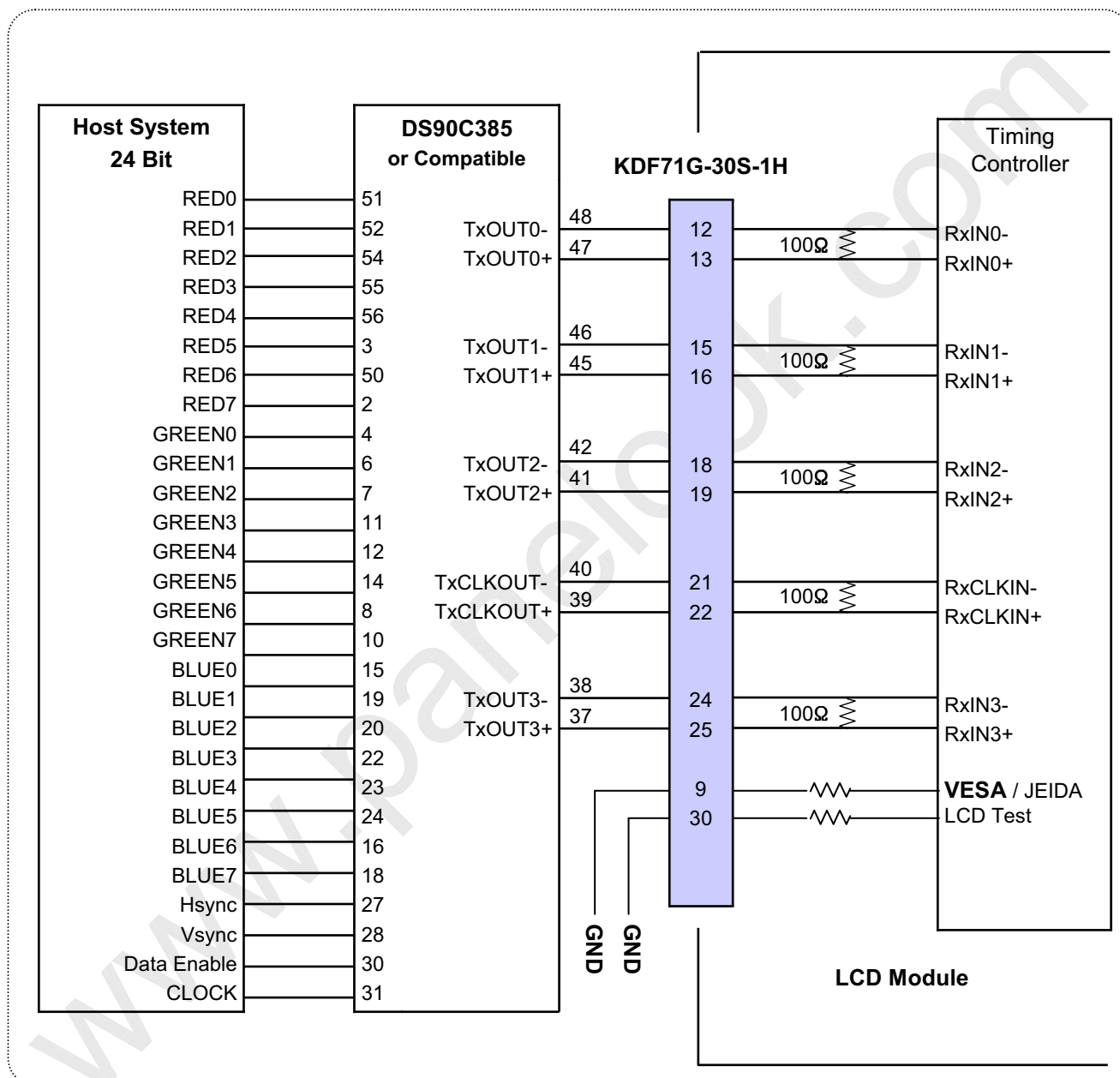
### 9-6. Handling Precautions for Protection Film

- (1) The protection film is attached to the bezel with a small masking tape.  
When the protection film is peeled off, static electricity is generated between the film and polarizer.  
This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
- (2) When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of glue still on the bezel after the protection film is peeled off.
- (3) You can remove the glue easily. When the glue remains on the bezel surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.

## Product Specification

## # APPENDIX-I-1

## ■ Required signal assignment for Flat Link Transmitter(Pin9="L" or NC)



## Notes:

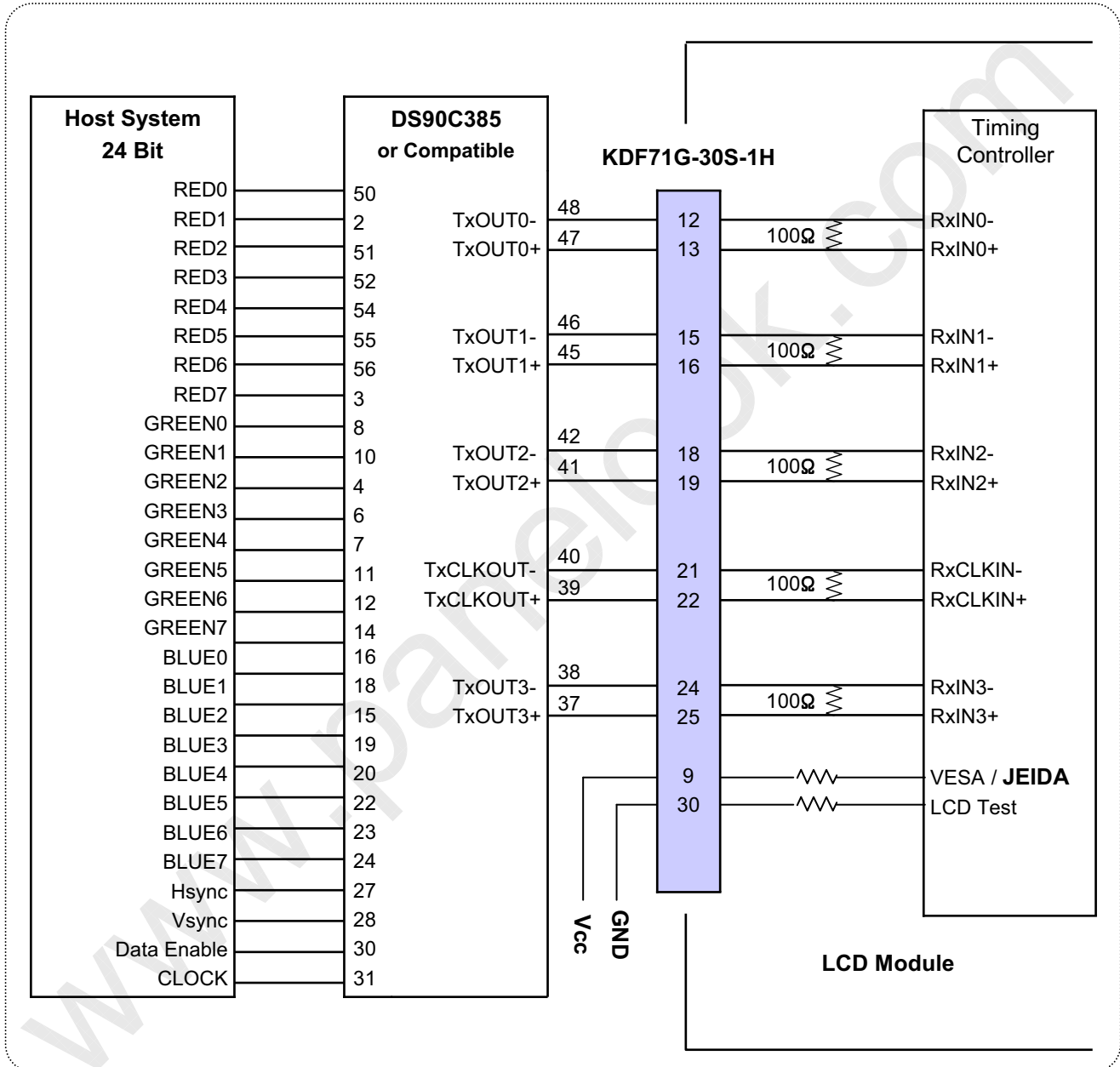
1. The LCD module uses a 100 Ohm( $\Omega$ ) resistor between positive and negative lines of each receiver input.
2. Refer to LVDS transmitter data sheet for detail descriptions. (DS90C385 or Compatible)
3. '7' means MSB and '0' means LSB at R,G,B pixel data.

