Specification for Approval

Customer:_____

Model Name:_____

Supplier Approval			Customer approval
R&D Designed	R&D Approved	QC Approved	
Peter	*Peng Jun*		

Revision Record

REV NO.	REV DATE	CONTENTS	Note
A	2019-10-31	NEW ISSUE	

Table of Contents

1. Scope

This specification defines general provisions as well as inspection standards for TFT module supplied by AMSON electronics.

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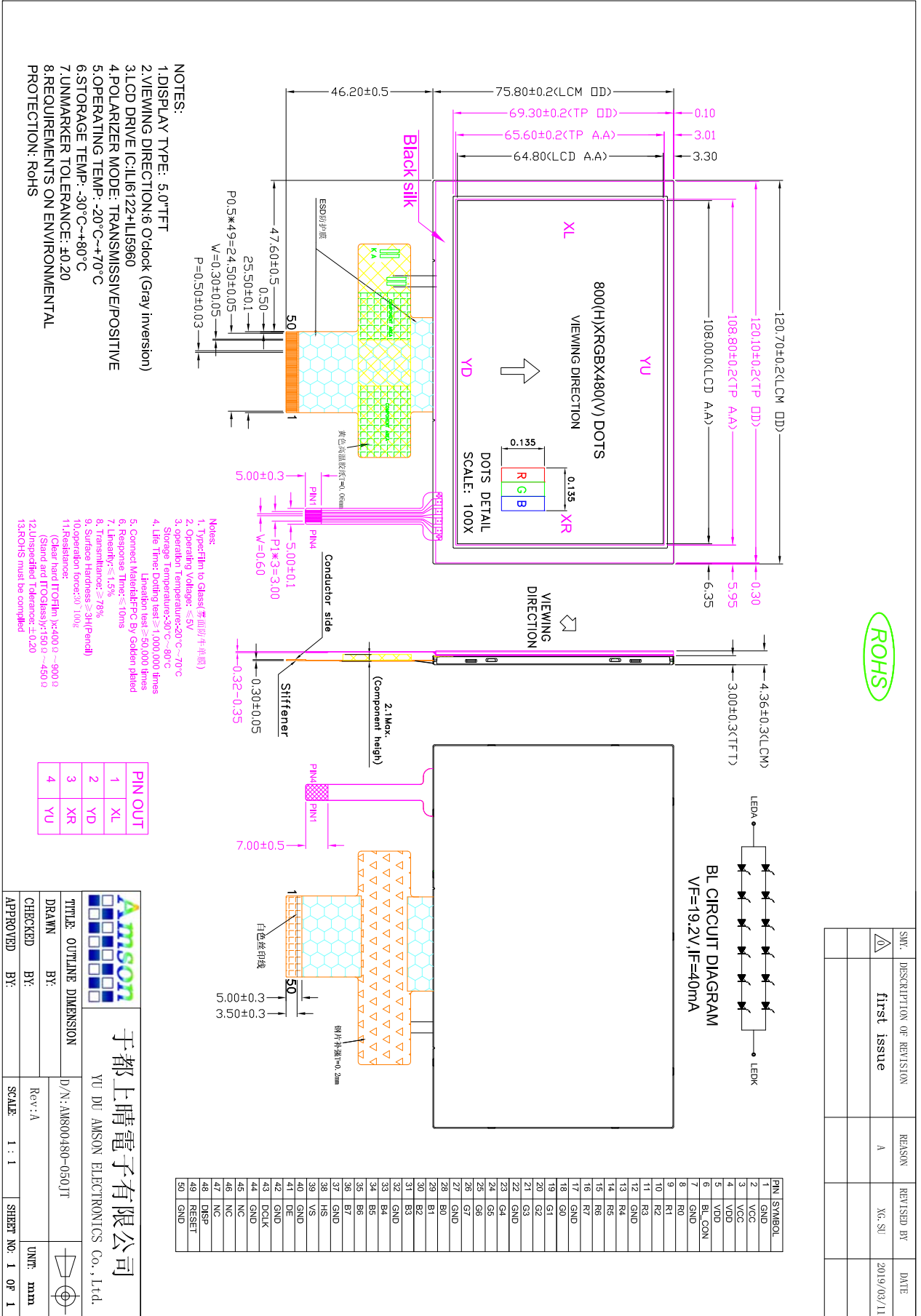
2. General Information

LCM

ITEM	STANDARD VALUES	UNITS
LCD type	5.0"TFT	--
Dot arrangement	800 (RGB)×480	dots
Color filter array	RGB vertical stripe	--
Display mode	Normally white TN	-
Gray Scale Inversion Direction	6 O'clock	--
Eyes Viewing Direction	12 O'clock	
Driver IC	ILI6122+ILI5960	--
Module size	120.7(W)×75.8(H)×4.36(T)	mm
Active area	108(W)×64.80(H)	mm
Dot pitch	0.135(W)×0.135(H)	mm
Interface	24-bit Parallel RGB Interface	--
Operating temperature	-20 ~ +70	°C
Storage temperature	-30 ~ +80	°C
Back Light	12 White LED	--

CTP

ITEM	STANDARD VALUES	UNITS
RTP type	Film + Glass + FPC	--
Surface hardness	3H	--
Transmittance	≥78％	--
RTP size	120.10(W)×74.80(H)×1.2(T)	mm
Active area	108.80(W)×65.6(H)	mm
Response Time	≤10ms	ms
Response Time	≤1.5%	%
Insulation resistance	>20MΩ	MΩ
Operation force	30~100g	g
Resistance	X:400Ω ~ 900Ω Y:150Ω ~ 450Ω	Ω

3. External Dimensions

NOTES:
1.DISPLAY TYPE: 5.0"TFT
2.VIEWING DIRECTION:6 O'clock (Gray inversion)
3.LCD DRIVE IC:ILI6122+ILI5960
4.POLARIZER MODE: TRANSMISSIVE/POSITIVE
5.OPERATING TEMP: -20°C~+70°C
6.STORAGE TEMP: -30°C~+80°C
7.UNMARKER TOLERANCE: ±0.20
8.REQUIREMENTS ON ENVIRONMENTAL
PROTECTION: RoHS

Notes:
1. Type:Film to Glass(零面到片面膜)
2. Operating Voltage: ≤5V
3. operation Temperature:-20°C~70°C
   Storage Temperature:-30°C~80°C
4. Life Timer:Dotting test≥1,000,000 times
5. Connect Material:FPC By Golden plated
6. Response Time:≤10ms
7. Linearity:≤1.5%
8. Transmittance:≥78%
9. Surface Hardness:≥3H(Pencil)
10.operation force:30¯100g
11.Resistance:
   (Clear hard ITO:Film)x:400Ω~900Ω
   (Stand ard ITO:Glass)y:150Ω~450Ω
12.Unspecified Tolerance:±0.20
13.ROHS must be complied

