**TD141THCA1**

*Tentative*                                                    Ver.: 0.00

# TFT LCD Specification

# Model Name: TD141THCA1

| Customer Signature |
| --- |
|  |
| Date |
|  |

This technical specification is subjected to change without notice

TD141THCA1

## Table of Contents

## Record of Revision

| Rev | Issued Date | Description |
|---|---|---|
| 0.00 | Oct. 26, 2005 | New Create |
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# TD141THCA1

## 1. FEATURES

This module is a color active matrix LCD module that uses LTPS (Low Temperature Poly Silicon) TFT (Thin Film Transistor). This module is composed of a color TFT-LCD panel, a driver circuit and a backlight unit. The resolution of a 14.1" contains 1280 x 800 pixels and can display up to 262,144 colors.

(1) 14.1" WXGA (1280 x 800 pixels) display size for notebook PC

(2) LTPS TFT technology

(3) High contrast ratio, high aperture ratio and high-brightness

(4) LVDS interface system

(5) Onboard EDID chip

(6) Low power consumption.

(7) Thin and light weight

(8) RoHS compliant

## 2. GENERAL SPECIFICATIONS

| Item | Description | Unit |
|---|---|---|
| Display Size | 14.1" Diagonal | inch |
| Aspect Ratio | 16 : 10 | |
| Active Area | 303.4 (H) x 189.6 (V) | mm |
| Number of Dots | 1280 (H) x RGB x 800 (V) | dot |
| Pixel Pitch | 0.237 (H) x 0.237 (V) | mm |
| Color Arrangement | R, G, B Vertical Stripe | |
| Outline Dimension (typ.) | 319.5 (H) x 205.5 (V) x 5.1 (T) | mm |
| Weight (typ.) | 415 | g |
| Display Mode | Normally White | |
| Surface Treatment | Glare + 3H Hard coating | |

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## 3. INPUT/OUTPUT TERMINALS

### 3.1 TFT LCD Panel

| Recommend Connector Type | JAE FI-XB30S-HF10 or Compatible |
|---|---|
| Matching Connector Type | FPC : FI-X30M  or  Compatible |
| | WIRE : FI-X30H  or  Compatible |

| Pin No | Symbol | Function | Polarity | Remark |
|---|---|---|---|---|
| 1 | VSS | Ground | | |
| 2 | VDD | Power supply +3.3 v | | |
| 3 | VDD | Power supply +3.3 v | | |
| 4 | $V_{EDID}$ | DDC 3.3V power | | |
| 5 | NC | Reserved for supplier test point | | |
| 6 | $Clk_{EDID}$ | DDC Clock | | |
| 7 | $DATA_{EDID}$ | DDC Data | | |
| 8 | Rin0- | -LVDS differential data input (R0~R5, G0) | Negative | 1CH |
| 9 | Rin0+ | +LVDS differential data input (R0~R5, G0) | Positive | |
| 10 | VSS | Ground | | |
| 11 | Rin1- | -LVDS differential data input (G1~G5, B0~B1) | Negative | 1CH |
| 12 | Rin1+ | +LVDS differential data input (G1~G5, B0~B1) | Positive | |
| 13 | VSS | Ground | | |
| 14 | Rin2- | -LVDS differential data input (B2~B5, DE, Hsync, Vsync) | Negative | 1CH |
| 15 | Rin2+ | +LVDS differential data input (B2~B5, DE, Hsync, Vsync) | Positive | |
| 16 | VSS | Ground | | |
| 17 | Clk IN- | -LVDS differential clock input (Clock input) | Negative | 1CH |
| 18 | Clk IN+ | +LVDS differential clock input (Clock input) | Positive | |
| 19 | VSS | Ground | | |
| 20 | | No connect | | |
| 21 | | No connect | | |
| 22 | VSS | Ground | | |
| 23 | N.C | No connect | | |
| 24 | N.C | No connect | | |
| 25 | VSS | Ground | | |
| 26 | N.C | No connect | | |
| 27 | N.C | No connect | | |
| 28 | VSS | Ground | | |
| 29 | N.C | No connect | | |
| 30 | N.C | No connect | | |

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### 3.2 Light Source

Light Source Type: CCFL Back Light

Recommend Connector Type：JST BHSR – 02VS - 1

| Pin NO. | Symbol | Color | Function |
|---------|--------|-------|----------|
| 1 | $V_H$ | Pink | High Voltage |
| 2 | $V_L$ | White | Low Voltage |

## 4. ABSOLUTE MAXIMUM RATINGS

GND =0V

| Item | Symbol | MIN | MAX | Unit | Remark |
|------|--------|-----|-----|------|--------|
| Power Supply Voltage | Vcc | Vss-0.3 | 4.0 | V | |
| Logic Input Voltage | Vin | Vss-0.3 | （Vss+0.3） | V | |
| Lamp Current | $I_L$ | 2.0 | 7.0 | mA rms | |
| Lamp Frequency | $F_L$ | 50 | 80 | KHz | |
| Operating Temperature | Topr | 0 | +50 | ℃ | |
| Storage Temperature | Tstg | -25 | +60 | ℃ | |
| Storage Humidity | Hstg | 10 | 90 | %RH | Note 4-1 |

Note 4-1: Maximum wet – bulb temperature at 39℃ or less.（Ta＞40℃）No condensation

## 5. ELECTRICAL CHARACTERISTICS
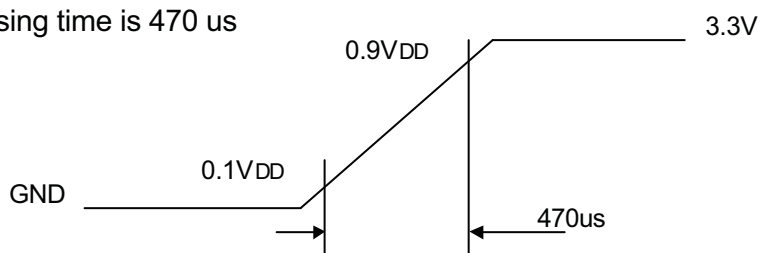
### 5.1 TFT LCD Module

Ta=25℃

| Item | | Symbol | MIN | TYP | MAX | Unit | Remark |
|------|--|--------|-----|-----|-----|------|--------|
| Voltage of power supply | | $V_{DD}$ | 3.0 | 3.3 | 3.6 | V | |
| Differential Input Threshold Voltage | $V_{HIH}$ | $V_{HIH}$ | -- | -- | 100 | mV | $V_{CM}$ = +1.2V |
| | $V_{HIL}$ | $V_{HIL}$ | -100 | -- | -- | mV | |
| Rush Current | $I_{RUSH}$ | $I_{RUSH}$ | -- | -- | 1.5 | A | Note 5.1 |
| Vsync Frequency | | $f_V$ | 40 | 60 | -- | Hz | |
| Hsync Frequency | | $f_H$ | 31.9 | 47.8 | -- | KHz | |
| Main Frequency | | $f_{DCLK}$ | 68 | 71 | 85 | MHz | |
| Current of Power Supply | White | | -- | 280 | -- | mA | Note 5.2 |
| | Mosaic | | -- | 335 | -- | mA | Note 5.2 |
| | Black | | -- | 397 | -- | mA | Note 5.2 |

