DP-0502-11A Datasheet

1 Introduction

The DP-0502-11A is a 5-inch TFT-LCD module with a resolution of 480 × 272 pixels. It integrates a TFT-LCD panel, HX8257 driver IC, flexible printed circuit (FPC), backlight unit, and resistive touch panel (RTP).

Designed to support 16.7 million colors through an RGB interface, the DP-0502-11A delivers high-quality display performance and reliable operation suitable for embedded applications.

1.1 Features

- 5.0" TFT-LCD with 480 × 272 resolution and resistive touch panel (RTP)
- Supports 16.7M colors for vivid and accurate display output
- RGB interface for reliable signal transmission
- Compliant with RoHS environmental requirements

2 Part Numbers/Ordering Information

Part No.	Description
DP-0502-11A	TFT Display 5 inch (480 * 272 resolution) with Resistive Touch Panel

Table 1 - Part Number/Ordering Information

Table of Contents

3 General Specifications

Item	Specification	Unit	Note
LCD Type	TFT	-	
LCD Size	5	inch	
Number of Pixels	480(H) x 272(V)	pixels	
Viewing Direction	12	o'clock	
Interface	24-bit RGB		
Display Colors	16.7M Colors (RGB 8 bit)	colors	Note 2
Module Size	120.70(H) x 75.80(V) x 4.30(D)	mm	Note 3
Active Area	110.88(H) x 62.83(V)	mm	
Display Driver IC	HX8257	-	
Polarizer Mode	Transmissive/negative	-	
Touch Panel	Resistive Touch Panel	-	
Operation Temperature	-20~+70°C	°C	
Storage Temperature	-30~+80°C	°C	

Table 2 - General Specifications

Note:

1. Complies with environmental protection requirements and is RoHS compliant.
2. Color tune is slightly changed by temperature and driving voltage.
3. Module size excludes FPC and solder; with RTP.

4 Hardware Description

The DP-0502-11A features a 5-inch TFT-LCD with a 480 × 272 resolution, integrated with a resistive touch panel.

4.1 TFT-LCD Interface Pin Assignment

The interface connector pin configuration is described below.

Pin no	Symbol	Type	Description
1	VLED-	P	LED backlight (Cathode)
2	VLED+	P	LED backlight (Anode)
3	GND	P	Ground
4	VCC	P	Power Supply
5	R0	I	Red Data Input
6	R1	I	Red Data Input
7	R2	I	Red Data Input
8	R3	I	Red Data Input
9	R4	I	Red Data Input
10	R5	I	Red Data Input
11	R6	I	Red Data Input
12	R7	I	Red Data Input
13	G0	I	Green Data Input
14	G1	I	Green Data Input
15	G2	I	Green Data Input
16	G3	I	Green Data Input
17	G4	I	Green Data Input
18	G5	I	Green Data Input
19	G6	I	Green Data Input
20	G7	I	Green Data Input
21	B0	I	Blue Data Input
22	B1	I	Blue Data Input
23	B2	I	Blue Data Input
24	B3	I	Blue Data Input
25	B4	I	Blue Data Input
26	B5	I	Blue Data Input
27	B6	I	Blue Data Input
28	B7	I	Blue Data Input
29	GND	P	Ground
30	PCLK	I	Data Clock
31	DISP	I	Normal Display and Standby Mode select pin
32	HSYNC	I	Line Sync Signal
33	VSYNC	I	Frame Sync Signal
34	DE	I	Data Enable Pin
35	NC	-	No Connection

36	GND	P	Ground
37	X1	O	Touch Panel Control Pin
38	Y1	O	Touch Panel Control Pin
39	X2	O	Touch Panel Control Pin
40	Y2	O	Touch Panel Control Pin

Table 3 - TFT-LCD Interface Pin Definition

5 Specifications

5.1 Absolute Maximum Ratings

5.1.1 Electrical Absolute Maximum Ratings

Condition: V_{SS}=0V, T_a=25°C

Item	Symbol	MIN.	MAX.	Unit	Note
Power Supply Voltage	VCC	-0.3	3.6	V	Note 1, 2
Logic Signal Input/ Output Voltage	V_{IOVCC}	-0.3	VCC+0.5	V	

Table 4 - Electrical Absolute Maximum Ratings

Note:

1. Permanent damage to the LCD module may occur if operated beyond the specified limits. Operation beyond the specified electrical characteristics may lead to malfunction or reduced reliability.
2. VCC must always be greater than Vss.