800(H)XRGBX480(V) DOTS
VIEWING DIRECTION

DOTS DETAIL
SCALE: 100X

BL CIRCUIT DIAGRAM
VF=19.2V,IF=40mA

PIN OUT	
1	XL
2	YD
3	XR
4	YU

PIN	SYMBOL
1	GND
2	VCC
3	VCC
4	VDD
5	VDD
6	BL_CON
7	GND
8	R0
9	R1
10	R2
11	R3
12	R4
13	R5
14	R6
15	R7
16	GND
17	G0
18	G1
19	G2
20	G3
21	G4
22	G5
23	G6
24	G7
25	GND
26	B0
27	B1
28	B2
29	B3
30	B4
31	B5
32	B6
33	B7
34	GND
35	GND
36	B7
37	GND
38	HS
39	VS
40	GND
41	DE
42	GND
43	DCLK
44	GND
45	NC
46	NC
47	NC
48	DISP
49	RESET
50	GND

SMT:	DESCRIPTION OF REVISION	REASON	REVISED BY	DATE
⚠	first issue	A	XG. SU	2019/03/11

TITLE: OUTLINE DIMENSION

DRAWN BY:
CHECKED BY:
APPROVED BY:

于都上睛電子有限公司
YU DU AMSON ELECTRONICS Co., Ltd.

D/N:AM800480-050JT
Rev:A

SCALE: 1 : 1
SHEET NO: 1 OF 1
UNIT: mm

4. Interface Description

TFT

PIN	PIN NAME	DESCRIPTION
1	GND	Power ground.
2，3	VCC	Supply Voltage
4，5	VDD	BL VIN Voltage
6	BL_CON	Common Voltage.
7	GND	Power ground.
8~11	R0~R3	Red Data Input
12	GND	Power ground.
13~16	R4~R7	Red Data Input.
17	GND	Power ground.
18~21	G0	Green Data Input
22	GND	Power ground.
23~26	G4	Green Data Input.
27	GND	Power ground.
28~31	B0	Blue Data Input
32	GND	Power ground.
33~36	B4	Blue Data Input.
37	GND	Power ground.
38	HS	Horizontal sync input. Negative polarity.
39	VS	Vertical sync input. Negative polarity.
40	GND	Power ground.
41	DE	Data Enable signal.
42	GND	Power ground.
43	DCLK	Clock input.
44	GND	Power ground.
45~47	NC.	Not connect.
48	DISP	STANDBY MODE. NORMALLY PULLED HIGH. DISP=H,NORMAL OPERATION.(DEFAULT) DISP=L, TIMING ,CONTORLLER , SOURCE DRIVER WILL TURN OFF,ALL OUTPUT ARE HIGH-Z
49	RESET	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high.(R=10KΩ, C=1µF)
50	GND	Power ground.

RTP

Pin	Symbol	Description.
1	XL	TP X-Left
2	YD	TP Y-Bottom
3	XR	TP X-Right
4	YU	TP Y-Up

5. Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.3	3.6	V
	VDD	-0.3	18	V
Operating Temperature	T_{OP}	-20	70	°C
Storage Temperature	T_{ST}	-30	80	°C
Storage Humidity	HD	-	90	%RH

6. DC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply Voltage	VCC	3.0	3.3	3.6	V	-
	VDD	3.0	5.0	15.0	V	-
Input High Voltage	V_{IH}	0.7VCC	-	VCC	V	-
Input Low Voltage	V_{IL}	GND	-	0.3 VCC	V	-
Output High Voltage	V_{OH}	0.8 VCC	-	VCC	V	-
Output Low Voltage	V_{OL}	GND	-	0.2 VCC	V	-
Logic Voltage	BL_PWM		3.3V		V	-
PWM Frequency	Fpwm	5		100	KHz	-

Note: Maximum current from RGB full-display

7. Timing Characteristics
7.1 Power Sequence

Power on sequence (VDD→VEE→VGH)
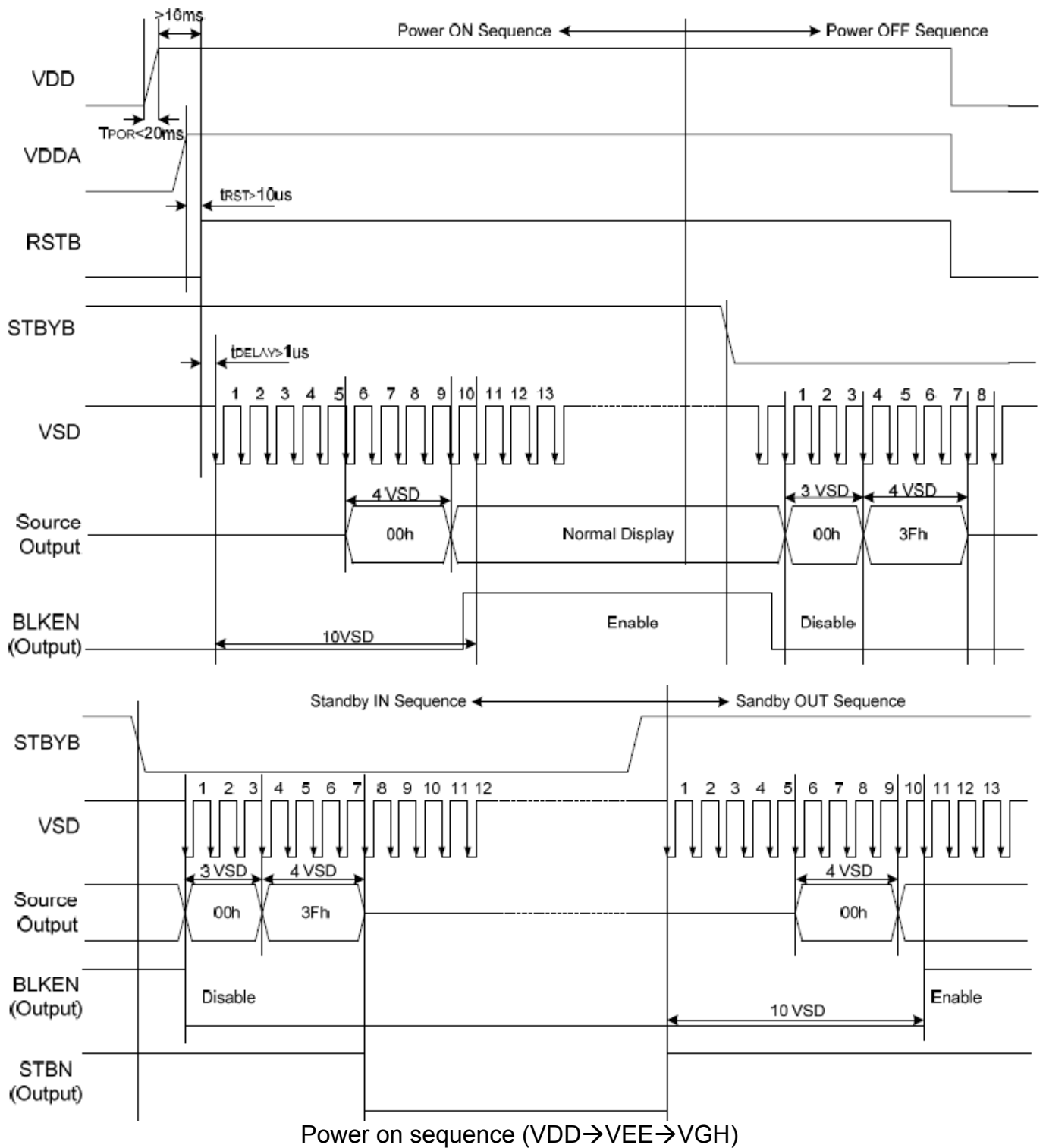
7.2 AC Timing characteristics