LC260WXN

## Product Specification

## # APPENDIX-I-2

## ■ Required signal assignment for Flat Link Transmitter(Pin9="H")



## Notes:

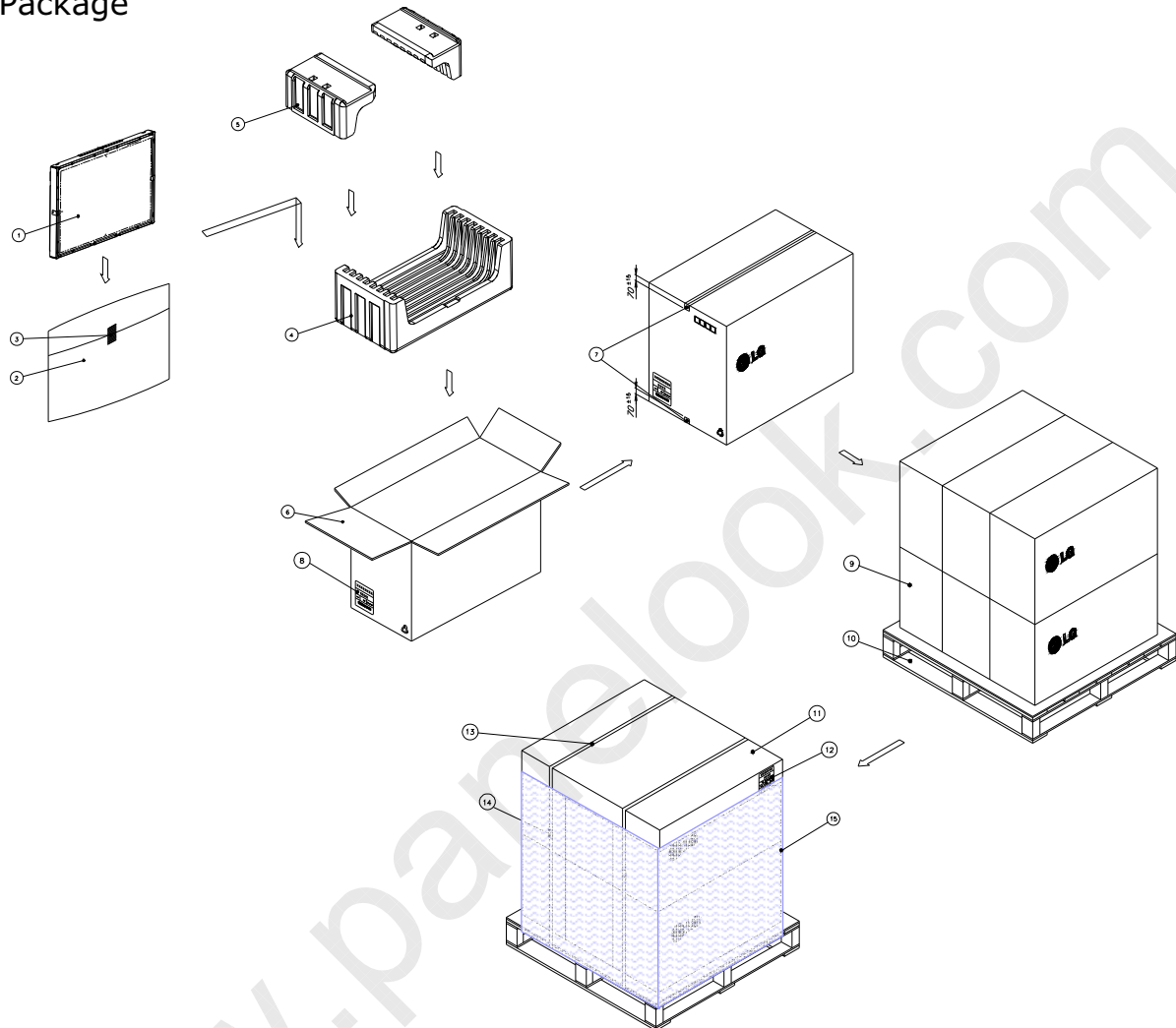
1. The LCD module uses a 100 Ohm( $\Omega$ ) resistor between positive and negative lines of each receiver input.
2. Refer to LVDS transmitter data sheet for detail descriptions. (DS90C385 or Compatible)
3. '7' means MSB and '0' means LSB at R,G,B pixel data.

