SPECIFICATIONS

CUSTOMER	:	
SAMPLE CODE	:	SH320240T028-ZHA
MASS PRODUCTION CODE	:	PH320240T028-ZHA
SAMPLE VERSION	:	02
SPECIFICATIONS EDITION	:	009
DRAWING NO. (Ver.)	:	LMD-PH320240T028-ZHA (Ver.002)
PACKAGING NO. (Ver.)	:	PKG-PH320240T028-ZHA (Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
廖志豪 Rex Liao	張慶源 Yuan Chang	陳宗淇 Howard Chen

POWERTIP
2023.03.06
TW RD APR

☐ Preliminary specification for design input

■ Specification for sample approval

POWERTIP TECH. CORP.

Represented by:

FIRST Components s.r.l.
www.first-components.com
technical@first-components.com
+39 0332 1888005

SPECIFICATIONS

Features

Item	Standard Value
Display Type	320 * 3 (RGB) * 240 Dots
LCD Type	Full Viewing Angle, Normally Black, Transmissive type
Screen size(inch)	3.5 inch
Surface treatment	Anti-Glare
Color configuration	RGB-Strip
Backlight Type	White LED B/L
Interface	Parallel RGB (Data), SPI (Configuration)
Other(controller/driver IC)	ST7272A (Or Compatible IC)
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC

Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	76.9(W) * 63.9(L) * 3.2(H)	mm

LCD Panel

Item	Standard Value	Unit
Active Area	70.08(W) * 52.56(L)	mm
Pixel Size	0.219(W) * 0.219(H)	mm

Note: For detailed information please refer to LCM drawing

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Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Supply for TFT Panel	VDD	GND=0	-0.3	4.5	V	-
Power Supply for Backlight Unit	VCC	GND=0	-0.3	+20.0	V	
Operating Temperature	T_{OP} (Ts)	Note 1	-20	70	°C	
Storage Temperature	T_{ST} (Ta)	Note 2	-30	80	°C	

The absolute maximum rating values of this product are not allowed to be exceeded at any time. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

Note 1: Ts is the temperature of panel's surface

Note 2: Ta is the ambient temperature of samples

DC Electrical Characteristics

Module

GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for TFT Panel	VDD	GND=0V	3.0	3.3	3.6	V
Power Supply for Backlight Unit	VCC	GND=0V	5	12	15	V
Input Voltage for TFT Panel	V_{IH}	GND=0V	0.7VDD	-	VDD	V
	V_{IL}	GND=0V	0	-	0.3VDD	
Supply Current for TFT Panel	IDD	IDD@VDD=3.3V	-	25	40	mA
Supply Current for Backlight Unit	ICC	ICC@VCC=5V	-	170	260	
Supply Current for Backlight Unit	ICC	ICC@VCC=12V	-	70	105	
Input Voltage for PWM Signal	VPH	GND=0V	1.2	-	-	V
	VPL	GND=0V	-	-	0.4	V
Dimming Clock Rate	fP	GND=0V	5	-	100	KHz

Optical Characteristics

TFT LCD Module VDD = 3.3 V, Ta=25°C

Item	Symbol		Condition	Min.	Typ.	Max.	unit	
Response time	Tr+Tf		Ta = 25°C θX, θY = 0°	-	30	40	ms	Note 2
Viewing angle	Top	θY+	CR ≥ 10	-	80	-	Deg.	Note 4
	Bottom	θY-		-	80	-		
	Left	θX-		-	80	-		
	Right	θX+		-	80	-		
Contrast ratio		CR	Ta = 25°C θX , θY = 0°	650	800	-		Note 3
Color of CIE Coordinate (With B/L)	White	X		0.23	0.28	0.33	-	Note1
		Y		0.27	0.32	0.37		
	Red	X		0.57	0.62	0.67		
		Y		0.31	0.36	0.41		
	Green	X		0.29	0.34	0.39		
		Y		0.55	0.60	0.65		
	Blue	X		0.09	0.14	0.19		
		Y		0.04	0.09	0.14		
Average Brightness Pattern=white display (With LCD)*1	IF		VCC=12.0V PWM="High" (Duty=100%)	800	1000	-	cd/m^2	Note1
Uniformity (With LCD)*2	△B		VCC=12.0V PWM="High" (Duty=100%)	70	-	-	%	Note1

