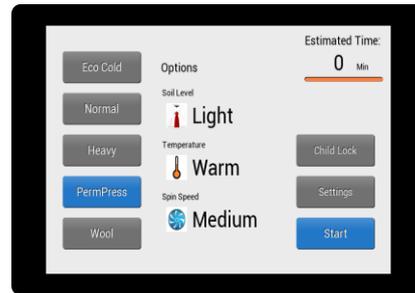


# DP-1012-01A Datasheet



## 1 Introduction

The DP-1012-01A is a colour active matrix TFT-LCD module using amorphous silicon thin-film transistors (TFTs) as active switching devices. It features a 10.1-inch diagonally measured active area with a WUXGA resolution of 1920 × 1200 pixels. Each pixel is divided into red, green, and blue sub-pixels arranged in a vertical stripe configuration, enabling the display of 16.7 million colours.

The module integrates a TFT-LCD panel, display driver ICs, backlight unit, and a capacitive touch panel (CTP). Driven by the HX8290-B display drivers, it supports a dual-channel LVDS interface for stable, high-speed image transmission. Touch input is managed by the GT911 controller over an I<sup>2</sup>C interface, providing accurate, smooth, and responsive capacitive multi-touch functionality.

## 1.1 Features

- 10.1" TFT-LCD with 1920 × 1200 resolution and CTP support
- 16.7M RGB colors for vivid display
- Dual-channel LVDS interface for high-speed, reliable data transfer
- High contrast ratio and transmittance
- Integrated GT911 touch controller with I<sup>2</sup>C interface providing accurate and low-latency capacitive touch response
- Supports up to 5-finger multi-touch
- Meets RoHS requirements for environmental compliance

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## 2 Part Numbers/Ordering Information

Part No.	Description
DP-1012-01A	TFT Display 10.1 inch (1920 x 1200 resolution) with Capacitive Touch Panel

**Table 1 - Part Number/Ordering Information**

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### 3 General Specifications

Item	Specification	Unit	Note
LCD Type	TFT	-	
LCD Size	10.1	inch	
Number of Pixels	1920(H) x 1200(V)	pixels	
Display Mode	Normally Black		
Viewing Angle(CR>10)	80°/80°/80°/80°(typ.)	o'clock	
Interface	2 port LVDS		
Display Colors	16.7M Colors (RGB 8 bit)	colors	
Module Size	259(H) x 158 (V) x 4.23 (D)	mm	
Active Area	216.8064(H) * 135.504(V)	mm	
Pixel Pitch	0.03764(H)×RGB×0.11292(V)	mm	
Display Driver IC	HX8290-B	-	
Touch Panel	Capacitive Touch Panel	-	
Touch Driver IC	GT911	-	
CTP Structure	G + G	-	
TFT & CTP Bonding	Air bonding		
Surface Treatment	HC		
Operation Temperature	-20~70	°C	
Storage Temperature	-30 ~80	°C	

**Table 2 - General Specifications**

**Note:** Complies with environmental protection requirements and is RoHS compliant.

## 4 Hardware Description

The DP-1012-01A features a 10.1-inch TFT-LCD with a 1920 × 1200 resolution, integrated with a capacitive touch panel directly bonded to the LCD.

### 4.1 Pin Assignment

The interface connector pin configurations are described in the following sections.

#### 4.1.1 TFT-LCD Interface Pin Assignment

Pin no	Symbol	Type	Description
1	VLED-	P	LED Cathode
2	VLED-	P	LED Cathode
3	VLED+	P	LED Anode
4	VLED+	P	LED Anode
5	NC	-	No Connection
6	GND	P	Ground
7	RXE3+	I	LVDS Data Input, Even Channel (+)
8	RXE3-	I	LVDS Data Input, Even Channel (-)
9	GND	P	Ground
10	RXE2+	I	LVDS Data Input, Even Channel (+)
11	RXE2-	I	LVDS Data Input, Even Channel (-)
12	GND	P	Ground
13	RXECLK+	I	LVDS Clock Input, Even Channel (+)
14	RXECLK-	I	LVDS Clock Input, Even Channel (-)
15	GND	P	Ground
16	RXE1+	I	LVDS Data Input, Even Channel (+)
17	RXE1-	I	LVDS Data Input, Even Channel (-)
18	GND	P	Ground
19	RXE0+	I	LVDS Data Input, Even Channel (+)
20	RXE0-	I	LVDS Data Input, Even Channel (-)
21	GND	P	Ground
22	RXO3+	I	LVDS Data Input, Odd Channel (+)
23	RXO3-	I	LVDS Data Input, Odd Channel (-)
24	GND	P	Ground
25	RXO2+	I	LVDS Data Input, Odd Channel (+)
26	RXO2-	I	LVDS Data Input, Odd Channel (-)
27	GND	P	Ground
28	RXOCLK+	I	LVDS Clock Input, Odd Channel (+)
29	RXOCLK-	I	LVDS Clock Input, Odd Channel (-)
30	GND	P	Ground
31	RXO1+	I	LVDS Data Input, Odd Channel (+)
32	RXO1-	I	LVDS Data Input, Odd Channel (-)
33	GND	P	Ground
34	RXO0+	I	LVDS Data Input, Odd Channel (+)

