Specifications For Approval

Product: 1.79" QCIF+ TFT LCM
Model No.:
Customer:

Approval			
Customer			
200 . . .	200 . . .	200 . . .	200 . . .
countersignature	countersignature	countersignature	countersignature
Sign	Sign	Sign	Sign

Status: Revision 0.0   **July 16, 2007**

Contents

REVISION HISTORY

REV	REVISION ITEM	DATE
0	Initial version	July 12, 2007

1. GENERAL DESCRIPTION:

This product is a single display module, which has the color transmissive AMLCD(Active Matrix Liquid Crystal Display) as a main display. This model is composed of the TFT-LCD module, driver circuit and white LED back light unit. The general display module specifications are provided in Table 1.1.1
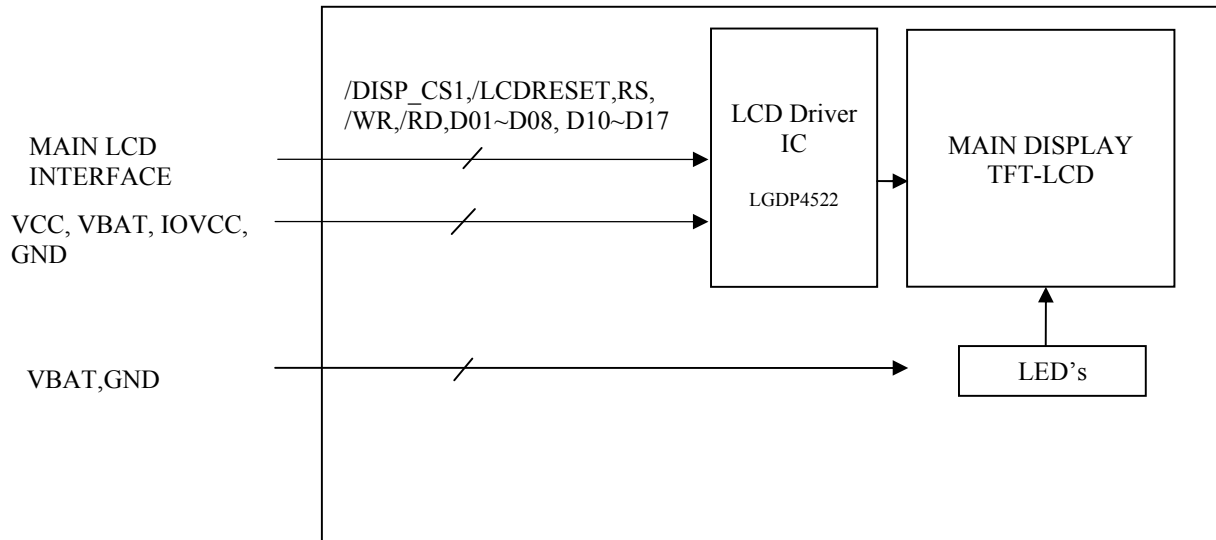
Table 1.1.1 : General Display Module Specifications

Category	Parameter	Specification
Main LCD	Display mode	a-Si TFT AMLCD
	Display type	Transmissive
	Display colors	65K & 262K
	Active area	28.512mm(H) x 35.64mm(V)
	Viewing area	32.4mm(H) x 39.82mm(V)
	Number of pixels	176(H) x 220(V)
	Pixel arrangement	RGB stripe
	Pixel size	0.054mm(H) x 0.162mm(V)
	Display mode	Normally White
	Viewing Direction	12 O'clock
Panel	F108GJ-1TU (CHI MEI)	
LCD Driver	LGDP4522 (LG)	
Mechanical	Overall Dimensions	35mm(H) x 59.23(V) x 2.85T
Backlight	LED Backlight	3 White LED's(1way)
Environmental	Operating Temperature	-20°C ~ 70°C
	Operating Humidity	10 ~ 90%, noncondensing

2. MODULE BLOCK DIAGRAM:

SYSTEM BOARD   **DISPLAY MODULE**

/DISP_CS1,/LCDRESET,RS,
/WR,/RD,D01~D08, D10~D17

MAIN LCD
INTERFACE

VCC, VBAT, IOVCC,
GND

VBAT,GND

LCD Driver
IC

LGDP4522

MAIN DISPLAY
TFT-LCD

LED's

3. ELECTRICAL REQUIREMENTS:

3.1 Absolute Maximum Ratings:

Table 3.1.1: Absolute Maximum Ratings

Parameter	Symbol	Condition	Rating	Unit	Remarks
Power supply (digital)	V_{DD}	Ta=25°C	-0.3 ~ + 3.0	V	Note 1
Input voltage (digital)	V_{ID}	Ta=25°C	-0.3 ~ + 3.3	V	Note 1
Operating temperature	T opr	--	-40 ~ + 85	°C	
Storage temperature	T stg		-55 ~ +125	°C	

Note 1: If used beyond the absolute maximum ratings, the LSI may permanentiy be damaged.
It is strongly recommened to use the LSI at a condition within the electrical characteristics
for normal operation.

3.2 Electrical Characteristics:

Table 3.2.1: Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Remarks
Supply voltage	V_{DD}	+2.4	+2.8	+3.3	V	
Battery voltage	V_{BATT}	+9.0	+9.9	+10.5	V	
Input voltage - (High)	V_{IH}	0.8IOVcc	--	IOVCC	V	
Input voltage - (Low)	V_{IL}	-0.3	--	0.2IOVcc	V	

Table 3.2.2: Current Consumption

Category	Parameter	Symbol	Minimum	Typical	Maximum	Unit	Remarks
Main display	Stand by	I_{STB}	-	1.4	10	uA	
	Sleep	I_{SLP}	-	-	0.1	mA	
	Still	I_{STL}	-	4.0	6.0	mA	
	Full	I_F	-	8.0	10	mA	

Table 3.2.3: Backlight Current consumption

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Remarks
Current	I_B	-	15		mA	note 1
Power Consumption	P_{BL}	-	149		mW	note 2

Note 1 : Three LEDs are connected in series
Note 2 : Where I_B = 15mA , V_B = P_{BL} / I_B

