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	2019-10-14	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.
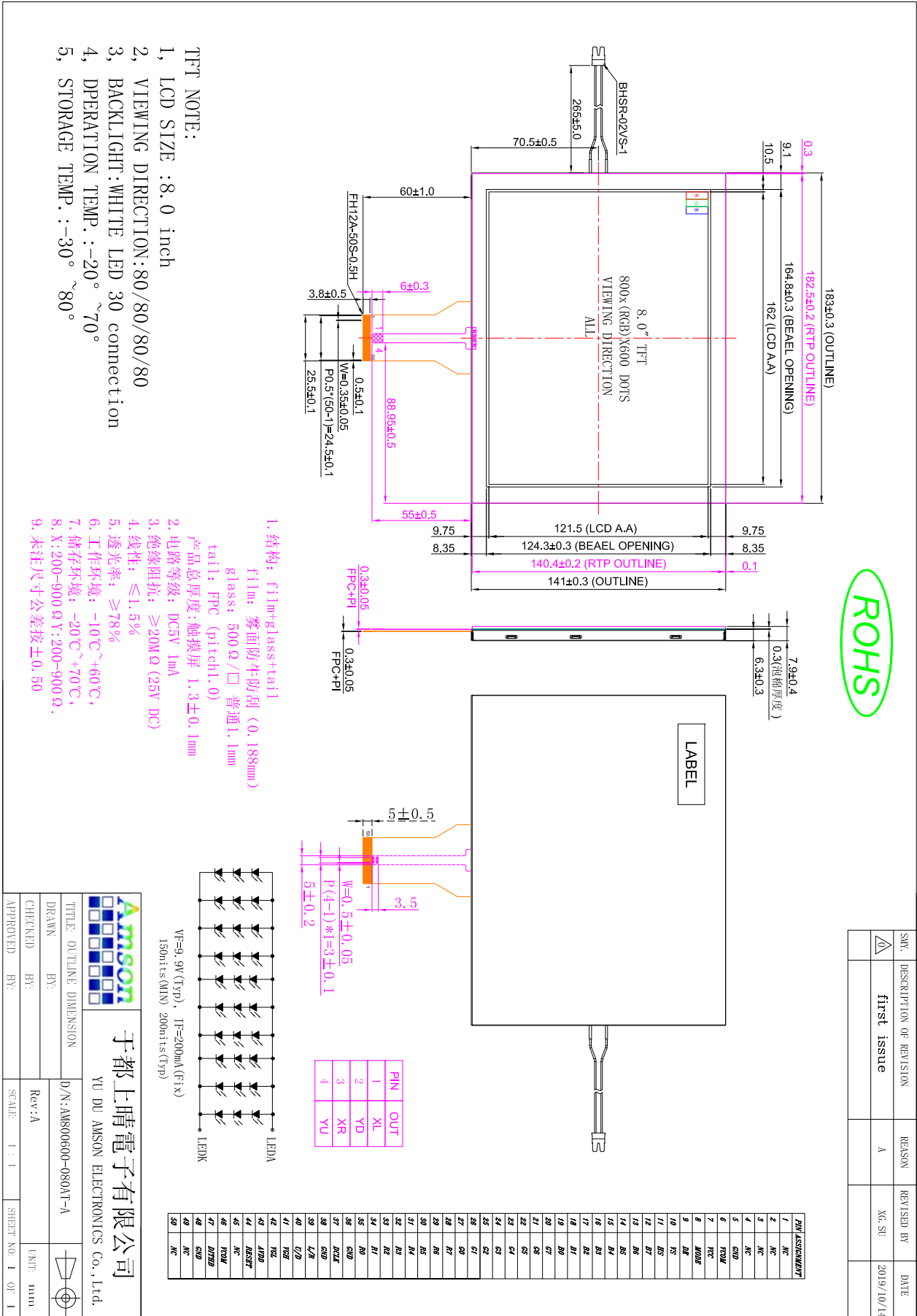
2. General Information

TFT

No.	Item	Specification	Remark
1	LCD size	8.0 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	800 x 3(RGB) x 600	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.0675(W) x 0.2025(H) mm	
6	Active area	162.0(W) x 121.5(H) mm	
7	Module size	183.0(W) x 141.0(H) x 6.3(D) mm	Note 1
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	Digital	
11	Backlight power consumption	1.782W (Typ.)	
12	Panel power consumption	0.356W (Typ.)	
13	Weight	258g (Typ.)	