35	RX00-	I	LVDS Data Input, Odd Channel (-)
36	GND	P	Ground
37	I2C_SDA	I	Reserved for LCD manufacturer's use (No Connection)
38	I2C_SCL	I	Reserved for LCD manufacturer's use (No Connection)
39	VDD_OTP	P	Reserved for LCD manufacturer's use (No Connection)
40	EEPEN	I	No Connection
41	VDD	P	Power Supply, 3.3V(Typ.)
42	VDD	P	Power Supply, 3.3V(Typ.)
43	VDD	P	Power Supply, 3.3V(Typ.)
44	VDD	P	Power Supply, 3.3V(Typ.)
45	VDD	P	Power Supply, 3.3V(Typ.)

**Table 3 - TFT-LCD Interface Pin Definition**

### 4.1.2 CTP Interface Pin Assignment

**I2C Interface Pin Definition, connector: FPC 0.5mm pitch 6pin**

Pin no	Name	Type	Description
1	SDA	I/O	I2C serial bus, data line (3.3V)
2	SCL	I/O	I2C serial bus, clock line (3.3V)
3	RES	I	Reset input(3.3V)
4	INT	O	Interrupt request to the host (3.3V)
5	GND	P	Ground
6	VDD_CTP	P	Power Supply, 3.3V(Typ.)

**Table 4 - CTP Interface Pin Definition**

## 5 Specifications

### 5.1 Absolute Maximum Ratings

The following values are absolute maximum ratings. Operation beyond these limits may cause malfunction or permanent damage to the device.

#### 5.1.1 Electrical Absolute Maximum Ratings

Item	Symbol	MIN.	MAX.	Unit	Remarks
Power Supply Voltage	VDD	VSS-0.3	3.6	V	T <sub>a</sub> =25°C

**Table 5 - Electrical Absolute Maximum Ratings**

#### 5.1.2 Environmental Absolute Maximum Ratings

Item	Symbol	MIN.	MAX.	Unit	Remarks
Operating Temperature	T <sub>OP</sub>	-20	70	°C	
Storage Temperature	T <sub>ST</sub>	-30	80	°C	
Operating Ambient Humidity	H <sub>OP</sub>	10	90	%RH	
Storage Humidity	H <sub>ST</sub>	10	90	%RH	

**Table 6 - Environmental Absolute Maximum Ratings**

## 5.2 Electrical Specifications

### 5.2.1 Electrical Characteristics

Condition: T<sub>a</sub>=25±2°C

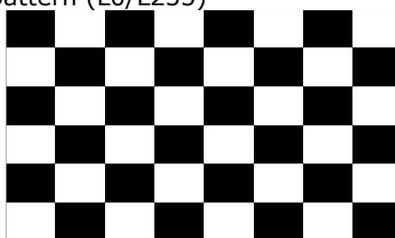
Item	Symbol	Min.	Typ.	Max.	Unit	Note	
Power Supply Voltage	VDD	3.0	3.3	3.6	V		
	V <sub>RP</sub>	-	-	300	mV	Ripple	
	VDD_CTP	-	3.3	-	V		
Power Supply Current	IDD	-	300	360	mA	Note 1	
Power Consumption	P <sub>LCD</sub>	-	1	1.2	W	Note 2	
Inrush Current	I <sub>RUSH</sub>	-	-	3.0	A		
CMOS Interface	Input Voltage	V <sub>IH</sub>	2.7	-	3.3	V	
		V <sub>IL</sub>	0	-	0.5	V	
	Output Voltage	V <sub>OH</sub>	2.7	-	3.3	V	
		V <sub>OL</sub>	0	-	0.5	V	