3.3 Input Pin Connections

Pin No.	Symbol	I/O	Function
1	BL_K	-	Ground
2	BL_A	I	Battery voltage
3	IOVCC	I	Supply voltage
4	NC	-	-
5	RESET	I	RESET
6	DB17	I/O	Data17
7	DB16	I/O	Data16
8	DB15	I/O	Data15
9	DB14	I/O	Data14
10	DB13	I/O	Data13
11	DB12	I/O	Data12
12	DB11	I/O	Data11
13	DB10	I/O	Data10
14	NC	-	-
15	DB08	I/O	Data8
16	DB07	I/O	Data7
17	DB06	I/O	Data6
18	DB05	I/O	Data5
19	DB04	I/O	Data4
20	DB03	I/O	Data3
21	DB02	I/O	Data2
22	DB01	I/O	Data1
23	NC	-	-
24	RD	I	Read
25	WR	I	Write/read
26	RS	I	Select Register
27	CS	I	Chip select
28	VCC	I	Supply voltage
29	GND	I	Ground

3.4 AC Characteristics:

3.4.1 Recommended Signal Timing (Main LCD)

Note 1) PWLW and PWLR are defined by the overlap period when CS* is "Low" and WR* or RD* is "Low".
Note 2) Unused DB pins must be fixed at "Vcc" or "GND".
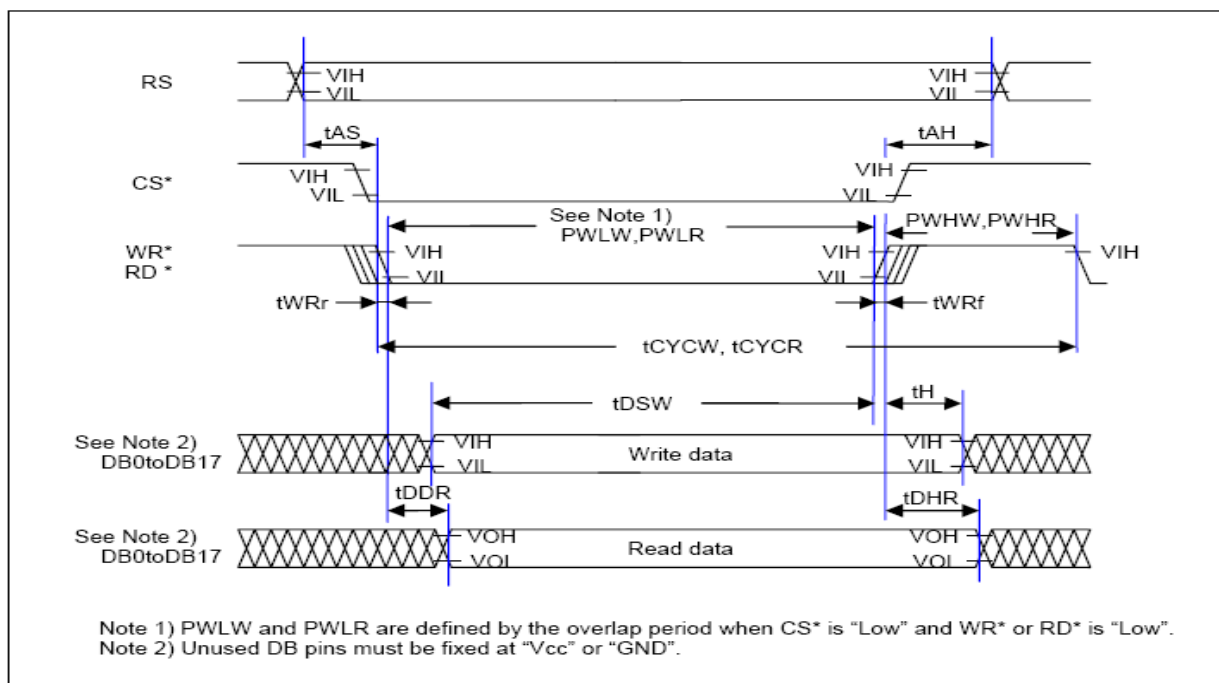
80 - System bus interface operation

(Condition: IOVcc = 1.65 to 3.30V, Vcc = 2.40 to 3.30V)

Item			Symbol	Unit	Min	Typ	Max
Bus cycle time		Write	t_{CYCW}	ns	70	-	-
		Read	t_{CYCR}		250	-	-
Write "Low" level pulse width		Write	PW_{LW}	ns	40	-	-
Read "Low" level pulse width		Read	PW_{LR}		150	-	-
Write "High" level pulse width		Write	PW_{HW}	ns	30	-	-
Read "High" level pulse width		Read	PW_{HR}		100	-	-
Write/Read rise/fall time			t_{WRr}, t_{WRf}	ns	-	-	25
Setup time	Write (RS to CS*/WR*)		t_{AS}	ns	0	-	-
	Read (RS to CS*/RD*)				10	-	-
Address hold time			t_{AH}	ns	2	-	-
Write data setup time			t_{DSW}	ns	25	-	-
Write data hold time			t_{H}	ns	5	-	-
Read data delay time			t_{DDR}	ns	-	-	200
Read data hold time			t_{DHR}	ns	5	-	-

Reset Timing

Reset operation

(Condition : Iovcc = 1.65V to 3.30V, VCC = 1.80V to 3.30V)

Item	Symbol	Unit	Min	Typ	Max
Reset "Low" level width	t_{RES}	ms	1	-	-
Reset rise time	t_{rRES}	us	-	-	10

3.4.2 Basic Colors and Gray Scales:

Table 3.4.1 provides a truth table defining the basic display colors and gray scales available in the main AMLCD. A maximum of 262k colors is possible.

Table 3.4.2: Signals, Basic Display Colors, and Gray Scales – TFT LCD

Colors & Gray Scale	Gray scale Levels	Data Signal																	
		R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	B4	B5
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
Magenta	--	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
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	GS29	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
⇓	GS30	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Red	GS31	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
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
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	GS29	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1
⇓	GS30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
Blue	GS31	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

Note 1: In Table 3.4: 0 = Logic low, 1 = Logic high.

4. OPTICAL REQUIREMENTS:

4.1 Optical Specifications (Main LCD):

Table 4.1 : Optical Characteristics (Main LCD)

Ta = 25°C , $V_{DD}=V_{BAT=3.3V}$, $I_{BKL=15mA}$

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast ratio		C/R		150	250	-		Note 4
Luminance of white		YL		-	200	-	cd/m^2	Note 5
Response time	Rising:Tr	Tr+Tf		-	15	-30	msec	Note 6
	Falling:Tf	Tf		-	35	-50		
Color chromaticity (CIE 1931)		Rx	Note1	0.604	0.634	0.664		Note 7
		Ry		0.298	0.328	0.358		
		Gx		0.266	0.296	0.326		
		Gy		0.545	0.575	0.605		
		Bx		0.103	0.133	0.163		
		By		0.083	0.113	0.143		
		Wx		0.281	0.311	0.341		
		Wy		0.317	0.347	0.377		
Viewing angle	Hor.	θL	CR>10	40	45	-	Degrees	Note 3
		θR		40	45	-		
	Ver.	θH		30	35	-		
		θL		10	15	-		

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Note 1

Measurement should be executed in a stable, windless, and dark room. 30 min after lighting the Back-light. This should be measured on the center of screen.

