

SHARP

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TECHNICAL LITERATURE
FOR
TFT - LCD module

MODEL No. LS038Y7DX01

TENTATIVE

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SHARP CORPORATION
MOBILE LIQUID CRYSTAL DISPLAY GROUP

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1. Applicable Scope

This specification is applicable to TFT-LCD Module “LS038Y7DX01”.

2. General Description

This module is a color transfective and active matrix LCD module incorporating CG-Silicon TFT (Continuous Grain-Silicon Thin Film Transistor). It is composed of a color TFT-LCD panel, driver ICs, Input FPC, a back light unit and a touch panel. Graphics and texts can be displayed on a 480×3×800 dots panel with 262,144 colors by supplying 18bit data signals(6bit×RGB), four timing signals, 3wire SPI Interface signals, logic(typ.+1.8V), analog (typ. +2.85V) supply voltages for TFT-LCD panel driving, supply voltage for back light and back light control signals.

It is a wide viewing-angle-mode (Vertical viewing angle :($\pm 80^\circ$), Horizontal viewing angle :($\pm 80^\circ$), CR>10).

3. Mechanical (Physical) Specifications

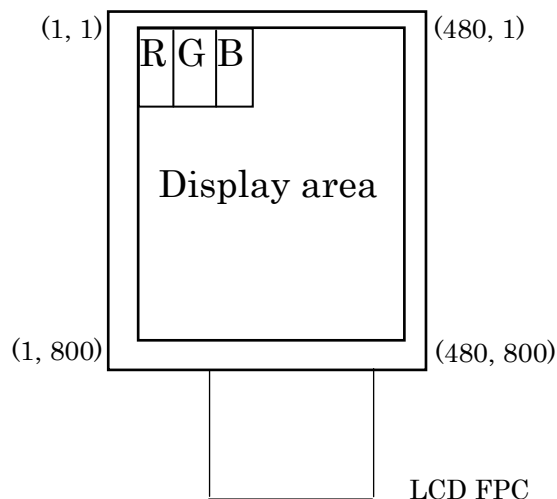
Table1

Item	Specifications	Unit	Remarks
Screen size	9.66 (3.8" type) Diagonal	cm	
Active area	49.68(H)×82.8(V)	mm	
Pixel format	480(H)×800(V)	pixel	
	1 Pixel =R+G+B dots	-	
Pixel pitch	0.0345(H)×0.1035(V)	mm	
Pixel configuration	R,G,B vertical stripes	-	
Display mode	Normally black	-	
Unit outline dimensions	54.6(W)×93.0(H)×2.0(D)	mm	【Note3-1】
Mass	(TBD)	g	
Surface hardness	3H	-	

【Note3-1】 The above-mentioned table indicates module sizes without some projections and FPC.

For detailed measurements and tolerances, please refer to Fig.1 Outline Dimensions.

4. Pixel Configuration



5. Input Terminal Names and Functions

Table2-1(BtoB:AXT450124)

Pin No.	Symbol	I/O	Description	Remarks
1	LED-	-	Power Supply for LED(Cathode)	
2	LED+	-	Power Supply for LED(Anode)	
3	NC	-	OPEN(Not Connected)	
4	VDC	-	Power Supply(Analog)	
5	GND	-	Ground	
6	VDDIO	-	Power Supply(Digital)	
7	GND	-	Ground	
8	BRESET	I	Reset Signal	
9	LCDCS	I	Serial Interface(Chip Select)	
10	SO	O	Serial Interface(Data output)	
11	SI	I	Serial Interface(Data Input)	
12	SCLK	I	Serial Interface(Clock)	
13	GND	-	Ground	
14	R0(ID0)	I(O)	Red Data Signal(LSB) ,(ID pin(10k Ω Pull-Up VDDIO))	
15	R1	I	Red Data Signal	
16	R2	I	Red Data Signal	
17	R3	I	Red Data Signal	
18	R4	I	Red Data Signal	
19	R5	I	Red Data Signal(MSB)	
20	GND	-	Ground	
21	G0	I	Green Data Signal(LSB)	
22	G1	I	Green Data Signal	
23	G2	I	Green Data Signal	
24	G3	I	Green Data Signal	
25	G4	I	Green Data Signal	
26	G5	I	Green Data Signal(MSB)	
27	GND	-	Ground	
28	ENAB	I	Data enable signal	
29	GND	-	Ground	
30	DOTCLK	I	Dot Clock	
31	GND	-	Ground	
32	HSYNC	I	Horizontal Synchronizing Signal	
33	VSYNC	I	Vertical Synchronizing Signal	
34	GND	-	Ground	
35	B0(ID1)	I(O)	Blue Data Signal(LSB),(ID pin(10k Ω Pull-Down GND))	
36	B1	I	Blue Data Signal	
37	B2	I	Blue Data Signal	
38	B3	I	Blue Data Signal	
39	B4	I	Blue Data Signal	
40	B5	I	Blue Data Signal(MSB)	
41	GND	-	Ground	
42	PWM	O	PWM output for backlight adjustment	
43	X-	-	Touch panel electrode(X-)	
44	Y-	-	Touch panel electrode(Y-)	
45	X+	-	Touch panel electrode(X+)	
46	Y+	-	Touch panel electrode(Y+)	
47	Key_1	-		
48	Key_2	-		
49	Key_3	-		
50	Key_C	-		

6. Absolute Maximum Ratings

Table 3

GND=0V

Parameter	Symbol	Conditions	Rated value	Unit	Remarks
Analog Power Supply Voltage	VDC	Ta=+25°C	-0.3 ~ +4.0	V	【Note6-1】
Digital Power Supply Voltage	VDDIO	Ta=+25°C	-0.3 ~ +4.0	V	【Note6-1】
Input Voltage	V _{IN}	Ta=+25°C	-0.3 ~ VDDIO+0.3	V	【Note6-1, 6-2】
Temperature for storage	T _{stg}	-	-30 ~ +70	°C	【Note6-3】
Temperature for operation	T _{opr}	-	-20 ~ +60	°C	【Note6-3】
LED Input electric current	I _{LED}	Ta=+25°C	35	mA	【Note6-4】

【Note6-1】 Voltage applied to GND pins. GND pin conditions are based on all the same voltage(0V).

Always connect all GND externally and use at the same voltage.

【Note6-2】 BRESET, LCDCS, SI, SCLK, ENAB, DOTCLK, HSYNC, VSYNC, R0~R5,

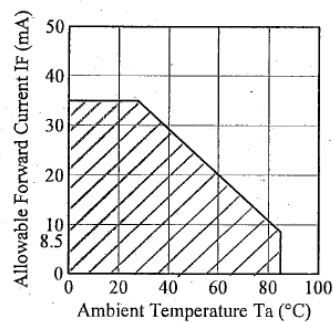
G0~G5, B0~B5 terminals are applied.

【Note6-3】 Humidity : 95%RHMax.(at Ta≤40°C). Maximum wet-bulb temperature is less than

39°C(at Ta>40°C). Condensation of dew must be avoided.

【Note6-4】 Ambient temperature and the maximum input are fulfilling the following operating conditions.