LC260WXN

## Product Specification

## # APPENDIX- I

## ■ Package



## ※ Packing Ass'y

| NO. | DESCRIPTION | MATERIAL         |
|-----|-------------|------------------|
| 1   | LCD Module  |                  |
| 2   | BAG         | PE               |
| 3   | TAPE        | MASKING 20MMX50M |
| 4   | Packing     | EPS              |
| 5   | Packing     | EPS              |
| 6   | BOX         | PAPER_SWR4       |
| 7   | TAPE        | OPP 70MMX300M    |
| 8   | Label       | ART 100X70       |

## ※ Pallet Ass'y

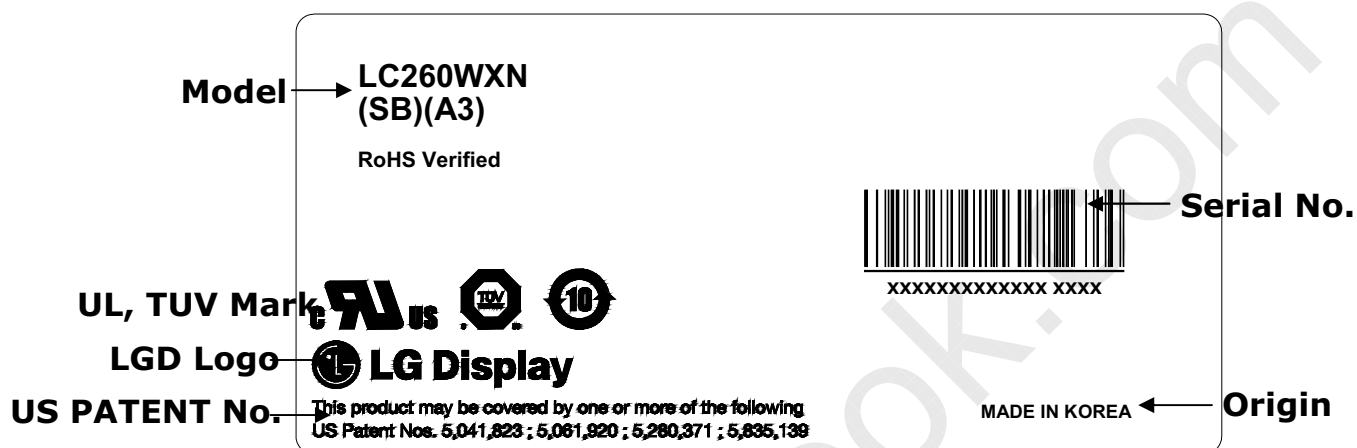
| NO. | DESCRIPTION   | MATERIAL     |
|-----|---------------|--------------|
| 9   | PACKING ASS'Y |              |
| 10  | PALLET        | Plywood      |
| 11  | ANGLE, COVER  | PAPER (SWR4) |
| 12  | LABEL         | PAPER        |
| 13  | BAND          | PP           |
| 14  | CLIP, BAND    | STEEL        |
| 15  | Wrap          | LLDPE        |

LC260WXN

## Product Specification

## # APPENDIX- III

## ■ LCM Label




LC260WXN


## Product Specification

## # APPENDIX- IV

## ■ Box Label

## ■ Pallet Label

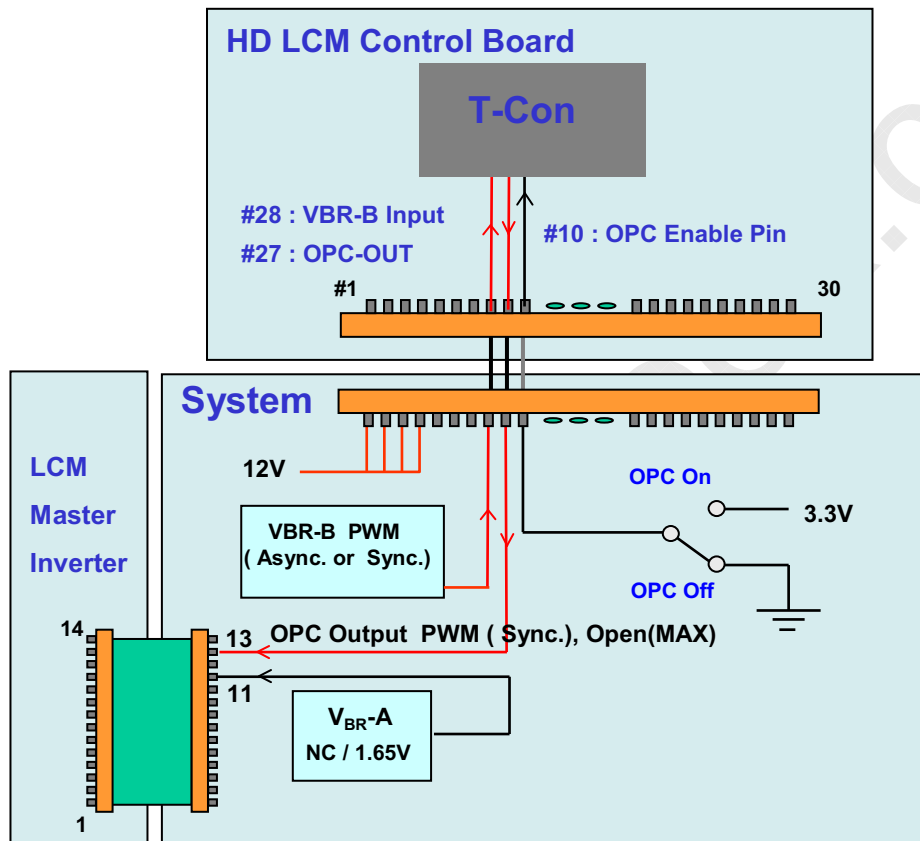
|   |               |  |
|---|---------------|--|
| LC260WXN  |               |  |
| SBA3  |               |  |
| 5 pcs   | 001/01-01     |  |
| MADE IN KOREA   | RoHS Verified |  |
|  |               |  |

|  |               |  |
|--|---------------|--|
| LC260WXN   |               |  |
| SBA3   |               |  |
| 30 PCS   | 001/01-01     |  |
| MADE IN KOREA  | RoHS Verified |  |
| <br>***** ** |               |  |

## # APPENDIX- V

**Inverter 13<sup>th</sup> Pin (EXTVBR-B) Design Guide**

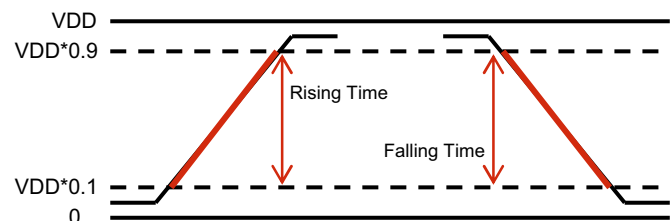
- ◇ When OPC Enable is "L", OPC Output = System Dimming.
- OPC Output( PWM Signal) is synchronized with V-Sync Freq. of System in T-Con Board.
- ◇ Regardless of OPC, System should always give dimming Signal (EXTVBR-B) to T-con.



