Technical Document

LCD Specification

LCD Group

LQ043T3DX04 LCD Module

Product Specification
September 2009

480 × 272 Wide Aspect, Normally Black, LCD Module featuring symmetrical 160° viewing angle; 320 nits brightness with 400:1 contrast. Full Specifications Listing.

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To	LIQUID CRYSTAL DISPLAY GROUP SHARP CORPORATION SPECIFICATION	APPLICABLE GROUP MOBILE LCD CHINA DESIGN CENTER WUXI SHARP

DEVICE SPECIFICATION FOR

TFT-LCD module

MODEL No. **LQ043T3DX04K**

CUSTOMER'S APPROVAL

DATE ____________________

BY ____________________

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RECORDS OF REVISION

MODEL No : LQ043T3DX04K

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LCY-W-09902	Sep 2, 2009	—	-	-	1st Issue

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1. Applicable Scope

This specification is applicable to TFT-LCD Module “LQ043T3DX04K” only.

2. General Description

This module is a color active matrix LCD module incorporating amorphous silicon TFT(Thin Film Transistor) It is composed of a color TFT-LCD panel, driver ICs, Input FPC and a back light unit. Graphics and texts can be displayed on a 480×3×272 dots panel with about 16million colors by supplying 24bit data signals (8bit×RGB), Four timing signals, logic (typ. +2.5V), analog (typ. +5V) supply voltages for TFT-LCD panel driving and supply voltage for back light.

3. Mechanical (Physical) Specifications

Item	Specifications	Unit
Screen size	10.9 (4.3” type) diagonal	cm
Active area	95.04(H)×53.856(V)	mm
Pixel format	480×272	pixel
	1Pixel =R+G+B dots	
Pixel pitch	0.198(H)×0.198(V)	mm
Pixel configuration	R,G,B vertical stripes	
Display mode	Normally black	
Unit outline dimensions	105.5(W)×67.2(H)×3.95(D)	mm
Mass	50	g
Polarizer・Surface treatment	Clear hard coat	

※ The above-mentioned table indicates module sizes without some projections and FPC.

4. Input Terminal Names and Functions

4-1. TFT LCD Panel Driving (Reference Connector : Hirose Electric CO., LTD.Product No.: FH12A-40S-0.5SH(55) Top contact type)

The Bottom contact type can be selected according to side of mounted connector and terminal side of FPC.

※ Please adopt the gold plated terminal.

Terminal No.	Terminal name	Function	Remarks
1	GND	GND(0V)	
2	GND	GND(0V)	
3	VCC	+2.5V power source	
4	VCC	+2.5V power source	
5	R0	RED Data Signal (LSB)	
6	R1	RED Data Signal	
7	R2	RED Data Signal	
8	R3	RED Data Signal	
9	R4	RED Data Signal	
10	R5	RED Data Signal	
11	R6	RED Data Signal	
12	R7	RED Data Signal (MSB)	
13	G0	GREEN Data Signal (LSB)	
14	G1	GREEN Data Signal	
15	G2	GREEN Data Signal	
16	G3	GREEN Data Signal	
17	G4	GREEN Data Signal	
18	G5	GREEN Data Signal	
19	G6	GREEN Data Signal	
20	G7	GREEN Data Signal (MSB)	
21	B0	BLUE Data Signal (LSB)	
22	B1	BLUE Data Signal	
23	B2	BLUE Data Signal	
24	B3	BLUE Data Signal	
25	B4	BLUE Data Signal	
26	B5	BLUE Data Signal	
27	B6	BLUE Data Signal	
28	B7	BLUE Data Signal (MSB)	
29	GND	GND(0V)	
30	CK	Clock signal to sample each data	
31	DISP	Display ON/OFF Signal	
32	Hsync	Horizontal synchronizing signal	
33	Vsync	Vertical synchronizing signal	
34	NC	NC	Note 1
35	AVDD	+5V Analog power source	
36	AVDD	+5V Analog power source	
37	NC	NC	Note 1
38	TEST1	TEST1	Note 2
39	TEST2	TEST2	Note 3
40	TEST3	TEST3	Note 3

Note 1） They have been open within FPC.

Note 2） Please be sure to set 38 pins (TEST1) to open.

Note 3） Please be sure to connect 39 pin (TEST2) ,40 pin (TEST3) with GND.

4-2. Backlight

0.5mmP 4Pin FPC (Reference Connector :Kyocera Elco Corporation Product No. : 6298 Bottom contact type)

※ The top and bottom contact type can be selected according to side of mounted connector and terminal side of FPC.

※ Please adopt the gold plated terminal.

Terminal No.	Signal	Function
1	V_{LED-}	LED Power Source Input terminal (Cathode side)
2	NC	No Connection
3	NC	No Connection
4	V_{LED+}	LED Power Source Input terminal (Anode side)

5. Absolute Maximum Ratings

Item	Symbol	Conditions	Rated value	Unit	Remarks
Input voltage	V_I	Ta=25℃	-0.3 ～ VCC+0.3	V	【Note 1】
2.5 V Power supply voltage	VCC	Ta=25℃	0 ～ +4.5	V	
5 V Power supply voltage	AVDD	Ta=25℃	0 ～ +6.0	V	
Temperature for storage	T_{stg}	—	-30 ～ +70	℃	【Note 2】
Temperature for operation	T_{opa}	—	-20 ～ +60	℃	【Note 3】
LED Input electric current	ILED	Ta=25℃	35	mA	【Note 4】
LED electricity consumption	PLED	Ta=25℃	123	mW	【Note 5】

【Note 1】CK,R0～R7,G0～G7,B0～B7,Hsync,Vsync,DISP

【Note 2】Humidity : 80%RHMax. (Ta≦40℃)

Maximum bulb temperature under 39℃ (Ta>40℃) See to it that no dew will be condensed.

【Note 3】Panel surface temperature prescribes.

(Reliability is examined at ambient temperature of 60℃.)

【Note 4】Input curret of one LED (Ta=25℃) (use LED NSSW008C 7pieces)

【Note 5】Power consumption of one LED (Ta=25℃) (use LED NSSW008C 7pieces)

6. Electrical Characteristics

6-1. TFT LCD Panel Driving

Ta = 25℃

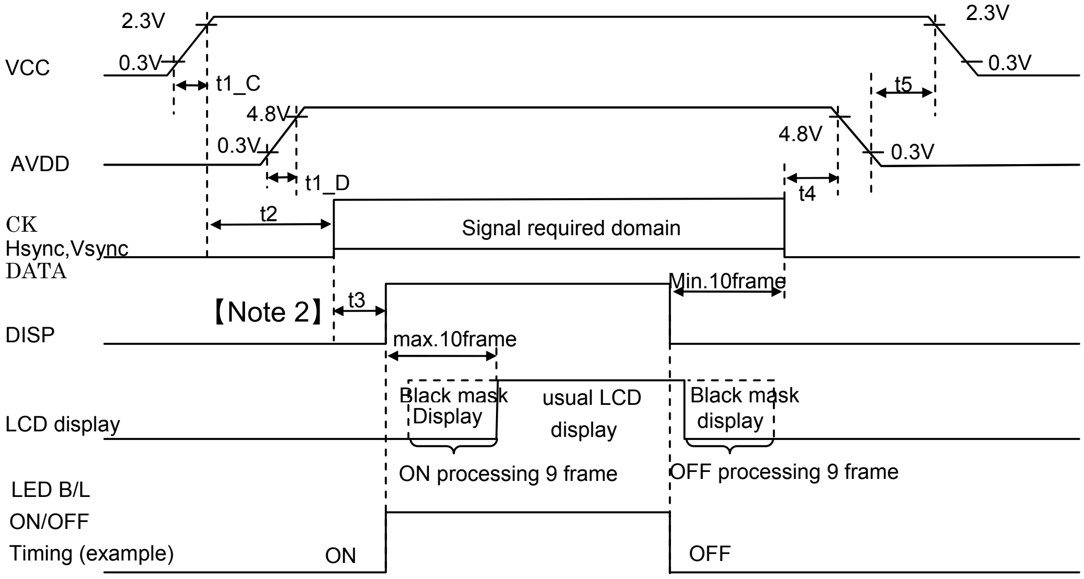
Item		Symbol	Min.	Typ.	Max.	Unit	Remarks
＋2.5V power supply	DC voltage	VCC	+2.3	+2.5	+3.3	V	【Note 1, **6**】
	DC Current	I_{CC}		1.2	3	mA	【Note 3】
＋5V power supply	DC voltage	AVDD	+4.8	+5.0	+5.2	V	【Note 1, **6**】
	DC Current	I_{AVDD}		10	18	mA	【Note 3】
Permissive Input ripple voltage		V_{RFVCC}			100	mVp-p	Vcc=+2.5V
		V_{RFAVDD}			100	mVp-p	Vcc=+5.0V
Input voltage (Low)		V_{IL}			0.2 V_{CC}	V	【Note 4】
Input voltage (High)		V_{IH}	0.8 V_{CC}			V	
Input current (Low)		I_{OL}			4.0	μA	V_I =0V 【Note 4】
Input current (High)		I_{OH}			4.0	μA	V_I =2.5V 【Note 4】

※ The rush current will flows when power supply is turned on, so please design the power supply circuit referring to 【Note 5】

(The rush current changes according to the condition of the supply voltage value, rising time and so on.)

