

**Display Elektronik GmbH**

**DATA SHEET**

**LCD MODULE**

**DEM 800480Q3 VMX-PW-N**

**(A-TOUCH)**

**5“ IPS**

*Product Specification*

*Version:1*

**17.03.2020**

## GENERAL SPECIFICATION

MODULE NO. :

DEM 800480Q3 VMX-PW-N(A-TOUCH)  
CUSTOMER

| VERSION NO. | CHANGE DESCRIPTION    | DATE       |
|-------------|-----------------------|------------|
| 0           | ORIGINAL VERSION      | 16.03.2020 |
| 1           | CHANGE MODULE DRAWING | 17.03.2020 |
|             |                       |            |
|             |                       |            |
|             |                       |            |
|             |                       |            |
|             |                       |            |
|             |                       |            |
|             |                       |            |
|             |                       |            |

PREPARED BY: CF

DATE: 17.03.2020

APPROVED BY: MHI

DATE: 17.03.2020

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**1. GENERAL SPECIFICATIONS**

| <b>ITEM</b>                    | <b>STANDARD VALUE</b>               | <b>UNIT</b> |
|--------------------------------|-------------------------------------|-------------|
| LCD SIZE                       | 5.0' TFT                            | INTH        |
| LCD TYPE                       | TFT/IPS/NORMALLY BLACK/TRANSMISSIVE |             |
| MODULE SIZE                    | 120.70 x 75.80 x 4.30               | MM          |
| ACTIVE AREA                    | 108.00 x 64.80                      | MM          |
| PIXEL PITCH (W*H)              | 0.135 x 0.135                       |             |
| NUMBER OF PIXELS               | 800 x 480                           |             |
| DIVER IC                       | ST7262                              |             |
| INTERFACE TYPE                 | RGB                                 |             |
| RECOMMEND VIEWING DIRECTION    | ALL                                 | O'CLOCK     |
| GRAY SCALE INVERSION DIRECTION | -                                   | O'CLOCK     |
| COLORS                         | 16.7 MILLION                        |             |
| BACKLIGHT TYPE                 | 18-DIES WHITE LED                   |             |
| TOUCH PANEL TYPE               | RTP                                 |             |

**Touch Panel Features:**

|             |                                      |
|-------------|--------------------------------------|
| Type:       | 4-Wire Analogy Resistive Touch Panel |
| Input Mode: | Stylus or Finger                     |
| ITO Film:   | 0.175 mm (T)                         |
| ITO Glass:  | 1.1 mm (T)                           |
| Connector:  | FPC                                  |

**Touch Panel Mechanical Characteristics**

Surface Hardness: 3H or more (according to JIS-K5400).

**Touch Panel Optical Characteristics**

Transmittance: 80% Typical.

**Touch Panel Rating****1. Maximum Voltage**

Less than DC 7 volts.

**2. Operating Temperature Range**

- 30°C to +85°C (Humidity: 20% RH to 70% RH, No condensation of dew).

**3. Storage Temperature Range**

- 30°C to +85°C (Humidity: 20% RH to 80% RH, No condensation of dew).

**Electrical Characteristics****1. Resistance between Terminals**

Direction "X": 410~920Ω

Direction "Y": 140~340Ω

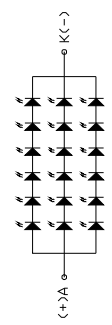
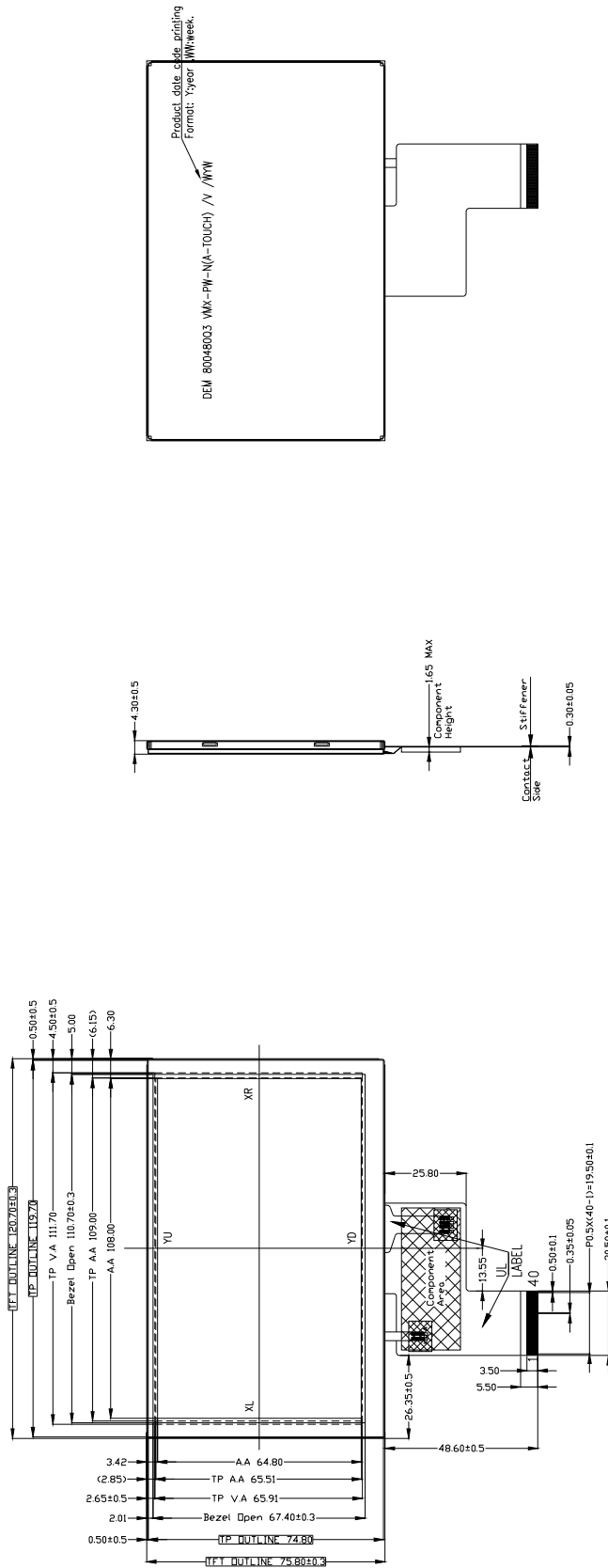
**2. Linearity**