Environment condition: Ta = 25 ± 2 ℃

Back-light ON condition

Photodetector	Field
BM-5A	1
BM-7	1
PR-650	1

Photodetector

Field

BM-5A : 50
BM-7 : 50
PR-650: 50

TFT - LCD Module

LCD Panel

The center of the screen
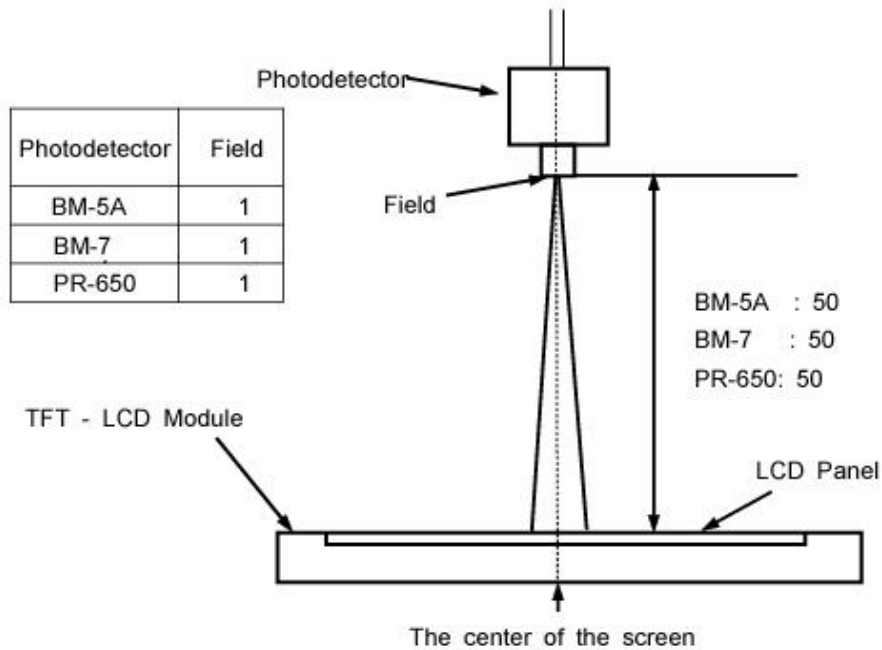
Back-light OFF condition

Photodetector	Field
LCD-7200	1

Photodetector

Reflected light

Light source : Halogen lamp or D65

LCD-7200 : 50

30

Incident light

TFT - LCD Module

LCD Panel

The center of the screen
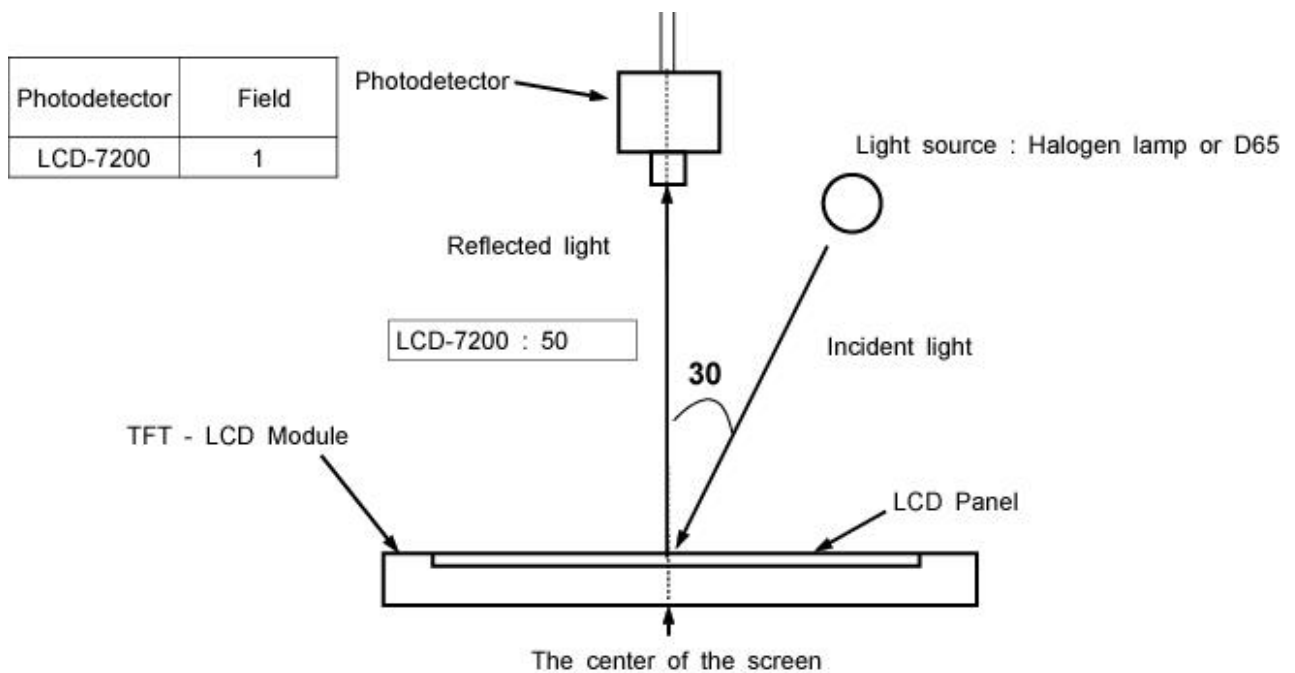
Note 2

Definition of Reflectance: The reflectance is relative quantity to the standard white BaSO$_4$ or MgO plate that the reflectance of the standard white plate is the 100%

$$\text{Reflectance} = \cfrac{\cfrac{\text{Light intensity of the reflected light on LCD}}{\text{Input intensity of the reflected light on BaSO4 plate}}}{\cfrac{\text{Output intensity of the reflected light on BaSO4 plate}}{\text{Input intesity of the reflected light on BaSO4 plate}}} \times 100\%$$