## ◇ PWM Specification ( VDD = 3.3V ) @ OPC

1. PWM High Voltage Range : 2.5V~3.6V
2. PWM Low Voltage Range : 0.0V~0.8V

|                 |                                       |
|-----------------|---------------------------------------|
| Input Frequency | MAX 1Khz<br>(Recommendation:50~300Hz) |
| Rising Time     | MAX 10.0 $\mu$ s                      |
| Falling Time    | MAX 10.0 $\mu$ s                      |





## Product Specification

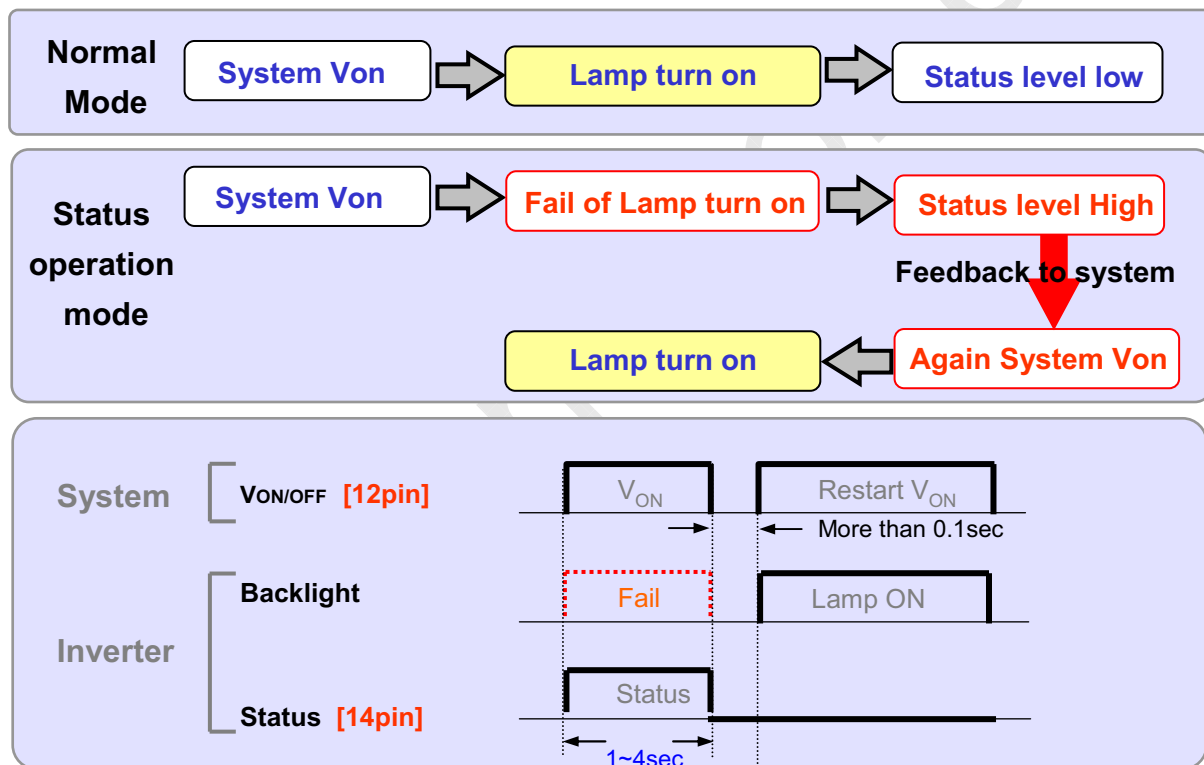
## # APPENDIX- VI

Inverter 14<sup>th</sup> Pin (Status) Design Guide

## □ Function of Status pin

- Purpose : Preventing of backlight off by restarting the inverter technically
- How to : When inverter is abnormal operation, TV system inputs the Von signal in the inverter once more to turn on the lamp safely
- Attention : Restart system's Von signal when status pin continue over 1~4sec high  
(The turn on time of lamp can be late such as the low temperature or the storage time)

## □ Status operation modes in TV set



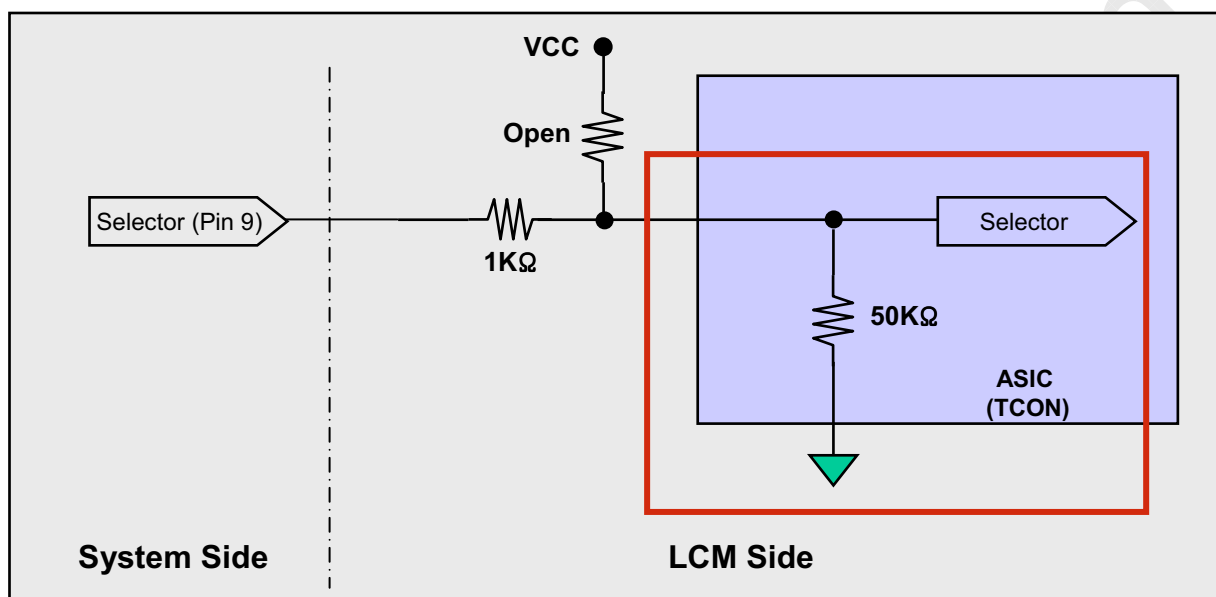
## □ Inverter pin map

| Pin No | Symbol   | Description  | Inv.            |
|--------|----------|--|-----------------|
| 11     | VBR-A    | Analog dimming voltage<br>DC 0.0V ~ 3.3V (Typ : 1.65V) | VBR-A           |
| 12     | VON/OFF  | 0.0V ~ 5.0V  | On/Off          |
| 13     | ExtVBR-B | Burst Dimming Control<br>PWM signal input              | External<br>PWM |
| 14     | Status   | Normal : Under 0.7V<br>Abnormal : Upper 3.0V           | status          |

