optoelectronic HUASHI

Date:2018-01-04

Specification For Approval

Customer : 与德 E300

Model Name : HS55EH27P1FB

Supplier Approval			Customer Approval
R&D Designed	*R&D Approved*	*QC Approved*	
李荣光	喻军	赵凯凯	

Revision History

Version No.	Date	Page	Description
A	2017-01-04	ALL	New Created

Contents

1. Scope

This specification defines general provisions as well as inspection standards for TFT module.

If the event of unforeseen problem or unspecified items may occur, naturally shall negotiate and agree to solution.

2. Features 显示参数

Item	Features
Display format 点阵	720X (RGB)(H) X 1440(V) dots
LCD Type 液晶显示类型	A-Si TFT , Tranmissive
Pixel arrangement 像素排列	RGB vertical strip
Display colors 色彩	16.7M
Viewing direction 可视角	ALL
Structure 结构组成	FOG + Backlight +TP
Interface 接口	MIPI interface
Back light 背光灯	12-Chip LED (White)
IC 驱动集成电路	ILI9881C-0DT00GA
TOUCH IC 触控芯片	GT917D

3. Mechanical specification 结构描述

Item	Specifications	Unit
Dimensional Outline 外形尺寸	66.6(W) X 143(H) X 2.54±0.2 (Exclude D.S.T)	Mm
Active area 有效区域	61.884(W) X123.768(H)	Mm
Pixel Pitch 像素间隙	0.08595 (W) X 0.08595 (H)	Mm
Weight 重量	T.B.D	G