■ Ambient Temperature vs.
Allowable Forward Current



7. Electrical Characteristics

7-1. TFT-LCD Panel Driving Section

Table 4

GND=0V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Analog Power Supply Voltage	VDC	(+2.7)	+2.85	+3.3	V	【Note7-1】
Digital Power Supply Voltage	VDDIO	+1.65	+1.8	VDC	V	【Note7-1】
Input voltage (Low)	V _{IL}	0	-	0.2VDDIO	V	【Note7-2, 7-3】
Input voltage (High)	V _{IH}	0.8VDDIO	-	VDDIO	V	【Note7-2, 7-4】
Input current (Low)	I _{OL}	-	-	(TBD)	μA	
Input current (High)	I _{OH}	-	-	(TBD)	μA	

【Note7-1】 Include Ripple Noise

【Note7-2】 BRESET, LCDCS, SI, SCLK, ENAB, DOTCLK, HSYNC, VSYNC, R0~R5,

G0~G5, B0~B5 terminals are applied.

【Note7-3】 without overshoot

【Note7-4】 applied overshoot

7-2. Back Light Driving Section

Table 5

Ta=+25°C, GND=0V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
LED Voltage	V _{LED}	-	+22.4	+24.5	V	【Note7-5】
LED Current	I _{LED}	-	20	-	mA	
Power Consumption	W _{LED}	-	448	-	mW	【Note7-6】

【Note7-5】 at I_{LED}=20mA【Note7-6】 $W_{LED}=V_L \times I_L$

7-3. Power Consumption

Table 6

Ta=+25°C, GND=0V

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	Remarks
Current Consumption		VDC=2.85V		(TBD)		mA	【Note7-7】
		VDDIO=1.8V		(TBD)		mA	【Note7-8】

【Note7-7】 Measurement Conditions TBD

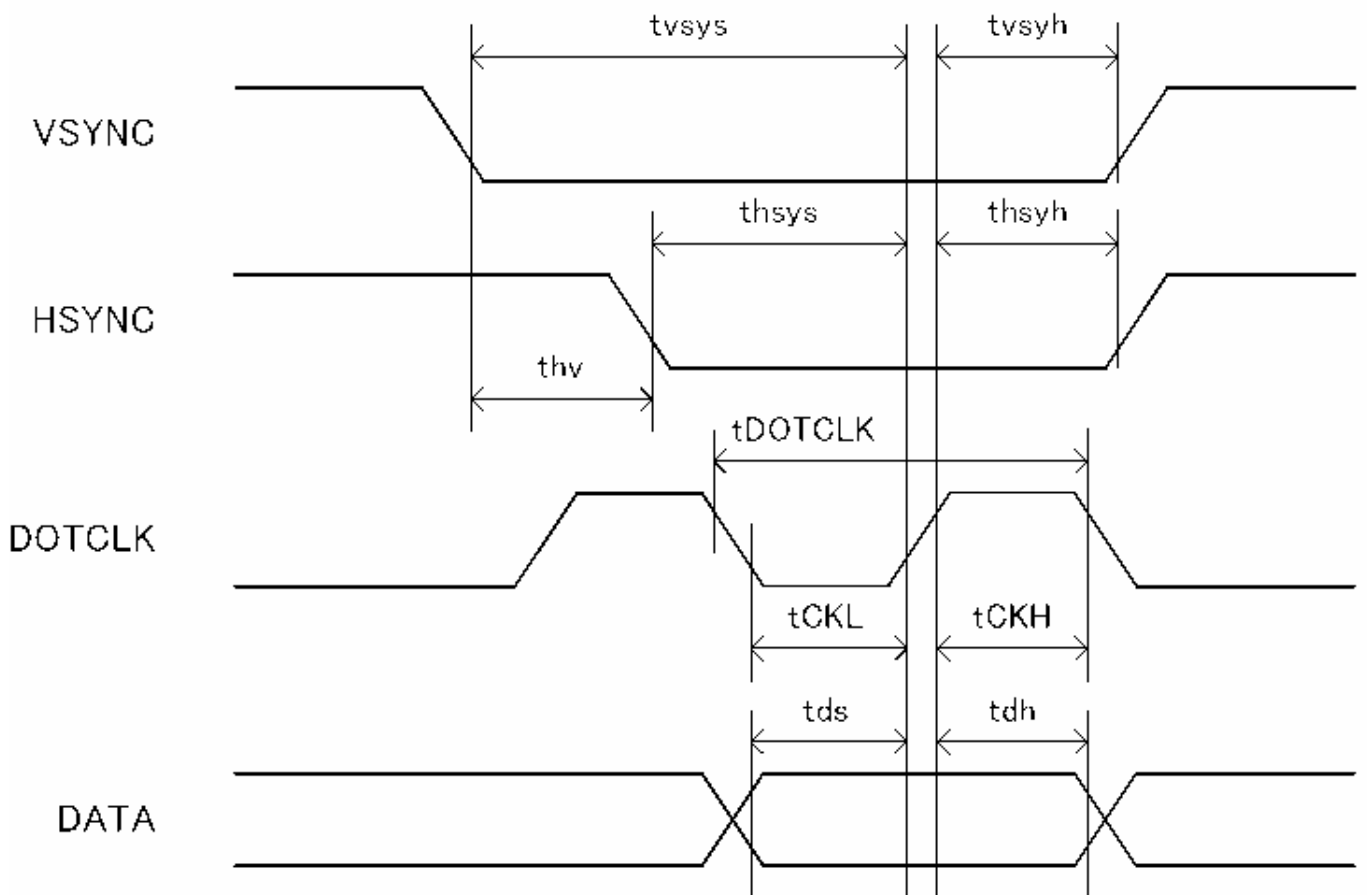
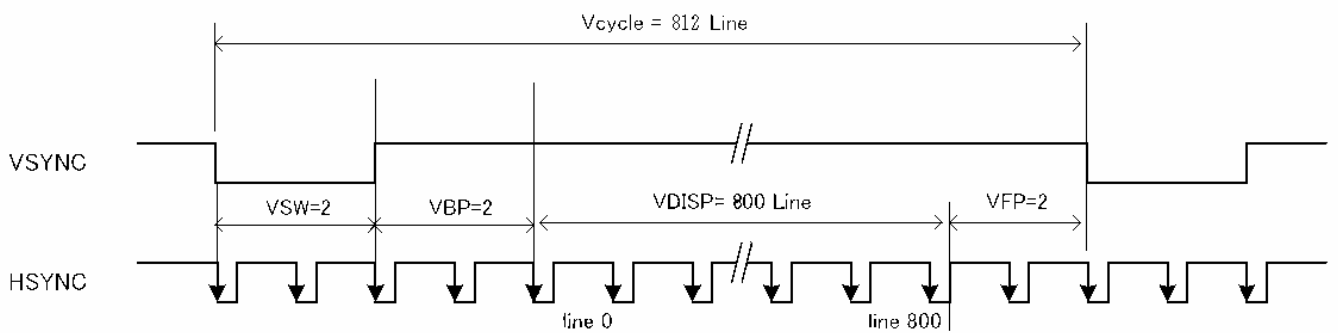
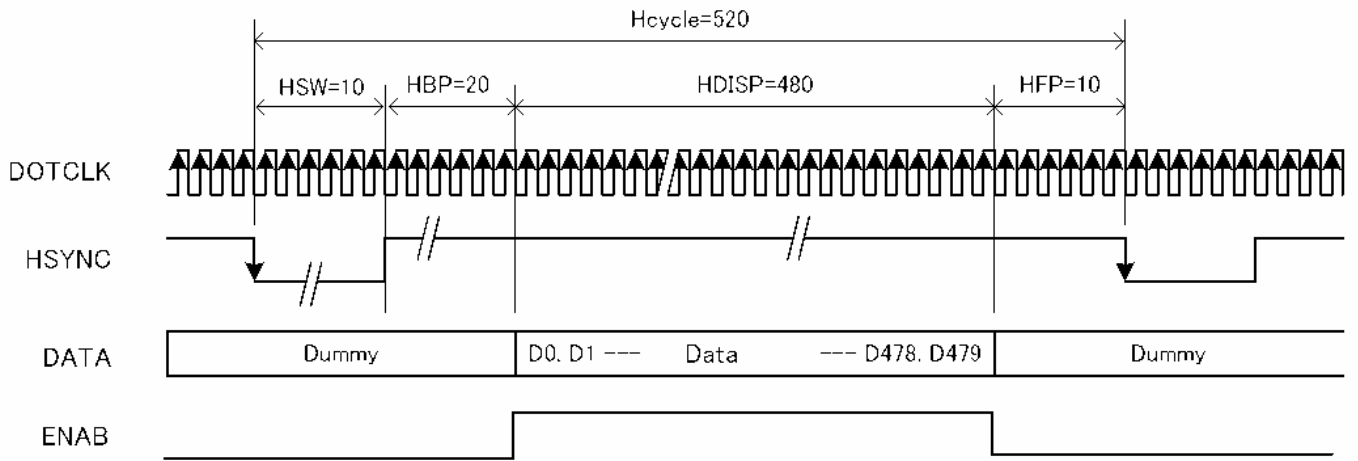
【Note7-8】 Measurement Conditions TBD