【Note 1】

Sequences of supply voltage and signals


2.3V
VCC
0.3V
t1_C
2.3V
0.3V
t5
4.8V
0.3V
AVDD
t1_D
4.8V
0.3V
t4
CK
Hsync,Vsync
DATA
t2
Signal required domain
Min.10frame
【Note 2】
t3
DISP
max.10frame
Black mask
Display
usual LCD
display
Black mask
display
LCD display
ON processing 9 frame
OFF processing 9 frame
LED B/L
ON/OFF
Timing (example)
ON
OFF

◎ Please do not supply AVDD before VCC.

◎ It discharges and boost up voltage for TFT module on the basis of a DISP-signal
It drives Max-10 flames (about 0.2seconds) from change of DISP-signals by reasons that
It takes time for 9 flames while each processing operation.
Therefore, the display start is delayed for 10 flames and Ten or more frames needs to be voltage maintained at the time of a display end.
Please do not change the DISP-signal level for 10 frames or less after the change.

◎ It is not problem to set up DISP=L , AVDD=GND when VCC voltage is supplied

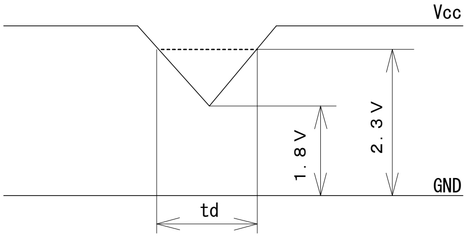
◎ Please don't set various signals to Hi-Z when VCC-voltage is supplied
in reason that those signals are CMOS input.

◎ Don't change DISP signal into the state of H level When AVDD voltage is in the state of GND.

◎ The ON/OFF timing of LED Back Light is an example.

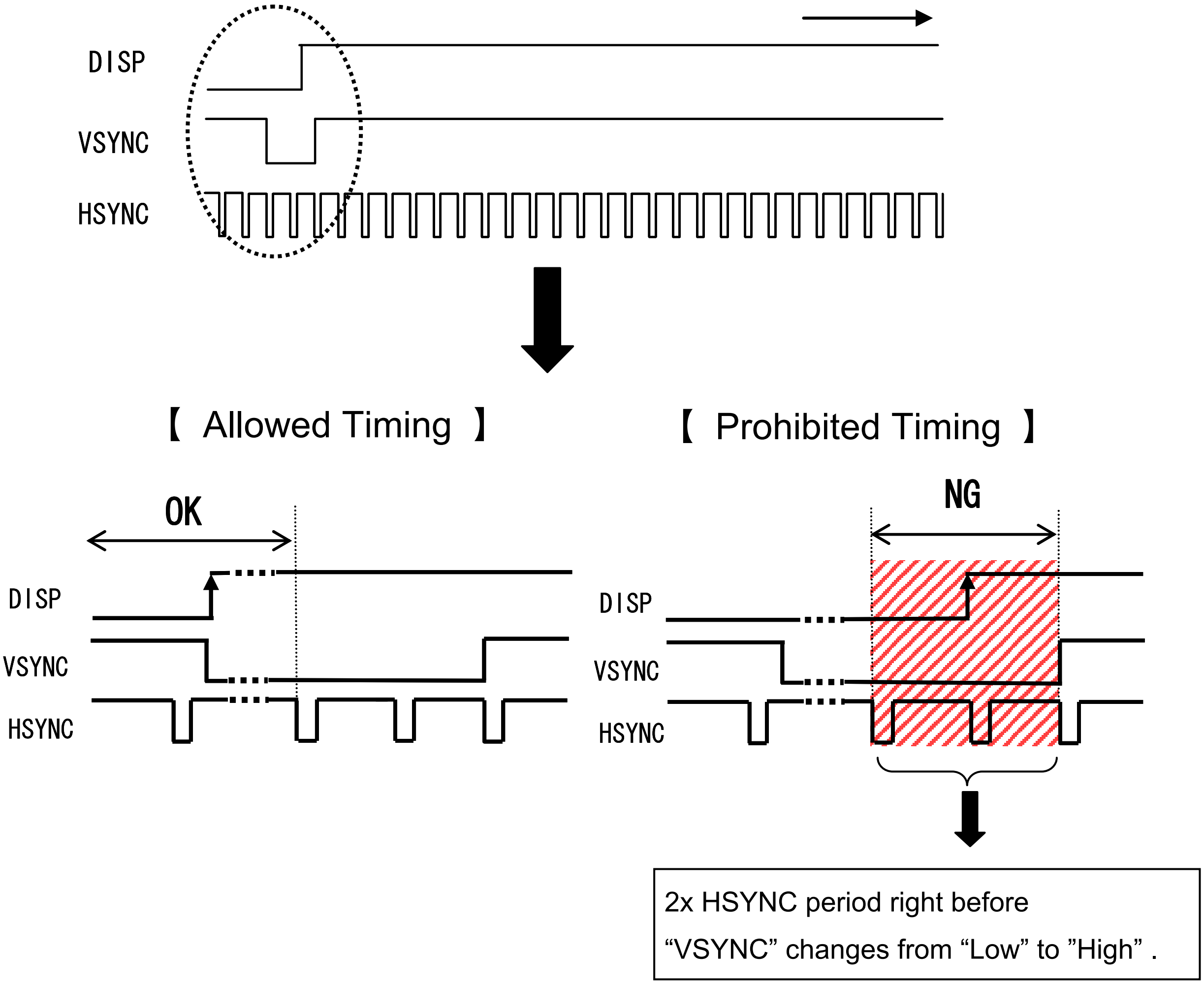
	MIN	TYP	MAX	unit	Remarks
t1_C	0	―	10	ms	
t1_D	0.5	―	10	ms	
t 2	50	―	―	ms	
t 3	0.5	―	―	ms	【Note 2】
t 4	0	―	―	ms	
t 5	0	―	―	ms	

Dip Conditions for supply voltage


Vcc
2.3V
1.8V
GND
td

td≦10ms

【Note 2】While “VSYNC” is “Low”, don’t change “DISP” signal “Low” to “High”.



DISP
VSYNC
HSYNC
OK
DISP
VSYNC
HSYNC
NG
DISP
VSYNC
HSYNC

【 Allowed Timing 】

【 Prohibited Timing 】

2x HSYNC period right before “VSYNC” changes from “Low” to ”High” .

【Note 3】Typical current situation: 256-gray-bar pattern VCC=2.5V AVDD=5.0V

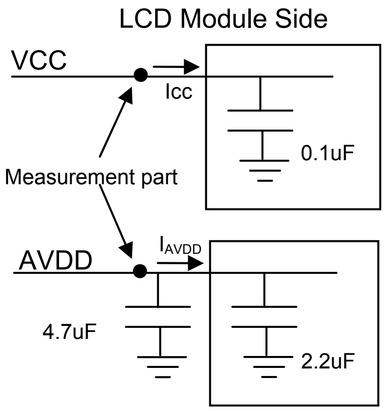
【Note 4】CK, R0～R7, G0～G7,B0～B7,Hsync,Vsync,DISP

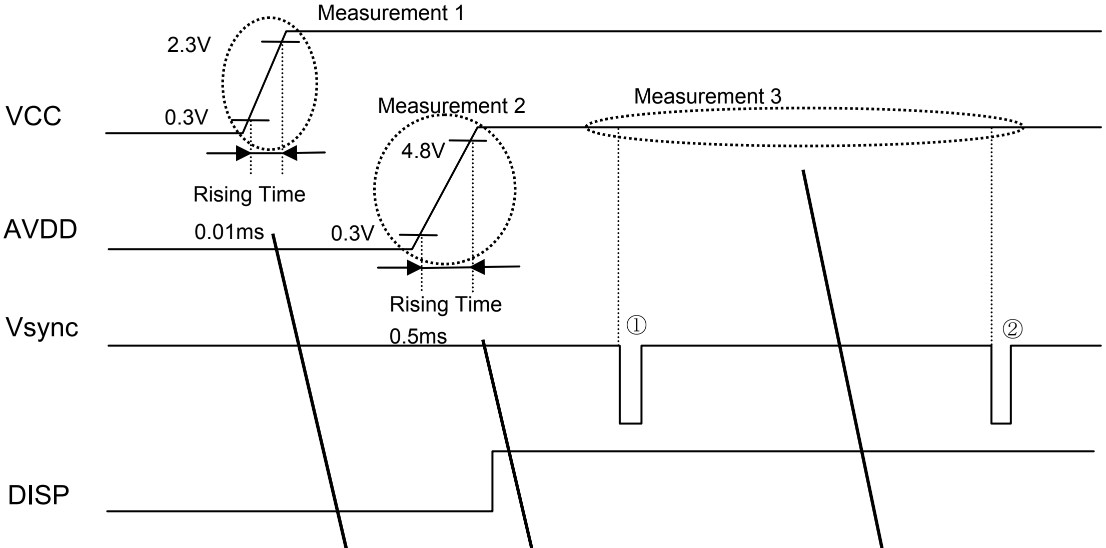
【 Note 5 】

An example of rush current measurement

◎Measurement conditions

- Power supply voltage VCC : 2.5V AVDD : 5.0V
- Disp signal : OFF ⇒ ON
- Other input signals : GND
- Measurement system : refer to right Fig.
- rush current measurement timing : refer to following Fig.