X axis:  $\leq \pm 1.5\%$

Y axis:  $\leq \pm 1.5\%$

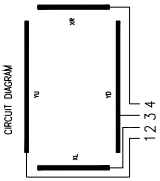
**3. Insulation Resistance: 20MΩ or more at DC 25 V.****4. Chattering Time: 10 msec or less at 100kΩ Pull-up.**

2. EXTERNAL DIMENSIONS



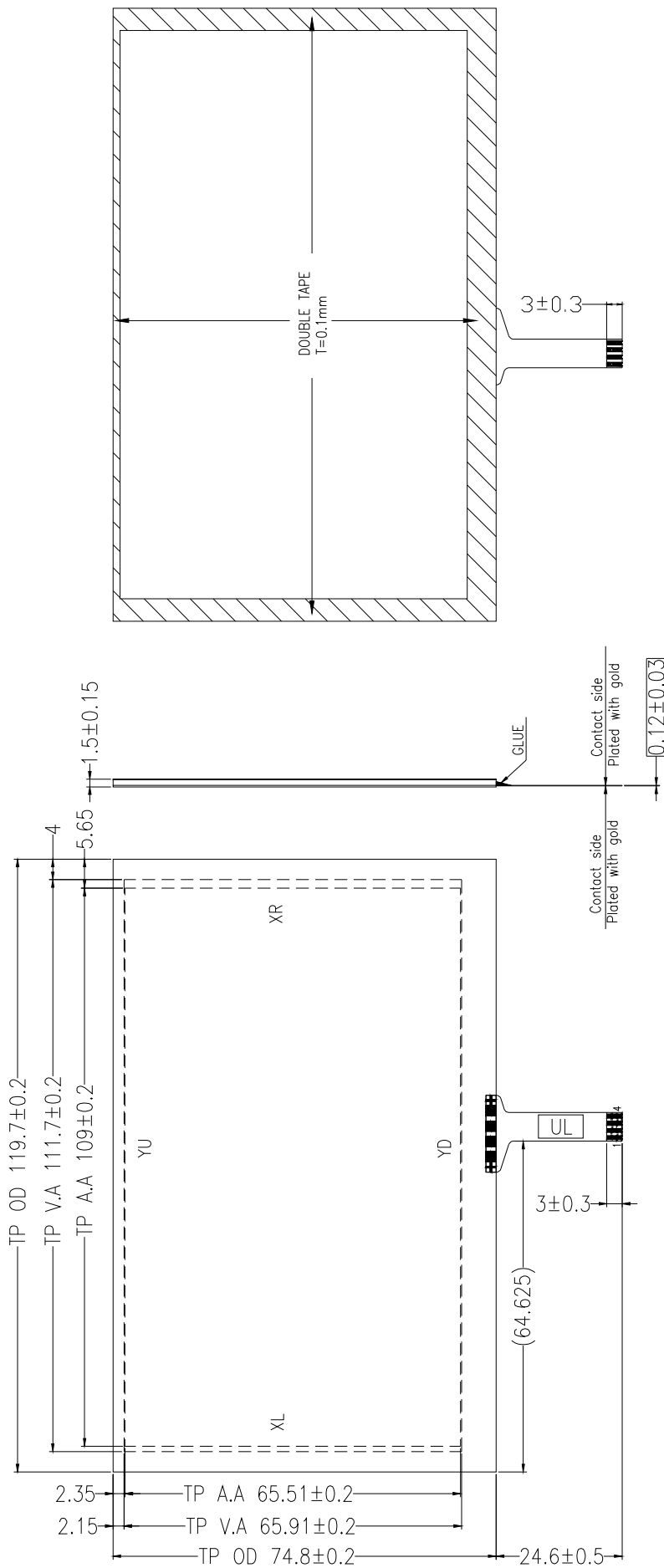
LED CIRCUIT DIAGRAM: 6\*3 Dice  
60mA @ 19.2V  
Brightness 500cd/m<sup>2</sup>(Min)

| PIN | NAME |
|-----|------|
| 1   | YU   |
| 2   | XL   |
| 3   | YD   |
| 4   | XR   |

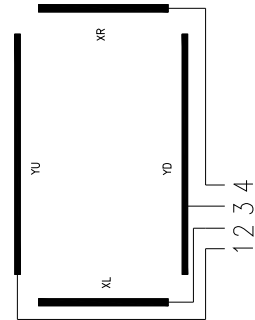


- Remark:
- 1.Unmarked tolerance is  $\pm 0.3$
  - 2.All materials comply with RoHS
  3. :critical dimension.
  - 4.LED Lifetime:50000h.
  - 5.Operating Temperature:-30~+85°C

TOUCH PANEL DRAWING:



CIRCUIT DIAGRAM



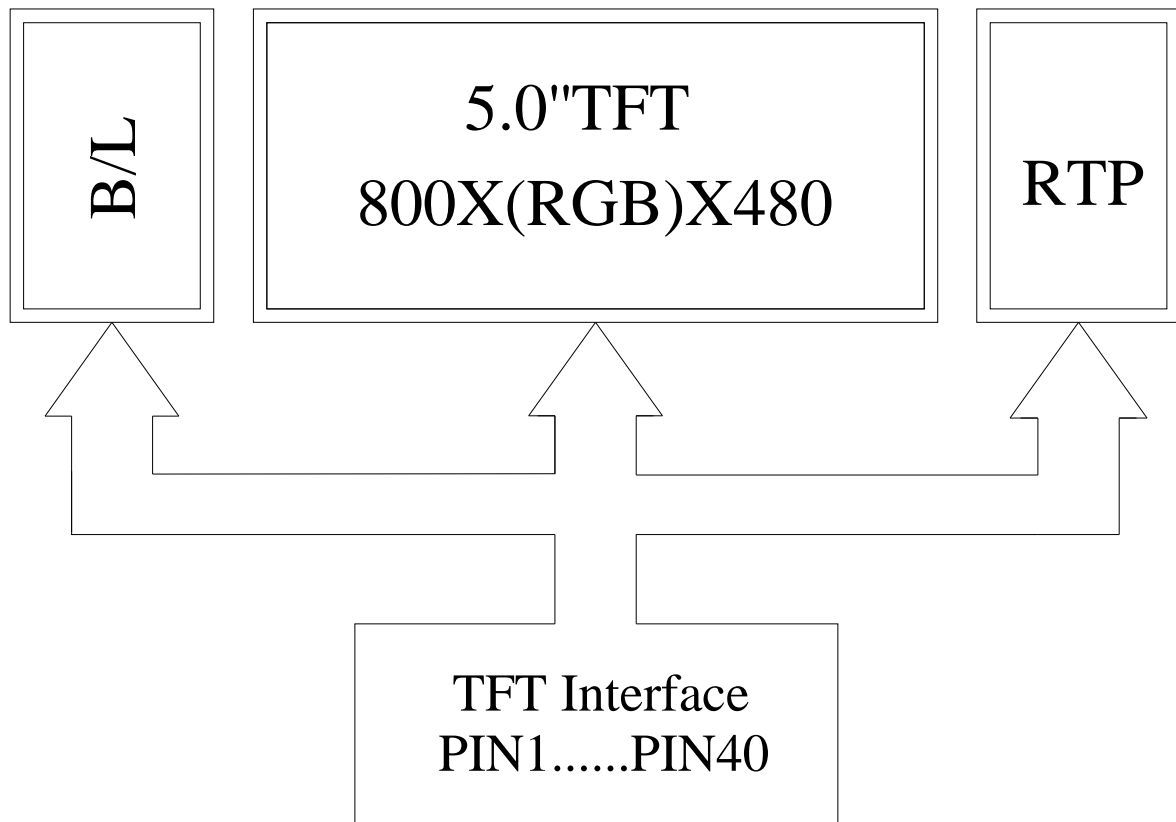
SIGNAL ASSIGNMENT

| PIN | NAME |
|-----|------|
| 1   | YU   |
| 2   | XL   |
| 3   | YD   |
| 4   | XR   |

REMARK:

1. Glass THK:1.1mm
2. Total THK:1.5±0.15mm
3. Linearity:±1.5% or less
4. Transmittance:80% Typical
5. Resistance  
410<X<920 ohm  
140<Y<340 ohm
6. Connector:FPC
7. For prevention of detach of FPC from Glass,add taping and gluing(Like LCD module)
8. Operating Force:20~100g  
Silicon Rubber Measuring Head Contact Area: φ0.3mm~φ0.8mm
9. General Tolerance:±0.3mm.
10. All materials comply with RoHS
11.  .....critical dimension.
12. FPC加上UL标签

3. BLOCK DIAGRAM



4. PIN ASSIGNMENT

| PIN NO. | SYMBOL | DESCRIPTION              |
|---------|--------|--------------------------|
| 1       | VLED-  | Cathode of LED Backlight |
| 2       | VLED+  | Anode of LED Backlight   |
| 3       | GND    | Power Ground             |
| 4       | VDD    | Power Voltage            |
| 5       | R0     | Red Data                 |
| 6       | R1     | Red Data                 |
| 7       | R2     | Red Data                 |
| 8       | R3     | Red Data                 |
| 9       | R4     | Red Data                 |
| 10      | R5     | Red Data                 |
| 11      | R6     | Red Data                 |
| 12      | R7     | Red Data                 |