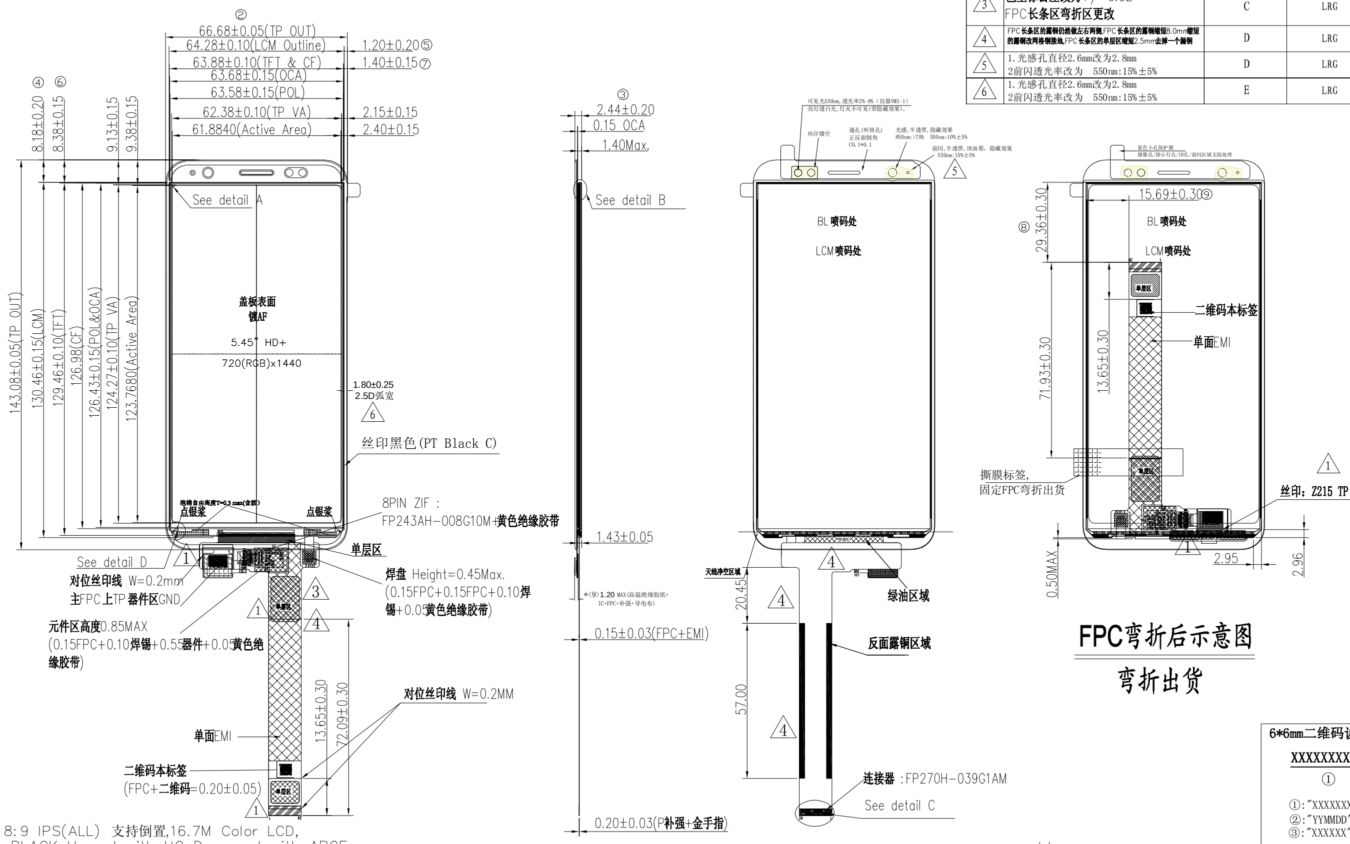
受控文件编号

RoHS	Reach	HF

SMY.	DESCRIPTION OF REVISION	REASON	REVISED BY	DATE
0		A	LRG	2017.09.25
1	更改亮度、TP 连接器背面露铜、绝缘胶带的颜色，215的TP对位丝印线，去掉电阻,修改弯折区，改为13点测试,缩窄FPC器件位置双层区宽度0.5mm，改色坐标,更改胶框挡墙高度,改TP连接器黄胶大小	B	LRG	2017.11.21
3	色坐标公差改为+/-0.02 FPC长条区弯折区更改	C	LRG	2017.12.05
4	FPC长条区的露铜仍然做左右两侧,FPC长条区的露铜缩短8.0mm缩短的露铜改网格铜接地,FPC长条区的单层区缩短2.5mm去掉一个漏铜	D	LRG	2017.12.11
5	1.光感孔直径2.6mm改为2.8mm 2前闪透光率改为 550nm:15%±5%	D	LRG	2017.12.20
6	1.光感孔直径2.6mm改为2.8mm 2前闪透光率改为 550nm:15%±5%	E	LRG	2018.01.04

重点尺寸

No:	测量标注
①	长度
②	宽度
③	厚度一
④	един基板边缘尺寸1
⑤	单侧基板边缘尺寸2
⑥	LCD 到边缘尺寸1
⑦	LCD 到边缘尺寸2
⑧	FPC尺寸1
⑨	FPC尺寸2



PIN	Define
1	GND
2	SCL 1.8V
3	SDA 1.8V
4	VDD 2.8V
5	INT
6	TP-RESET
7	INT(红外中断脚)
8	GND

PIN Difinition

NO.	SYMBOL
1	GND
2	IC_ID_1
3	IC_ID_0
4	LCM-RST
5	GND
6	DSI_D2P
7	DSI_D2N
8	GND
9	DSI_D1P
10	DSI_D1N
11	GND
12	DSI_CP
13	DSI_CN
14	GND
15	DSI_D0P
16	DSI_D0N
17	GND
18	DSI_D3P
19	DSI_D3N
20	GND
21	TE
22	INT(红外中断脚)
23	IOVDD
24	NC
25	LEDA
26	LEDK1
27	LEDK2
28	VCC+(5.5V)
29	VCC-(-5.5V)
30	LED_PWM
31	GND
32	GND
33	GND
34	GND
35	SCL(1.8V)
36	SDA(1.8V)
37	VDD(2.8V)
38	INT
39	TP-RESET