Note 1: Refer to Mechanical Drawing.

RTP

ITEM	STANDARD VALUES	UNITS
RTP type	Film + Glass + FPC	--
Surface hardness	3H	--
Transmittance	≥78％	--
RTP size	182.5(W)×140.4(H)×1.3(T)	mm
Active area	162.6(W)×121.9(H)	mm
Response Time	≤10ms	ms
Linearity	≤1.5%	%
Operation force	50-120	g
Resistance	X:200Ω ~900Ω Y:200Ω ~ 900Ω	Ω

3. External Dimensions

TFT NOTE：
1、LCD SIZE：8.0 inch
2、VIEWING DIRECTION:80/80/80/80
3、BACKLIGHT:WHITE LED 30 connection
4、DPERATION TEMP.：-20°～70°
5、STORAGE TEMP.：-30°～80°

1.结构：film+glass+tail
 film：雾面防牛防刮（0.188mm）
 glass：500Ω/□ 普通1.1mm
 tail：FPC（pitch1.0）
2.产品总厚度:触摸屏 1.3±0.1mm
3.电路等级：DC5V 1mA
4.绝缘阻抗：≥20MΩ（25V DC）
5.透光率：≥78%
6.工作环境：-10℃~+60℃,
7.储存环境: -20℃~+70℃,
8.X:200~900ΩY:200~900Ω.
9.未注尺寸公差拔±0.50

8.0" TFT
800x(RGB)X600 DOTS
VIEWING DIRECTION
ALL

183±0.3 (OUTLINE)
182.5±0.2 (RTP OUTLINE)
164.8±0.3 (BEAEL OPENING)
162 (LCD A.A)

BHSR-02VS-1
265±5.0
70.5±0.5
60±1.0
FH12A-50S-0.5H
3.8±0.5
6±0.3
25.5±0.1
88.95±0.5
55±0.5
0.5±0.1
W=0.35±0.05
P0.5*(50-1)=24.5±0.1

9.1
10.5
0.3

9.75   121.5 (LCD A.A)   9.75
8.35   124.3±0.3 (BEAEL OPENING)   8.35
140.4±0.2 (RTP OUTLINE)   0.1
141±0.3 (OUTLINE)

0.3±0.05
FPC+PI
FPC+PI
0.3±0.05

7.9±0.4
0.3(泡棉厚度)
6.3±0.3

LABEL

ROHS

5±0.5
W=0.5±0.05
P(4-1)=3.5
3.5
5±0.2
P(4-1)*1=3±0.1

VF=9.9V(Typ), IF=200mA(Fix)
150nits(MIN) 200nits(Typ)

LEDK   LEDA

PIN	OUT
1	XL
2	YD
3	XR
4	YU

于都上晴電子有限公司
YU DU AMSON ELECTRONICS Co., Ltd.

TITLE: OUTLINE DIMENSION
D/N:AM800600-080AT-A
Rev:A
SCALE: 1:1
SHEET NO. 1 OF 1
UNIT: mm

DRAWN BY:
CHECKED BY:
APPROVED BY:

SYM.	DESCRIPTION OF REVISION	REASON	REVISED BY	DATE
A	first issue	A	XG,SU	2019/10/14

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

4. Interface Description

TFT

PIN	PIN NAME	DESCRIPTION	REMARK
1	NC	No connection	
2	NC	No connection	
3	NC	No connection	
4	NC	No connection	
5	GND	Power ground	
6	VCOM	Common voltage	
7	VCC	Power for Digital Circuit	
8	MODE	DE/SYNC mode select	Note 3
9	DE	Data Input Enable	
10	VS	Vertical Sync Input	
11	HS	Horizontal Sync Input	
12	B7	Blue data(MSB)	
13	B6	Blue data	
14	B5	Blue data	
15	B4	Blue data	
16	B3	Blue data	
17	B2	Blue data	
18	B1	Blue data	
19	B0	Blue data(LSB)	
20	G7	Green data(MSB)	
21	G6	Green data	
22	G5	Green data	
23	G4	Green data	
24	G3	Green data	
25	G2	Green data	
26	G1	Green data	
27	G0	Green data(LSB)	
28	R7	Red data(MSB)	
29	R6	Red data	
30	R5	Red data	

