SHARP

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	SPECIFICATION	

DEVICE SPECIFICATION for
CGS LCD Module
Model No.

LS026B8PX02

□CUSTOMER'S APPROVAL

DATE _____

BY _____

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SHARP	SPEC No. LCY-2506501C	MODEL No. LS026B8PX02	

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JULY.27 2006	P.10	A	*1*	Correspondable connector modification
JULY.27 2006	P.15	A	*2*	LED forward current modification
JULY.27 2006	P.16	A	*3*	Register setting modification (SSDC, GSDC=0)
SEP.20 2006	P.21	B	*4*	LCD module outline dimensions modification
DEC.5 2006	P.3.4	C	*5*	Adds the precaution of the super-thin LCD panel
DEC.5 2006	P.7	C	*6*	IIS number addition
DEC.5 2006	P.7	C	*7*	Mass spec addition
DEC.5 2006	P.12	C	*8*	White chromaticticity addition
DEC.5 2006	P.16	C	*9*	Register setting modification (SSDC, GSDC=1)
DEC.5 2006	P.19.20	C	*10*	Packaging specification addition
DEC.5 2006	P.21	C	*11*	LOT No identification addition

《Precautions》

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- Contact and consult with a SHARP sales representative for any questions about this device.

[For handling and system design]

(1) Do not scratch the surface of the polarizer film as it is easily damaged.

(2) If the cleaning of the surface of the LCD panel is necessary, wipe it swiftly with cotton or other soft cloth. Do not use organic solvent as it damages the polarizer.

(3) Water droplets on the polarizer must be wiped off immediately as they may cause color changes, or other defects if remained for a long time.

(4) Since this LCD panel is made of thin glass, dropping the module or banging it against hard objects may cause cracks or fragmentation.

(5) Certain materials such as epoxy resin (amine's hardener) or silicone adhesive agent (de-alcohol or de-oxym) emits gas to which polarizer reacts(color change). Check carefully that gas from materials used in system housing or packing do not hart polarizer.

(6) Liquid crystal material will freeze below specified storage temperature range and it will not get back to normal quality even after temperature comes back within specified temperature range.
Liquid crystal material will become isotropic above specified temperature range and may not get back to normal quality. Keep the LCD module always within specified temperature range.

(7) Do not expose LCD module to the direct sunlight, or to strong ultraviolet light for long time.

(8) Don't light a thousand lx in after 10 minutes, it's cause of misleading results. And please leave from the light for no more 30cm.

(9) Do not disassemble the LCD module as it may cause permanent damage.

(10) As this LCD module contains components sensitive to electrostatic discharge, be sure to follow the instructions in below.

1. Operators
Operators must wear anti-static wears to prevent electrostatic charge up to and discharge from human body.

2. Equipment and containers
Process equipment such as conveyer, soldering iron, working bench and containers may possibly generate electrostatic charge up and discharge. Equipment must be grounded through 100M ohms resistance.

3. Floor
Floor is an important part to leak static electricity which is generated from human body or equipment.
There is a possibility that the static electricity is charged to them without leakage in case of insulating floor, so the countermeasure(electrostatic earth:$1\times10^{8}\Omega$) should be made.

4. Humidity
Proper humidity of working room may reduce the risk of electrostatic charge up and discharge.
Humidity should be kept over 50% all the time.

5. Transportation/storage
Storage materials must be anti-static to prevent causing electrostatic discharge.

6. Others1
Protective film is attached on the surface of LCD panel to prevent scratches or other damages.
When removing this protective film, remove it slowly under proper anti-ESD control such as ion blower.

7. Others2

There is possibility that incorrect working is caused by ESD.

Therefore please regularly make renewal register inside driver while displaying.

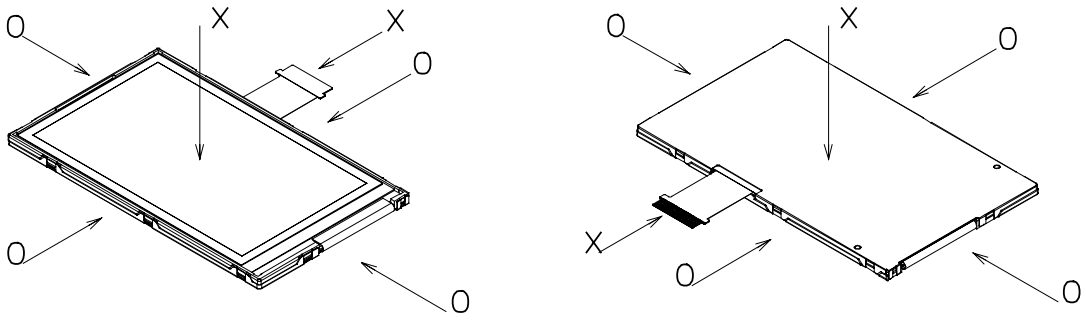
(11) Don't put much stress on the LCD panel and TCP, where the mechanical design of the system is. Don't use CHLOROPRENE-rubber in the cabinet surrounding LCD module.

(12) If one needs to touch the surface of LCD panel such as when installing the module, hold it with a cushioned foam. Do not to use chloroprene rubber as it may affect on the reliability of the electrical interconnection.

(13) Do not hold or touch LCD panel to flex interconnection area as it may be damaged.

(14) As the binding material between LCD panel and flex connector mentioned in 12) contains an organic material, any type of organic solvents are not allowed to be used. Direct contact by fingers are also prohibited.

(15) When carrying the LCD module, place it on the tray to protect from mechanical damage. It is recommended to use the conductive trays to protect the CMOS components from electrostatic discharge. When holding the module, hold the side Plastic Frame of LCD module so that the panel, FPC and other electric parts are not damaged.



(16) Do not touch the LCD patterning area. Otherwise the circuit may be damaged

(17) Place a protective cover on the LCD module to protect the plastic panel from mechanical damages.

(18) LCD panel is susceptible to mechanical stress and even the slightest stress will cause a color change in background. So make sure the LCD panel is placed on flat plane without any continuous twisting, bending or pushing stress

(19) Protective film is placed onto the surface of LCD panel when it is shipped from factory. Make sure to peel it off before assembling the LCD module into the system. Be very careful not to damage LCD module by electrostatic discharge when peeling off this protective film. Ion blower and ground strap are recommended.

(20) Make sure the mechanical design of the system in which the LCD module will be assembled matches specified viewing angle of this LCD module.