Backlight Characteristics

Maximum Ratings

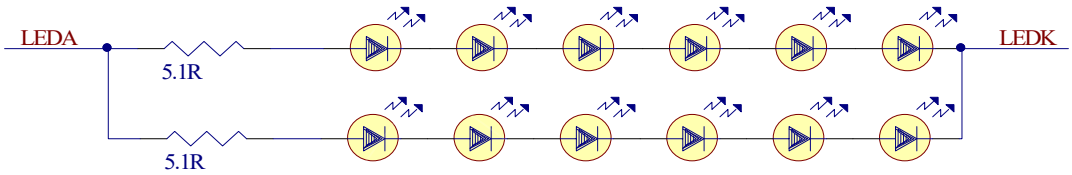
Item	Symbol	Min.	Max.	Unit	Remark
LED Forward Current	I_F	30		mA	One LED
LED Reverse Voltage	V_R	5.0		V	

Electrical / Optical Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Voltage	V_L	18.0	19.0	-	V	Note1
LED Current	I_L	-	40	-	mA	-
LED life time	-	50,000	-	-	H_r	Note2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and I_L =40 mA

Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and I_L =40 mA. The LED life time could be decreased if operating I_L is larger than 40 mA



Interface Pin Description

TFT LCM Interface

Pin#	Name	Description
1	GND	Power ground.
2	VDD	Power for Digital Circuit.
3	VDD	Power for Digital Circuit.
4	VCC	Power For LED backlight.
5	VCC	Power For LED backlight.
6	PWM	Shutdown & Dimming control input for backlight. Do not allow this pin to float. “Hi” =100%, “Low” = 0%.
7	GND	Power ground.
8	R0	Red Data.
9	R1	Red Data.
10	R2	Red Data.
11	R3	Red Data.
12	GND	Power ground.
13	R4	Red Data.
14	R5	Red Data.
15	R6	Red Data.
16	R7	Red Data.
17	GND	Power ground.
18	G0	Green Data.
19	G1	Green Data.
20	G2	Green Data.
21	G3	Green Data.
22	GND	Power ground.
23	G4	Green Data.
24	G5	Green Data.
25	G6	Green Data.
26	G7	Green Data.
27	GND	Power ground.
28	B0	Blue Data.
29	B1	Blue Data.

