DP-0501-01A Datasheet

1 Introduction

The DP-0501-01A is a 5-inch TFT-LCD module featuring a resolution of 800 × 480 pixels. It integrates a TFT-LCD panel, driver ICs (ILI6122 and ILI5960), flexible printed circuit (FPC), backlight unit, and a capacitive touch panel (CTP).

Touch input is managed by the FT5336 touch controller, which supports an I²C interface for seamless communication and enables smooth, responsive touch performance with support for up to five simultaneous touch points.

Designed to deliver 16.7 million colors via an RGB interface, the DP-0501-01A provides high-quality visual performance and reliable operation for a wide range of applications.

1.1 Features

- 5.0" TFT-LCD with 800 × 480 resolution and integrated capacitive touch panel (CTP)
- Integrated FT5336 touch controller with I²C interface, supporting up to 5-point multi-touch input
- Supports 16.7M colors for vivid and accurate image reproduction
- RGB interface ensuring stable and reliable signal transmission
- Compliant with RoHS environmental requirements

2 Part Numbers/Ordering Information

Part No.	Description
DP-0501-01A	TFT Display 5 inch (800*480 resolution) with Capacitive Touch Panel

Table 1 - Part Number/Ordering Information

Table of Contents

3 General Specifications

Item	Specification	Unit
LCD Type	TFT	-
LCD Size	5	inch
Number of Pixels	800(H) x 480(V)	pixels
Technology Type	a-Si	-
Pixel Pitch	0.135(W) X 0.135(H)	mm
Display Mode	TN with Normally White	-
Surface Treatment(Up Polarizer)	Anti-Glare	-
Viewing Direction	12	o'clock
Gray Scale Inversion Direction	6	o'clock
Interface	24-bit RGB	-
Display Colors	16.7M Colors (RGB 8 bit)	colors
Module Size	136.80(H) x 93.60(V) x 5.00(D)	mm
Active Area	108.00(H) x 64.80(V)	mm
Display Driver IC	ILI6122 & ILI5960	-
Touch Panel	Capacitive Touch Panel	-
Touch Driver IC	FT5336	-
CTP Supported Touch Points	Up to 5 points	-
CTP Surface hardness	>6H	-
CTP Transparency	>85	%
Operation Temperature	-9 ~+60	°C
Storage Temperature	-20 ~+70	°C

Table 2 - General Specifications

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

4 Hardware Description

The DP-0501-01A features a 5-inch TFT-LCD with a 800 × 480 resolution, integrated with a capacitive touch panel.

4.1 Pin Assignment

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

4.1.1 TFT-LCD Interface Pin Assignment

FPC: 0.5 mm pitch, 40-pin

Pin no	Symbol	Type	Description
1	VLED-	P	LED backlight (Cathode)
2	VLED+	P	LED backlight (Anode)
3	NC	-	No Connection
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	NC	-	No Connection
38	NC	-	No Connection
39	NC	-	No Connection
40	NC	-	No Connection

Table 3 - TFT-LCD Interface Pin Definition

4.2 CTP Interface Pin Assignment

I2C Interface Pin Definition, FPC: 0.5 mm pitch, 40-pin

Pin no	Symbol	Type	Description
1	GND	P	Ground
2	SDA	I/O	I2C serial bus, data line (3.3V)
3	SCL	I/O	I2C serial bus, clock line (3.3V)
4	VDD	P	Power Supply
5	INT	O	Interrupt pin
6	RST	I	Reset the touch controller

Table 4 - CTP Interface Pin Definition

5 Specifications

5.1 Absolute Maximum Ratings

5.1.1 Electrical Absolute Maximum Ratings

Condition: T_a=25°C

Item	Symbol	MIN.	MAX.	Unit	Note
Power Supply Voltage	VCC	-0.5	5.0	V	Note 1, 2
Backlight Forward Current	I_F	-	25	mA	For each serial LED
Power Supply Voltage for CTP	VDD	-0.3	3.6	V	

Table 5 - 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	-20°C	70°C	-9°C	60°C	Note 1, 2

Table 6 - 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.