LCD Module Side
VCC
Icc
Measurement part
0.1uF
AVDD
IAVDD
4.7uF
2.2uF

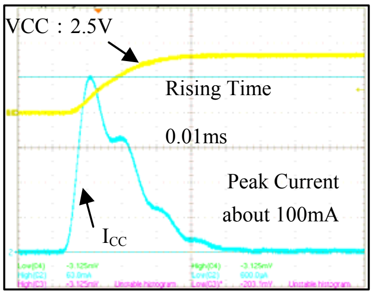

Measurement 1
2.3V
VCC
0.3V
Rising Time
0.01ms
Measurement 2
4.8V
Measurement 3
AVDD
0.3V
Rising Time
0.5ms
Vsync
①
②
DISP

◎Measurement Example

Measurement 1

Y : 20mA/Div., 2V/Div., X : 0.003ms/Div.

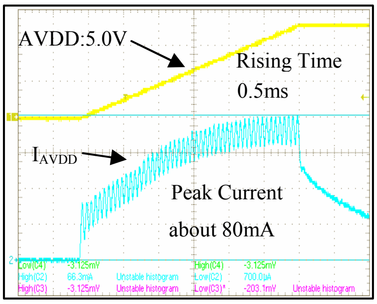
Icc



IAVDD

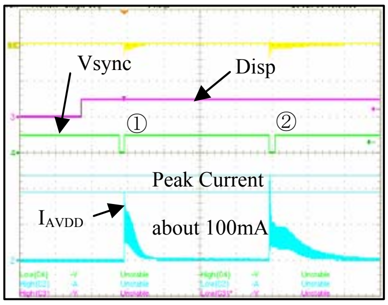
Measurement 2

Y : 20mA/Div., 2V/Div., X : 0.08ms/Div.



Measurement 3

Y : 50mA/Div., 5V/Div., X : 4ms/Div.



These rush current won't flow stationary,
these will flow at the timing shown in Measurement 3.

【 **Note 6** 】Please input the voltage between the maximum values and minimum value in the table.
（Example: Vcc;+3.3V±5% is not allowable. ）

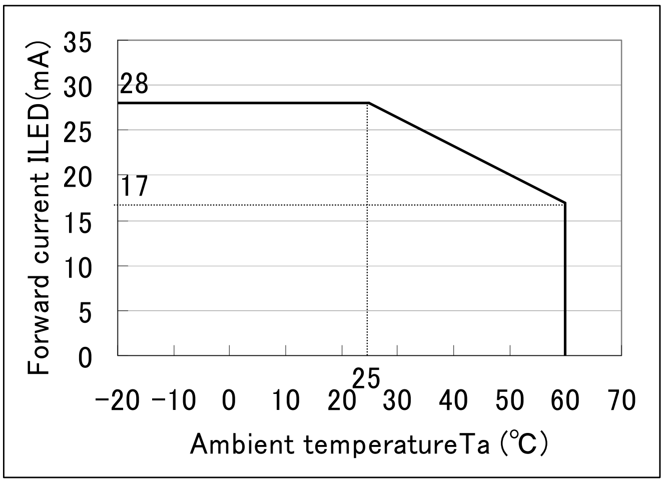
6-2. Back light driving

The back light system has seven LEDs
[NSSW008C]

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Rated Voltage	V_{BL}	—	24.5	25.8	V	Ta=25℃ **【Note 1】**
Rated Current	I_L	—	18	28	mA	Ta=25℃ **【Note 2】**

【Note 1】 V_{BL}(Typ) is the maximum voltage when I_{LED} =18mA, V_{BL}(Max) is the maximum voltage when I_{LED} =28mA.

【Note 2】 Ambient temperature and the maximum input(Forward currrent I_{LED} in a figure) satisfy the following terms of use.



Ambient temperature and the maximum input

7.Timing characteristics of input signals

An input signal timing waveform is shown in Fig. 2.

7-1 Timing characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	7.83	9.00	9.26	MHz	
	Duty ratio	Th/T	40	50	60	%	
Data	Set up time	Tds	25	—	—	ns	
	Hold time	Tdh	25	—	—	ns	
Horizontal synchronizing	Period	TH	—	525	—	Clock	
	Pulse width	THp	—	41	—	Clock	
	Horizontal	THd	480	480	480	Clock	
	Back porch	THb	2	2	2	Clock	
	Front porch	THf	2	2	—	Clock	
	Set up time	THs	25	—	—	ns	
Vertical synchronizing	Period	TV	—	286	—	Line	
	Pulse width	TVp	2	10	—	Line	
	Vertical	TVd	272	272	272	Line	
	Back porch	TVb	2	2	2	Line	
	Front porch	TVf	2	2	—	Line	
	Set up time	TVs	25	—	—	ns	

【Note】 ・In case of using the slow frequency, the deterioration of display, flicker etc may occur.
・The timing characteristics are basically fixed as above.

