Display Elektronik GmbH

DATA SHEET

LCD MODULE

DEM 800480D2

VMH-PW-N (A-TOUCH)

5,0” TFT with Touch-Panel

Product Specification **Ver.: 0**

03.11.2026

Revise Records

Rev.	Date	Contents	Written	Approved
0	03.11.2026	Preliminary Specification	R	LF

Special Notes

Note1.	

Contents

1 General Description and Features 4
1.1 Features 4
1.2 LCD Module 4
2 Mechanical Information 5
3 Electrical Specifications 6
3.1 Absolute Max. Ratings 6
3.2 Electrical Absolute Rating 6
4 Electrical Characteristics 7
4.1 DC Characteristics 7
4.2 Backlight Unit 7
5 Block Diagram 8
6 Input Terminal Pin Assignment 9
7 Touch Screen Panel Specifications 10
8 Optical Characteristics 11
9 Basic Display Color and Gray Scale 13
10 RGB Interface 14
10.1 SYNC MODE 14
10.2 SYNC-DE Mode 15
10.3 DE Mode 16
10.4 Parallel 24-bit RGB Input Timing Table 17
11 System Bus Timing for RGB Interface 18
12 Reliability Condition 19
13 Dimensional outlines 21
14 Incoming Inspection Standards 22

1 General Description and Features

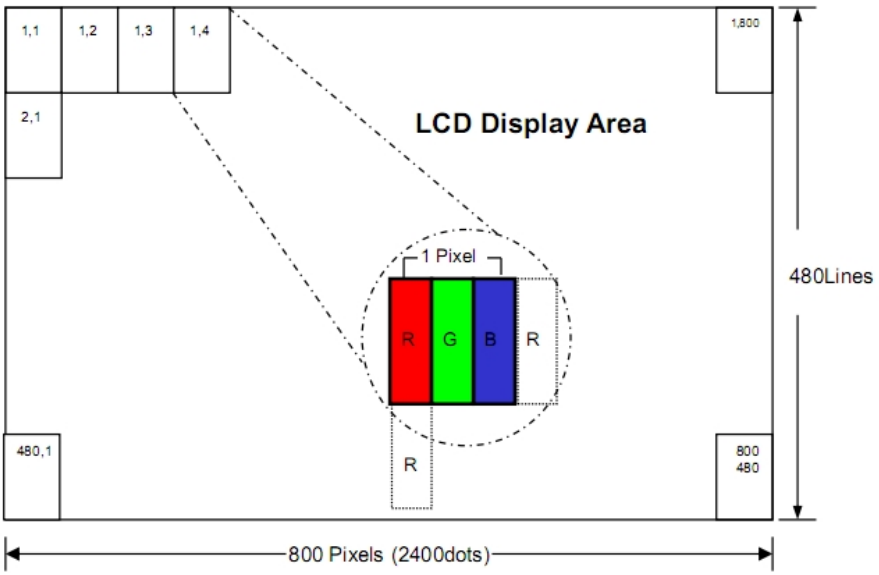
DEM 800480D2 VMH-PW-N(A-TOUCH) is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT-LCD module, a driver circuit, a Touch panel and a back-light unit. The model has a 5.0 (5:3) inch diagonally measured active display area with 800X480 (800 horizontal by 480 vertical pixel) resolution. The following table described the features of DEM 800480D2 VMH-PW-N(A-TOUCH).

1.1 Features

- The Backlight with 14 LEDs are available.
- IPS Mode.
- 4-Wire-Resistive Touch Panel
- Digital RGB (8-Bits/Color) Data Transfer.
- ROHS Compliance

1.2 LCD Module

Item	Specification	Unit
Screen Size	5.0 Inches	Diagonal
Display Resolution	800 x RGB x 480	Pixel
Active Area	108.00 x 64.80	mm
Outline Dimension	118.50 x 77.55 x 4.50	mm
Display Mode	Normally Black	--
Pixel Arrangement	RGB Vertical-Stripe	--
Pixel Size	0.135 x 0.135	mm
Surface Treatment(POL)	Anti-Glare (AG)	--
Display Color	16.7 Million	--
Viewing Direction	ALL	--
Input Interface	Digital RGB (8-Bits/Color) Data Transfer	--



2 Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	118.35	118.5	118.65	mm	--
	Vertical (V)	77.40	77.55	77.70	mm	(1)
	Thickness (T)	4.20	4.50	4.80	mm	(1)
Weight		--	(76.5)	--	g	--

Note (1) Not include FPC.
Refer to the Outline Dimension Drawing as attached.

3 Electrical Specifications

3.1 Absolute Max. Ratings

3.1.1 Absolute Ratings of Environment

If the operating condition exceeds the following absolute maximum ratings, the TFT LCD module may be damaged permanently.

(Ta=25±2°C, V_{SS}=GND=0)

Item	Symbol	Min.	Max.	Unit	Note
Storage Temperature	T_{STG}	-30	80	°C	(1)
Operating Temperature	T_{OPR}	-20	70	°C	(1,2,3)

Note (1) 95 % RH Max. (40°C ≥ Ta). Maximum wet-bulb temperature at 39°C or less. (Ta > 40°C) No condensation.

Note (2) In case of below 0°C, the response time of liquid crystal (LC) becomes slower and the color of panel becomes darker than normal one. Level of retardation depends on temperature, because of LC's character

Note (3) Only operation is garantied at operating temperature. Contrast, response time, another display quality are evaluated at +25°C.

3.2 Electrical Absolute Rating

3.2.1 TFT-LCD Module

(Ta=25±2°C, V_{SS}=GND=0)

Item	Symbol	Value		Unit	Condition
		Min.	Max.		
Power Supply Voltage	V_{DD}	-0.3	+4.0	V	--
IO Supply Voltage	V_{DDI}	-0.3	+4.0	V	
Charge Pump Supply Voltage	PV_{DD}	-0.3	+4.0	V	
Enhance Charge Pump Supply Voltage	PV_{DD1}	-0.3	+4.0	V	
Logic Input Voltage Range	VIN	-0.3	V_{DDI}+0.3	V	--
Logic Output Voltage Range	VOUT	-0.3	V_{DDI}+0.3	V	

3.2.2 Backlight Unit

(Ta=25±2°C)

Item	Symbol	Min.	Max.	Unit	Note
Current of One LED	I_B	--	(25)	mA	(1)

Note (1) Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded. Functional operation should be restricted to the conditions described under normal operating conditions.

