晶采光電科技股份有限公司
AMPIRE CO., LTD.

Specifications for LCD module

Customer	
Customer part no.	
Ampire part no.	**AM-1280720L2TZQW-T10H**
Approved by	
Date	

■ **Preliminary Specification**
☐ **Formal Specification**

Approved by	Checked by	Organized by
Kokai	Mark	Lawlite

This Specification is subject to change without notice.

RECORD OF REVISION

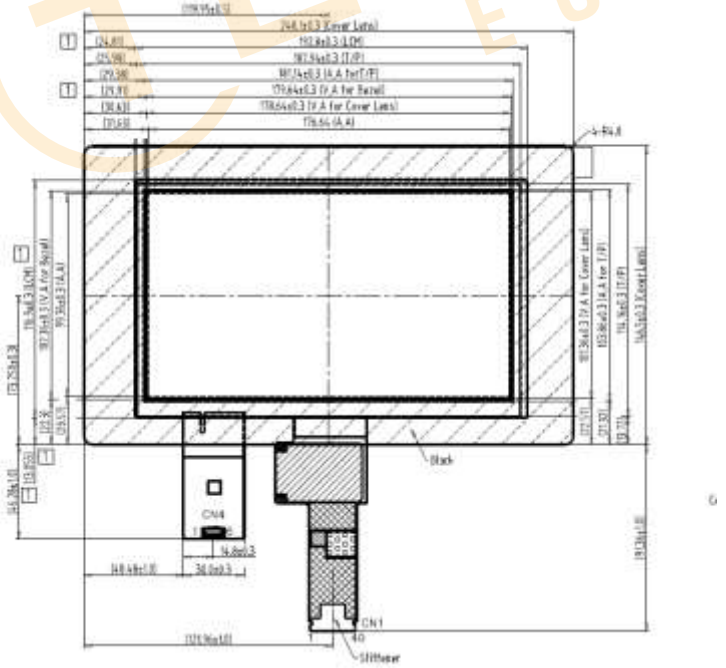
Revision Date	Page	Contents	Editor
2020/06/16	-	New Release	Lawlite
2020/09/28	22,23	Modify CN2 part number	Lawlite

1. Features

8” TFT Liquid Crystal Display module is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a timing controller, voltage reference, common voltage, column driver, row driver circuit. This TFT LCD has an 8 inch diagonally measured active display area with 1280 horizontal by 720 vertical pixel array resolutions.

2. Physical Specifications

Item	Specifications	Remark
LCD size	8 inch(Diagonal)	
Driver element	a-Si TFT active matrix	
Display resolution	1280 (W) × 3(RGB) x 720(H) dots	
Display mode	Normally Black, Transmissive (IPS)	
Pixel size	0.1380 (W) x 0.1380 (H) mm	
Color arrangement	R.G.B-stripe	
Interface	LVDS	
Color Depth	16.7M	



3. Absolute Maximum Ratings

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power Voltage	VDD	-0.3	4.0	V	GND=0V, TA=25℃
Operation Temperature	TOP	**-30**	**85**	℃	
Storage Temperature	TST	**-30**	**85**	℃	

Note(1) The absolute maximum rating values of this product are not allowed to be exceeded at any times. 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.

4. Electrical Specifications

4.1 Typical Operation Conditions

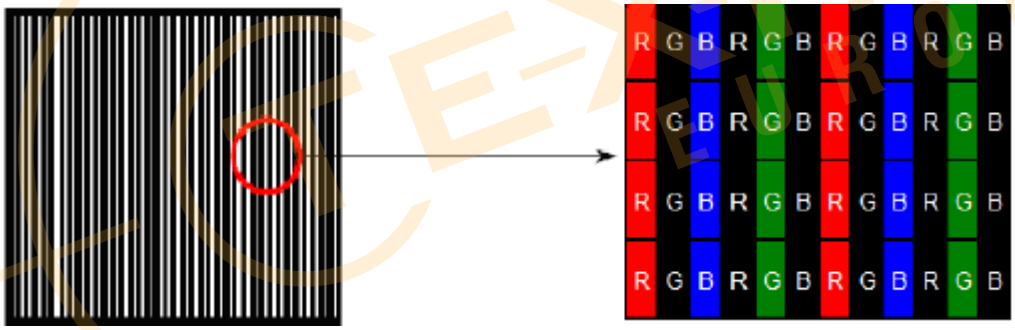
Item		Symbol	Values			Unit	Remark
			Min.	Typ.	Max.		
Power Voltage		VDD	3.0	3.3	3.6	V	Note(1),(2)
Power Consumption		IVDD	--	--	180	mA	Note (1),(2),(3) VDD=3.3V
Logic Input Voltage	Input Voltage	VIN	0	-	VDD	V	
	Logic input high voltage	VTH	3.0	-	3.6	V	Note(4)
	Logic input low voltage	VTL	0	-	0.4	V	Note(4)

Note(1) Value for Power Board combined panel.

Note(2) VDD setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note(3) VDD current capacity >1.5A

The specified VDD current and power consumption are measured under the VDD = 3.3 V, FV= 60 Hz condition and V-Stripe pattern.



Note(4) SHLR, UPDN.

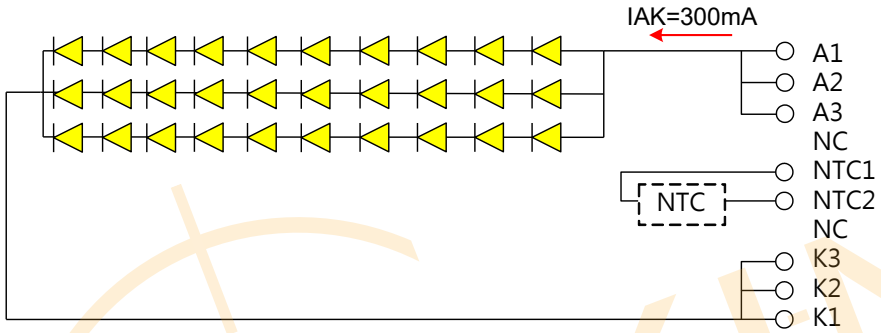
4.2 LED Driving Conditions

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
LED Backlight Voltage	VAK	27	30	33	V	IAK=300mA
LED Backlight Current	IAK	--	300	--	mA	Ta=25℃
LED Life Time		--	50	--	kHr	Note(1)