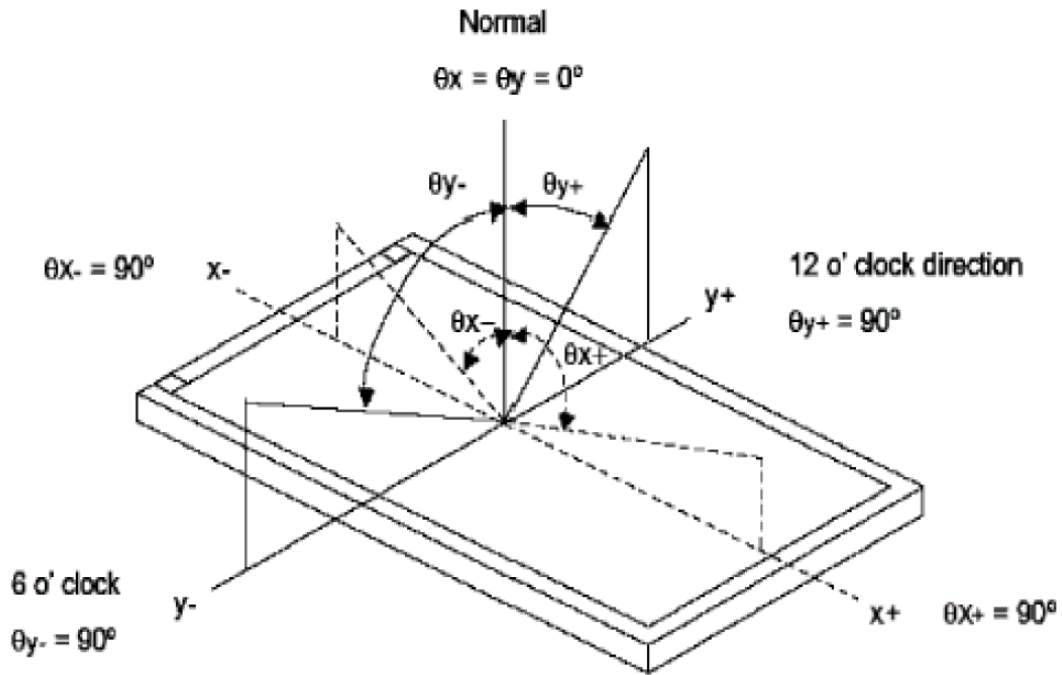


|    |       |                     |
|----|-------|---------------------|
| 13 | G0    | Green Data          |
| 14 | G1    | Green Data          |
| 15 | G2    | Green Data          |
| 16 | G3    | Green Data          |
| 17 | G4    | Green Data          |
| 18 | G5    | Green Data          |
| 19 | G6    | Green Data          |
| 20 | G7    | Green Data          |
| 21 | B0    | Blue Data           |
| 22 | B1    | Blue Data           |
| 23 | B2    | Blue Data           |
| 24 | B3    | Blue Data           |
| 25 | B4    | Blue Data           |
| 26 | B5    | Blue Data           |
| 27 | B6    | Blue Data           |
| 28 | B7    | Blue Data           |
| 29 | GND   | Power Ground        |
| 30 | CLK   | Sample Clock        |
| 31 | DISP  | Display On / Off    |
| 32 | NC/HS | No Connection       |
| 33 | NC/VS | No Connection       |
| 34 | DE    | Data Input Enable   |
| 35 | NC    | No Connection       |
| 36 | GND   | Power Ground        |
| 37 | XR    | Touch Panel Control |
| 38 | YD    | Touch Panel Control |
| 39 | XL    | Touch Panel Control |
| 40 | YU    | Touch Panel Control |

**5. OPTICAL CHARACTERISTICS**

| ITEM                        | SYMBOL       | CONDITIONS         | SPECIFICATIONS          |      |       | UNIT              | NOTE |
|-----------------------------|--------------|--------------------|-------------------------|------|-------|-------------------|------|
|                             |              |                    | MIN                     | TYP. | MAX   |                   |      |
| Luminance                   | L            |                    | -                       | 400  | -     | Cd/m <sup>2</sup> |      |
| Contrast Ratio              | CR           | $\theta = 0^\circ$ | 800                     | 1000 |       |                   |      |
| Response Time               | Ton+<br>Toff | 25°C               |                         | 30   | 40    | ms                |      |
| CIE<br>COLOUR<br>COORDINATE | RED          | XR                 | VIEWING<br>NORMAL ANGLE |      | 0.629 |                   |      |
|                             |              | YR                 |                         |      | 0.326 |                   |      |
|                             | GREEN        | XG                 |                         |      | 0.337 |                   |      |
|                             |              | YG                 |                         |      | 0.546 |                   |      |
|                             | BLUE         | XB                 |                         |      | 0.136 |                   |      |
|                             |              | YB                 |                         |      | 0.143 |                   |      |
|                             | WHITE        | XW                 |                         |      | 0.320 |                   |      |
|                             |              | YW                 |                         |      | 0.345 |                   |      |
| VIEWING<br>ANGLE            | Hor.         | $\theta_{x+}$      | CR $\geq$ 10            | 70   | 80    | Degree            |      |
|                             |              | $\theta_{x-}$      |                         | 70   | 80    |                   |      |
|                             | Ver.         | $\theta_{y+}$      |                         | 70   | 80    |                   |      |
|                             |              | $\theta_{y-}$      |                         | 70   | 80    |                   |      |