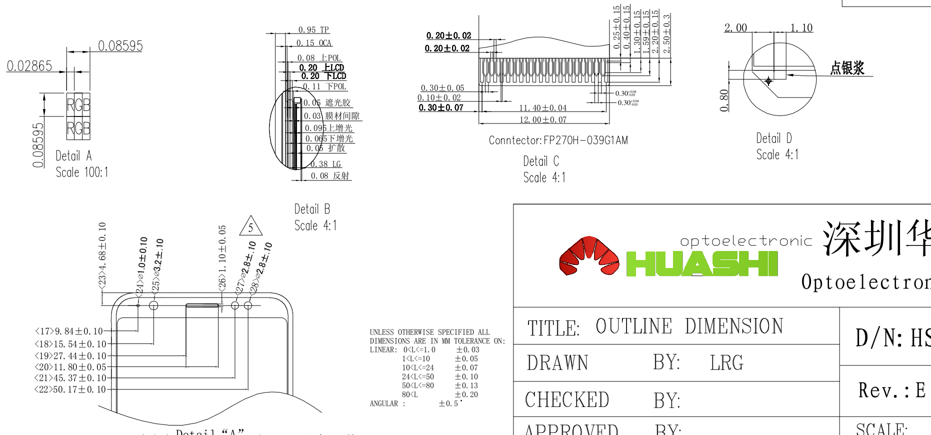
6*6mm二维码说明:

XXXXXXXXXXXYYMMDDXXXXXX
① ② ③

①:"XXXXXXXXXXX"代表与德料号(11码)
②:"YYMMDD"代表年、月、日(6码)
③:"XXXXXX"代表流水号(6码)

需要烧录VCOM
需要烧录ID:
A1H:0XA1
DCH:0Xa1

技术参数:
1.显示模组: 5.45" HD+ 18:9 IPS(ALL) 支持倒置,16.7M Color LCD, TRANSMISSIVE,NORMAL BLACK Up pol with HC,,Down pol with APCF
2.Panel厂商/型号: HSD/XXXXXX 驱动芯片: ILI9881C-0DT00GA
3.亮度(贴合后): 360min,450typ(AVG. of 13 point) ,, cd/m², IF=20mA/LED
4.色坐标: x=0.295+/-0.02; y=0.315+/-0.02
5.对比度: 800MIN.
6.NTSC: 67% MIN.72% TYP
7.均匀性: 80% MIN
8.GAMMA=2.2+/-0.3
9.CROSSTALK: 2.5%MAX
10.可视角度，量测LCD4 个方向的可视角度，CR >10:
75°/75°/75°/75° (min) 80°/80°/80°/80° (typ)
11.flicker -28dB (max)，各画面不可有画面闪烁现象
12.ESD(裸屏):接触+/-4Kv,空气+/-8Kv
13.*为重点尺寸，公差管控: +/-0.1 CPK ≥1; +/-0.15 CPK ≥1.33,
公差超过+/-0.15 CPK ≥2; 平整度≤0.3mm
14. Logic voltage 1.65V-3.65V.
15. Input signal voltage (包含High level, Low level):
VSP,4.5V_6.5V (5.5V) ,VSN: -4.5--6.5v(-5.5V) .
16.FPC阻抗匹配: 100+/-10ohm要求使用20um无胶基材，高延展性电解铜
17.使用材料和工艺均符合RoHS要求
18.其他技术规格请参考与德企标与华硕标准
19.Operating temp.: -20°C ~ +70°C
Storage temp.: -30°C ~ +80°C
注: 1.需要烧录OTP (包含ID 、V-com)
2.需要走线预留TVS 管
3.MIPI 接口 ，阻抗要求: 100+/-10ohm



背光电路设计参考

Im=40mA Vf=18Typ./ 19.2 Max.
BL POWER: 720mW TPY/768 MAX

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM TOLERANCE ON:
LINEAR: 0<L<=1.0 ±0.03; 1<L<10 ±0.05; 10<L<24 ±0.07; 24<L<50 ±0.10; 50<L<80 ±0.13; 80L ±0.20
ANGULAR: ±0.5°

深圳华视光电有限公司
HUASHI optoelectronic
Optoelectronics Technology Co.,Ltd.