8. Timing characteristics of input signals

8-1 AC Timing

Table 7

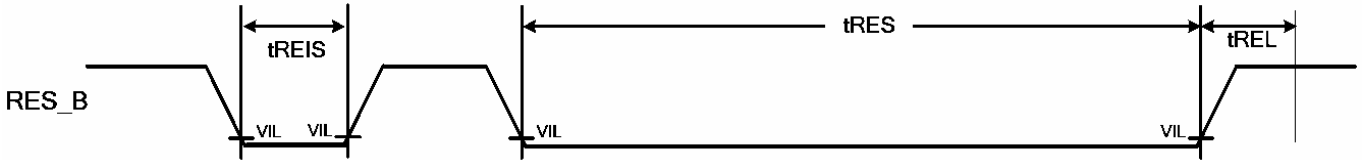
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Vertical frequency	f_V	-	60	-	Hz	
Horizontal frequency	f_H				kHz	
DOTCLK frequency	f_{DOTCLK}	-	(30)	(40)	MHz	TBD
DOTCLK cycle	t_{DOTCLK}	(25)	(33.3)	-	ns	TBD
Hsync low pulse width	t_{HSW}	2	10	-	DOTCLK	
Horizontal back porch	t_{HBP}	2	20	-	DOTCLK	
Horizontal front porch	t_{HFP}	8	10	-	DOTCLK	
Horizontal data start point	$t_{\text{HSW}} + t_{\text{HBP}}$	12	30	-	DOTCLK	
Horizontal blanking period	$t_{\text{HSW}} + t_{\text{HBP}} + t_{\text{HFP}}$	20	40	-	DOTCLK	
Horizontal display area	H _{DISP}	-	480	-	DOTCLK	
Horizontal cycle	H_{cycle}	500	520	1023	DOTCLK	
Vsync low pulse width	t_{VSW}	1	(2)	-	Line	TBD
Vertical back porch	t_{VBP}	2	(2)	-	Line	TBD
Vertical front porch	t_{VFP}	1	(2)	-	Line	TBD
Vertical data start point	$t_{\text{VSW}} + t_{\text{VBP}}$	2	(4)	-	Line	TBD
Vertical blanking period	$t_{\text{VSW}} + t_{\text{VBP}} + t_{\text{VFP}}$	3	(6)	-	Line	TBD
Vertical display area	V _{DISP}	-	800	1023	Line	
Vertical cycle	V_{cycle}	-	(812)	-	Line	TBD
Vertical synchronization setup time	t_{Vsys}	7.5	-	-	ns	
Vertical synchronization hold time	t_{Vsyh}	7.5	-	-	ns	
Horizontal synchronization setup time	t_{Hsys}	7.5	-	-	ns	
Horizontal synchronization hold time	t_{Hsyh}	7.5	-	-	ns	
Sync signal falling phase difference	t_{hv}	-	-	480	DOTCLK	
Clock low period	t_{CKL}	12.5	-	-	ns	
Clock high period	t_{CKH}	12.5	-	-	ns	
Data setup time	t_{ds}	7.5	-	-	ns	
Data hold time	t_{dh}	7.5	-	-	ns	



8-2 Reset Input Timing

Table 8

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Low pulse width	t_{RES}	30			us	
Non-reactive low pulse width	t_{REIS}			5	us	
Release time	t_{REL}	1			ms	



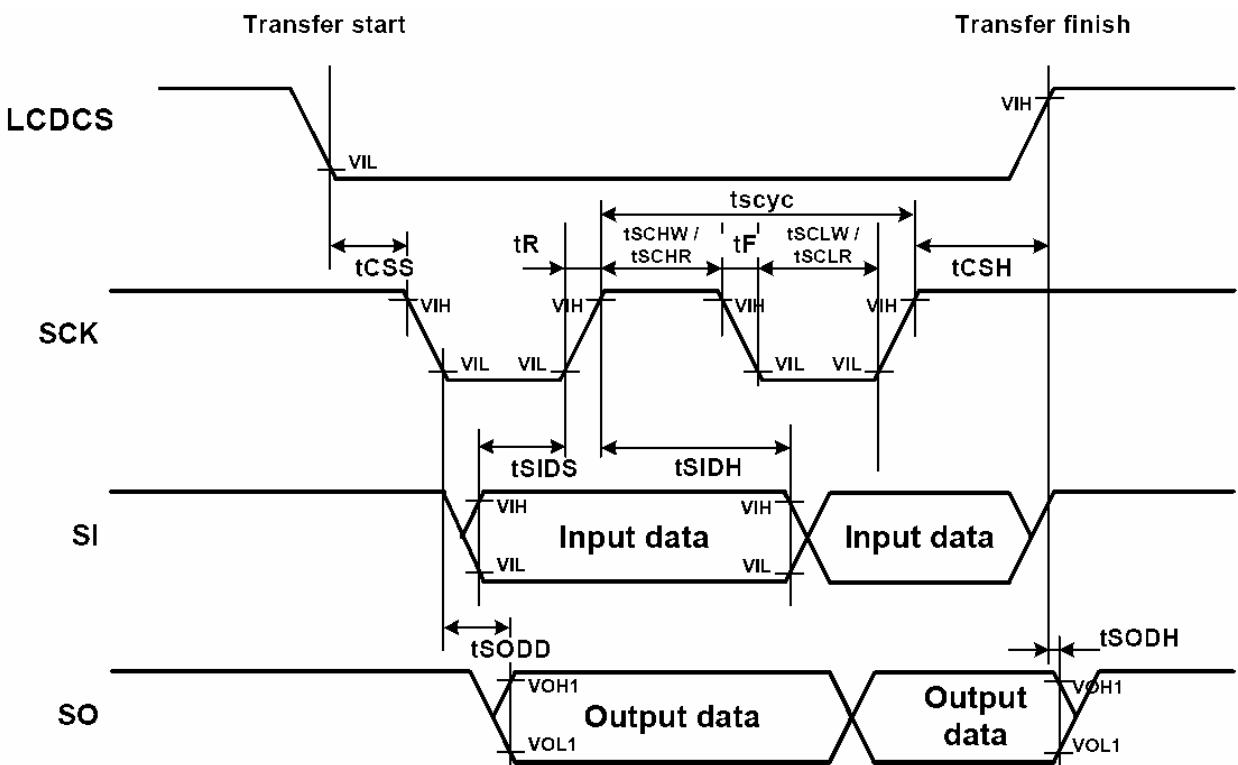
8-3 Serial Interface Input Timing and Sequence(Address/Data Transfer Mode)