4 Electrical Characteristics

4.1 DC Characteristics

Recommended Operating Range
DC Electrical Characteristics (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Supply Voltage	VDD	3.2	3.3	3.6	V	--
IO Supply Voltage	VDDI	3.2	3.3	3.6	V	--
Charge Pump Supply Voltage	PVDD	3.2	3.3	3.6	V	--

DC Characteristics for Digital Circuit
DC Electrical Characteristics (PVDD=PVDD1=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Logic-High Input Voltage	VIH	0.7VDDI	-	VDDI	V	--
Logic-Low Input Voltage	VIL	DGND	-	0.3 VDDI	V	--
Logic-High Output Voltage	Voh	VDDI-0.4	-	VDDI	V	--
Logic-Low Output Voltage	Vol	DGND	-	DGND+0.4	v	--

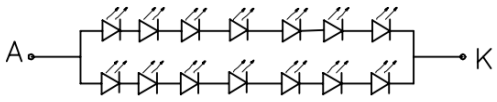
4.2 Backlight Unit

The back-light system is an edge-lighting type with white LED (Light Emitting Diode)s.

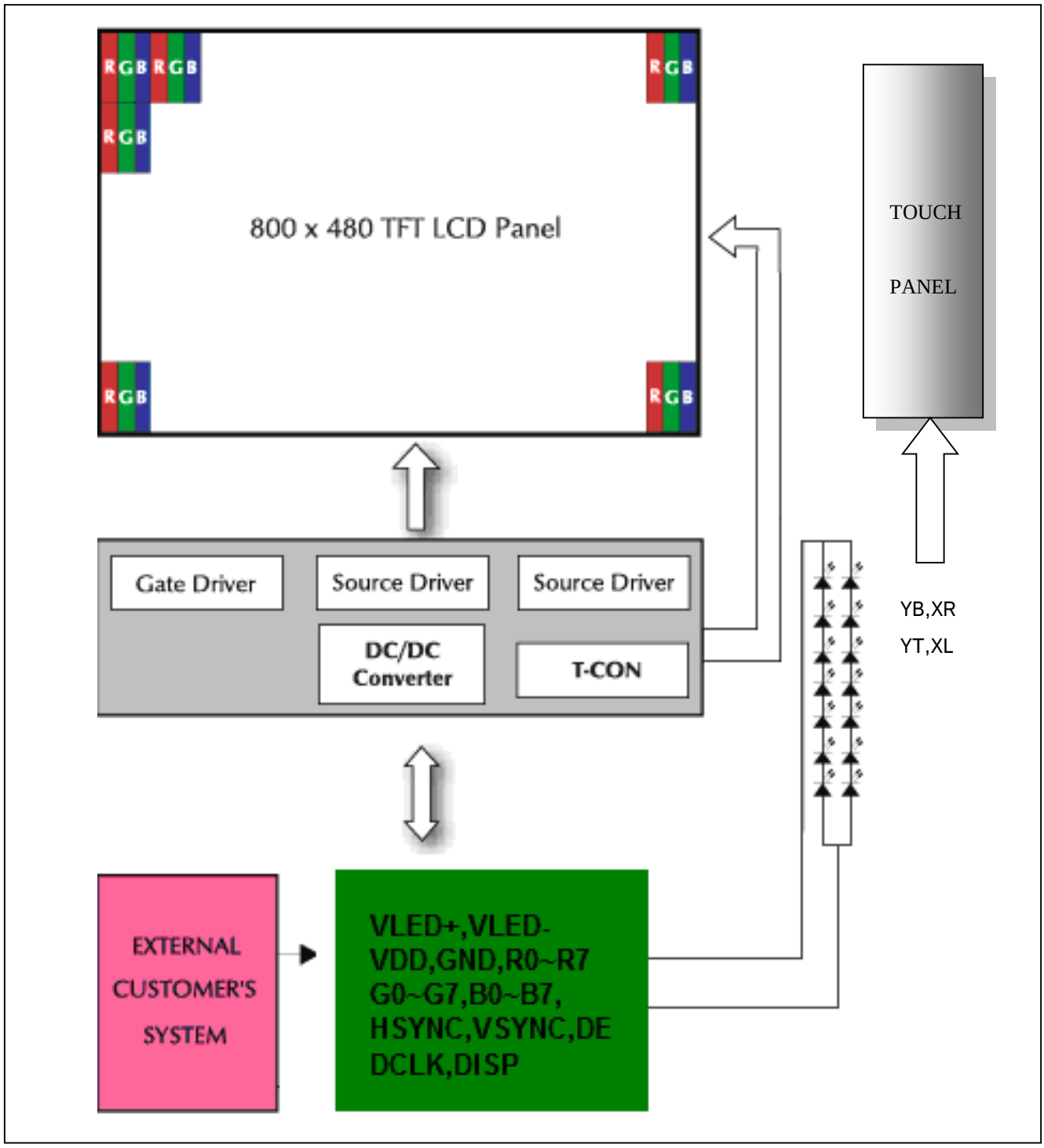
(Ta=25±2°C)

Item	Symbol	Value			Unit	Condition
		Min.	Typ.	Max.		
LED Voltage	VL	21.0	22.4	23.8	V	--
LED Current	If	-	40	50	mA	--
Power Consumption	P_{LED}	-	896	1190	mW	--
LED Lifetime (25℃)	-	35.000	50.000	-	hr	--

Note: (1) 14 LEDs serial type.
(2) Where I_f = 40mA, V_L = 22.4V, $P_{LED} = V_L \times I_f$
(3) The environmental conducted under ambient air flow, at Ta=25°C ± 2°C, 60%RH±5%



5 Block Diagram



7 Input Terminal Pin Assignment

7.1 CN1 Pin Assignment

Pin No.	Symbol	I/O	Function	Remark
1	VLED-	P	Power for LED backlight cathode	
2	VLED+	P	Power for LED backlight anode	
3	GND	P	Power Ground	
4	VDD	P	Power Supply	
5	R0	I	Red data signal (LSB)	
6	R1	I	Red data signal	
7	R2	I	Red data signal	
8	R3	I	Red data signal	
9	R4	I	Red data signal	
10	R5	I	Red data signal	
11	R6	I	Red data signal	
12	R7	I	Red data signal (MSB)	
13	G0	I	Green data signal (LSB)	
14	G1	I	Green data signal	
15	G2	I	Green data signal	
16	G3	I	Green data signal	
17	G4	I	Green data signal	
18	G5	I	Green data signal	
19	G6	I	Green data signal	
20	G7	I	Green data signal (MSB)	
21	B0	I	Blue data signal (LSB)	
22	B1	I	Blue data signal	
23	B2	I	Blue data signal	
24	B3	I	Blue data signal	
25	B4	I	Blue data signal	
26	B5	I	Blue data signal	
27	B6	I	Blue data signal	
28	B7	I	Blue data signal (MSB)	
29	DGND	P	Digital ground	
30	DCLK	I	Pixel clock	
31	DISP	I	DISP sets the display mode.	
32	HSYNC	I	Horizontal sync signal	
33	VSYNC	I	Vertical sync signal	
34	DE	I	Data Enable signal	
35	NC	I	No Connect	
36	GND	P	Power Ground	
37	XR	O	Touch Panel Right	
38	YB	O	Touch Panel Bottom	
39	XL	O	Touch Panel Left	
40	YT	O	Touch Panel Top	

I: Input, O: Output, P: Power

Notes:

1) NC Pin must be retained; this pin can't contact GND or other signal.
2) GND Pin must ground contact, can not be floating.
3) Connector Part No: FH12A-40S-0.5SH(55) or equivalent.
4) Default Use SYNC MODE.