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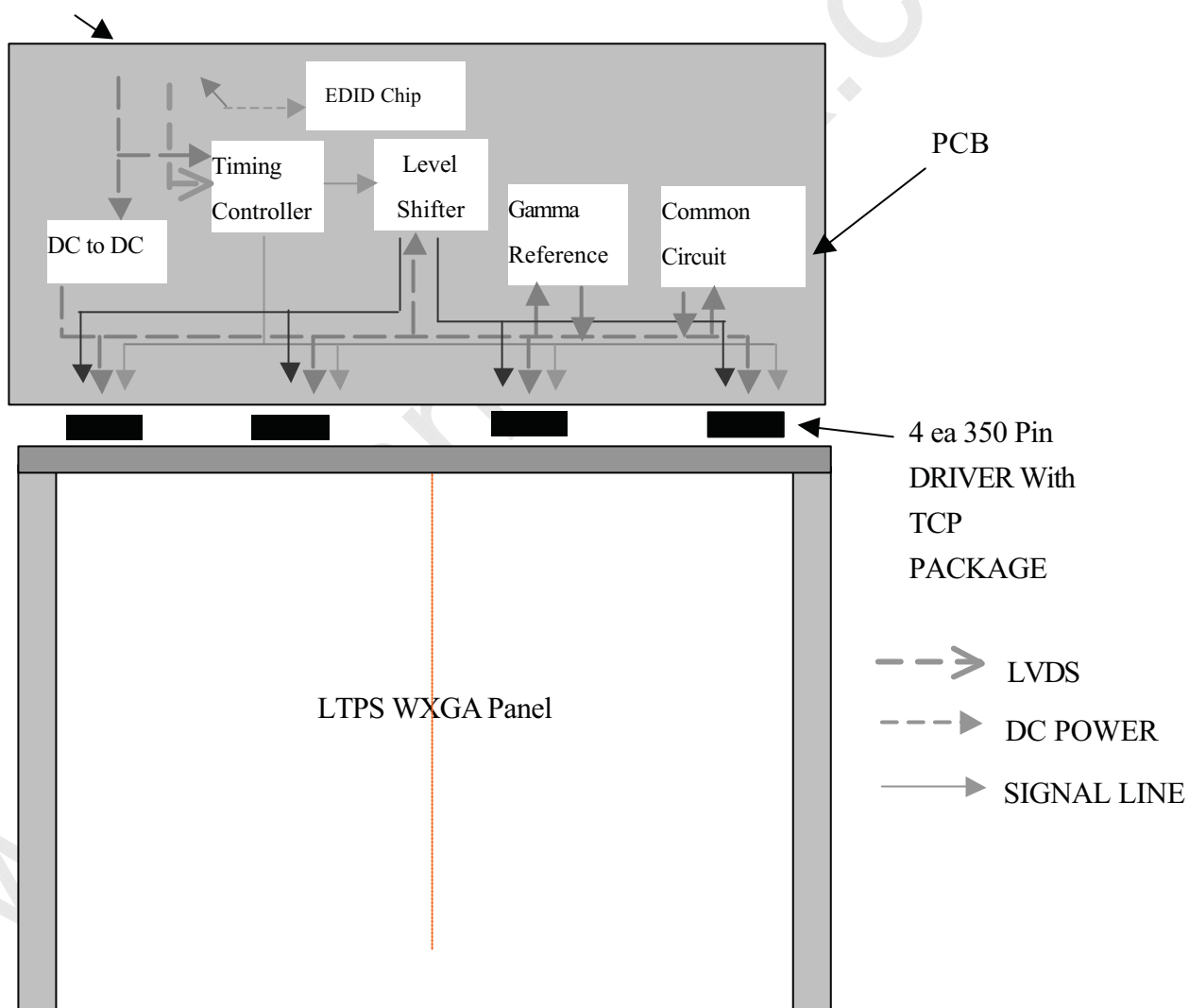
Note 5-1: Refer to the following power-on condition

VDD rising time is 470 us



Note 5-2: Power are measure as following test condition: $f_V$ =60 Hz, $f_{DCLK}$ =71 MHz, $V_{DD}$ =3.3V, DC Current

Driving TFT LCD Module Block Diagram

1-CH LVDS INTERFACE

### 5.2 Driving Backlight

The backlight system is an edge – lighting type with a single CCFL (Cold Cathode Fluorescent Tube)

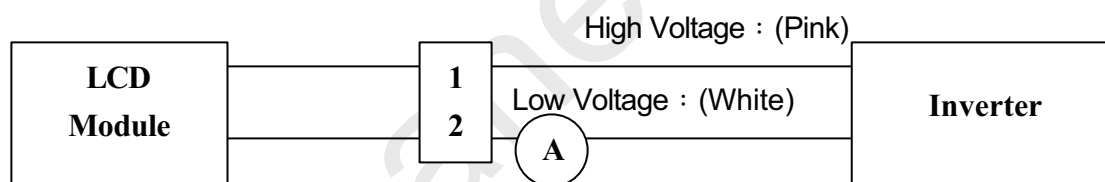The characteristics of a single lamp are shown in the following tables.

Ta=25℃

| Item | Symbol | MIN | TYP | MAX | Unit | Remark |
|---|---|---|---|---|---|---|
| Lamp Current | $I_L$ | 3.0 | 6.0 | 6.5 | mArms | Note 5-1 |
| Lamp Voltage | $V_L$ | 576 | 680 | 704 | Vrms | $I_L = 6mA$ |
| Power Consumption | $P_L$ | -- | 4.08 | -- | W | Note 5-2 |
| Frequency | $F_L$ | 50 | 60 | 80 | kHz | Note 5-3 |
| Operating Life time | Hr | 15,000 | -- | -- | Hour | Note 5-4 |
| Lamp starting voltage | Vs | -- | -- | 1160（25℃）<br>1450（0℃） | Vrms | Note 5-5 |

Note) The performance of backlight, for example life time or brightness are deep influence by the characteristic of the inverter. So all the parameters of inverter should be designed carefully. And should not to produce too much leakage current from high-voltage output of the inverter.

The Inverter should be designed with the characteristic of lamp. Please make sure that a poor lighting cause by the mismatch of the backlight and inverter never occur.

Note 5-1: Lamp current is measured with a high frequency current meter as show below.

```
┌──────────┐          ┌──┐   High Voltage：(Pink)    ┌──────────┐
│   LCD    │──────────│1 │                            │          │
│  Module  │          │2 │   Low Voltage：(White)     │ Inverter │
│          │──────────│(A)│───────────────────────────│          │
└──────────┘          └──┘                            └──────────┘
```

Switching Frequency：(50~80)KHz

Note 5-2: $W = I_L (TYP) \times V_L(TYP)$

Note 5-3: Lamp frequency may produce interference with horizontal synchronous frequency and this may cause line flow on the display. Therefore lamp frequency shall be detached from the horizontal synchronous frequency and its harmonics as far as possible in order to avoid interference.

Note 5-4: Operating Life time is defined as lamp which are continue to operate under the condition Ta=25℃ and $I_L = 6mArms$ until the brightness is decreased to the 50% or lower than the initial brightness.
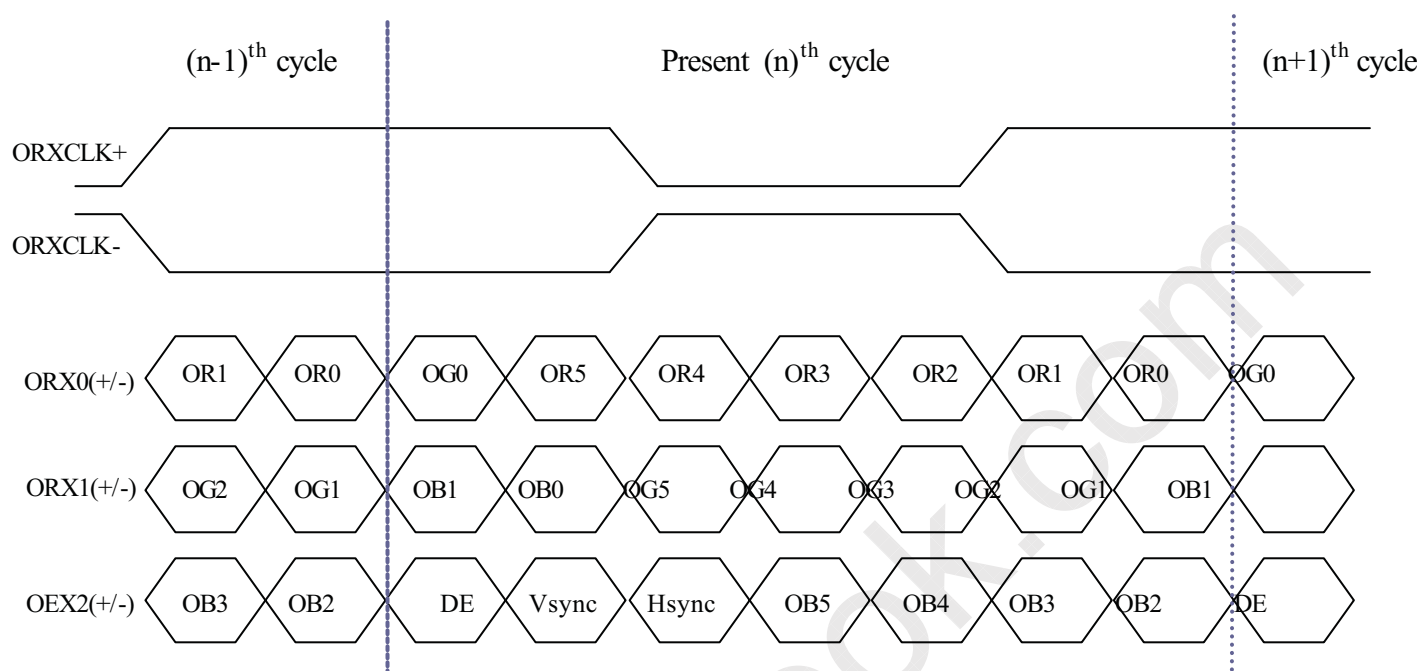
Note 5-5: Above this value should be applied to the lamp for more than 1 second to startup, otherwise the lamp may not be turned on.
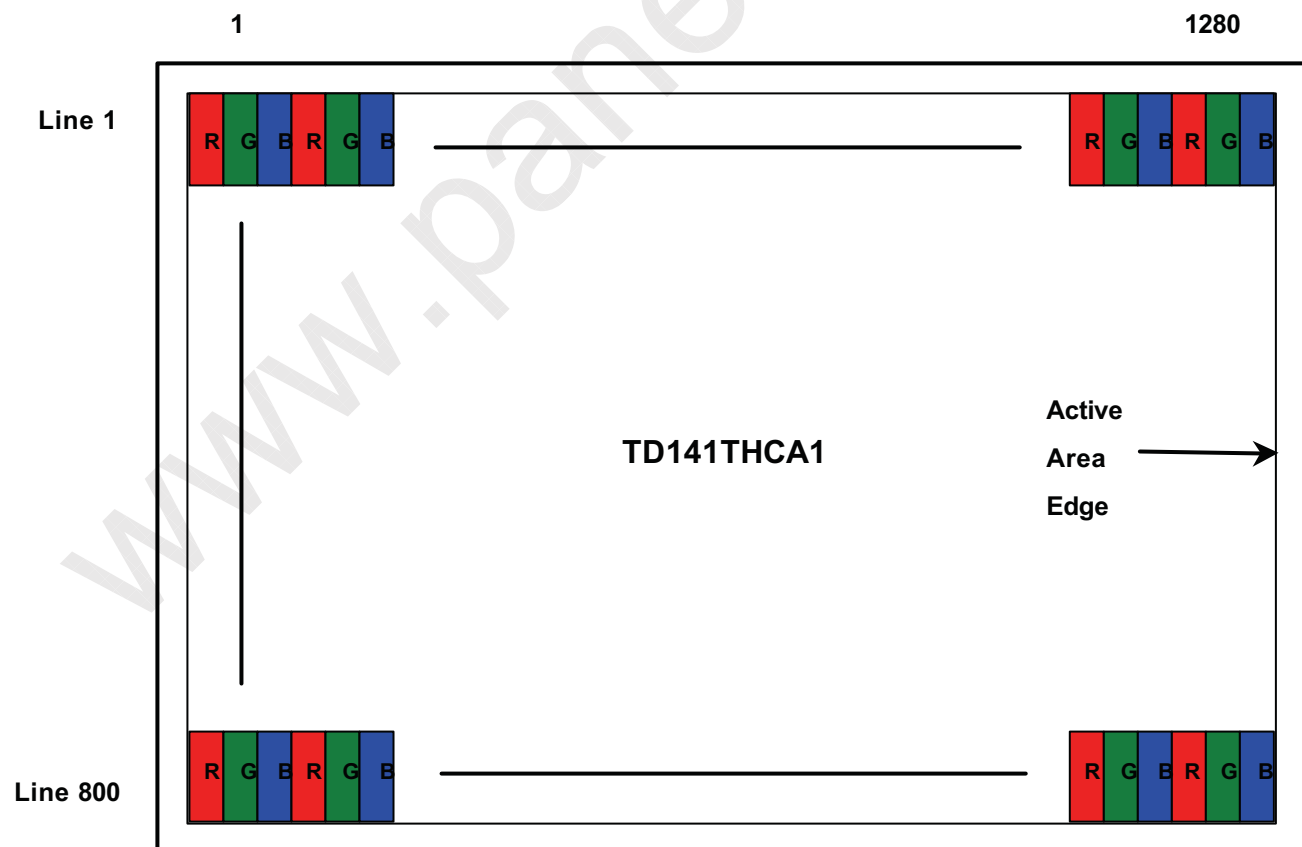
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## 6. TIMING CHART