(1) Serial Interface Input Timing

Table 9

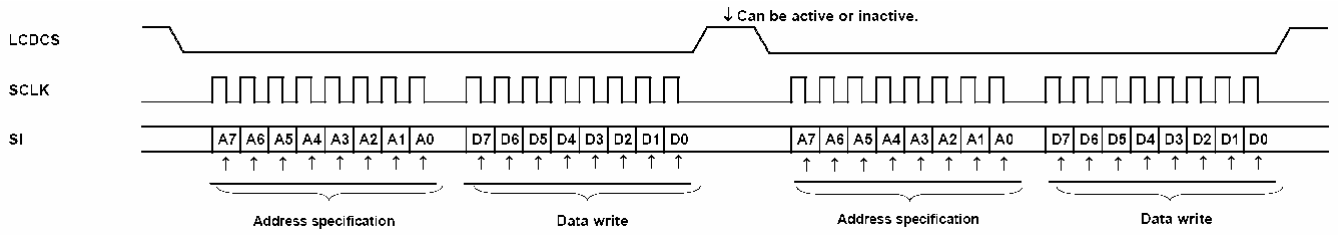
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
SCLK cycle	t_{scyc}	210	-	-	ns	
SCLK rise/fall time	t_R, t_F	-	-	25	ns	
High pulse width	t_{SCHW} / t_{SCHR}	90	-	-	ns	
Low pulse width	t_{SCLW} / t_{SCLR}	90	-	-	ns	
LCDCS setup time	t_{CSS}	120	-	-	ns	
LCDCS hold time	t_{CSH}	120	-	-	ns	
Serial input data setup time	t_{SIDS}	90	-	-	ns	
Serial input data hold time	t_{SIDH}	90	-	-	ns	
Serial output data delay time	t_{SODD}	-	-	100	ns	
Serial output data hold time	t_{SODH}	100	-	-	ns	

*All timings are 20 – 80%(VDDIO).

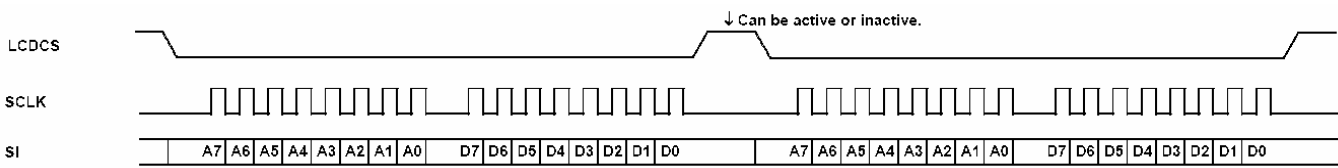


(2) Serial Interface Sequence

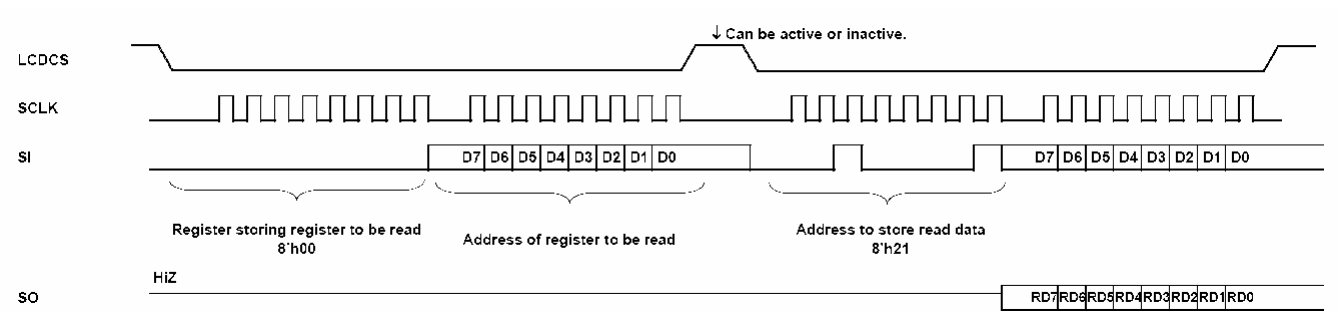
(a) Basic Sequence(Write Sequence)