5.1.2 Environmental Absolute Maximum Ratings

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30°C	80°C	-20°C	70°C	Note 1, 2
Humidity	-	-	-	-	Note 3

Table 5 - Environmental Absolute Maximum Ratings

Note:

1. Response time decreases at low operating temperatures.
2. Background color may vary slightly with ambient temperature; this phenomenon is reversible.
3. Ta<=40°C: 85%RH MAX
   Ta>=40°C: Absolute humidity must not exceed the equivalent of 85% RH at 40°C.

5.2 Electrical Specifications

5.2.1 Electrical Characteristics

Condition: Vss=0V, T_a=25°C

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply		VCC	3.0	3.3	3.6	V	
Input Voltage	'H'	V_{IH}	0.8*Vcc	-	Vcc	V	Vcc=2.8V
	'L'	V_{IL}	0	-	0.2*Vcc	V	Vcc=2.8V
Current Consumption		I_{cc1}	-	20	30	mA	Normal mode, Note 2
		I_{cc2}	-	0.03	0.09	mA	Sleep mode, Note 2

Table 6 - Electrical Characteristics

Note:

1. Measured at optimum contrast in transmissive mode.
2. Tested in 1x1 chessboard pattern.

5.2.2 LED Backlight Specification

The backlight consists of 12 white LEDs arranged in a 6 × 2 matrix, providing uniform illumination across the display.

Condition: V_{SS}=0V, T_a=25°C

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage		Vf	17	18	19	V	Note 1
Supply Current		I_f	-	40	-	mA	Note 2
Forward Current	Normal	I_{pn}	-	40	-	mA	
	Dimming	I_{pd}	-	-	-	mA	6x2-chip serial

Table 7 - LED Backlight Specification

Note:

1. V_{LED} = V_{LED}(+) - V_{LED}(-)
2. The LED current is 20mA.
   It is recommended to drive the LED using a constant current mode.
3. LED power consumption is around 0.132W.
4. The forward current versus ambient temperature characteristics shown in Figure 1 are specified per LED string.