31	R4	Red data	
32	R3	Red data	
33	R2	Red data	
34	R1	Red data	
35	R0	Red data(LSB)	
36	GND	Power Ground	
37	DCLK	Sample clock	
38	GND	Power Ground	
39	L/R	Left / right selection	Note 2,5
40	U/D	Up/down selection	Note 2,5
41	VGH	Gate ON Voltage	
42	VGL	Gate OFF Voltage	
43	AVDD	Power for Analog Circuit	
44	RESET	Global reset pin	Note 1
45	NC	No connection	
46	VCOM	Common Voltage	
47	DITHB	Dithering function	Note 4
48	GND	Power Ground	
49	NC	No connection	
50	NC	No connection	

Note 1: Global reset pin. Active Low to enter Reset State. Suggest to connecting with an RC reset circuit for stability. Normally pull high.

Note 2: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	R/L	
GND	V_{CC}	Up to down, left to right
V_{CC}	GND	Down to up, right to left
GND	GND	Up to down, right to left
V_{CC}	V_{CC}	Down to up, left to right

Note 3: DE/SYNC mode select, Normally pull high.
H: DE mode.
L: HS/VS mode.

Note4: Dithering function enable control .Normally pull high.
DITHB="1",Disable internal dithering function. For 18bit RGB interface, connect two LSB bits of all the R/G/B data buses to GND.
DITHB="0",Enable internal dithering function, For TTL 24bit parallel RGB image data input.

Note 5: Definition of scanning direction.
     Refer to the figure as below:
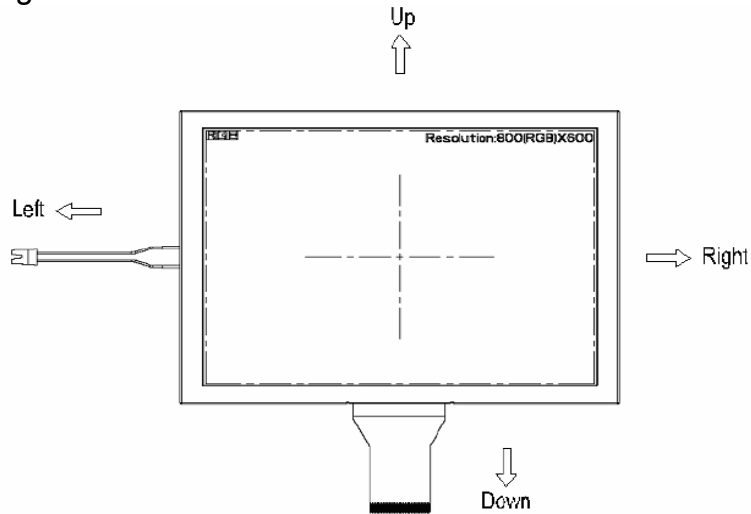
RTP

PIN	PIN NAME	DESCRIPTION
1	XL	TP Left
2	YD	TP Bottom
3	XR	TP Right
4	YU	TP Up

5. Absolute Maximum Ratings

(GND=AV$_{SS}$=0V, Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	V$_{CC}$	-0.3	5.0	V	
	AV$_{DD}$	-0.5	13.5	V	
	V$_{GH}$	13.0	19.0	V	
	V$_{GL}$	-12.0	-2.0	V	
	V$_{GH}$-V$_{GL}$	-	31.0	V	
Operation Temperature Storage Temperature	T$_{OP}$	-20	70	℃	
	T$_{ST}$	-30	80	℃	
LED Reverse Voltage	V$_R$	-	1.2	V	each LED Note 2
LED Forward Current	I$_F$	-	25	mA	each LED