### 6.1 1CH LVDS Channel Interface Data Mapping Diagram



Note1: R/G/B [5] are the MSBs and R/G/B[0] are LSBs

### 6.2 Pixel Format in Display



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## 6.3 Input Signals, Basic Display Color and Gray Scale of Each Color

Input Signals, Basic Display Colors and Gray Scale of Each Color

| COLOR | DISPLAY | R0 | R1 | R2 | R3 | R4 | R5 | G0 | G1 | G2 | G3 | G4 | G5 | B0 | B1 | B2 | B3 | B4 | B5 | GRAY SCALE LEVEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLOR | BLACK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | BLUE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | GREEN | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | CYAN | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | RED | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - |
| | MAGENTA | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | YELLOW | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 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 | - |
| GRAY SCALE OF RED | BLACK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | R0 |
| | DARK ↑ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | R1 |
| | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | R2 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | R3~R60 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| | ↓ | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | R61 |
| | LIGHT | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | R62 |
| | RED | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | R63 |
| GRAY SCALE OF GREEN | BLACK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | G0 |
| | DARK ↑ | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | G1 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | G2 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | G3~G60 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| | ↓ | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | G61 |
| | LIGHT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | G62 |
| | GREEN | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | G63 |
| GRAY SCALE OF BLUE | BLACK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B0 |
| | DARK ↑ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | B1 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | B2 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | B3~B60 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | |
| | ↓ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | B61 |
| | LIGHT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | B62 |
| | BLUE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | B63 |

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## 6.4 Interface Timing

### a. Timing Parameters

| Signal | Item | Symbol | MIN | TYP | MAX | Unit | Note |
|--------|------|--------|-----|-----|-----|------|------|
| Frame Frequency | Cycle | $T_V$ | - | 823 | - | Lines | |
| Vertical Active Display Time | Display Period | $T_{VD}$ | - | 800 | - | Lines | |
| One Line Scanning Time | Cycle | $T_H$ | - | 1440 | - | Tc* | |
| Horizontal Active Display Time | Display Period | $T_{HD}$ | - | 1280 | - | Tc* | |

NOTE*: Tc = ain frequency's clocks.