5.2 Electrical Specifications

5.2.1 Electrical Characteristics for TFT-LCD

Condition: 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}	0.7* Vcc	-	Vcc	V	
	'L'	V_{IL}	0	-	0.3*Vcc	V	
Current Consumption (Excluded the Backlight)		I_{DD}	-	120	-	mA	VCC=3.3V Black display pattern

Table 7 - Electrical Characteristics for TFT-LCD

5.2.2 Electrical Characteristics for CTP

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply		VDD	2.8	-	3.6	V	
Input Voltage	'H'	V_{IH}	0.7* IOVDD	-	IOVDD	V	
	'L'	V_{IL}	-0.3	-	0.3*IOVDD	V	
Output Voltage	'H'	V_{OH}	0.7* IOVDD	-	-	V	IOH=-0.1mA
	'L'	V_{OL}	-	-	0.3*IOVDD	V	IOH=0.1mA

Table 8 - Electrical Characteristics for CTP

5.2.3 LED Backlight Specification

The backlight consists of 18 white LEDs arranged in a 6 × 3 matrix, providing uniform illumination across the display.

Condition: T_a=25°C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I_F	-	60	-	mA	
Forward Voltage	V_F	-	18.0	19.0	V	Note 2
Backlight Power Consumption	W_{BBLB}	-	1.08	-	W	Note 1
Life Time	-	20k	-	-	hours	Note 3

Table 9 - LED Backlight Specification

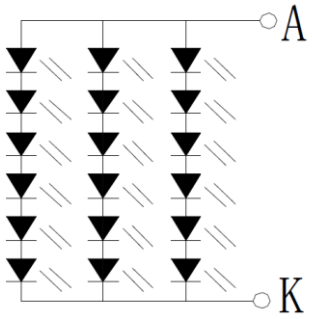


Figure 1 - Backlight LED Circuit

Note:

1. The LED driving conditions are defined for the total backlight consumption and depend on the forward current (I_F) setting.
2. The forward voltage (V_F) is provided for reference for a single LED string.
3. The operating lifetime is defined as the time for the module brightness to decrease to 50% of its original brightness at Ta = 25 °C and IF = 60 mA. The LED lifetime may decrease if the operating IF larger than 60 mA.

5.3 Timing Chart

5.3.1 Horizontal Input Timing

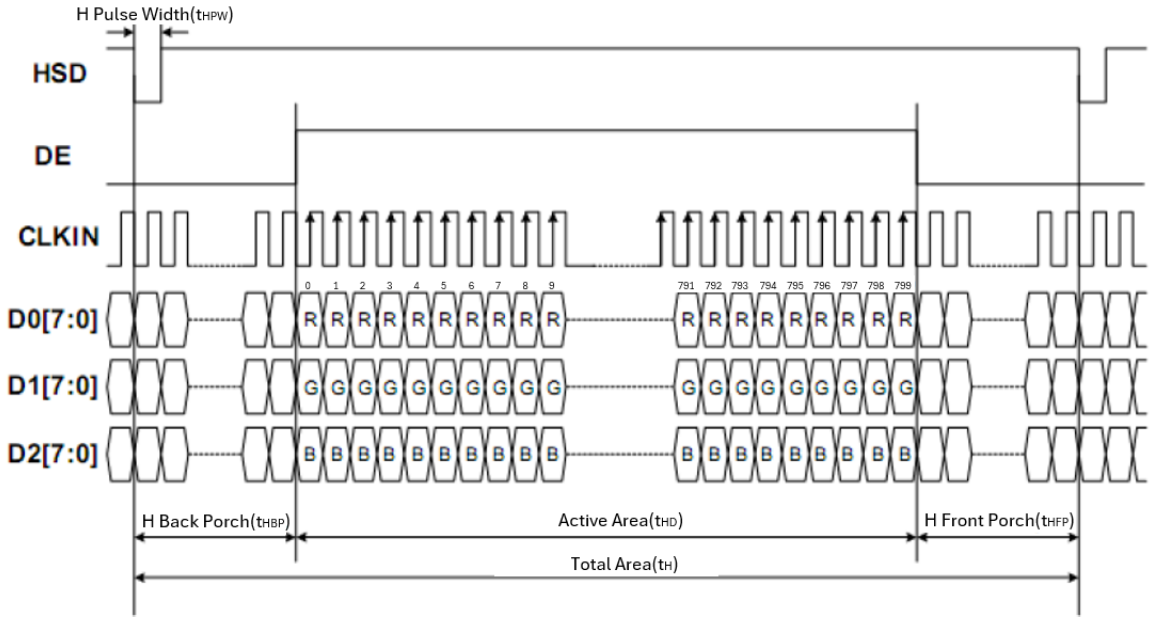


Figure 2 - Horizontal Input Timing

Parameter		Symbol	Min.	Typ.	Max.	Unit
Horizontal Display Area		t_{HD}	-	800	-	CLKIN
CLKIN Frequency		F_{CLK}	-	33.3	50	MHz
1 Horizontal Line Period		t_H	862	1056	1200	CLKIN
HSD Pulse Width		t_{HPW}	1	-	40	CLKIN
HSD Back Porch	SYNC	t_{HBP}	46	46	46	CLKIN
HSD Front Porch	SYNC	t_{HFP}	16	210	354	CLKIN