**Table 7 - LCD Module Electrical Specifications**

**Note:**

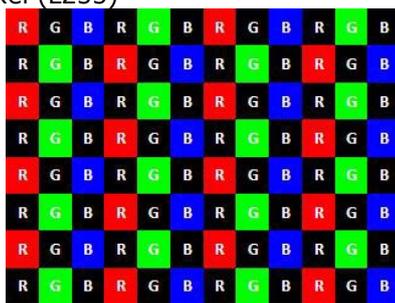
1. The supply is measured and specified at the LCM interface connector. Current consumption and power values are based on VDD = 3.3 V, frame rate f<sub>V</sub> = 60 Hz, and clock frequency = 80 MHz. Power supply current is measured under the following test patterns:

a) Typical: Mosaic 8 × 6 pattern (L0/L255)



**Figure 1 - Mosaic 8x6 pattern**

b) Maximum: Skip sub-pixel (L255)



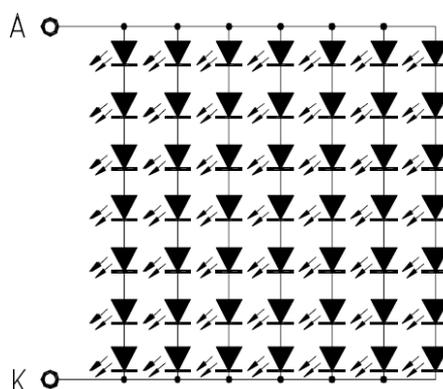
**Figure 2 - Skip sub-pixel**

2. The inrush current duration is approximately 2 ms and the power input rise time is 1 ms(min).

### 5.2.2 LED Backlight Specification

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Current	$I_{LED}$	-	160	-	mA	Total LED
Forward Voltage	$V_F$	18.9	22.4	24.5	V	$I_F=160mA$
Reverse Current	$I_R$	-	-	10	uA	$V_R=5V$ , 1 LED Note 1
Power Dissipation	$P_d$	3584			mW	Total LED

**Table 8 - LED Backlight Specification**



**Figure 3 - Backlight LED Circuit**

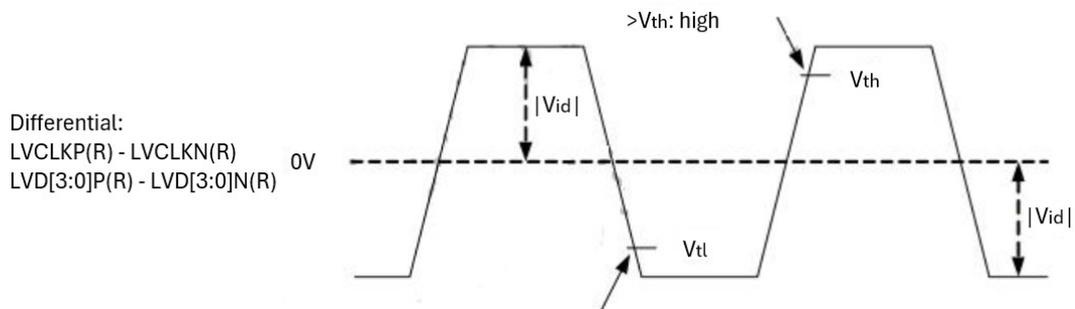
**Note:**

The specified Reverse Voltage ( $V_r$ ) and Reverse Current ( $I_r$ ) are defined per LED. Since the backlight is a 7×7 array, the effective reverse voltage for a full string will scale accordingly. Only the full array terminals are accessible at the module level.

### 5.2.3 LVDS Electrical Characteristics

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Differential Input High Threshold Voltage	$V_{th}$	-	-	0.1	V	$V_{cm} = 1.2V$
Differential Input Low Threshold Voltage	$V_{tl}$	-0.1	-	-	V	
Differential Input Common Threshold Voltage	$V_{cm}$	1	1.2	$1.7 -  V_{id} /2$	V	
LVDS Input Voltage	$V_{invi}$	0.7	-	1.7	V	
Differential Input Voltage	$ V_{id} $	0.35	-	0.6	V	
Differential Input Leakage Voltage	$I_{ivleak}$	-10	-	10	$\mu A$	

**Table 9 - AC Electrical Characteristics**



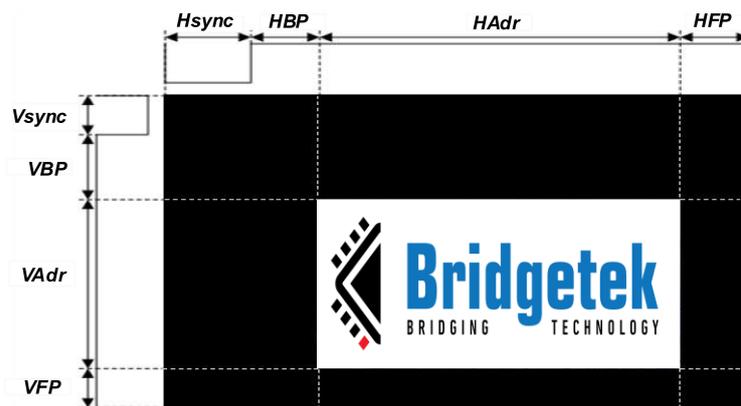
**Figure 4 - LVDS Electrical Characteristics**