8 Touch Screen Panel Specifications

8.1 Electrical Characteristics

Item	Min.	Typ.	Max.	Unit	Note
Linearity	-1.5	-	1.5	%	Analog X and Y directions
Terminal Resistance	(200)	-	(1000)	Ω	X
	(200)	-	(900)	Ω	Y
Insulation Resistance	20	-	-	MΩ	DC 25V
Voltage	-	5.0	-	V	DC
Chattering	-	-	10	ms	100kΩ pull-up

9 Optical Characteristics

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room
Measuring equipment: BM-7A

(Ta=25±2°C , VDD =3.3V, $I_{f=}$40mA)

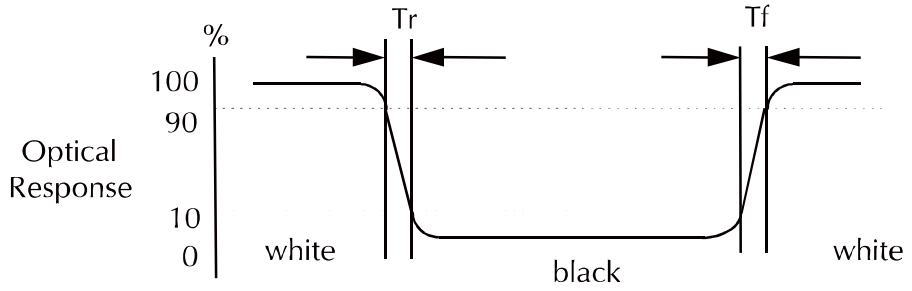
Item		Symbol	Condition	Min	Type	Max	Unit	Note
Brightness		--	--	320	400	--	cd/m^2	--
Response Time		T_{on+} T_{off}	θ=0°	--	30	40	ms	--
Contrast Ratio		CR	At optimized viewing angle	1000	1200	--	--	--
Color Chromaticity	Red	R_X	θ=0° Normal Viewing Angle	0.538	0.588	0.638	--	--
		R_Y		0.276	0.326	0.376		
	Green	G_X		0.2855	0.335	0.385	--	
		G_Y		0.576	0.616	0.676		
	Blue	B_X		0.091	0.141	0.191	--	
		B_Y		0.050	0.110	0.150		
	White	Wx		0.250	0.300	0.350	--	
		Wy		0.270	0.320	0.370		
Viewing Angle (6H)	Hor.	θ_R	CR≥10	70	80		Degree	--
		θ_L		70	80			
	Ver.	θ_U		70	80			
		θ_D		70	80			

a. Test equipment setup

After stabilizing and leaving the panel alone shall be warmed up for the stable operation of LCM, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-5A/BM-7(fast) with a viewing angle of 2° at a distance of 50cm and normal direction.

b. Definition of response time: Tr and Tf

The response time is defined as the following figure and shall be measured by switching the input signal for “black” and “white”.

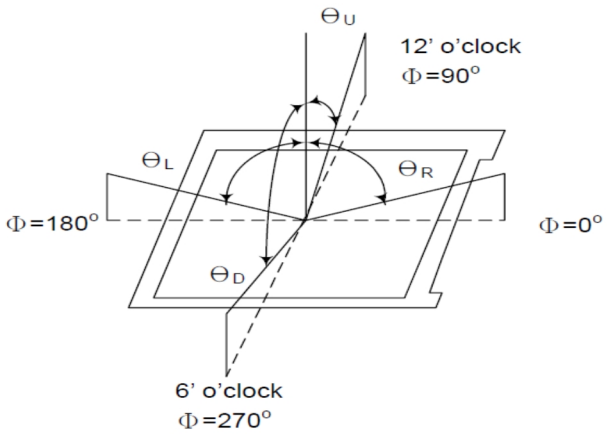


c. Definition of contrast ratio:

$$\text{Contrast Ratio (CR)} = \frac{\text{Brightness measured when LCD is at “white state”}}{\text{Brightness measured when LCD is at “black state”}}$$

d. Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

e. View Angle



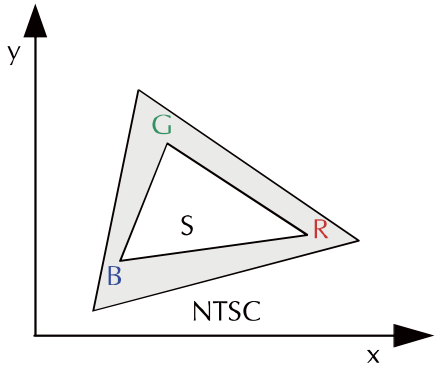
f. Definition of Luminance of White: Luminance of white at the center points

Light Source of Back-Light Unit	LED Type

g. Definition of White Uniformity

$$\text{White Uniformity} = \frac{\text{Min. luminance of white among 9-points}}{\text{Max. luminance of white among 9-points}} \times 100\%$$

h. The definition of Color Gamut -Color Chromaticity CIE 1931
Color coordinate of white & red, green, blue at center point.
Color Gamut : NTSC(%) = (RGB Triangle Area / NTSC Triangle Area) x 100



10 Basic Display Color and Gray Scale

	Color & Gray Scale	Data Signal																							
		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(0)	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(0)	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(0)	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	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(1)	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(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(127)	0	1	1	1	1	1	1	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	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
	Green(1)	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(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(127)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	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	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
	Blue(1)	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(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(127)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	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