Table 10 - Horizontal Input Timing

5.3.2 Vertical Input Timing

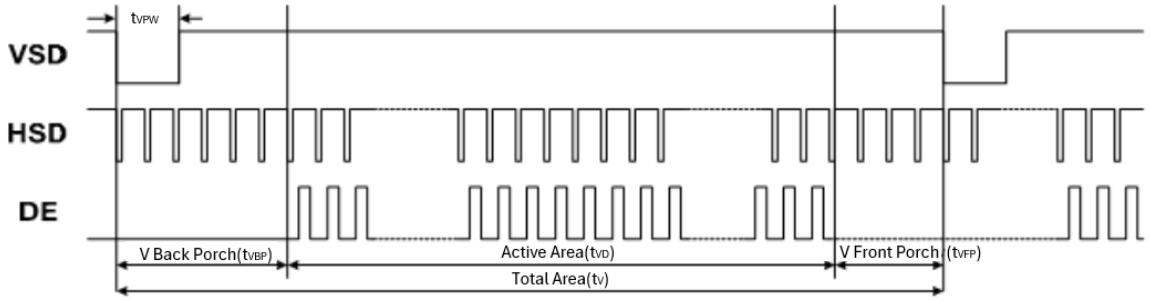


Figure 3 - Vertical Input Timing

Parameter	Symbol	Min.	Typ.	Max.	Unit
Vertical Display Area	t_{VD}	-	480	-	HSD
VSD Period time	t_V	510	525	650	HSD
VSD Pulse Width	t_{VPW}	1	-	20	HSD
VSD Back Porch	t_{VBP}	23	23	23	HSD
VSD Front Porch	t_{VFP}	7	22	147	HSD

Table 11 - Vertical Input Timing

5.4 Optical Specifications

Test Conditions: I_F = 60mA , T_a = 25°C.

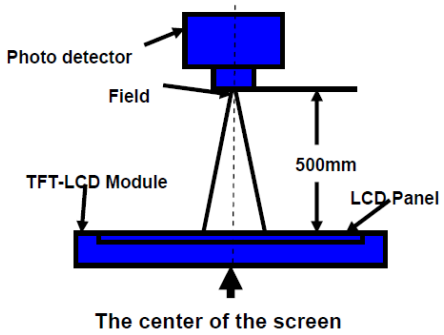
Item	Symbol		Condition	Min.	Typ.	Max.	Unit	Note
Luminance	L		-	350	420	-	Cd/m^2	Note 1 Note 7
Uniformity	⊿Bp			75	-	-	%	Note 1 Note 6
Viewing Angle	Θ_T		Cr≥9	-	65	-	Deg	Note 2
	Θ_B			-	55	-		
	Θ_L			-	65	-		
	Θ_R			-	65	-		
Contrast Ratio	Cr		θ=0°	400	500	-	-	Note 1 Note 3
Response Time	T_r		25°C	-	20	30	ms	Note 1 Note 4
	T_f			-	20	30	ms	
Color of CIE Coordinate	W	x	Backlight is ON	0.274	0.324	0.374	-	Note 1 Note 5
		y		0.295	0.345	0.395	-	
	R	X		0.544	0.594	0.644	-	
		y		0.301	0.351	0.401	-	
	G	x		0.299	0.349	0.399	-	
		y		0.531	0.581	0.631	-	
	B	x		0.092	0.152	0.202	-	
		y		0.053	0.093	0.153	-	
NTSC Ratio	S		-	45	50	-	%	Note 5

Table 12 - Optical Specifications

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

Note:

1. Data Definition of the optical measurement system.
   Optical characteristics should be measured in a dark room. After 5 minutes of operation, the optical properties are measured at the center point of the LCD screen. All input terminals of the LCD panel must be grounded when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	BM-7A	1°
Luminance		
Chromaticity		
Luminance Uniformity		

Figure 4 - Measurement Setup

2. Definition of Viewing Angle Range and Measurement System.
The viewing angle is measured at the center point of the LCD using a CONOSCOPE (ERGO-80).