7-2 Timing details

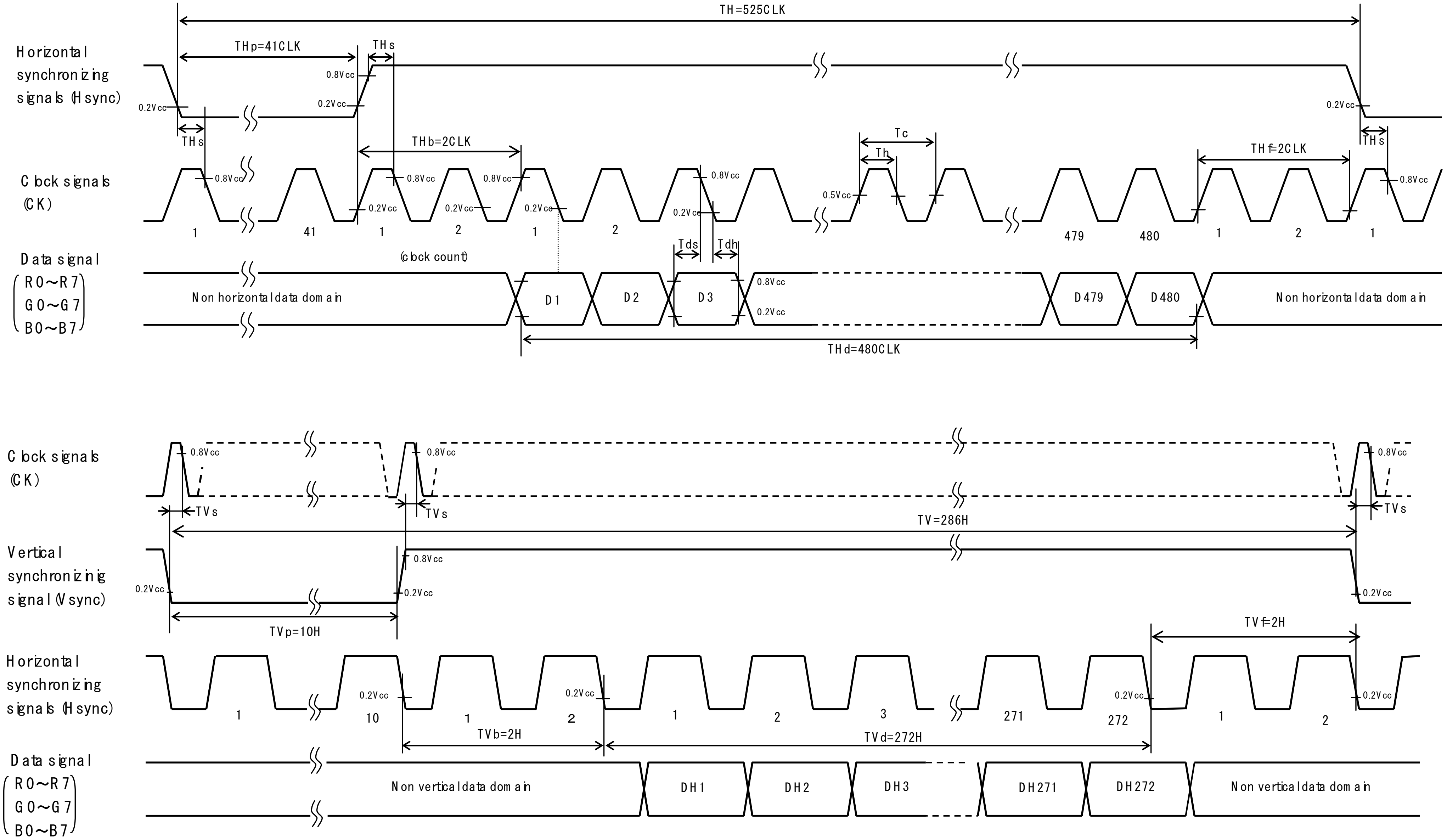
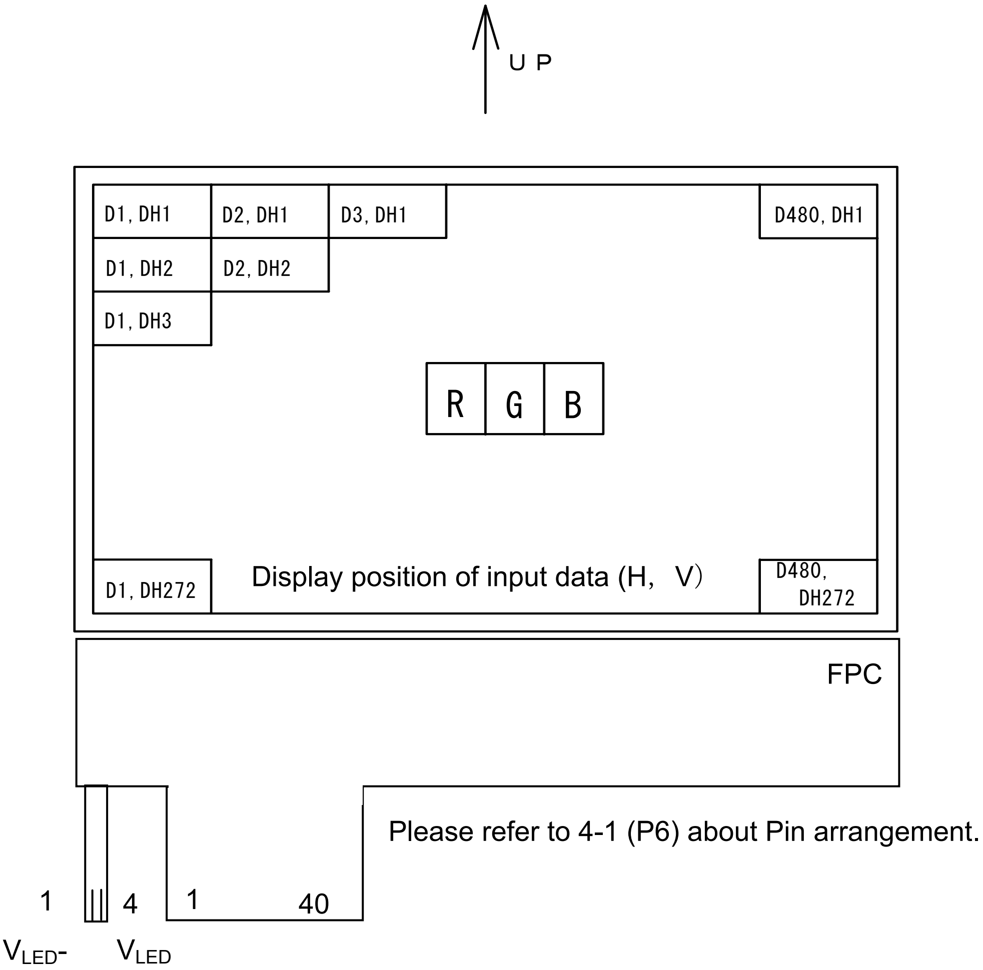

TH=525CLK
THp=41CLK
THs
Horizontal synchronizing signals (Hsync)
0.8Vcc
0.2Vcc
THb=2CLK
Tc
Th
THf=2CLK
Clock signals (CK)
0.5Vcc
1
41
1
2
1
2
479
480
1
2
1
(clock count)
Tds
Tdh
Data signal (R0~R7 G0~G7 B0~B7)
Non horizontal data domain
D1
D2
D3
D479
D480
Non horizontal data domain
THd=480CLK
Clock signals (CK)
TVs
TV=286H
Vertical synchronizing signal (Vsync)
TVp=10H
TVf=2H
Horizontal synchronizing signals (Hsync)
1
10
1
2
1
2
3
271
272
1
2
TVb=2H
TVd=272H
Data signal (R0~R7 G0~G7 B0~B7)
Non vertical data domain
DH1
DH2
DH3
DH271
DH272
Non vertical data domain

Fig 2 Input signal timing

7-3 Input Data Signals and Display Position on the screen


U P
D1, DH1
D2, DH1
D3, DH1
D480, DH1
D1, DH2
D2, DH2
D1, DH3
R
G
B
D1, DH272
Display position of input data (H, V)
D480, DH272
FPC
1
4
1
40
VLED-
VLED

Please refer to 4-1 (P6) about Pin arrangement.

Please refer to 4-2 about LED side Pin arrangement.

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

	Colors & Gray Scale	Data signal																								
		Gray Scale	R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7
			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	0	0	0	0	0	0
	Blue	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	—	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	—	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red	—	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	—	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	—	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	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	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	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	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	0	0	0	0	0	0
	⇧	↓				↓								↓								↓				
	⇩	↓				↓								↓								↓				
	Brighter	GS253	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇩	GS254	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	GS255	1	1	1	1	1	1	1	1	0	0	0	0	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	0	0	0	0	0	0
	⇧	GS1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇧	↓				↓								↓								↓				
	⇩	↓				↓								↓								↓				
	Brighter	GS253	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	⇩	GS254	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Green	GS255	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale Blue	Black	GS0	0	0	0	0	0	0	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	0	0	0	0	1	0	0	0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	⇧	↓				↓								↓								↓				
	⇩	↓				↓								↓								↓				
	Brighter	GS253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1
	⇩	GS254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
	Blue	GS255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

0 : Low level voltage 1 : High level voltage

Each basic color can be displayed in 256 gray scales from 8 bit data signals. According to the combination of 24 bit data signals, the 16-million-color display can be achieved on the screen.

9. Optical Characteristics

Module characteristics

Ta = 25℃, VCC = +2.5V, AVDD = 5.0V

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Horizontal	θ21,θ22	CR＞10	—	80	—	Deg.	【Note1,4】
	Vertical	θ11		—	80	—	Deg.	
		θ12		—	80	—	Deg.	
Contrast ratio		CR	θ=0°	100	400	—		【Note2,4】
Response Time	Rise	τr	θ=0°	—	30	45	ms	【Note3,4】
	Decay	τd		—	30	45	ms	
Chromaticity of White		x		0.259	0.309	0.359		【Note4】
		y		0.297	0.347	0.397		
Luminance of white		X_{L1}		—	230	—	cd/m^2	I_{LED}=18mA 【Note4】
				—	320	—		I_{LED}=28mA 【Note4】

※ The optical characteristics measurements are operated under a stable luminescence(I_{LED} = 18mA) and a dark condition. (refer to Fig.3)