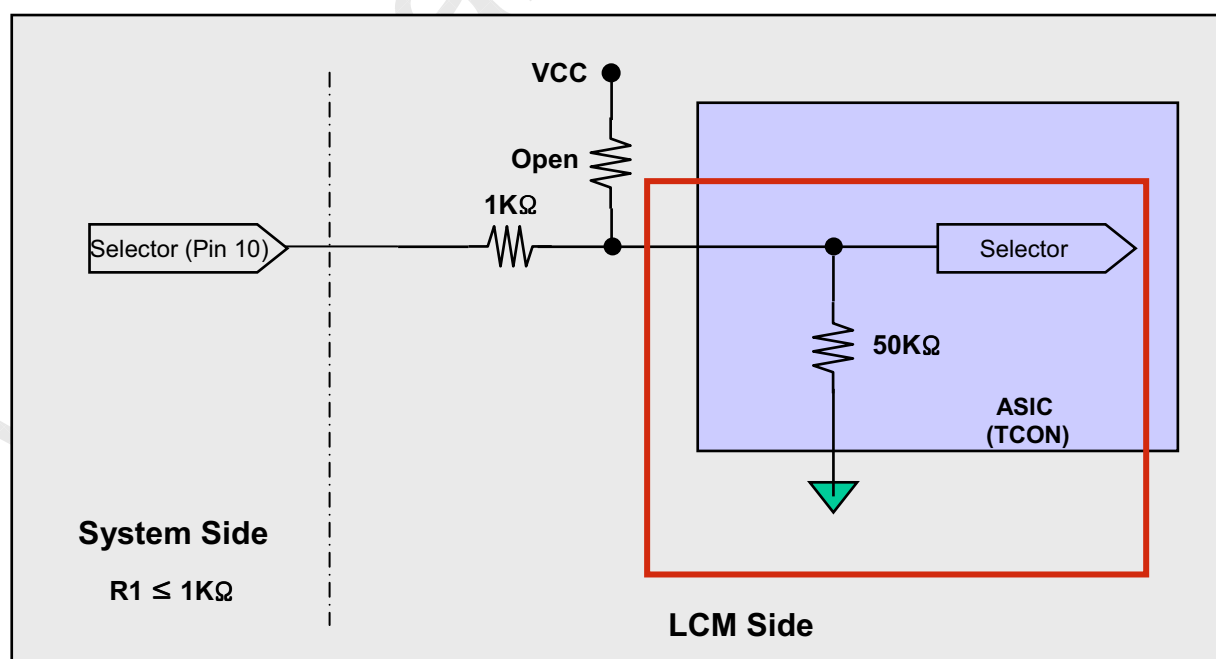
## # APPENDIX- VII

## Option Pin Circuit Block Diagram

## Circuit Block Diagram of LVDS Format Selection pin



## Circuit Block Diagram of OPC Enable pin

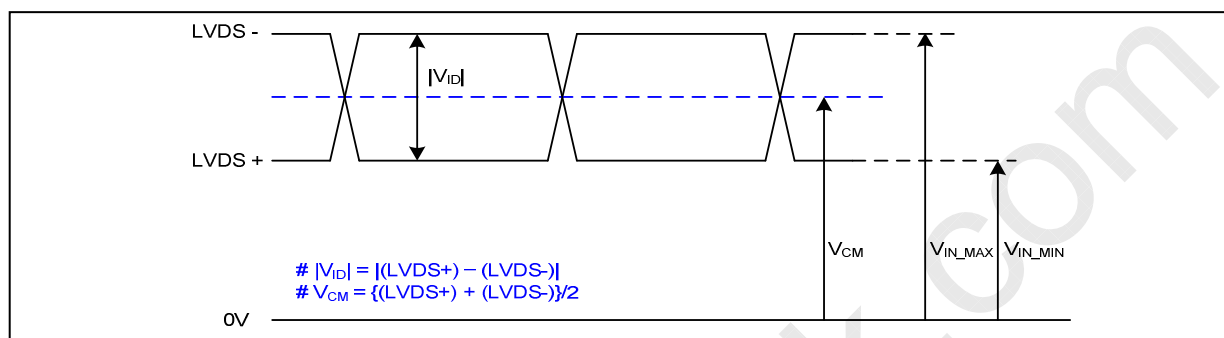


## Product Specification

## # APPENDIX- VIII

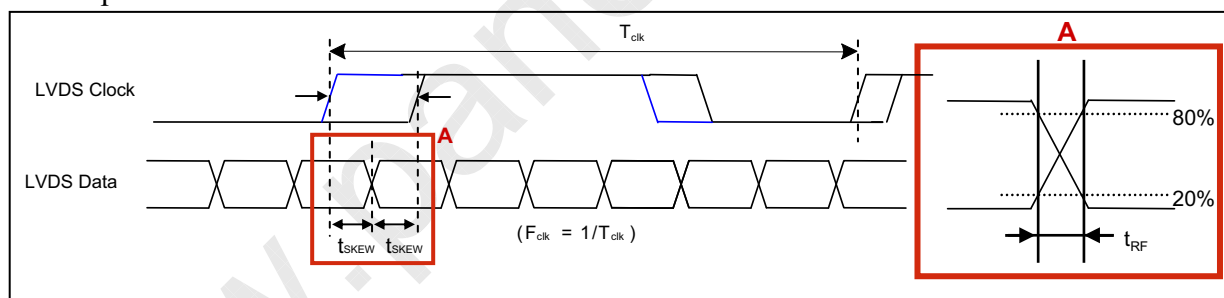
## LVDS Input characteristics

## 1. DC Specification



| Description                   | Symbol          | Min | Max | Unit | Notes |
|-------------------------------|-----------------|-----|-----|------|-------|
| LVDS Single end Voltage       | $ V_{ID} $      | 200 | 600 | mV   | -     |
| LVDS Common mode Voltage      | $V_{CM}$        | 1.0 | 1.5 | V    | -     |
| LVDS Input Voltage Range      | $V_{IN}$        | 0.7 | 1.8 | V    | -     |
| Change in common mode Voltage | $\Delta V_{CM}$ |     | 250 | mV   | -     |

## 2. AC Specification



| Description                         | Symbol     | Min       | Max                        | Unit | Notes |
|-------------------------------------|------------|-----------|----------------------------|------|-------|
| LVDS Clock to Data Skew Margin      | $t_{SKEW}$ |           | $ (0.25 \cdot T_{clk})/7 $ | ps   | -     |
| LVDS Clock/DATA Rising/Falling time | $t_{RF}$   | 260       | $(0.3 \cdot T_{clk})/7$    | ps   | 2     |
| Effective time of LVDS              | $t_{eff}$  | $\pm 360$ |                            | ps   | -     |

Notes : 1. All Input levels of LVDS signals are based on the EIA 644 Standard.