(b) Continuous Write Sequence



(c) Continuous read Sequence

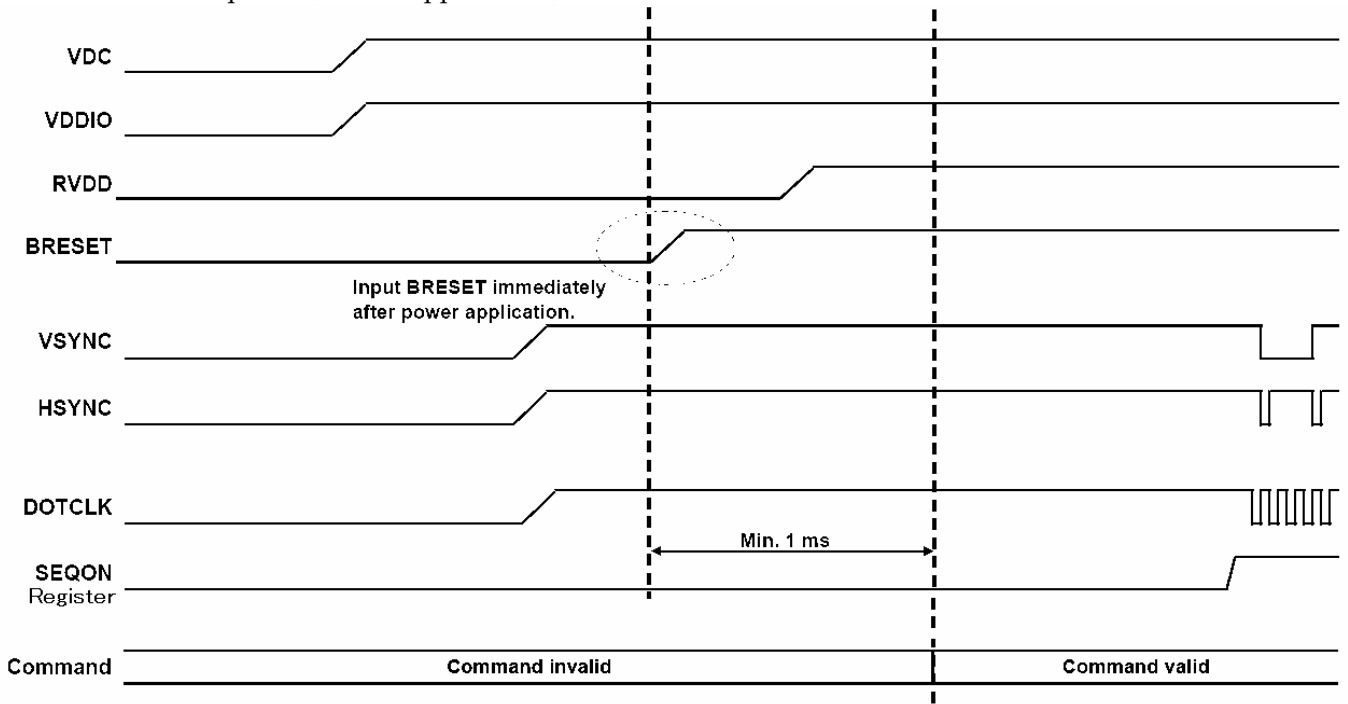


(3) Register Setting

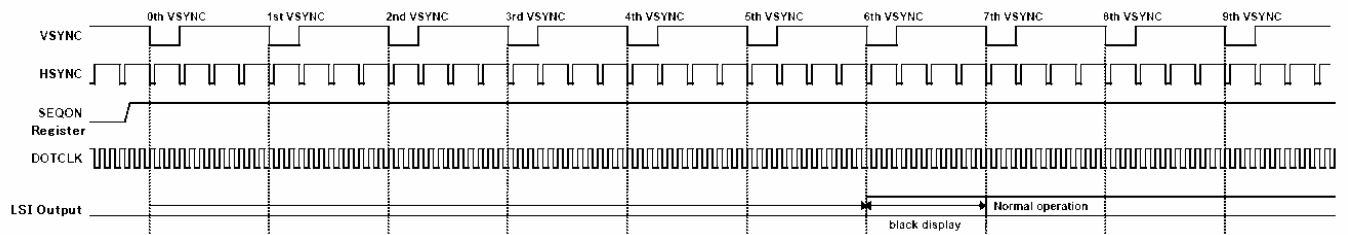
TBD

9. Power Sequence

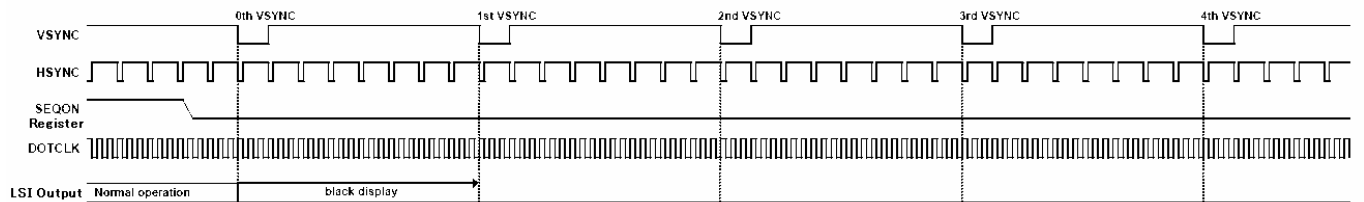
9-1 Power On Sequence(Power application)



9-2 Power On Sequence(After power application)



9-3 Power Off Sequence



10. Input Signals, Basic Display Colors and Gray Scale of Each Color

Table 12

	Colors & Gray Scale	Data signals																		
		Gray Scale	R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	B4	B5
			LSB	MSB					LSB	MSB					LSB	MSB				
Basic Color	Black	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	—	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Green	—	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Cyan	—	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Red	—	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Magent	—	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	—	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	—	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	GS1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	GS2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	↓	↓					↓					↓							
	↓	↓	↓					↓					↓							
	Brighter	GS61	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	↓	GS62	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red	GS63	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	GS1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	↑	↓	↓					↓					↓							
	↓	↓	↓					↓					↓							
	Brighter	GS61	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0
	↓	GS62	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0
	Green	GS63	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Gray Scale of Blue	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	GS1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	↑	↓	↓					↓					↓							
	↓	↓	↓					↓					↓							
	Brighter	GS61	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1
	↓	GS62	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
	Blue	GS63	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

0: Low level voltage, 1: High level voltage

Each basic color can be displayed in 64 gray scales from 6 bit data signals. According to the combination of total 18 bit data signals, the 262,144-color display can be achieved on the screen.

