

LCD Brightness Test Report

Test Item: LCD Brightness Test		File No: SDT-003890
Product Name: IPPC1202-RE V-A1	P/N: S02IPPC12--A10100P	Quantity: 1
Date: 2015 / 06 / 29	Temp.: 23.9°C	Humidity: 53.1 %
Place: iBASE Lab	Inspector: Tony Tsai	Leader: T.L. Chiang

Configuration:

Item	Description	Remark
M/B	IB806-D25S V-1.0	ZD01IB806---10030P
CPU	Intel® Atom™ Processor D2550 (1M Cache, 1.86 GHz)	C018ATOMG18615100P
DIMM	Transcend / SO-DIMM DDR3L 2G/1600 1.35V [TS7W9SDSQ-I]	C0373900200081520P
Storage	TOSHIBA / 2.5" 500G SATAIII 5400RPM 7mm[MQ01ABF050]	A002SLSAG50010120P
LCD Panel	IVO / 12.1" TFT-LCD [M121GNX2 R1]	A003LCDM121GNX000P
Touch panel	ELO / 12.1" 5-WIRE RESISTIVE ZERO-BEZEL [E803003]	A003LCDPANEL07600P
Operating System	Windows 7 Ultimated (32bit)	

Test Equipment:

Item	Vender	Model	Remark
Display Color Analyzer	Konica Minolta	CA-310	
Small LCD Flicker Measuring Probe	Konica Minolta	CA-PS32/35	

Test result:

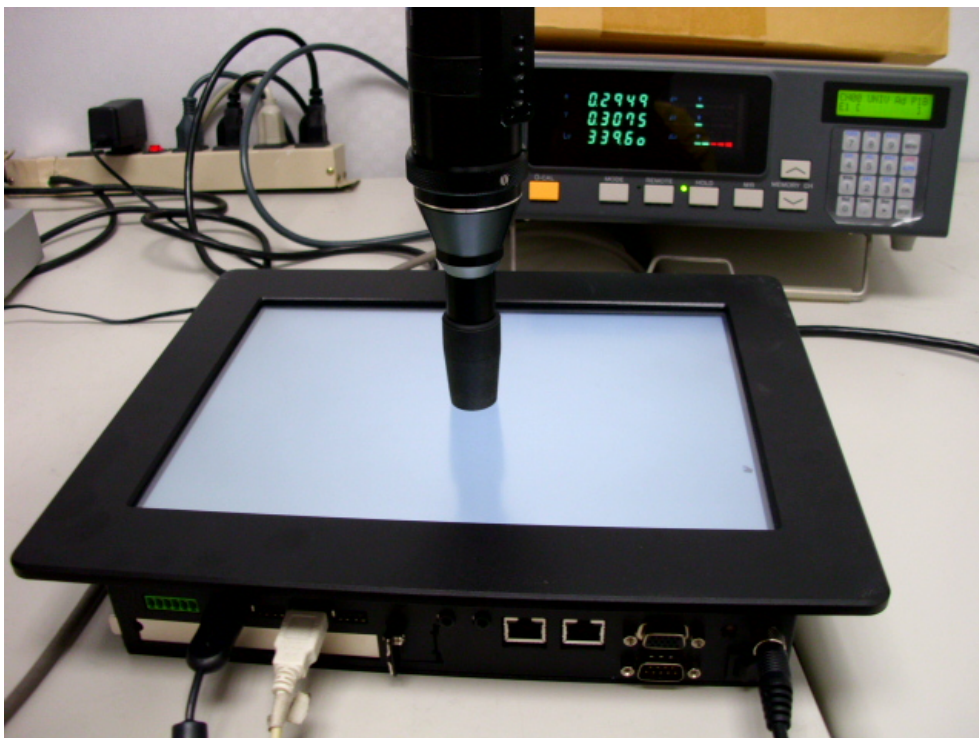
PASS

Test Purpose:

To evaluate the system display brightness data and compare with specification requirement to determine whether the result meet the requirement.

Testing Procedure:

1. Power on system with normal condition.
2. Power on "Display Color Analyzer" and calibrate with standard procedure, refer user manual.
3. Setting DUT display "White" only, most high Gray level.
4. Keep DUT power on at least 30 mins.
5. Measuring DUT color chromaticity and 5 points brightness data of white. The definition of point refers Appendix A.
6. Measuring method please refer Appendix B.
7. Testing criterion please refer Appendix C.

