TITLE : TV101WXM-NL0 Product Specification

Rev.0

HEFEI BOE OPTOELECTRONICS TECHNOLOGY

REV.	ECN NO.	DESCRIPTION OF CHANGES	DATE	PREPARED
0	-	Initial Release	2015.05.25	S.N.Chen

Contents

1.0 General Description

Parameter	Specification	Unit	Remarks
LCD Size	10.1	inch	-
Active area	135.36 x216.576	mm	-
Number of pixels	800*1280	pixels	-
Pixel pitch	169.2*169.2	um	-
Pixel arrangement	RGB	-	-
Display colors	16.7M	colors	-
Display mode	Normal black	-	-
LCM Outline Dimension	142.00 x 228.50x2.5(Typ.)	mm	±0.15
Transmittance	5.3%	-	W/O APF
NTSC	Typ. 60%, Min. 55%	-	-
Inversion Type	Column-Inv	-	
Response Time	Typ. 30ms	ms	
Power Consumption (Max) @White pattern	Panel Power:300W BLU Power:1764W	mW	W/O LED Driver
CR	Typ. 1000 Min:800		
Brightness	Typ:350 Min:300	nits	@center
Brightness Uniformity（13Point）	Typ.75%,70%Min.@13points, Typ.80%,75%Min.@5points	-	
Viewing angle (CR≧10)	Typ:80/80/80/80		
LCM Weight	150(Max.)	gram	-

Parameter	Specification	Unit	Remarks
Driver IC	NT35523B	-	
Upper pol size	137.36*220.08	mm	HC, 3H
Lower pol size	139.16*221.78	mm	Clear
Interface	MIPI	-	-

2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

Item		Symbol	Values			Unit	Remark
			Min	Typ	Max		
Power Supply Voltage		IOVCC	-0.3	1.8	5.5	V	
		VDD	-0.3	3.3	5.5	V	
Ripple Voltage		V_{RP}	-	50	-	mV	
LEDPWMOUT	High Level	VOH	0.8VDDI	-	VDDI	V	VDDI=1.65V to 3.6V
	Low Level	VOL	0		0.2VDDI	V	
Frame frequency		fFrame	55	60		HZ	

2.1 Power Consumption of TFT Panel

Power Supply: Frame Frequency: Fframe >=60HZ @ 25degC

Display Mode	Item	Symbol	Value		Unit	Remark
			Typ	Max		
Display White	Current of IOVCC	IIOVCC	-	10	mA	
	Current of VDD	IVDD	-	180	mA	
Display Black	Current of IOVCC	IIOVCC	-	10	mA	
	Current of VDD	IVDD	-	180	mA	
Standby Mode	Current of IOVCC	IIOVCC	-	0	mA	
	Current of VDD	IVDD	-	0	mA	

2.2 Power Consumption of Backlight

Test Condition : ILED=21mA LED 28PCS
Warning: LCM Brightness must match Optical Spec requirement when ILED=21mA
Backlight Unit Schematic:

Item	Symbol	Value			Unit	Remark
		Min	Typ	Max		
Forward Voltage	VBL		2.9	3.0	V	Note 5
Power Consumption	PBL		1705	1764	mW	
LED Quantity			28		pcs	
LED Rank			Luminous Flux: TBD		lm	
			Chromaticity:TBD			

Note 5 : When ILED=20mA, the VBL must be in the range of above table specified.
The FPC wire resistance between LED+ and LED- must be less than 0.15ohm
PBL= ILEDX VBL

4.0 INTERFACE CONNECTION

4.1 Module Input Signal & Power

- FPC Signal interface : 39 Pin.(FH26W-39S-0.3SHW(60))

<Table 4. 1Display Interfacer>

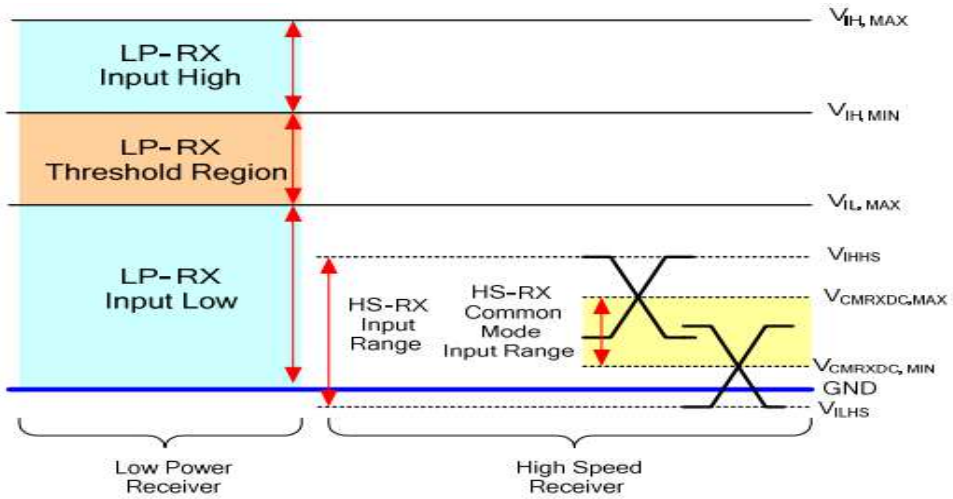
Pin No.	Symbol	Description	I/O
1	MTP	Power supply for MTP	P
2	NC	NC	-
3	NC	NC	-
4	FB4	Cathode	P
5	FB3	Cathode	P
6	FB2	Cathode	P
7	FB1	Cathode	P
8	NC	NC	-
9	VLED	Anode	P
10	VLED	Anode	P
11	VLED	Anode	P
12	NC	NC	-
13	LEDPWMIN	PWM intput	I
14	LEDPWMOUT	PWM output	O
15	ID	ID (connect to GND)	O
16	RESX	Device Reset Signal	I
17	NC	NC	-
18	NC	NC	-
19	VDD	Power supply , 3.3V	P
20	VDD	Power supply , 3.3V	P
21	VDD	Power supply , 3.3V	P
22	IOVCC	Logical voltage , 1.8V	P
23	IOVCC	Logical voltage , 1.8V	P
24	GND	Ground	P
25	MIPI_D3_P	MIPI Differential Data3 Input	I

Pin No.	Symbol	Description	I/O
26	MIPI_D3_N	MIPI Differential Data3 Input	I
27	GND	Ground	P
28	MIPI_D2_P	MIPI Differential Data2 Input	I
29	MIPI_D2_N	MIPI Differential Data2 Input	I
30	GND	Ground	P
31	MIPI_CLK_P	MIPI Differential CLOCK Input	I
32	MIPI_CLK_N	MIPI Differential CLOCK Input	I
33	GND	Ground	P
34	MIPI_D1_P	MIPI Differential Data1 Input	I
35	MIPI_D1_N	MIPI Differential Data1 Input	I
36	GND	Ground	P
37	MIPI_D0_P	MIPI Differential Data0 Input	I
38	MIPI_D0_N	MIPI Differential Data0 Input	I
39	GND	Ground	P

