Project Size.	4.3 inch
Model No.	P043B018-IPS-CTP
Samples No.	
Product type.	800xRGBx480 RGB mode
Signature by customer:	

Prepared	Checked	Approved

1.0 GENERAL DESCRIPTION

Item	Specification	Unit
Screen Size	4.3`inch	Diagonal
Number of Pixel	800RGB(H)x480(V)	Pixels
Display area	95.04(H)x53.86(V)	mm
Pixel pitch	118.8(H)x112.2(V)	um
Outline Dimension	105.42x67.07x4.85	mm
Pixel arrangement	RGB Vertical Stripe	——
Display mode	Normally Black	——
Viewing Direction(eye)	ALL	——
Gray inversion direction	--	
Display Color	262k	——
Luminance(cd/m^2)	300	nit
Contrast Ratio	1200:1	——
Surface treatment	——	——
Interface	RGB 24bit	
Back-light	LED Side-light type	——
LCM IC	ST7262E43	
CTP IC	GT911	
Operation Temperature	-20~70	℃
Storage Temperature	-30~80	℃
Weight	——	g

1.1 Features

- **n** RGB 24bit interface.

1.2 Applications

- **n** MPOS Device.
- **n** Personal Navigation Device.
- **n** Other devices which require high quality displays.

2.0 INPUT INTERFACE PIN ASSIGNMENT

LCM FPC connector is used for electronics interface.

PinNo.	Symbol	Function
1	LEDK	LED back light(Cathode)
2	LEDA	LED back light(Anode)
3	GND	Ground
4	VCC	Power Supply. 2.8V
5-12	R0-R7	RGB Red data input
13-20	G0-G7	RGB green data input
21-28	B0-B7	RGB blue data input
29	GND	Ground
30	CLK	Dot clock signal for RGB interface operation
31	DISP	Display control / standby mode selection
32	HSYNC	Line synchronizing signal for RGB interface operation
33	VSYNC	Frame synchronizing signal for RGB interface operation
34	DE	Data enable signal for RGB interface operation
35	NC	NC
36	GND	Ground
37	XR	Touch the right end line
38	YD	Touch the lower line
39	XL	Touch the left line
40	YU	Touch the upper circuit

TP FPC connector is used for electronics interface

1	CTP_RST	Touch screen reset
2	VCC	Power Supply
3	GND	Ground
4	CTP_INT	Touch screen interrupt signal
5	CTP_SDA	Touch screen data signal
6	CTP_SCL	Touch screen clock signal

3.0 ABSOLUTE MAXIMUM RATINGS

3.1 Electrical Absolute Rating

3.1.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Note
Digital supply voltage	VDDI	-0.3	+4.6	V	GND=0
Analog supply voltage	VCI	-0.3	+4.6	V	GND=0
Logic Signal Input Level	VIN	-0.3	VDDI+0.5	V	GND=0

3.1.2 Back-Light Unit

Item	Symbol	Min	Max	Unit	Note
LED current	I_{BL}	30	40	mA	-
LED voltage	V_{BL}	14	16	V	-

3.2 Environment Absolute Rating

Item	Symbol	Min	Max	Unit	Note
Operating temperature	TOPR	-20	70	°C	-
Storage temperature	TSTG	-30	80	°C	-

Note:
Permanent damage may occur to the LCD module if beyond this specification.

4.0 OPTICAL CHARACTERISTICS

4.1 Optical specification

Item		Symbol	Condition	Min	Type	Max	Unit	Note
White luminance (Center)		Lv	Θ=0 Normal Viewing Angle I_{BL}=40mA	--	300	--	cd/m^2	(4)(5)(7)
Response time		Tr+Tf		--	30	--	ms	(6)
Contrast ratio		CR		--	1200	--	--	(2)
Color Chromaticity (CIE1931)	white	Wx		0.281	0.311	0.341		(5)
		Wy		0.308	0.338	0.368		
Viewing Angle	Hor	ΘL	CR≥10	--	80	--		(1)
		ΘR		--	80	--		
	Ver	ΘU		--	80	--		
		ΘD		--	80	--		
Brightness uniformity		Avg	Θ=0	80	90	--	%	(5)
Color Gamut		NTSC	Θ=0	--	50	--	%	(5)
Optima View Direction		ALL						(1)

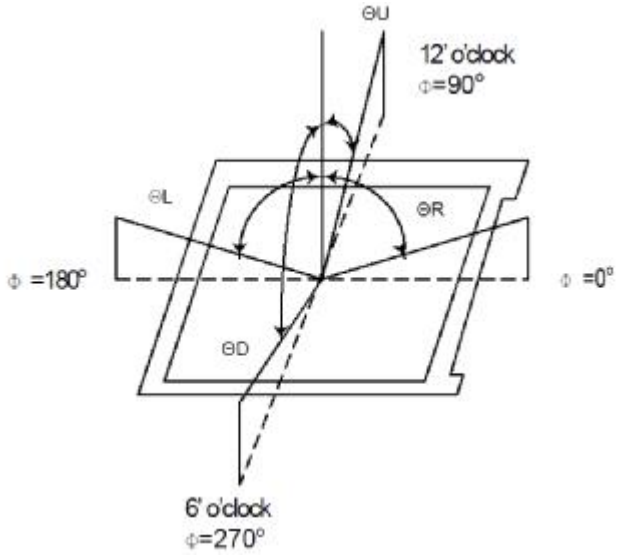
4.2 Measuring Condition

- Measuring surrounding: dark room
- LED current IL:40mA
- Ambient temperature: 25±2℃
- 15min. warm-up time