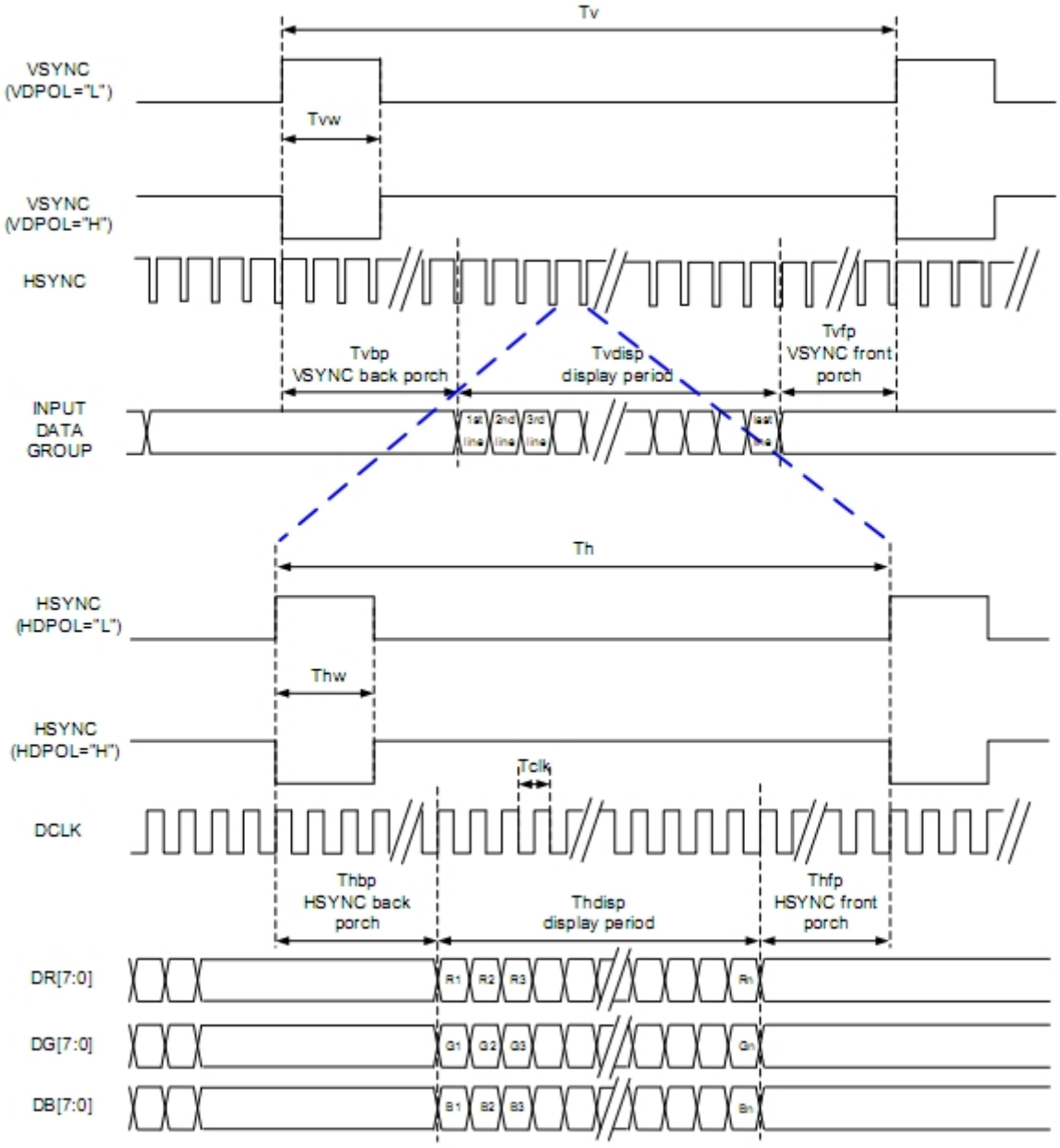
0 : Low level voltage, 1 :High level voltage

Each basic color can be displayed in 256 gray scales from 8 bit data signals. With the combination of total 24 bit data signals, the 16,7M-color display can be achieved on the screen.