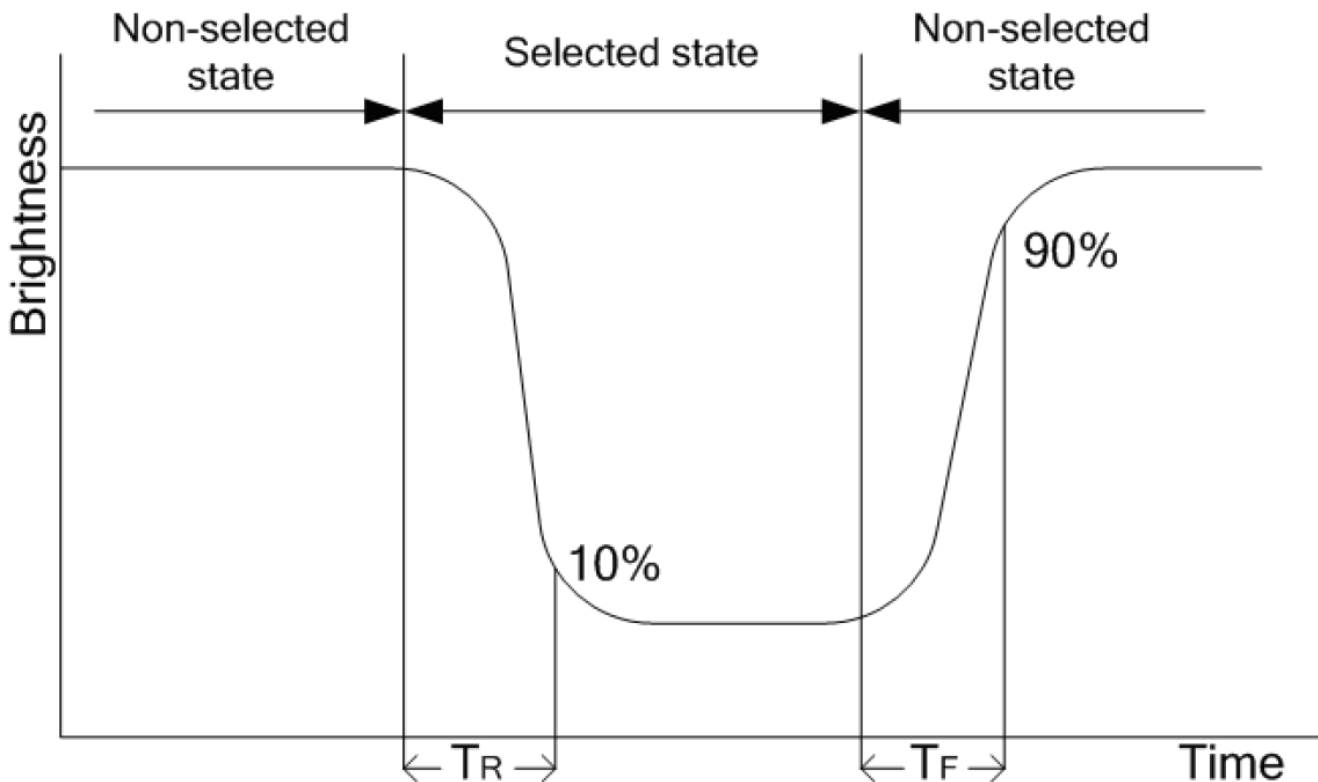
Note 1 : Definition of Viewing Angle  $\theta_x$  and  $\theta_y$  :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

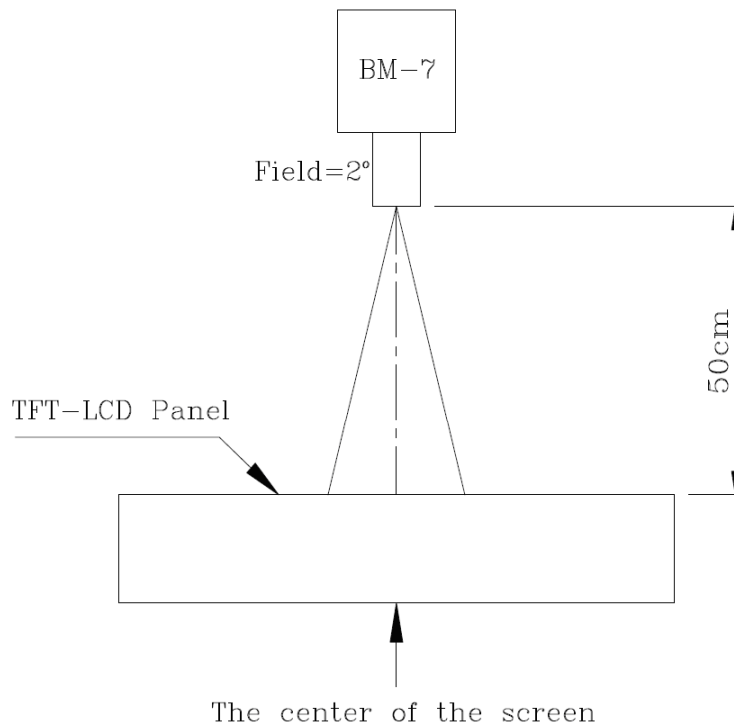
Note 3: Definition of response time ( $T_R$ ,  $T_F$ )



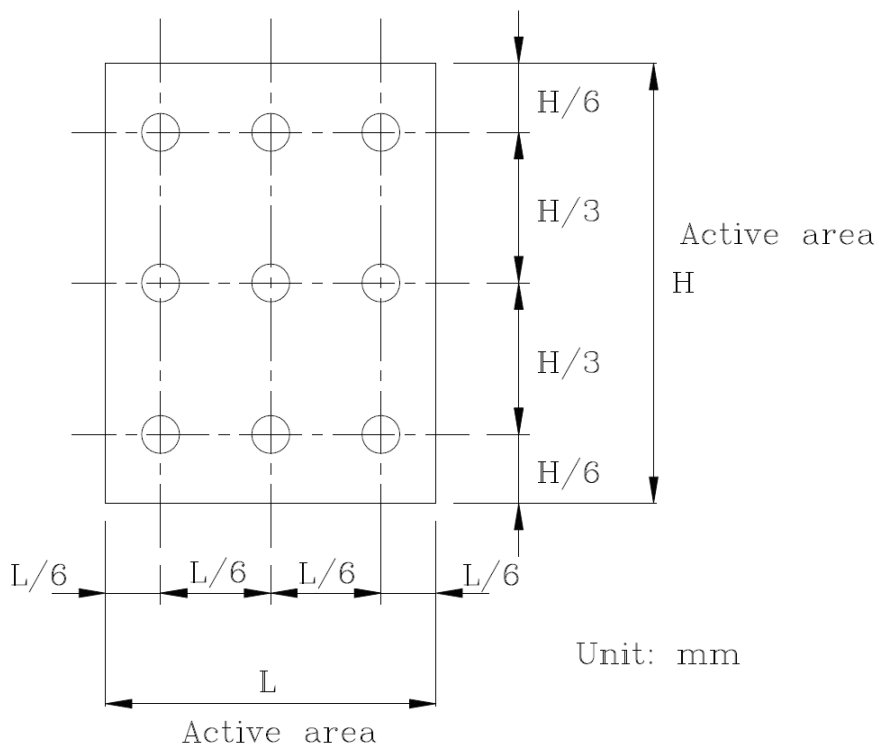
**Note 4: Definition of Luminance**

**①The Brightness Test Equipment Setup**

Field=2° (As measuring “black” image, field=2° is the best testing condition)