### b. Timing Diagrams Of Interface Signal
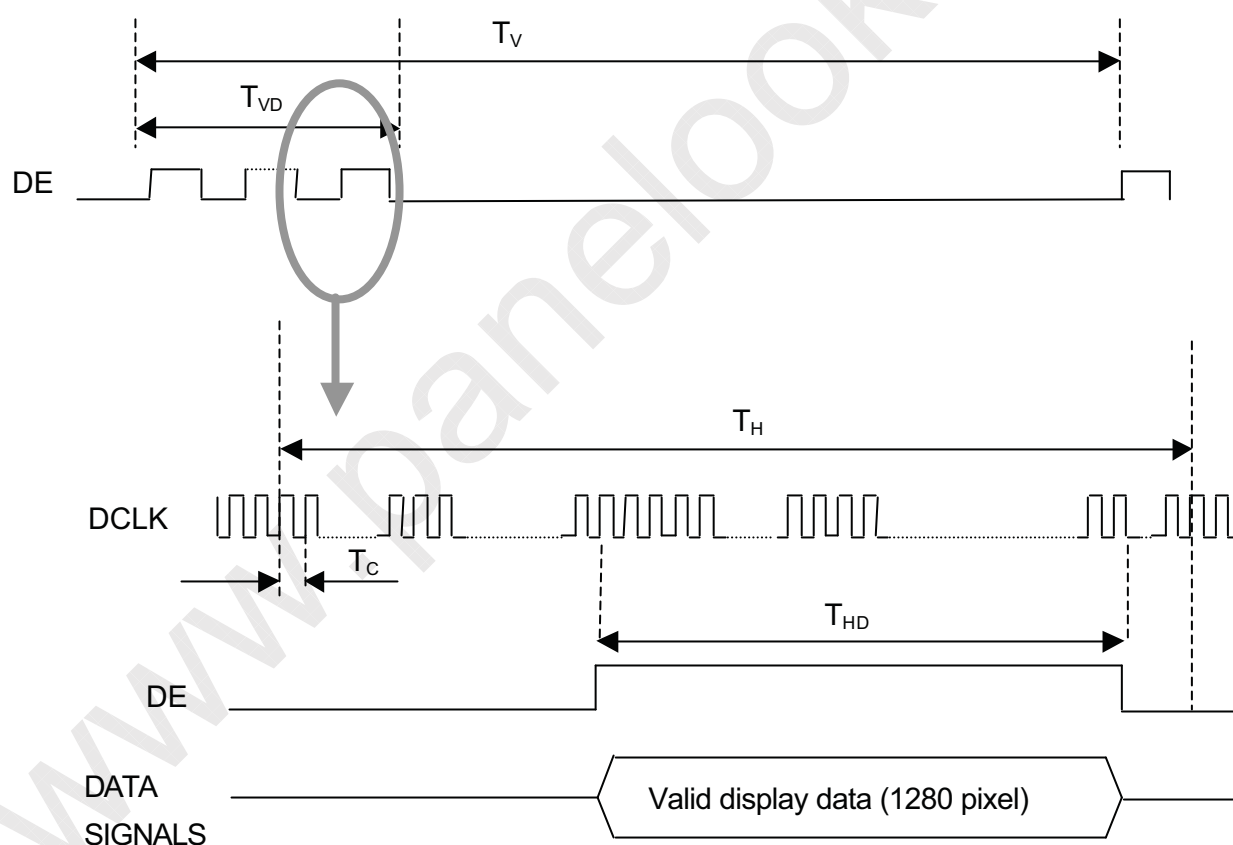
## 6.5 Power ON/OFF Sequence

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.
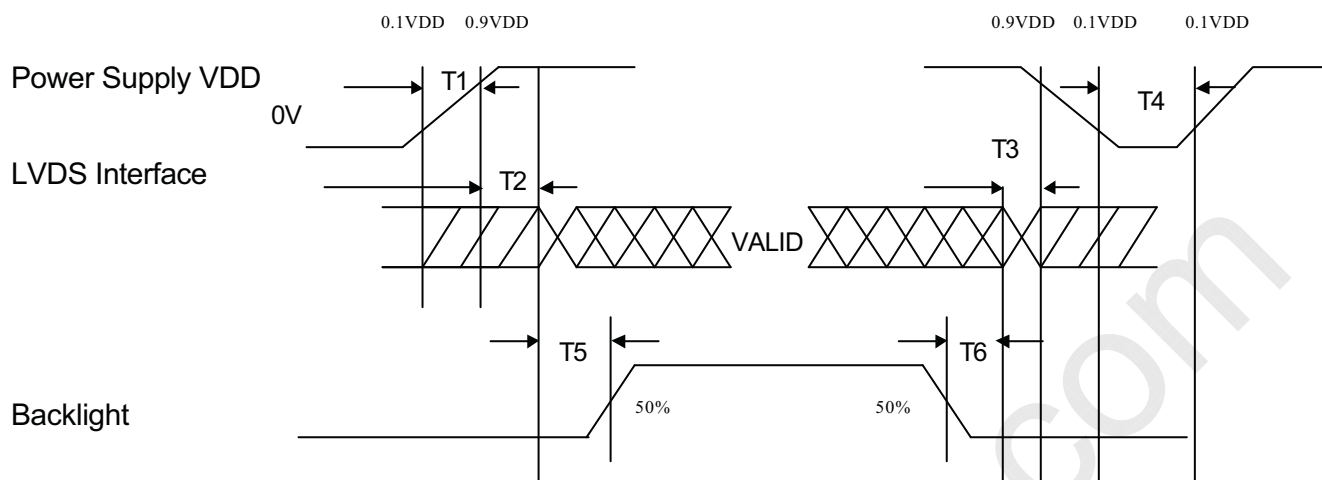


T1≦10ms　　0≦T2≦50ms　　0≦T3≦50ms　　400ms≦T4　　200ms≦T5　　200ms≦T6

T1: VDD rising time from 0.1 VDD to 0.9 VDD.

T2: The time from 0.9VDD to valid data at power ON.

T3: The time from 0.9VDD to valid data at power OFF.

T4: VDD off time for window restarts.

T5: The time from valid data to B/L enable at POWER ON.

T6: The time from valid data off to B/L disable at power OFF.

Apply the lamp voltage within the LCD operation range. When the backlight turns on before the LCD operation or the LCD turns off before the backlight turns off, the display maybe momentarily become white.

## 7. OPTICAL CHARACTERISTICS

### 7.1 Optical Specification

Ta=25℃

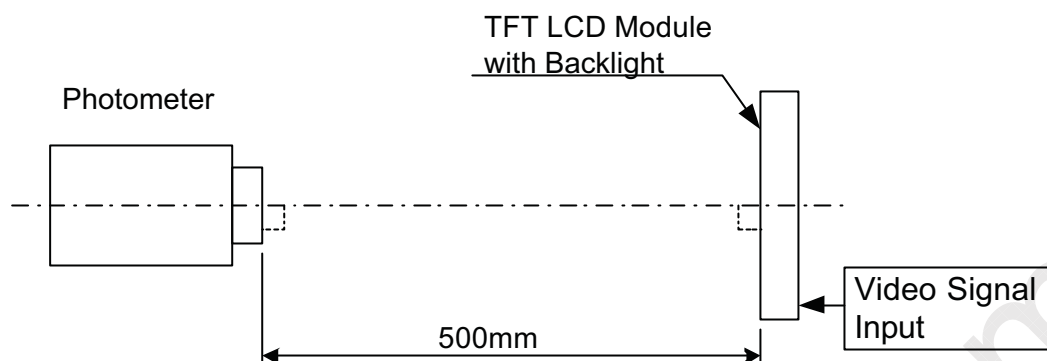| Item | | Symbol | Condition | MIN | TYP | MAX | Unit | Remarks |
|---|---|---|---|---|---|---|---|---|
| Viewing Angle | Hor. | $\Theta 11$ | CR≧10 （At center point） | 40 | 45 | - | degree | Note 7-1 |
| | | $\Theta 12$ | | 40 | 45 | - | | |
| | Ver. | $\Theta 21$ | | 15 | 20 | - | | |
| | | $\Theta 22$ | | 40 | 45 | - | | |
| Contrast ratio (5 Point） | | CR | $\Theta=0°$ $\Phi=0°$ Normal Viewing Angle | 300 | - | - | | Note 7-2 |
| Response time | Rising | Tr | | - | 8 | 10 | ms | Note 7-4 |
| | Falling | Tf | | - | 16 | 20 | | |
| Luminance of White (5 Point) | | $Y_L$ | | 150 | 185 | - | cd/m$^2$ | Note 7-5 |
| Color Chromaticity (CIE1931) | Red | $R_X$ | | 0.543 | 0.573 | 0.603 | | Note 7-6 |
| | | $R_Y$ | | 0.311 | 0.341 | 0.371 | | |
| | Green | $G_X$ | | 0.283 | 0.313 | 0.343 | | |
| | | $G_Y$ | | 0.524 | 0.554 | 0.584 | | |
| | Blue | $B_X$ | | 0.118 | 0.148 | 0.178 | | |
| | | $B_Y$ | | 0.09 | 0.120 | 0.150 | | |
| | White | $W_X$ | | 0.280 | 0.310 | 0.340 | | |
| | | $W_Y$ | | 0.300 | 0.330 | 0.360 | | |
| White Variation | | $\delta_{L5}$ | 5 Points | 0.8 | - | - | | Note 7-3 |
| | | $\delta_{L13}$ | 13 Points | 0.65 | - | - | | |

### 7.2 Basic measure condition

(1) Ambient temperature: Ta=25℃

(2) Vcc = 3.3V°

(3) Fv = 60Hz

(4) $f_{DCLK}$ = 108MHz(1CH) / 54MHz(2CH)

(5) $I_L$ = 6mA

(6) Inverter model: HIU-766 (62K)

　　Environmental illumination:≦1 lux
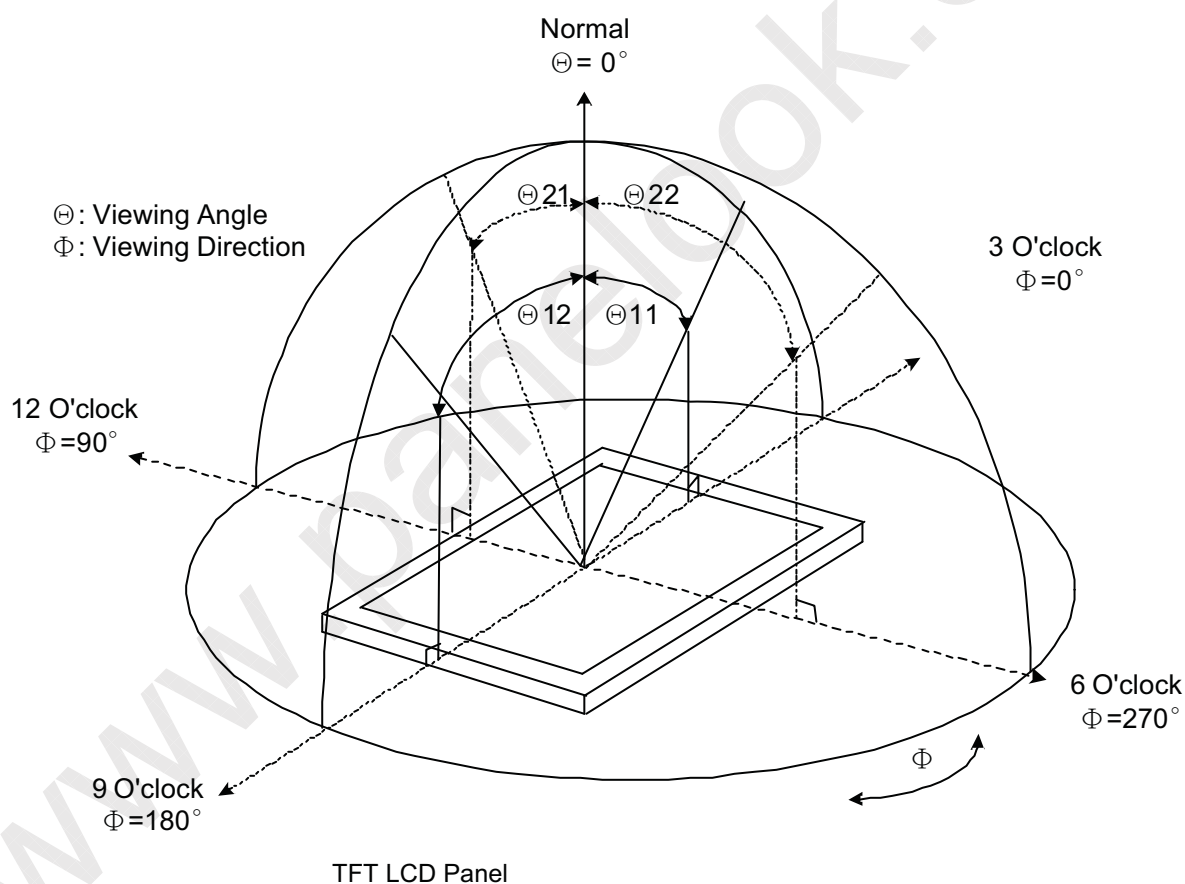
(7) Optical measuring equipment are TOPCON BM-5A