Note(1) The brightness is decreased to 50% of the initial value. Ta=25℃

Note(2) The structure of LED B/L shows as below:

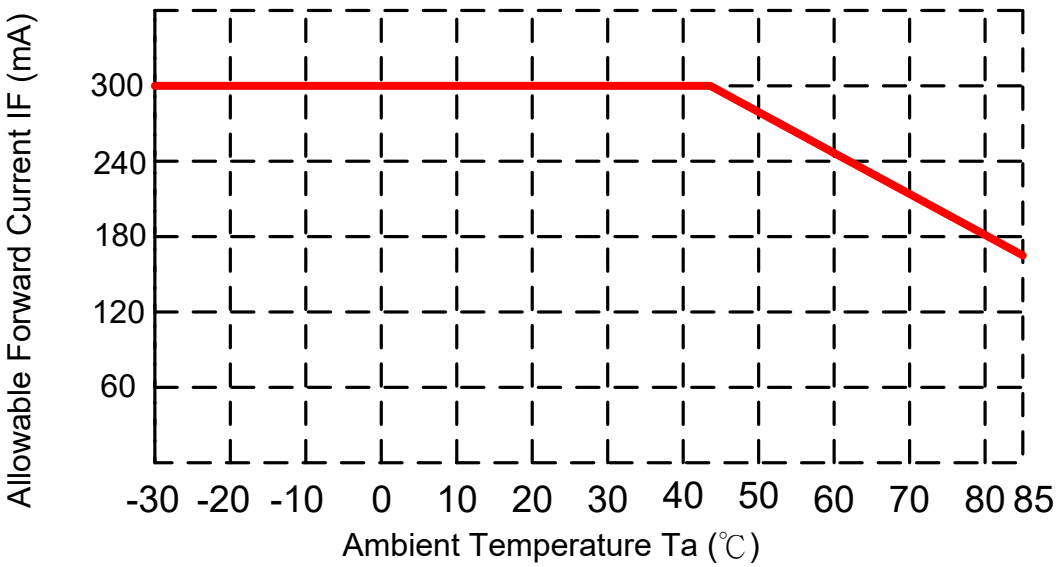
- 10 Serial x 3 parallel LED.
- The default is without NTC resistor.



CN2: Mating Connector: HIROSE FH28-10S-0.5SH or Equivalent

Pin #	Signal Name	Description	Remarks
1~3	A1,A2,A3	LED Anode	-
4	NC	Dummy Pin. Keep it floating	
5	NTC1	Default without NTC. Keep it floating	
6	NTC2	Default without NTC. Keep it floating	
7	NC	Dummy Pin. Keep it floating	-
8~10	K3,K2,K1	LED Cathode	

Note(3) When LCM is operated over 40℃ ambient temperature, the IAK should be follow :



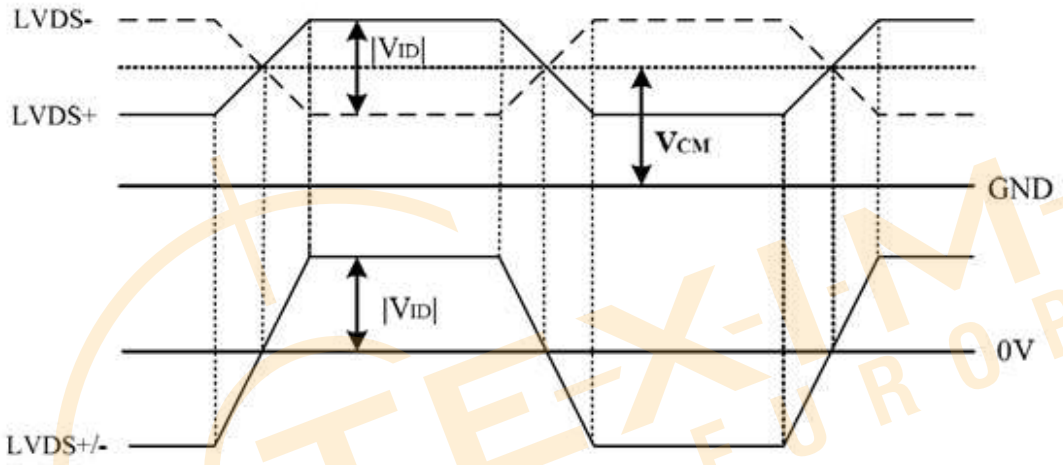
5. LVDS Signal Timing Characteristics

5.1 AC Electrical Characteristics

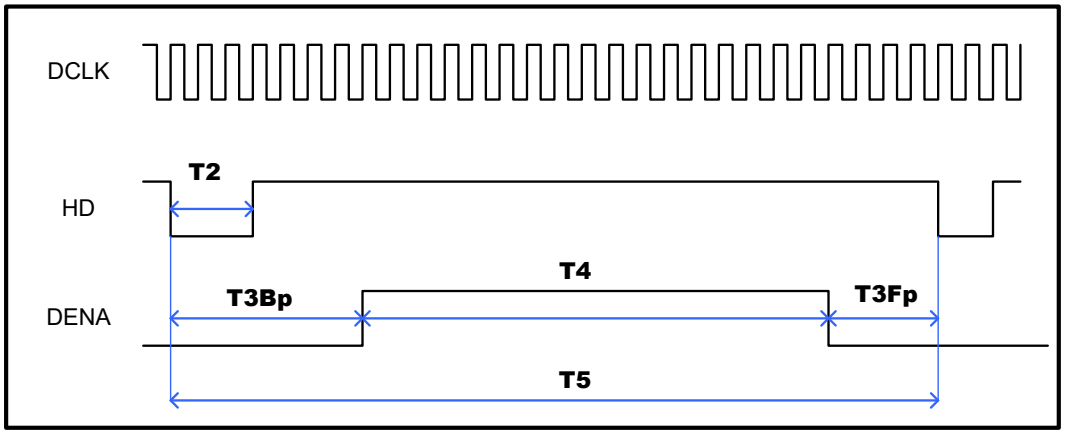
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High	Vth	-	-	+100	mV	V_{CM}=+1.2V
Differential Input Low	Vtl	-100	-	-	mV	V_{CM}=+1.2V
Magnitude Differential Input	$\|V_{ID}\|$	200	-	400	mV	-
Common Mode Voltage	V_{CM}	0.3+(VID/2)	-	VDD-1.2-(VID/2)	V	-
Common Mode Voltage	ΔV_{CM}	-	-	50	mV	V_{CM}=+1.2V