**②The Brightness Test Point Setup**



**6. ABSOLUTE MAXIMUM RATINGS**

| <b>PARAMETER</b>      | <b>SYMBOL</b> | <b>MIN</b> | <b>MAX</b> | <b>UNIT</b> |
|-----------------------|---------------|------------|------------|-------------|
| Power Supply Voltage  | VDD           | -0.3       | 4          | V           |
| Operating Temperature | Top           | -30        | +85        | °C          |
| Storage Temperature   | Tst           | -30        | +85        | °C          |

**7. ELECTRICAL CHARACTERISTICS****7.1 ELECTRICAL CHARACTERISTICS**

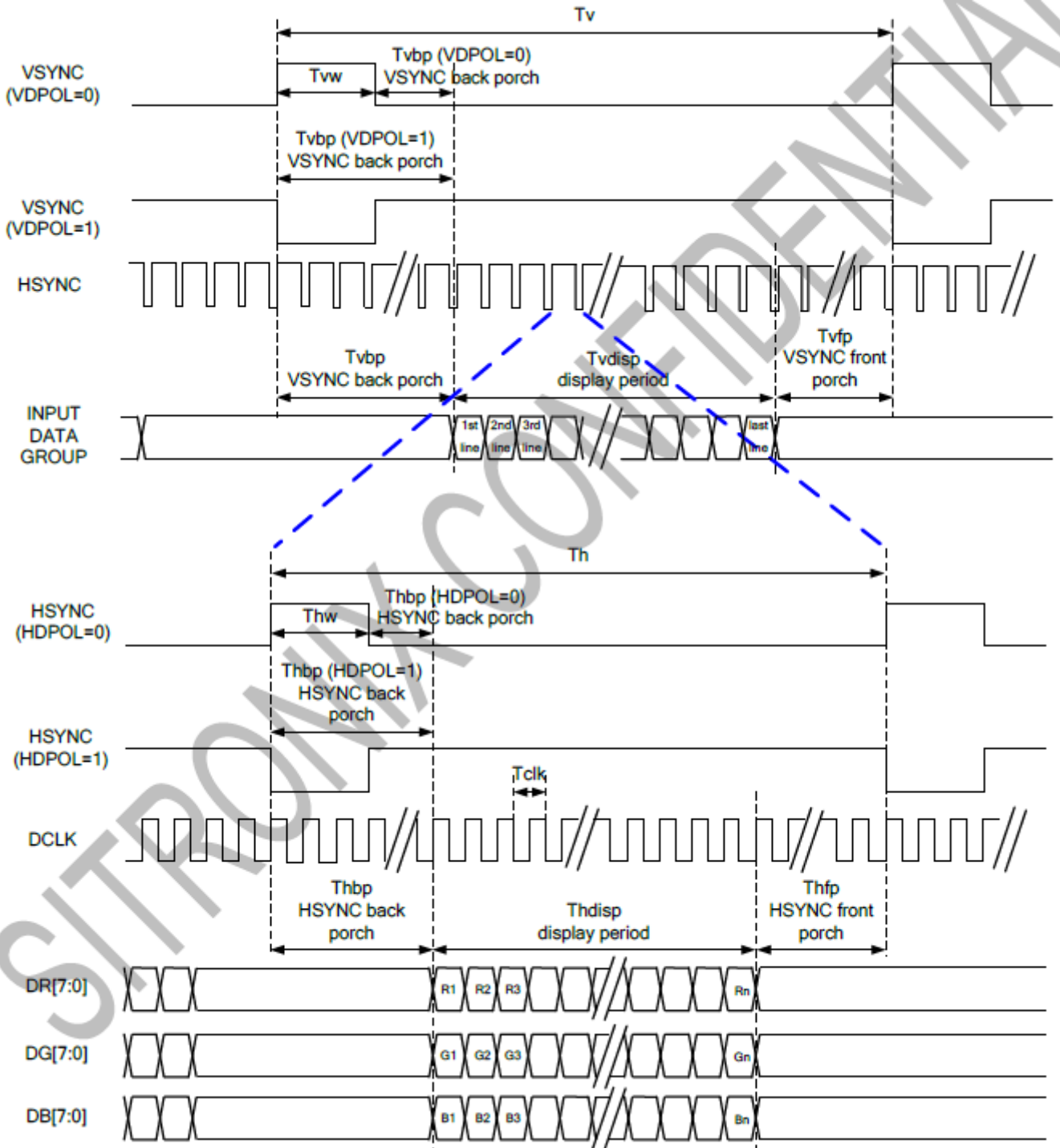
| ITEM                      | SYMBOL | MIN    | TYP. | MAX    | UNIT |
|---------------------------|--------|--------|------|--------|------|
| Supply Voltage for Analog | VDD    | 3.1    | 3.3  | 3.5    | V    |
| Current for Driver(Black) | IDD    |        | 110  | 170    | mA   |
| Input Voltage             | Vil    | GND    | -    | 0.3VDD | V    |
|                           | Vih    | 0.7VDD | -    | VDD    | V    |