DE Mode (MODE='1')
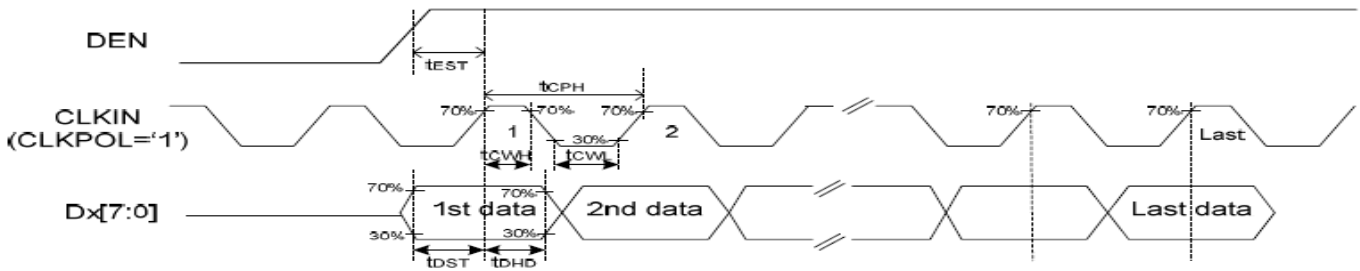
SYNC Mode (MODE='0')
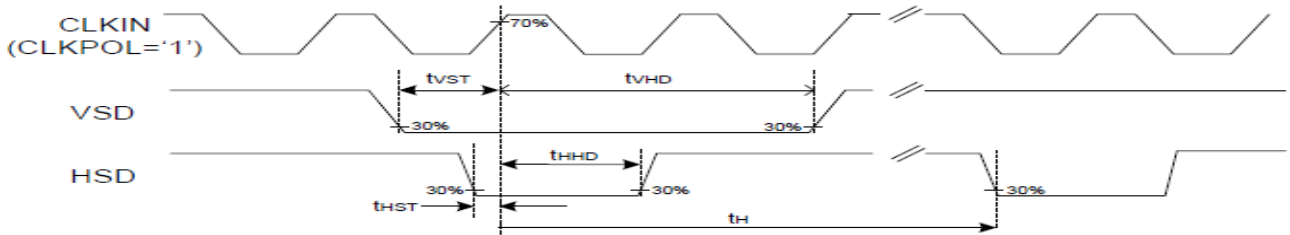
Source Output timing Diagram (Cascade)
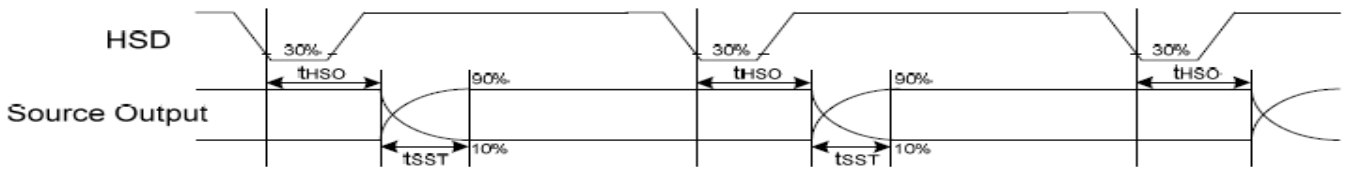
Vertical Timing Diagram of SYNC Mode (Dual Gate)
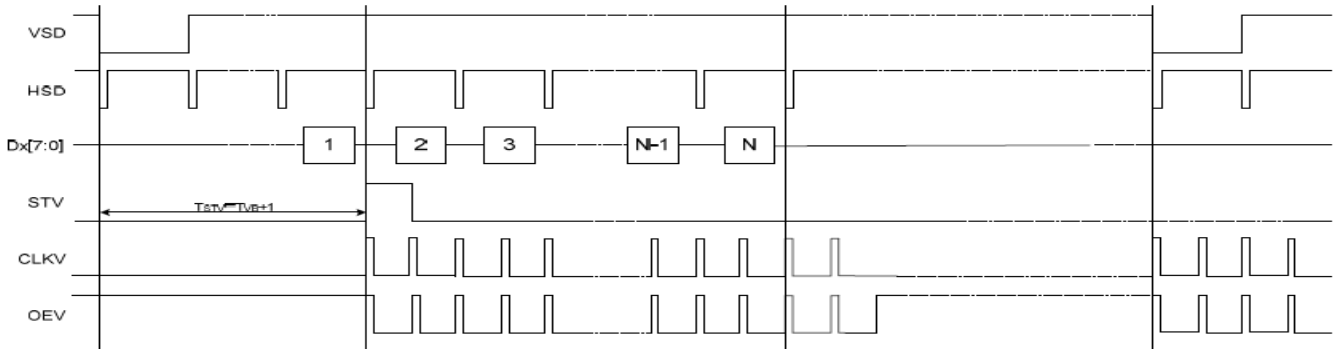
Vertical Timing Diagram of DE Mode (Dual Gate)
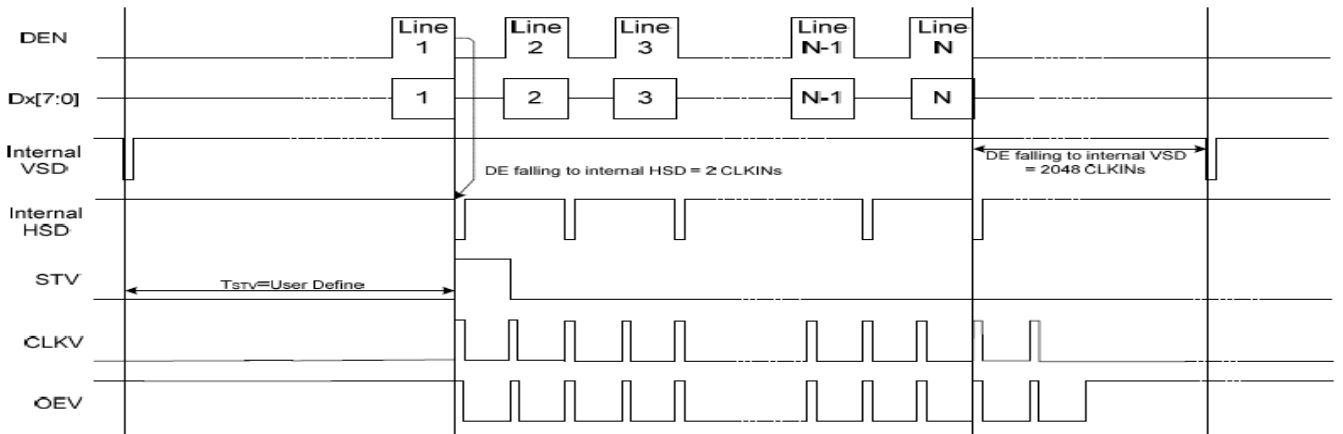
7.3 Display Timing characteristics (Resolution: 800x480)
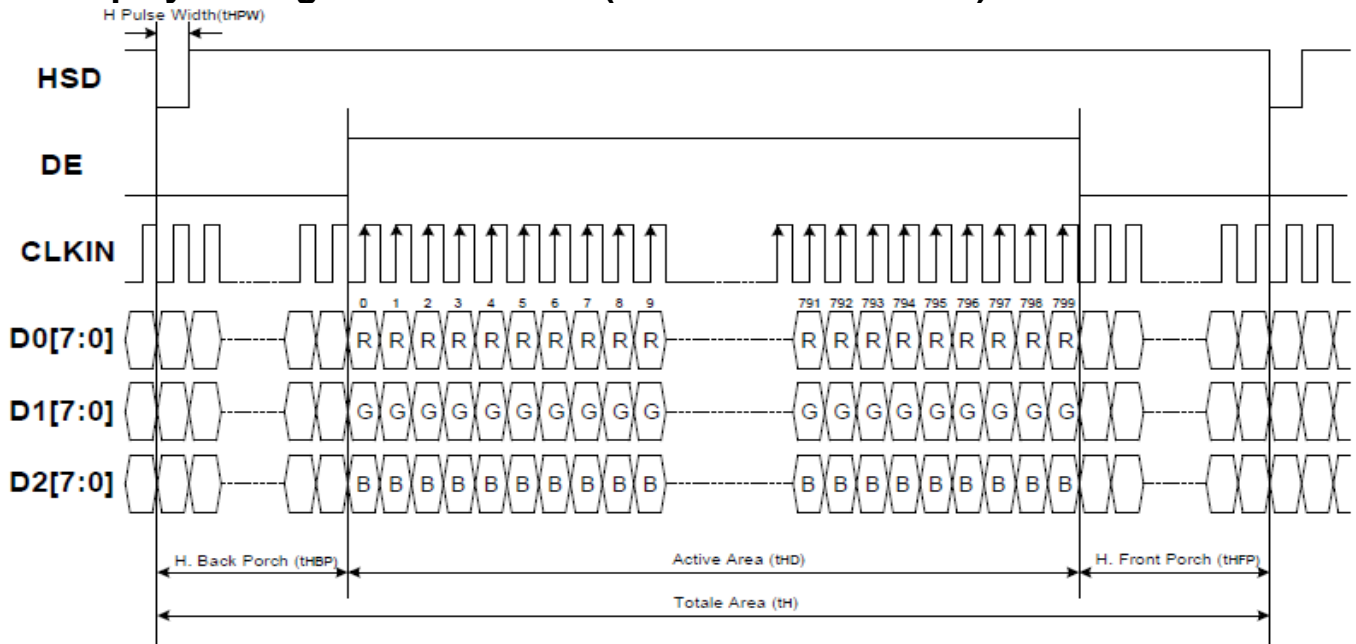
Horizontal Input Timing