4.3 Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-7 for other optical characteristics.
- Measuring spot size：20 ~ 21 mm

Note (1) Definition of Viewing Angle

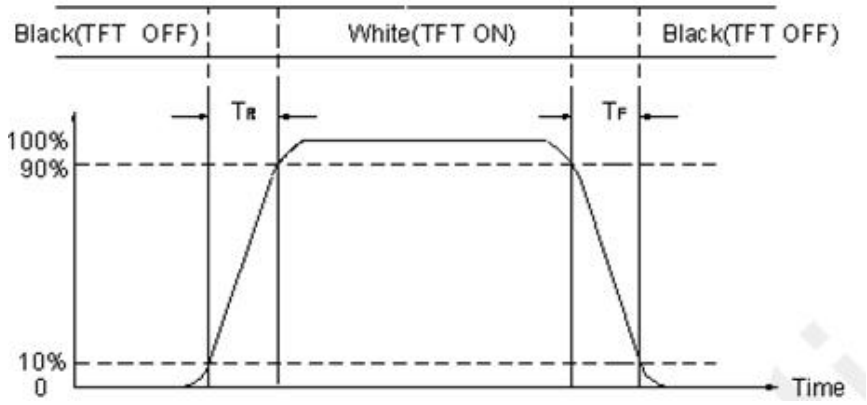


Note (2) Definition of Contrast Ratio(CR):

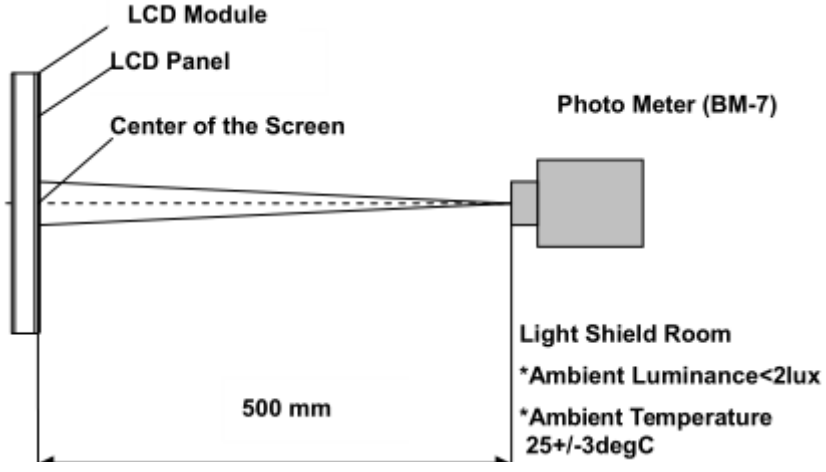
Measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time: Sum of TR and TF



Note (4) Definition of optical measurement setup



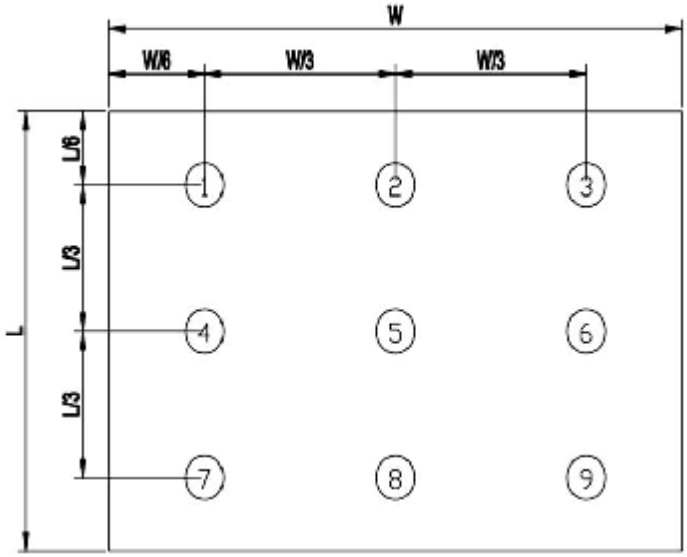
Note (5) Definition of brightness uniformity

The luminance uniformity is calculated by using following formula.