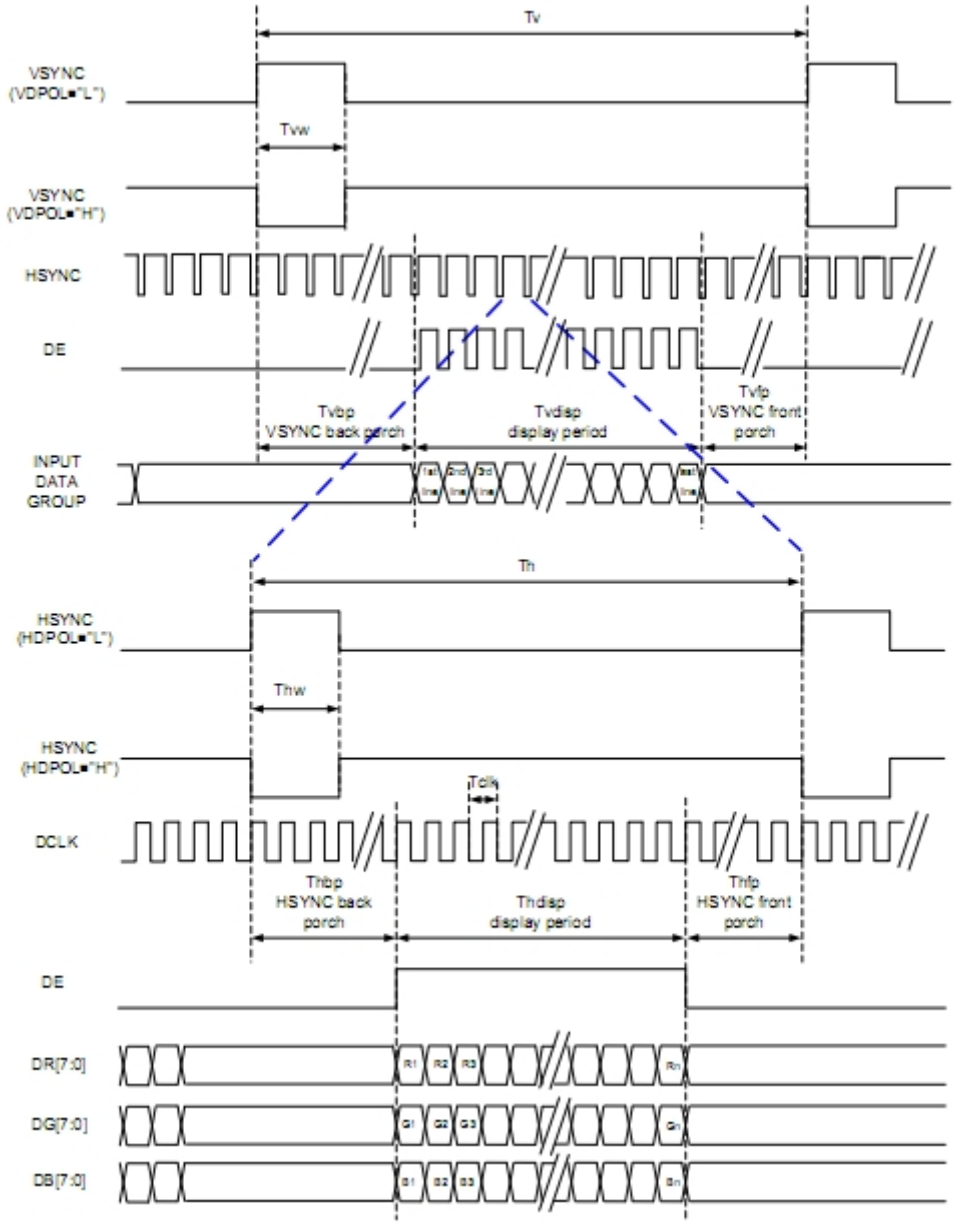
11 RGB Interface

RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

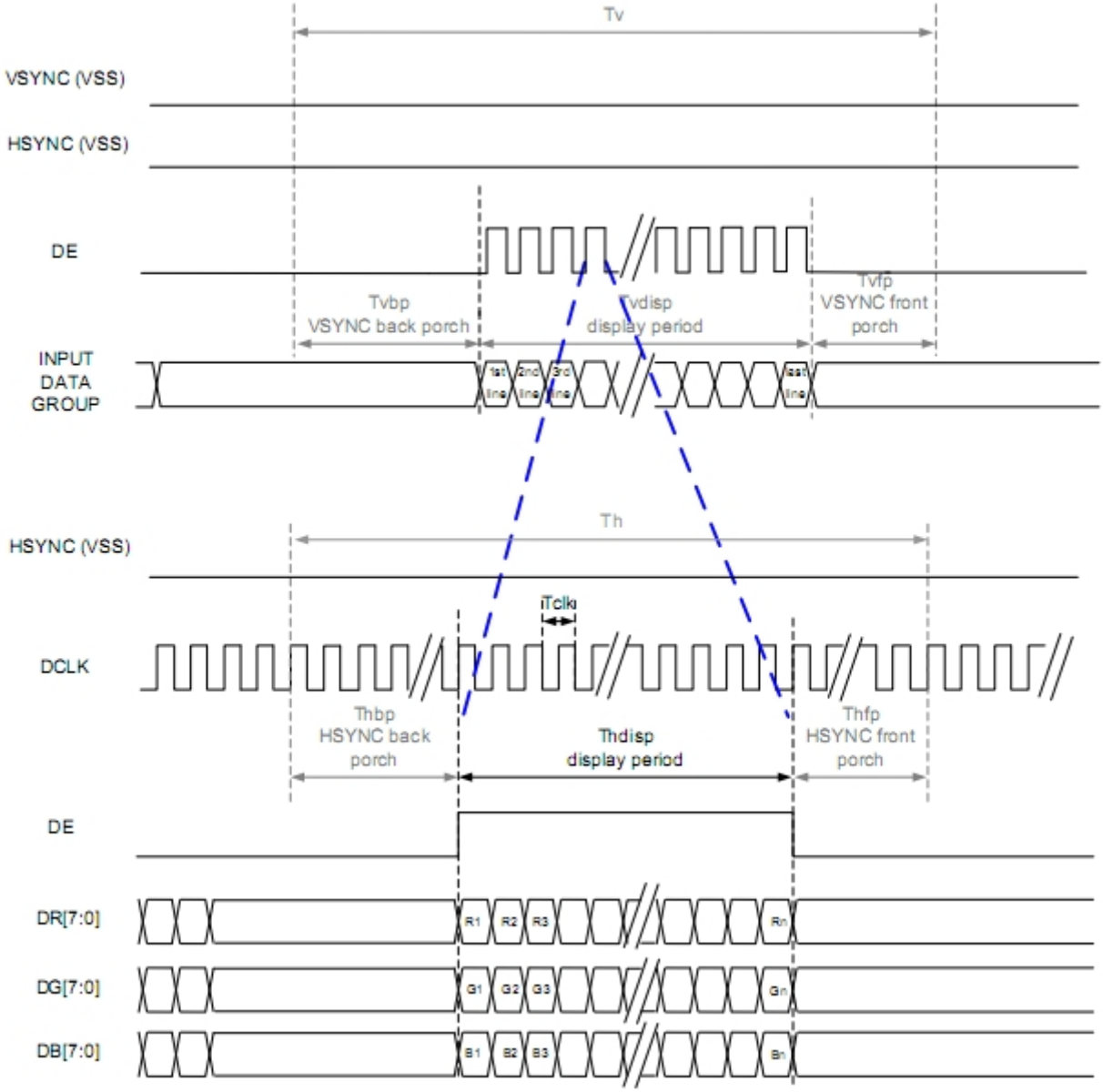
11.1 SYNC MODE



11.2 SYNC-DE Mode



11.3 DE Mode


Tv
VSYNC (VSS)
HSYNC (VSS)
DE
Tvbp
VSYNC back porch
Tvdisp
display period
Tvfp
VSYNC front
porch
INPUT
DATA
GROUP
1st line
2nd line
3rd line
last line
Th
HSYNC (VSS)
iTclk
DCLK
Thbp
HSYNC back
porch
Thdisp
display period
Thfp
HSYNC front
porch
DE
DR[7:0]
R1
R2
R3
Rn
DG[7:0]
G1
G2
G3
Gn
DB[7:0]
B1
B2
B3
Bn

11.4 Parallel 24-bit RGB Input Timing Table

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

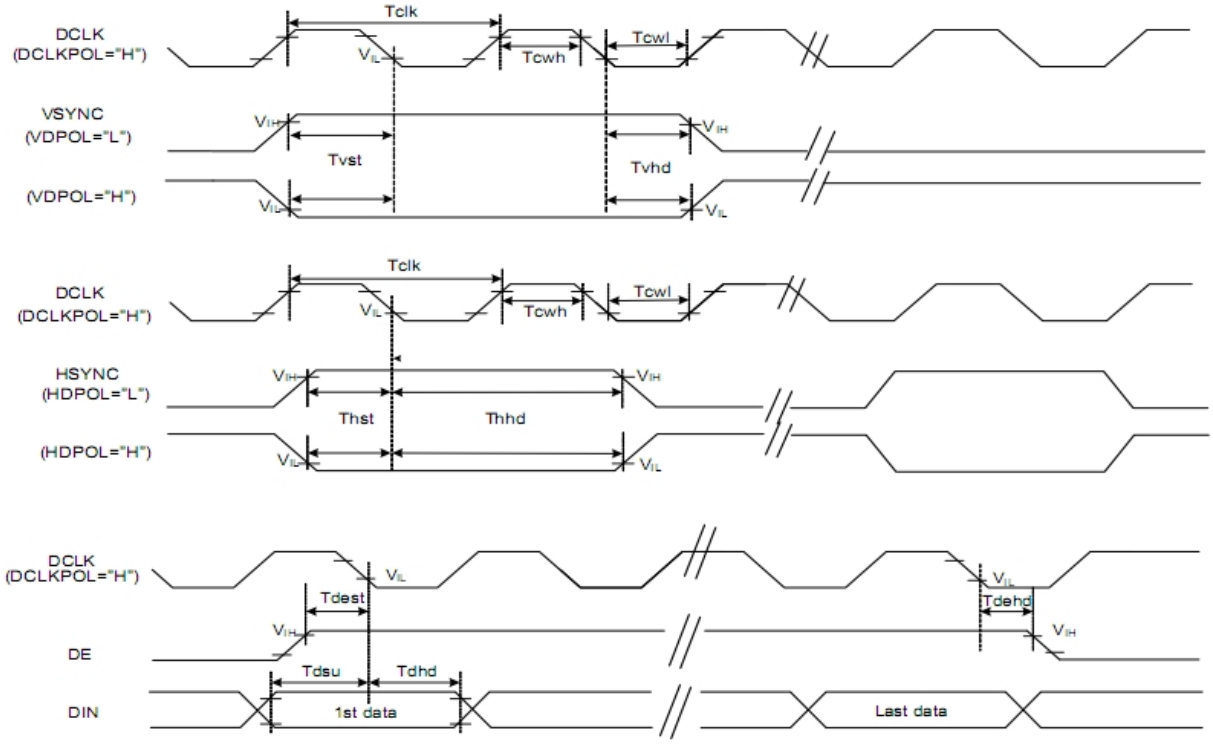
Parallel 24-bit RGB Interface Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	23	25	27	MHz	.
HSYNC	Period Time	Th	808	816	848	DCLK	
	Display Period	Thdisp		800		DCLK	
	Back Porch	Thbp	4	8	24	DCLK	
	Front Porch	Thfp	4	8	24	DCLK	
	Pulse Width	Thw	2	4	8	DCLK	
VSYNC	Period Time	Tv	496	512	528	HSYNC	
	Display Period	Tvdisp		480		HSYNC	
	Back Porch	Tvbp	8	16	24	HSYNC	
	Front Porch	Tvfp	8	16	24	HSYNC	
	Pulse Width	Tvw	2	4	8	HSYNC	