Note 3

Definition of Viewing Angle: Viewing angle range (CR≥10)
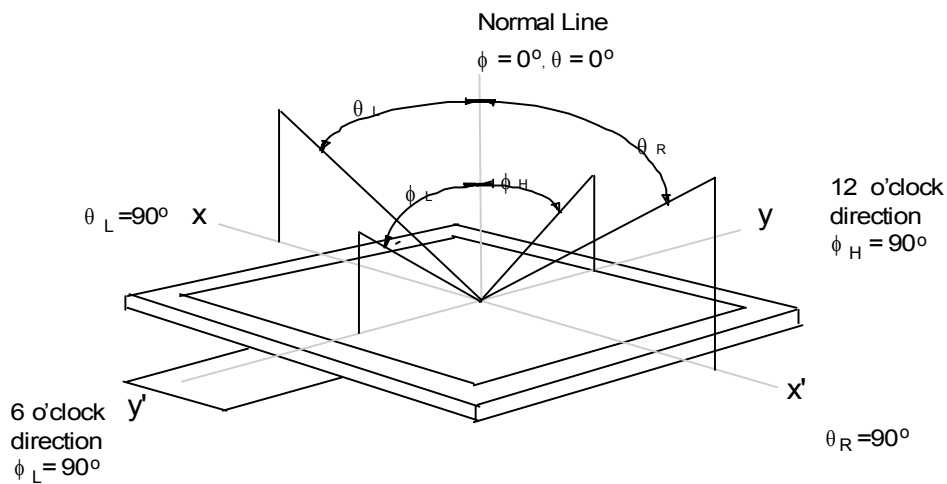
Note 4

Definition of Contrast Ratio (C/R): Ratio of gray max (Gmax) & gray min (Gmin) at the center point of the panel. If front light is on state, it is the light source and the BM-5A will be used to measure.

$$CR = \frac{G_{MAX}}{G_{MIN}}$$

* Gmax : Luminance with all pixels white

* Gmin : Luminance with all pixels black

Note 5

Definition of Luminance of White: Luminance of white at center point.

Note 6

Definition of Response time: Sum of Tr, Tf
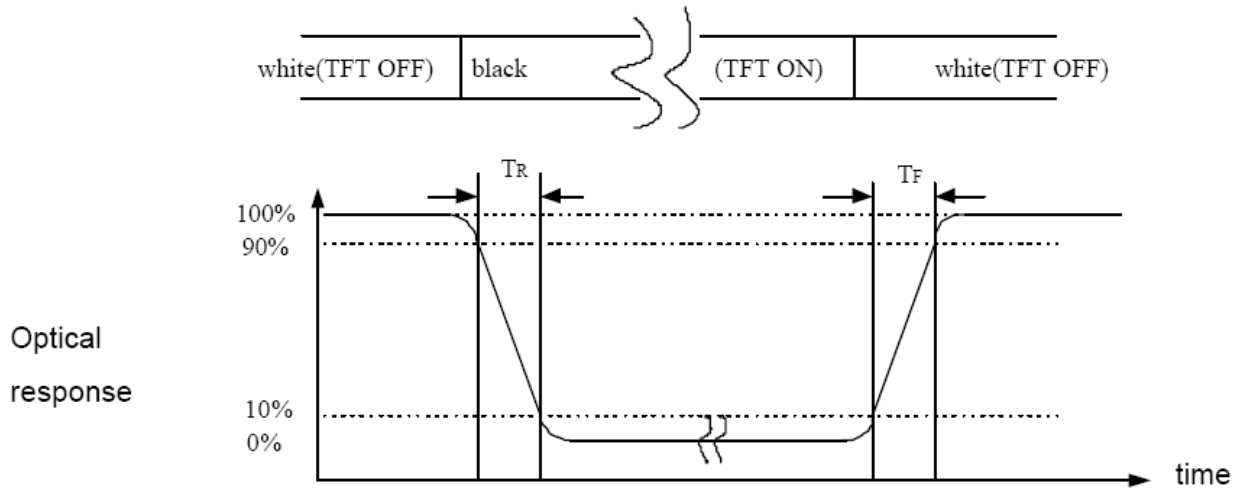
Note 7

Definition of Color Chromaticity (CIE 1931)
Color coordinate of white& red, green, blue at center point.

5. QUALIFICATION

5.1 Inspection condition.

① **Temperature • Humidity**
- Room Temperature : 23±3°C
- Humidity : 60±20%

② **Inspection distance and degree**
- Keep distance over 30cm from LCD surface under the 20W lighting source from the lamp.
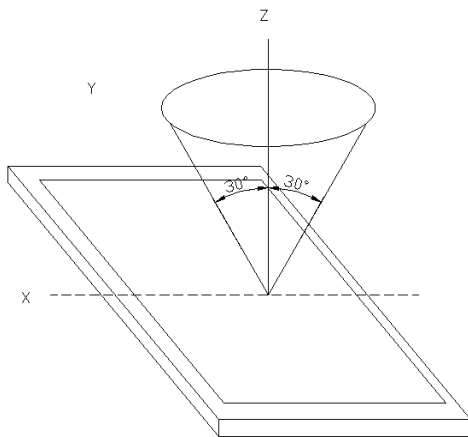
Inspects from Z to X and Y within Φ(Φ=30°)
The distance should be kept over 30cm.

- LCD surface and light source has to be perpendicular and inspection should be done within 30° from the inspection position (Z-axis) .

Display surface
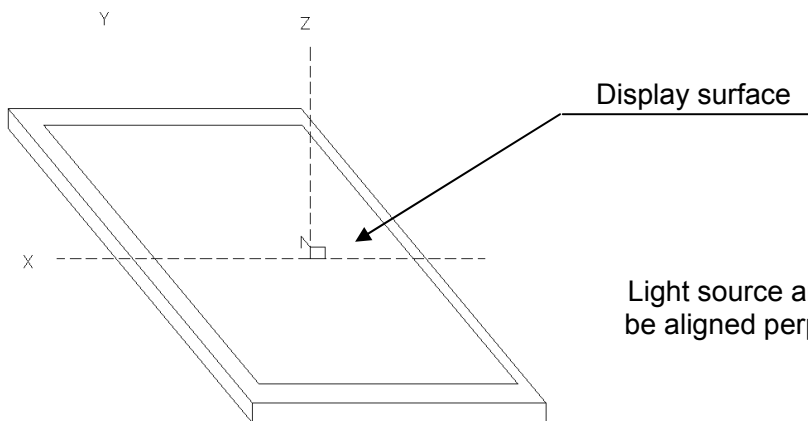
Light source and LCD surface must
be aligned perpendicular.