Testing Photos:

Test Data:

Test Item		Measured value (cd/m ²)	
		w/ Touch panel	
Luminance of White	1	334.3	
	2	319.3	
	3	339.6	
	4	328.3	
	5	323.5	
Criterion (Central Luminance)		Min.: 315 / Typ.: 350; Touch panel transparency: 80±5% w/ Touch panel shall at least 252 cd/m ²	

Test Item		Measured value	Criterion	Remark
Luminance Contrast Ratio		339.6 / 0.42 = 808.6	Min.: 720 / Typ.: 800	Note 1
White Luminance Uniformity		319.3 / 339.6 = 94.02%	Min.: 75 / Typ.: 80	Note 2
Color Chromaticity	White	W _x	0.2949	0.305±0.05
		W _y	0.3075	0.325±0.05
	Red	R _x	0.6458	0.644±0.03
		R _y	0.3413	0.344±0.03
	Green	G _x	0.3186	0.310±0.03
		G _y	0.6262	0.634±0.03
	Blue	B _x	0.1492	0.152±0.03
		B _y	0.0751	0.081±0.03

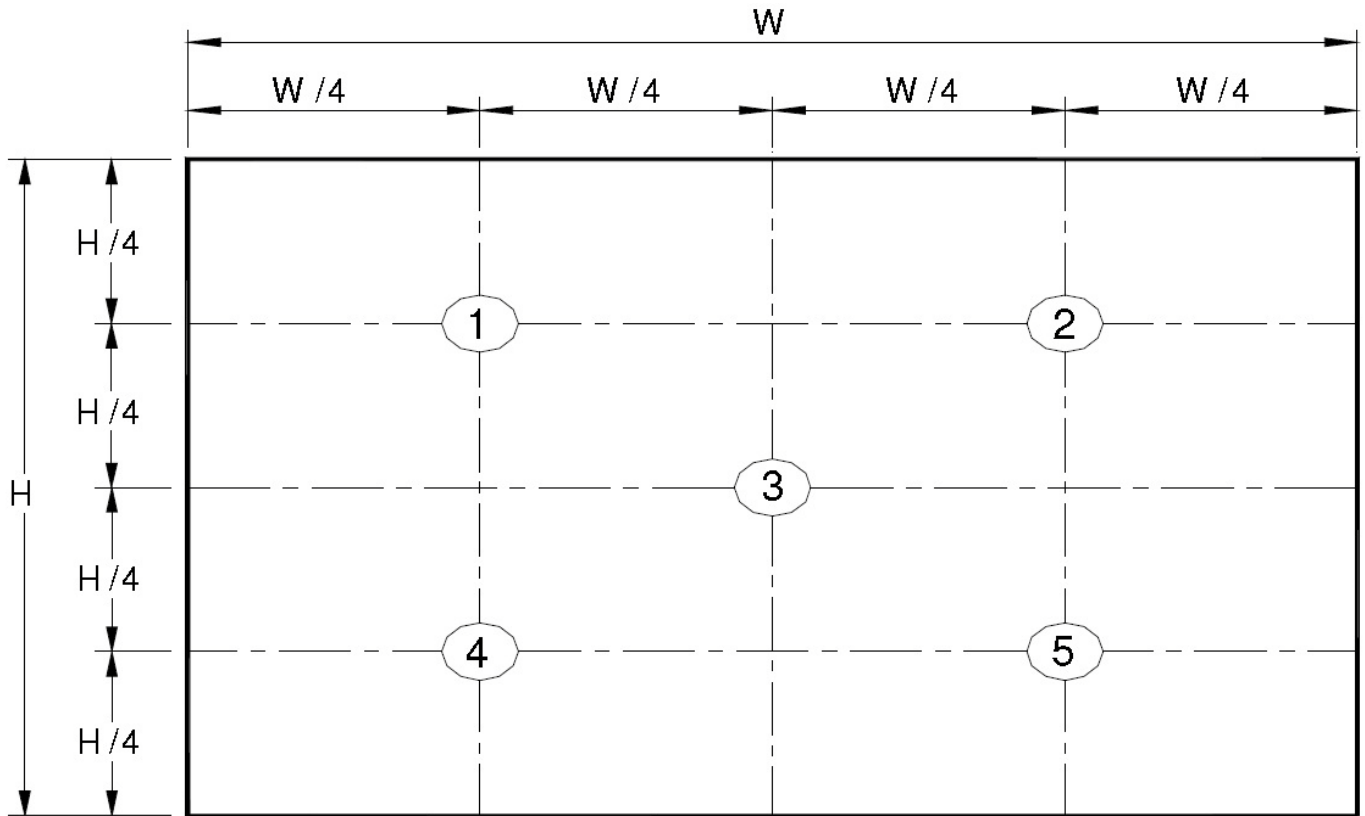
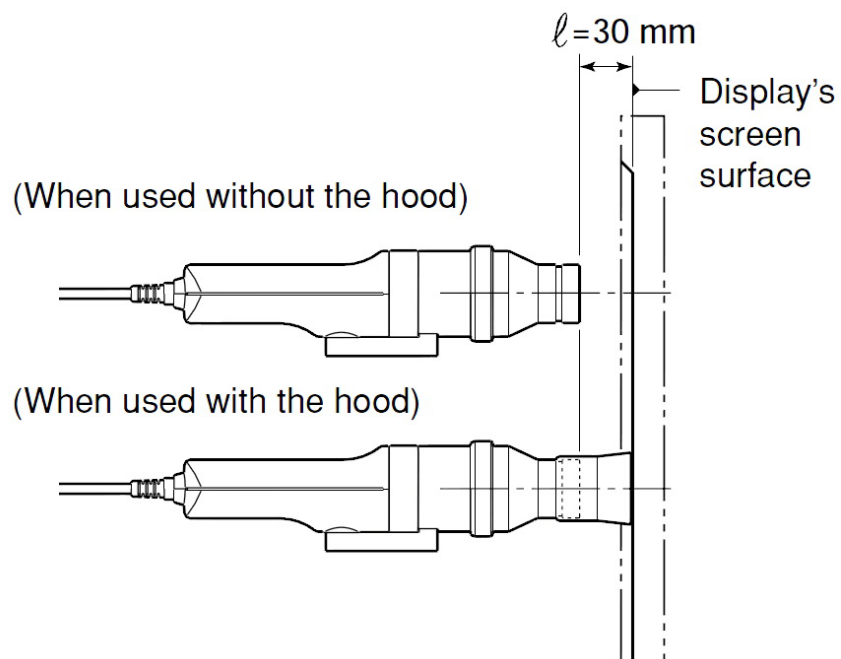
Note : 1. Contrast measurements shall be made at viewing angle of $\Theta = 0^\circ$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state.