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

Note 2: VR Conditions: Saner Diode 20mA

6. DC Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	V_{CC}	3.0	3.3	3.6	V	Note 2
	AV_{DD}	10.2	10.4	10.6	V	
	V_{GH}	15.3	16.0	16.7	V	
	V_{GL}	-7.7	-7.0	-6.3	V	
Input signal voltage	V_{COM}	3.5	3.7	3.9	V	
Input logic high voltage	V_{IH}	$0.7V_{CC}$	-	V_{CC}	V	Note 3
Input logic low voltage	V_{IL}	0	-	$0.3V_{CC}$	V	

Note 1: Be sure to apply VCC and VGL to the LCD first, and then apply VGH.
Note 2: VCC setting should match the signals output voltage (refer to Note 3) of customer's
        system board .

Note 3: DCLK, HS, VS, RSTB, UPDN, STLR, MODE, DITHB.

Current Consumption

(GND=AV_{SS}=0V)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.2	0.5	mA	V_{GH} =16.0V
	I_{GL}	-	0.2	1.0	mA	V_{GL} = -7.0V
	I_{CC}	-	5.5	10.0	mA	V_{CC} =3.3V
	IAV_{DD}	-	32.0	50.0	mA	AV_{DD} =10.4V

7. Timing Characteristics
7.1 AC Electrical Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
HS setup time	T_{hst}	8	-	-	Ns	
HS hold time	T_{hhd}	8	-	-	Ns	
VS setup time	T_{vst}	8	-	-	Ns	
VS hold time	T_{vhd}	8	-	-	Ns	
Data setup time	T_{dsu}	8	-	-	Ns	
Data hole time	T_{dhd}	8	-	-	Ns	
DE setup time	T_{esu}	8	-	-	Ns	
DE hole time	T_{ehd}	8	-	-	Ns	
VDD Power On Slew rate	T_{POR}	-	-	20	ms	
RSTB pulse width	T_{Rst}	10	-	-	us	
CLKIN cycle time	T_{coh}	20	-	-	Ns	
CLKIN pulse duty	T_{cwh}	40	50	60	%	
Output stable time	T_{sst}	-	-	6	us	

7.2 Timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	-	40	50	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Back Porch(Blanking)	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tvd	-	600	-	TH	
VS period time	tv	624	635	700	TH	
VS pulse width	tvpw	1	-	20	TH	
VS Back Porch(Blanking)	tvb	23	23	23	TH	
VS Front Porch	tvfp	1	12	77	TH	