△Bp = Bp (Min.) / Bp (Max.)×100 (%)

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

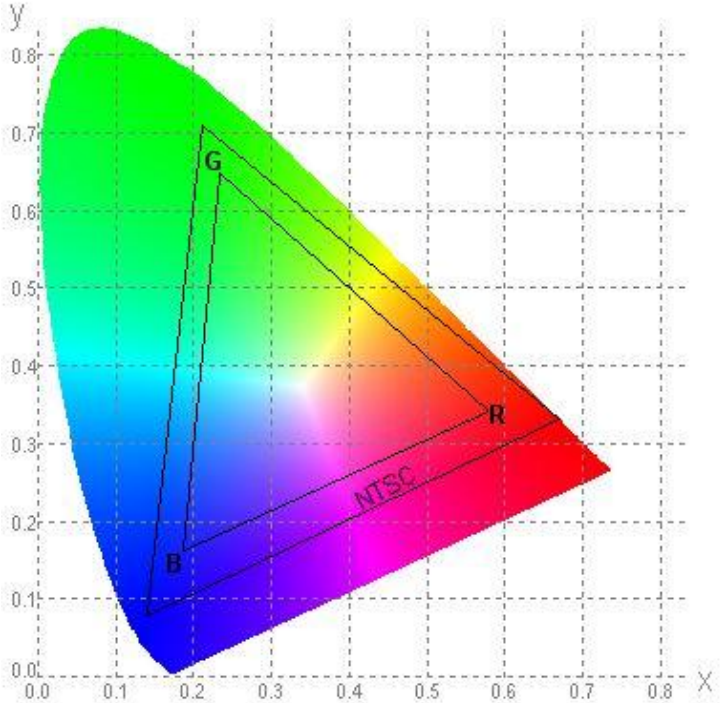
Bp (Min.) = Minimum brightness in 9 measured spots .



Note (6) Definition of Color of CIE1931 Coordinate and NTSC Ratio.

Color gamut:

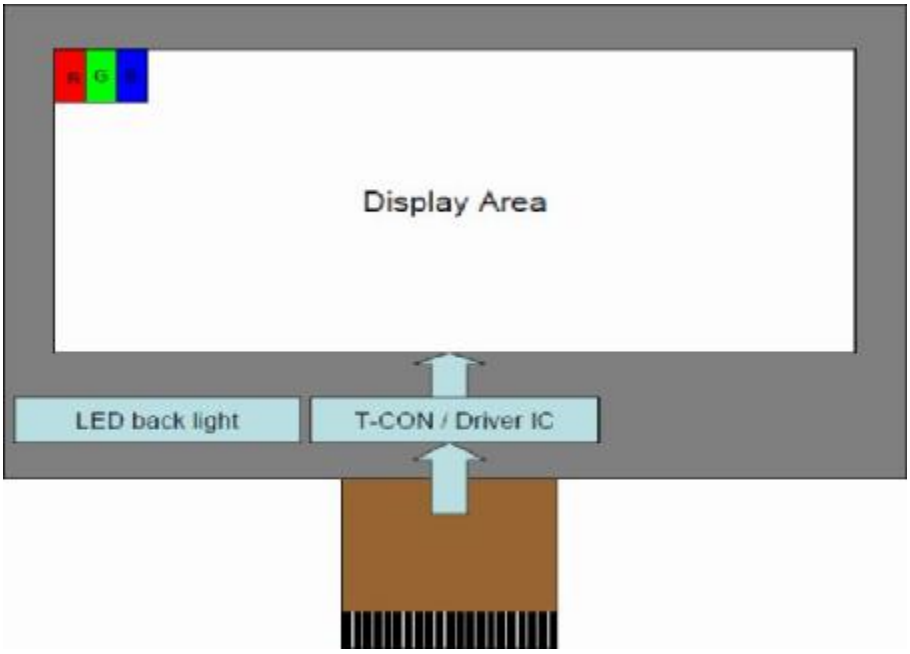
$$S = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}} \times 100\%$$



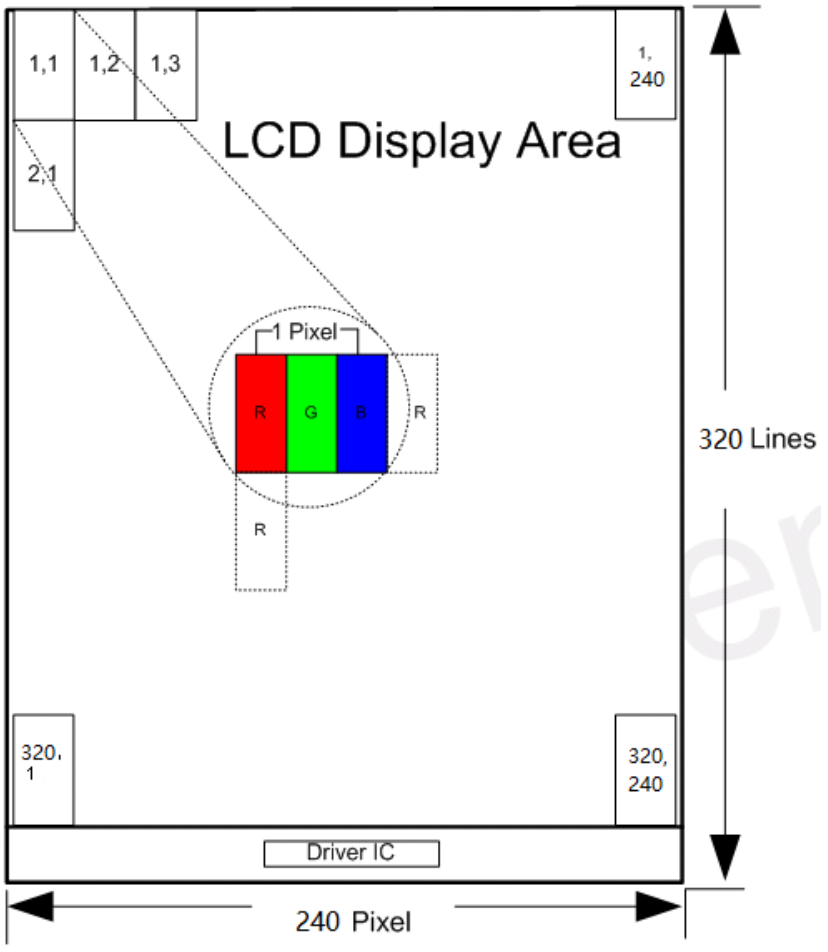
Note (7) Measured the luminance of white state at center point.