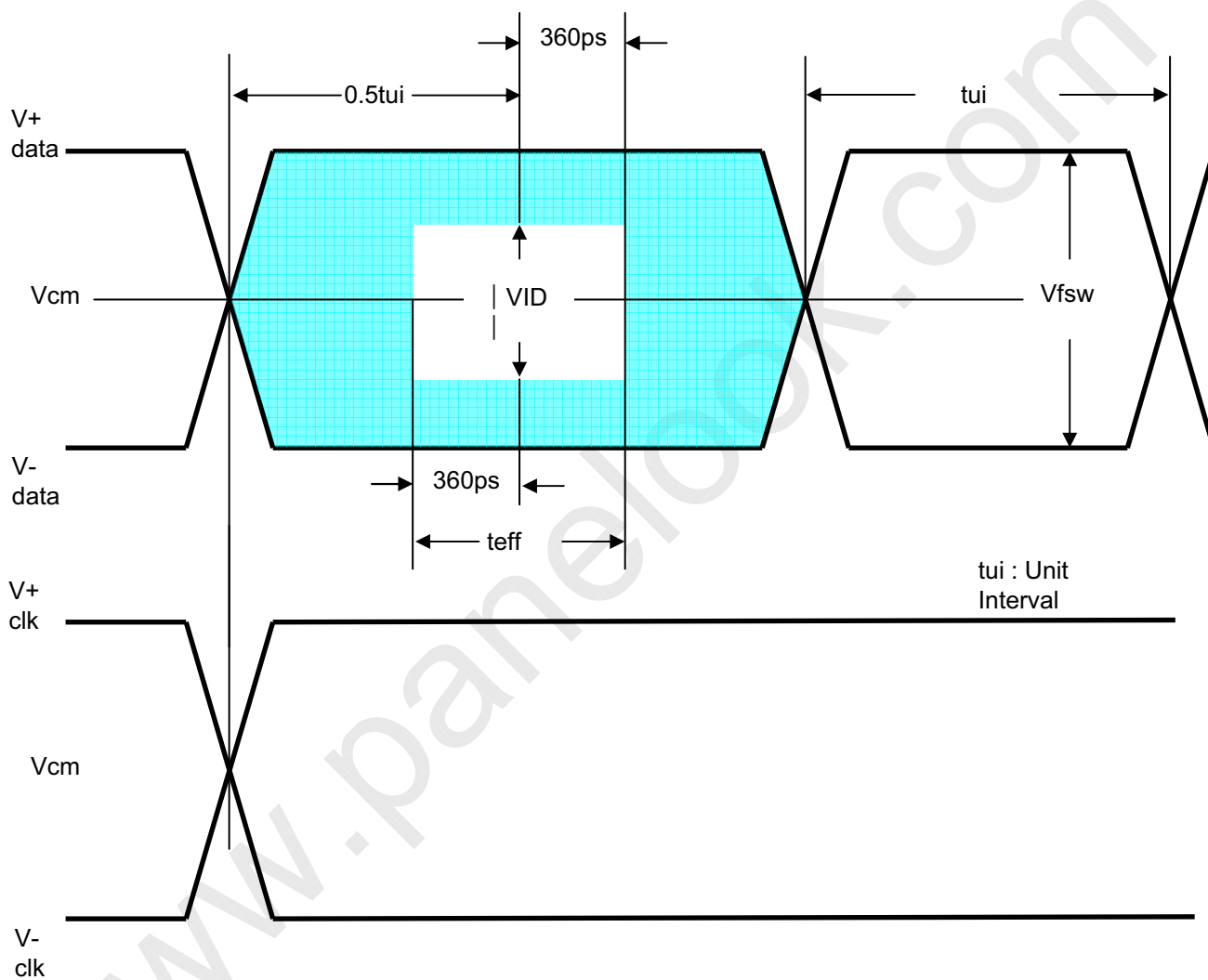
2. If  $t_{RF}$  isn't enough,  $t_{eff}$  should be meet the range.