Note: 1. The minimum blanking time depends on the GIP timing of the panel specification.

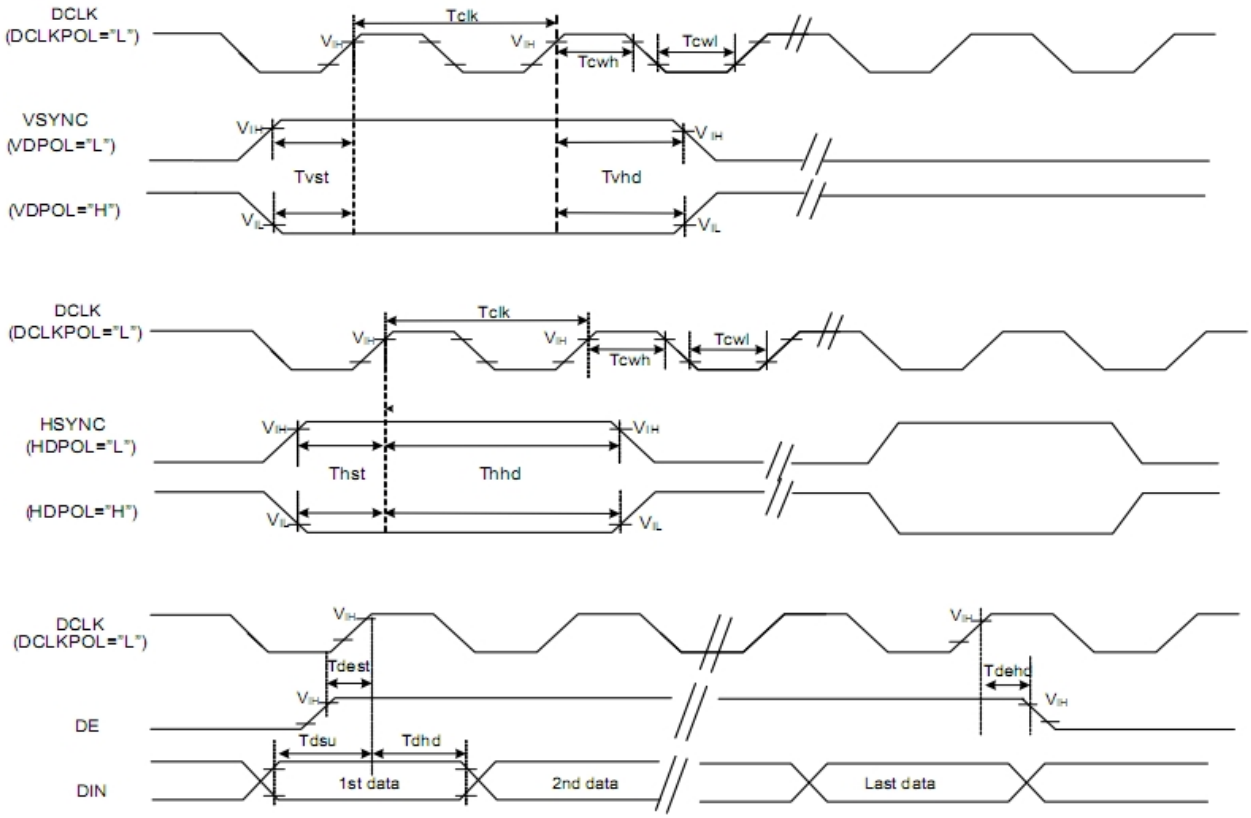
2. To ensure the compatibility of different panels, it is recommended to use the typical setting.
3. It is necessary to keep Tvbp =16 and Thbp =8 in sync mode. DE mode is unnecessary to keep it.
4. The maximum DCLK Frequency is 27MHz. If the case needs faster DCLK, please contact Sitronix.

12 System Bus Timing for RGB Interface

DCLK Neagtive Polarity (DCLPOL="H")



DCLK Positive Polarity (DCLPOL="L")



DC Electrical Characteristics (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C, Bare Chip).

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tcw	40	50	60	%	
VSYNC Setup Time	Tvst	10	-	-	ns	
VSYNC Hold Time	Tvhd	10	-	-	ns	
HSYNC Setup Time	Thst	10	-	-	ns	
HSYNC Hold Time	Thhd	10	-	-	ns	
Data Setup Time	Tdsu	10	-	-	ns	
Data Hold Time	Tdhd	10	-	-	ns	
DE Setup Time	Tdest	10	-	-	ns	
DE Hold Time	Tdehd	10	-	-	ns	

13 Reliability Condition

No change on display and in operation under the following test condition.

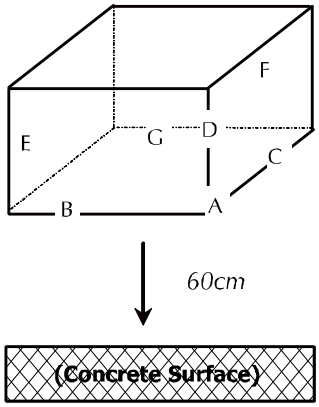
Condition: Unless otherwise specified, tests will be conducted under the following condition.

Temperature: 20°C ± 5°C.

Humidity: 65% ± 5% RH.

Tests will be not conducted under functioning state.