TITLE: OUTLINE DIMENSION		D/N: HS55EH27P1FB	
DRAWN BY: LRG		Rev.: E	
CHECKED BY:			UNIT: mm
APPROVED BY:		SCALE: 1:1	SHEET NO: 1 OF 1

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5. Maximum rating

[VSS=0V]

Item	Symbol	Min.	Max.	Unit
Supply voltage	VCC	-0.3	5.5	V
Supply voltage	IOVCC	-0.3	3.3	V
Input voltage	VI	-0.3	IOVCC + 0.3	V
Operating temperature	T_{OP}	-20	70	°C
Storage temperature	T_{STG}	-30	80	°C
Humidity	---	---	90	%RH

Note 1: Temp. ＞60℃ ， 90% RH MAX

Temp. ＞60℃ ， Absolute humidity shall be less than 90% RH at 60

Note 2: If the LSI is used above these absolute maximum ratings, it may become permanently damaged.

6. Electrical characteristics

6-1. TFT-LCD Module Electrical characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Note
Input voltage range	VCI	2.3	-	4.8	V	-
Input voltage "H' level	VIH	0.7* IOVCC	-	IOVCC	V	-
Input voltage "L' level	VIL	0.0	-	0.3* IOVCC		-
output voltage "H' level	VOH	0.8* IOVCC	-	IOVCC		IOH=-0.1mA
output voltage "L' level	VOL	0	-	0.2* IOVCC		IOL=1.0mA
Current 1	VI1	-	-	-	mA	Normal mode
Current 2	VI2	-	-	-	mA	Sleep mode

Note:

1、Test Condition: IOVCC = 1.65 ~ 3.3

6-2.Back-Light Electrical characteristics

The backlight system is an edge-lighting type with 12 white LED (Light Emitting Diode).

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I_f	-	40	-	mA	-
Forward Voltage	Vf	16.8	18	19.2	V	If=20mA
Number of LED	-	-	2*6	-	Piece	-

7. Electro-optical characteristics

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note (2).

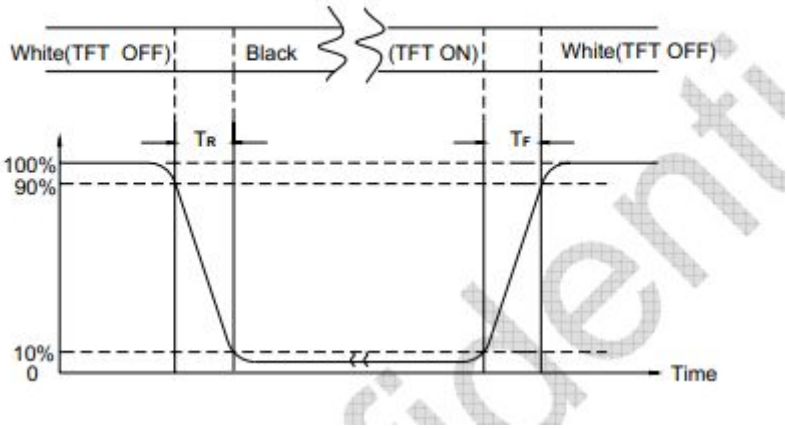
Measuring equipment: LCD-7200, BM-5A, PR-650, EZ-Contrast

(Ta = 25 ± 2℃, Reference only)