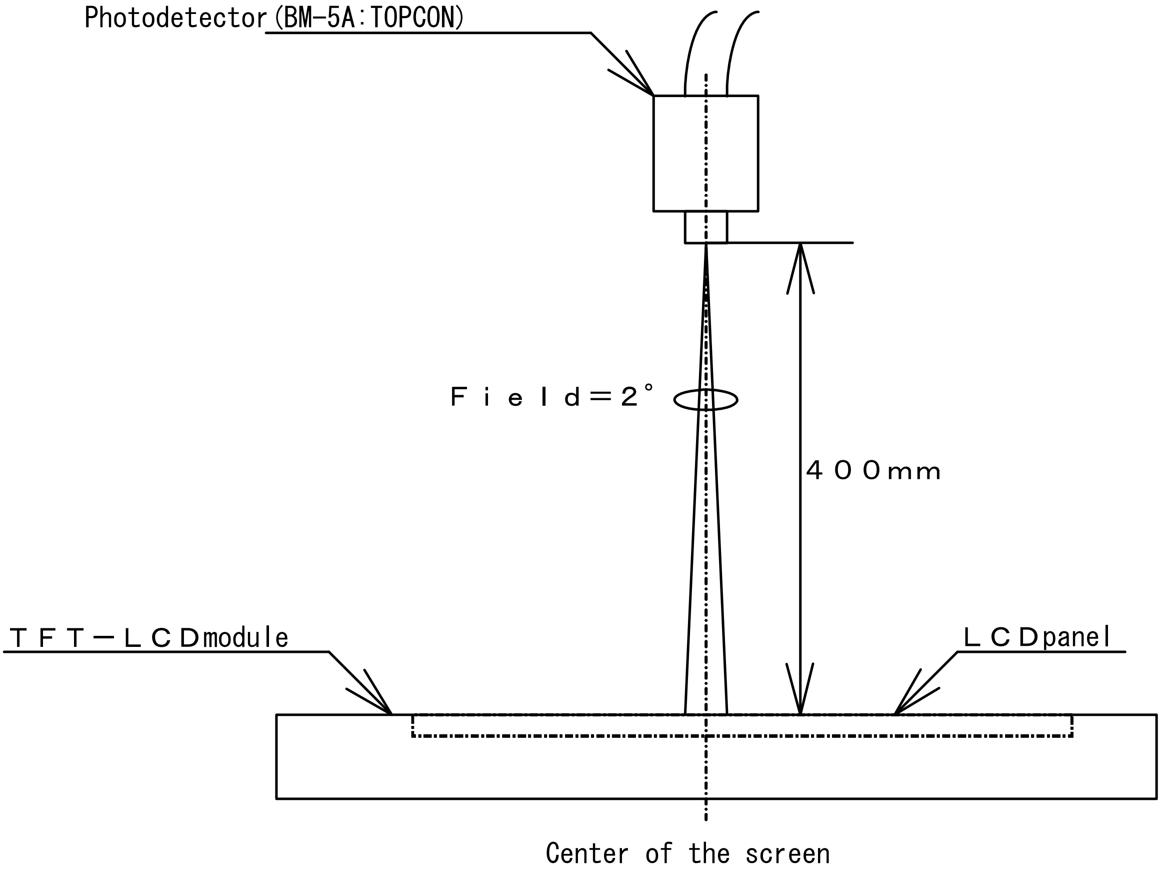
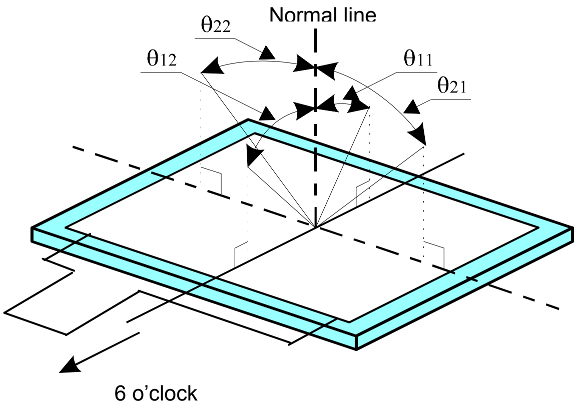

Photodetector(BM-5A:TOPCON)
Field=2°
400mm
TFT－LCDmodule
LCDpanel
Center of the screen

Fig.3 Optical characteristics measurement method

【 Note 1 】Definitions of viewing angle range


Normal line
θ22
θ12
θ11
θ21
6 o'clock

【 Note 2 】Definition of contrast ratio

The contrast ratio is defined as the following

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

【 Note 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"

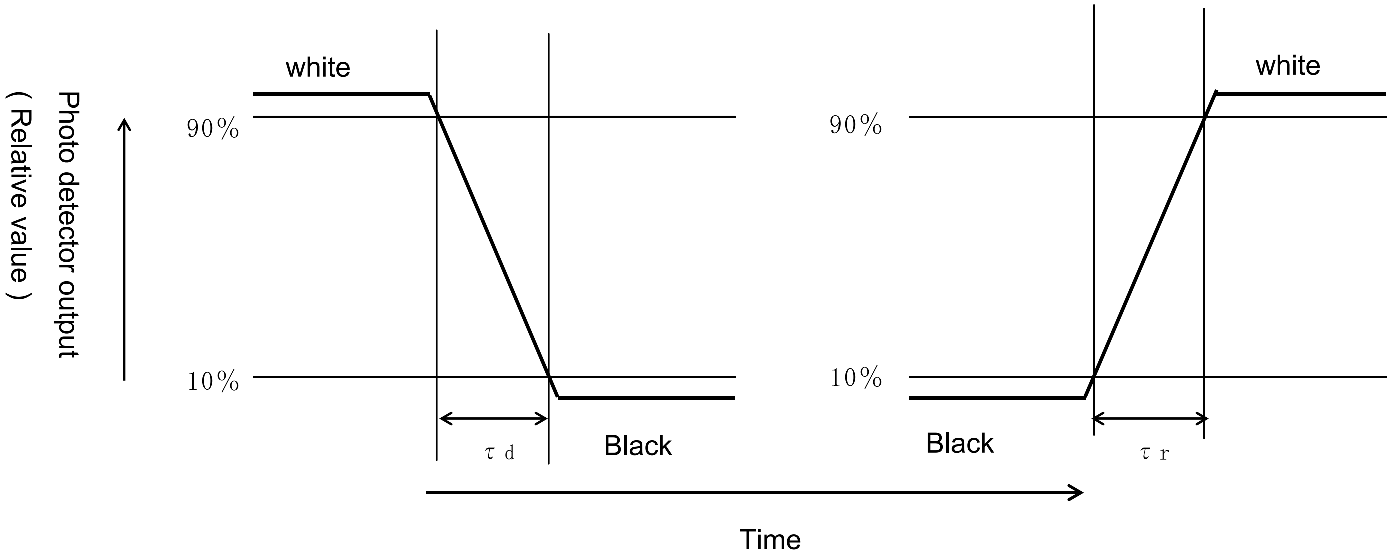


Photo detector output
(Relative value)
white
90%
10%
τ d
Black
90%
10%
Black
τ r
white
Time

【 Note 4 】This shall be measured at center of the screen.

10. Handling of modules

10-1 Inserting the FPC into its connector and pulling it out.

① Be sure to turn off the power supply and the signals when inserting or disconnecting the cable.

② Please insert for too much stress not to join FPC in the case of insertion of FPC.

10-2 About handling of FPC

① The bending radius of the FPC should be more than 1.4mm, and it should be bent evenly.

② Do not dangle the LCD module by holding the FPC, or do not give any stress to it.

③ The direction of the bend of FPC is only a direction of the module back. Please do not bend FPC in the direction of the module surface.

10-3 Mounting of the module

① The module should be held on to the plain surface. Do not give any warping or twisting stress to the module.

② Please consider that GND can ground a modular metal portion etc. so that static electricity is not charged to a module.

10-4 Cautions in assembly / Handling pre cautions.

As the polarizer can be easily scratched, be most careful in handling it.

① Work environments in assembly.

Working under the following environments is desirable:

a) Implement more than 1MΩ conductive treatment (by placing a conductive mat or applying Conductive paint) on the floor or tiles.

b) No dusts come in to the working room. Place an adhesive, anti-dust mat at the entrance of the room.

c) Humidity of 50～70％ and temperature of 15～27℃ are desirable.

d) All workers wear conductive shoes, conductive clothes, conductive fingerstalls and grounding belts without fail.

e) Use a blower for electrostatic removal. Set it in a direction slightly tilt downward so that each Module can be well subjected to its wind. Set the blower at an optimum distance between the blower and the module.

② How the remove dust on the polarizer

a) Blow out dust by the use of an N2 blower with antistatic measures taken. Use of an ionized air Gun is recommendable.

b) When the panel surface is soiled, wipe it with soft cloth.

③ In the case of the module’s metal part (shield case) is stained, wipe it with a piece of dry, soft cloth. If rather difficult, give a breath on the metal part to clean better.

④ If a water dropped, etc. remains stuck on the polarizer for a long time, it is apt to get discolored or cause stains. Wipe it immediately.

⑤ As a glass substrate is used for the TFT-LCD panel, if it is dropped on the floor or hit by something hard, it may be broken or chipped off.

⑥ Since CMOS LSI is used in this module, take care of static electricity and take the human earth into consideration when handling.

10-5 Others

① Regarding storage of LCD modules, avoid storing them at direct sunlight-situation.
You are requested to store under the following conditions:
(Environmental conditions of temperature/humidity for storage)

(1) Temperature: 0～40℃

(2) Relative humidity : 95% or less

- As average values of environments (temperature and humidity) for storing, use the following control guidelines:
  Summer season: 20～35℃, 85％ or less Winter season: 5～15℃, 85％ or less
- If stored under the conditions of 40℃ and 95% RH, cumulative time of storage must be less than 240 hours.