(21) This LCD module does not contain nor use any ODS(1,1,1-Trichloroethane , CCL4) in all materials used, in all production processes..

(22) If the LCD driver IC is exposed to light, normal operation may be impeded.
It is necessary to design so that the light is shut off when the LCD module is mounted.

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Please note the following points about the LCD module handling since this LCD model has adopted super-thin module form.

About the handling of the LCD module.

(1) The number of piling steps of trays that put modules is up to ten steps or less.

(2) When the tray that put modules is transported to the next process, each board was put under the tray, not having the tray but having the board and transports the whole board is recommended. (Bending by having a tray directly is mitigated and it is LCD at the time of conveyance. In order to make it the load to a module not applied if possible)

About the non-uniformity condition by the lamination for the front polarizer protection.

In the LCD module manufacture process, it becomes easy to generate non-uniformity by lamination turning over for the front polarizer protection etc. by the manufacture variation of a panel,This condition is extinguished within from 1 to 5 minutes after removing all protection lamination when the mounting in the cellular phone in your company.

Therefore, Even if the condition occurs at the time of module delivery, it is no problem for Display quality, please consider as unquestioned about the non-uniformity condition by the above-mentioned lamination for the front polarizer protection.

Also since non-uniformity may occur by "To remove a protection lamination to the middle" or "The air bubbles at the time of protection lamination re-attachment", it recommends not doing the work which removes a protection lamination to the middle at the process of your company as much as possible.

[For operating LCD module]

(1) Be sure not to exceed the rated voltage, otherwise a malfunction may occur.

(2) At the shipment, adjust the contrast of each LCD module with electric volume.
LCD contrast may vary from panel to panel depending on variation of LCD power voltage.

(3) As opto-electrical characteristics of LCD will be changed, dependent on the temperature, the confirmation of display quality and characteristics has to be done after temperature is set at 25°C and it becomes stable.

[For storing LCD module]

<Out door, Warehouse>

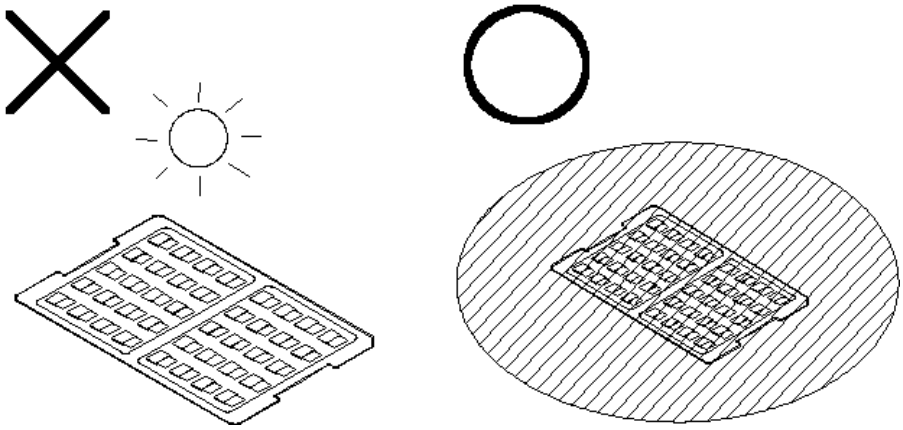
(1) Do not expose the LCD module to direct sunlight or strong ultraviolet light for long periods. Store in a dark place.

(2) The liquid crystal material will solidify if stored below the rated storage temperature and will become an isotropic liquid if stored above the rated storage temperature, and may not retain its original properties.
Only store the module at normal temperature and humidity (25±5°C、60±10% RH) in order to avoid exposing the front polarizer to chronic humidity.

(3) This module's guarantee's term is six months after shipments being in the site.

(4) Keeping Method

a. Don't keep under the direct sunlight. b. Keep in the tray under the dark place.



<In door, assembling>

(1) Do not expose the LCD module to fluorescent lamp for long periods. Store in a dark place.

(2) Fluorescent lamp don't light a thousand lx in after 10 minutes, which may cause unexpected results. And please leave from the light for no more 30cm.

[Other precaution]

(1) Please Attention. We can't guarantee to use out of certification.

(2) Place the decoupling capacitor near by LCD module as close as possible because electrical impedance of power supply lines (VDDIO,VCI-GND) needs to lower when LCD module is working.

(3) Reset signal must be sent after power on to initialize LSI. LSI does not function properly until initialize it by reset signal.

(4) No bromide specific fire-retardant material is used in this module.

(5) Don't touch to FPC surface , electric parts and other parts ,to any electric, metallic materials.

[Precautions for Discarding Liquid Crystal Modules]

LCD panel: Dispose of as glass waste.
This LCD module contains no harmful substances.
The liquid crystal panel contains no dangerous or harmful substances. The liquid crystal panel only contains an extremely small amount of liquid crystal (approx. 100 mg)and therefore it will not leak even if the panel should break. Its median lethal dose (LD50) is greater than 2,000 mg/kg and a mutagenetic. (Aims test: negative) material is employed.

FPC: Dispose of as similar way to circuit board from electric device.

Contents Page

1. Application

This data sheet is to introduce the specification of active matrix 262,144 color LCD module.
Color LCD module controlled by control IC(IR3M77) without LCD module.
If any problem occurs concerning the items not stated in this specification, it must be solved sincerely by both parties after deliberation.

As to basic specification of control IC(IR3M77) refer to the IC specification.

2. Construction and Outline

Construction: 240×400 dots color display module consisting of an LCD panel, FPC.
Plastic chassis with 4 LED back light to fix them mechanically.
Outline dimension: See Fig.12
Connection: 35 pins

There shall be not scratches, stains, chips, distortions and other external that may affect the display function
Applicable Inspection Standard for this LCD module : S-U-058-m *6*

In order to realize thin module structure, double-side adhesive tapes are used to fix LCD panel. As these tapes do not guarantee to permanently fix the panel, the LCD panel may rise from the module when shipped from factory.
So please make sure to design the system to hold the edges of the LCD panel by the soft material such as sponge when LCD module is assembled into the cabinet.