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5.2 Inspection method (Sampling)

- General inspection.

1) Fail 1 (Heavy defect) : Unable to use product, cannot use product up to it's expectation
and can not perform the standard of it's purpose.

2) Fail 2 (Light defect) : Unstable and degraded product but still can be use.

3) Defect applied area : Active Area
4) Criterion : AQL of Fail 1 : 0.65, AQL of Fail 2 : 1.5

5.3 Inspection category

- Sampling procedures for each item's acceptance level
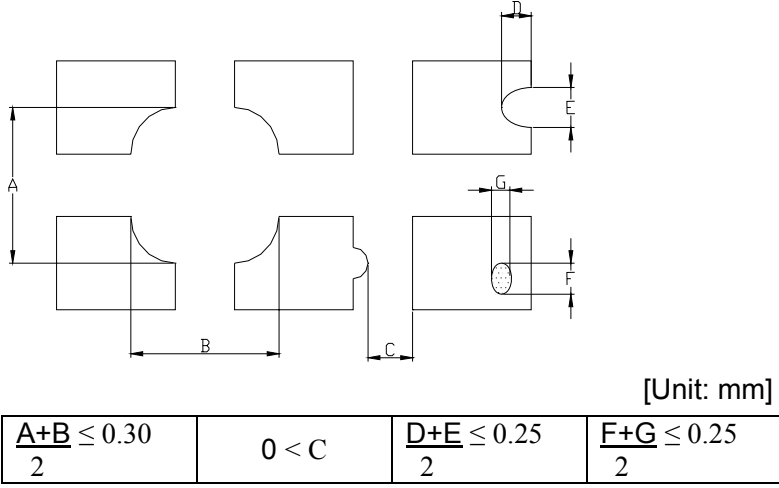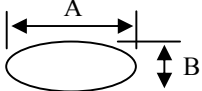
Defect type	Sampling procedures	AQL
Major defect	MIL-STD-105D Inspection level Ⅰ normal inspection single sample inspection	0.65
Minor defect	MIL-STD-105D Inspection level Ⅰ normal inspection single sample inspection	1.5

- Definition of Black / Spot or Line

Item	Criterion for defects
Black / White spots（Ⅰ） Black / White lines（Ⅰ）	Spots or lines appear dark or white in display patterns and remain unvaried in terms of size or shade with varying the LCD operating voltage.
Black / White spots（Ⅱ） Black / White lines（Ⅱ）	Spots or lines appear dark or white in display patterns and they are variable in terms of size or shade with varying the LCD operating voltage.

5.4 Visual inspection

ITEM	Criterion for defects	Defect type
1) Non display	• No non display is allowed	Major
2) Irregular operation	• No irregular operation is allowed	Major
3) Short	• No shorts are allowed	Major
4) Open	• Any segments or common patterns that don't activate are rejectable.	Major

5) Black / White spot（Ⅰ）	<table><tr><td>Size Ø (mm)</td><td>Acceptable number</td></tr><tr><td>Ø ≤ 0.15 0.15 < Ø ≤ 0.20 0.20 < Ø ≤ 0.30 0.30 < Ø</td><td>Ignore 3 2 0</td></tr></table>	Minor
6) Black / White line（Ⅰ）	<table><tr><td>Length (mm)</td><td>Width (mm)</td><td>Acceptable number</td></tr><tr><td>10 < L 5.0 < L ≤ 10 10 < L ≤ 5.0 L ≤ 1.0</td><td>0.03 < W≤ 0.04 0.04 < W≤ 0.06 0.06 < W≤ 0.07 0.07< W≤ 0.09</td><td>5 3 2 1</td></tr></table>	Minor
7) Black / White spot（Ⅱ）	<table><tr><td>Size Ø (mm)</td><td>Acceptable number</td></tr><tr><td>Ø ≤ 0.30 0.30 < Ø ≤ 0.50 0.50 < Ø ≤ 1.20 1.20 < Ø</td><td>Ignore 5 3 0</td></tr></table>	Minor
8) Black / White line（Ⅱ）	<table><tr><td>Length (mm)</td><td>Width (mm)</td><td>Acceptable number</td></tr><tr><td>20 < L 10 < L ≤ 20 5.0 < L ≤ 10 L ≤ 5.0</td><td>0.05 < W≤ 0.07 0.07 < W≤ 0.09 0.09 < W≤ 0.10 0.10< W≤ 0.15</td><td>5 3 2 1</td></tr></table>	Minor
9) Back Light	1) No Lighting is reject able 2) Flickering and abnormal lighting are rejectable ※ In case of the model with back light (E/L, LED or CCFT type)	

ITEM	Criterion for defects	Defect type
10) Display pattern	 [Unit: mm] $\dfrac{A+B}{2} \le 0.30$ | $0 < C$ | $\dfrac{D+E}{2} \le 0.25$ | $\dfrac{F+G}{2} \le 0.25$ Note : 1) Acceptable up to 3 damages 2) NG if there're two or more pinholes per dot	Minor
11) Blemish & Foreign matters Size: Ø=(A+B)/ 2 	Size Ø (mm) | Acceptable number Ø ≤ 0.15 | Ignore 0.15 < Ø ≤ 0.20 | 3 0.20 < Ø ≤ 0.30 | 2 0.30 < Ø | 0	Minor
12) Scratch on Polarizer	Length (mm) | Width (mm) | Acceptable number Ignore | W≤ 0.03 | Ignore L < 2.0 | 0.03 < W≤ 0.05 | Ignore L > 2.0 | | 1 L > 1.0 | 0.05 < W≤ 0.08 | 1 L ≤ 1.0 | | Ignore Note (1) | 0.08< W | Note (1) Note (1) Regard as a blemish	Minor
13) Bubble in Polarizer	Size Ø (mm) | Acceptable number Ø ≤ 0.20 | Ignore 0.20 < Ø ≤ 0.50 | 3 0.50 < Ø ≤ 0.80 | 2 0.80 < Ø | 0	Minor
14) Stains on LCD panel surface	Stains which cannot be removed even when wiped lightly with a soft cloth or similar cleaning too are rejectable.	Minor