5. Signal Timing Specifications

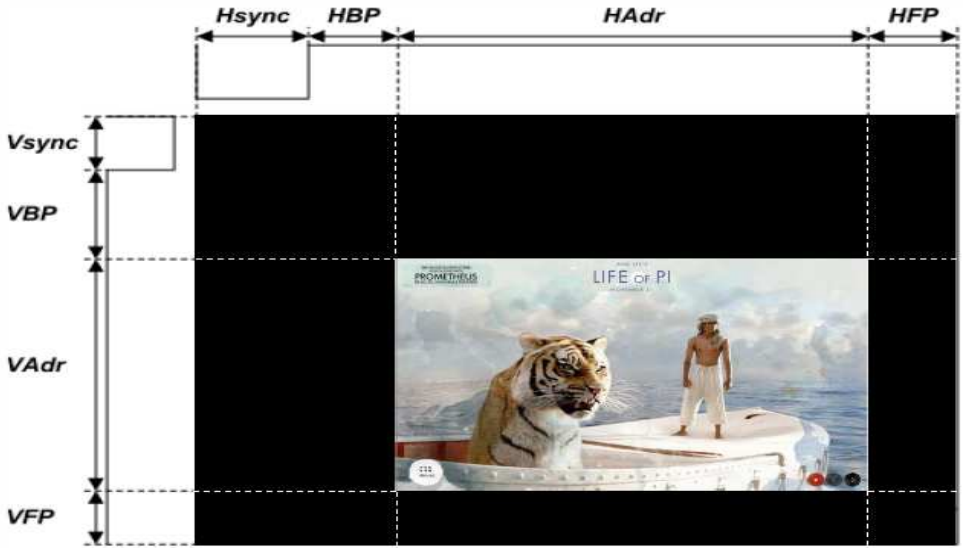
5.1 MIPI Input Signal SPEC

Parameter	Symbol	Min	Typ	Max	Unit	Condition
MIPI digital operation current	I_{VCCIF}	-	-	24	mA	-
MIPI digital stand-by current	$I_{VCCIFST}$	-	200	-	uA	-
MIPI Characteristics for High Speed Receiver						
Single-ended input low voltage	V_{ILHS}	-40	-	-		
Single-ended input high voltage	V_{IHHS}	-	-	460	mV	
Common-mode voltage	V_{CMRXDC}	155	-	330	mV	
Differential input impedance	Z_{ID}	80	100	125	Ω	
HS transmit differential voltage(V_{OD}=V_{DP}-V_{DN})	$\|V_{OD}\|$	85	200	250	mV	
MIPI Characteristics for Low Power Receiver						
Pad signal voltage range	V_I	-50	-	1350	mV	
Ground shift	V_{GNDSH}	-50	-	50	mV	
Output low level	V_{OL}	-150	-	150	mV	
Output high level	V_{OH}	1.1	1.2	1.3	V	

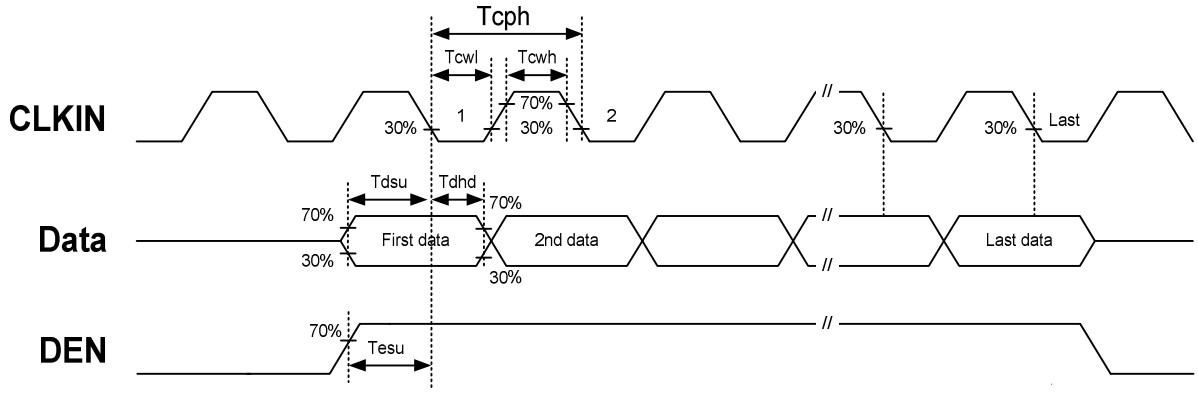


5.2 Signal Timing Spec

Item			SYNBOL	min	Typ.	Max.	UNIT
LCD	Frame Rate		-	-	60	-	Hz
	Pixels Rate		-	156.8	156.8	159.9	MHz
Timing	DCLK	Frequency	fCLK	490	490	498	MHz
		Period	Tclk	2.01	2.04	2.04	ns
	Horizontal	Horizontal total time	tHP	1343	1343	1366	t_{CLK}
		Horizontal Active time	tHadr		1200		t_{CLK}
		Horizontal Pulse Width	tHsync	1	1	1	t_{CLK}
		Horizontal Back Porch	tHBP	32	32	32	t_{CLK}
		Horizontal Front Porch	tHFP	110	110	133	t_{CLK}
	Vertical	Vertical total time	tvp	1946	1946	1951	t_H
		Vertical Active time	tVadr		1920		t_H
		Vertical Pulse Width	tVsync	1	1	1	t_H
		Vertical Back Porch	tVBP	14	14	14	t_H
		Vertical Front Porch	tVFP	11	11	16	t_H
Bit Rate			TX SPD (MBPS)	980	980	995	Mbps
Lane				-	4	-	Lane

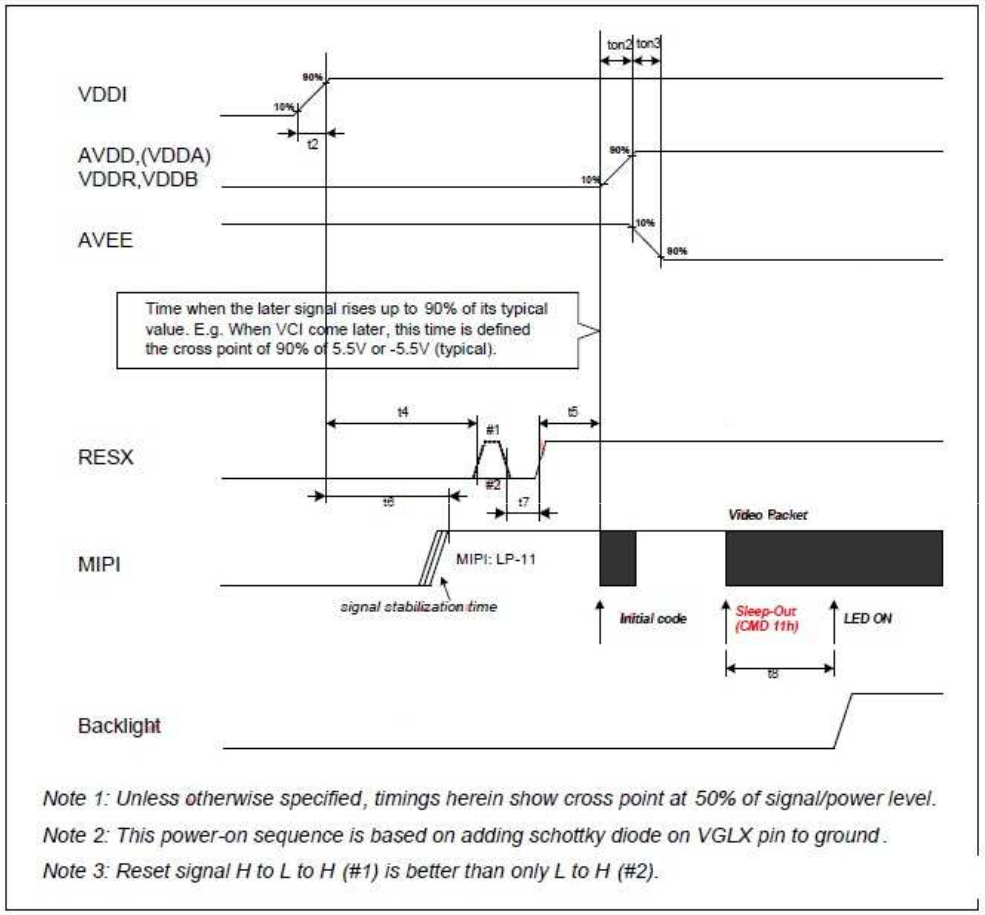


5.3 Signal Timing wave forms



5.4 Power sequence (NT35523B)

Power on



Note 1: Unless otherwise specified, timings herein show cross point at 50% of signal/power level.

Note 2: This power-on sequence is based on adding schottky diode on VGLX pin to ground.