(8) Testing facility

Photometer

TFT LCD Module
with Backlight

Video Signal
Input

500mm

Note 7-1: Viewing angle diagrams:

Normal
$\Theta = 0°$

$\Theta 21$    $\Theta 22$

$\Theta$: Viewing Angle
$\Phi$: Viewing Direction

3 O'clock
$\Phi = 0°$

$\Theta 12$    $\Theta 11$

12 O'clock
$\Phi = 90°$

6 O'clock
$\Phi = 270°$

$\Phi$

9 O'clock
$\Phi = 180°$

TFT LCD Panel

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Note 7-2: Definition of Contrast ratio：Ratio of gray max (Gmax), gray min (Gmin) at 5 point

$$CR = \frac{CR(A) + CR(B) + CR(C) + CR(D) + CR(E)}{5}$$
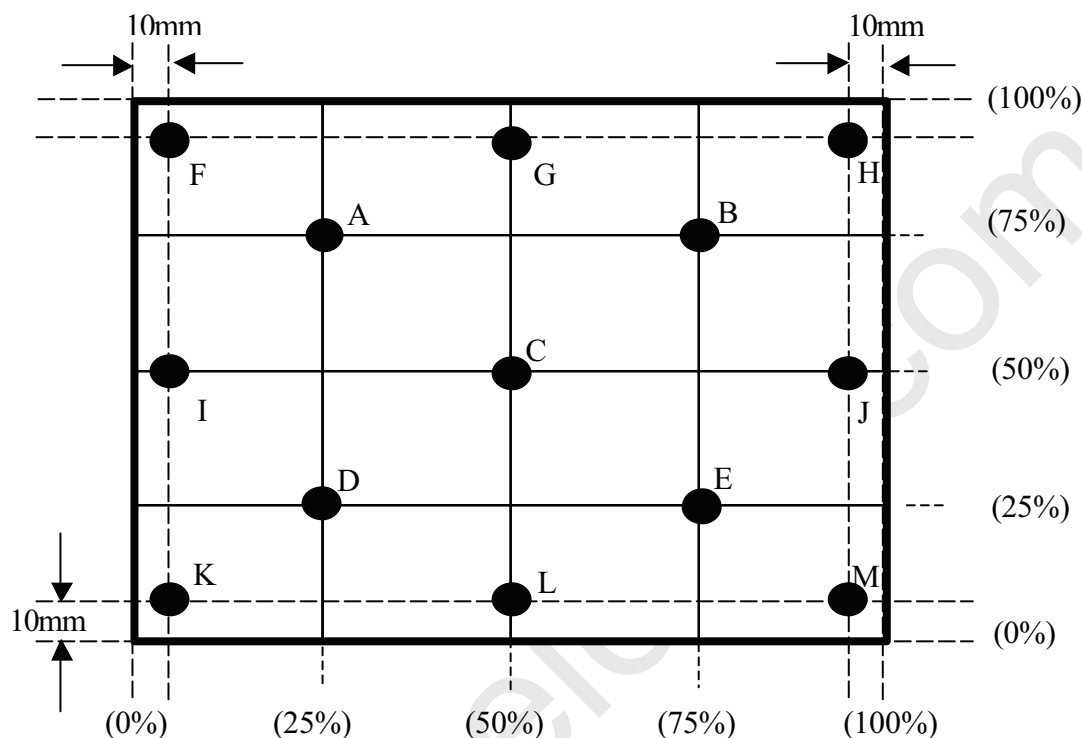
Note 7-3: Definition of uniformity;

(1)5 points, Test point (A,B,C,D,E) as Note 7-2

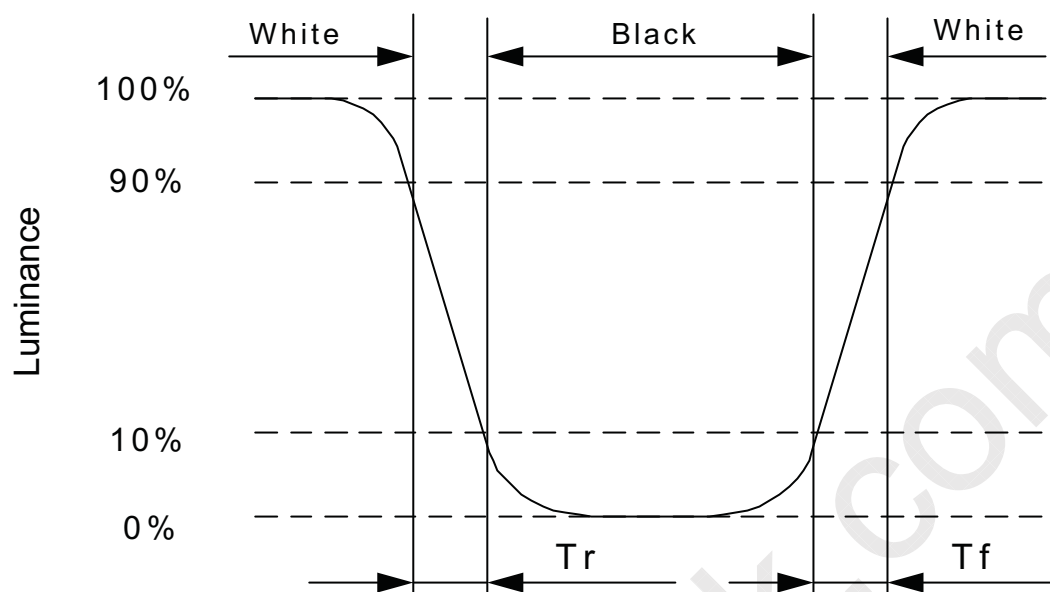$$\delta_{L5} = \frac{\text{Minimum Luminance of 5 point}}{\text{Maximum Luminance of 5 point}}$$

(2)13 points, Test point as Note 7-2

$$\delta_{L13} = \frac{\text{Minimum Luminance of 13 point}}{\text{Maximum Luminance of 13 point}}$$
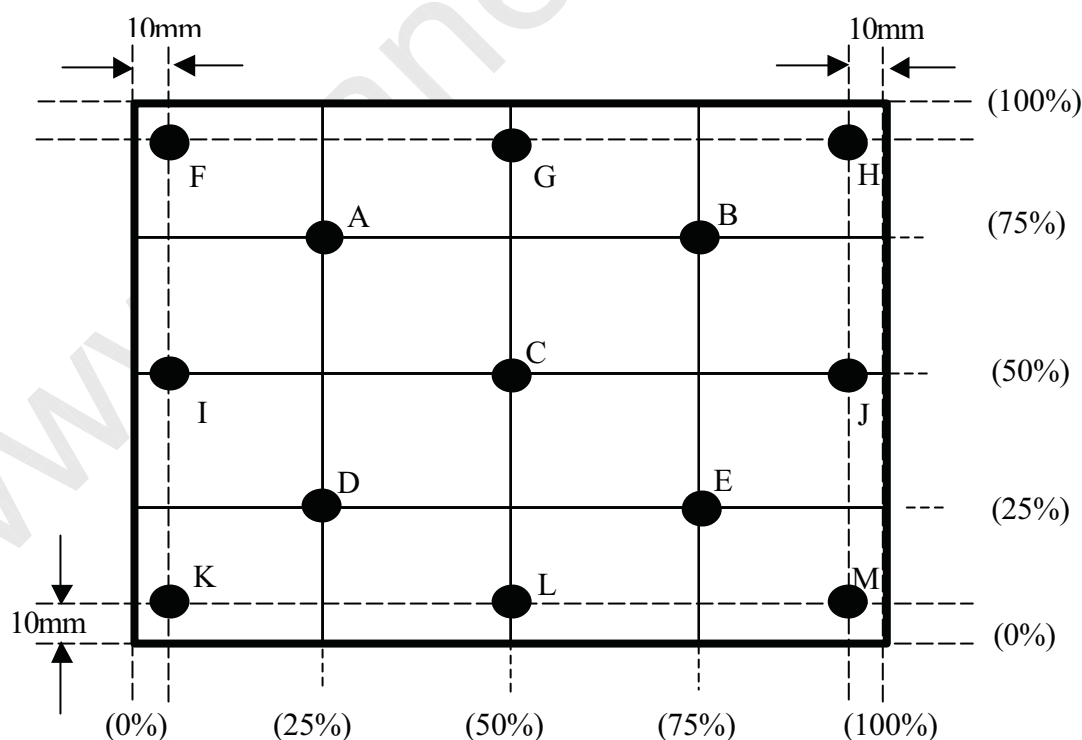
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Note 7-4: Definition of response time:



Note 7-5: Definition of Average Luminance of White：measure the luminance of white at 5 points.