Parameter		Symbol	Value			Unit
			Min.	Typ.	Max.	
Horizontal display area		t_{HD}	--	800	--	CLKIN
CLKIN frequency		f_{CLK}	--	33.3	50	MHz
1 Horizontal line period		t_H	862	1056	1200	CLKIN
HSD pulse width	Min.	t_{HPW}	--	1	--	CLKIN
	Typ.		--	--	--	CLKIN
	Max.		--	40	--	CLKIN
HSD back porch	SYNC	t_{HBP}	46	46	46	CLKIN
HSD front porch	SYNC	t_{HFP}	16	210	354	CLKIN
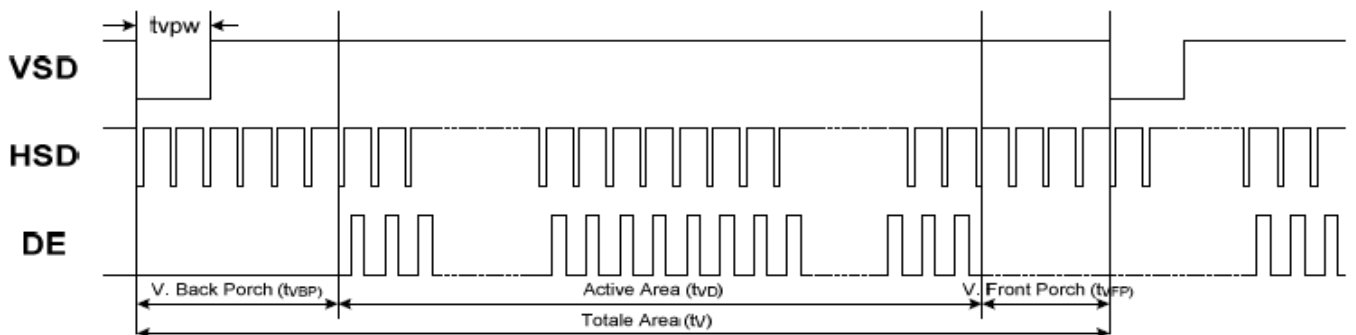
Vertical Input Timing

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	t_{VD}	--	480	--	HSD
VSD period time	t_V	510	525	650	HSD
VSD pulse width	t_{VPW}	1	--	20	HSD
VSD back porch	t_{VBP}	23	23	23	HSD
VSD front porch	t_{VFP}	7	22	147	HSD