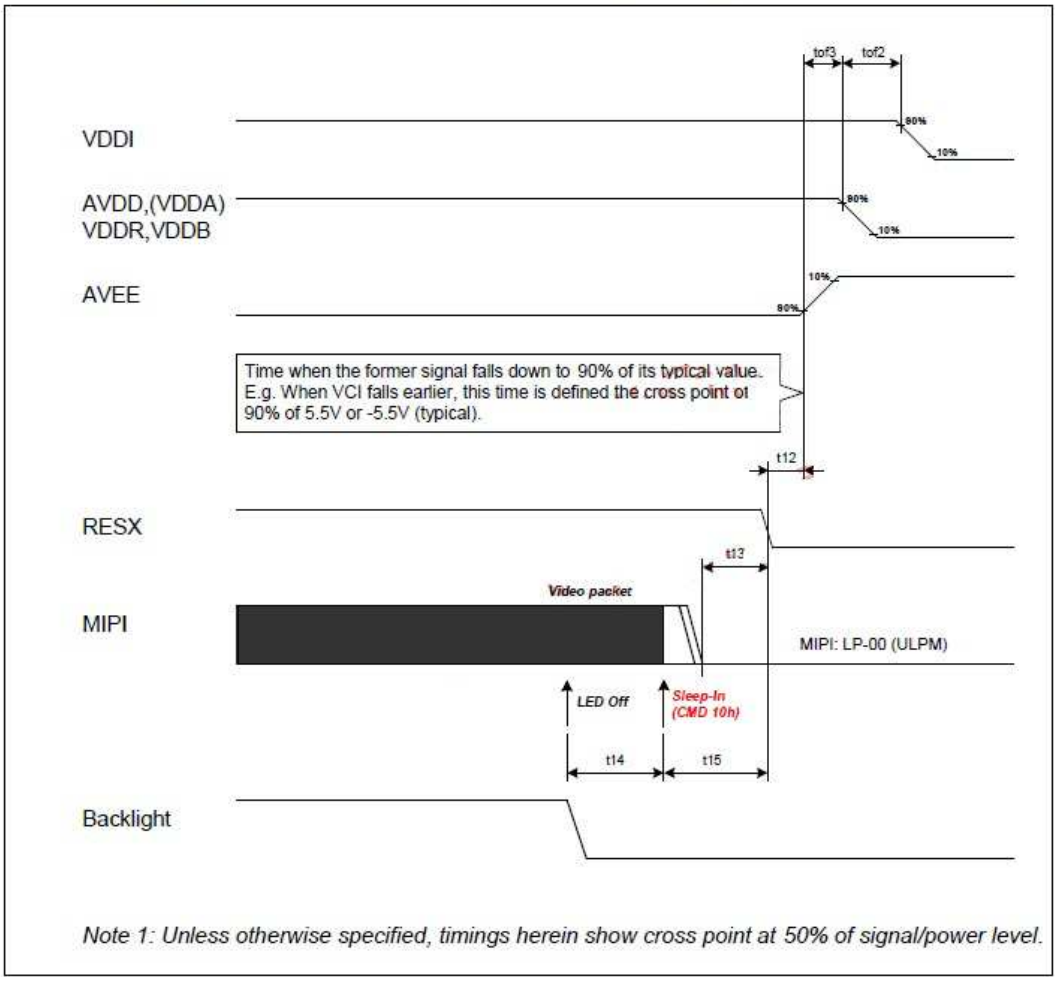
Note 3: Reset signal H to L to H (#1) is better than only L to H (#2).

symbol	value			unit	remark
	min.	typ.	max.		
ton1	-	no limit		ms	
ton2	0	-	-	ms	
ton3	0	-	-	ms	
ton4	0	-	-	ms	
t2	-	-	2	ms	
t4	15	-	-	ms	
t5	20	-	-	ms	OTP Reload time
t6	0	-	t4	ms	
t7	10	-	-	us	
t8	6	-	-	VS	Keep data more than 6 frames (VS)

5.4 Power sequence (NT35523B)

Power off

- 3 Input power (BTM[1:0]="00" or "10"):
  VDDI=1.65~3.6V, AVDD=VDDR=VDDB(=VDDA)=4.5~6.3V, AVEE=-4.5~-6.3V



symbol	value			unit	remark
	min.	typ.	max.		
tof1	-	no limit	-	ms	
tof2	0	-	-	ms	
tof3	0	-	-	ms	
tof4	0	-	-	ms	
t12	0	-	-	ms	
t13	0	-	-	ms	
t14	0	-	-	ms	
t15	100			ms	

6.0 Optical Specifications

The test of Optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = 25±2℃) with the equipment of Luminance meter system (CA-310、BM-5A) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. We refer to $\theta_{Ø=0}$ (=θ_3) as the 3 o'clock direction (the "right"), $\theta_{Ø=90}$ (= θ_{12}) as the 12 o'clock direction ("upward"), $\theta_{Ø=180}$ (= θ_9) as the 9 o'clock direction ("left") and $\theta_{Ø=270}$(= θ_6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the Display surface shall stay fixed. The measurement shall be executed after 30 minutes warm-up period. VDD shall be 3.3V +/-10% at 25°C. Optimum viewing angle direction is 6 'clock.

Item		Symbol	Condition	Value			Unit	Note
				Min	Typ	Max		
luminance		Bp	θ=0 Φ=0	300	350	--	cd/m2	Note 7
Maximum Brightness of Black Pattern		Bblk		---	---	0.65	cd/m2	
Uniformity		△Bp		75	80	--	%	Note 8
Color Uniformity		△u'△ v'-A				TBD		Note 26 Sign the limit sample shall prevail.
		△u'△ v'-B				TBD		
		△E*ab				TBD		
Viewing Angle	Left	θ_L	Cr≥10	75	80	--	deg	Note 9
	Right	θ_R		75	80	--		
	Top	ψ_T		75	80	--		
	Bottom	ψ_B		75	80	--		
Contrast Ratio		Cr	θ=0 Φ=0	800	1000	--	-	Note 10
Response Time		Tr+Tf		--	25	35	ms	Note 11
		Tgray		-	45	55	ms	
Color Coordinate of CIE1931	Red	x	θ=0 Φ=0	0.575	0.605	0.635	-	Note 12
		y		0.321	0.351	0.381		
	Green	x		0.298	0.328	0.358		
		y		0.568	0.598	0.628		
	Blue	x		0.124	0.154	0.184		
		y		0.061	0.091	0.121		
	White	x		0.27	0.30	0.33		
		y		0.29	0.32	0.35		

6.0 Optical Specifications

NTSC Ratio	NTSC	CIE1931	55	60	--	%	Note 13
Flicker	amount	-	-	-	-30	dB	Note 14
Gamma	-		2.0	2.2	2.4		Note 15
Crosstalk	△CT	-	-	1.10	1.20		Note 16
Transmittance @w/o APF	Tm		TBD		--	%	
Reflectance	Rf	@550nm	--		TBD	%	Note 17
Polarization Direction of Front Polarizer	PdF			TBD		deg	Note 18
Polarization Direction of Rear Polarizer	PdR			TBD		deg	
Luminance decrease ratio		θL=30°	---	---	70	%	Note 19
		θR=30°	---	---	70	%	
		ψT=30°	---	---	70	%	
		ψB=30°	---	---	70	%	
Contrast decrease ratio		θL=30°	---	---	70	%	Note 20
		θR=30°	---	---	70	%	
		ψT=30°	---	---	70	%	
		ψB=30°	---	---	70	%	
Color shift		θL=30°	---	---	3	JNCD	Note 21
		θR=30°	---	---	3	JNCD	
		ψT=30°	---	---	3	JNCD	
		ψB=30°	---	---	3	JNCD	
Gray inversion angle		ψ=0°		NA		deg	Note 22
Sunglass Readability			NA				
Afterimage			3			Minute	Note 23
CABC Test							Note 24
Hot spot	△Bp	θ=0° Φ=0°	75	80		%	Note25
		θ=0° Φ=0°	80	85		%	Every near 9 points Note25

Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).