3. Mechanical specifications

Table.1

Parameter	Specifications	Unit
Outline dimensions	40.8(W) × 68.1(H) × 2.3(D) *1	mm
Active area	33.84(W) × 56.40(H)	mm
Display format	240 × RGB(W) × 400(H)	-
Dot pitch	0.047(W) × 0.141(H)	mm
Base color*2	Normally black *3	-
Mass	12 *7*	g

*1 See P22
*2 Due to characteristics of LC material, color may vary with environmental temperature.
*3 Normally black type Display data “H” : ON →White, Display data “L” : OFF →Black

4. LCD-FPC Curcuit

4-1. LCD-FPC Curcuit

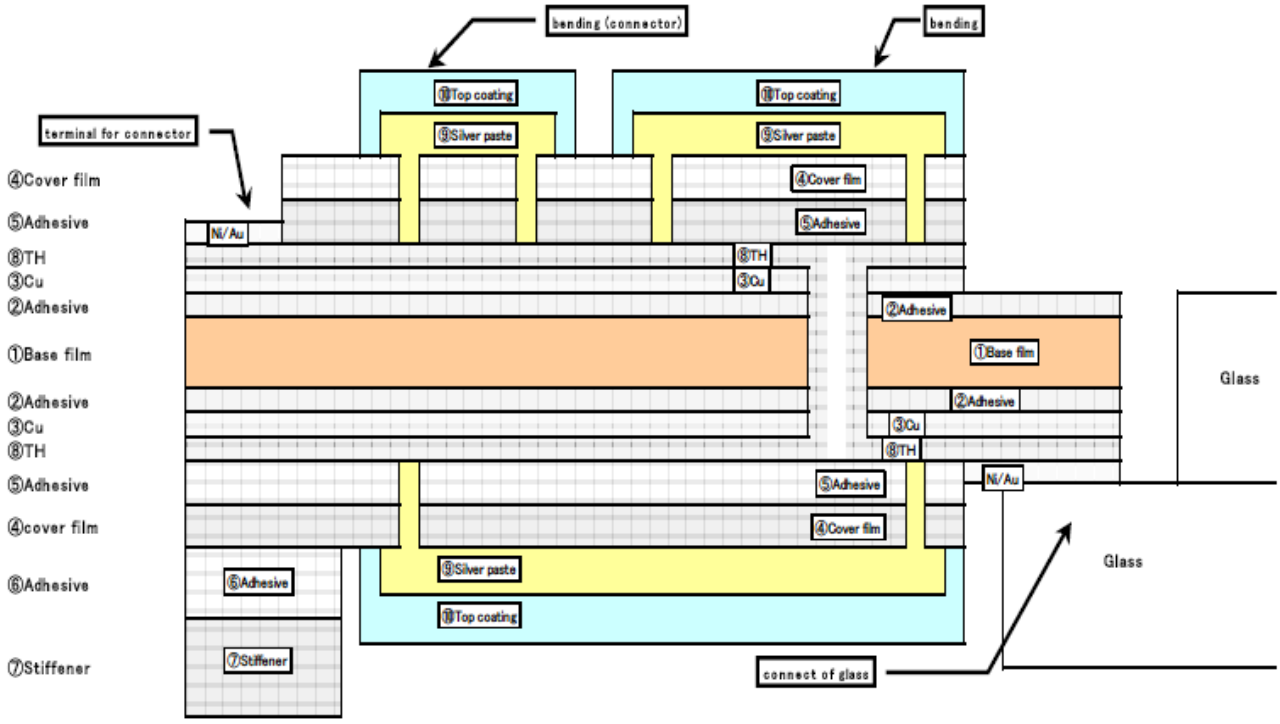
Panel side

Pin No	Symbol
1	TCOM1
2	TFTCOM1
3	VSS
4	VB4
5	VB3
6	VB2
7	VB1
8	VSS
9	VG4
10	VG3
11	VG2
12	VG1
13	VSS
14	VR4
15	VR3
16	VR2
17	VR1
18	VSS
19	LR
20	PVID1
21	PVID2
22	PCTL
23	SCKB
24	SCK
25	VSS
26	SSPB
27	ADOUT
28	VDD
29	AONB
30	INIT
31	GOE
32	UD
33	GCK
34	GDOUT
35	GSPB
36	NC
37	GVSS
38	NC
39	TFTCOM2
40	TCOM2

Connector side

Symbol	Pin No
TCOM1	1
VSS	2
VB4	3
VB3	4
VB2	5
VB1	6
VSS	7
VG4	8
VG3	9
VG2	10
VG1	11
VSS	12
VR4	13
VR3	14
VR2	15
VR1	16
VSS	17
LR	18
PVID1	19
PVID2	20
PCTL	21
SCKB	22
SCK	23
VSS	24
SSPB	25
VDD	26
INIT	27
GOE	28
UD	29
GCK	30
GSPB	31
GVSS	32
TCOM2	33
LED(C)	34
LED(A)	35

4-2. LCD-FPC structure



Material

	name	Thickness
①	Base film	12.5μ
②	Adhesive	8μ
③	Cu	12μ
④	cover film	12.5μ
⑤	Adhesive	18μ
⑥	Adhesive	30 μ
⑦	Stiffener	75μ
⑨	Silver paste	15μ
⑩	Top coating	15μ

Plate

name	Thickness
TH	8μ±3μ
Ni/Au	NI 1~6μ, Au0.03~0.1μ

5. Interface signals

Table.2

Pin No.	Symbol	Description	I/O	Remark
1	TCOM1	TCOM1	I	
2	VSS	GND	I	
3	VB4	Video signal(B)4	I	
4	VB3	Video signal(B)3	I	
5	VB2	Video signal(B)2	I	
6	VB1	Video signal(B)1	I	
7	VSS	GND	I	
8	VG4	Video signal(G)4	I	-
9	VG3	Video signal(G)3	I	
10	VG2	Video signal(G)2	I	
11	VG1	Video signal(G)1	I	
12	VSS	GND	I	
13	VR4	Video signal(R)4	I	
14	VR3	Video signal(R)3	I	
15	VR2	Video signal(R)2	I	
16	VR1	Video signal(R)1	I	
17	VSS	GND	I	
18	LR	Select left-right direction	I	
19	PVID1	Precharge signal 1	I	
20	PVID2	Precharge signal 2	I	
21	PCTL	Precharge control signal	I	
22	SCKB	Source clock signal (inverted)	I	
23	SCK	Source clock signal	I	
24	VSS	GND	I	
25	SSPB	Source start pulse signal	I	
26	VDD	Supply VDD	I	
27	INIT	Initialize control signal	I	
28	GOE	Gate output enable	I	
29	UD	Select upside-down direction	I	
30	GCK	Gate clock signal	I	
31	GSPB	Gate start pulse signal	I	
32	GVSS	Supply GVSS	I	
33	TCOM2	TCOM2	I	
34	LED(C)	B/L LED Cathode	-	
35	LED(A)	B/L LED Anode	I	