8. Backlight Characteristic
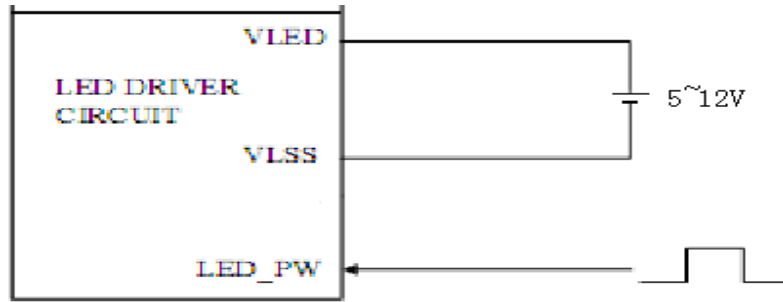
NOTE (1) : ADJUST THE PWM SIGNAL IN ORDER TO CONTROL LED BACKLIGHTS BRIGHTNESS. THE HIGHER THE DUTY CYCLE, THE HIGHER THE BRIGHTNESS LUMINANCE
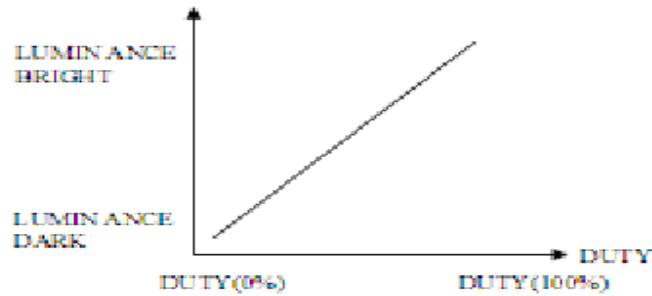
NOTE (2) : PWM SIGNAL=0~3.3V, OPERATION FREQUENCY : 100+/-5 KHz
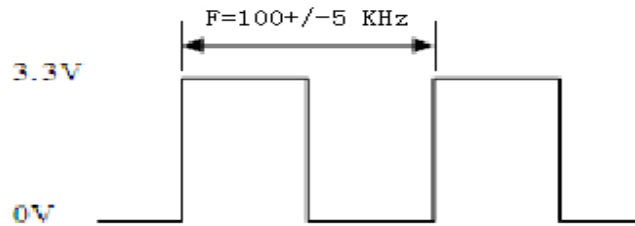
Item		Symbol	MIN	TYP	MAX	UNIT	NOTE
Backlight Power		LED_VCC	3	5	15	V	Ta = 25°C
Backlight Power		ILED_VCC	-	(0.15)	(0.2)	A	LED_VCC=5V
			-	(0.07)	(0.1)	A	LED_VCC=12V
EN Signal Voltage	VIH	BL_CON	1.2			V	
	VIL		GND		0.4	V	
PWM Frequency		LED_PWM	5		100	Hz	
Lifetime			50000	-	-	Hr	
Color		White					
Average Brightness			-	300	350	-	Cd/cm2
Luminance uniformity			-	--	80	-	%

9. Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR>10)	Horizontal	θL	-	70	-	degree	(1),(2),(6)
		θR	-	70	-		
	Vertical	θT	-	50	-		
		θB	-	70	-		
Contrast Ratio	Center		400	500	-	-	(1),(3),(6)
Response Time	Rising		-	10	20	ms	(1),(4),(6)
	Falling		-	15	30		
CF Color Chromaticity (CIE1931)	Red x		Typ. -0.05	TBD	Typ. +0.05	-	(1), (6)
	Red y			TBD		-	
	Green x			TBD		-	
	Green y			TBD		-	
	Blue x			TBD		-	
	Blue y			TBD		-	
	White x			TBD		-	
	White y			TBD		-	
NTSC			-	61.	-	%	(1),(6)

Note (1) Measurement Setup: The LCD module should be stabilized at given temp. 25°C for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.
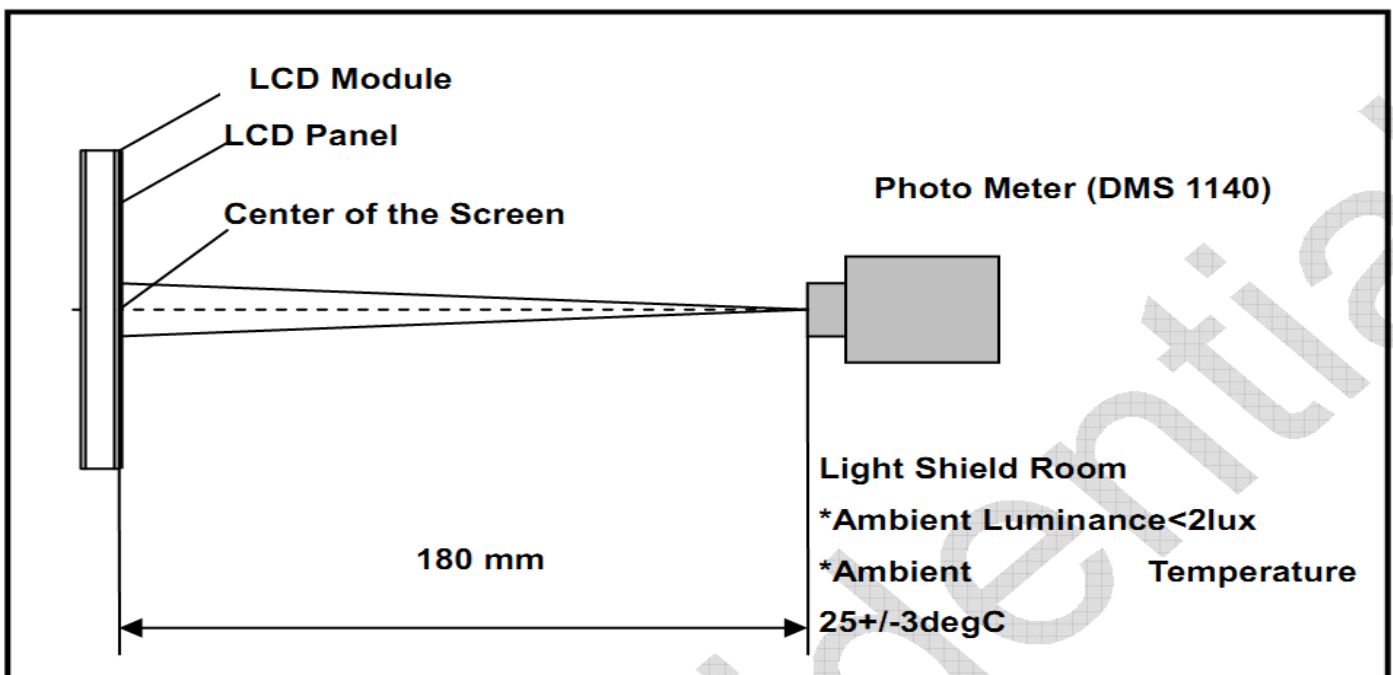
Note (2) Definition of Viewing Angle
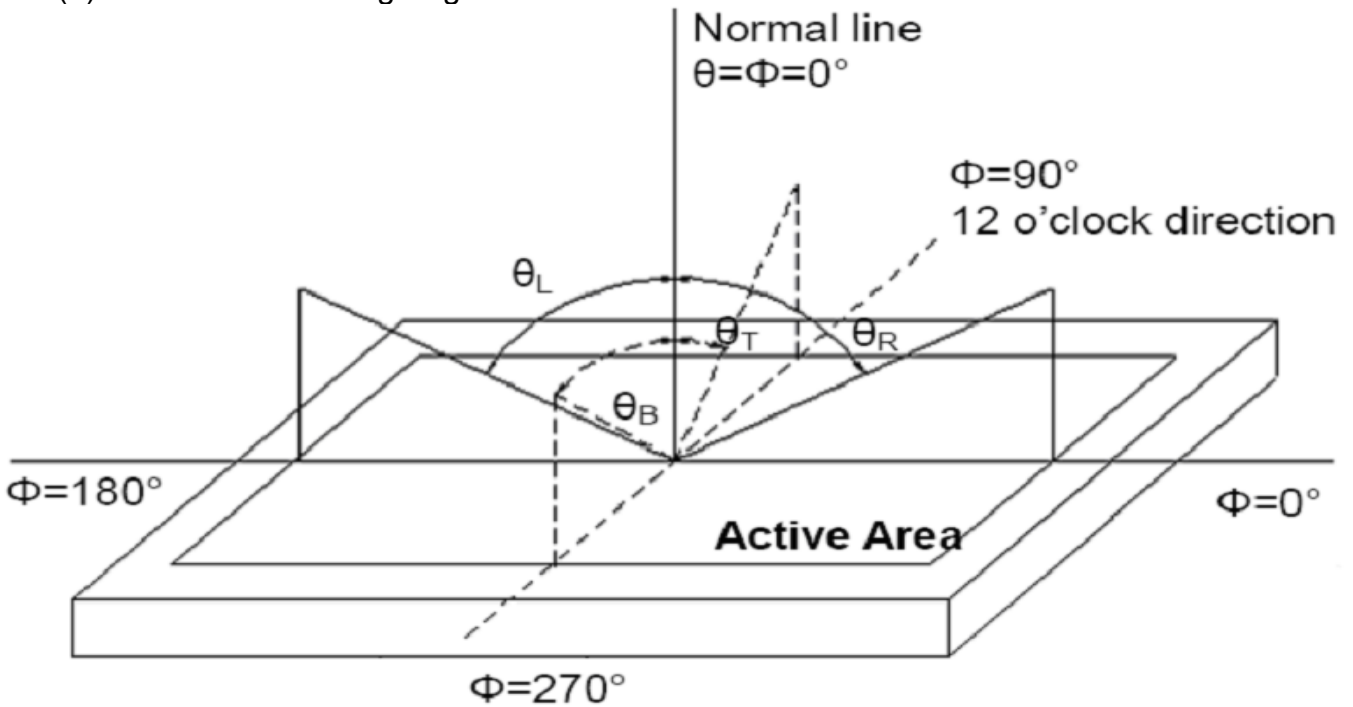
Note (3) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63, L0: Luminance of gray level 0