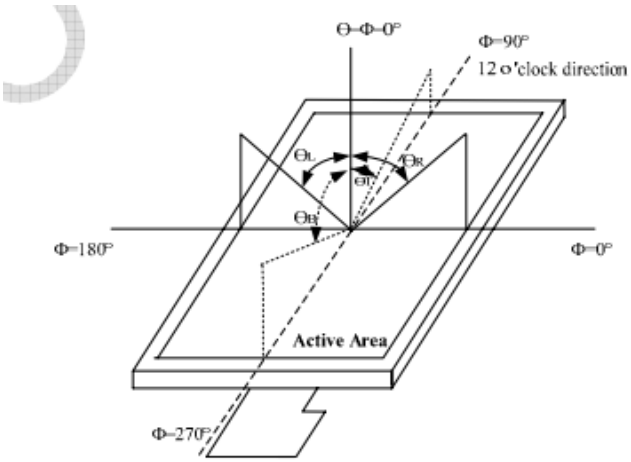
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance		T%	θ=0° ∅=0° Ta=25℃	3.0	3.35	-	%	
Contrast ratio (Center point)		C/R		800	1000	-		Note(3)
Surface Luminance		Lv		360	450		cd/m2	20MA/LED
Luminance uniformity		δ WHITE		80	-	-	%	
Response time		Tr+ Tf		-	25	35	msec	Note(1)
Color Chromaticity (CIE 1931)	White	Wx		0.275	0.295	0.315		C light
		Wy		0.295	0.315	0.335		
	Red	Rx		0.642	0.662	0.682		
		Ry		0.308	0.328	0.348		
	Green	Gx		0.240	0.260	0.280		
		Gy		0.556	0.576	0.596		
	Blue	Bx		0.114	0.134	0.154		
		By		0.097	0.117	0.137		
Viewing angle	Left	θL	C/R≥10	-	80	-		Note(2)
	Right	θR		-	80	-		
	Top	ψT		-	80	-		
	Bottom	ψB		-	80	-		
NTSC Ratio		NTSC	CIE 1931	65	70			
Flicker		amount		-	-	-28	dB	Note(4)
GAMMA				1.9	2.2	2.5		
Crosstalk		△CT		-	-	2.5	%	

Note1: Definition of Response Time (Tr, Tf)
备注 1：响应时间定义

Figure 3 Definition of Response Time



Note2: Definition of Viewing Angle
备注 2:视角范围定义



Note3: Definition of Contrast Ratio:
备注 3：对比度定义

CR = White Luminance (ON) / Black Luminance (OFF)
对比度=白色亮度/黑色亮度

Note4: Definition of Flicker:
备注 3：flicker pattern 是經過特別編輯,讓人眼可以觀察到閃爍的現象,以檢測出更小的直流偏差,一般增加正負極性的差別來當作 flicker pattern

1、為了提高開口率，Cst 儲存電容的大小有設計極限，所以導致 VHR 差異較大，因此 flicker 水準只能達到中心值-28dB 以下。
2、綜合△Vp 差異性和 Vcom RC loading 差異性，所以會有中間調整至最佳 Vcom 值不閃爍,旁邊些微閃爍的差異。
3、flicker 檢測 pattern 是便於調整最佳 Vcom 之特殊畫面,在正常手機操作畫面下並不會感受到 flicker 閃爍差異。