Correspondable connector: (500797-3530(Molex))

1

6. Absolute maximum ratings

6-1. Absolute maximum rating(Electrical)

Table.3

Parameter		Symbol	Min	Max	Unit	Remark
Supply voltage (+)		VDD	-0.3	11.0	V	
Supply voltage (-)		GVSS	-6.0	+0.3	V	
Input voltage	High	V_{INH}	-	VDD+0.3	V	*1
	Low	V_{INL}	VSS-0.3	-	V	
Input voltage (Video signals)		Vvideo	-0.3	VDD/2+0.3	V	*2
COM Voltage	High	V_{COMH}	-	+6.0	V	*3
	Low	V_{COML}	-0.3	-	V	
Input voltage (Precharge signal)	High	V_{PCH}	-	VDD/2+0.3	V	*4
	Low	V_{PCL}	-0.3	-	V	
LED backward voltage		$V_{R(LED)}$	-	5.0	V	*5
LED forward voltage		$I_{(LED)}$	-	35	mA	
LED power dissipation		$P_{D(LED)}$	-	123	mW	

*1 SCK, SCKB, SSPB, GCK, GSPB,GOE, PCTL, INIT, UD, LR Pins

*2 VR1-VR4, VG1-VG4, VB1-VB4 Pins

*3 TCOM1, TCOM2 Pins

*4 PVID1, PVID2 Pins

*5 ANODE, CATHODE Pins

6-2. Environment Conditions

Table 4

Item	Top		Tstg		Remark
	MIN.	MAX.	MIN.	MAX.	
Ambient temperature	-20 °C	+60 °C	-20 °C	+70 °C	Note 2)
Humidity	Note 1)		Note 1)		No condensation

Note1) Ta≦40 °C ..... 95 % RH Max

Ta> 40 °C ..... Absolute humidity shall be less than Ta = 40 °C / 95 %RH

Note2) As opto-electrical characteristics of LCD will be changed, dependent on the temperature, the confirmation of display quality and characteristics has to be done after temperature is set 25 °C and it becomes stable.

Note3) Be sure not to exceed the rated voltage, otherwise a malfunction may occur.

7. Optical characteristics

Table.5 *8* Ta=25 °C

Parameter		Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remark
Transmissive mode	Brightness	B	θ = 0 °, φ = 0 ° ILED=20 mA	130	200	-	cd/m²	Note1,2
	Contrast ratio	Co	θ = 0 °, φ= 0 °	170	260	-		Note1,3
	Viewing angle range (Co≧3)	θ1	φ = 0 °~180 ° at Diffusion light	70	80	-	Deg.	Note1
		θ2		70	80	-		
		θ1'	φ = 90 °~270 ° at Diffusion light	70	80	-		
		θ2'		70	80	-		
	White chromaticity	x	θ = 0 °, φ = 0 °	0.25	0.30	0.35		Note1
		y		0.30	0.32	0.37		
Reflective mode	Reflectance	R	θ = 0 °, φ = 0 °	1	2	-	%	Note5
	White chromaticity	x	θ = 0 °, φ = 0 °	0.27	0.32	0.37		Note1
		y		0.30	0.35	0.40		
Response Time	Rise	τr	θ = 0 °, φ = 0 °	-	13	30	ms	Note1,4
	Decay	τd		-	18	40		

Note 1) Definition of range of visual angle.

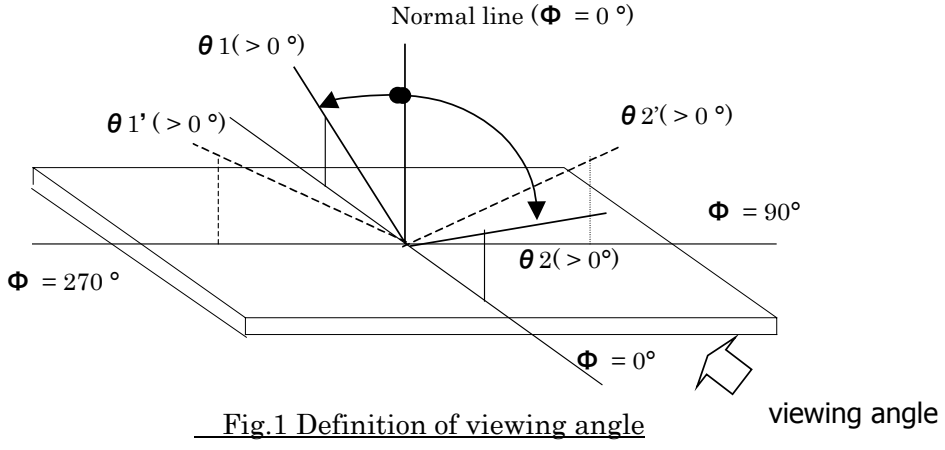


Fig.1 Definition of viewing angle

Note2) Brightness is measured as shown in Fig.6, and is defined at 25℃ as the brightness of all pixels "White" at the center of display area on optimum contrast.

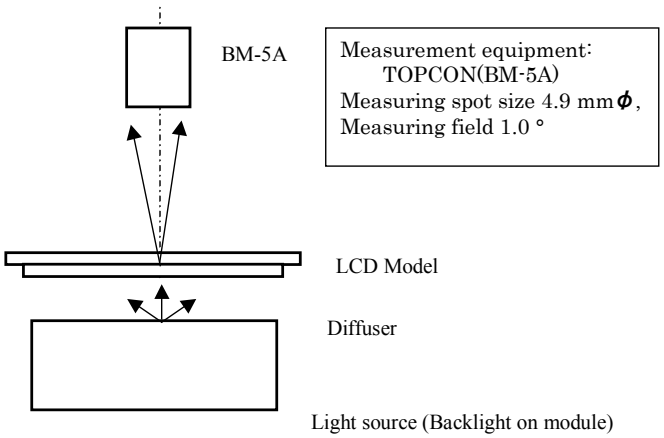


Fig.2 Optical Characteristics Test Method

Note3) Contrast ratio is defined as follows:

$$Co = \frac{\text{Luminance(brightness) all pixels “White”}}{\text{Luminance(brightness) all pixels “Black”}}$$

Note 4)Response time is defined as follows:

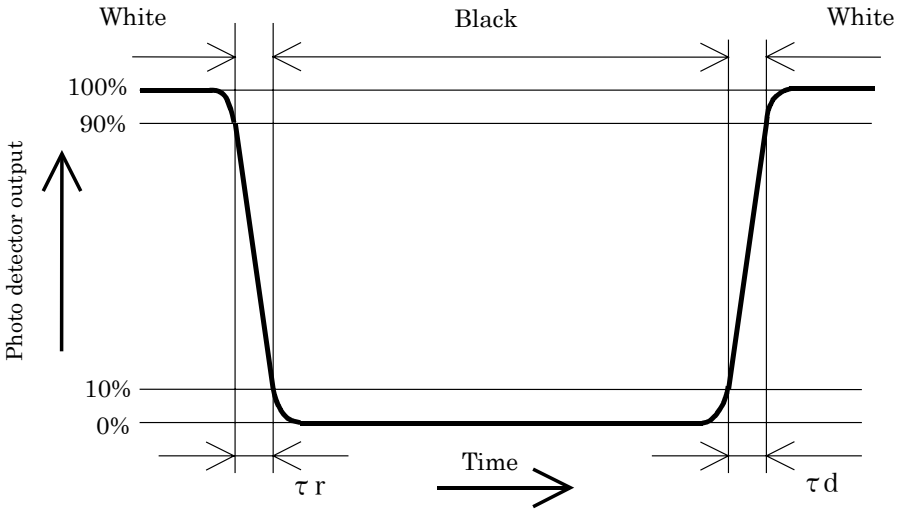


Fig.3 Definition of response time

Note 5) Reflectance is defined as follows:

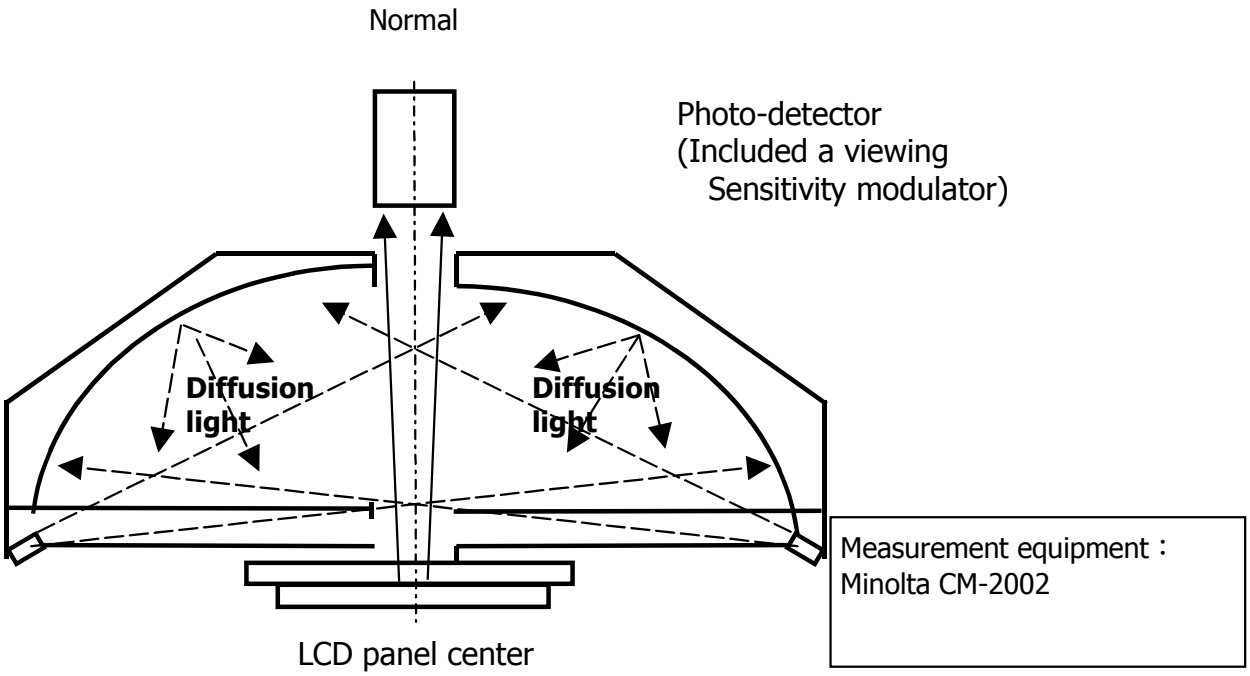


Fig. 4 Optical Characteristics Test Method

8. Electrical Specifications

(8-1) Electrical characteristic

Table.6 Ta=25℃

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Supply GND Voltage		VSS	-	0	-	V	(*1)
Supply Voltage of the panel (+)		VDD	9.5	10	10.5	V	
Supply Voltage of the panel(-)		GVSS	-5.3	-5.1	-4.9	V	
Input Voltage	High	V_{INH}	VDD-0.5		VDD	V	(*2)
	Low	V_{INL}	0		0.5	V	
Input Voltage (Video Signals)	(+)	V_{VIDEOP}	1.2		VDD-5.0	V	(*3, 5)
	(-)	V_{VIDEON}	V_{VIDEON_L}(*4)		VDD-5.0		
COM Voltage	High	V_{COMH}	(5.0)	5.1	(5.2)	V	(*6, 5)
	Low	V_{COML}		0		V	
	Width	V_{COMPP}		5.1(*7)	V_{COMPP_max} (*8)	V	
Input Voltage (Precharge signal)	High	V_{COMPP}	1.2		VDD-5.0	V	(*9, 5)
	Low	V_{PC_P}	$V_{PC\text{-}min}$(※10)		VDD-5.0	V	
LED forward current		$I_{(LED)}$	-	20 *2*		mA	(*11)
Current consumption		I_{VDD}	-	(0.52)	(0.75)	mA	(*12)
		I_{GVSS}	-	(0.04)	(0.08)	mA	(*13)

*1: The above voltage is VSS standard.

*2: SCK, SCKB, SSP, GCK, GSPB, GOE, PCTL, INIT, UD, LR Pins

*3: VR1-4, VG1-4, VB1-4 pins

*4: It is a value to satisfy in more than 1.2V and the next expression.

$V_{VIDEO\_L} = G_{VSS}+V_{COMPP}+1.0V+\Delta V$

*5: Please reverse polarity in every one scanning line and one Field

*6: TCOM1, TCOM2 pins

*7: The amplitude of the common electrode voltage gives priority to MAX. value over TYP. Value.