2. Contrast measurements shall be made at viewing angle of Θ= 0 and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Center Luminance of white is defined as luminance values of 1point average across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display. The luminance is measured by CA310 when the LED current is set at 16.8mA.

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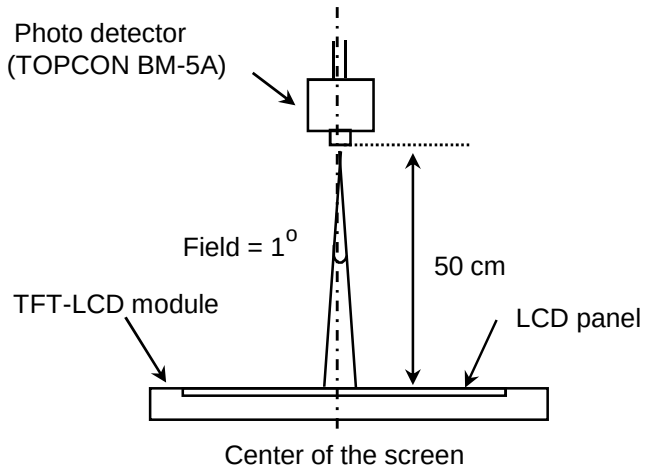
4. The White luminance uniformity on LCD surface is then expressed as : ΔY = Minimum Luminance of 9points / Maximum Luminance of 9points (see FIGURE 2).

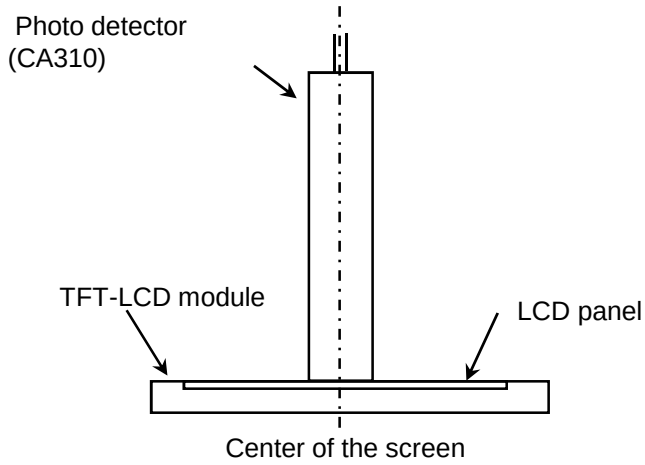
5. The color chromaticity coordinates specified shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

6. The color chromaticity coordinates specified shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

7. The electro-optical response time measurements shall be made as FIGURE 4 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

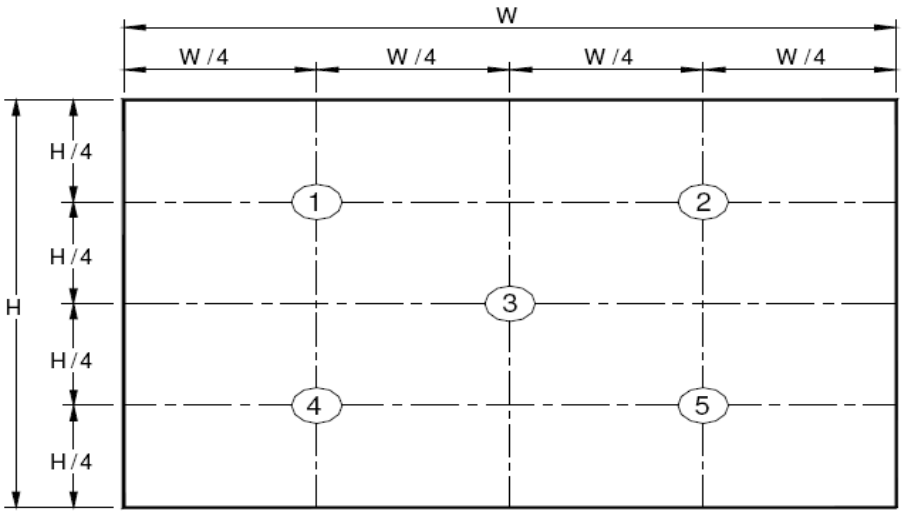
Figure 1. Measurement Set Up





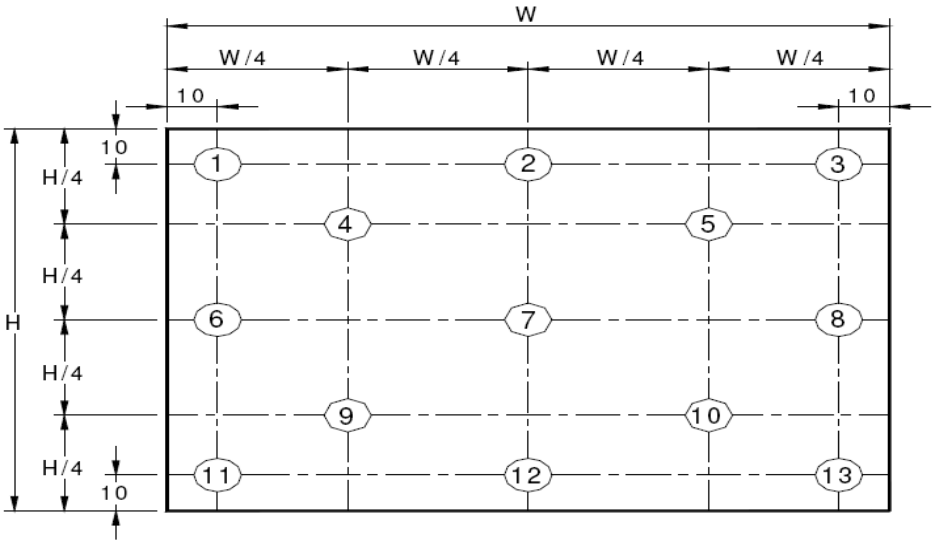
View angel range measurement setup Luminance , uniformity and color measurement setup

Figure 2. White Luminance and Uniformity Measurement Locations (5 points)



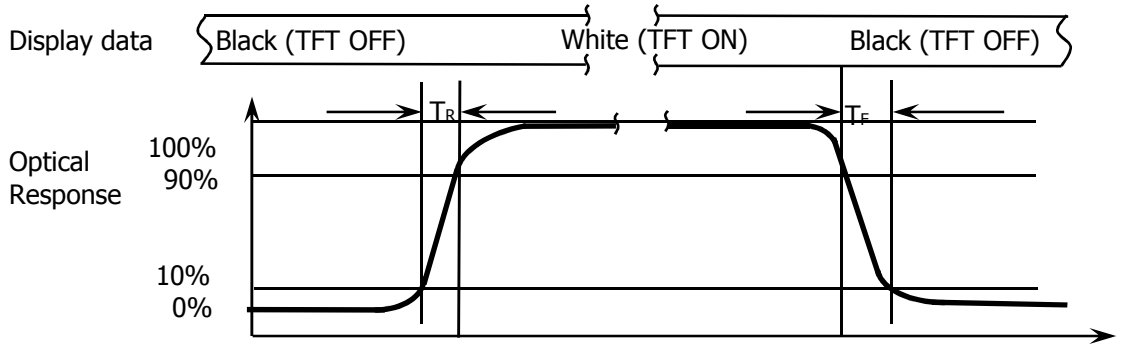
Center Luminance of white is defined as luminance values of center 5 points across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.
The White luminance uniformity on LCD surface is then expressed as : ΔY5 = Minimum Luminance of 5 points / Maximum Luminance of 5points (see FIGURE 2).

Figure 3. Uniformity Measurement Locations (13 points)



The White luminance uniformity on LCD surface is then expressed as : ΔY13 = Minimum Luminance of 13 points /Maximum Luminance of 13 points (see FIGURE 3).
The White luminance uniformity of 5 point is the same test method as 13 point u sing FIGURE 2.