Luminance of White (5 Point) $(Y_{L, AVE})$

$$Y_{L, AVE} = \frac{Y_A + Y_B + Y_C + Y_D + Y_E}{5}$$



Note 7-6: To be measured in dark room environment and after lighting the backlight for 30 minutes.

## 8. RELIABILITY

| No | Test Item | Condition |
|----|-----------|-----------|
| 1 | High Temperature Operation | Ta=+50℃, 240hrs |
| 2 | High Temperature & High Humidity Operation No Condensation | Ta=+40℃, 90% RH, 240hrs |
| 3 | Low Temperature Operation | Ta=0℃, 240hrs |
| 4 | High Temperature Storage | Ta=+60℃, 240hrs |
| 5 | Low Temperature Storage | Ta=-25℃, 240hrs |
| 6 | Shock (non-operation) | Half-sine wave 220 G, 2ms, ±X, ±Y, ±Z (Once for each direction) |
| 7 | Vibration (non-operation) | Frequency: 10~500~10Hz<br>1.5 x 9.8m/s$^2$ constant<br>Amplitude: 1.5mm; Sweep Time: 15min<br>Test Time: 1.0 hr for each direction of X, Y, Z |

Ta: Ambient Temperature

Note 8.1: Evaluation should be tested after one hour of room temperature storage.

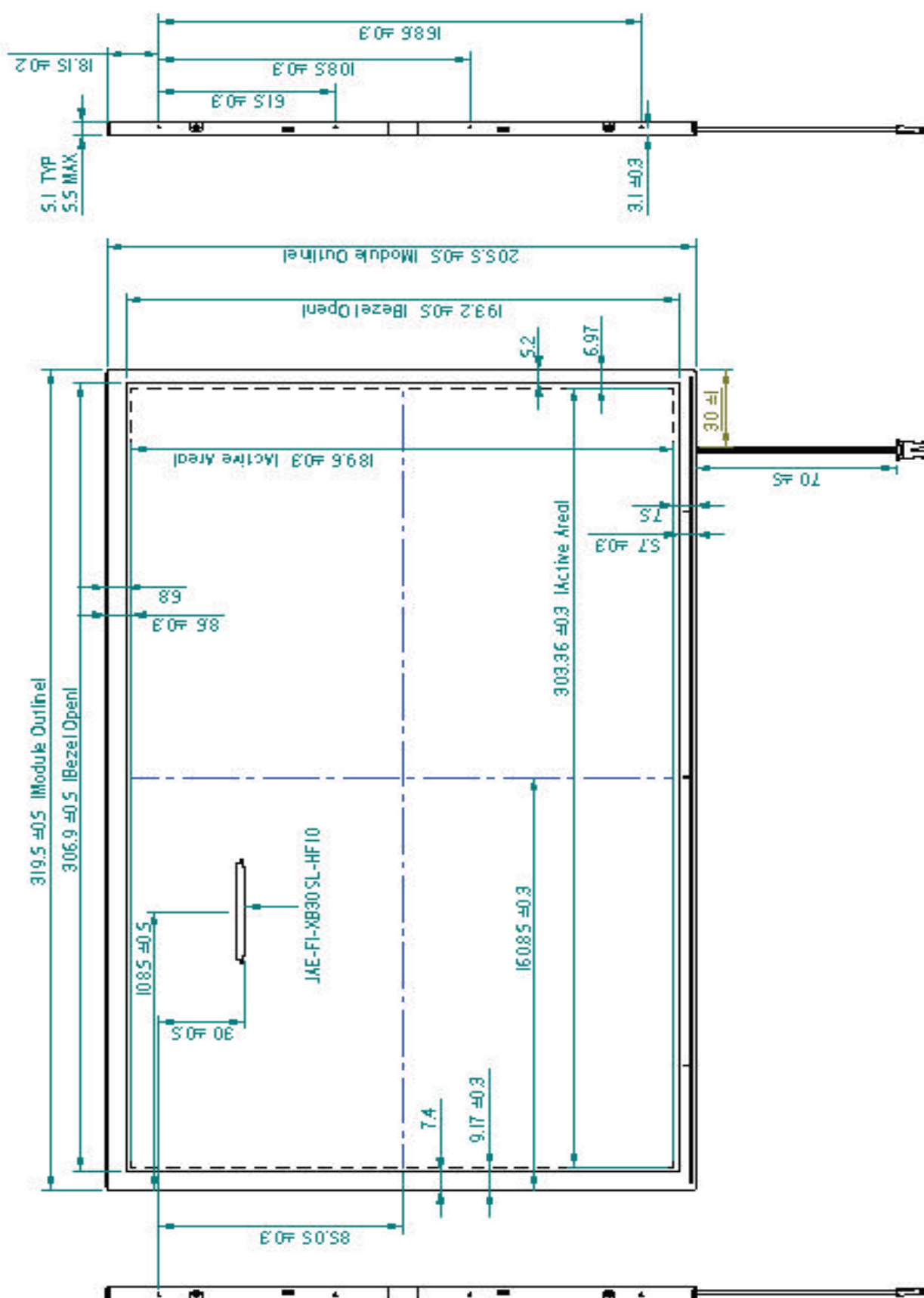Note 8.2: Temperature and relative humidity range is shown as below.

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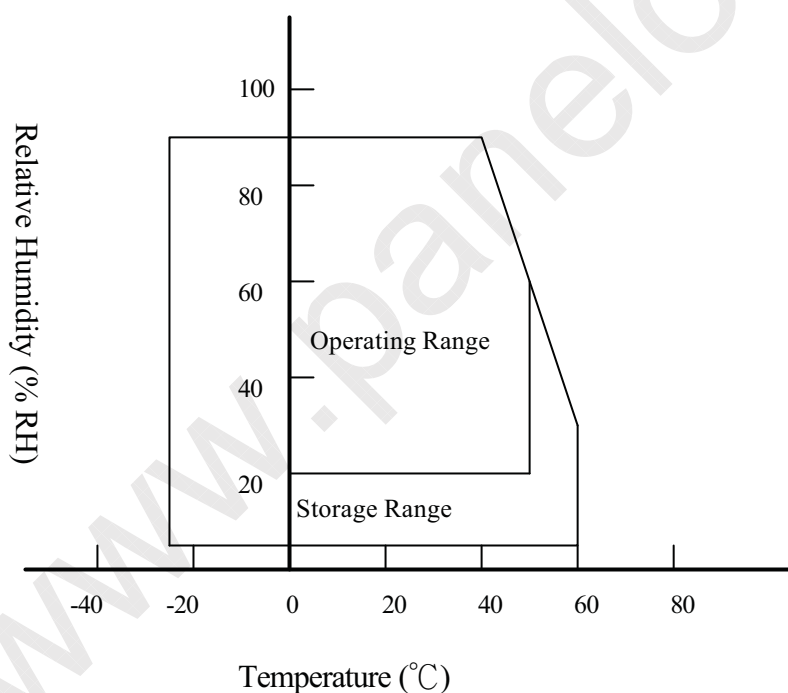
## 9. HANDLING CAUTIONS

9.1 Module assembly working environment should in the clean room.

9.2 The polarizer is easy damaged, handle it carefully and do not press or scratch the surface by sharp material.

9.3 Panel has polarizer protective film in the surface please remove the protection film of polarizer slowly to prevent the electrostatic discharge.

9.4 Wipe off water drop immediately. Long contact with water may cause discoloration or spots.

9.5 It is not permitted the pressure or impulse on the module, it may cause LCD panel or Backlight damaged.

9.6 Wipe panel surface with special clean cloth of LCD when the surface is dirty.

9.7 Turn off the power supply before connecting and disconnecting signal input cable.

9.8 The lamp wire is very weak, do not handle panel only by lamp wire.

9.9 As the packing bag open, watch out the environment of the panel storage. High temperature and high humidity environment is prohibited.

9.10 Please to storage the LCD module within the specification condition. High temperature or high humidity environment may reduce the module performance.

9.11 Do not disassemble the module.

9.12 Do not touch the backlight connecter. The backlight start voltage about 1000Volts.it may cause electrical shock.

9.13 Mounting screw hole can sustain torque 1.3 ~ 2.5 Kgf-cm.

9.14 Do not adjust the variable resistor that is located on the module back side.

9.15 I/F connector pins shall not to be touched directly with bare hands.

9.16 When the TFT LCD module is broken or liquid crystal leaks from the panel, it should be keep always from the eyes or month. If your hand touches liquid crystal, wash your hand cleanly by water and soap as soon as possible.