5.0 BLOCK DIAGRAM

5.1 TFT LCD Module



5.2 Pixel Format



6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Analog supply voltage	VDD	2.4	2.8	3.3	V	
Digital supply voltage	VDDI	1.65	1.8	3.3		
Input signal Voltage	VIH	0.7VDDI	-	VDDI	V	
	VIL	GND	-	0.3VDDI	V	

6.2 Back-Light Unit

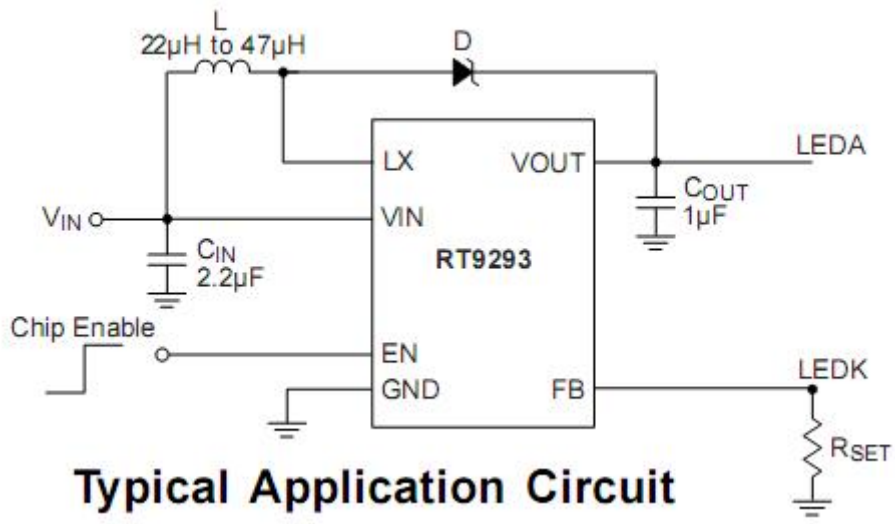
The backlight system is an edge-lighting type with 10 LED Dies.
The characteristics of the LED are shown in the following tables.

Item	Symbol	Min	Typ	Max	Unit	Note
LED current	IL	-	30	40	mA	(2)
LED voltage	VL	-	14	16	V	
Operating LED life time	Hr	-	20000	15000	Hour	(1)(2)

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25±3 ℃, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note (2) The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃and IL=20mA. The LED lifetime could be decreased if operating IL is larger than 40mA. The constant current driving method is suggested.

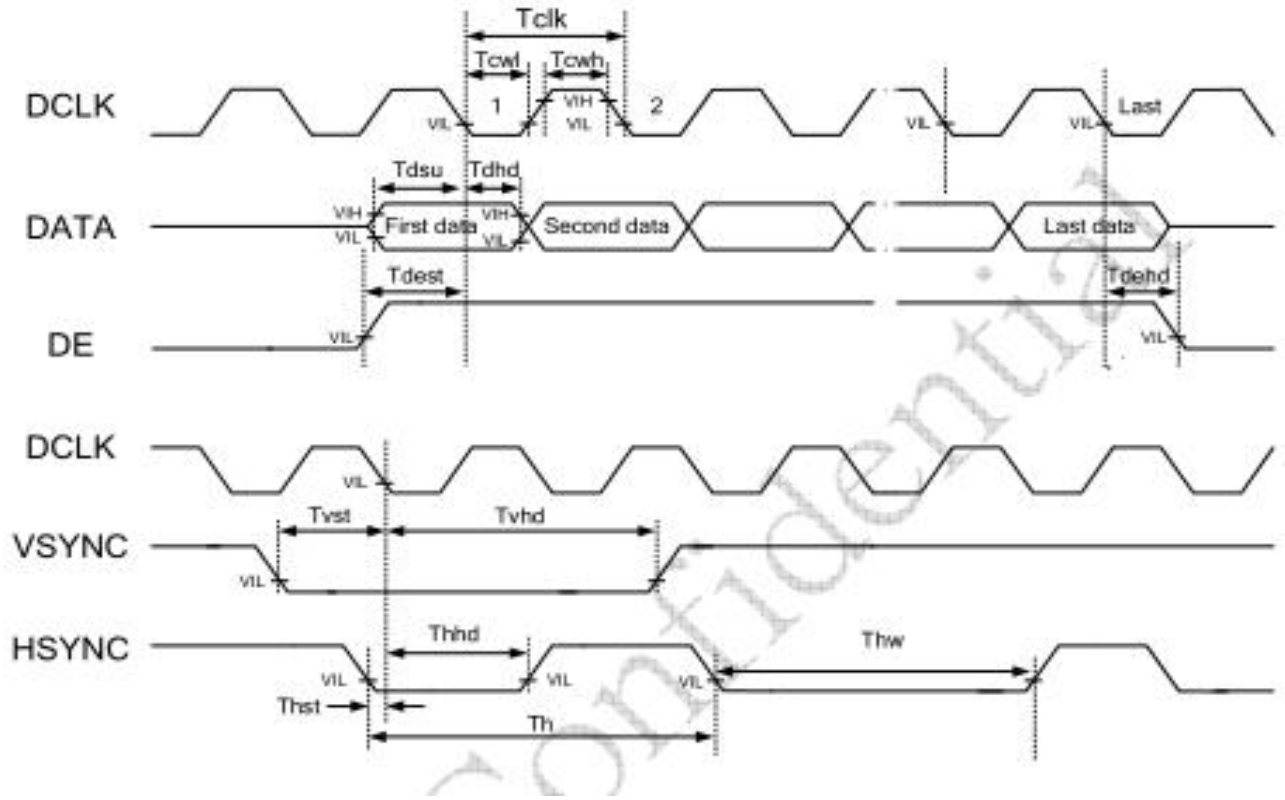
Note (3) Suggested schematic of LED backlight driver