8. I/O terminal 屏接口定义

1	GND	Ground
2	IC_ID_1	Connect 10K resistance to IOVDD
3	IC_ID_0	Connect 10K resistance to IOVDD
4	LCM-RST	Chip RESET signal
5	GND	Ground
6	DSI_D2P	DATA BUS
7	DSI_D2N	DATA BUS
8	GND	Ground
9	DSI_D1P	DATA BUS
10	DSI_D1N	DATA BUS
11	GND	Ground
12	DSI_CP	DATA BUS
13	DSI_CN	DATA BUS
14	GND	Ground
15	DSI_D0P	DATA BUS
16	DSI_D0N	DATA BUS
17	GND	Ground
18	DSI_D3P	DATA BUS
19	DSI_D3N	DATA BUS
20	GND	Ground
21	TE	Serve as TE(tearing effect) onput signal
22	INT	INT
23	IOVDD	A supply voltage to the analog circuit
24	NC	NC
25	LEDA	Backlight power supply (+)
26	LEDK1	Backlight power supply (-)
27	LEDK2	Backlight power supply (-)
28	VCC+(5V)	POWER+5V INPUT
29	VCC-(-5V)	POWER-5V INPUT
30	LED_PWM	The PWM frequency output for LED driver control.
31-34	GND	GND
35	SCL(1.8V)	TP PIN
36	SDA(1.8V)	TP PIN
37	VDD(2.8V)	TP PIN
38	INT	TP PIN
39	TP-RESET	TP PIN

9. Quality level

9-1. Inspection conditions

9-1-1. The environmental conditions for inspection shall be as follows.

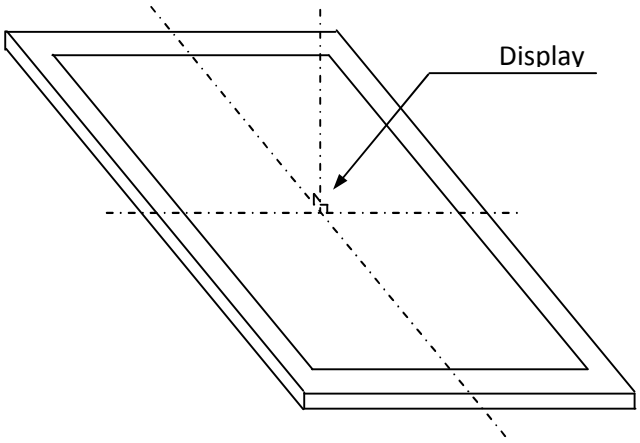
Room temperature : 20±3°C

Humidity : 65±20%RH

9-1-2. The external visual inspection

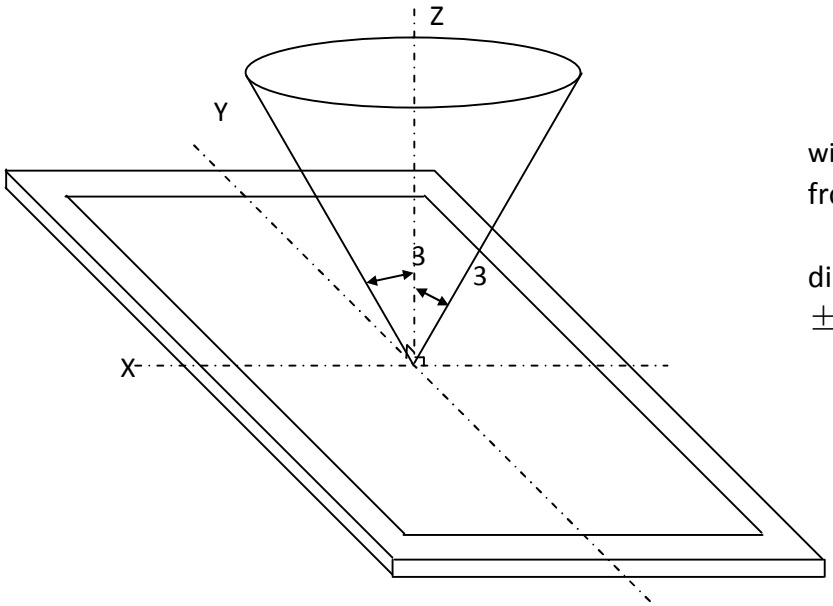
The inspection shall be performed by using a single 20W fluorescent lamp for illumination and the distance from LCD to eyes of the inspector should be 30cm or more.

9-1-3. (1) Light method



Fluorescent lamp set the perpendicular to the display surface.

(2) Inspection distance and angle



Inspection should be performed within ϕ (ϕ is usually 30 degree) from Z axis to each X and Y axis.