**7.2 BLACKLIGHT DRIVING CONDITIONS**

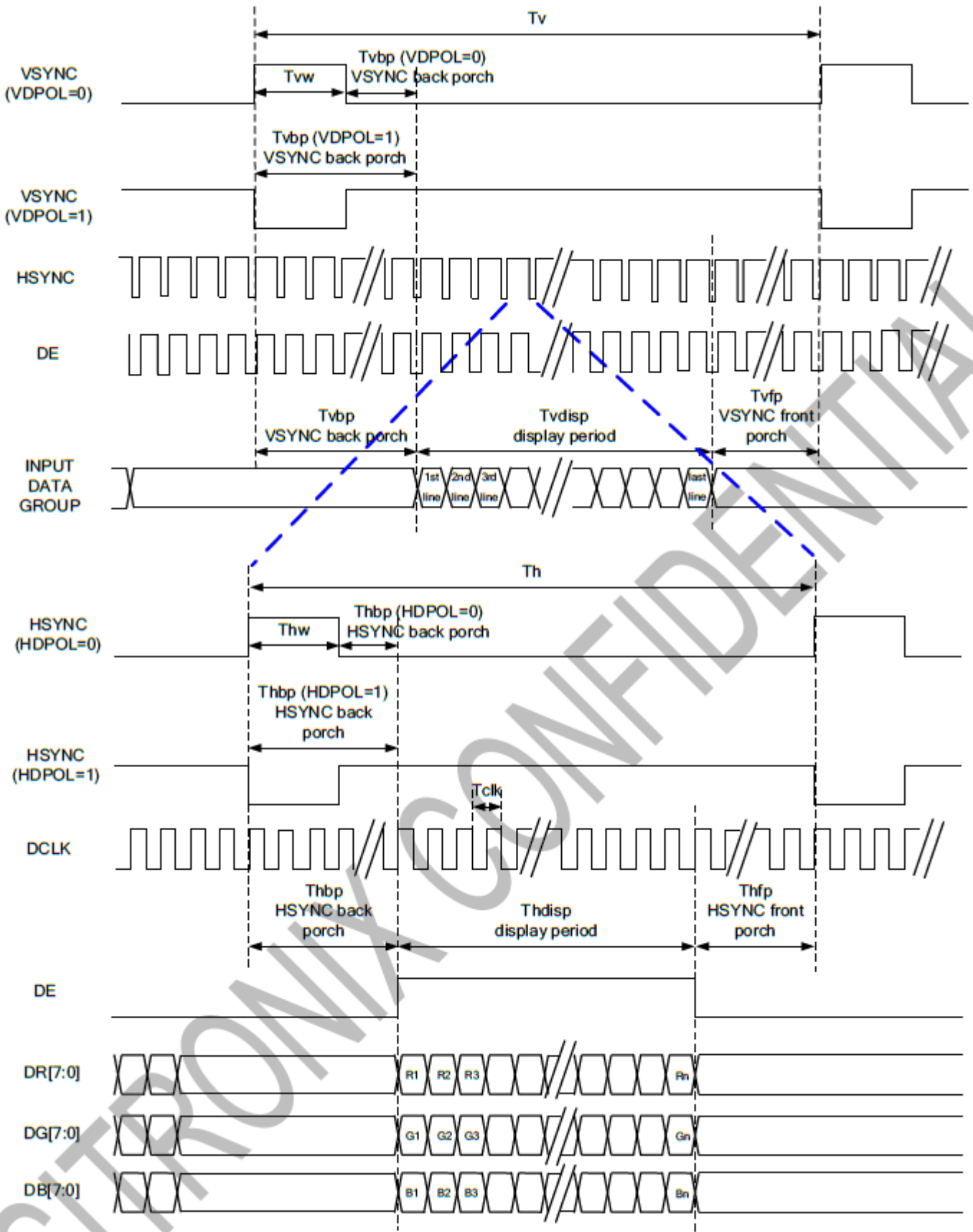
| ITEM                      | SYMBOL | MIN | TYP.  | MAX | UNIT |
|---------------------------|--------|-----|-------|-----|------|
| Voltage for LED Backlight | VL     | 18  | 19.2  | 20  | V    |
| Current for LED Backlight | IL     |     | 60    |     | mA   |
| LED Lifetime              |        |     | 50000 |     | Hr   |