Note (4) Definition of response time
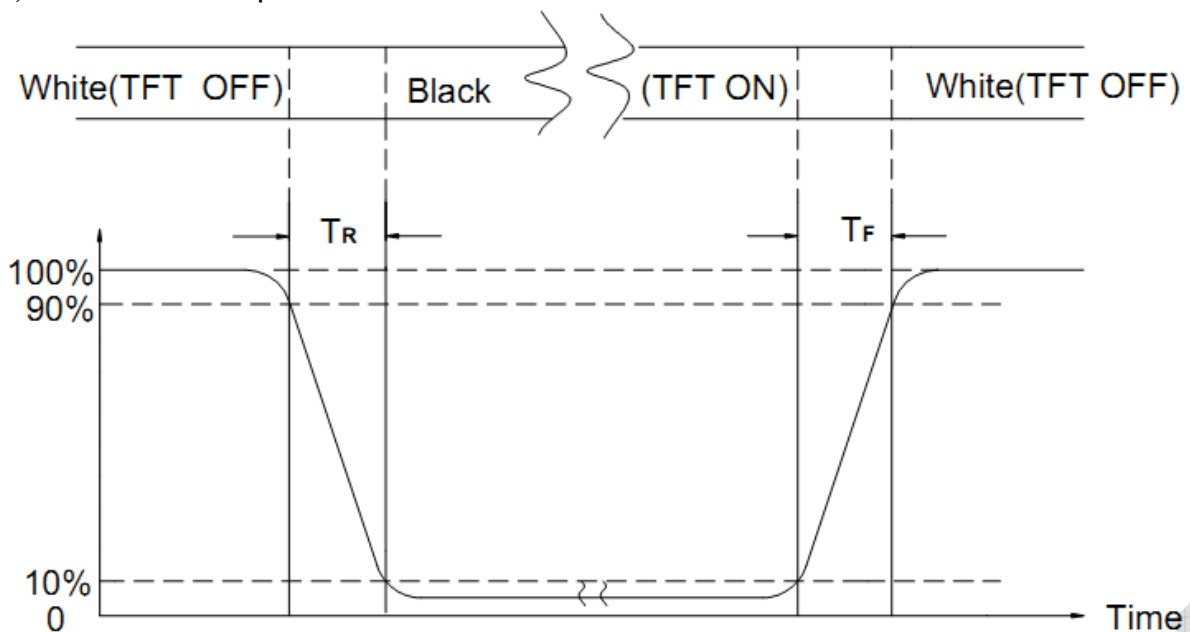
Note (5) Definition of Transmittance (Module is without signal input)

Transmittance = Center Luminance of LCD / Center Luminance of Back Light x 100%

Note (6) Definition of color chromaticity (CIE1931)

Color coordinates measured at the center point of LCD

10. Reliability Test Conditions and Methods

NO.	TEST ITEMS	TEST CONDITION	INSPECTION AFTER TEST
	High Temperature Storage	80°C±2°C×96Hours	Inspection after 2~4hours storage at room temperature, the samples should be free from defects: 1, Air bubble in the LCD. 2, Seal leak. 3, Non-display. 4, Missing segments. 5, Glass crack. 6, Current IDD is twice higher than initial value. 7, The surface shall be free from damage. 8, The electric characteristic requirements shall be satisfied.
	Low Temperature Storage	-30°C±2°C×96Hours	
	High Temperature Operating	70°C±2°C×96Hours	
	Low Temperature Operating	-20°C±2°C×96Hours	
	Temperature Cycle(Storage)	-20°C ⟷ 25°C ⟷ 70°C (30min) (5min) (30min) 1cycle Total 10cycle	
	Damp Proof Test (Storage)	50°C±5°C×90%RH×96Hours	
	Vibration Test	Frequency:10Hz~55Hz~10Hz Amplitude:1.5MM X,Y,Z direction for total 3hours (packing condition test will be tested by a carton)	
	Drooping Test	Drop to the ground from 1M height one time every side of carton. (packing condition test will be tested by a carton)	
	ESD Test	Voltage:±8KV,R:330Ω,C:150PF,Air Mode,10times	

REMARK:
1, The Test samples should be applied to only one test item.
2, Sample side for each test item is 5~10pcs.
3,For Damp Proof Test, Pure water(Resistance＞10MΩ)should be used.
4,In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.
5, EL evaluation should be accepted from reliability test with humidity and temperature: Some defects such as black spot/blemish can happen by natural chemical reaction with humidity and Fluorescence EL has.
6, Failure Judgment Criterion: Basic Specification Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

11. Inspection Standard
11.1. QUALITY :
THE QUALITY OF GOODS SUPPLIED TO PURCHASER SHALL COME UP TO THE FOLLOWING STANDARD.