7.3 Timing Diagram
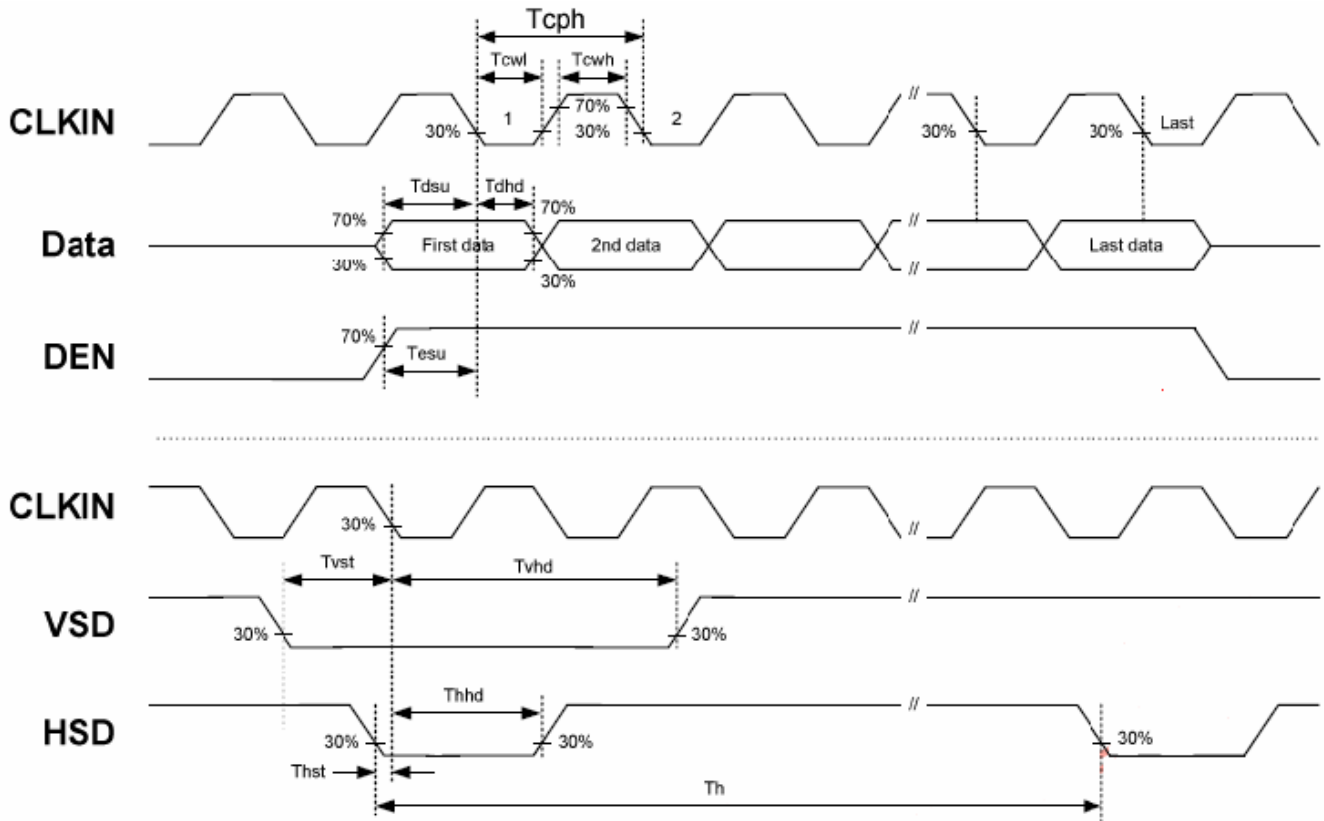
Input Clock and Data Timing Diagram
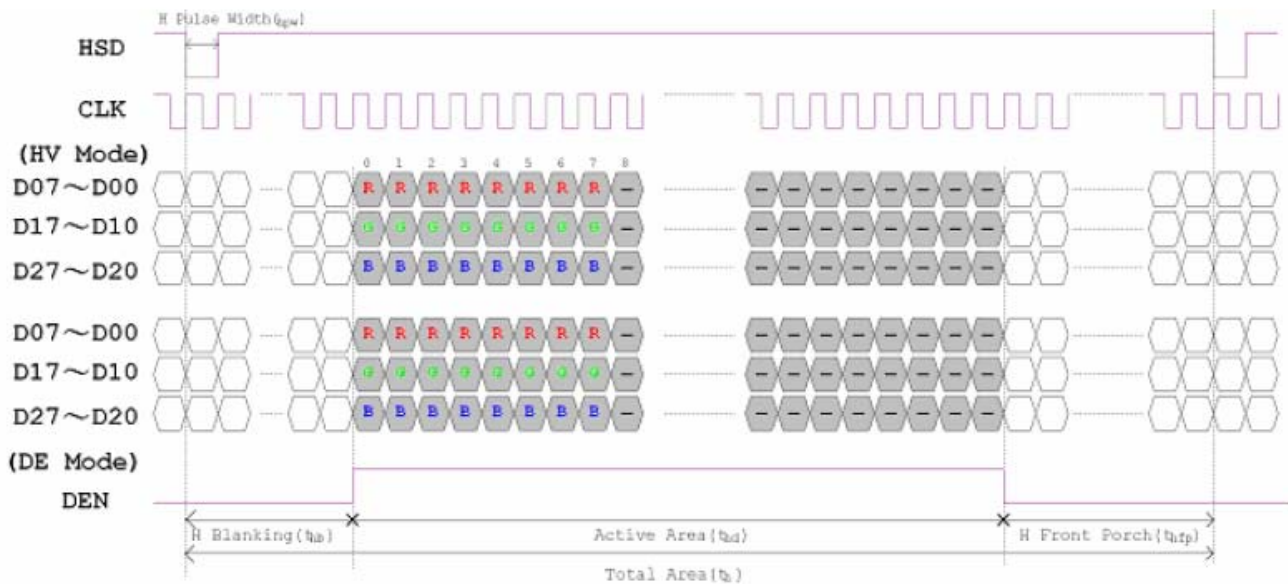
Horizontal input timing diagram.