LC260WXN

## Product Specification

## # APPENDIX- VIII

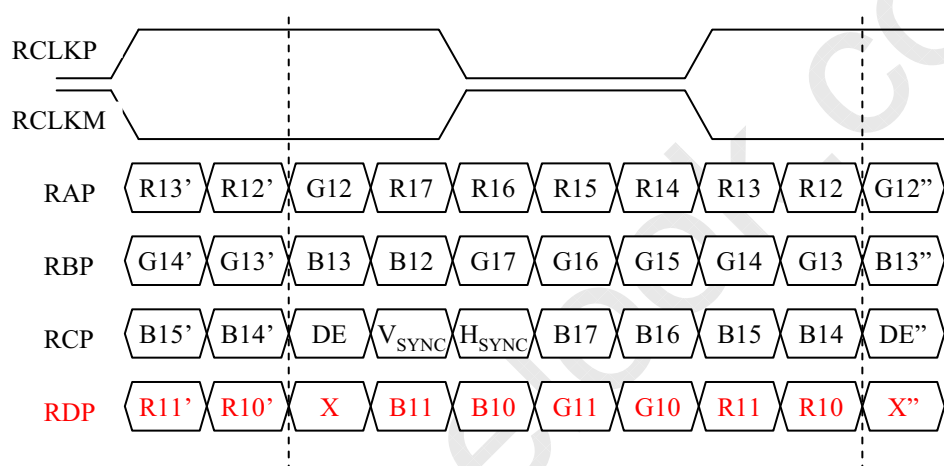
## LVDS Input characteristics



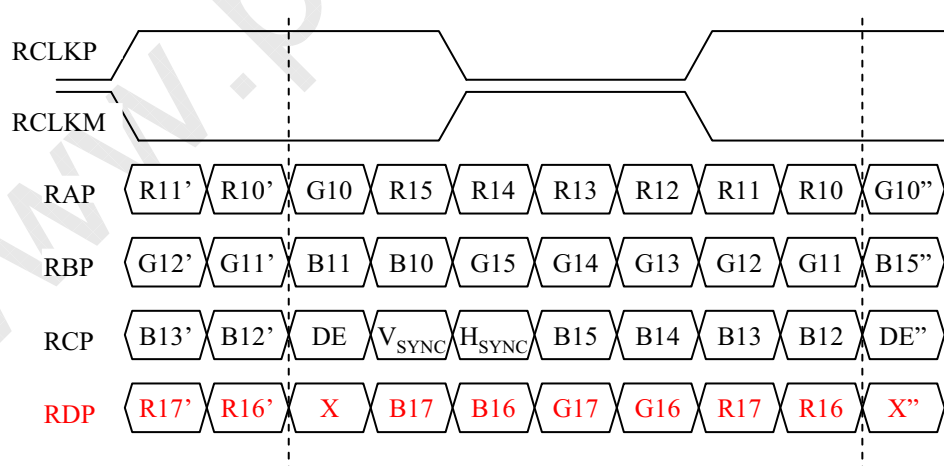
## # APPENDIX- IX

## LVDS Data-Mapping info. (8bit)

## ■ LVDS Select : "H" Data-Mapping (JEIDA format)



## ■ LVDS Select : "L" Data-Mapping (VESA format)



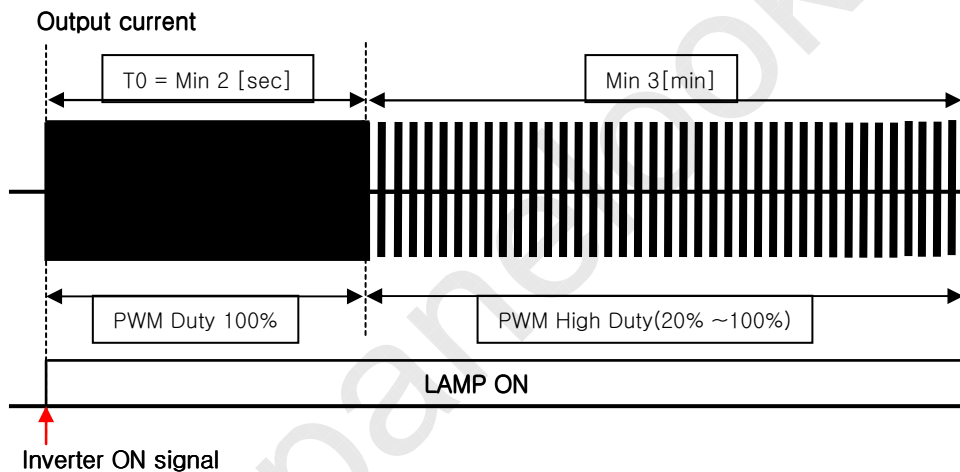
## # APPENDIX- X-1

## Mega DCR using condition(1)

- After Inverter ON signal, PWM Duty 100% should be sustained during 2sec.
- It is recommended not to sustain more than 10 min for Deep Dimming ( Low Duty of the inverter output current 0%~20%). (About the input PWM duty see the table 3 (min duty)).

The deep dimming must be used very carefully due to limitation of lamp characteristics and specification.

- 1) For stable lamp on, its duty condition should follow below the condition.  
After Inverter ON signal, T0 duration should be sustained.



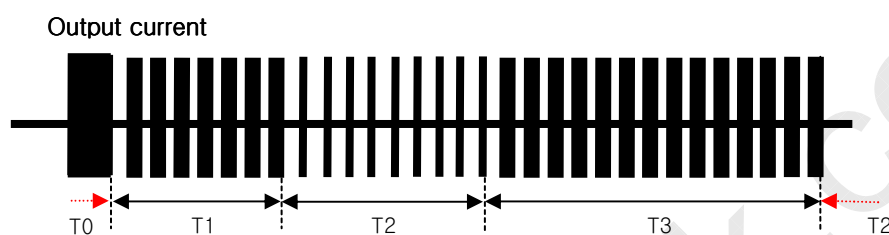
- 2) Low duty(0%~20%) of the inverter output current, B/L may not satisfy some of LCM specification.
  - Duration : the low duty operation(0 ~ 20%) must be limited within 10 minutes for one time operation.
  - Ratio : the period of the low duty operation must be less than 1/5 compare to that of the high duty operation(20~100%) in a certain period to prevent unwanted operation.
  - FOS : partial darkness or darkness of center area during the low duty might be happened due to insufficient lamp current.
  - Warm up : the low duty must be used 3 min after the lamps "ON". In case of low temperature, more warm up time may be needed.

LC260WXN

## Product Specification

## # APPENDIX- X-2

## Mega DCR using condition(2)



| Parameter | Value  |     |     | Unit | Note                   |
|-----------|--------|-----|-----|------|------------------------|
|           | Min    | Typ | Max |      |                        |
| T1        | 3      | -   | -   | min  | PWM High Duty[20~100%] |
| T2        | -      | -   | 10  | min  | PWM Low Duty[0~20%]    |
| T3        | T2 x 5 | -   | -   | min  | PWM High Duty[20~100%] |

- 3) The output current duty may not be same as input PWM duty due to rise/fall time of output.
- 4) Following the recommended conditions as aforementioned, there is no difference of lamp lifetime between conventional method and new one.