11.1.1. INSPECTIONTOOLS AND INSTRUMENTS
Vernier calipers, film scales, multimeter, magnifying eyepiece, ND5%, luminance meter and so on.

11.1.2. THE METHOD OF PRESERVING GOODS
AFTER DELIVERY OF GOODS FROM AMSON TO PURCHASER. PURCHASER SHALL CONTROL THE LCM   AT -10 TO 40 ,AND IT MIGHT BE DESIRABLE TO KEEP AT THE NORMAL ROOM TEMPERATURE AND HUMIDITY UNTIL INCOMING INSPECTION OR THROWING INTO PROCESS LINE.

11.1.3. INCOMING INSPECTION
(A) THE METHOD OF INSPECTION

IF PURCHASER MAKE AN INCOMING INSPECTION , A SAMPLING PLAN SHALL BE APPLIED ON THE CONDITION THAT QUALITY OF ONE DELIVERY SHALL BE REGARDED AS ONE LOT.

(B) THE STANDARD OF QUALITY

ISO-2859-1 (SAME AS MIL-STD-105E) ,LEVEL:Ⅱ

CLASS	AQL(%)
CRITICAL	0.4 %
MAJOR	0.65 %
MINOR	1.5 %

EVERY ITEM SHALL BE INSPECTED ACCORDING TO THE CLASS.

(C) MEASURE

IF AS THE RESULT OF ABOVE RECEIVING INSPECTION , A LOT OUT IS DISCOVERED. PURCHASER SHALL BE INFORM SELLER OF IT WITHIN SEVEN DAYS. BUT FIRST SHIPMENT WITHIN FOURTEEN DAYS.

11.1.4. WARRANTY POLICY
AMSON WILL PROVIDE ONE-YEAR WARRANTY FOR THE PRODUCTS ONLY IF UNDER SPECIFICATION OPERATING CONDITIONS. AMSON WILL REPLACE NEW PRODUCTS FOR THESE DEFECT PRODUCTS WHICH UNDER WARRANTY PERIOD AND BELONG TO THE RESPONSIBILITY OF AMSON.

11.2. CHECKING CONDITION
11.2.1. CHECKING DIRECTION SHALL BE IN THE 45 DEGREE AREA TO FACE THE SAMPLE.

11.2.2. CHECKER SHALL SEE OVER 300±25 mm. WITH BARE EYES FAR FROM SAMPLE

11.2.3. Ambient Illumination:

0 ~30 Lux for functional inspection

500 ~ 1200 Lux for external appearance inspection.

11.2.4. TEST AREA：

END SEAL

可视区
显示区
边框
电极
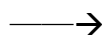
11.2.5. Inspection should be carried out with rope electrostatic ring and static finger cover (both hands except small fingers must be worn)
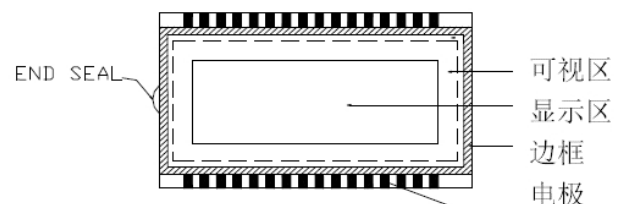
11.2.6. The inspector may make a visual inspection or a comparative examination with a film ruler and a magnifying eyepiece. Individual defects shall be determined according to the limited samples.

11.2.7. Functional testing uses electrical testing fixtures or test fixtures required by customers.
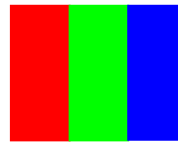
11.2.8. the ion fan should be used when testing.

11.2.9. the principle of judgment

11.3.1 If the defect outside the visual area does not affect the assembly and display, it will be judged as a good product.

11.3.2 Poor definition

Pixel:
A combination of three sub-pixels (Red + Green + Blue).

Dot:
Any of the sub-pixels (Red or Green or Blue).
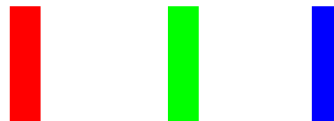
Bright and dark dots:
A point pixel (sub-pixel: R, G, B pixels) is lit or turned off during the display function test.

Highlights:
Usually considered to be shown on a black screen.
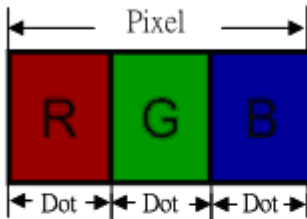
Dark spots:
They are generally considered to be shown on R, G, B solid colors or white images.
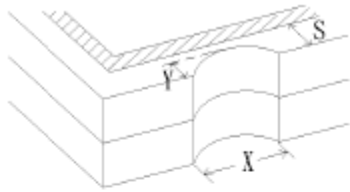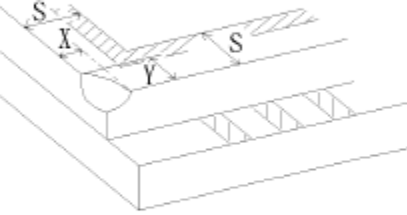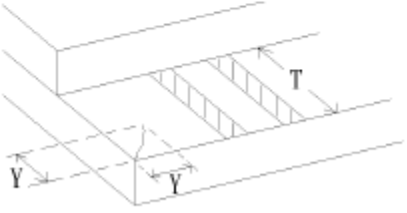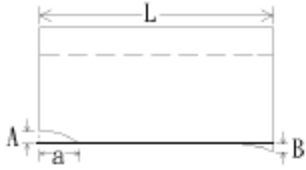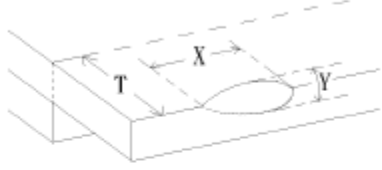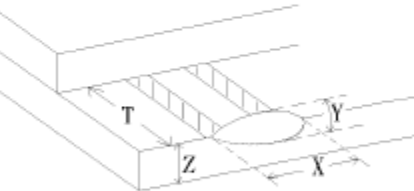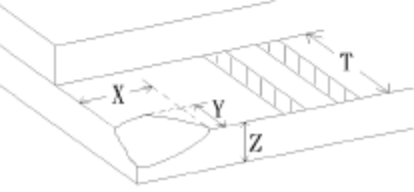
Neighborhood:
Two or three adjacent point pixels (dot: sub-pixel) connected together (R, G or G, B or B, R or RGB).