Figure 4. Response Time Testing



The electro-optical response time measurements shall be made as shown in FIGURE 3 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr and 90% to 10% is Td.

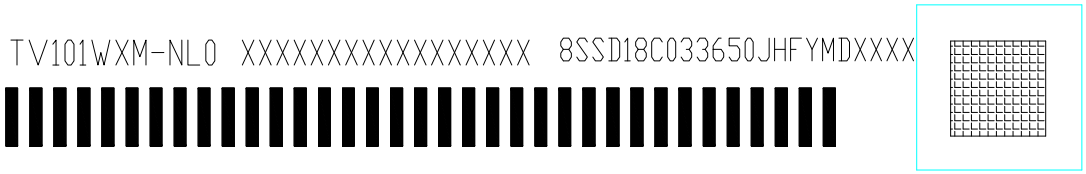
7.0 Reliability Test

No	Test Item	Test Condition	Remark
1	High temperature storage	70C/240h	-
2	Low temperature storage	-30C/240h	
3	High temperature/High humidity Storage	60C/90%RH/240h	
4	High temperature operating	60C/240h	
5	Low temperature operating	-10℃/240h	
6	High temperature/High humidity operating	40C/95%RH/240h	
7	Thermal Shock Storage	-30℃ (30 min)~ +70 ℃(30 min) , 27 cycles	

No	Other Test Item	Test Condition
1	Shock test	980m/s2,Action time: 6ms, Time: 3 times for each direction, Diretion:+/-X, +/-Y, +/-Z
2	Package Vibration test	Frequency range: 10-55Hz, stroke:1.5mm, swep time: 1 minute, test period: 2 hours for each direction of X, Y, Z
3	Package Drop test	Height: 60cm, 1 corner, 3 edges, 6 surfaces: 1 time for each direction
4	FPC Bending test	Bending degree is 180, bending 30 imes and the bending radius is 1.0mm
5	FPC Insert/Remove test	30 time FPC insert/remove
6	ESD test (Component-LCD MDL)	Air +/-12KV ,contact +/-8KV , Criteria C

9.0 LABEL

(1) Product label



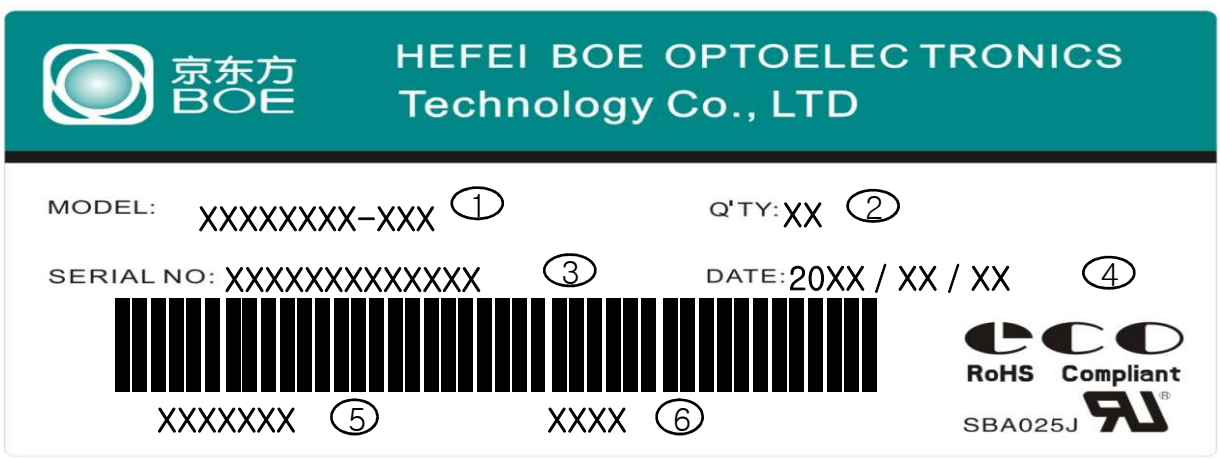
序列号	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
代码	4	F	P	3	1	2	7	3	8	0	0	0	0	1	E	E	J
描述	GBN代码		等级	B3	年份		月	FG Code后四位				序列号					

Code	Description
L	LCM
H	HYDIS
A	BOEOT
B	BOEOT
C	BOEOT
3	BOEHF

Code	Description
1	1月
2	2月
…	…
X	10月
Y	11月
Z	12月

(2) Box label

Label Size: 110 mm (L) × 56 mm (W)
Contents
Model: TV101WXM-NL0
Q`ty: Module Q`ty in one box
Serial No.: Box Serial No. See next figure for detail description.
Date: Packing Date
Internal use of Product



1. **FG-CODE**
2. **Box 产品数量**
3. **Box ID, 编码规则如下**
4. **Box Packing 日期**
5. **产品物料号(客户端)**
6. **FG-CODE 后四位**

序列号	1	2	3	4	5	6	7	8	9	10	11	12	13
代码	4	J	P	3	1	2	7	0	0	0	1	H	D
描述	GBN代码		等级	B3	年份		月	Rev	序列号				

11.0 Handing & Cautions

(1) Cautions when taking out the module
- Pick the pouch only, when taking out module from a shipping package.

(2) Cautions for handling the module
- As the electrostatic discharges may break the LCD module, handle the LCD module with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.
- As the LCD panel and back - light element are made from fragile glass material, impulse and pressure to the LCD module should be avoided.
- As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.
- Do not pull the interface connector in or out while the LCD module is operating.
- Put the module display side down on a flat horizontal plane.
- Handle connectors and cables with care.

(3) Cautions for the operation
- When the module is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.

(4) Cautions for the atmosphere
- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

(5) Cautions for the module characteristics
- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

(6) Other cautions
- Do not disassemble and/or re-assemble LCD module.
- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

12.0 MECHANICAL OUTLINE DIMENSION

Figure 12. LCM Module Outline Dimension (Front View)