ITEM	Criterion for defects	Defect type
15) Rust in Bezel	Rust which is visible in the bezel is rejectable.	Minor
16) Defect of land surface contact (Poor soldering)	Evident crevices which is visible are rejectable.	Minor
17) Parts mounting	(1) Failure to mount parts (2) Parts not in the specifications are mounted (3) Polarity, for example, is reversed	Major Major Major
18) Parts alignment	(1) LSI, IC lead width is more than 50% beyond pad outline. (2) Chip component is off center and more	Minor Minor

19) Conductive foreign matter(Solder ball, solder chips)	(1) $0.45 < \varnothing$, $N \geq 1$
	(2) $0.30 < \varnothing \leq 0.45$, $N \geq 1$
	    $\varnothing$: Average diameter of solder ball (unit: mm)
	(3) $0.50 < L$, $N \geq 1$
	    L: Average length of solder chip (unit: mm)
		Major
		Minor
		
		Minor

5.5 Electrical inspection

Defect Type	Accept	Reject
Bright dot (Fig 1) Random	N <= 7	N > 7
Two adjacent	N <= 3	N > 3
Dark dot (Fig 2) Random Two adjacent Three adjacent	N <= 7 N <= 4 N <= 2	N > 7 N > 4 N > 2
Four or more adjacent	Not allowed	
Maximum allowable number of dot defect	N <= 14	N > 14

Minimum distance between defects (Fig 3)
    bright dot – to – bright dot
    dark dot – to – dark dot
    bright dot – to – dark dot
	L => 4mm
	Don't' care
	Don't' care
		L => 4mm
		Don't' care
		Don't' care

[L : length,   N : count]

Inspection pattern for electrical defect should be pure R,G,B Black and White.

Light leakage   not allowed

Image sticking   image sticking pattern shall not be to persist longer than 10 seconds in
                           the next pattern

Glue / stain / dirt   glue, non-removable stain and dirt which are visible in the inspection area
                           are not acceptable.

Fig 1. Bright dot defect description

(Good)   (N.G)
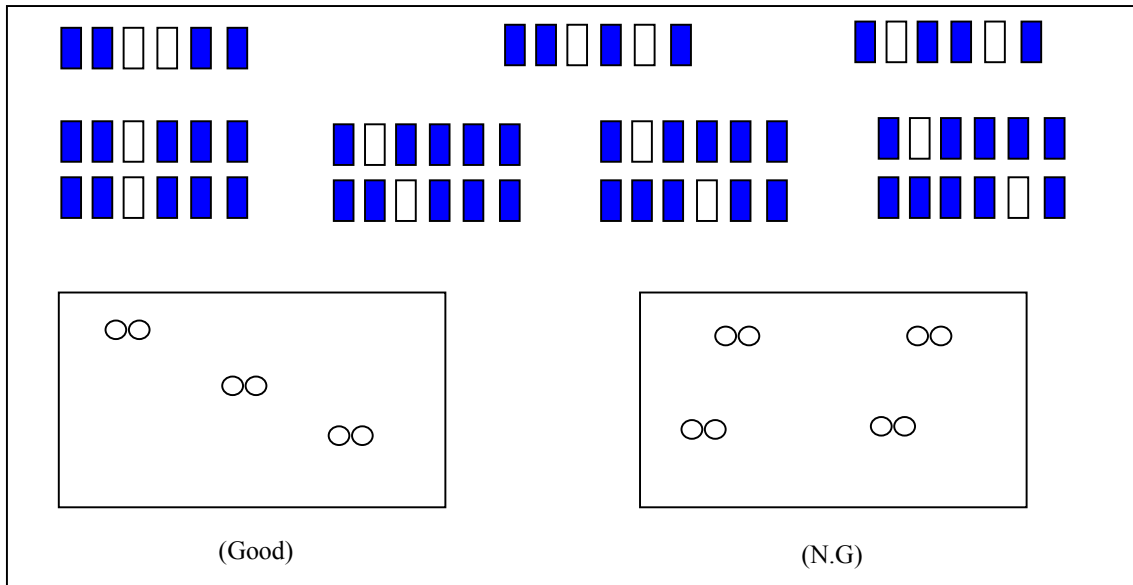
* adjacent two dots in horizontal direction will be considered as one dot

Fig 2. Dark dot defect description
[two adjacent]

(Good)   (N.G)

* adjacent two dots in horizontal direction will be considered as one dot

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Fig 2. Dark dot defect description – continued
[three adjacent]

(Good)   (N.G)
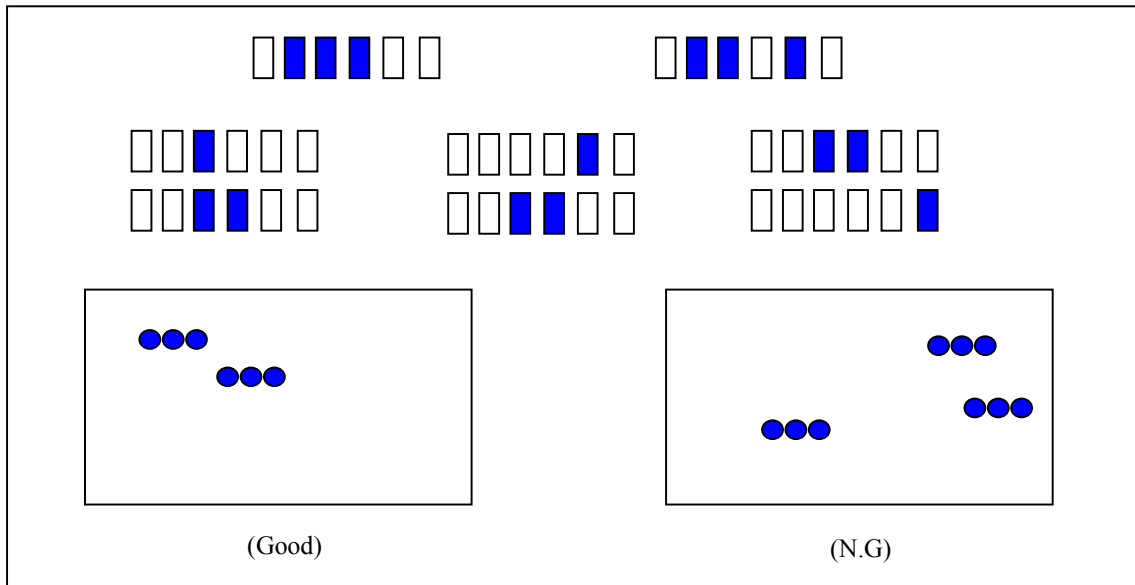
Fig 3. Minimum distance between dot defects
[Bright dot - to - Bright]

4mm

(Good)

3.9mm

(N.G)

6. RELIABILITY

6.1 Items of reliability

All test result of items should be judged in 1 hour recovery time at room temperature.