Typical Application Circuit

6.3 Interface Characteristics

8080 Series RGB Interface Characteristics: 24-bit Bus

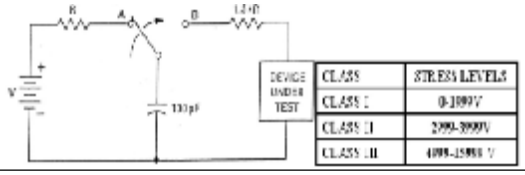


10.1.1 Parallel 24-bit RGB Timing Table

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp	-	480	-	DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_Blanking setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	75	DCLK	
VSYNC	Period Time	Tv	276	292	321	H	
	Display Period	Tvdisp	-	272	-	H	
	Back Porch	Tvbp	2	12	12	H	By V_Blanking setting
	Front Porch	Tvfp	2	8	37	H	
	Pulse Width	Tvw	2	4	37	H	

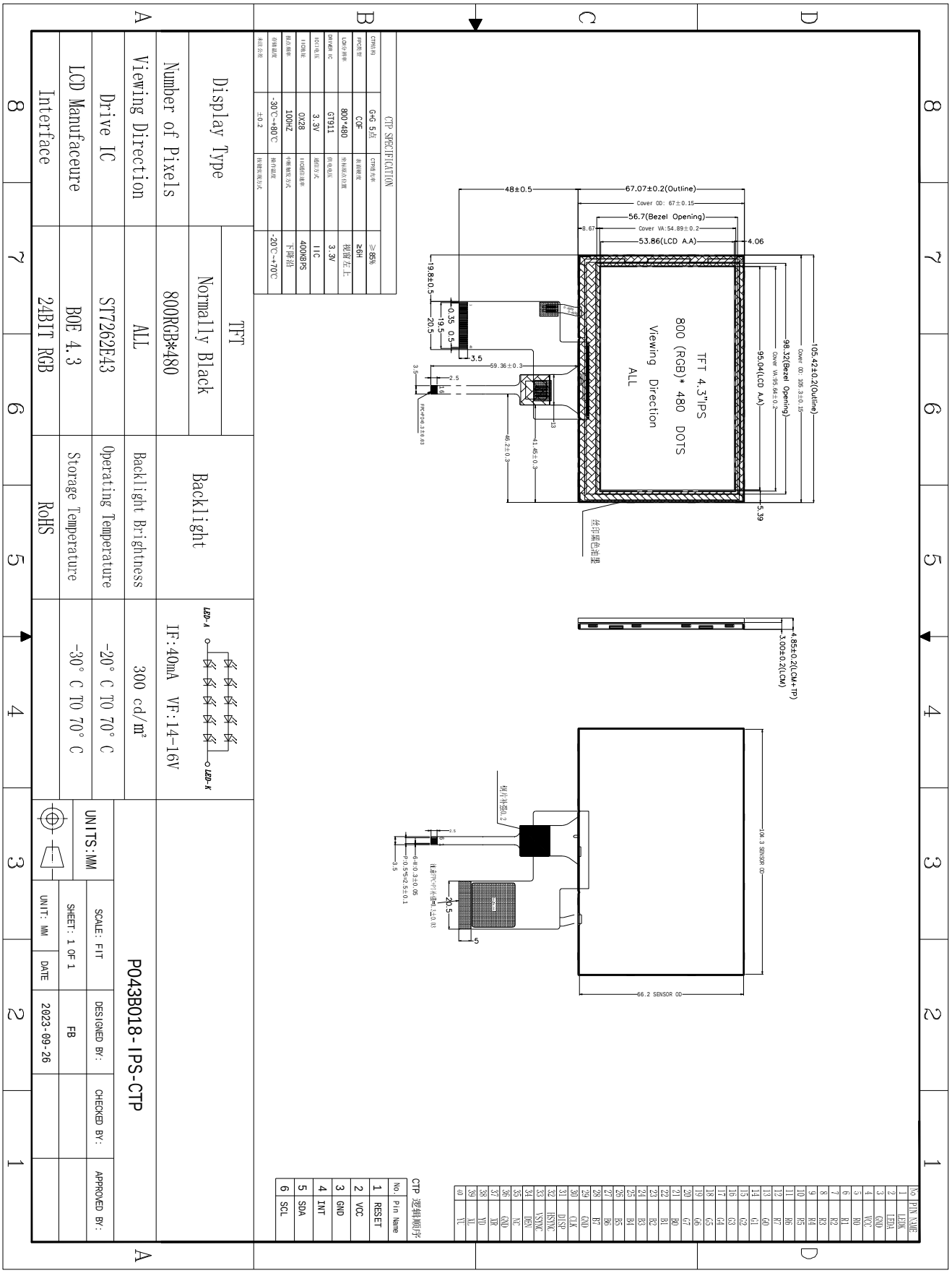
Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