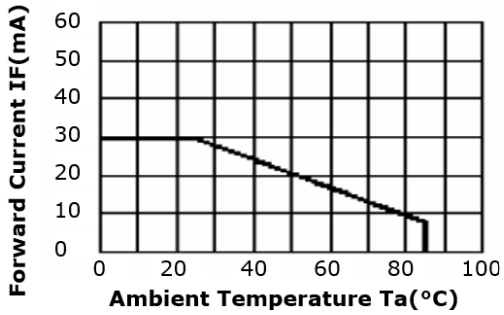

Figure 1 - Forward Current vs Ambient Temperature

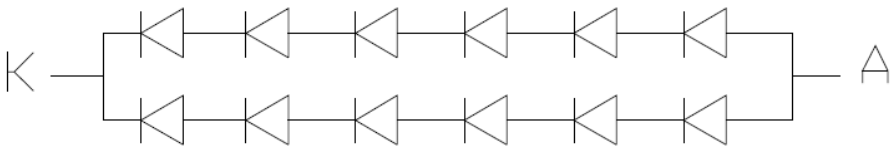

Figure 2 - Backlight LED Circuit

5.3 Parallel RGB Input Timing

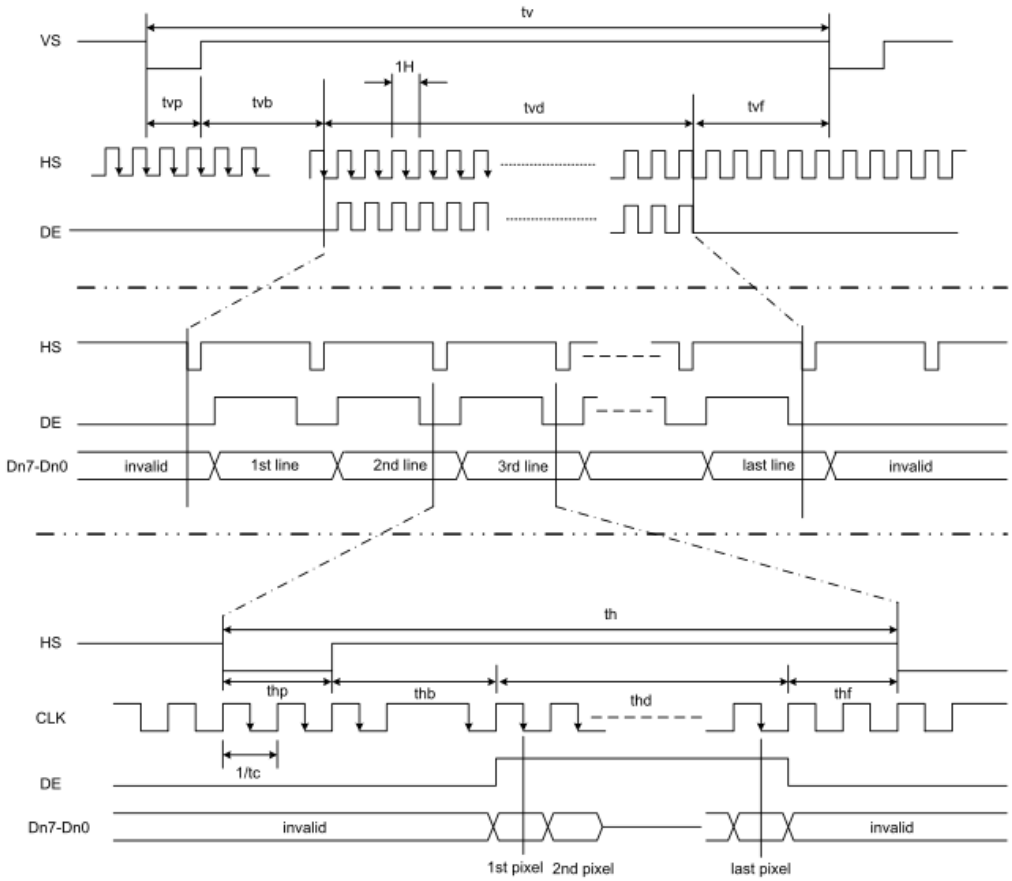

Figure 3 - Parallel RGB Input Timing

Condition: V_{SS}=0V, T_a=25°C

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Clock Cycle	f_{CLK}	-	9	15	MHz
Hsync Cycle	1/th	-	17.14	-	KHz
Vsync Cycle	1/tv	-	59.94	-	Hz
Horizontal Cycle	th	525	525	605	CLK
Horizontal Display Period	thd		480		CLK
Horizontal Front Porch	thf	2	2	82	CLK
Horizontal Pulse Width	thp	2	41	41	CLK
Horizontal Back Porch	thb	2	2	41	CLK
Vertical Cycle	tv	285	286	399	H
Vertical Display Period	tvd		272		H
Vertical Front Porch	tvf	1	2	227	H
Vertical Pulse Width	tvp	1	10	11	H
Vertical Back Porch	tvb	1	2	11	H

Table 8 - Parallel RGB Input Timing

Note: Unit: CLK=1/f_{CLK} , H=th

5.4 Optical Specifications

All optical specifications are measured under typical condition (Note 1, 2)

Item	Symbol		Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp		θ=0° Φ=0°	200	250	-	Cd/m^2	Note 1
Uniformity	⊿Bp			70	80	-	%	Note 1 Note 2
Viewing Angle	3:00		Cr≥10	-	45	-	Deg	Note 3
	6:00			-	25	-		
	9:00			-	45	-		
	12:00			-	45	-		
Contrast Ratio	Cr		θ=0° Φ=0°	350	500	-	-	Note 4
Response Time	T_r			-	10	-	ms	Note 5
	T_f			-	10	-	ms	
Color of CIE Coordinate	W	x	θ=0° Φ=0°		0.28		-	Note 1 Note 6
		y			0.33		-	
	R	X			0.51		-	
		y			0.34		-	
	G	x			0.31		-	
		y			0.56		-	
	B	x			0.15		-	
		y			0.14		-	
NTSC Ratio	S			50	60	-	%	

Table 9 - Optical Specifications

Remark: ***Parameters may vary slightly depending on temperature, driving voltage, and material.***

Note:

1. Data are measured after the LEDs are turned on for 5 minutes with the LCM displaying full white. Brightness is the average value of 9 measured points. Measurement equipment: PR-705 (Φ8mm)

   Measuring Conditions:

   - Environment: Dark room
   - Temperature: Ta=25°C
   - Operating voltage adjusted for optimum contrast at the center of the display
   - Values measured at the center point of the LCD panel after more than 5 minutes of backlight operation