① If stored at temperatures below the rated values, the inner liquid crystal may freeze, causing cell destruction. At temperatures exceeding the rated values for storage, the liquid crystal may become isotropic liquid, making it no longer possible to come back to its original state in some cases.

② If the LCD is broken, do not drink liquid crystal in the mouth. If the liquid crystal adheres to a hand or foot or to clothes, immediately cleanse it with soap.

③ If a water drop or dust adheres to the polarizer, it is apt to cause deterioration. Wipe it immediately.

④ Be sure to observe other caution items for ordinary electronic parts and components.

⑤ Epoxy resin (amine series curing agent), silicone adhesive material (dealcoholization series and oxime series), tray forming agent (azo compound) etc, in the cabinet or the packing materials may induce abnormal display with polarizer film deterioration regardress of contact or noncontact to polarizer film. Be sure to confirm the component of them.

11. Delivery Form

11-1 . Carton storage conditions

1) Carton piling-up: Max 8 rows

2) Environments
Temperature: 0～40℃
Humidity: 65% RH or less (at 40℃)
There should be no dew condensation even at a low temperature and high humidity.

3)Packing form : As shown in Figure 4.

※Cartons are weak against damp, and they are apt to be smashed easily due to the compressive pressure applied when piled up. The above environmental conditions of temperature and humidity are set in consideration of reasonable pile-up for storage.

11-2. Packing composition

Name	quantity	Note
Carton size	1	575×360×225 （mm）
Tray	12	Material：Electrification prevention polypropylene
(The number of Module)		8 unit／tray：80unit/carton
Electrification prevention bag	2	Material : Electrification prevention polyethylene 680mm(length)×500mm(depth)×50μm(thin)

Carton weight (80unit):8kg

12. Reliability test items

No.	Test item	Conditions
1	High temperature storage test	Ta = 70℃ 240h
2	Low temperature storage test	Ta = -30℃ 240h
3	High temperature & high humidity operation test	Ta = 40℃ ; 95%RH 240h (No condensation)
4	High temperature operation test	Ta = 60℃ 240h (The panel temp. must be less than 60℃)
5	Low temperature operation test	Ta = -20℃ 240h
6	Vibration test (non- operating)	Frequency : 10～55Hz/Vibration width (one side) : 1.5mm Sweep time : 1minutes Test period : (2 hours for each direction of X,Y,Z)
7	Shock test	Direction : ±X, ±Y, ±Z, Time : Third for each direction. Impact value : 100G Action time 6ms
8	Thermal shock test	Ta=-30℃～70℃ /10 cycles (30 min) (30min)

【Result Evaluation Criteria】

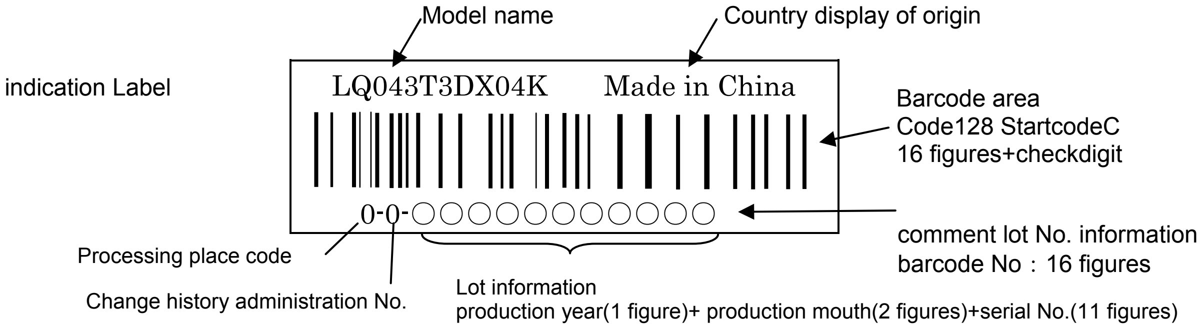
Under the display quality test conditions with normal operation state, these shall be no change which may affect practical display function.

13. Display Grade

The standard regarding the grade of color LCD displaying modules should be based on the delivery inspection standard

14. Lot No. marking

The lot No. will be indicated on individual labels. The location is as shown


Model name
Country display of origin
indication Label
LQ043T3DX04K
Made in China
Barcode area
Code128 StartcodeC
16 figures+checkdigit
0-0-○○○○○○○○○○○
comment lot No. information
barcode No：16 figures
Processing place code
Change history administration No.
Lot information
production year(1 figure)+ production mouth(2 figures)+serial No.(11 figures)

outward form : width 29.0±0.5mm length11.5±0.5mm

comment column :

1 figure	Processing place code	「0」 WSEC Wuxi Factory 「1」 WSEC Lianyungang Factory
2 figure	Change history administration No.	「0」
3 figure	Production year	
4, 5figure	Production month	
6 -16figures	Serial No.	

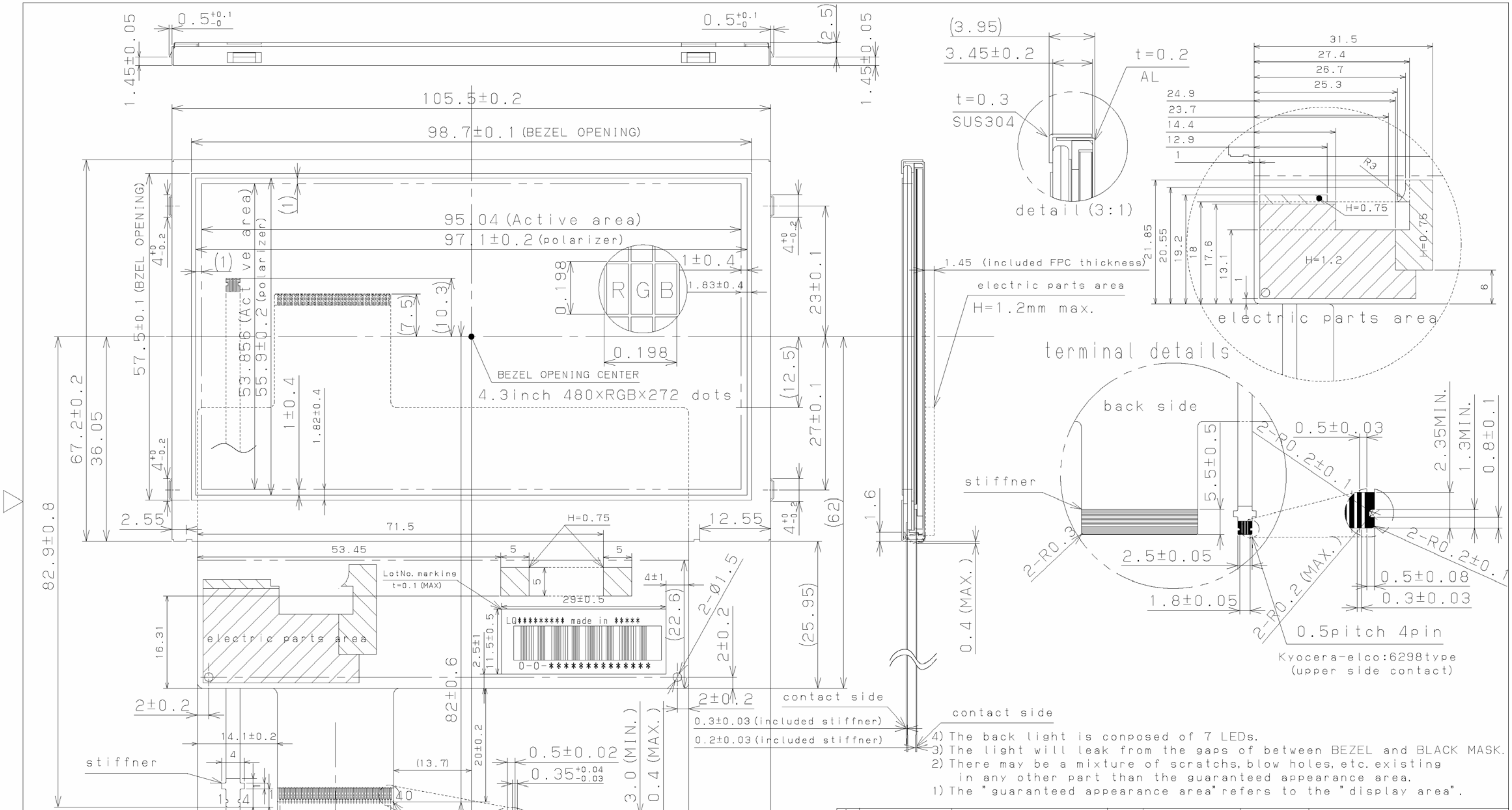
15. Others

1 Disassembling the module can cause permanent damage and you should be strictly avoided.

2 Please be careful that you don’t keep the screen displayed fixed pattern image for a long time, since retention may occur.