ITEM	Condition	Criterion
1) high temperature operating	Ta = +70°C,96hrs	• After testing, cosmetic defects should not happen. • Contrast ratio should not happen lower than 10% of initial value. • Total current consumption should not be over 10% of initial value.
2) Low temperature operating	Ta = -20°C,96hrs	
3) Humidity	Ta = +60°C,90%RH, 96hrs	
4) High temperature storage	Ta = +80°C,96hrs	
5) Low temperature storage	Ta = -20°C,96hrs	
6) Temperature humidity cycle	-30°C(0.5hr) → 80°C(0.5hr), 200cycles	
7) Vibration	1.Sine, 1.5G, 2~200Hz, 1hr/X,Y,Z direction 2.Random, 1.5Grms, 5~200Hz, 15min/X,Y,Z direction	• Not allowed cosmetic and electrical defects. (Note1) test will be performed at state of carton box, not each of the modules
8) Static Electricity	200pF 0Ω ±200V	• After testing, cosmetic and electrical defects should not happen. • Total current consumption should be below double of initial value.

Note

All tests above are practiced at module type
There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress

7. HANDLING

7.1 Handling

- LCD module is composed of the fragile glass attached weak polarizer film. Thus it can be damaged easily. Everyone needs to handle very carefully without shock by dropping and damage or dust on the surface.

7.2 Handling and cleaning of LCD

- While cleaning LCD module (see below) take soft cloth and wipe it carefully with cleaning solvent.
  ◎ Isopropyl alcohol
  ◎ Ethyl alcohol
  ◎ Trichloroethylene

- To prevent damage to module, do not wipe with hard fabric.
  Do not use below cleaning solvent.
  ◎ Water
  ◎ Ketone
  ◎ Aromatics

- To prevent damage to ITO pad
  ◎ HCFC
  ◎ Soldering flux
  ◎ CI, S
  ◎ Spittle, Fingerprint

- Products include pad to prevent corrosion to ITO.
  Hahotech recommend that all products include pad to it's products.
  If customer damages ITO using chemicals or solvent not recommend by manufacture, than customer is liable and responsible for the damages caves to product.

7.3 Electrostatic Shielding

- LCD modules uses C-MOS LSI driver, so we recommend our customer as so;
  Do not press key or send signals before power on. In order to prevent additional electrostatic damage, should do earth any operator and tools for the product manufacturing. When removing the protective film from LCD, electrostatic damage happens. Therefore we are continuously testing to countermeasure against electrostatic damage and making sure the shielding method for the product safety.

7.4 Packing

- It is standard to keep LCD modules in package.
  Please note below when keeping out of package.
- LCD modules are composed of glass, so be careful not to put pressure, impact or drop it in anyway.
- To prevent damages do not place it in high temperature/humidity, Also when safe keeping do not directly place in sun.

7.5 Layout and How to use

- In case not following normal POWER ON, OFF order, can nausea damages that are not recoverable.
  Also not following normal procedures can cause permanent damages.

- Using under below the normal operating temperature the response time can be delayed and using under higher operating temperature the color can show darker than normal.
  But these conditions do not mean the LCD is a defect.
  It will recover back to normal, once using it in a normal operating temperature.

- Color of LCD can change if put to a pressure, and will not operate normal.
  So, the layout must show that LCD modules can be protected with think layer of protection under pressure.

- Do not force or pull the LCD module connector or cables.
  TAIL draws a plan not to become TOUCH at the region which the transit does FOLDER HINGE.

- VDD of LCD MODULE POWER LINE must draw a plan in SET WINDOW.

- Needs to be design up to the EMI standards.

- The design must do SET WINDOW so that it is suitable to VIEWING AREA.

- The mark characteristic except VIEWING AREA can not guarantee.

7.6 Safekeeping

- Do not place under direct fluorescent light or beam of light.

- Do not place near water or where water can reach, can cause erosion and rust.

- We do at a polarizer surface lest the store it should be touched you being due to at anything.
  The encouragement does with the outgoing putting at an inside courage to keep.

7.7 Safety
- Do not open module, can cause damages from sharp objects.

- In case of breaking the LCD, a liquid can leak from it.
  If come in contact with liquid, wash off with water immediately.

- Do not touch LCD module with bare hands, can cause static electricity.

8. MECHANICAL DRAWINGS

REVISION DESCRIPTIONS

NO.	DATE	REVISION DESCRIPTIONS	REMARK
	2006.09.19	Module outline drawing	

FPC PIN CONNECTION

NO	SYMBOL	NO	SYMBOL
1	BL_K	16	DB7
2	BL_A	17	DB6
3	IOVCC	18	DB5
4	NC	19	DB4
5	RESET	20	DB3
6	DB17	21	DB2
7	DB16	22	DB1
8	DB15	23	NC
9	DB14	24	RD
10	DB13	25	WR
11	DB12	26	RS
12	DB11	27	CS
13	DB10	28	VCC
14	NC	29	GND
15	DB8		

* NOTE

1. LCD SPEC.
   1) LCD: 1.79" 176 x 220 TFT(Hanstar) + TL1769(Tomato)
   2) Veiwing Angle: 12 O'clock
   3) Display color: 65K or 260K