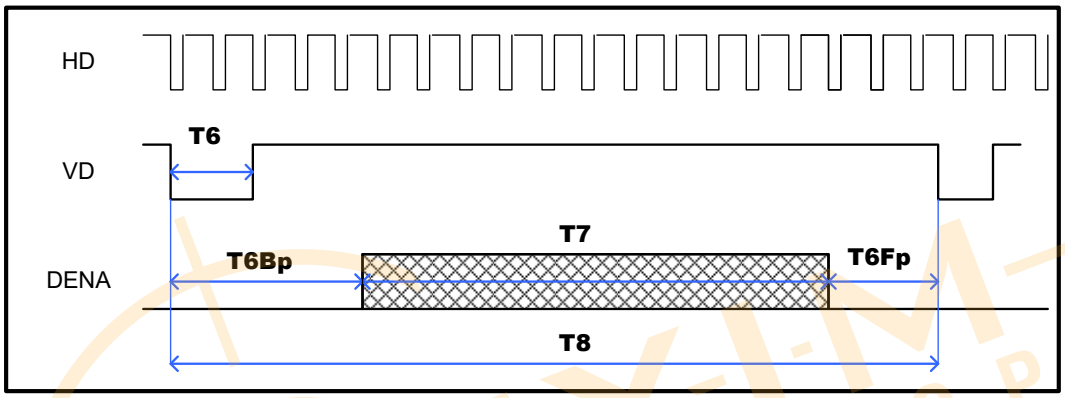
Note (1) Input signals shall be low or Hi-Z state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.



5.2 TTL Timing Table

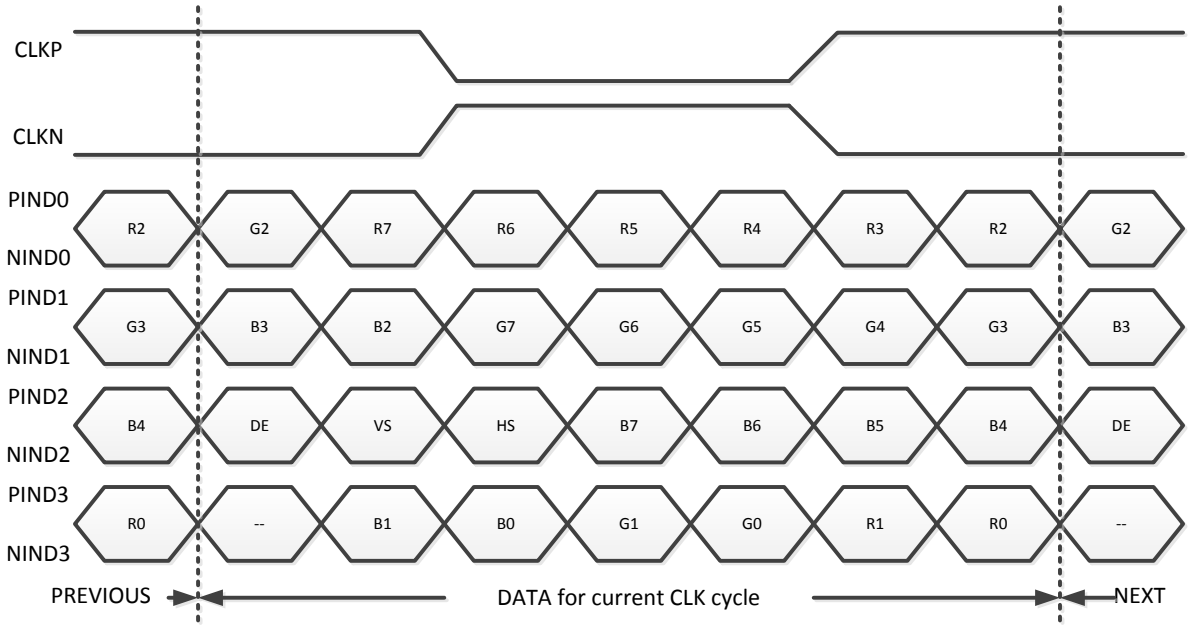




Item	Symbol	Min.	Typ.	Max.	Unit
Clock Frequency	1/T1	69.49	71.15	75.54	MHz
Horizontal Blanking	T3Fp+T3Bp	224	260	286	Clocks
Horizontal Display Period	T4	--	1280	--	Clocks
Horizontal total Period	T5	1524	1540	1566	Clocks
Vertical Blanking	T6Fp+T6Bp	40	50	84	Lines
Vertical Display Period	T7	--	720	--	Lines
Vertical total Period	T8	760	770	804	Lines

5.3 LVDS Input Data Format

JEIDA Format 24BIT LVDS



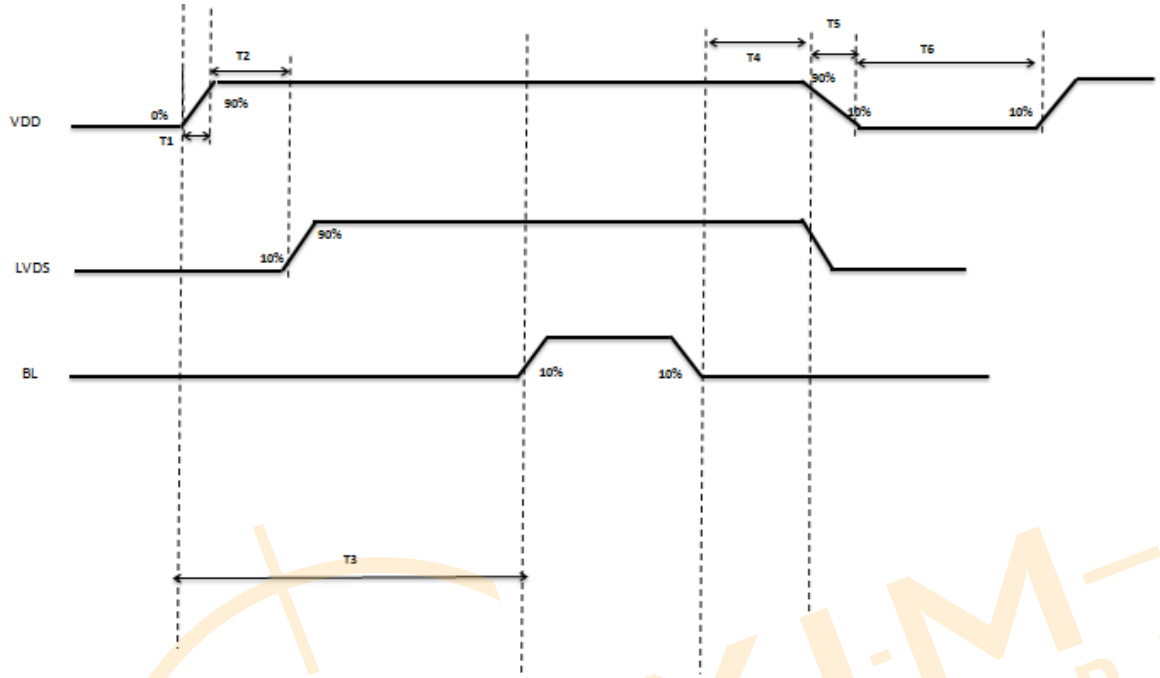
Note: R/G/B data 7: MSB, R/G/B data 0: LSB