*8: $V_{COMPP\_max} = V_{VIDEON\_L}$-GVSS-1.0V-ΔV

*9: PVID1, PVID2 Pins

*10: (-)polarity

It is a value to satisfy in more than 1.2V and the next expression.

$V_{PCL\text{-}min}$ = GVSS+V_{COMPP}+1.0V+ΔV

[note] ΔV Voltage is different every panel.

*11: ANODE, CATHODE Pins

*12: Conditions VDD=10V,Gray scale Pattern

*13: Conditionw GVSS=-5.1V, Gray scale Pattern

9. Example of setting sequence

Conditions : Driver IC is IRM77 (SHARP)

1DCK=7MHz(TYP),1H=297DCLK,thp=5DCLK,thb=24DCLK,thf=28DCLK,1V=410H,
tvp=2H,tvb=1H,tvf=7H

(9-1) Power ON Sequence

1.RESET="L"
2.Logic signals
DCLK=L or H, HSYNC=L or H,VSYNC=L or H,DATA=L or H, SCS=L,SCLK=L or H,SI=L or H
3.Power ON (VDD)
4.Power ON (VIN)

(9-2) Display ON command sequence

Display Off → Display On Table.7

Step	Timing	REG./DATA	Note
1	RESET Signal = " L " ⇒ " H "		
2	Wait = 1ms Min.		
3		07(Hex)=01h(Hex)	Software reset
4	More than Wait=50μs	04(Hex)=00h(Hex)	
5	DCLK,HSYNC,VSYNC Input start (Data= " L " or " H " fixed)		
6		00(Hex)=04h(Hex)	
7		01(Hex)=35h(Hex)	
8		02(Hex)=01h(Hex)	
9		03(Hex)=20h(Hex)	
10		05(Hex)=03h(Hex)	
11		06(Hex)=1Dh(Hex)	
12		22(Hex)=0Ch(Hex)	
13		20(Hex)=01h(Hex)	
14		10(Hex)=0Ah(Hex)	
15		11(Hex)=02h(Hex)	
16		12(Hex)=06h(Hex)	
17		16(Hex)=06h(Hex)	
18		17(Hex)=0Ah(Hex)	
19		18(Hex)=50h(Hex)	
20		1A(Hex)=70h(Hex)	
21		1B(Hex)=6Eh(Hex)	
22		1C(Hex)=63h(Hex)	
23		1D(Hex)=62h(Hex)	
24		1E(Hex)=09h(Hex)	
25	Wait=1V	21(Hex)=20h(Hex)	
26	Wait=1V	21(Hex)=30h(Hex)	
27	Wait=1V	21(Hex)=32h(Hex)	
28	Wait=1V	21(Hex)=33h(Hex)	
29	Wait=1V	02(Hex)=00h(Hex)	
30	Wait=1V	03(Hex)=60h(Hex)	
31	Wait=1V	01(Hex)=31h(Hex)	
32	Wait=1V	01(Hex)=30h(Hex) *9*	Display On

γ setting ••set γ setting during wait time step 25~29 Table.8

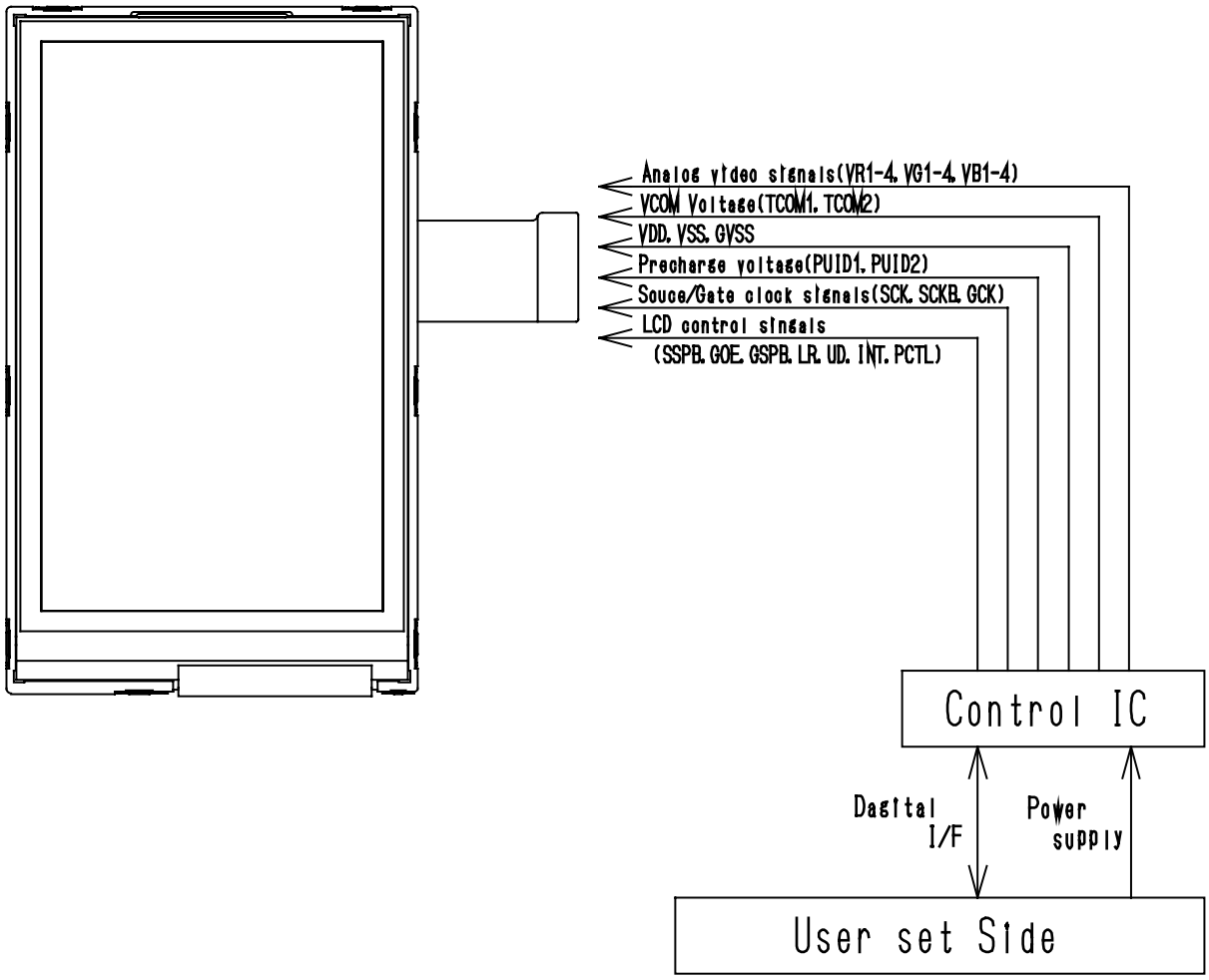
REG (HEX)	DATA (HEX)	REG (HEX)	DATA (HEX)	REG (HEX)	DATA (HEX)	REG (HEX)	DATA (HEX)
40	FF	60	94	80	0	A0	6A
41	F7	61	92	81	6	A1	6C
42	F1	62	90	82	C	A2	6E
43	FB	63	8F	83	12	A3	6F
44	E6	64	8D	84	18	A4	71
45	E1	65	8B	85	1D	A5	73
46	DC	66	89	86	21	A6	75
47	D8	67	87	87	26	A7	77
48	D4	68	85	88	2A	A8	79
49	D0	69	83	89	2E	A9	7B
4A	CC	6A	81	8A	31	AA	7D
4B	C9	6B	7F	8B	35	AB	7F
4C	C5	6C	7D	8C	38	AC	81
4D	C2	6D	7B	8D	3C	AD	83
4E	BF	6E	79	8E	3F	AE	85
4F	BC	6F	77	8F	42	AF	87
50	B9	70	75	90	44	B0	89
51	B6	71	73	91	47	B1	8B
52	B4	72	71	92	4A	B2	8D
53	B1	73	6F	93	4D	B3	8F
54	AF	74	6D	94	4F	B4	91
55	AC	75	6A	95	52	B5	94
56	AA	76	68	96	54	B6	97
57	A7	77	65	97	56	B7	99
58	A5	78	61	98	59	B8	9D
59	A3	79	5D	99	5B	B9	A1
5A	A1	7A	58	9A	5D	BA	A6
5B	9F	7B	51	9B	5F	BB	AD
5C	9D	7C	46	9C	61	BC	B9
5D	9B	7D	33	9D	63	BD	CC
5E	98	7E	13	9E	65	BE	EC
5F	96	7F	0	9F	67	BF	FF