## 5.3 Timing

### 5.3.1 LVDS Timing Specification

Item	Symbol	Values			Unit
		Min.	Typ.	Max.	
DCLK Frequency	$F_{dclk}$	74.5	77.56	85	MHz
Horizontal Display Area	$T_{hd}$	960			DCLK
HSYNC Period Time	$T_h$	989	1040	1248	DCLK
Horizontal Blank	$t_{HB}$	29	80	288	DCLK
HSYNC Pulse Width	$T_{hp}$	2	10	255	DCLK
HSYNC Back Porch	$T_{hbp}$	3	6	255	DCLK
HSYNC Front Porch	$T_{hfp}$	24	64	260	DCLK
Vertical Display Area	$T_{vd}$	1200			H
VSYNC Period Time	$T_v$	1243	1243	1560	H
Vertical Blank	$T_{VB}$	43	43	360	H
VSYNC Pulse Width	$T_{vp}$	4	4	20	H
VSYNC Back Porch	$T_{vbp}$	20	20	255	H
VSYNC Front Porch	$T_{vfp}$	19	19	260	H
Frequency	$f_v$	-	60	-	Hz

**Table 10 - LVDS Timing Parameter**

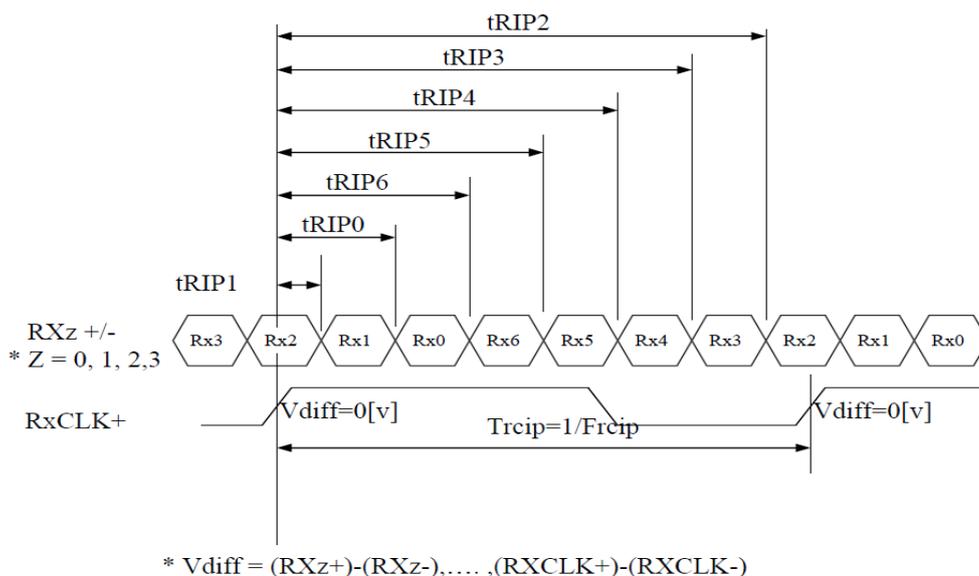


**Figure 5 - LVDS Timing Characteristic**

### 5.3.2 LVDS AC Timing Specification

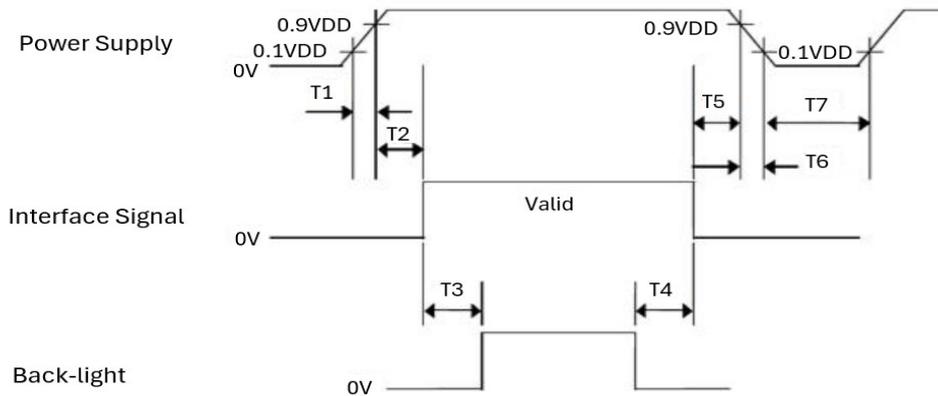
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
CLK Frequency	Frcip	20	-	85	MHz	
CLKIN Period	tRCIP	11.76	-	-	nsec	
Input Data 0	tRIP1	tRCIP/7 x (-0.2)	0	tRCIP/7 x 0.2	nsec	
Input Data 1	tRIP0	tRCIP/7 x 0.8	tRCIP/7	tRCIP/7 x 1.2	nsec	