Signal Name	Description	Remark
R7 R6 R5 R4 R3 R2 R1 R0	Red Data 7 (MSB) Red Data 6 Red Data 5 Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0 (LSB)	Red-pixel Data Each red pixel's brightness data consists of these 8 bits pixel data.
G7 G6 G5 G4 G3 G2 G1 G0	Green Date 7 (MSB) Green Date 6 Green Date 5 Green Date 4 Green Date 3 Green Date 2 Green Date 1 Green Date 0 (LSB)	Green-pixel Data Each green pixel's brightness data consists of these 8 bits pixel data.
B7 B6 B5 B4 B3 B2 B1 B0	Blue Data 7 (MSB) Blue Data 6 Blue Data 5 Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0 (LSB)	Blue-pixel Data Each blue pixel's brightness data consists of these 8 bits pixel data.
CLKP CLKN	LVDS Clock Input	
DE	Display Enable	
VS	Vertical Sync Signal	
HS	Horizontal Sync Signal	

5.4 Power On/OFF Timing

(1) Interface signals are also shown in the chart. Signals from any system shall be Hi-resistance state or low level when VDD voltage is off.

(2) When system first start up, should keep the VDD high time longer than 200ms, otherwise may cause image sticking when VDD drop off.



Item	Symbol	Min.	Typ.	Max.	Unit	Remark
VDD rising time 0%~90%	T1	(1)	-	(10)	ms	
VDD90% to LVDS10%	T2	(2)	-	-	ms	
VDD rising time 0%to BL10%	T3	(190)	-	-	ms	
BL Off to VDD off	T4	(90)	-	-	ms	
VDD falling time	T5	-	-	(1)	s	
VDD restart time	T6	(1)	-	-	s	

6. Interface

CN1: Mating Connector: AORORA F31L-1A7H1-21040 or Equivalent

Pin #	Signal Name	Description	Remarks
1	NC/BIST	Internal test pin. Hi : Bist mode. (Aging mode) Lo: Normal operating. When it is not used, Connecting to GND is recommended, don't floating.	-
2	NC	Dummy Pin. Keep it floating	
3	SHLR	Horizontal scanning direction setting	Note(1)
4	UPDN	Vertical scanning direction setting	Note(1)
5	VDD	Power Supply, 3.3V (typical)	-
6	NC	Dummy Pin. Keep it floating	
7	GND	Ground	
8	CLKP	+LVDS differential clock input	
9	CLKN	-LVDS differential clock input	
10	GND	Ground	
11	PIND0	+LVDS differential data input	
12	NIND0	-LVDS differential data input	
13	GND	Ground	
14	PIND1	+LVDS differential data input	
15	NIND1	-LVDS differential data input	
16	GND	Ground	
17	PIND2	+LVDS differential data input	
18	NIND2	-LVDS differential data input	
19	GND	Ground	
20	PIND3	+LVDS differential data input	
21	NIND3	-LVDS differential data input	
22	GND	Ground	
23	NC	Dummy Pin. Keep it floating	
24	VDD	Power Supply, 3.3V (typical)	

25	NC/VPP	Dummy Pin. Keep it floating.	
26	GND	Ground	
27	NC/AVDD	Dummy Pin. Keep it floating.	
28	NC/AVDD	Dummy Pin. Keep it floating.	
29	NC	Dummy Pin. Keep it floating.	
30	NC/CSB	Dummy Pin. Keep it floating.	
31	NC/SCL	Dummy Pin. Keep it floating.	
32	NC/SDA	Dummy Pin. Keep it floating.	
33	NC/ATREN	Dummy Pin. Keep it floating.	
34	GND	Ground	
35	NC	Dummy Pin. Keep it floating.	
36	NC/VGH	Dummy Pin. Keep it floating.	
37	NC	Dummy Pin. Keep it floating.	
38	NC/VGL	Dummy Pin. Keep it floating.	
39	NC	Dummy Pin. Keep it floating.	
40	NC	Dummy Pin. Keep it floating.	

Note(1)

SHLR	UPDN	Scan direction
H	H	Data scan from left to right ; Gate scan from down to up
L	H	Data scan from right to left ; Gate scan from down to up
H	L	Data scan from left to right ; Gate scan from up to down
L	L	Data scan from right to left ; Gate scan from up to down