(9-3) Display OFF command sequence

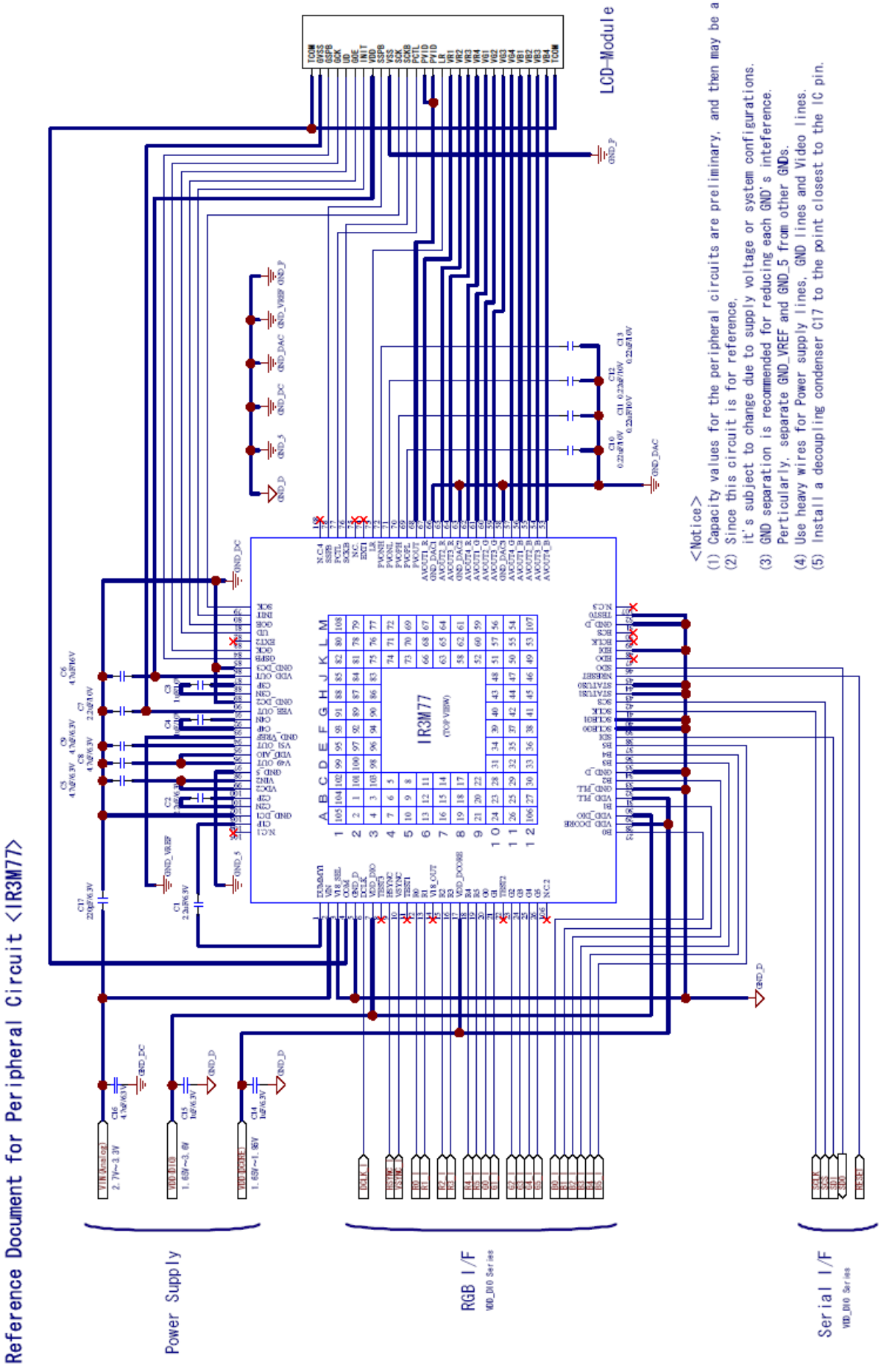
Display On → Display Off Table.9

Step	Timing	REG./DATA	Note
1		01(Hex)=31h(Hex)	
2	Wait=2V	03(Hex)=00h(Hex)	
3	Wait=1V	01(Hex)=35h(Hex)	
4	Wait=1V	21(Hex)=22h(Hex)	
5	Wait=1V	02(Hex)=01h(Hex)	
6	Wait=1V	21(Hex)=00h(Hex)	
7	Wait=1V	20(Hex)=00h(Hex)	
8	Wait=1V		
9	Logic signals is initial level fixed		
10	RESET Signal = ″ H ″ ⇒ ‘′ L ‘′		