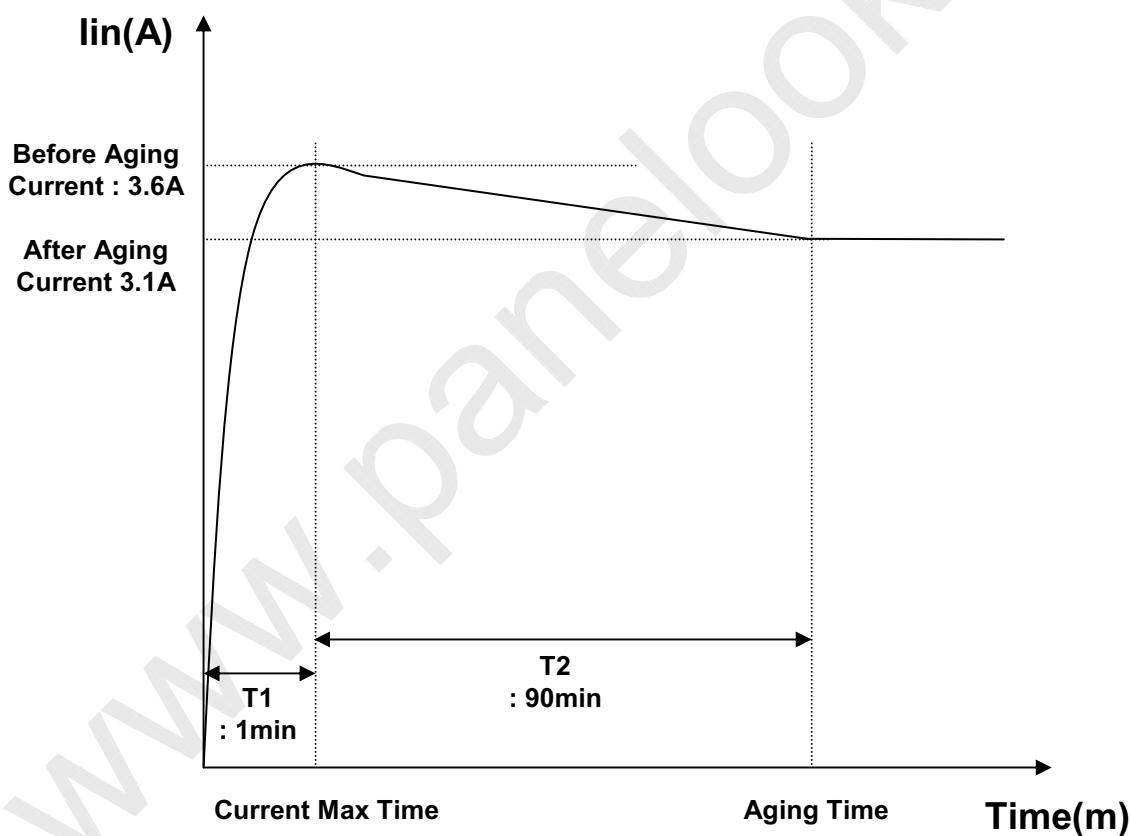
## Product Specification

## # APPENDIX- XI

## Inverter input current ( Design for power supply)

This is only the reference data of Inverter input current for LC260WXN-SBA1 model.

1. Model : LC260WXN-SBA1
2. Test condition :  $V_{in} = 24V$  ,  $V_{BR\_B} : 3.3V(100\%)$  ,  $V_{BR\_A} : 1.65V$  , At  $25^{\circ}C$
3. Equipment : Oscilloscope (Tektronix : TDS5054) ,  
AC/DC Current Probe(TCP312)



※ Initial Current Boost Function is not used at LC260WXN-SBA1



Product Specification

# APPENDIX- XII

## Gray to Gray Response Time Uniformity

This is only the reference data of G to G and uniformity for LC260WXN-SBA1 model.

1. G to G Response Time :

Response time is defined as Figure3 and shall be measured by switching the input signal for "Gray (N) " and "Gray(M)".(32Gray Step at 8bit)

2. G to G Uniformity

The variation of G to G Uniformity ,  $\delta_{G \text{ to } G}$  is defined as :

$$G \text{ to } G \text{ Uniformity} = \frac{\text{Maximum}(G \text{ to } G) - \text{Typical}(G \text{ to } G)}{\text{Typical}(G \text{ to } G)} \leq 1$$

\*Maximum (GtoG) means maximum value of measured time (N, M = 0 (Black) ~ 255(White), 32 gray step).

|         |             |              |              |     |               |               |
|---------|-------------|--------------|--------------|-----|---------------|---------------|
|         | 0Gray       | 32Gray       | 64Gray       | ... | 223Gray       | 255Gray       |
| 0Gray   |             | TrR:0G→32G   | TrR:0G→64G   | ... | TrR:0G→223G   | TrR:0G→255G   |
| 32Gray  | TrD:32G→0G  |              | TrR:32G→64G  | ... | TrR:32G→223G  | TrR:32G→255G  |
| 64Gray  | TrD:64G→0G  | TrD:64G→32G  |              | ... | TrR:64G→223G  | TrR:64G→255G  |
| ...     | ...         | ...          | ...          | ... | ...           | ...           |
| 223Gray | TrD:223G→0G | TrD:223G→32G | TrD:223G→64G | ... |               | TrR:223G→255G |
| 255Gray | TrD:255G→0G | TrD:255G→32G | TrD:255G→64G | ... | TrD:255G→223G |               |

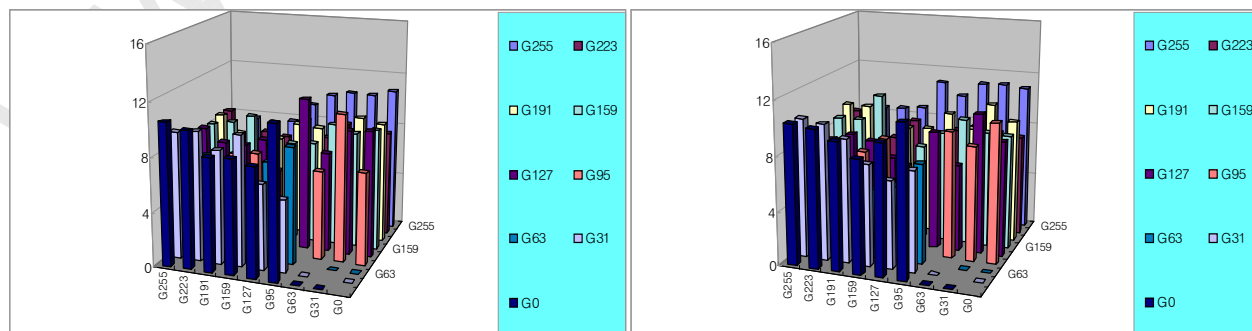
3. Sampling Size : 2 pcs

4. Measurement Method : Follow the same rule as optical characteristics measurement.

5. Current Status

Below table is actual data of production on 11. 27, 2008 ( LGD RV Event Sample)

|     | G to G Response Time [ms] |       | Uniformity |
|-----|---------------------------|-------|------------|
|     | Min.                      | Max.  |            |
| # 1 | 5.16                      | 11.19 | 0.35       |
| # 2 | 5.44                      | 11.25 | 0.32       |



< # 1 >

< # 2 >

LC260WXN

## Product Specification

## # APPENDIX- XIII

## Humming Noise Level

These are measurement method and condition of Humming Noise Level for LC260WXN-SBA1 model of RV sample conditions

|                     |       |                      |
|---------------------|-------|----------------------|
| Type of room        |       | Anechoic             |
| Distance to display |       | 0.5m (Typical)       |
| Measurement Point   |       | @ LCM Center         |
| Humming Noise Level | Front | Typ 19dBA, Max 20dBA |
|                     | Rear  | Max 25dBA            |