Input Data 2	tRIP6	tRCIP/7 x 1.8	tRCIP/7 x 2	tRCIP/7 x 2.2	nsec	
Input Data 3	tRIP5	tRCIP/7 x 2.8	tRCIP/7 x 3	tRCIP/7 x 3.2	nsec	
Input Data 4	tRIP4	tRCIP/7 x 3.8	tRCIP/7 x 4	tRCIP/7 x 4.2	nsec	
Input Data 5	tRIP3	tRCIP/7 x 4.8	tRCIP/7 x 5	tRCIP/7 x 5.2	nsec	
Input Data 6	tRIP2	tRCIP/7 x 5.8	tRCIP/7 x 6	tRCIP/7 x 6.2	nsec	

**Table 11 - LVDS AC Timing Parameter**



**Figure 6 - LVDS AC Timing Characteristic**

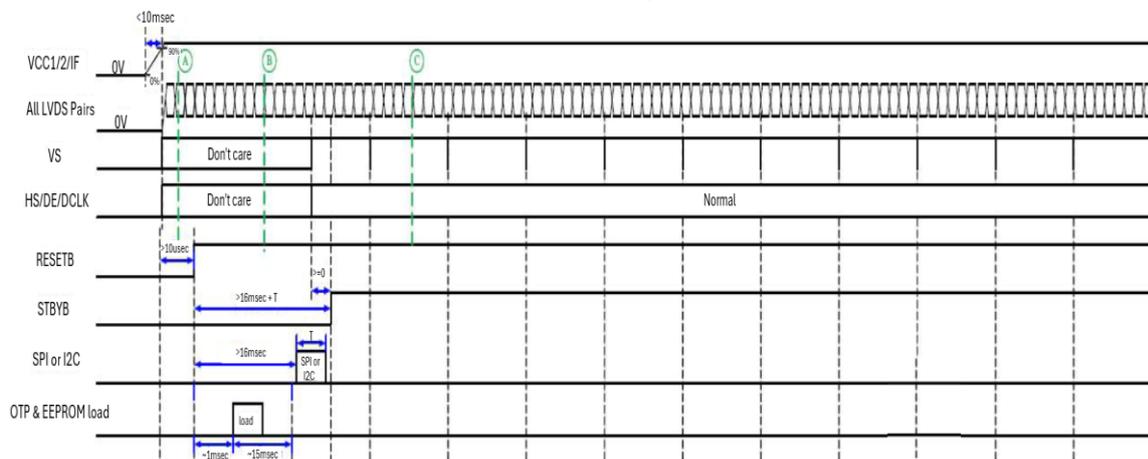
## 5.4 Power Sequence



**Figure 7 - Power Sequence**

Symbol	Values			Unit
	Min.	Typ.	Max.	
T1	0	-	10	ms
T2	0	-	50	ms
T3	200	-	-	ms
T4	500	-	-	ms
T5	0	-	50	ms
T6	0	-	10	ms
T7	500	-	-	ms

**Table 12 - Sequence Table**



**Figure 8 - Power Sequence**

## 5.5 Optical Specifications

The optical specifications shall be measured in a dark room (ambient luminance  $\leq 1$ lux, temperature =  $25 \pm 2$  °C) using a luminance meter system (gonio-meter system and TOPCON BM-5). The test unit shall be positioned approximately 50 cm from the LCD surface at a viewing angle of  $\theta$  and  $\Phi = 0^\circ$ .