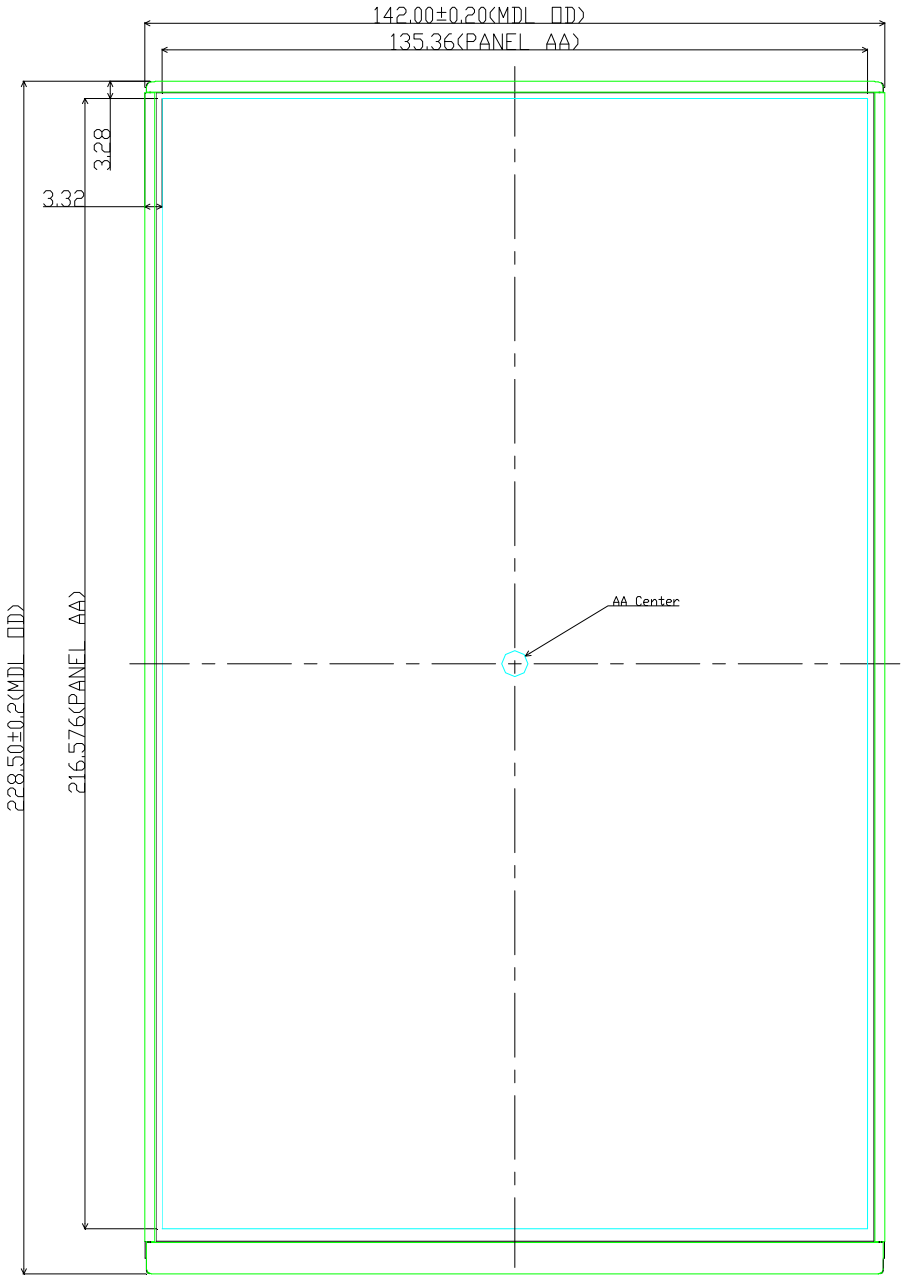
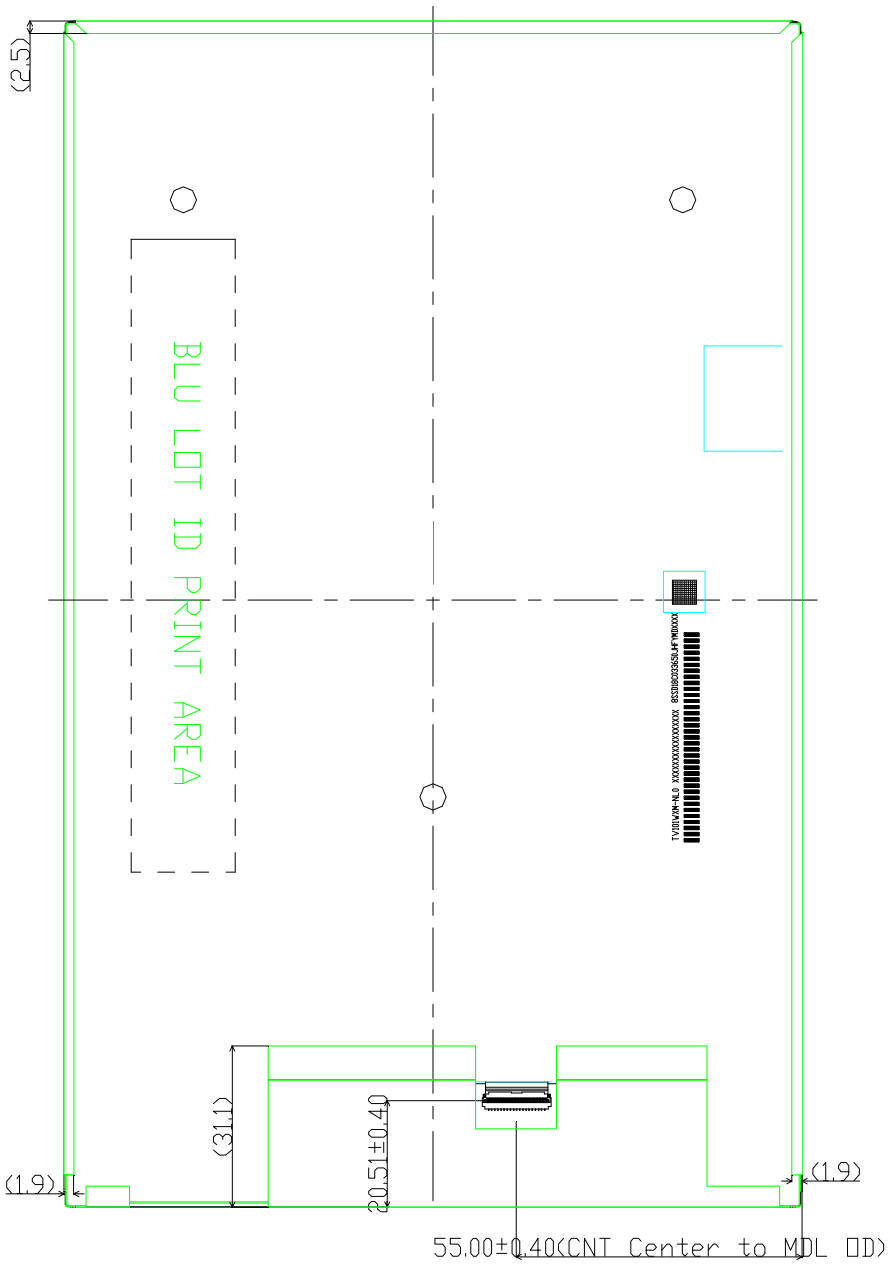


Figure 13. TFT-LCD Module Outline Dimensions (Rear view)

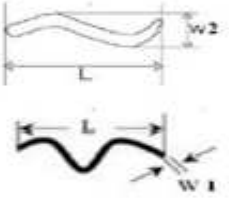


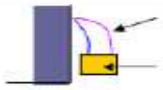
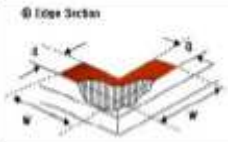
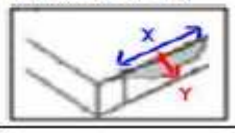
16.0 入料检测标准

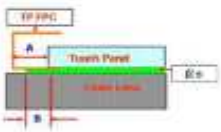
A. 外觀檢驗標準

檢驗環境	環境照度	不點亮: 不低於 1000 lux 點 亮: 100+/-50 lux			目視距離	30±5cm
	旋轉角度	45度（上下左右）			目視時間	15±3s
檢驗項目	允收標準				缺點類型	注意
7'以下 (不含 7')	點狀		直徑	數目		
	可視區	異物	0.1< D ≤0.2	N≤3	MI	1.以點線規測量判定 2.請參閱附錄 I 3.兩缺點之間的距離必須大於 15mm。 4. ASUS Logo 及 IR 孔周圍 20mm 不可有（适用油墨区）。 5.對於油墨針孔在油墨面使用 RoHS-Qualified 油性筆修補後從正面不可視，則忽略不計。
		刮傷	0.1< D ≤0.2	N≤3		
		氣泡	0.1< D ≤0.25	N≤3		
		凹凸點	0.1< D ≤0.25	N≤3		
		魚眼		N=0		
		點狀不良總數		N≤3		
	油墨區	異物(黑色油墨)	0.1< D ≤0.2	N≤2	MI	
		異物(白色油墨)	0.1< D ≤0.15	N≤2		
		針孔	0.1< D ≤0.2	N≤2		
		氣泡		N=0		
		凹凸點		N=0		
		魚眼		N=0		
		點狀不良總數		N≤2		
	所有點狀不良總數			N≤3		
	線狀		寬度	長度	數目	
	可視區	線條異物	W1≦0.05 且 W2≦1	L≦2	N≤3	MI
	油墨區	線條異物			N=0	
	可視區+油墨區	線狀無感刮傷(有感刮傷不允許有)	0.01≦W1≦0.03	L≦3	N≤2	MI
			0.03≦W1≦0.05	L≦2	N≤2	
			線狀刮傷總數		N≤2	
	異物異色點(如單獨呈現紅/橙/黃/綠/青/藍/紫等點則稱之為異物異色點)				N=0	MI
	以上所有點狀&線狀不良總數				N≤4	MI