7. Optical Specifications

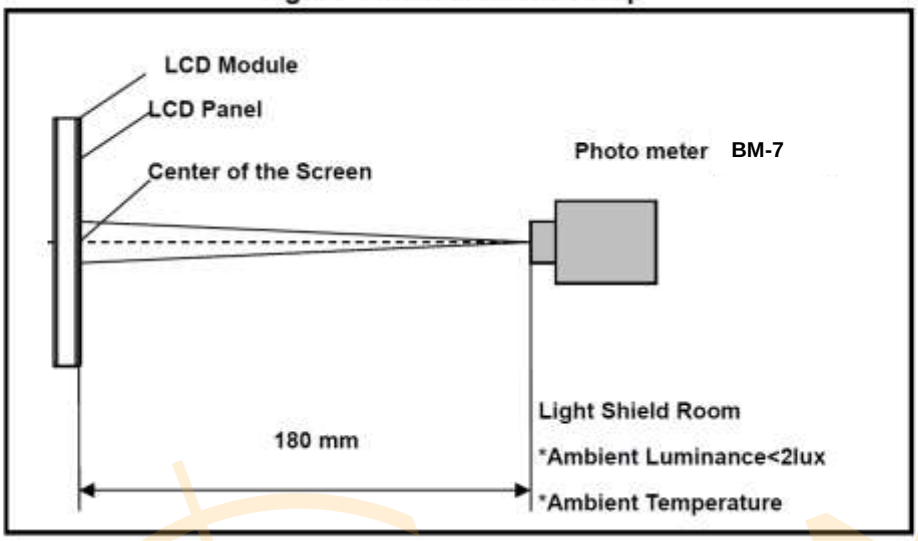
Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR>10)	Horizontal	θx+	(80)	(85)	-	degree	(1),(2),(3)
		θx-	(80)	(85)	-		
	Vertical	θy+	(80)	(85)	-		
		θy-	(80)	(85)	-		
Contrast Ratio	Center		800	900	-	-	(1),(2),(4)
Response Time	Rising		-	-	-	ms	(1),(2),(5)
	Falling		-	-	-	ms	
	Rising + Falling		-	-	35	ms	
Color Chromaticity (CIE1931)	NTSC		70	75	-	%	(1),(2)
	Red	x	Typ. -0.05	0.664	Typ. +0.05	-	(1),(2)
	Red	y		0.328		-	
	Green	x		0.253		-	
	Green	y		0.601		-	
	Blue	x		0.138		-	
	Blue	y		0.093		-	
	White	x		0.299		-	
	White	y		0.323		-	
White Luminance	Center		**816**	**1020**	-	cd/m^2	(1),(2),(6)
Luminance Uniformity	9Points		70	75	-	%	(1),(2),(6)

Note(1)

Measurement Setup:

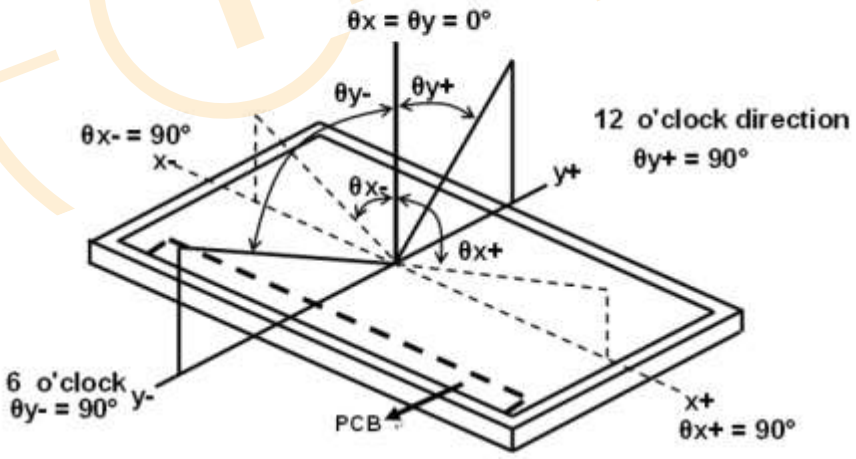
The LCD module should be stabilized at given temperature(25℃) for 15 minutes to Avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

Figure 4 Measurement Setup



Note(2) The LED driving current IAK=540mA

Note(3) Definition of viewing angle:



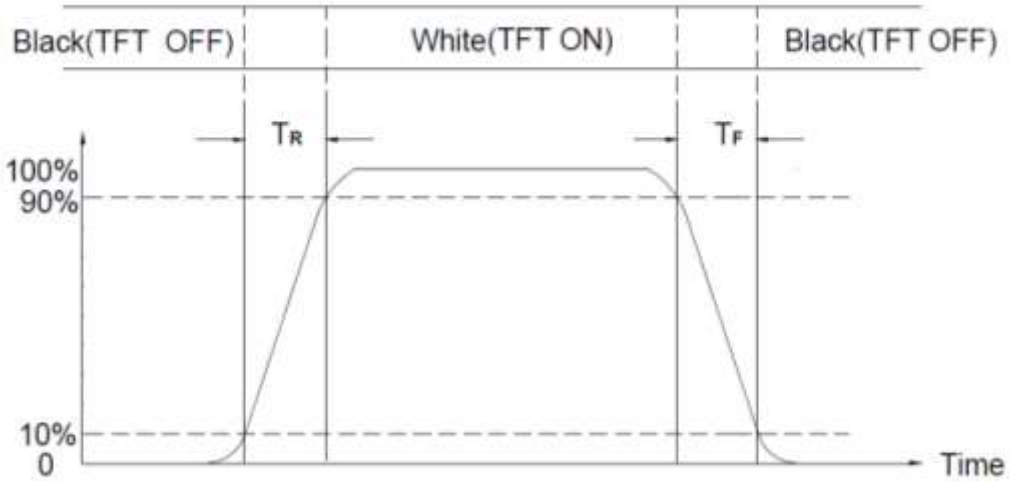
Note(4) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

Contrast Ratio (CR) = L255 / L0

L63: Luminance of gray level 255, L0: Luminance of gray level 0

Note(5) Definition of Response Time (TR, TF)



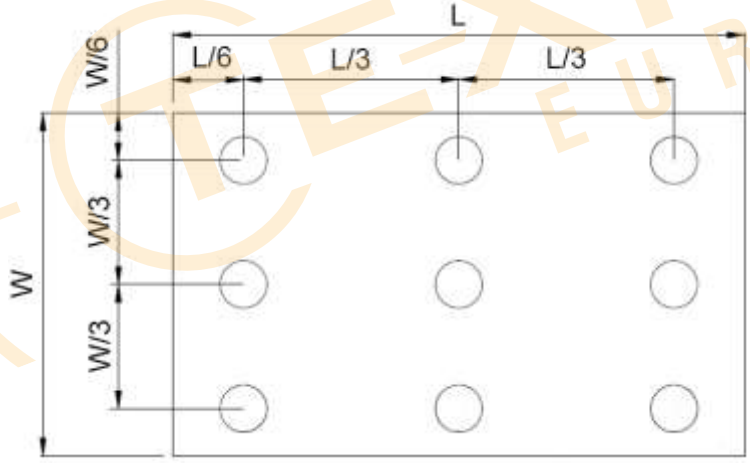
Note(6) Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to bellow figure).

Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{Bmin}{Bmax}$$

L ----- Active area length W ----- Active area width



Bmax : The measured maximum luminance of all measurement position.

Bmin : The measured minimum luminance of all measurement position.

8. Projected capacitive-type TOUCH PANEL ELECTRICAL SPECIFICATION

Basic Characteristic

ITEM	SPECIFICATION
Type	Projective Capacitive Touch Panel
Activation	10-fingers or Signal-finger
X/Y Position Reporting	Absolute Position
Touch Force	No contact pressure required
Calibration	No need for calibration
Report Rate	Approx 100 points/sec
Interface	USB
Control IC	ILI2511

Specify the normal operating condition
(DGND=0V)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	VDD	4.75	5.0	5.25	V	
Power Consumption	I_{VDD}		T.B.D		mA	

Note 1: SDA , SCL ,/RES

Interface

Pin No.	Symbol	Function
1	GND	POWER GND
2	D-	USB Data-
3	D+	USB Data+
4	VDD	USB power input 5V
5	NC	No connection.
6	NC	No connection.

9. Reliability Test Conditions

Test Item		Test Conditions	Note
High Temperature Operation		85±3°C ,Dry t=240 hrs	
Low Temperature Operation		-30±3°C, Dry t=240 hrs	
High Temperature Storage		85±3°C , Dry t=240 hrs	1,2
Low Temperature Storage		-30±3°C ,Dry t=240 hrs	1,2
Storage Humidity Test		60 °C, Humidity 90%, 240 hrs	1,2
Vibration Test (Packing)		Sweep frequency : 10 ~ 55 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis	2
Image Sticking	Normal Temperature 25°C	chessboard 7*5 pattern, change to 50% gray pattern; Checkpoint: 1hrs,release 5min;2hrs, release 5min; ND8% invisible	5
	High Temperature 65°C	chessboard 7*5 pattern, change to 50% gray pattern; Checkpoint: 1hrs,release 5min;2hrs, release 5min; ND8% invisible	5

Note(1) Condensation of water is not permitted on the module.

Note(2) The module should be inspected after 1 hour storage in normal conditions (15-35°C, 45-65%RH).

Note(3) The module shouldn't be tested over one condition, and all the tests are independent.

Note(4) All reliability tests should be done without the protective film.

Note(5) It is recommended to follow the nominal parameter specified by AMPIRE before the Image Sticking test. Besides, Vcom must be adjusted to optimize display quality.

Definitions of life end point:

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.
- Appearance and display quality should not have degraded noticeably.
- Contrast ratio should be greater than 50% of the initial value.

10. General Precaution

10.1 Safety

(1) Liquid crystal is poisonous. Do not put it your month. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

10.2 Handling

(1) The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
(2) The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
(3) To avoid contamination on the display surface, do not touch the module surface with bare hands.
(4) Keep a space so that the LCD panels do not touch other components.
(5) Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
(6) Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
(7) Do not leave module in direct sunlight to avoid malfunction of the ICs.
(8) Please hold the LCD module properly when you use or store it.

10.3 Static Electricity

(1) Be sure to ground module before turning on power or operation module.
(2) Do not apply voltage which exceeds the absolute maximum rating value.

10.4 Storage

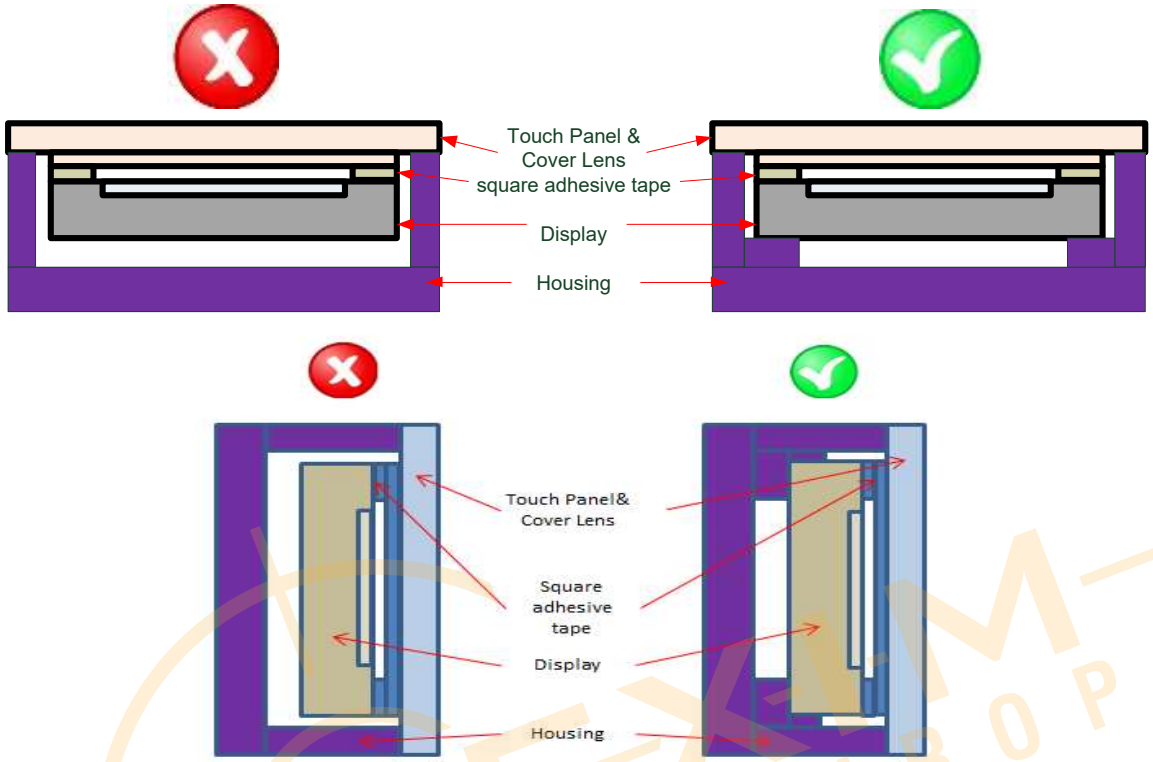
(1) Store the module in a dark room where must keep at +25±10℃ and 65%RH or less.
(2) Do not store the module in surroundings containing organic solvent or corrosive gas.
(3) Store the module in an anti-electrostatic container or bag.