11. Optical Characteristics

11-1 Not Driving the Back Light Condition

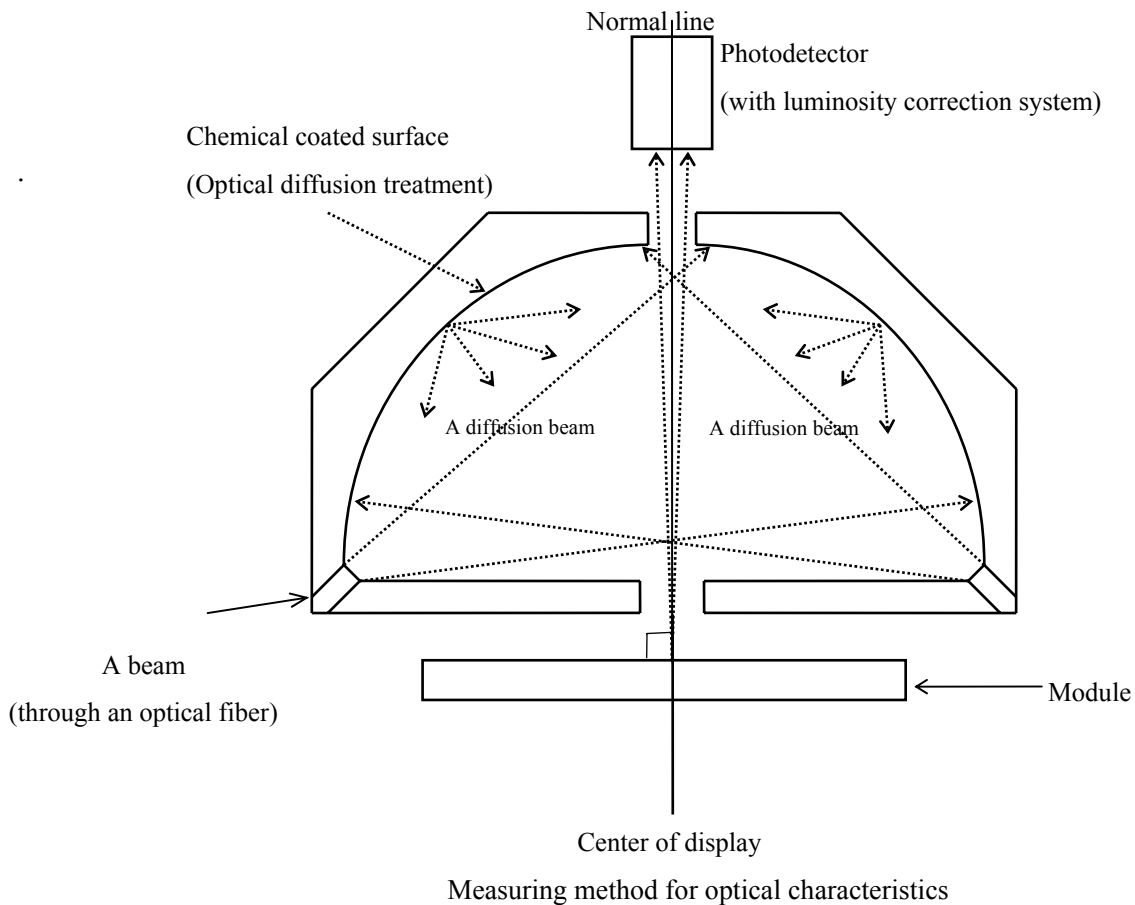
Table 13

Ta=+25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	θ_{21}, θ_{22}	CR>2		TBD		degree	【Note11-1, 11-2】
	θ_{11}, θ_{12}			TBD		degree	
Contrast ratio	CR	$\theta=0^\circ$		TBD		-	【Note11-2, 11-4】
Response Time	Rise	$\theta=0^\circ$		TBD		ms	【Note11-3】
	Fall			TBD		ms	
White Chromaticity	x	$\theta=0^\circ$		(0.320)		-	【Note11-4】
	y			(0.347)		-	
Reflection Ratio	R	$\theta=0^\circ$		(1.5)		%	【Note11-5】

*The measuring method of the optical characteristics is shown by the following figure.

*A measurement device is DMS diffuse measurement system.



11-2 Driving the Back Light Condition

Table 14

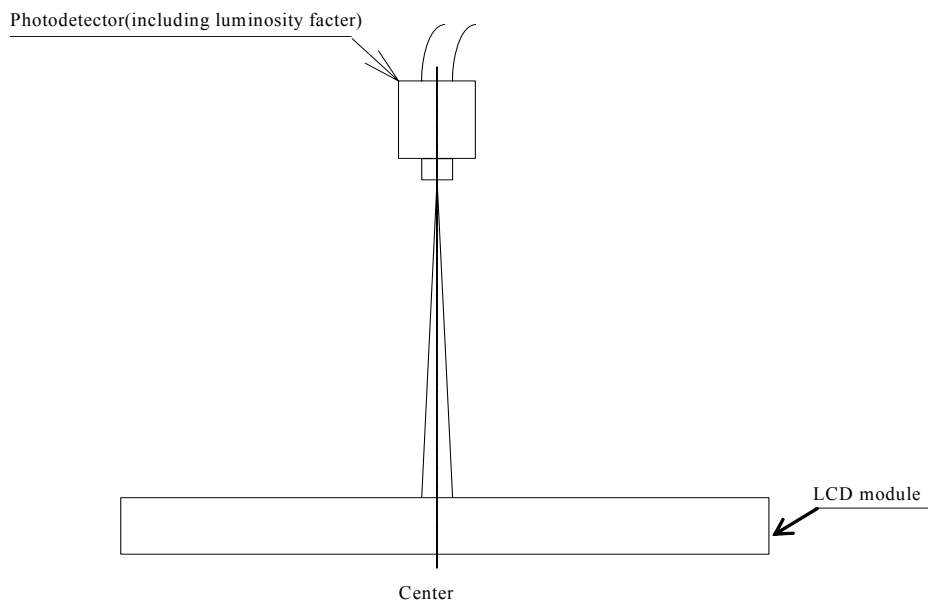
Ta=+25°C

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Viewing Angle Range	θ21, θ22		CR>10	(70)	(80)		degree	【Note11-1, 11-2】	
	θ11, θ12			(70)	(80)		degree		
Contrast Ratio		CR	θ=0°		(500)		-	【Note11-2】	
Response Time	Rise	τr	θ=0°			(35)	ms	【Note11-3】	
	Decay	τd				(35)	ms		
White Chromaticity	x		θ=0°	(0.275)	(0.310)	(0.345)	-		
	y			(0.295)	(0.330)	(0.365)	-		
Red Chromaticity	x		θ=0°		(0.630)				
	y				(0.345)				
Green Chromaticity	x		θ=0°		(0.320)				
	y				(0.625)				
Blue Chromaticity	x		θ=0°		(0.150)				
	y				(0.065)				
Brightness		XL1	θ=0°		(300)		cd/m ²		I _{LED} =20mA
Uniformity		U	θ=0°	(75)	(85)		%		【Note11-6】
NTSC Ratio		S		(60)	(70)		%		



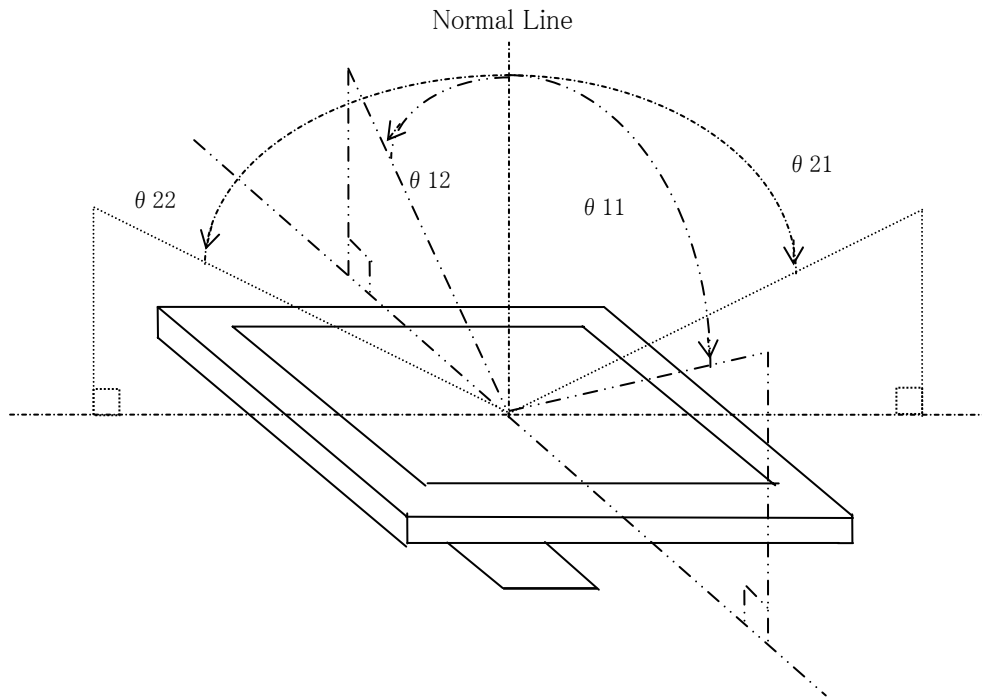
*The measuring method of the optical characteristics is shown by the following figure.

*A measurement device is TOPCON luminance meter SR-3.(Viewing cone1.)



Measuring method for optical characteristics

【Note 11-1】 Viewing angle range is defined as follows.