Inspection distance of any direction within ϕ must be kept 30 ±5cm to the display surface.

9-2. Sampling procedures for each item's acceptance level table.

Defect type.	Sampling procedures	AQL
Major defect	MIL-STD-105E Inspection level 1 Normal inspection Single sample inspection	0.4
Minor defect	MIL-STD-105E Inspection level 1 Normal inspection Single sample inspection	1.2

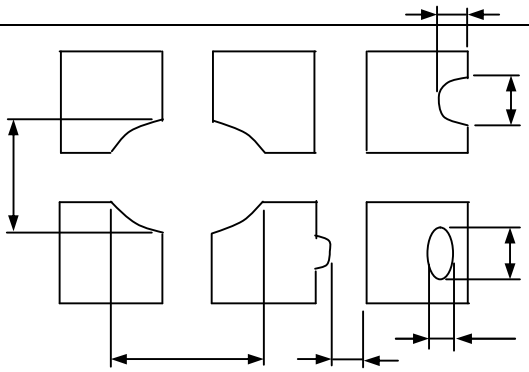
9-3. Classification of defects

9-3-1. Major defects: A major defect refers to a defect that is not considered to substantially degrade usability for product applications.

9-3-2. Minor defect: A minor defect refers to a defect which is not considered to substantially degrade product application or a defect which deviates from existing standards almost unrelated to the effective use of the product or it's operation.

9-4. Incoming Inspection standards

<table>
<tr><th>Item</th><th>Criterion for defects</th><th>Defect type</th></tr>
<tr><td>1) Display on inspection</td><td>(1) Non display
(2) Vertical line is deficient
(3) Horizontal line is deficient
(4) Cross line is deficient</td><td>Major</td></tr>
<tr><td>2) Black/White spot</td><td><table><tr><td>Size Ø (mm)</td><td>Acceptable number</td></tr><tr><td>Ø≤0.10</td><td>Lgnore (note)</td></tr><tr><td>0.10 <Ø≤0.15</td><td>2</td></tr><tr><td>0.15 <Ø≤0.2</td><td>1</td></tr></table>Note: NG if four or more spot crowd together</td><td>Minor</td></tr>
<tr><td>3) Black/White line</td><td><table><tr><td>Length(mm)</td><td>Width(mm)</td><td>Acceptable number</td></tr><tr><td>----</td><td>W<0.03,距离≥10</td><td>Lgnore</td></tr><tr><td>L<5</td><td>0.05<W≤0.08</td><td>1</td></tr></table>Defects separate at interval if 30mm each</td><td>Minor</td></tr>
</table>

<table>
<tr><th>Item</th><th>Criterion for defects</th><th>Defect type</th></tr>
<tr><td>4) Display pattern</td><td> 
<table>
<tr><td>(A+B)/2 ≤ 0.3</td><td>0< C</td><td>(D+E)/2 ≤ 0.15</td></tr>
</table>
Note: 1. Up to 5 damages acceptable.
2. NG if there’re two or more pinholes per dot.</td><td>Minor</td></tr>
<tr><td>5) Spot-like contrast irregularity</td><td>
<table>
<tr><th>Size Ø (mm)</th><th>Acceptable number</th></tr>
<tr><td>Ø≤0.1</td><td>Ignore (note)</td></tr>
<tr><td>0.1 <Ø≤0.2</td><td>2</td></tr>
<tr><td>0.2<Ø0.25</td><td>1</td></tr>
</table>
Note: 1) Conformed to limit samples.
2) Defects separate at intervals of 50mm each other</td><td>Minor</td></tr>
<tr><td>6) Bubble in polarizer</td><td>
<table>
<tr><th>Size Ø (mm)</th><th>Acceptable number</th></tr>
<tr><td>Ø≤0.1</td><td>Ignore (note)</td></tr>
<tr><td>0.1 <Ø≤0.15</td><td>2</td></tr>
<tr><td>0.15<Ø0.2</td><td>1</td></tr>
</table>
Note: 1) Conformed to limit samples.
2) Defects separate at intervals of 50mm each other</td><td>Minor</td></tr>
<tr><td>7) Scratches and dent on the polarizer</td><td>Scratches and dent on the polarizer shall be in the accordance with. “2) Black/White spot. 3) Black/White line”.</td><td>Minor</td></tr>
<tr><td>8) Stains on LCD panel surface</td><td>Stains which cannot be removed even when wiped lightly with a soft cloth or similar cleaning too</td><td>Minor</td></tr>
<tr><td>9) Rainbow color</td><td>The rainbow color of limited sample is allowed in the optimum contrast on state within the active area</td><td>Minor</td></tr>
<tr><td>10) Threshold voltage coloration</td><td>Non-uniform brightness at optimum contrast is not allowed and the criterion abides by standard samples</td><td>Minor</td></tr>
</table>