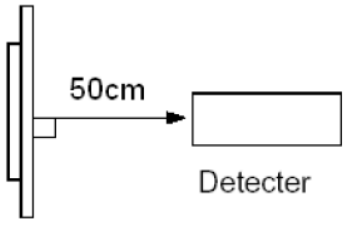

Figure 4 - Measurement Setup

2. The luminance uniformity is calculated using the following formula:

$$\Delta Bp = \frac{\mathbf{Bp\ (Min.)}}{\mathbf{Bp\ (Max.)}} \times 100\%$$

Bp (Max.) = Maximum brightness in 9 measured spots
Bp (Min.) = Minimum brightness in 9 measured spots

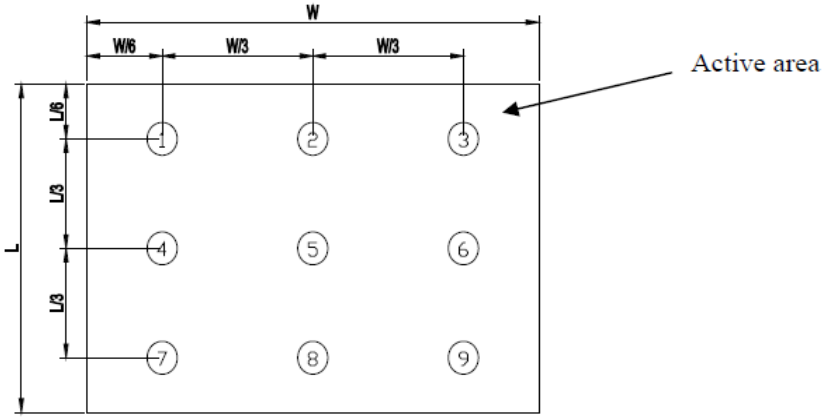

Figure 5 - Measurement Point

3. Definition of viewing angle: Refer to the figure below, indicated by θ and Φ.

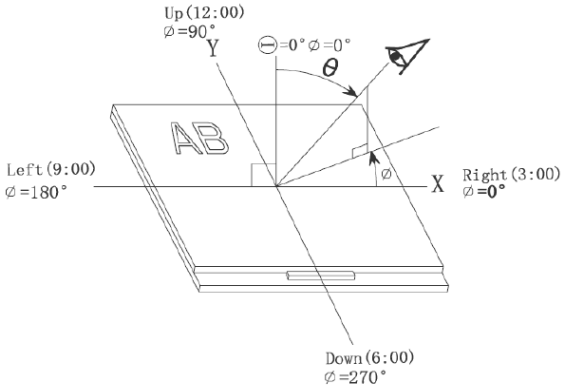

Figure 6 - Viewing Angle

4. Definition of Contrast ratio. (Test equipment: DMS501)

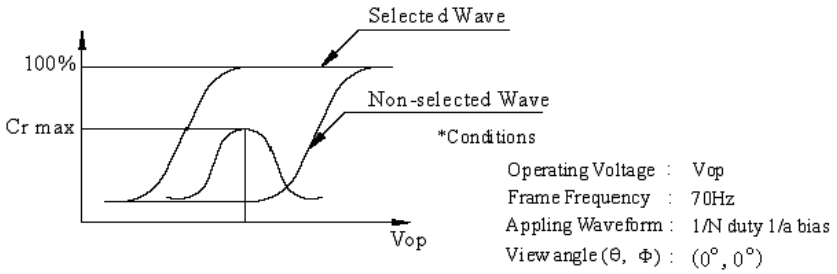

Figure 7 - Contrast Ratio

$$\text{Contrast ratio, } Cr = \frac{\mathbf{Brightness\ of\ selected\ dots}}{\mathbf{Brightness\ of\ non-selected\ dots}}$$

5. Definition of response time. (Test equipment: DMS501)

   The output signals of the photo detector are measured when the input signal changes from "black" to "white" (falling time) and from "white" to "black" (rising time). Response time is defined as the time interval between 10% and 90% of the signal amplitude. Refer to the figure below for illustration.