3 If you pressed down a liquid crystal display screen with your finger and so on, the alignment disorder of liquid crystal will occur. And then It will become display fault.
Therefore, Be careful not to touch the screen directly, and to consider not stressing to it.

4 If any problem arises regarding the items mentioned in this specification sheet or otherwise, it should be discussed and settled mutually in a good faith for remedy and/or improvement.


0.5+0.1/-0
1.45±0.05
(2.5)
105.5±0.2
98.7±0.1 (BEZEL OPENING)
95.04 (Active area)
97.1±0.2 (polarizer)
57.5±0.1 (BZEL OPENING)
53.856 (Active area)
55.9±0.2 (polarizer)
(1)
4+0/-0.2
67.2±0.2
36.05
82.9±0.8
(7.5)
(10.3)
0.198
RGB
1±0.4
1.83±0.4
BEZEL OPENING CENTER
4.3inch 480×RGB×272 dots
1.82±0.4
23±0.1
(12.5)
27±0.1
(62)
2.55
12.55
71.5
53.45
H=0.75
5
LotNo. marking t=0.1 (MAX)
4±1
29±0.5
LQ********* made in *****
0-0-***************
2.5±1
11.5±0.5
(22.6)
2-Ø1.5
2±0.2
(25.95)
16.31
electric parts area
82±0.6
20±0.2
(13.7)
14.1±0.2
stiffner
40
19.5±0.05
20.5±0.07
40.75±0.8
2.5±0.05
0.5±0.02
0.35+0.04/-0.03
3.0 (MIN.)
0.4 (MAX.)
R
0.5±0.1
86.5±0.2
14.5
48.3±0.6
0.5pitch 40pin
contact side
0.3±0.03 (included stiffner)
0.2±0.03 (included stiffner)
1.6
(3.95)
3.45±0.2
t=0.2
AL
t=0.3
SUS304
detail (3:1)
1.45 (included FPC thickness)
electric parts area
H=1.2mm max.
terminal details
31.5
27.4
26.7
25.3
24.9
23.7
14.4
12.9
R3
H=0.75
H=1.2
21.85
20.55
19.2
18
17.6
13.1
6
back side
stiffner
5.5±0.5
2-R0.3
2.5±0.05
1.8±0.05
2-R0.2±0.1
2-R0.2 (MAX.)
0.5±0.03
0.5±0.08
0.3±0.03
2.35MIN.
1.3MIN.
0.8±0.1
0.5pitch 4pin
Kyocera-elco:6298type (upper side contact)

4) The back light is conposed of 7 LEDs.
3) The light will leak from the gaps of between BEZEL and BLACK MASK.
2) There may be a mixture of scratchs, blow holes, etc. existing in any other part than the guaranteed appearance area.
1) The "guaranteed appearance area" refers to the "display area".

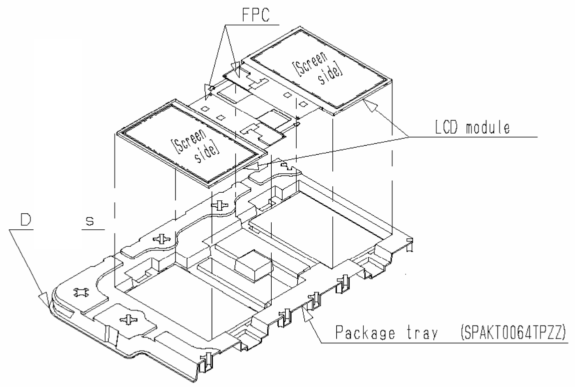
LQ043T3DX04K
LQ043T3DX04
年 月 日 DATE
改 定 記 事 REVISE
担当 PREPA
適 用 形 名 MODEL
名 称 NAME
LCD MODULE OUTLINE DIMENTIONS
材 質 MATERIAL
板 厚 THICKNESS
仕 上 FINISH
尺度 SCALE 1.5/1
記 号 SYMBOL
部品コード PARTS CODE *************
設計 DESIGN 平山
写図 TRACE
検図 CHECK
検図 CHECK
承認 APPROVE
SHARP CORPORATION
シャープ株式会社モバイル液晶（事本）
発行部門 モバイル液晶第2事業部 第2開発部
作 成 日 付 DATE . . .
図 番 DRAWING. No
ENGINEERING DEPARTMENT II
MOBILE LCD DIVISION II
MOBILE LCD GROUP

【How to store the LCD modules in the package trays】

1. Clear the package trays and the modules of dust and remove static electricity from them with the static eliminator.
2. Place the LCD modules with the screen side facing upward and arrange 8 of them in 2 horizontal lines and 4 vertical lines on a package tray so that the FPC parts on the modules come alternately.*1
3. Make sure that the LCD modules are placed in each storage space of the package tray.
   (Check especially whether the LCD nodules are not left loose on the tray and whether they are not placed in reverse.)
4. Pile 5 package trays with the LCD modules placed right and put an empty package tray on top of the piles.
   (Pile the packeage trays with the round corner joined with each other, and do not pile up the package trays in reverse)

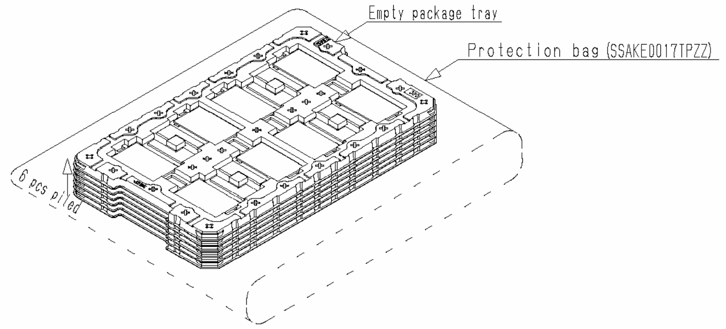
*1 Start placing the module in the space closest to the round corner of the package tray as a datums. Continue placing the next one to the right until 4 of them are completely placed horizontally. And then arrange the other 4 of them from the right to the left on the front side.
(Don't start placing them from the front side)

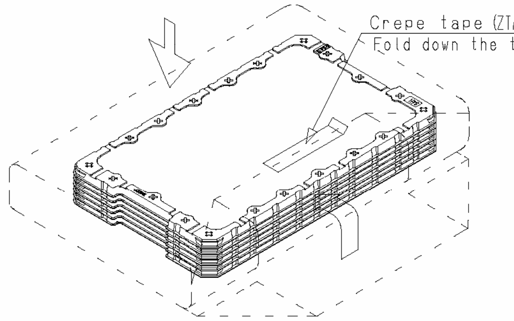
* Make sure that 6 of the package trays are placed in a sleeve even if there are some fraction trays.


FPC
[Screen side]
[Screen side]
LCD module
D
s
Package tray (SPAKT0064TPZZ)

【How to store the set of the 6 package trays in the protction bag】

1. Place the package tray (6 package trays piled) into the protection bag.
2. Fold down the ends of corner of the protection bag and stick them on the top of the package tray with the crepe tape which is folded down the end.