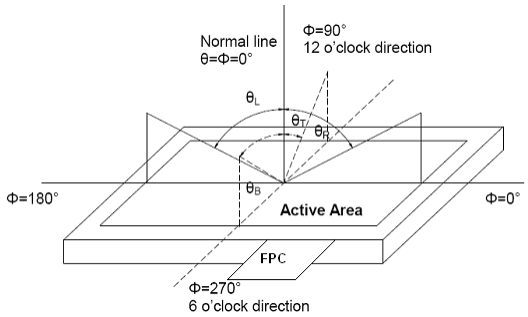


Figure 5 - Viewing Angle

3. Definition of Contrast ratio.

$$\text{Contrast ratio, Cr} = \frac{\textbf{Luminance measured when LCD is on the "White" state}}{\textbf{Luminance measured when LCD is on the "Black" state}}$$

"White" state: The state is that the LCD should drive by Vwhite.
"Black" state: The state is that the LCD should drive by Vblack.
Wwhite: To be determined.
Vblack: To be determined.

4. Definition of response time.
The response time is defined as the LCD optical switching interval between the "White" and "Black" states.
   - Rise time (Tr): The time required for the photo detector output intensity to change from 90% to 9%.
   - Fall time (Tf): The time required for the photo detector output intensity to change from 9% to 90%.

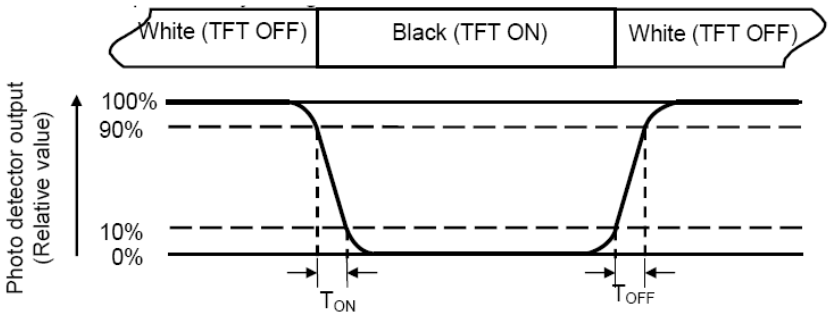


Figure 6 - Definition of Response Time

5. Definition of color chromaticity (CIE1931).
   Color coordinates measured at center point of LCD.

6. Definition of Luminance Uniformity.
   Active area is divided into 9 measuring area. Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity,U} = \frac{\mathbf{Lmin}}{\mathbf{Lmax}}$$

Lmax: The measured Maximum luminance of all measurement position.
Lmin: The measured Minimum luminance of all measurement position.

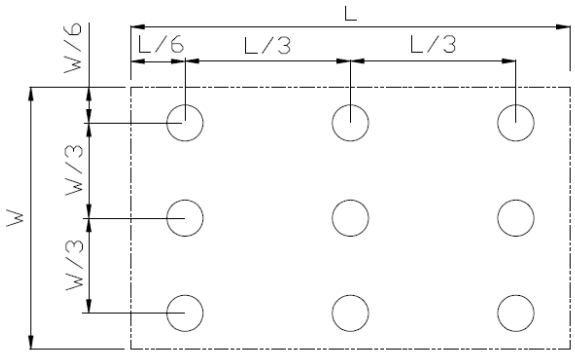


Figure 7 - Measuring Area for Luminance Uniformity

7. Definition of Luminance.
   Measure the luminance of white state at center point.

6 Reliability Test Items

Test Item	Test Conditions
High Temperature Operation	Temperature: +60°C Duration: 240hrs
Low Temperature Operation	Temperature: -9°C Duration: 240hrs
High Temperature Storage	Temperature: +70°C Duration: 240hrs
Low Temperature Storage	Temperature: -20°C Duration: 240hrs
Storage at High Temperature and Humidity	Temperature: +40°C Humidity: 90%RH max Duration: 240hrs
Thermal Shock (non-operation)	Temperature Range: -20°C (30min) ~ +70°C (30min) Transfer Time: 5min Cycles: 90 cycles Start with cold temperature, end with high temperature.
ESD	Capacitance: 150pF, Resistance: 330ohm, 5point/panel Air Discharge: ±8kV, 5 times Contact Discharge: ±4kV, 5 times Environment: 15°C ~ 35°C, 30% ~ 60%, 86kpa ~ 96kpa
Vibration Test	Frequency range: 9Hz ~ 55Hz Stroke: 1.5mm Sweep: 9Hz ~ 55Hz ~ 9Hz Duration: 2 hrs per axis (X, Y, Z)
Mechanical Shock (non-operation)	Waveform: Half-sine wave Peak Acceleration: 90G Pulse Duration: 6ms Directions: ±X, ±Y, ±Z, 3 times each