10.Block Diagram



11. Recommended circuit diagram around control IC



12) Packaging specifications *10*

(12-1) Details of packing

1) Packing materials: Table.11
Packing style : Fig.5

(12-2) Reliability

1) Vibration test

Table.10

Item	Test			
Frequency	5 Hz to 50 Hz (3 minutes cycle)			
Direction	Up-Down, Left-Right, Front-Back (3 directions)			
Period	Up-Down	Left-Right	Front-Back	Total
	60 min	30 min	30 min	120 min

The frequency should start at 5 Hz and vary continuously.

Total amplitude	20 mm	0.2 mm	20 mm	0.2 mm	
Frequency	5 Hz	50 Hz	5 Hz	50 Hz	(For 9.8 m/s^2)

○ ○ ○

← 3 minutes →

2) Drop test
Drop height: 750 mm
Number of drop: 10 times (Drop sequence: 1 corner, 3 edges, 6 faces)

(2-3) Packaging quantities

400 modules (Max) per master carton

(2-4) Packaging weight

11 Kg

(2-5) Packaging outline dimensions

360mm×525mm× 225mm(H)

(2-6) Tray outline dimensions

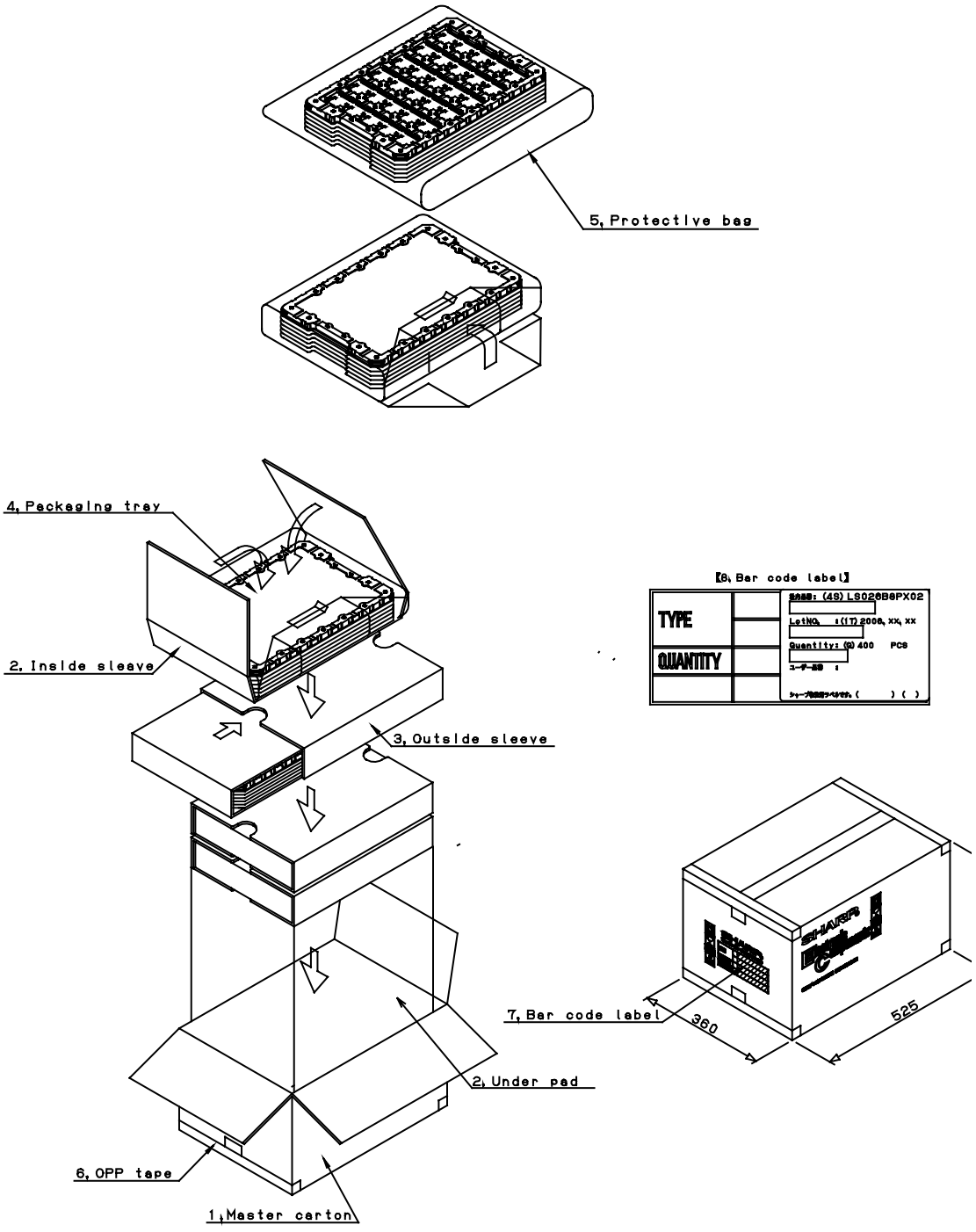
330mm×500mm

Packing materials

Table.11

	Parts name	Materials
1	Master carton	Corrugate card board
2	Inside sleeve	Corrugate card board
3	Outside sleeve	Corrugate card board
4	Tray for packaging	Polystyrene with anti-static treatment+anti-static polystyrene
5	Protective bag	Polyethylene with anti-static treatment
6	OPP tape	Polypropylene
7	Bar code label	

Fig.5 Packaging style



13.Lot No identification *11*

Lot numbering and location are specified as follows.

①	②③	④⑤	⑥
LS026B8PX02	05	A000001	A	Q

① Model No.

② Product year (lower 2 digits)

01 : 2001

02 : 2002

③ Product month

A : JANUARY

B : FEBRUARY

C : MARCH

:

:

L : DECEMBER

④ Serial number

000001 ~ 999999

⑤ Version number

A (Revises a version to the change)

⑥ Manufacture ground

14. LCD module outline dimensions *4*