Viewing directions are defined as follows:

- $\theta = 0^\circ$  ( $\theta_3$ ): 3 o'clock direction ("right")
- $\theta = 90^\circ$  ( $\theta_{12}$ ): 12 o'clock direction ("upward")
- $\theta = 180^\circ$  ( $\theta_9$ ): 9 o'clock direction ("left")
- $\theta = 270^\circ$  ( $\theta_6$ ): 6 o'clock direction ("bottom")

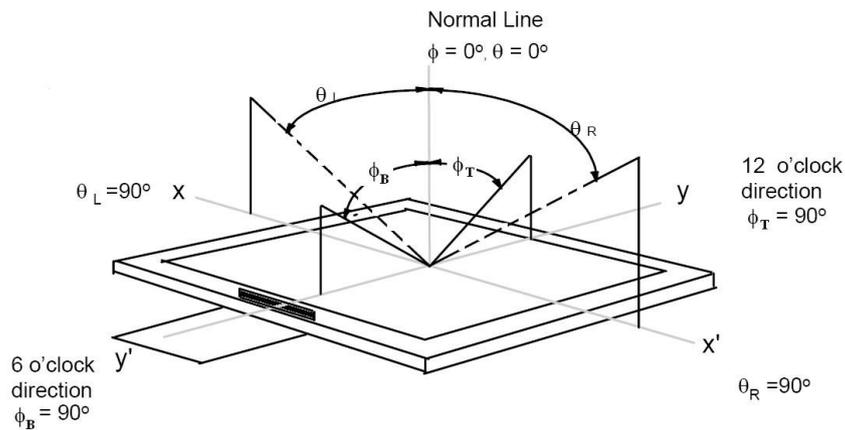
While scanning  $\theta$  and/or  $\Phi$ , the center of the measuring spot on the display surface shall remain fixed.

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp	$\theta=0^\circ$	300	350	-	Cd/m <sup>2</sup>	
Viewing Angle	$\theta_L$	Cr $\geq$ 10	70	80	-	Deg	Note 1
	$\theta_R$		70	80	-		
	$\Phi_T$		70	80	-		
	$\Phi_B$		70	80	-		
Contrast Ratio	Cr	$\theta=0^\circ$	700	900	-	-	Note 2
Response Time	$T_r + T_f$	FF=0°	-	30	35	ms	Note 3
Color Coordinate of CIE 1931	Red	x	-0.03	0.644	+0.03	-	@BOE BLU Note 4
		y		0.344		-	
	Green	x		0.315		-	
		y		0.632		-	
	Blue	x		0.157		-	
		y		0.054		-	
	White	x		0.285		-	
		y		0.327		-	
NTSC Ratio	NTSC	CIE 1931	-	72	-	%	@BOE BLU Note 5
Polarization Direction of Front Polarizer	PdF	-	-	0	-	deg	Absorption axis Note 6
Polarization Direction of Rear Polarizer	PdR		-	90	-	deg	

**Table 13 - Optical Specifications**

**Note :**

1. Definition of viewing angle: Refer to Figure 9 below, indicated by  $\theta$  and  $\Phi$ .



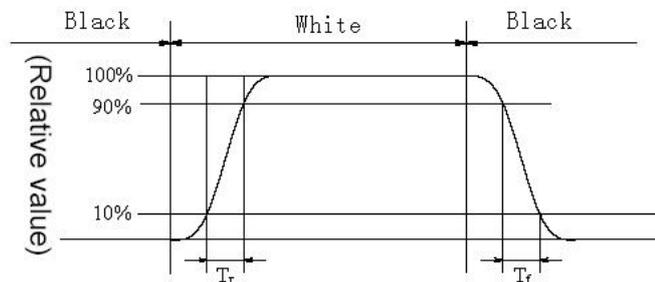
**Figure 9 - Viewing Angle**

2. Definition of contrast ratio: Contrast ratio is measured in optimum common electrode voltage.

$$\text{Contrast Ratio(CR)} = \frac{\text{Luminance when LCD is at "White" state}}{\text{Luminance when LCD is at "Black" state}}$$

3. Definition of response time. (Test equipment: RD80S or similar equipment)  
The output signal and photo detector response are measured when the input signal changes from "black" to "white" (voltage falling time) and from "white" to "black" (voltage rising time), respectively.

The response time is defined as the time interval between 10% and 90% of the signal amplitude. Refer to the figures below.