Table 13 - Reliability Test Items

7 Dimension

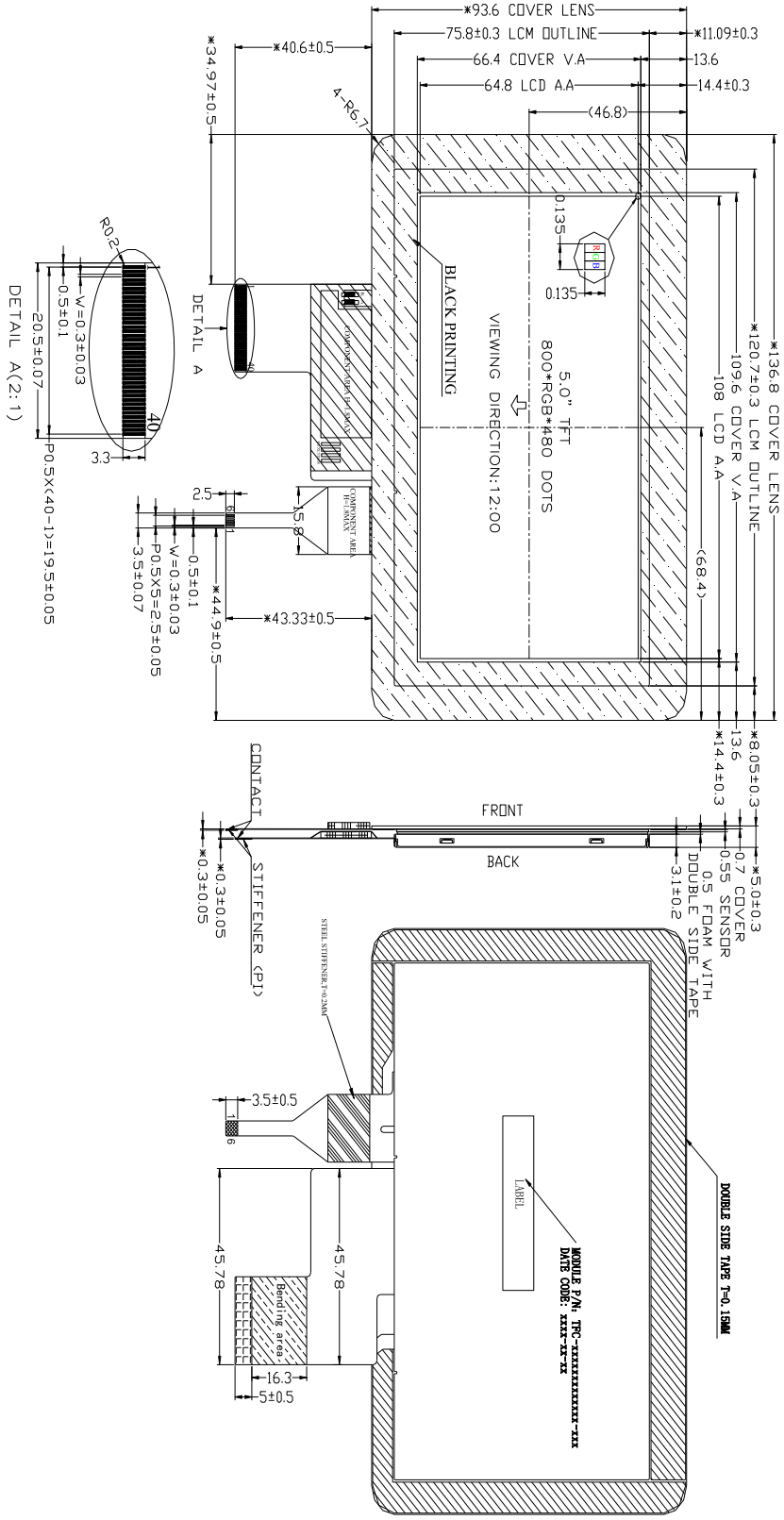


Figure 8 - LCM Dimension

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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

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
CTP	Capacitive Touch Panel
ESD	Electrostatic Discharge
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
TFT	Thin Film Transistor

Appendix B – List of Tables & Figures

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Appendix C – Revision History

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