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## 10. MECHANICAL DRAWING

# TD141THCA1

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## 11. PACKING DRAWING

(1)

14.1" Module

Connector wire fix with
adhesive tape

LDPE bag

(2)

Packing Ass y(UP)

Tape

Packing Ass y

Module with LDPE bag
(Total module Q ty in 1 cushion = 20 pcs)

(3)

Desiccant

Carton

(4)

toppoly tape

Carton Label

Carton dimensions:L386xW346xH330
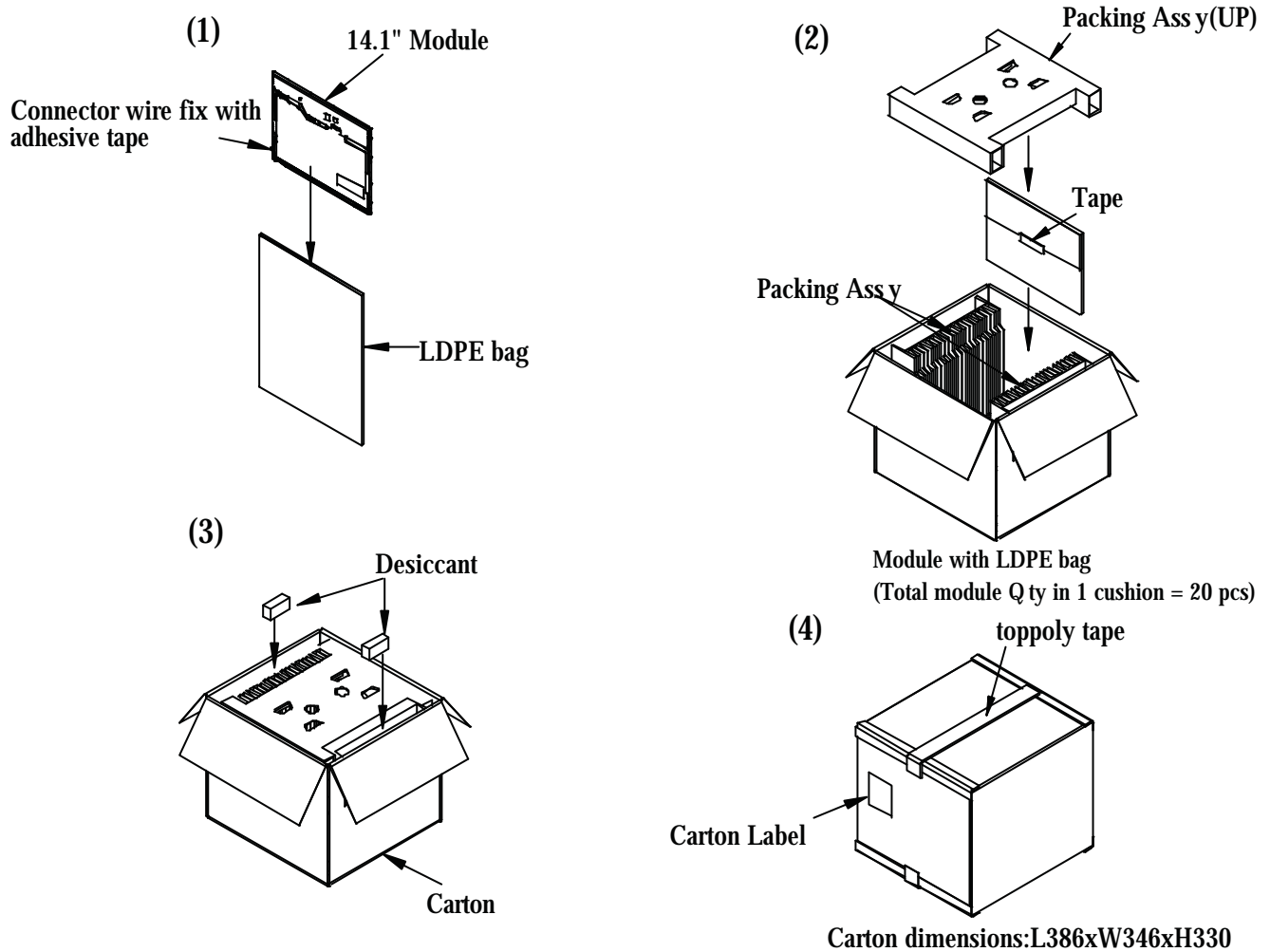
## 12. Module & Carton Label Drawing & Definition

12.1 The module Label Drawing & Definition illustration as below:

80mm

40mm

**TD141THCA1**

**Serial No. Bar Code**

cULus
E123456

**A503002302.02 513T1AA000001A1**

BAUART
GEPRÜFT
TYPE
APPROVED
TÜV
Rheinland
Product Safety

Made in Taiwan

a. Product Name: TD141THCA1

b. Lot ID: A503002302.02

c. Serial No.: There are 16 symbols as below,
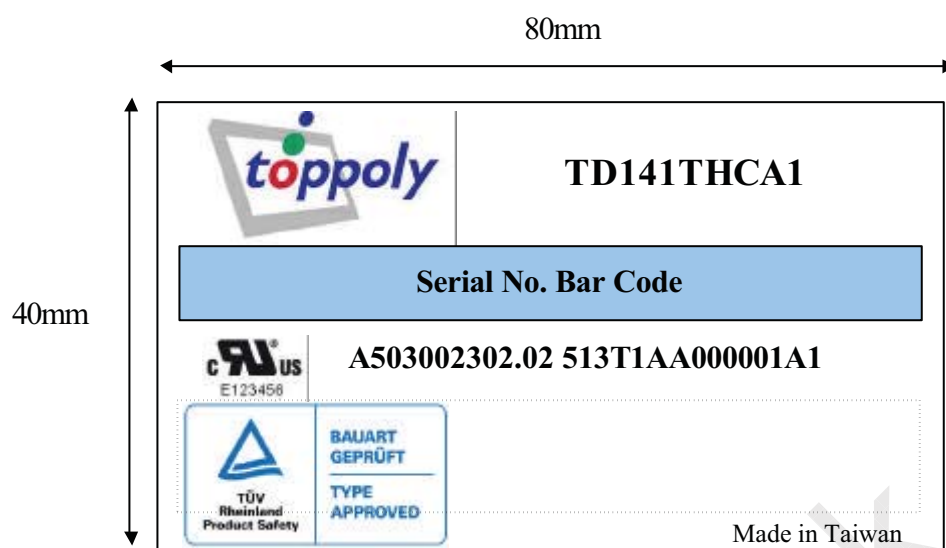
5 13 T 1A A 0 000001 A1

Year ＋ Week ＋ Factory ＋ Version ＋ Grade ＋ Customer ＋ Sequential Number ＋ RR code

(1) Year is the last number of A.D

(2) The expression of Week is 01 ～ 53 in order.

(3) The expression of Factory is one English letter, T for TP01 and N for NJ.

(4) The expression of Version is two English letters: Version of BOM

(5) The expression of Grade is one English letter: Product grade level

(6) The expression of Customer is one English letter: Customer service beforehand byte

(7) The order of sequential number is 000001~999999➔A00001~A99999➔B00001~B99999➔ and so on.

(8) The expression of code is two English letters: RR code

d. Made in Taiwan or Made in China (Module only).

TD141THCA1

12.2 The Packing Carton Label Drawing & Definition illustration as below:

100mm

80mm

| Product ID | TD141THCA1 | | QA Check |
|---|---|---|---|
| Carton ID | TM51500001          Bar  Code | | |
| Serial No. | From | TD141THCA1 513T1AA000001A1 | |
| | To | TD141THCA1 513T1AA000020A1 | |
| Quantity | 20 Pcs | | Green Product |
| Lot ID | A503002302.02 20 Pcs | | |
| Made in Taiwan | | | |

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# TD141THCA1

Appendix1 EDID

Header

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|-----------|-----------|-------------------------|------------|---------------|
| 0 | 00 | Header | 00 | 0000 0000 |
| 1 | 01 | Header | FF | 1111 1111 |
| 2 | 02 | Header | FF | 1111 1111 |
| 3 | 03 | Header | FF | 1111 1111 |
| 4 | 04 | Header | FF | 1111 1111 |
| 5 | 05 | Header | FF | 1111 1111 |
| 6 | 06 | Header | FF | 1111 1111 |
| 7 | 07 | Header | 00 | 0000 0000 |

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|-----------|-----------|-------------------------|------------|---------------|
| 8 | 08 | ID Manufacturer Name | 51 | 0101 0001 |
| 9 | 09 | | CA | 1100 1010 |
| 10 | 0A | ID Product Code | 60 | 1100 0000 |
| 11 | 0B | | 02 | 0000 0010 |
| 12 | 0C | 32-bit serial no. | 00 | 0000 0000 |
| 13 | 0D | | 00 | 0000 0000 |
| 14 | 0E | | 00 | 0000 0000 |
| 15 | 0F | | 00 | 0000 0000 |
| 16 | 10 | Week of manufacture | 00 | 0000 0000 |
| 17 | 11 | Year of manufacture | 0F | 0000 1111 |
| 18 | 12 | EDID Structure Ver. | 01 | 0000 0001 |
| 19 | 13 | EDID revision # | 03 | 0000 0011 |