兩缺點之間的距離必須大於 15mm。



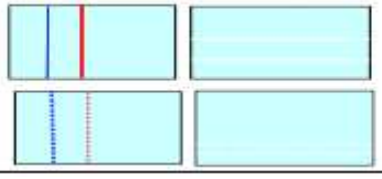
電源線及連接器	外露之電源線及連接器外觀不得斷裂或損毀或變形 燈管線貼附位置須依承認書定義	MI	 注意事項: 注意輕拿 LCD 邊緣
LCD 玻璃基板	01. LCD 玻璃基板不得破裂; 02. 角邊崩不能傷及有效線路; 03. 角邊崩不能導致十字 Mark 四邊的破損; 04. Cell 角崩建議定義崩角不良之長邊≤1.5mm，短邊≤0.8mm，即 W≤1.5, a≤0.8 or W≤0.8, a≤1.5，不可有逐漸裂痕;	MA	
	05. Cell 邊崩不可有。		
Touch Panel 崩邊 (Chipping)	寬 X≤0.2mm 且長 Y 與深 Z≤0.15mm; 每條邊N≤2，總數N≤5。	MI	兩缺點之間的距離必須大於 20mm
Touch Panel 邊緣裂(Edge Crack)	不可有	MA	
凸邊	Y≤0.05mm，不計 0.05≤Y≤0.1mm 且 X≤1mm; 每條邊N≤2，總數N≤6。	MI	距離 ASUS Logo 30mm 內不可有 
油墨鋸齒	印刷邊緣鋸齒: W≤0.1mm，不計 0.1mm<W≤0.15mm 且 L≤1mm，N≤2 油墨區和可視區鋸齒: W≤0.1mm 不計; W>0.1mm N=0	MI	兩缺點之間的距離必須大於5mm
油墨區邊緣漏光	W≤0.1mm，不計 W≤0.15mm 且 L≤20mm，N≤2	MI	兩缺點之間的距離必須大於 5mm (在油墨面使用 RoHS-Qualified 油性筆修補後從正面不可視，則忽略不計)
油墨溢出	W≤0.05mm 不計 W>0.05mm N=0	MI	
攝像孔	不可有异物/脏污/刮伤	MI	N=0 或依據限度樣品判定
IR 孔	不可有色差/點/線狀不良	MI	N=0 或依據限度樣品判定

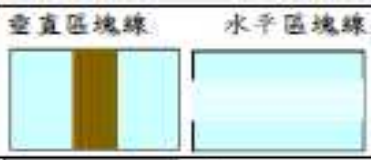
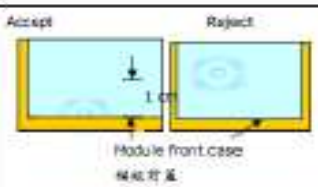
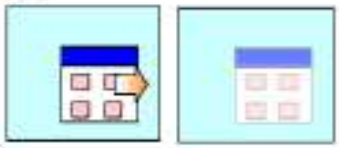
Logo	不可有色差/點/線狀不良		MI	N=0 或依據限度樣品判定
Icon	不可有色差/點/線狀不良		MI	N=0 或依據限度樣品判定
Touch Mura	不可有		MI	
色差	不可有		MI	
保護膜殘膠	不可有		MI	氣泡建議小於 5mm
髒汙	如果可以被氣槍或者通過簡單輕擦去除掉，則可以不計算不良		MI	
輪痕/擦拭痕/吸盤痕/手指印	1.正常使用環境下不可有 2.有霧氣環境下(如哈氣 or 蒸汽時)不可有		MI	
異紋	輪廓不清晰,以肉眼辨識不易的沾汙或與觸控面板表面有明顯色差，存在於薄膜與玻璃內部，無法擦拭乾淨，此類現象不可有		MI	
標籤	廠商必須清楚標示廠牌、型號、版本、製造日期、批號及條碼等，以利辨識 條碼編碼原則須定義於承認書		MI	依據承認書
LCD 偏光板漏白線	前後左右 45 度目視不可有		MI	
偏光片貼附歪斜	不可有		MI	依據承認書
FPC	FPC 異物/髒汙	Cover Film 內層雜質跨越兩迴路	MI	NG
	FPC 殘膠	不可有	MI	NG
	FPC 刮傷/壓傷	刮傷處以指甲刮過有明顯阻力； 壓傷成銳角凸起	MI	NG
	FPC 皺折	折痕形成死折與銳角變形	MI	NG
	FPC 壓合處的平整度		MI	依據限度樣品
	歪斜	尺寸out spec不得有	MI	依據承認書
溢膠	TP溢膠Spec各個機種的MERD確定		MI	 依據承認書
透光率			MI	依據承認書

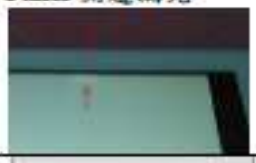
B. 機構檢驗標準

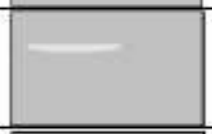
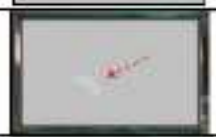
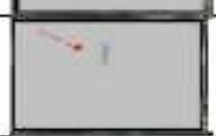
檢驗項目	允收標準	缺點類型	注意
外觀尺寸	長度、寬度、厚度及電源線長度均需符合承認書標示之尺寸範圍	MA	依據承認書
平整度	依據 MERD設計規格	MA	依據承認書
螺絲及螺孔	LCD 本體螺絲孔與螺紋不得缺少 螺孔須符合承認書定義之扭力值與螺絲尺寸	MI	依據承認書
LCD 外圍金屬框	LCD 外圍金屬框不得變形彎曲	MI	依據承認書
保護膜	必須有保護膜。	MI	貼合機種必須使用POL原材保護膜
壓克力貼付位置	壓克力貼附位置需依據承認書規定，不可超過定義範圍。	MI	依據承認書
LCD 異音	輕拿LCD邊緣部位前後晃動15度(共30度)晃動1來回/秒，晃動時間3秒確認異音有則即視為缺點	MI	異音請參閱附錄III

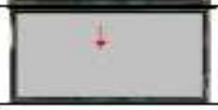
C.電氣性質檢驗標準

檢驗環境	環境照度	100+/-50 lux	目視距離	30~50 公分
	角度	45 度	目視時間	60 秒
檢驗項目	允收標準		缺點類型	注意
For 7'以下 Model (不含 7')				
亮點(像素亮點+異物亮點+看似亮點的白點)	全黑畫面	N≤1	MI	1.用 ND filter 8%不可見； 2.直徑 4cm 的圈內不可超過 3顆； 3.亮點直徑 D≦0.1mm （使用點規比對卡）
	其它畫面	N＝0		
暗點	單一暗點	N≤2	MI	暗點定義請參閱附錄II
	兩相鄰暗點	N＝0		
	三相鄰暗點	N＝0		
亮暗點總數		N≤3	MI	
線缺陷	何畫面下均不得有水平或垂直直線/模糊線.		MA	垂直線 水平線 