7.0 Reliability conditions

NO	Item	Conditions	Notes
1	High Temperature Storage	Ta=80℃±2℃, 72hrs	
2	Low Temperature Storage	Ta=-30℃±2℃, 72hrs	
3	High Temperature Operation	Ta=70℃±2℃, 72hrs(Operation state)	
4	Low Temperature Operation	Ta=-20℃±2℃, 72hrs(Operation state)	
5	High Temperature and High Humidity (Storage)	Ta=+60℃, 90%RH, 72hrs	
6	Thermal Cycling Test (non operation)	-20℃(30min) → +70℃(30min), 10cycles	
7	Electro static Discharge	Human Body Mode 100pF±10%/1500Ω±1% Air±8kV / contact±6kV Consecutive 10times/ Each discharge 	
8	Vibration test(with carton)	Total fixed amplitude:15mm Vibration Frequency :10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	
9	Drop (with carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	

Note: There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.

8.0 OUTINE DIMENSION



No	PIN NAME
1	LEDK
2	LEDA
3	GND
4	VCC
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	CLK
31	DISP
32	HSYNC
33	VSYNC
34	DEN
35	NC
36	GND
37	XR
38	YD
39	XL
40	YU

CTP 逻辑顺序

No.	Pin Name
1	RESET
2	VCC
3	GND
4	INT
5	SDA
6	SCL

CTP SPECIFICATION			
CTP结构	G+G 5点	CTP透光率	≥85%
PPI点密度	C0F	表面硬度	≥6H
LCM分辨率	800*480	坐标原点位置	视窗 左上
DRIVER IC	GT911	供电电压	3.3V
IO口电压	3.3V	通信方式	IIC
I2C地址	0X28	I2C操作速率	400KBPS
响应频率	100HZ	中断触发方式	下降沿
存储温度	-30℃~+80℃	操作温度	-20℃~+70℃
表贴公差	±0.2	按键定位方式	

Display Type	TFT	Backlight	IF:40mA VF:14-16V
	Normally Black		
Number of Pixels	800RGB*480	Backlight Brightness	300 cd/m²
Viewing Direction	ALL	Operating Temperature	-20° C TO 70° C
Drive IC	ST7262E43	Storage Temperature	-30° C TO 70° C
LCD Manufaceure	BOE 4.3	RoHS	
Interface	24BIT RGB		