Empty package tray
Protection bag (SSAKE0017TPZZ)
6 pcs piled

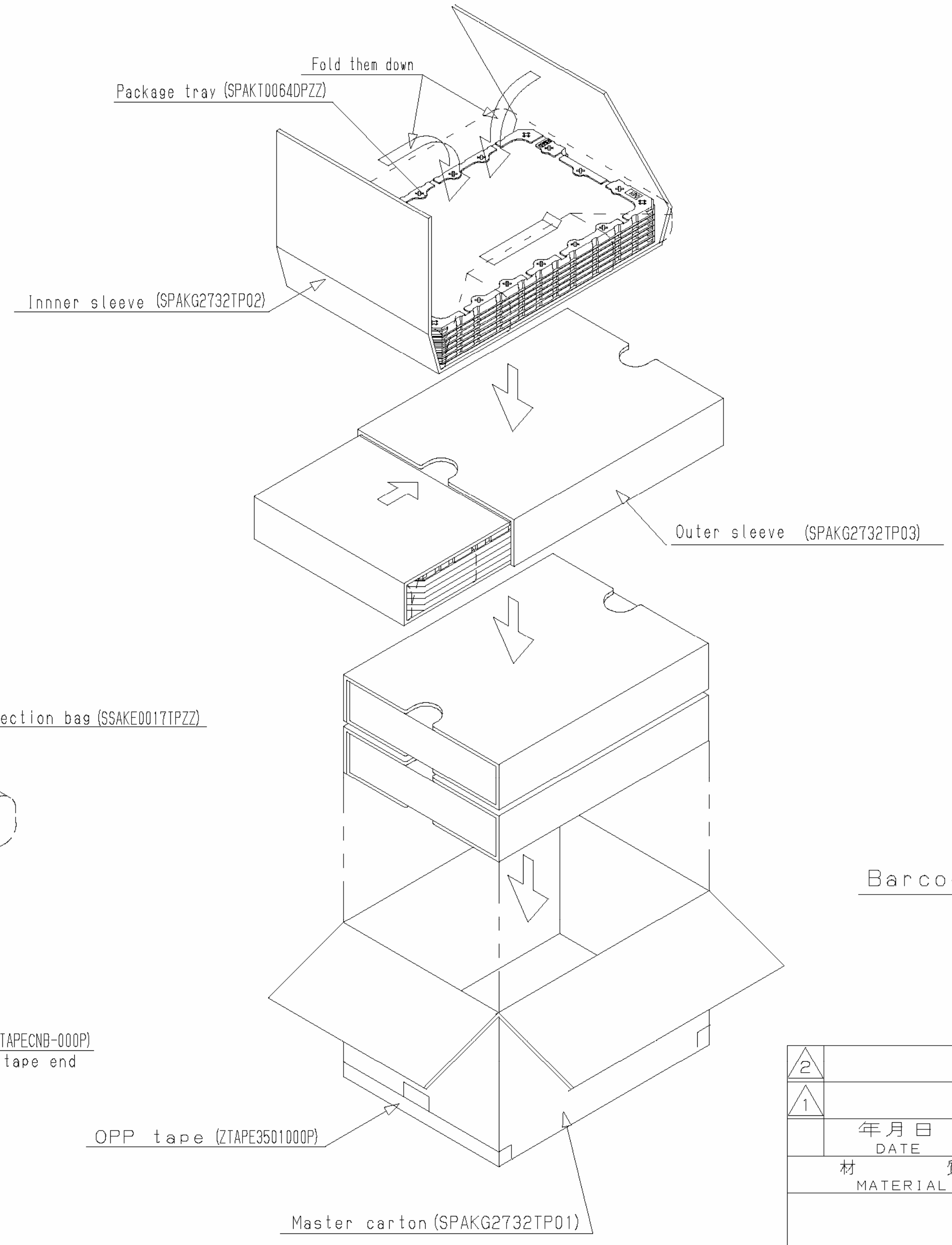

Crepe tape (ZTAPECNB-000P)
Fold down the tape end

【How to store the set of package in the carton】

1. The set of the 6 package trays in a protection bag is placed in an inner sleeve and inserted in an outer sleeve.

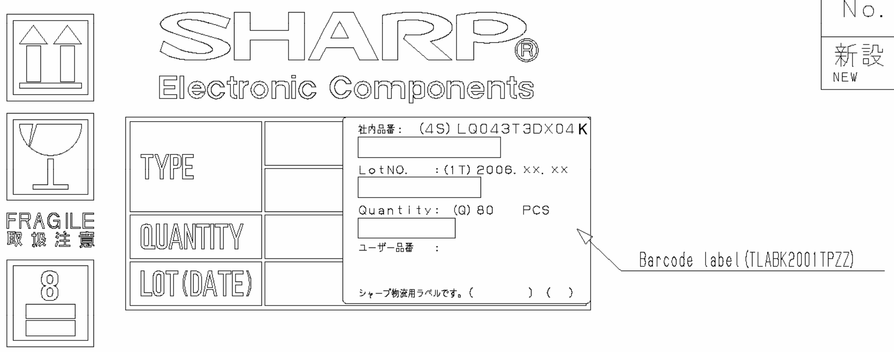
(Make sure that the whole protection bag is encased in the outer sleeve without any parts of the bag being out of the sleeve.)

2. Seal the center and both sides of the bottom of the master carton with OPP tape forming an "H" pattern and pile up 2 of the outer sleeves.
3. Seal the center and both sides of the top of the master carton with OPP tape forming an "H" pattern.
4. stick a barcode label on the detail frame of the master carton.


Fold them down
Package tray (SPAKT0064DPZZ)
Innner sleeve (SPAKG2732TP02)
Outer sleeve (SPAKG2732TP03)
OPP tape (ZTAPE3501000P)
Master carton (SPAKG2732TP01)

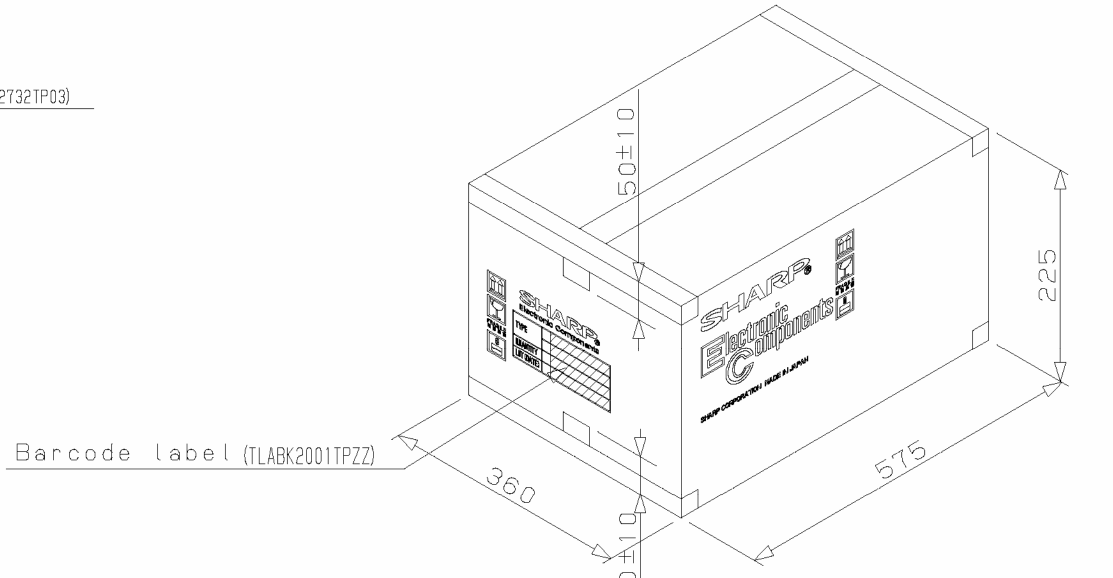
【Contents of the barcode label and the instruction of sticking】

Stick the barcode label on the detail frame of the master carton with the upper right joined with each other.


SHARP®
Electronic Components
FRAGILE
取 扱 注 意
8
TYPE
QUANTITY
LOT (DATE)
社内品番： (4S) LQ043T3DX04K
LotNO. : (1T) 2006. xx. xx
Quantity: (Q) 80 PCS
ユーザー品番 :
シャープ物流用ラベルです。( ) ( )
Barcode label (TLABK2001TPZZ)

【Packing specification】

Quantity	2 hor. X 4 vert. = 8 / tray, 8 X 5 trays = 40 / sleeve, 40 X 2 sleeves = 80 LCD modules / ctn		
The dim. of ctn	575X360X225 (H) The lim. of piling up : 8 ctn		
Part list	Description	Part code	Qty
	Set of package	SPAKG2732TPZZ	1/80
	(Master carton)	(SPAKG2732TP01)	(1/80)
	(Inner sleeve)	(SPAKG2732TP02)	(2/80)
	(Outer sleeve)	(SPAKG2732TP03)	(2/80)
	Package tray	SPAKT0064TPZZ	12/80
	Protection bag	SSAKE0017TPZZ	2/80
	Crepe tape	ZTAPECNB-000P	40cm/80
	OPP tape	ZTAPE3501000P	329cm/80
	Barcode label	TLABK2001TPZZ	1/80


50±10
225
SHARP
Electronic Components
Barcode label (TLABK2001TPZZ)
360
575
50±10

指示なき寸法公差は
UNSPECIFIED TOL TO BE

2					LQ043T3DX04K
1					LQ043T3DX04
	年月日 DATE	改定記事 RIVISE	設通 No	担当 PREPA	適用機種 MODEL

名 称 NAME: Procedure of Packing

記 号 SYMBOL:

部品コード PARTS CODE:

材 質 MATERIAL | 板 厚 THIKNESS | 仕 上 FINSH | 尺度 SCALE: 1/10

設計 DESIGN	写図 TRACE	検図 CHECK	検図 CHECK	承認 APPROVE
	平山			

ENGNEERING DEPARTMENT II MOBILE LCD DIVISION II

MOBILE LCD GROUP

SHARP CORPORATION

作成日付 DATE: . . .

図 番 DRAWING. No

中 園

出図 ISSUE

設計通報 DRAWING INFO. 連絡書 INFORMATION
No. ( ) 号による

新設 NEW · 変更 CHANGE · 書換 REPLACE. 図面

Figure 4 Packing style

Dellnt1/cad_data/pack_tel/LQ043T3DX01 (S)