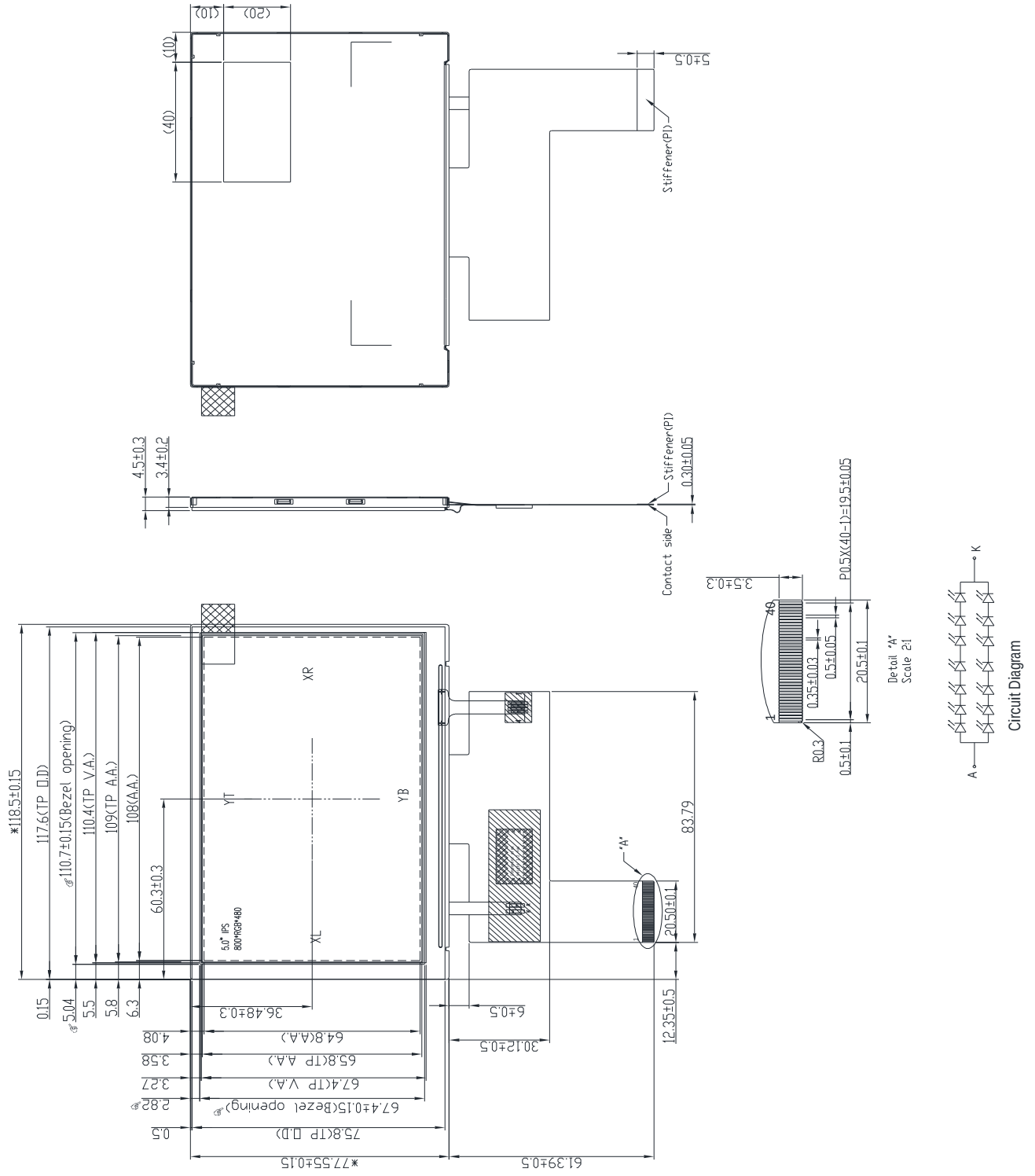
No.	Parameter	Condition	Notes
1	High Temperature Operating	70°C±2°C, 240hrs (Operation state).	-
2	Low Temperature Operating	-20°C±2°C, 240hrs (Operation state).	1
3	High Temperature Storage	80°C±2°C, 240hrs.	2
4	Low Temperature Storage	-30°C±2°C, 240hrs.	1,2
5	High Temperature and High Humidity Operation Test	60°C±2°C, 90%, 240hrs	1,2
6	Vibration Test	Total fixed amplitude: 1.5mm. Vibration Frequency: 10~55Hz. One cycle 60 seconds to 3 direction of X, Y, Z each 15 minutes.	3
7.	Drop Test	To be measured after dropping from 60cm high on the concrete surface in packing state.	-

			*Dropping method corner dropping:* *A corner: Once edge dropping.* *B, C, D edge: Once face dropping.* *E, F, G face: Once.*	

14 Dimensional Outlines

PIN FUNCTION

PIN	SYMBOL
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	XR
38	YB
39	XL
40	YT



15 Incoming Inspection Standards

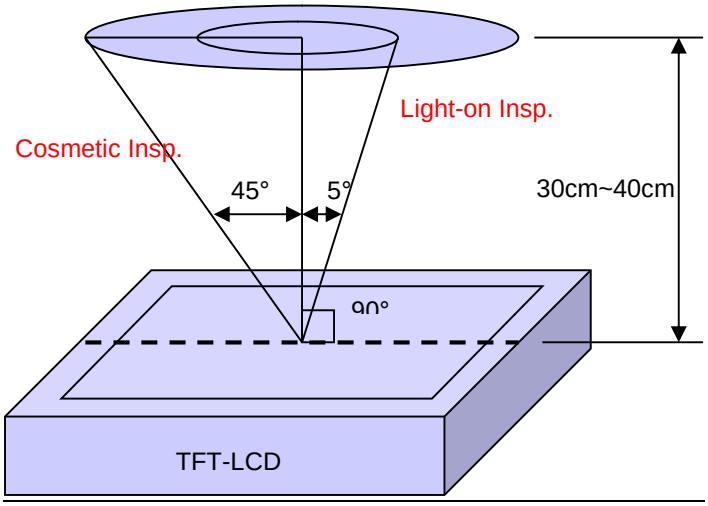
14.1 Inspection and Environment Conditions

14.1.1 Inspection Conditions:

(1)Inspection Distance: 35 cm±5cm

(2)View Angle : Light-on Inspection Angle：±5°

Cosmetic Inspection Angle：±45°



(perpendicular to LCD panel surface)

14.1.2 Environment Conditions:

Ambient Temperature		23°C - 5°C
Ambient Humidity		55±10%RH
Ambient Illumination	Cosmetic Inspection	more than 600 Lux
	Functional Inspection	300~500 Lux

14.1.3 Sampling Conditions:

(1) Lot Size: Quantity of shipment lot per model

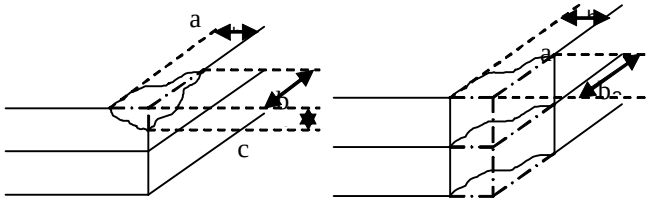
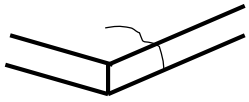
(2) Sampling Method:

Sampling Plan		MIL-STD-105E
		Normal Inspection, Single Sampling
		Level II
AQL	Major Defect	1.0%
	Minor Defect	1.5%

(3) The classification of Major(MA) and Minor(MI) defects is shown as 3.