Luminance Contrast Ratio (CR) is defined mathematically.

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

2. The White luminance uniformity on LCD surface is then expressed.

$$\text{Luminance Uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

Appendix A – Definition of 5 measuring points**Appendix B – Measuring method**

Appendix C – Original specifications:
1. LCD Panel SPEC.:

Item	Conditions	Min.	Typ.	Max.	Unit	Note	
Viewing Angle (CR>10)	Horizontal	θ_{x+}	70	80	-	degree	(1),(2),(3)
		θ_{x-}	70	80	-		
	Vertical	θ_{y+}	70	80	-		
		θ_{y-}	70	80	-		
Contrast Ratio	Center	720	800	-	-	(1),(2),(4)	
Response Time	Rising + Falling	-	16	19	ms	(1),(2),(5)	
Color Chromaticity (CIE1931)	White	x	0.255	0.305	0.355	-	(1),(2)
	White	y	0.275	0.325	0.375	-	
	Red	x	0.614	0.644	0.674	-	
	Red	y	0.314	0.344	0.374	-	
	Green	x	0.280	0.310	0.340	-	
	Green	y	0.604	0.634	0.664	-	
	Blue	x	0.122	0.152	0.182	-	
	Blue	y	0.051	0.081	0.111	-	
NTSC		-	70	-	-	-	
White Luminance	5 Points Average	315	350	-	cd/m ²	(1),(2),(6)	
Luminance Uniformity	9 Points	75	80	-	%	(1),(2),(7)	

2. Touch Panel SPEC.:
Light Transmission

Light Transmission testing is in accordance with [ASTM D1003](#).

- **HL Products:** 80% +/-5% at 550 nm wavelength (visible light spectrum).