11.3. INSPECTION PLAN :

CLASS	ITEM	JUDGEMENT	CLASS
PACKING & INDICATE	1. OUTSIDE AND INSIDE PACKAGE	"MODEL NO." , "LOT NO." AND "QUANTITY" SHOULD INDICATE ON THE PACKAGE.	Minor
	2. MODEL MIXED AND QUANTITY	OTHER MODEL MIXED...............REJECTED QUANTITY SHORT OR OVER......REJECTED	Critical
	3. PRODUCT INDICATION	"MODEL NO." SHOULD INDICATE ON THE PRODUCT	Major

ASSEMBLY	4. DIMENSION,
	    LCD GLASS SCRATCH
	    AND SCRIBE DEFECT.
		ACCORDING TO SPECIFICATION OR DRAWING.	Major

APPEARANCE	5. VIEWING AREA	POLARIZER EDGE OR LCD'S SEALING LINE IS VISABLE IN THE VIEWING AREA ....REJECTED	Minor

	6. BLEMISH、BLACK SPOT、
	    WHITE SPOT IN THE LCD
	    AND LCD GLASS CRACKS
		ACCORDING TO STANDARD OF VISUAL INSPECTION(INSIDE VIEWING AREA)	Minor

	7. BLEMISH、BLACK SPOT
	    WHITE SPOT AND SCRATCH
	    ON THE POLARIZER
		ACCORDING TO STANDARD OF VISUAL INSPECTION(INSIDE VIEWING AREA)	Minor

	8. BUBBLE IN POLARIZER	ACCORDING TO STANDARD OF VISUAL INSPECTION(INSIDE VIEWING AREA)	Minor
	9. LCD'S RAINBOW COLOR	STRONG DEVIATION COLOR (OR NEWTON RING) OF LCD......REJECTED. OR ACCORDING TO LIMITED SAMPLE (IF NEEDED, AND INSIDE VIEWING AREA)	Minor

ELECTRICAL	10. ELECTRICAL AND OPTICAL
	    CHARACTERISTICS
	    (CONTRAST、VOP、
	    CHROMATICITY ... ETC)
		ACCORDING TO SPECIFICATION OR DRAWING . (INSIDE VIEWING AREA)	Critical

	11.MISSING LINE	MISSING DOT、LINE、CHARACTER ....REJECTED	Critical
	12.SHORT CIRCUIT、 WRONG PATTERN DISPLAY	NO DISPLAY、WRONG PATTERN DISPLAY、CURRENT CONSUMPTION OUT OF SPECIFICATION...... REJECTED	Critical
	13. DOT DEFECT (FOR COLOR AND TFT)	ACCORDING TO STANDARD OF VISUAL INSPECTION	Minor

NO.	CLASS	ITEM	JUDGEMENT
11.4.1	MINOR	BLACK AND WHITE SPOT FOREIGN MATERIEL DUST IN THE CELL BLEMISH SCRATCH	(A) ROUND TYPE: unit : mm. (B) LINEAR TYPE: unit : mm.
11.4.2	MINOR	BUBBLE IN POLARIZER DENT ON POLARIZER	unit : mm.
11.4.3	MINOR	Dot Defect	
11.4.4	MINOR	Mura	Not visible thriugh 5% ND filter in 50% gray or judge by limit sample if necessary

(A) ROUND TYPE: unit : mm.

DIAMETER (mm.)	ACCEPTABLE Q'TY
$\Phi \leq 0.15$	Distance≥1mm
$0.15 < \Phi \leq 0.4$	3 (Distance>15mm)
$0.4 < \Phi$	0

NOTE: Φ=(LENGTH+WIDTH)/2

(B) LINEAR TYPE: unit : mm.

LENGTH	WIDTH	ACCEPTABLE Q'TY
------	$W \leq 0.03$	Distance≥1mm
$L \leq 4.0$	$0.03 < W \leq 0.05$	3 (Distance>15mm)
------	$0.05 < W$	FOLLOW ROUND TYPE

unit : mm.

DIAMETER	ACCEPTABLE Q'TY
$\Phi \leq 0.2$	Distance≥1mm
$0.2 < \Phi \leq 0.3$	3 (Distance>15mm)
$0.3 < \Phi$	0

Items	ACC. Q'TY
Bright dot	$N \leq 2$ (Distance≥15mm)
Dark dot	$N \leq 3$ (Distance>15mm)

Pixel Define :

Note 1: The definition of dot: The size of a defective dot over 1/2 of whole dot is regarded as one defective dot. Definittion:<1/2dot and visible by 5% ND filter $N \leq 5$

Note 2: Bright dot: Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern.

Note 3: Dark dot: Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green ,blue pattern.

NO.	CLASS	ITEM	JUDGEMENT
11.4.4	MINOR	LCD GLASS CHIPPING	$Y > S$ Reject
11.4.5	MINOR	LCD GLASS CHIPPING	X or $Y > S$ Reject
11.4.6	MAJOR	LCD GLASS GLASS CRACK	$Y > (1/2)\,T$ Reject
11.4.7	MAJOR	LCD GLASS SCRIBE DEFECT	1. $a > L/3$, $A > 1.5$mm. Reject 2. B : ACCORDING TO DIMENSION
11.4.8	MINOR	LCD GLASS CHIPPING (ON THE TERMINAL AREA)	$\Phi = (x+y)/2 > 2.5$ mm Reject
11.4.9	MINOR	LCD GLASS CHIPPING (ON THE TERMINAL SURFACE)	$Y > (1/3)\,T$ Reject
11.4.10	MINOR	LCD GLASS CHIPPING	$Y > T$ Reject

12. Handling Precautions
12.1 Mounting method

The LCD panel of AMSON TFT module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

12.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent
[Recommended below] and wipe lightly
- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:
- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns
Do not use the following solvent on the pad or prevent it from being contaminated:
- Soldering flux
- Chlorine (CI) , Sulfur (S)

If goods were sent without being silicon coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (CI), Sulfur (S) from customer, Responsibility is on customer.

12.3 Caution against static charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to power or ground, do not input any signals before power is turned on, and ground your body, work/assembly areas, and assembly equipment to protect against static electricity.

12.4 packing

- Module employs LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity

12.5 Caution for operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- Slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

12.6 storing

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it. And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.
- Storing with no touch on polarizer surface by the anything else.
  [It is recommended to store them as they have been contained in the inner container at the time of delivery from us.

12.7 Safety

- It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.
- When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water.

13. Precaution for Use

13.1

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

13.2

On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- When a question is arisen in this specification.
- When a new problem is arisen this is not specified in this specification.
- When an inspection specifications change or operating condition change in customer is reported to AMSON TFT and some problem is arisen in this specification due to the change.
- When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.

14. Packing Method
TBD