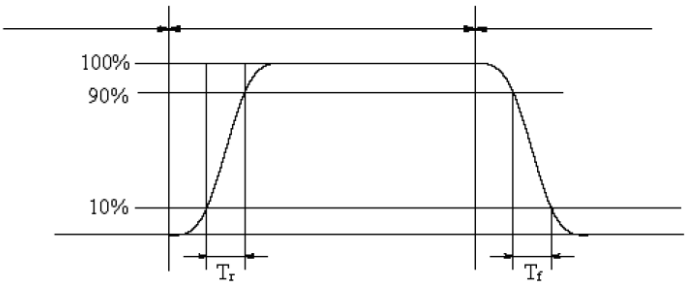

Figure 8 - Definition of Response Time

6. Definition of color in terms of CIE coordinates and NTSC ratio.

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

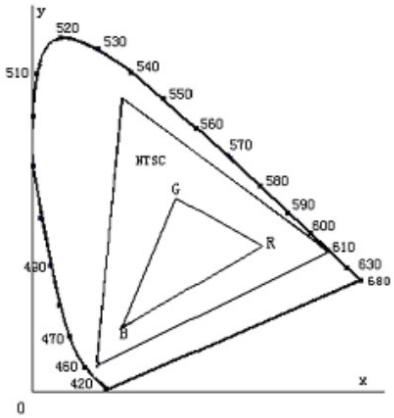

Figure 9 - 1931 CIE Chromaticity Diagram

7. Definition of cross talk.

   Cross talk ratio(%)= $\frac{|\text{Pattern A Brightness} - \text{Pattern B Brightness}|}{\text{Pattern A Brightness}} \times 100\%$

Electric volume value=3F+/-3Hex

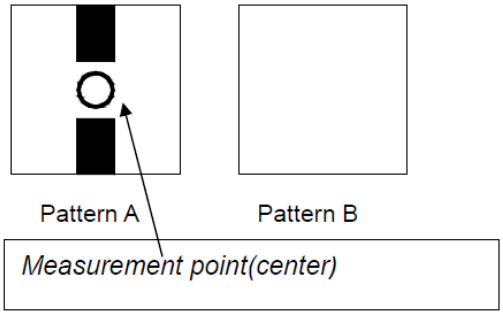

Figure 10 - Definition of Cross Talk

6 Reliability Test Items

Test Item	Test Conditions	Criterion
High Temperature Storage	Temperature: +80°C±2°C Duration: 96hrs Restoration: 2hrs at 25°C Power Status: OFF	1.No cosmetic or electrical defects shall be observed after testing. 2.Total current consumption shall not exceed twice the initial value.
Low Temperature Storage	Temperature: -30°C±2°C Duration: 96hrs Restoration: 2hrs at 25°C Power Status: OFF	
High Temperature Operation	Temperature: +70°C±2°C Duration: 96hrs Restoration: 2hrs at 25°C Power Status: ON	
Low Temperature Operation	Temperature: -20°C±2°C Duration: 96hrs Restoration:4hrs at 25°C Power Status: ON	
High Temperature and Humidity Operation	Temperature: +60°C±2°C Humidity: 90% RH Duration: 96hrs Power Status: ON	
Temperature Cycle	Range: -30°C ~ +80°C Cycle: 5 cycles Dwell: 30 min at each extreme Transfer Time: 5 min Restoration: 2hrs at 25°C Power Status: OFF	
Vibration Test	Frequency: 10Hz ~ 150Hz Acceleration:100m/s^2 Duration: 120min	Cosmetic and electrical defects are not permitted.
Shock Test	Waveform: Half-sine wave Acceleration: 300m/s^2 Duration: 11ms	

Table 10 - Reliability Test Items

Note: Operation：Supply 3.3 V to the logic system.

The inspection criteria after reliability testing are as follows:

Item	Inspection
Contrast	CR > 50%
I_{DD}	I_{DD} < 200%
Brightness	Brightness > 60%
Color Tone	Color Tone ±0.05