2. Back Light Unit
   1) White LED 3 chip (Serial / 1 way)
   2) 전압 = 9.9V , 전류 = 15mA
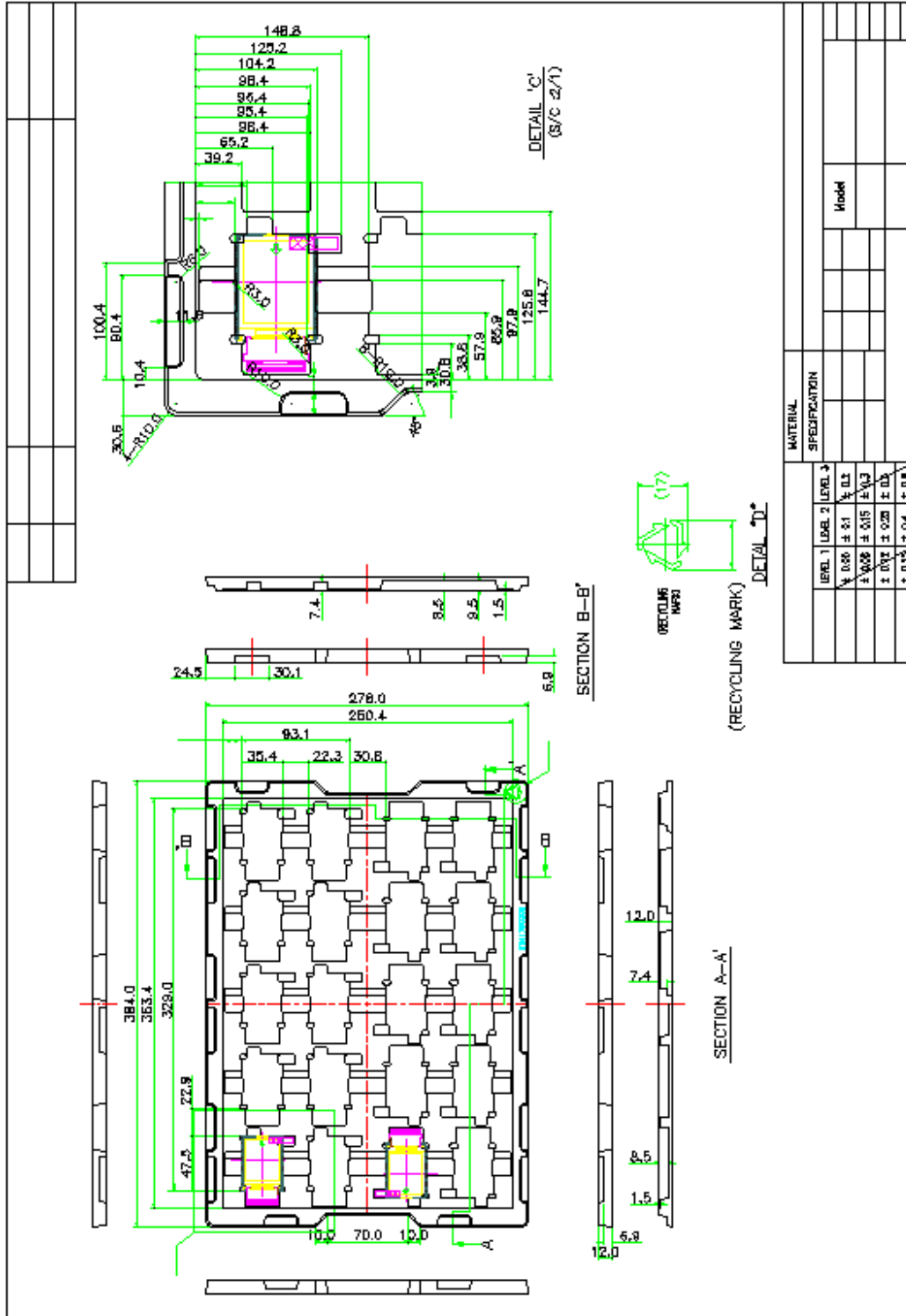
Back light Unit-CIRCUIT

A(+)　　K(-)

MATERIAL

SPECIFICATION

Model name

Application Model

GENERAL TOLERANCE

DEMESION	LEVEL 1	LEVEL 2	LEVEL 3
0 ~ 4	± 0.05	± 0.1	± 0.2
4 ~ 16	± 0.08	± 0.15	± 0.3
16 ~ 64	± 0.12	± 0.25	± 0.5
64 ~ 256	± 0.25	± 0.4	± 0.8

Dimensions on drawing:
27.6
4-Ø1.0
2.85±0.1
2.4(With Double tape)
2.35
35(LCM)
34.4±0.1(BLU)
32.4±0.2(LCD)
28.51±0.2(Active Area)
35.64(Active Area)
44.62±0.2(LCD)
47.1±0.1(BLU)
12.13
LGDP4522
2-Ø0.8
2.3
0.5
0.8
P0.8×(29-1)=22.4
24.3
25.7
Double tape

9. TRAY DRAWINGS

10. BOX DRAWINGS

NO.	ITEM	CODE	Dimension	Q'nty	Remark
1	Cushion-Sponge	-	385*280*5	2EA	PE Sheet
2	Plastic-Tray	HTN179000S	384*278*12	32EA	PP Tray
3	LCD Module	HTN179000S	59.23*35*2.85	640EA	
4	Dummy Plastic-Tray	HTN179000S	384*278*12	1EA	PP Tray Cap
5	Box-Inner	-	388*282*92	4EA	
6	Box-Carton	-	430*310*430	1EA	

430

310

430

Total Solution For
Flat Panel Display Business

20 EA / PP Tray

PP Tray : 8 EA

160 EA / Box-Inner

Box-inner : 4 EA

GENERAL TOLERANCE			
DEMESION	LEVEL 1	LEVEL 2	LEVEL 3
0 ~ 4	± 0.05	± 0.1	± 0.2
4 ~ 16	± 0.08	± 0.15	± 0.3
16 ~ 64	± 0.2	± 0.25	± 0.5
64 ~ 256	± 0.25	± 0.4	± 0.8

MATERIAL

SPECIFICATION

UNIT	mm				
TOLERANCE	LEVEL 2				
SCALE	1/1				

DESIGN	CHECK	APPROVAL	MODEL NAME		
			PART NAME	YURI NS-XV17	
			PART NO.		

SIZE A4
SHEET 1/1
REV. NO

11. FPC Circuit

12. Part list

NO	구분	Part Name	DESCRIPTION	Location No.	수량	Manufacture
P–1	LCM	FPC	2 Layers		1	MIT
P–2	LCM	Panel(1.79")	F018GJ-1TU		1	CMO
P–4	LCM	Driver IC	LGDP4522		1	LG
P–5	LCM	Diode	RB520G-30	D1, D2, D3	3	ROHM
P–6	LCM	C-CERAMIC,CHIP	1uF,6.3V,1005	C1, C3~C7, C9~C10	8	MURATA
P–7	LCM	C-CERAMIC,CHIP	1uF,10V,1005	C8, C11, C13~C15	5	MURATA
P–8	LCM	C-CERAMIC,CHIP	1uF,1608,25V	C12, C16	2	MURATA
P–9	LCM	R-CHIP	1K, 1005, F급	R1	1	ROHM
P–9	LCM	R-CHIP	33K, 1005, F급	R2	1	ROHM
P–10	LCM	BLU	3LEDS		1	RAYGEN
P–11	LCM	SMT	FPC SMT		1	