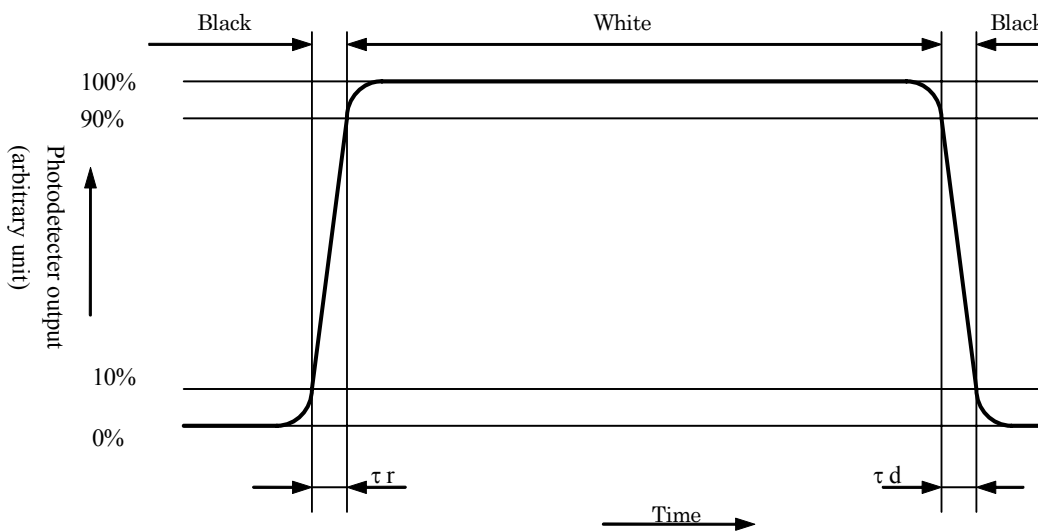
【Note 11-2】 Definition of contrast ratio:

The contrast ratio is defined as the follows:

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance (brightness) with all pixels white}}{\text{Luminance (brightness) with all pixels black}}$$

【Note 11-3】 Definition of response time:

The response time is defined as the following figure and shall be measured by switching the input signal for “black” and “white”



【Note 11-4】 A measurement device is Minolta CM-2002.

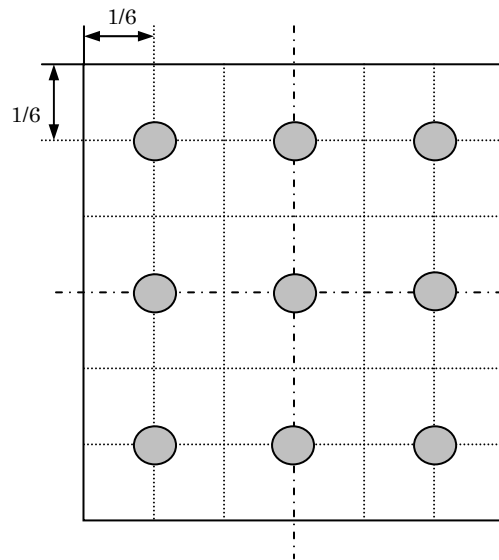
【Note 11-5】 Definition of reflection ratio

$$\text{Reflection ratio} = \frac{\text{Light detected level of the reflection by the LCD module}}{\text{Light detected level of the reflection by the standard white board}}$$

【Note 11-6】 Definition of Uniformity.

$$\text{Uniformity} = \frac{\text{Minimum Brightness}}{\text{Maximum Brightness}} \times 100 (\%)$$

The brightness should be measured on the 9-point as shown in the following figure.



12. Display quality

The display quality of the color TFT-LCD module shall be in compliance with the Incoming Inspection Standards(TBD) TFT-LCD.

13. Mechanical characteristics

13-1. External appearance

See Fig.1 Outline Dimension

13-2. FPC characteristics

Specific connector

NAIS AXT450124

14. Handling Precautions

14-1. Insertion and taking out of Connector

Be sure insert and take out of the connector(header) into the connector(socket) of the set after turning off the power supply on the set side.

14-2. Handling of FPC

The FPC for LCD panel shall be bent only slit portion. The bending slit shall be bent uniformly on the whole slit portion with bending radius larger than 1.0mm.

14-3. Installation of the module

On mounting the module, be sure to fix the module on the same plane. Taking care not to warp or twist the module

14-4. Precaution when mounting

- (1) If water droplets and oil attaches to it for a long time, discoloration and staining occurs.

Wipe then off immediately.

- (2) Glass is used for the TFT-LCD panel or touch panel. IF it is dropped or bumped against a hard object, it may be broken. Handle it with sufficient care.

- (3) As the CMOS IC is used in this module, pay attention to static electricity when handling it.

Take a measure for grounding on the human body.

14-5. Other

- (1) The liquid-crystal is deteriorated by ultraviolet rays. Do not leave it in direct sunlight and strong ultraviolet rays for many hours.

- (2) If it is kept at a temperature below the rated storage temperature, it becomes coagulated and the panel may be broken. Also, if it is kept at a temperature above the rated storage temperature, it becomes isotropic liquid and does not return to its original state. Therefore, it is desirable to keep it at room temperature as much as possible.

- (3) If the LCD breaks, don't put internal liquid crystal into the mouth. When the liquid crystal sticks to the hands, feet and clothes, wash it out immediately.

- (4) Wipe off water drop or finger grease immediately. Long contact with water may cause discoloration or spots.

- (5) Observe general precautions for all electronic components.

- (6) Static image should not be displayed more than 5 minutes in order to prevent from occurrence of residual image.

15. Reliability Test Items

Table 15

No.	Test item	Conditions
1	High temperature storage test	Ta = +70°C, 240h
2	Low temperature storage test	Ta = -30°C, 240h
3	High temperature and high humidity storage test	Ta = +60°C90%RH, 240h (No condensation)
4	High temperature operation test	Ta = +60°C, 240h
5	Low temperature operation test	Ta = -20°C, 240h
6	High temperature and high humidity operation test	Ta = +40°C95%RH, 240h (No condensation)
7	Electro static discharge test	±200V, 200pF(0Ω) to Terminals(Contact) (1 time for each terminals) ±8kV, 150pF(330Ω) to Housing bezel or T/P(Contact) ±15kV, 150pF(330Ω) to Housing bezel or T/P(in Air)
8	Shock test	Half Sin, 100 G, 6 ms, 6 faces(±X, ±Y & ±Z), Non-Op
9	Vibration test	Sine: 10-500-10Hz, 6 G, 30min (1 cycle: 10~500~10 Hz, 15 min/cycle, 2 cycles), X, Y, Z Random: 10-500Hz (6 Grms (0.074 G2/Hz)), 500-2000Hz (-3db/octave), 60min, X, Y, Z
10	Heat shock test	Ta = -30°C(30min)~70°C(30min), 50cycle
11	FPC Bending Test	Bending 30 times by bending radius R1.0mm and angle=90°(LCD FPC)

*Ta = Ambient temperature

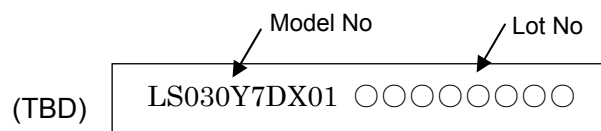
*Check items

In the standard condition, there shall be no practical problems that may affect the display function.