11) Viewing area encroachment	Polarizer edge or line is visible in the opening viewing area due to polarizer shortness or sealing line.	Minor
12) Bezel appearance	Rust and deep damage which are visible in the bezel is rejectable.	Minor
13) Defect or land surface contact (Poor soldering)	(1) Failure to mount parts (2) Parts not in the specifications are mounted (3) Polarity for example is reversed	Major
15) Parts alignment	(1) LSI, IC lead width is more then 50% beyond pad outline. (2) Chip component is off center and more then 50% of the leads is off the pad outline.	Minor Minor
16) Conductive foreign matter (Solder ball Solder chips)	(1) 0.45<Ø N≥1 (2) 0.30<Ø≤0.45 N≥1 Ø : Average diameter of solder ball (unit :mm) (3) 0.50<L N≥1 L : Average length of solder ship (unit :mm)	Major Minor Minor
17) PWB pattern damage	(1) Deep damage is found on copper foil and the pattern is nearly broken. (2) Damage on copper foil other than (1) above.	Minor Minor
18) Faulty PWB correction	(1) Due to PWB copper foil pattern burnout, the pattern is connected, using a jumper wire for repair; 2 or more places are corrected per PWB. (2) Short circuited part is cut, and no resist coating has been performed.	Minor Minor
19) Bezel claw	Bezel claw missing or not bent	Minor
20) Indication of name plate (sampling indication label)	(1) Failure to stamp or label error, or not legible. (all acceptable if legible) (2) The separation is more than 1/3 for indication discoloration In which the characters can be checked.	Minor

10. Reliability

10-1. Life time

50,000 Hrs (25℃ in the room without ray of sun)

10-2. Items of reliability

No.	Test Items	Test Condition	Remarks
1	High Temperature Storage	80℃±3℃ for 240 hours	Module (Without Contamination) Module (Without Contamination)
2	Low Temperature Storage	-40℃±3℃ for 240 hours	
3	High Temperature Operating	55℃±3℃for 240 hours	
4	Low Temperature Operating	-20℃±3℃for 240 hours	
5	High Temp. and High Humidity Operating	T = 60±3℃ / 95±5℃% RH for 240hr	
6	Thermal Shock	Keep in - 40 ℃ + 3 ℃ low temperature 30 min to switch to 80 ℃ + 3 ℃ high temperature to maintain 30 min, a total of 100 cycles	
7	ESD Test	V: (8KV) R: 330Ω C: 150PF Air discharge: 10 time V: (4KV) R: 330Ω C: 150PF Contact discharge : 10 time	
8	Packing Vibration	Random 1.06Grms XYZ 30min for each direction	
9	Package Drop Test	Height :75cm Two sides, each surface falls 10 times	

Note: 1) No cosmetic failure' means there must be no permanent cosmetic defect and does not include any recoverable defect after 24 hours.

Note: 2) After any reliability test which is stated above, let it alone unpowered for 24 hours or more in a room temperature and check the criterion.