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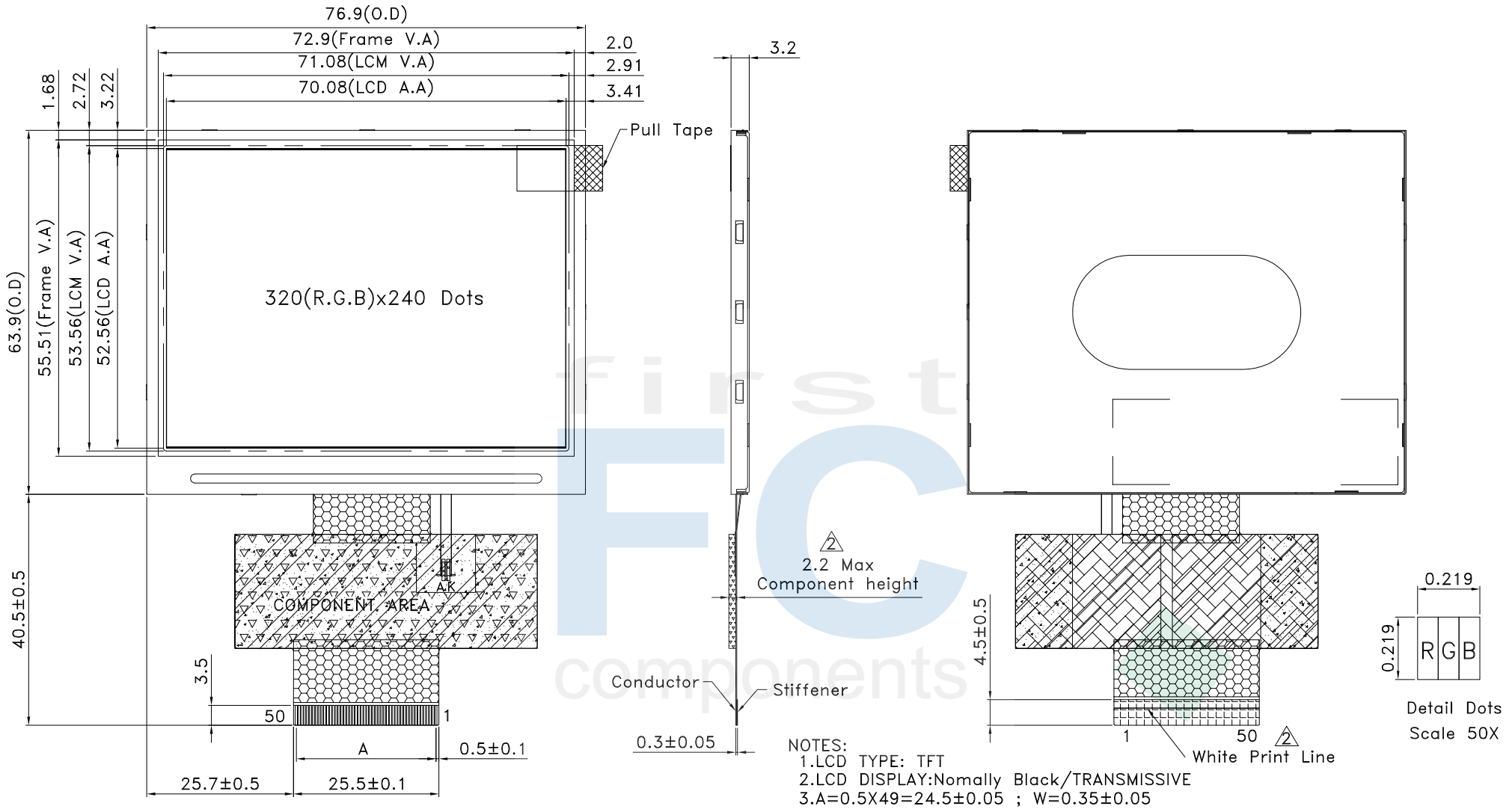
Pin#	Name	DESCRIPTION
30	B2	Blue Data.
31	B3	Blue Data.
32	GND	Power ground.
33	B4	Blue Data.
34	B5	Blue Data.
35	B6	Blue Data.
36	B7	Blue Data.
37	GND	Power ground.
38	HS	Line synchronization signal. Horizontal Sync Input.
39	VS	Frame synchronization signal. Vertical Sync Input.
40	GND	Power ground.
41	DE	Data Enable.
42	GND	Power ground.
43	DCLK	Sample clock. Data will be latched at the rising edge of DCLK.
44	GND	Power ground.
45	CS/ ID1	Serial communication chip selection/ID[4:1]These pins select LCM type. See NOTE1
46	SDIN/ ID2	Serial communication data/ ID[4:1]These pins select LCM type. See NOTE1
47	SCK/ ID3	Serial communication clock/ ID[4:1]These pins select LCM type. See NOTE1
48	DISPLAY CONTROL / ID4	Display Enable(Hi Active)./ ID[4:1]These pins select LCM type. See NOTE1
49	/RESET	Global Reset (Low Active).
50	GND	Power ground.

Note1:

ID Pins Definition:

	PIN 45 ID1	PIN 46 ID2	PIN 47 ID3	PIN 48 ID4
3.5” Module	X	0	0	X
4.3” Module	X	1	0	X
5.0” Module	X	0	1	X
7.0” Module	X	1	1	X

1. Resistor = 10k ohm
2. “X” = No use



NOTES:
1. LCD TYPE: TFT
2. LCD DISPLAY:Nomally Black/TRANSMISSIVE
3. A=0.5X49=24.5±0.05 ; W=0.35±0.05
4. The tolerance unless classified ±0.3mm
5. :Shielding tape; :Component area; :Stiffener(SUS t=0.2mm to GND)
   :Aluminum Foil Conductive Adhesive Tape; :EMI Film
6. FPC Matching Connector : HIROSE FH12A-50S-0.5H OR EQUIVALENT

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002	Modify Component height and Add Print Line	Tina	2019/10/24
001	NEW DRAWING	Tina	2019/05/13

sales@first-components.com

PART NO: PH320240T028-ZHA

DRAWING NAME : LMD-PH320240T028-ZHA

TITLE: LCD MODULE DRAWING PH320240T028-ZHA

久正光電股份有限公司
POWERTIP TECHNOLOGY CORPORATION

Design	Tina	(3)	Surface		
Check	Jimmy	Unit	MM	Material	
Approve	Jimmy	Scale	FIT	Thickness	
		Page	1/2	Quantity	

Length(Min) (mm) \ Tolerance \ Precision	Precision Level
1 ~ 4	-
4 ~ 16	-
16 ~ 63	-
63 ~ 250	-
250 ~ 1000	-