區塊不良	任何畫面下均不得有垂直或水平區塊不良		MA	
GAP不良	任何畫面下,不可有 GAP 不良		MA	
注入不良	任何畫面下均不得有注入不良		MA	
背光模組	a. 不清晰或無法看見,即視為缺點 b. 背光光源較正常時為暗時,即視為缺點		MA	
白畫面	資料無輸出、畫面反白即視為缺點		MA	
影像畫面閃屏	不可有or依據限度樣本 (以灰色畫面處判斷)		MA	
水波紋	輕拿LCD 邊緣部位前後晃動 15 度(共 30 度)晃動 1 來回/秒晃動時間為 3 秒確認水波紋,有則即視為缺點。(距模組前蓋邊緣一公分範圍內允收)		MA	
藍色背景畫面不均亮痕	檢測畫面為淡藍色背景,輕捏 LCD 邊緣部位前後晃動 15 度(共 30 度)晃動 1 來回/秒晃動時間 3 秒,確認畫面會產生皺折般的亮度不均勻現象有則即視為缺點。 (靜止狀態下不明顯)		MA	
殘影	TN Panel	視窗正常使用的情形下(在同一畫面停留 2 小時), 切換下一視窗時,2 秒不得有前一視窗畫面殘留的情形發生,關機或在 suspend 的狀態下,後影像殘留不得超過 5 秒。	MA	視窗關閉前 視窗關閉後之殘像 
	IPS Panel	1.從棋盤格畫面燒付 30mins 後切到 127 灰階畫面等待 2 秒 recovery,2 秒後再觀察是否有殘影現象; 2.或依據 ASUS RD or CPM Approved 的承認書。	MA	
Mura/漏光類不良判定方式如下:				

漏光	a.LCD 邊緣(靠近背光源處)LCD 燈管光源不規則的照射出來產生陰影,則即視為缺點 b.LCD 燈光產生陰影以全黑，全白畫面，灰階畫面判定(輕微漏光顯偏黃，偏綠，偏藍，偏白則NG). c. 45度視角不可有; d.如有限度樣品則參看樣品；	MA	Tape 浮起漏光  Panel 側邊漏光 
Cross talk	在 Crosstalk 狀況下不可見串擾殘影 or 依據限度樣本	MA	
COG Mura	任何畫面下不可有 or 依據限度樣本	MA	
不均亮痕	任何畫面下不可有 or 依據限度樣本	MA	
色偏(Color shift)	正視 45°角內不可有色偏, 45°角外有色偏為允收； Or 依據限度樣本	MA	一般以紅色畫面下出現的色度不均現象稱之為色偏
類似浮水印mura	任何畫面下不可有 or 依據限度樣本	MA	
Blue 色差	任何畫面下不可有 or 依據限度樣本	MA	
C/F 色差	任何畫面下不可有 or 依據限度樣本	MA	
Cell 色差	任何畫面下不可有 or 依據限度樣本	MA	
Rubbing 色差	任何畫面下不可有 or 依據限度樣本	MA	

Stage mura	任何畫面下不可有 or 依據限度樣本	MA	
立體黑白色差	任何畫面下不可有 or 依據限度樣本	MA	
橫條黑色差	任何畫面下不可有 or 依據限度樣本	MA	
周邊色差(cell)	任何畫面下不可有 or 依據限度樣本	MA	
橫條白色差	任何畫面下不可有 or 依據限度樣本，	MA	
直條白色差	任何畫面下不可有 or 依據限度樣本	MA	
線狀白色差	任何畫面下不可有 or 依據限度樣本	MA	
直條黑色差	任何畫面下不可有 or 依據限度樣本	MA	
花花色差	任何畫面下不可有 or 依據限度樣本	MA	
面狀白色差	任何畫面下不可有 or 依據限度樣本	MA	
面狀黑色差	任何畫面下不可有 or 依據限度樣本	MA	
線狀黑色差	任何畫面下不可有 or 依據限度樣本	MA	
放射狀色差	任何畫面下不可有 or 依據限度樣本	MA	

點狀黑色差	任何畫面下不可有 or 依據限度樣本，若為異物造成的黑點/黑斑可按照異物標準判定	MA	
點狀白色差	任何畫面下不可有 or 依據限度樣本，若視覺上類似亮點則以亮點 Spec 判定；	MA	
Touch 功能測試			
劃線測試	測試方式：寫在動作區測試橫線和豎線劃線功能。 劃線偏移，斷線，延時均不可以有。	MA	
Raw Count 值測試	依據承認書	MA	
Pin Fault 測試	依據承認書	MA	

D. 光學性質檢驗標準

檢驗項目	允收標準	缺點類型	注意
亮度	依據承認書	MI	
色度	依據承認書	MI	
對比度	依據承認書	MI	
畫面均勻度	依據承認書	MI	

E．其它檢驗項目：

HSF	Follow S-AT2-001	MA	
HF	Follow S-AT2-003	MA	
安規	未依要求使用安規材料或未符合安規規定	MA	NG

F．以上所列項目中不包括的缺點一律不可有,如有 ASUS SPM 簽訂限度樣品則依據限度樣品判定.

6. 附件:
無。

附錄Ⅰ：刮傷和異物，凹痕&氣泡的定義

1.異物刮傷—線條型

異物刮傷—規格（包括凹痕，氣泡）

2. 異物或內部髒污—線條型

異物或內部髒污—規格

附錄Ⅱ：像素亮暗點的定義

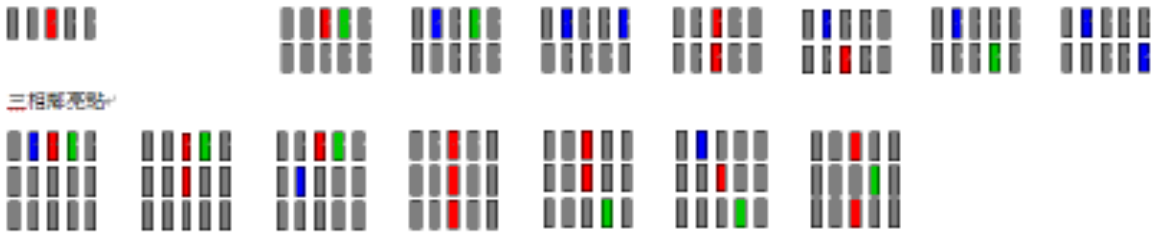
一個像素由(R,G,B)3種點組成。

1. 亮點

單一亮點

兩相鄰亮點

三相鄰亮點

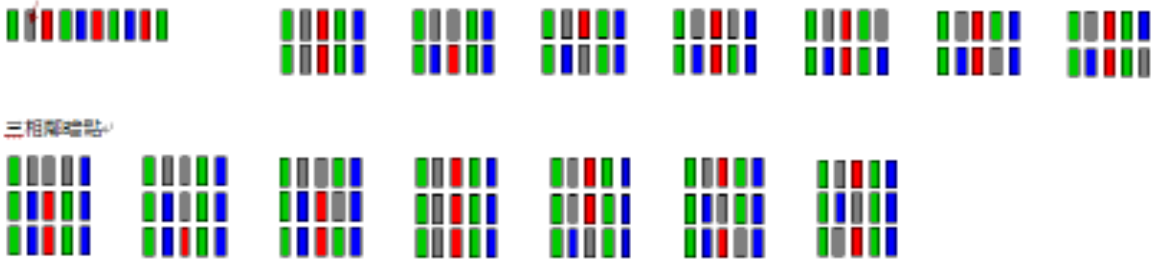


2. 暗點定義

單一暗點

兩相鄰暗點

三相鄰暗點



附錄Ⅲ：LCD 異音檢驗標準

檢驗步驟：

A.將 LCD 兩端置於 IQC 檢驗治具的上,類比 LCD 在 NB or PAD 的固定模式。

B.拿 LCD 邊緣部位,並將耳朵貼近 LCD,輕微擺動,

注意事項:
1. 輕拿 LCD 邊緣部位;
2. 前後擺動各 15 度,聽到異音即 NG.

附錄Ⅳ：ND-Filter 使用方式

檢驗距離：1.ND-Filter 與 Panel 距離：1-2cm。
2.眼睛與 ND-Filter 距離：30cm。

檢驗角度：90+/-15 度。

注意點：1. ND-Filter 表面要保持乾淨。
2.目視發現 Mura 時直接使用 ND-Filter 按照圖示方式遮住 Mura 不良位置來判定。
3.光照測試方式：使照度計的光源採集器靠近 Panel 正中心位置，光源採集器平躺朝上來測試，測試時需模擬實際作業環境，切勿有人員對光源存在干擾。
4.以上定義的方式下檢驗只要看到則為 NG，如有爭議依據 ASUS SQA 判定為準。