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|-----------|-----------|-------------------------|------------|---------------|
| 20 | 14 | Video input definition | 80 | 1000 0000 |
| 21 | 15 | Max H image size | 1E | 0001 1110 |
| 22 | 16 | Max V image size | 13 | 0001 0011 |
| 23 | 17 | Display Gamma | 78 | 0111 1000 |
| 24 | 18 | Feature support | 0A | 0000 1010 |

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|-----------|-----------|-------------------------|------------|---------------|
| 25 | 19 | Red / green low bits | 93 | 1001 0011 |
| 26 | 1A | Blue / white low bits | E5 | 1110 0101 |
| 27 | 1B | Red x / high bits | 92 | 1001 0010 |

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| 28 | 1C | Red y | 57 | 0101 0111 |
|----|----|-------|----|-----------|
| 29 | 1D | Green x | 50 | 0101 0000 |
| 30 | 1E | Green y | 8D | 1000 1101 |
| 31 | 1F | Blue x | 25 | 0010 0101 |
| 32 | 20 | Blue y | 1E | 0001 1110 |
| 33 | 21 | White x | 4F | 0100 1111 |
| 34 | 22 | White y | 54 | 0101 0100 |
| 35 | 23 | Established timing 1 | 00 | 0000 0000 |
| 36 | 24 | Established timing 2 | 00 | 0000 0000 |
| 37 | 25 | Established timing 3 | 00 | 0000 0000 |

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|-----------|-----------|-------------------------|------------|---------------|
| 38 | 26 | Standard timing #1 | 01 | 0000 0001 |
| 39 | 27 | | 01 | 0000 0001 |
| 40 | 28 | Standard timing #2 | 01 | 0000 0001 |
| 41 | 29 | | 01 | 0000 0001 |
| 42 | 2A | Standard timing #3 | 01 | 0000 0001 |
| 43 | 2B | | 01 | 0000 0001 |
| 44 | 2C | Standard timing #4 | 01 | 0000 0001 |
| 45 | 2D | | 01 | 0000 0001 |
| 46 | 2E | Standard timing #5 | 01 | 0000 0001 |
| 47 | 2F | | 01 | 0000 0001 |
| 48 | 30 | Standard timing #6 | 01 | 0000 0001 |
| 49 | 31 | | 01 | 0000 0001 |
| 50 | 32 | Standard timing #7 | 01 | 0000 0001 |
| 51 | 33 | | 01 | 0000 0001 |
| 52 | 34 | Standard timing #8 | 01 | 0000 0001 |
| 53 | 35 | | 01 | 0000 0001 |

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|-----------|-----------|-------------------------|------------|---------------|
| 54 | 36 | Pixel Clock/10,000 (LSB) | BC | 1011 1100 |
| 55 | 37 | Pixel Clock/10,000 (MSB) | 1B | 0001 1011 |
| 56 | 38 | Horizontal Active=xxxx pixels (lower 8 bits) | 00 | 0000 0000 |
| 57 | 39 | Horizontal Blanking=xxxx pixels (lower 8 bits) | A0 | 1010 0000 |
| 58 | 3A | Horizontal Active/Horizontal Blanking(Thbp) | 50 | 0101 0000 |
| 59 | 3B | Vertical Active =xxxx lines | 20 | 0010 0000 |
| 60 | 3C | Vertical Blanking(Tvbp)=xxxx lines(DE Blanking min for | 17 | 0001 0111 |

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| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|---|---|---|---|---|
| | | DE only panels) | | |
| 61 | 3D | Vertical Active : Vertical Blanking(Tvbp) (upper4:4bits) | 30 | 0011 0000 |
| 62 | 3E | Horizontal Sync, Offset (Thfp)=xxxx piexls | 30 | 0011 0000 |
| 63 | 3F | Horizontal Sync, Pulse Width=xxxx pixels | 20 | 0010 0000 |
| 64 | 40 | Vertical Sync,Offset (Tvfp)=xx lines<br>Sync Width=xx lines | 36 | 0011 0110 |
| 65 | 41 | Horizontal Vertical Sync Offset / Width upper 2 bits | 00 | 0000 0000 |
| 66 | 42 | Horizontal Image Size=xxx mm | 2F | 0010 1111 |
| 67 | 43 | Vertical image Size=xxx mm | BE | 1011 1110 |
| 68 | 44 | Horizontal Image Size / Vertical image size | 10 | 0001 0000 |
| 69 | 45 | Horizontal Border = 0 (Zero for Notebook LCD) | 00 | 0000 0000 |
| 70 | 46 | Vertical Border = 0 (Zero for Notebook LCD) | 00 | 0000 0000 |
| 71 | 47 | EDID Standard | 18 | 0001 1000 |
| 72 | 48 | Flag | 00 | 0000 0000 |
| 73 | 49 | Flag | 00 | 0000 0000 |
| 74 | 4A | Flag | 00 | 0000 0000 |
| 75 | 4B | Data Type Tag: Descriptor Defined by Manufacturer | FE | 1111 1110 |
| 76 | 4C | Flag | 00 | 0000 0000 |
| 77 | 4D | ASCII(T) | 54 | 0101 0100 |
| 78 | 4E | ASCII(D) | 44 | 0100 0100 |
| 79 | 4F | ASCII(1) | 31 | 0011 0001 |
| 80 | 50 | ASCII(4) | 34 | 0011 0100 |
| 81 | 51 | ASCII(1) | 31 | 0011 0001 |
| 82 | 52 | ASCII(T) | 54 | 0101 0100 |
| 83 | 53 | ASCII(H) | 48 | 0100 1000 |
| 84 | 54 | ASCII(C) | 43 | 0100 0011 |
| 85 | 55 | ASCII(A) | 41 | 0100 0001 |
| 86 | 56 | ASCII(1) | 31 | 0011 0001 |
| 87 | 57 | End of ASCII string | 0A | 0000 1010 |
| 88 | 58 | Padding with "Blank" character | 20 | 0010 0000 |
| 89 | 59 | Padding with "Blank" character | 20 | 0010 0000 |

| Byte(dec) | Byte(hex) | Field Name and Comments | Value(hex) | Value(binary) |
|---|---|---|---|---|
| 90 | 5A | Flag | 00 | 0000 0000 |
| 91 | 5B | Flag | 00 | 0000 0000 |
| 92 | 5C | Flag | 00 | 0000 0000 |
| 93 | 5D | Dummy Descriptor | FE | 1111 1110 |

| 94 | 5E | Flag | 00 | 0000 0000 |
|----|----|------|----|-----------|
| 95 | 5F | ASCII (T) | 54 | 0101 0100 |
| 96 | 60 | ASCII (O) | 4F | 0100 1111 |
| 97 | 61 | ASCII (P) | 50 | 0101 0000 |
| 98 | 62 | ASCII (P) | 50 | 0101 0000 |
| 99 | 63 | ASCII (O) | 4F | 0100 1111 |
| 100 | 64 | ASCII (L) | 4C | 0100 1100 |
| 101 | 65 | ASCII (Y) | 59 | 0101 1001 |
| 102 | 66 | End of ASCII string | 0A | 0000 1010 |
| 103 | 67 | Padding with "Blank" character | 20 | 0010 0000 |
| 104 | 68 | Padding with "Blank" character | 20 | 0010 0000 |
| 105 | 69 | Padding with "Blank" character | 20 | 0010 0000 |
| 106 | 6A | Padding with "Blank" character | 20 | 0010 0000 |
| 107 | 6B | Padding with "Blank" character | 20 | 0010 0000 |
| 108 | 6C | Flag | 00 | 0000 0000 |
| 109 | 6D | Flag | 00 | 0000 0000 |
| 110 | 6E | Flag | 00 | 0000 0000 |
| 111 | 6F |  | FE | 1111 1110 |
| 112 | 70 | Flag | 00 | 0000 0000 |
| 113 | 71 | ASCII (T) | 54 | 0101 0100 |
| 114 | 72 | ASCII (D) | 44 | 0001 0001 |
| 115 | 73 | ASCII (1) | 31 | 0011 0001 |
| 116 | 74 | ASCII (4) | 34 | 0011 0100 |
| 117 | 75 | ASCII (1) | 31 | 0011 0001 |
| 118 | 76 | ASCII (T) | 54 | 0101 0100 |
| 119 | 77 | ASCII (H) | 48 | 0100 1000 |
| 120 | 78 | ASCII (C) | 43 | 0100 0011 |
| 121 | 79 | ASCII (A) | 41 | 0100 0001 |
| 122 | 7A | ASCII (1) | 31 | 0011 0001 |
| 123 | 7B | End of ASCII string | 0A | 0000 1010 |
| 124 | 7C | Padding with "Blank" character | 20 | 0010 0000 |
| 125 | 7D | Padding with "Blank" character | 20 | 0010 0000 |
| 126 | 7E | Extension flag | 00 | 0000 0000 |
| 127 | 7F | Checksum | D3 | 1101 0011 |