10.5 Cleaning

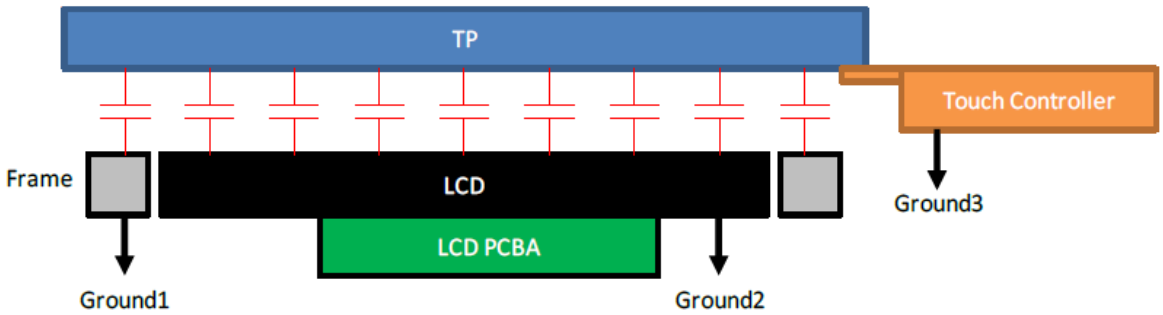
(1) Do not wipe the polarizer with dry cloth. It might cause scratch.
(2) Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

10.6 Mechanism

(1) Please mount LCD module by using mounting holes arranged in four corners tightly.
(2) The square adhesive tape which is between the touch panel and display can't provide well supporting in the long term and high ambient temperature condition. Whether upright or horizontal position the support holder which is in the back side of the display is needed. Do not let the display floating.



(3) TP needs to work in environment with stable stray capacitance. In order to minimize the variation in stray capacitance, all conductive mechanical parts must not be floating. Intermittent floating any conductive part around the touch sensor may cause significant stray capacitance change and abnormal touch function. It is recommended to keep all conductive parts having same electrical potential as the GND of the touch controller module.



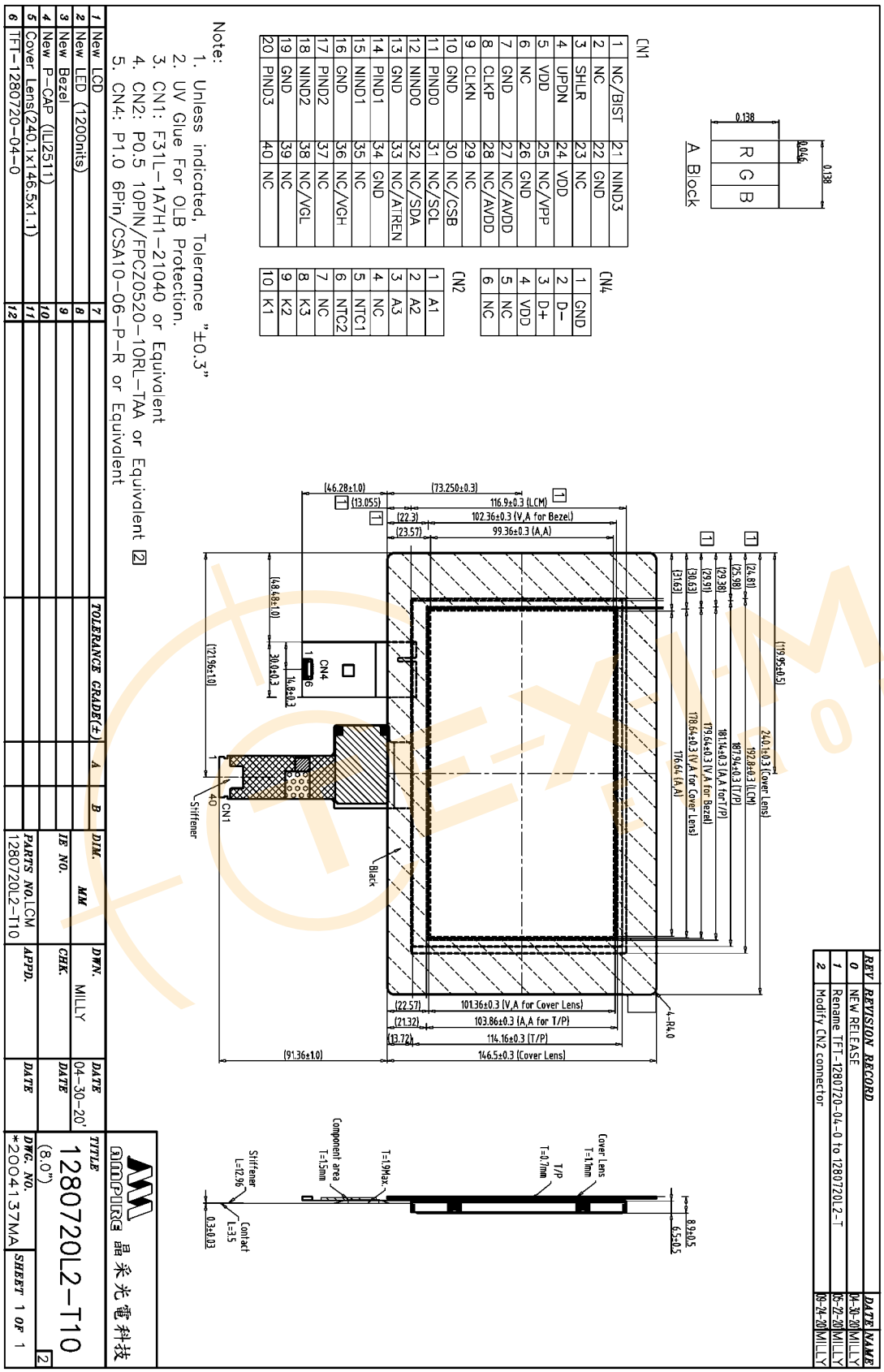
GND1, GND2 and GND3 should be connected together to have the same ground

10.7 Others

(1) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

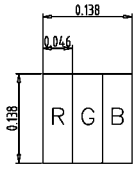
(2) Do not keep the LCD at the same display pattern continually. The residual image will happen and it will damage the LCD. Please use screen saver.