UNITS:MM	SCALE: FIT	DESIGNED BY:	CHECKED BY:	APPROVED BY:
	SHEET: 1 OF 1	FB		
UNIT: MM	DATE	2023-09-26		

P043B018-IPS-CTP

9.0 LOT MARK

9.1 Location of Lot Mark

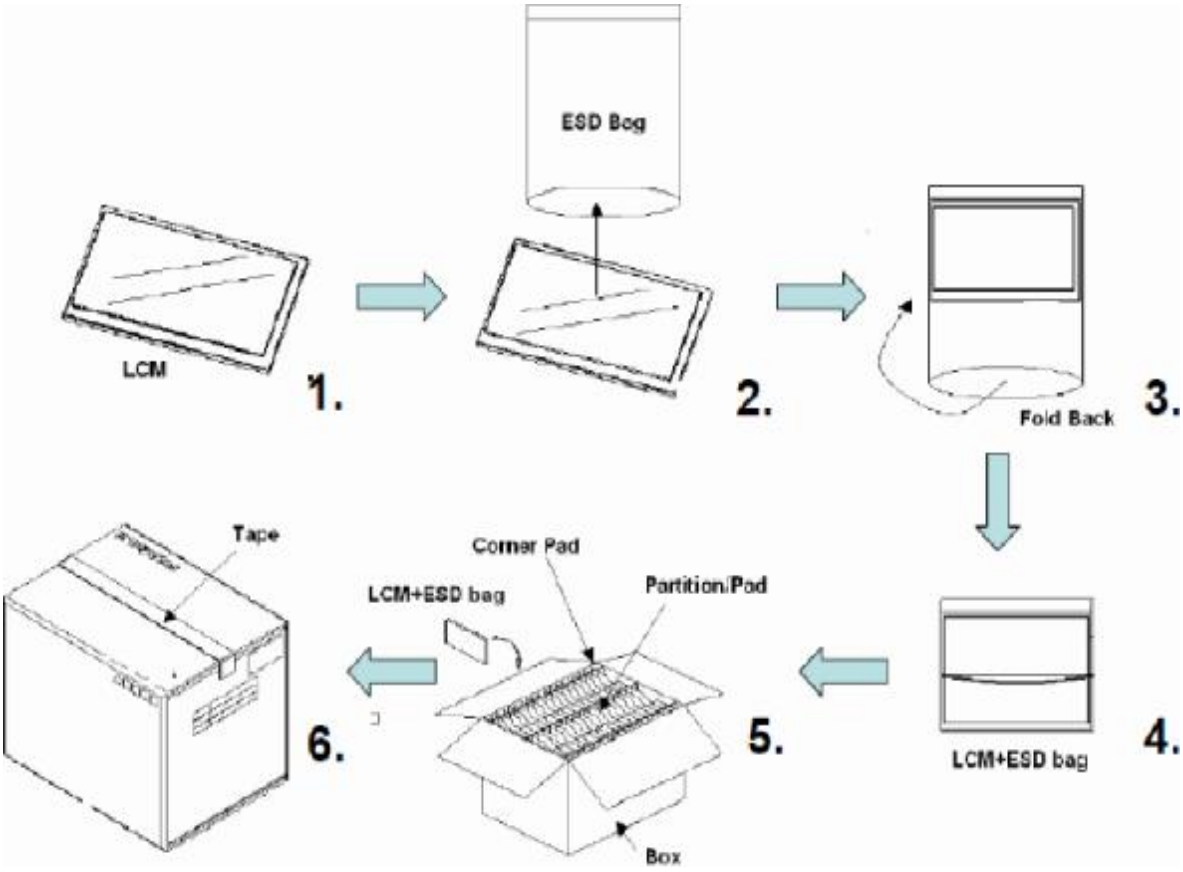
(1) Location: The label is attached to the backside of the LCD module.
(2) Detail of the Mark: as attached below.
(3) This is subject to change without prior notice.

10.0 PACKAGE SPECIFICATION

10.1 Packing form

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Notice
	TDB	TDB	

10.2 Packing assembly drawings11.2 Packing assembly drawings



Items	Material	Notice
Box	Corrugated Paper Board	AB Flute
Partition/Pad	Corrugated Paper Board	A/B Flute
Corner Pad	Corrugated Paper Board	AB Flute
ESD bag	PE	

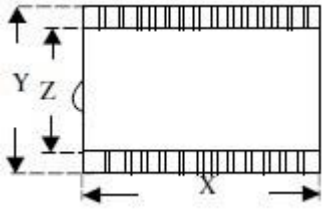
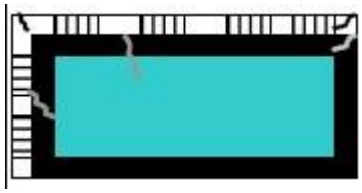
11.0 Items and Criteria：

11.1 Guarantee

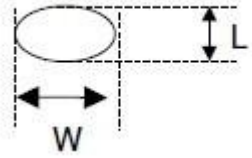
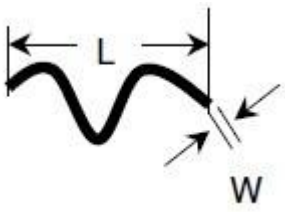
Polcd warrants the quality of our products for ***1 year*** (from the date of delivery).If there are functional defectsfounddu ring the period of warranty, the defective products would be replaced on a one-to-one basis. Polcd would not be responsible for any direct /indirect liabilities consequential to any parties.All the products should be stored or used as specified conditions described in these sheets. If module productionsare not stored or used as specified conditions, herein, it will be void the ***1 year*** warranty(guarantee).

11.2 Visual inspection criterion in cosmetic

(1) Glass defect

Glass defect			
NO	Defect	Criteria	Remark
1	Dimension(Minor)	By engineering diagram	
2	Cracks(Major)	Extensive crack 【Reject】	

(2) LCM appearance defect

NO	Defect	Criteria		Remark
1	Round type(Minor)	Spec	Permissible Qty	1.ψ=(L+W)/2, L: Length, W: Width 2. Disregard if out of A.A. 
		ψ≦0.10mm	Disregard	
		0.10mm<ψ ≦ 0.20mm	**3**	
		0.20mm<ψ	**0**	
2	Line type(Minor)	Spec	Permissible Qty	1. L: Length, W: Width 2. Disregard if out of A.A. 
		W≦0.03mm	Disregard	
		L≦3.0mm and 0.03mm<W≦0.05mm	2	
		L≦3.0mm and 0.05mm<W≦0.10mm	1	
		W>0.10mm orL>3.0mm	0	
3	Polarizer dent(Minor)	Spec.	Permissible Qty	1.ψ=(L+W)/2 , L: Length, W: Width 2.Disregard if out of A.A.
		ψ≦0.20mm	Disregard	
		0.20mm<ψ≦ 0.30mm	2	
		0.30mm<ψ≦ 0.50mm	1	