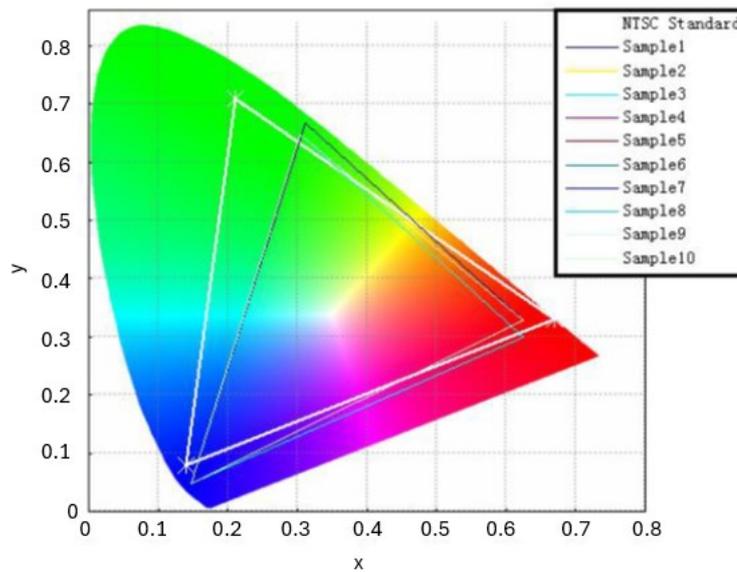
**Figure 10 - Response Time**

4. Color Coordinates of CIE 1931 : The Color Coordinates (CIE 1931) are measured at the center of the display.

Test Conditions: - LED Current (ILED): 20 mA  
- Measurement Location: On the surface of the LCD module at 25 °C  
- Equipment: CS2000 or equivalent

5. Definition of Color of CIE Coordinate and NTSC Ratio.

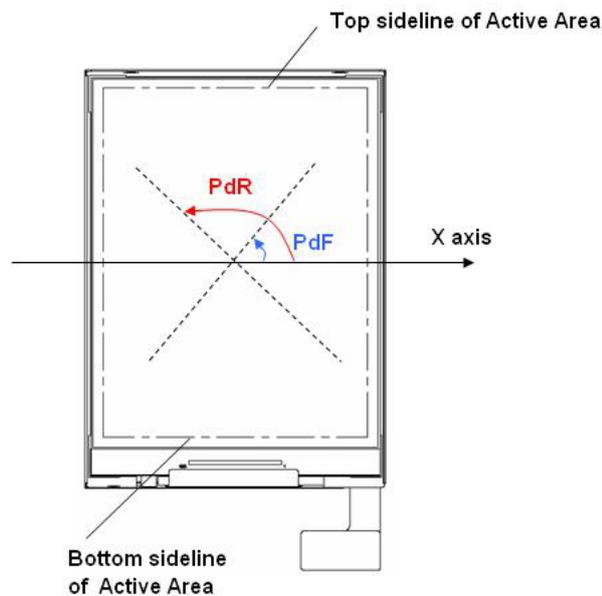
$$S = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}} \times 100\%$$



**Figure 11 - Color of CIE Coordinate and NTSC Ratio**

6. Definition of Polarization Direction

- Viewing Direction: Defined as the normal user viewing direction, perpendicular to the display surface.
- Front Polarizer: The polarizer closer to the viewer.
- Rear Polarizer: The polarizer on the side opposite the viewer.
- X-Axis: Defined as the line parallel to the top and bottom edges of the Active Area.
- PdF: Polarization degree of the Front Polarizer, indicated by the blue arrow.
- PdR: Polarization degree of the Rear Polarizer, indicated by the red arrow.
- Polarization Degree: Must be specified within a range of 0° to 180° according to the definitions above.