7.3 TIMING CHARACTERISTICS

7.3.1 SYNC MODE

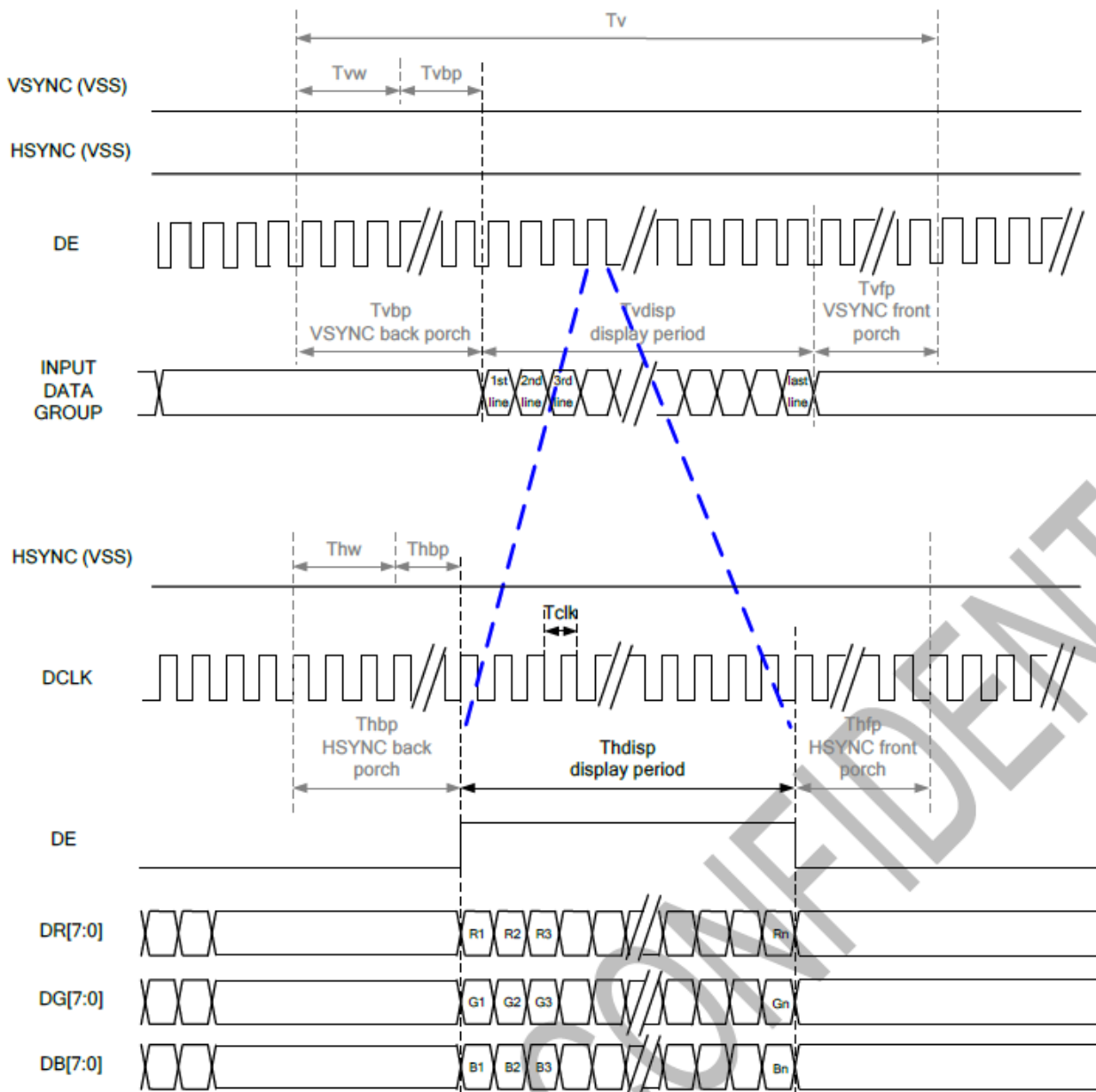


7.3.2 SYNC DE MODE





7.3.3 DE MODE



**7.3.4 PARALLEL 24-BIT RGB INPUT TIMING TABLE**

Parallel 24-bit RGB Input Timing (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

| Parallel 24-bit RGB Interface Timing Table |                |        |      |      |      |        |  |
|--|----------------|--------|------|------|------|--------|--|
| Item                                       | Symbol         | Min.   | Typ. | Max. | Unit | Remark |  |
| DCLK Frequency                             | Fclk           | 23     | 25   | 27   | MHz  |        |  |
| HSYNC                                      | Period Time    | Th     | 808  | 816  | 896  | DCLK   |  |
|  | Display Period | Thdisp | 800  |      |      | DCLK   |  |
|  | Back Porch     | Thbp   | 4    | 8    | 48   | DCLK   |  |
|  | Front Porch    | Thfp   | 4    | 8    | 48   | DCLK   |  |
|  | Pulse Width    | Thw    | 2    | 4    | 8    | DCLK   |  |
| VSYNC                                      | Period Time    | Tv     | 488  | 496  | 504  | HSYNC  |  |
|  | Display Period | Tvdisp | 480  |      |      | HSYNC  |  |
|  | Back Porch     | Tvbp   | 4    | 8    | 12   | HSYNC  |  |
|  | Front Porch    | Tvfp   | 4    | 8    | 12   | HSYNC  |  |
|  | Pulse Width    | Tvw    | 2    | 4    | 8    | HSYNC  |  |

**8. RELIABILITY TEST**

| <b>NO.</b> | <b>TEST ITEM</b>                             | <b>CONDITIONS</b> |       |
|------------|--|-------------------|-------|
| 1          | HIGH TEMPERATURE STORAGE                     | TA=85°C           | 240Hr |
| 2          | LOW TEMPERATURE STORAGE                      | TA=-30°C          | 240Hr |
| 3          | HIGH TEMPERATURE OPERATION                   | TA=85°C           | 240Hr |
| 4          | LOW TEMPERATURE OPERATION                    | TA=-30°C          | 240Hr |
| 5          | HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION | +60°C, 90%RH      | 240Hr |

## **9. LCD MODULES HANDLING PRECAUTIONS**

- n** The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- n** If the display panel is damaged and the liquid crystal substance inside it leaks out, do not get any in your mouth. If
- n** The substance come into contact with your skin or clothes promptly wash it off using soap and water.
- n** Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- n** The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarize carefully.
- n** To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  - Be sure to ground the body when handling the LCD module.
  - Tools required for assembly, such as soldering irons, must be properly grounded.
  - To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
  - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- n** Storage precautions

When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature / normal humidity conditions (avoid high temperature / high humidity and low temperatures below 0°C).

Whenever possible, the LCD modules should be stored in the same conditions in which they were shipped from our company.

## **10. OTHERS**

- n** Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- n** If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomena does not adversely affect performance reliability.
- n** To minimize the performance degradation of the LCD modules resulting from caused by static electricity, etc. exercise care to avoid holding the following sections when handling the modules:
  - Exposed area of the printed circuit board
  - Terminal electrode sections.

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