16. Others

16-1. Indication of lot number

The lot number is shown on a label. Attached location is shown in Fig.1(Outline Dimensions).



16-2. Used Regulation of Chemical Substances Breaking Ozone Stratum

Substances with the object of regulating : CFCS, Carbon tetrachloride, Halon

1,1,1-Trichloro ethane(Methyl chloroform)

- (a) This LCD module, Constructed part and Parts don't contain the above substances.
- (b) This LCD module, Constructed part and Parts don't contain the above substances in processes of manufacture.

16-3. If some problems arise about mentioned items in this document and other items, the user of the TFT-LCD module and Sharp will cooperate and make efforts to solve the problems with mutual respect and good will.

17. Forwarding form(TBD)

- (a) Piling number of cartons : TBD deep
- (b) Package quality in one cartons : TBD pcs
- (c) Carton size : TBD mm × TBD mm × TBD mm
- (d) Total mass of 1 carton filled with full modules : approximately TBD g

Condition for storage

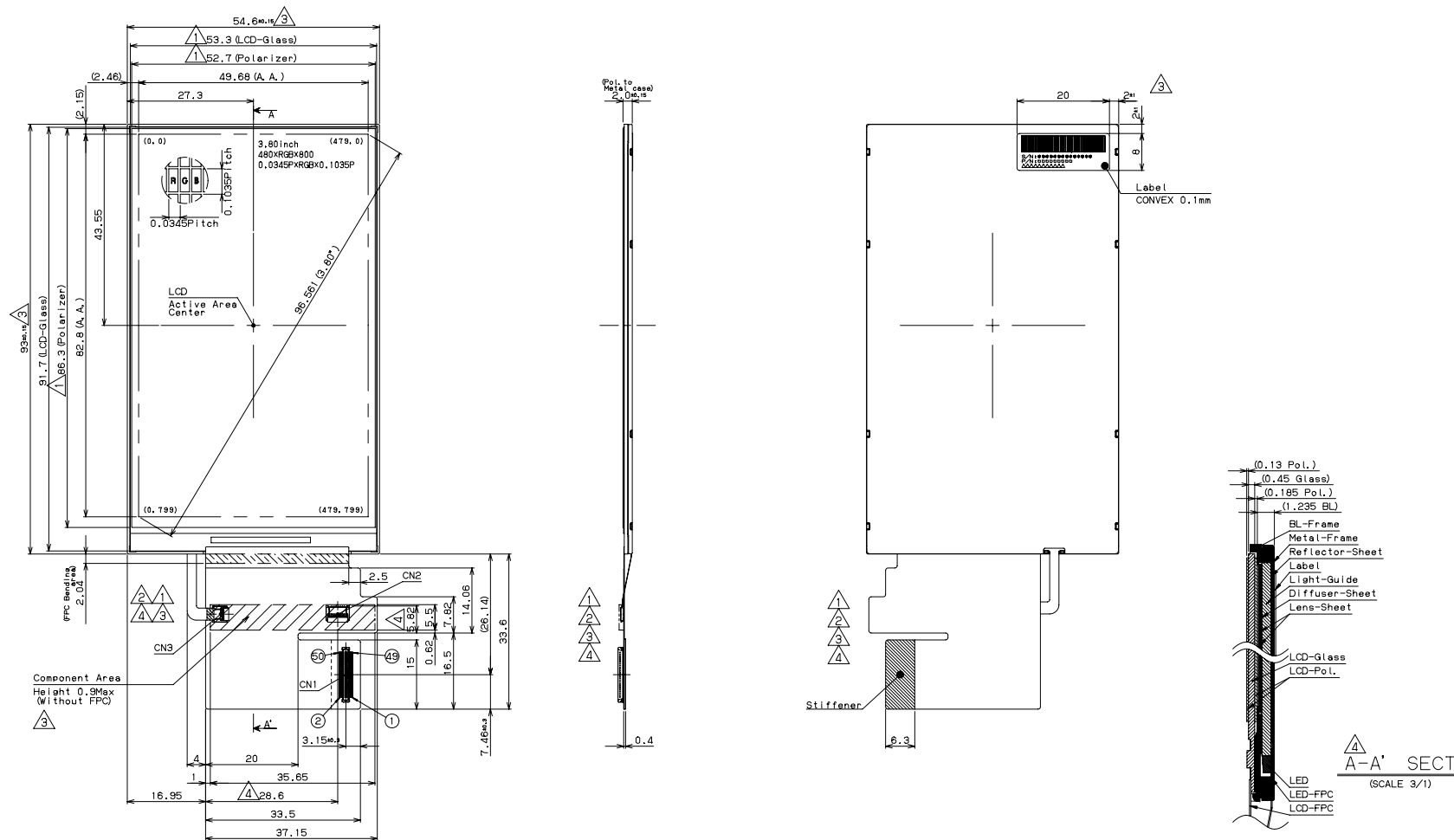
Environment

- (1) Temperature : 0~40°C
- (2) Humidity : 60%RH or less(at 40°C)
- (3) Atmosphere : Harmful gas, such as acid or alkali which bites electronic components and/or wires, must not be detected.
- (4) Period : about 3 months
- (5) Opening of the package : In order to prevent the LCD module from breakdown by electrostatic charges, please control the room humidity over 50%RH and open the package taking sufficient countermeasures against electrostatic charges, such as earth, etc.

SHARP

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for TENTATIVE drawing



Any foreign materials and contamination outside the Active area are to be treated as "NO-Count" at our inspections.
 Guarantee of appearance=LCD Active Area.
 General tolerance is ±0.5.
 LCD-FPC bend larger than 0.6 in radius.
 Please design carefully to hide the polarizer and other frame areas, which are outside of the guaranteed area.
 As the light from backlight may leak from the gap at outside of active area, which are outside of active area, please pay attentions to such leakage when designing the set.
 The tolerances of the module width do not include warp of the case.

TENTATIVE

The drawings above are tentative as the some parts are currently being under review, which may be changed in future.

	Application	Maker	part No.
CN1	for I/F	Panasonic	AXT450124
CN2	for TP	DDK	FF18-8A-R11A
CN3	for LED	DDK	FF18-4A-R11A

5	.	.	ORIGINAL MODEL	LS038*****
4	'08/2/4	Drawing changed. / A-A' sect added.	T.Tobi	画面サイズ (3.80")
3	'08/1/30	Drawing changed.	T.Tobi	ACTIVE AREA SIZE 480XRGBX800
2	'08/1/29	Drawing changed.	T.Tobi	尺度 1/1 日付 DATE 28/Dec/2007
1	'08/1/24	Drawing changed.	T.Tobi	単位 mm 名称 3.80" WVGA
改訂日 改訂記事 REVISION 担当			ユーザー USER	HTC
DESIGNER	DRAFTER	検図 DSN CK	承認 ENG APPD	原紙サイズ A3
8/15/07 SHARP CORPORATION ENGINEERING DEPT.1 MOBILE LIQUID CRYSTAL DISPLAY DIVISION I MOBILE LIQUID CRYSTAL DISPLAY GROUP				番番 LDM-03315E DRAWING NO

Fig.1 Outline dimension