11. Outline Dimension



1	New LCD				
2	New LED (1200nits)				
3	New Bezel				
4	New P-CAP (ILI2511)				
5	Cover Lens(240.1x146.5x1.1)				
6	TFT-1280720-04-0				

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	04-30-20	MILLY
1	Rename TFT-1280720-04-0 to 1280720L2-T	06-22-20	MILLY



A Block

CN1

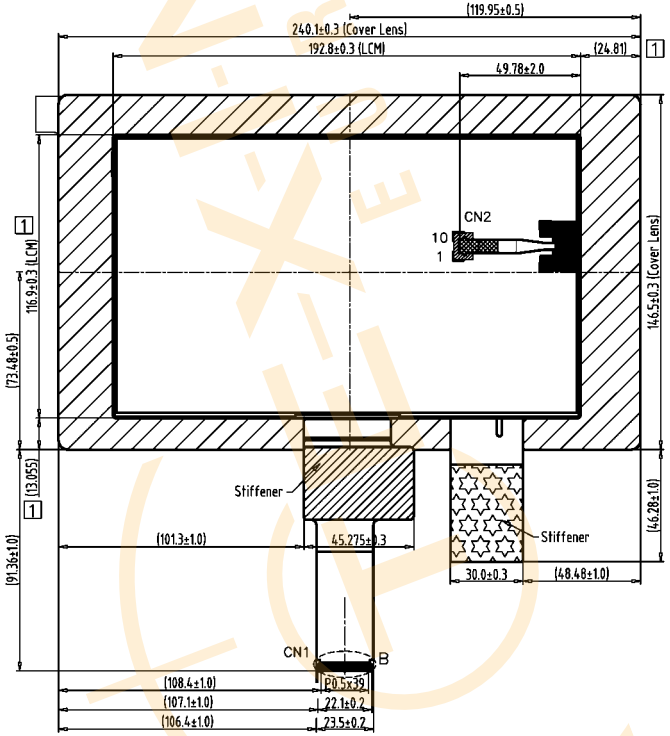
1	NC/BIST	21	NIND3
2	NC	22	GND
3	SHLR	23	NC
4	UPDN	24	VDD
5	VDD	25	NC/VPP
6	NC	26	GND
7	GND	27	NC/AVDD
8	CLKP	28	NC/AVDD
9	CLKN	29	NC
10	GND	30	NC/CSB
11	PIND0	31	NC/SCL
12	NIND0	32	NC/SDA
13	GND	33	NC/ATREN
14	PIND1	34	GND
15	NIND1	35	NC
16	GND	36	NC/VGH
17	PIND2	37	NC
18	NIND2	38	NC/VGL
19	GND	39	NC
20	PIND3	40	NC

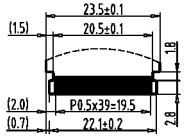
CN4

1	GND
2	D−
3	D+
4	VDD
5	NC
6	NC

CN2

1	A1
2	A2
3	A3
4	NC
5	NTC1
6	NTC2
7	NC
8	K3
9	K2
10	K1





B Block

Note:

1. Unless indicated, Tolerance "±0.3"
2. UV Glue For OLB Protection.
3. CN1: F31L−1A7H1−21040 or Equivalent
4. CN2: P0.5 10PIN/FPCZ0520−10RL−TAA or Equivalent 2
5. CN4: P1.0 6Pin/CSA10−06−P−R or Equivalent

1	New LCD	7		TOLERANCE GRADE(±)	A	B	DIM. MM	DWN. MILLY	DATE 04-30-20'	TITLE 1280720L2−T10 (8.0") 2
2	New LED (1200nits)	8								
3	New Bezel	9					IE NO.	CHK.	DATE	
4	New P−CAP (ILI2511)	10								
5	Cover Lens(240.1x146.5x1.1)	11					PARTS NO.LCM−1 1280720L2−T10	APPD.	DATE	DWG. NO. *2004138MA / SHEET 1 OF 1
6	TFT−1280720−04−0	12								

AMPIRE 晶采光電科技

AMPIRE CO., LTD.

Date: 2020/09/28

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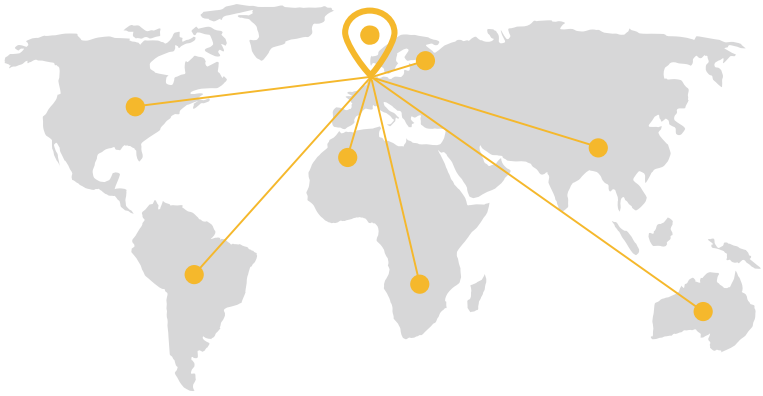
Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.

Texim Europe - contact details



Headquarters & Warehouse

Elektrostraat 17
NL-7483 PG Haaksbergen
The Netherlands

T: +31 (0)53 573 33 33
E: info@texim-europe.com
Homepage: www.texim-europe.com

The Netherlands

Elektrostraat 17
NL-7483 PG Haaksbergen

T: +31 (0)53 573 33 33
E: nl@texim-europe.com

Belgium

Zuiderlaan 14, box 10
B-1731 Zellik

T: +32 (0)2 462 01 00
E: belgium@texim-europe.com

UK & Ireland

St Mary's House, Church Lane
Carlton Le Moorland
Lincoln LN5 9HS

T: +44 (0)1522 789 555
E: uk@texim-europe.com

Germany

Bahnhofstrasse 92
D-25451 Quickborn

T: +49 (0)4106 627 07-0
E: germany@texim-europe.com

Germany

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: muenchen@texim-europe.com

Austria

Warwitzstrasse 9
A-5020 Salzburg

T: +43 (0)662 216 026
E: austria@texim-europe.com

Nordic

Stockholmsgade 45
2100 Copenhagen

T: +45 88 20 26 30
E: nordic@texim-europe.com

Italy

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: italy@texim-europe.com