(3) FPC

NO	Defect	Criteria	Remark
1	Copper peeling(Minor)	Copper peeling 【Reject】	
2	Golden finger	FPC golden finger broken, dead fold, indentation makes FPC surface broken 【Reject】 Tin plating layer(or gold plating) scratch, but not hurt circuit 【Accept】 Except circuit, other position scratch but not expose metal wire 【Accept】	
3	Pin	FPC PI layer delamination 【Reject】 Material and color are inconsistent with sample, FPC burrs 【Reject】 FPC Pin deformation but not affect function. 【Accept】 FPC Pin area is dirty 【Reject】 Other than FPC Pin area is dirty but not affect function 【Accept】	
4	Golden finger	Golden finger edge has burrs,foreign material【Reject】 Golden finger oxidation (dark), uneven electroplating, pinhole, foreign material 【Reject】 Golden finger soldering pad crack exceeds 1/3 length of soldering pad, and soldering pad crack exceed 2 Pins【Reject】 Golden finger tin plating(or gold plating)scratch, but not hurt circuit 【Accept】 Other than golden finger area scratch but not expose metal circuit 【Accept】	
5	FPC Silk printing	Ghosting, incomplete silk printing, wrong printing 【Reject】	
6	FPC Circuit line width	Line width deviation exceed 1/3 line width【Reject】	

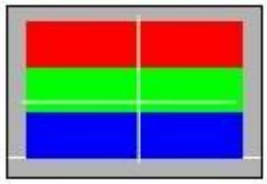
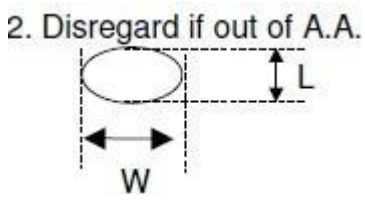
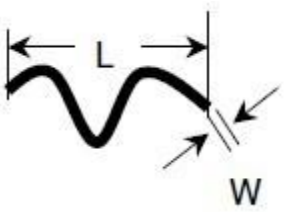
(4) Black tape

NO	Defect	Criteria	Remark
1	Shift(Minor)	IC exposed 【Reject】	
2	No black tape(Minor)	No black tape【Reject】	

(5) Silicon

NO	Defect	Criteria	Remark
1	Amount of silicon (Minor)	ITO exposed 【Reject】	

11.3 Visual inspection criterion in electrical display

<table>
<tr><th>NO</th><th>Defect</th><th colspan="3">Criteria</th><th>Remark</th></tr>
<tr><td>1</td><td>No display (Major)</td><td colspan="3">Not allowed</td><td>  </td></tr>
<tr><td>2</td><td>Missing line (Major)</td><td colspan="3">Not allowed</td><td>  </td></tr>
<tr><td>3</td><td>Darker or lighter Line (Major)</td><td colspan="3">Not allowed</td><td>  </td></tr>
<tr><td>4</td><td>Weak line(Major)</td><td colspan="3">By limited sample</td><td></td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Bright / Dark point (Minor)</td><td>Spec.</td><td colspan="2">Permissible Qty</td><td rowspan="3">1:1sub-pixel: 1R or 1G or1B
2:Point defect area≧1/2 sub pixel.</td></tr>
<tr><td>Bright point</td><td colspan="2">1</td></tr>
<tr><td>Dark point</td><td colspan="2">2</td></tr>
<tr><td rowspan="4">6</td><td rowspan="4">Round type (Minor)</td><td colspan="2">Spec</td><td>Permissible Qty</td><td rowspan="4">1.ψ=(L+W)/2, L: Length, W: Width
  </td></tr>
<tr><td colspan="2">ψ≦0.10mm</td><td>Disregard</td></tr>
<tr><td colspan="2">0.10mm<ψ≦ 0.20mm</td><td>3</td></tr>
<tr><td colspan="2">0.20mm<ψ</td><td>0</td></tr>
<tr><td rowspan="5">7</td><td rowspan="5">Line type (Minor)</td><td colspan="2">Spec.</td><td>Permissible Qty</td><td rowspan="5">1. L: Length, W: Width
2. Disregard if out of A.A.
  </td></tr>
<tr><td colspan="2">W≦0.03mm</td><td>Disregard</td></tr>
<tr><td colspan="2">L≦3.0mm and 0.03mm<W≦0.05mm</td><td>2</td></tr>
<tr><td colspan="2">L≦3.0mm and 0.05mm<W≦0.10mm</td><td>1</td></tr>
<tr><td colspan="2">W>0.10mm or L>3.0mm</td><td>0</td></tr>
<tr><td>8</td><td>Mura (Minor)</td><td colspan="3">By 5% ND filter invisible</td><td></td></tr>
</table>