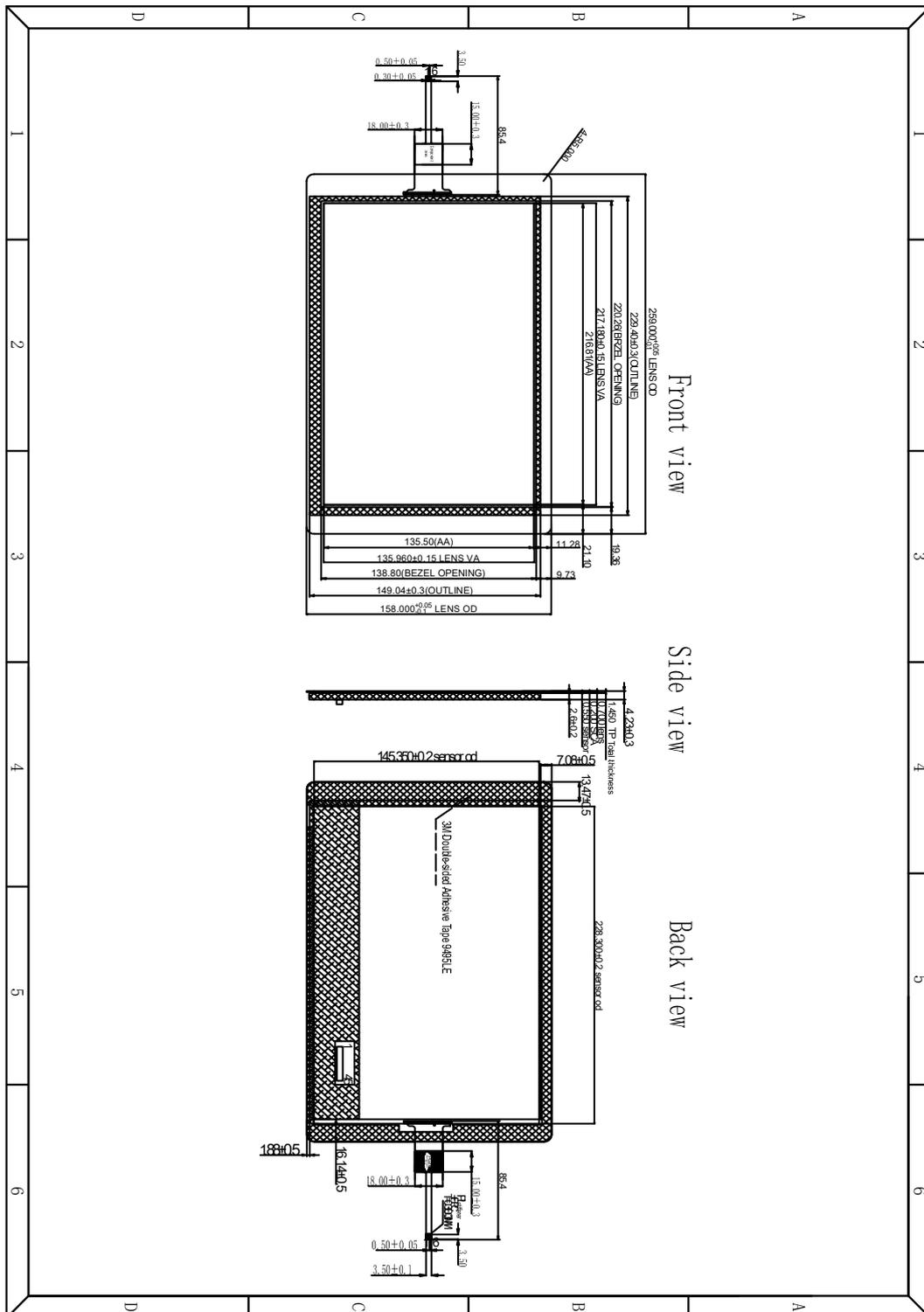
**Figure 12 - Polarization Direction**

## 6 Reliability Test Items

<b>Test Item</b>	<b>Test Conditions</b>	
High Temperature Storage Test	+80°C	240hrs
Low Temperature Storage Test	-30°C	240hrs
High Temperature Operation Test	+70°C	240hrs
Low Temperature Operation Test	-20°C	240hrs
High Temperature and High Humidity (operation test)	+60°C, 90%RH	240hrs
Thermal Shock	-40°C ~ +80°C	1hr/cycle, 100 cycles

**Table 14 - Reliability Test Items**

## 7 Dimension



**Figure 13 - LCM Dimension**

## **8 Disclaimer Notice: Use of Third-Party Software or Websites**

We may recommend use of software or web sites that are owned or operated by other companies. We offer or facilitate this recommendation by hyperlinks or other methods to aid your access to the third-party resource. While we endeavour to direct you to helpful, trustworthy resources, we cannot endorse, approve, or guarantee software, information, products, or services provided by or at a third-party resource or track changes in the resource. Thus, we are not responsible for the content or accuracy of any third-party resource or for any loss or damage of any sort resulting from the use of, or for any failure of, products or services provided at or from a third party resource.

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## 9 Warranty Statement

According to our after-sales policy, the warranty (if applicable) will be void under the following circumstances:

- The device has been damaged due to human factors, such as dropping, impact, water exposure, or unauthorized disassembly/modification.
- The device has malfunctioned due to improper use, mishandling, or usage beyond its intended design.
- The device has been disassembled, repaired, or modified by unauthorized personnel.
- Any other conditions that do not comply with our warranty policy. For details, please [contact our sales team](#).

## 10 Contact Information

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## Appendix A – References

### Document References

NA

### Acronyms and Abbreviations

Terms	Description
BLU	Backlight Unit
CTP	Capacitive Touch Panel
DC	Direct Current
FPC	Flexible Printed Circuit
IC	Integrated Circuit
I2C	Inter-Integrated Circuit
LCD	Liquid Crystal Display
LCM	Liquid Crystal Module
LED	Light Emitting Diode
LEDA	Light Emitting Diode Anode
LEDK	Light Emitting Diode Cathode
LVDS	Low-Voltage Differential Signaling
TFT	Thin Film Transistor

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## Appendix C – Revision History

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