14.1.4 Inspection Criteria

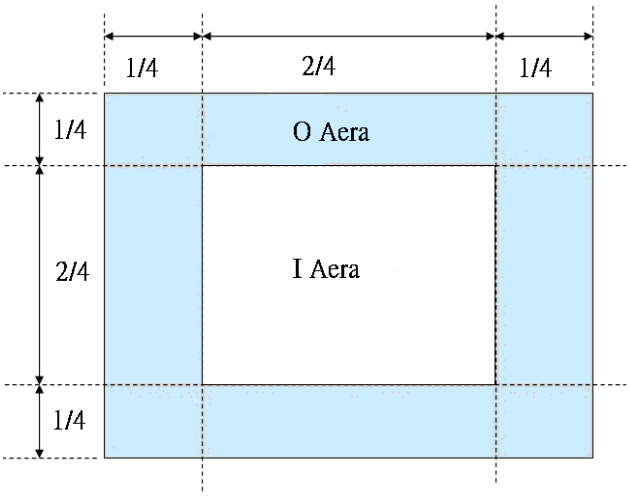
14.1.4.1 Cosmetic Inspection(Panel):

Item	Judgment Criteria	Classification
Chipping on Panel	 a≦3.0mm、b≦3.0mm、c≦t (Bottom glass thickness)	MA
Scratch on Panel *Note-2	W≦0.05mm or L< 5mm: Ignored 0.05mm<W≦0.1mm and L≦5mm: N≦5 W>0.1mm or L>5mm: Not allowed	MI
Bubble or Dent on Panel *Note-3	D≦0.2mm: Ignored 0.2mm<D≦0.3mm: N≦5 D>0.3mm: Not allowed	MI
Panel Crack	 Not Allowed crack	MA
Bezel Deformation	Obvious deformation is not allowed.	MI
Bezel Oxidation	Not allowed if it rusts continuously over 1 cm (It is out of warranty with rusted tin plate)	MI
Bezel Scratch	L□20mm , W□0.2 , N□3	MI
Metal Squash Dent /Flange(Front Side)	D(W)□1,L□3,N□3;	MI
B/L High Voltage Wire Denudation	Not allowed	MA
Polarizer flaw or leak out resin	Defect is defined as the active area.	MI
Outline Dimension	Must in Spec, refer to related product spec.	MI

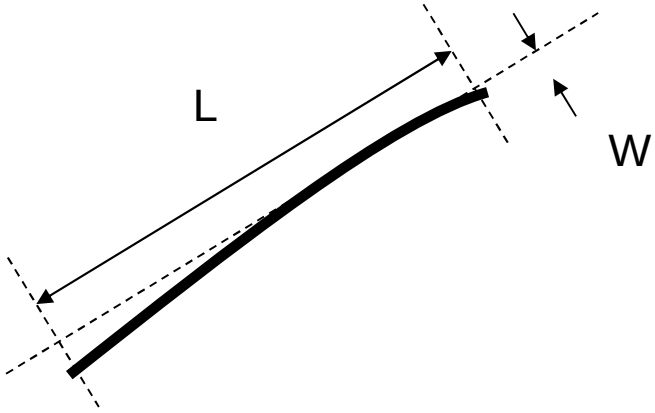
14.1.4.2 Functional Inspection:

<table>
<tr><th rowspan="2">Item</th><th colspan="4">Judgment Criteria</th><th rowspan="2">Classification</th></tr>
<tr><th colspan="2">Area(Note1)</th><th>I</th><th>O</th></tr>
<tr><td rowspan="11">Point Defect</td><td rowspan="3">Bright dot</td><td>Random</td><td colspan="2">2</td><td rowspan="11">MI</td></tr>
<tr><td>2 dots adjacent</td><td>0</td><td>0</td></tr>
<tr><td>3 dots adjacent or more</td><td>0</td><td>0</td></tr>
<tr><td rowspan="3">Dark dot</td><td>Random</td><td colspan="2">3</td></tr>
<tr><td>2 dots adjacent</td><td colspan="2">0</td></tr>
<tr><td>3 dots adjacent or more</td><td>0</td><td>0</td></tr>
<tr><td colspan="2">Total Dot Defect</td><td colspan="2">5</td></tr>
<tr><td rowspan="3">Distance</td><td>Distance between Bright and Bright dot</td><td colspan="2">L□5mm</td></tr>
<tr><td>Distance between Bright and Dark dot</td><td colspan="2">L□5mm</td></tr>
<tr><td>Distance between Dark dot</td><td colspan="2">L□5mm</td></tr>
<tr><td colspan="4">(1) It is defined as Point Defect if defect area > 0.5dot
(2) It is ignored if defect area≦0.5dot
(3)Weak point defect will be defined as Bright Dot if it can be observed through ND filter 5%(Full Screen Black Inspection)</td></tr>
<tr><td>Line Defect</td><td colspan="4">Obvious vertical or horizontal line defect is not allowed.</td><td>MA</td></tr>
<tr><td>Mura</td><td colspan="4">Not allowed if it can be observed through ND Filter 5 %</td><td>MI</td></tr>
<tr><td>Foreign Material
in spot shape
*Note-3</td><td colspan="4">D≦0.2mm: Ignored
0.2mm<D≦0.5mm: N≦8
D>0.5mm: Not allowed</td><td>MI</td></tr>
<tr><td>Foreign Material
in line
or spiral shape
*Note-4</td><td colspan="4">W≦0.05mm or L≦5mm: Ignored
0.05mm<W≦0.2mm and L1.0mm≦5mm: N≦8
W>0.2mm or L>5mm: Not allowed</td><td>MI</td></tr>
<tr><td>Display
Function Abnormal</td><td colspan="4">No Malfunction can be allowed</td><td>MA</td></tr>
</table>

Note-1： I/O Area Definition

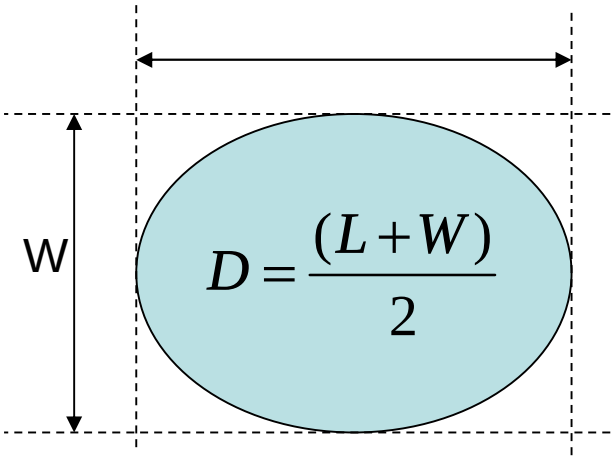


Note-2： Polarizer Scratch



Note-3：Spot Foreign Material

(W ≧L / 4)



Note-4：Line or Spiral Foreign Material

(W<L / 4)