7 Dimension

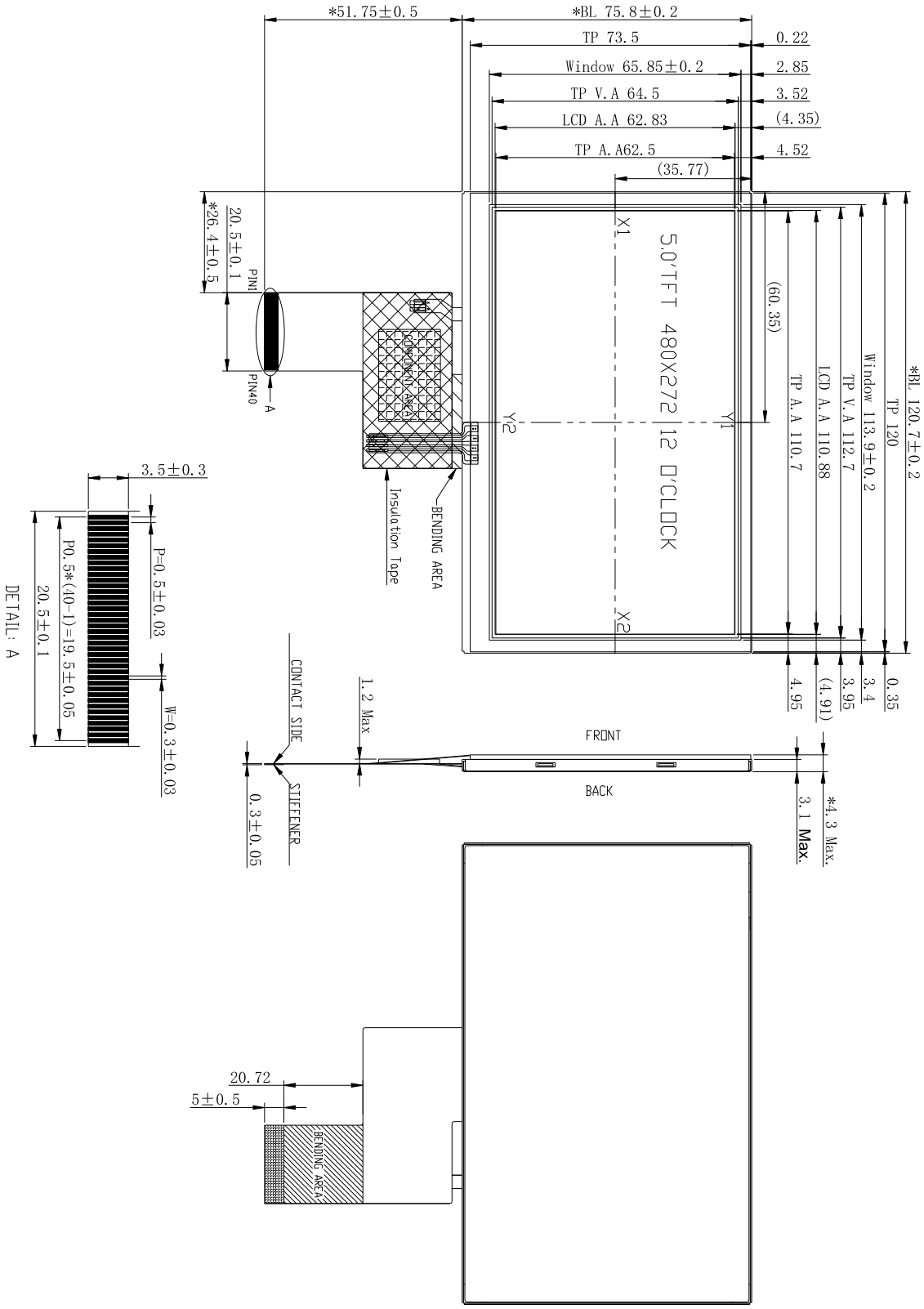

Figure 11 - LCM Dimension

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.

We recommend these resources on an "as is" basis. When you use a third party resource, you will be subject to its terms and licenses and no longer be protected by our privacy policy or security practices, which may differ from the third policy or practices or other terms. You should familiarize yourself with any license or use terms of, and the privacy policy and security practices of, the third party resource, which will govern your use of that resource.

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

Refer to https://brtchip.com/contact-us/ for contact information.

Distributor and Sales Representatives

Please visit the Distribution Network – IC & Module (brtchip.com) page for the contact details of our distributor(s) and sales representative(s) in your country.

Appendix A – References

Document References

NA

Acronyms and Abbreviations

Terms	Description
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
RTP	Resistive Touch Panel
TFT	Thin Film Transistor

Appendix B – List of Tables & Figures

List of Tables

List of Figures

Appendix C – Revision History

Document Title: DP-0502-11A Datasheet

Document Reference No.: BRT_000500

Clearance No.: BRT#265

Product Page: https://brtchip.com/product-category/products/

Document Feedback: Send Feedback

Revision	Changes	Date
Version 1.0	Initial Release	07-11-2025