7.4 Power ON/OFF SEQUENCE

Power on:

VCC→VGL→VGH→Data→B/L

Power off:

B/L→Data→VGH→VGL→VCC
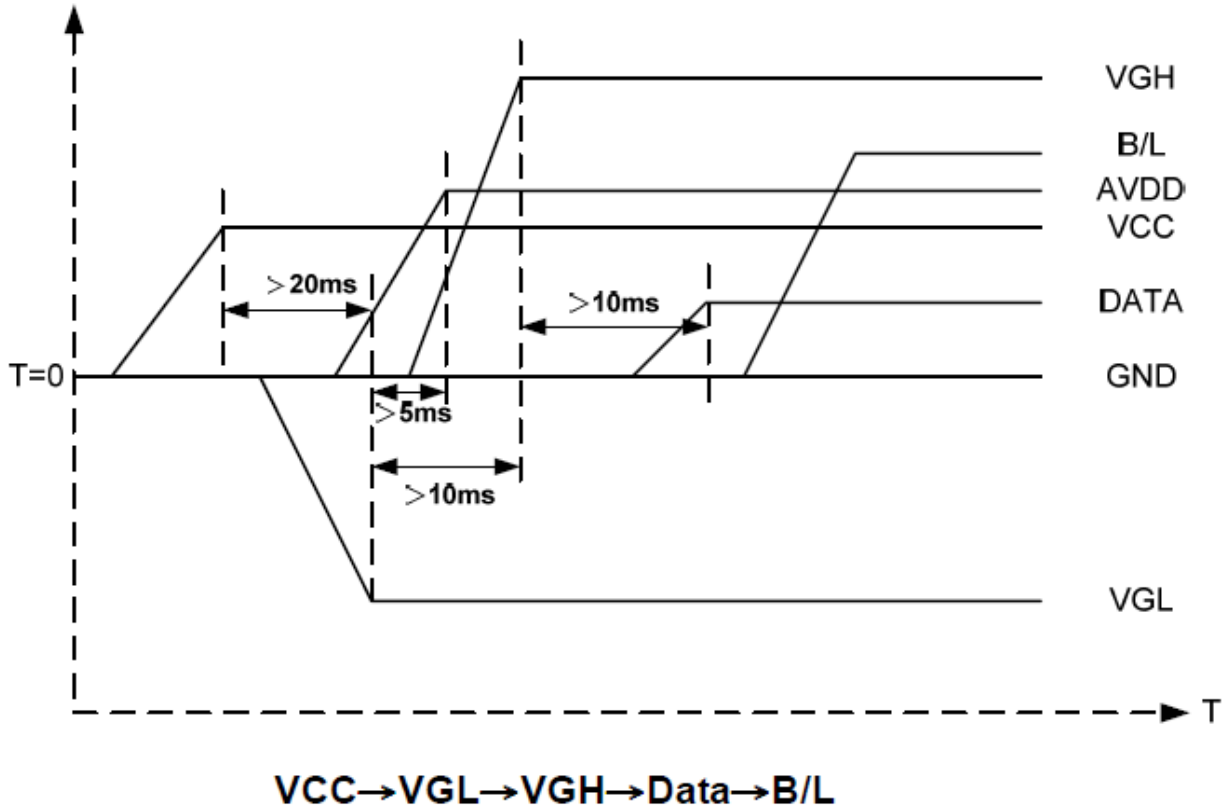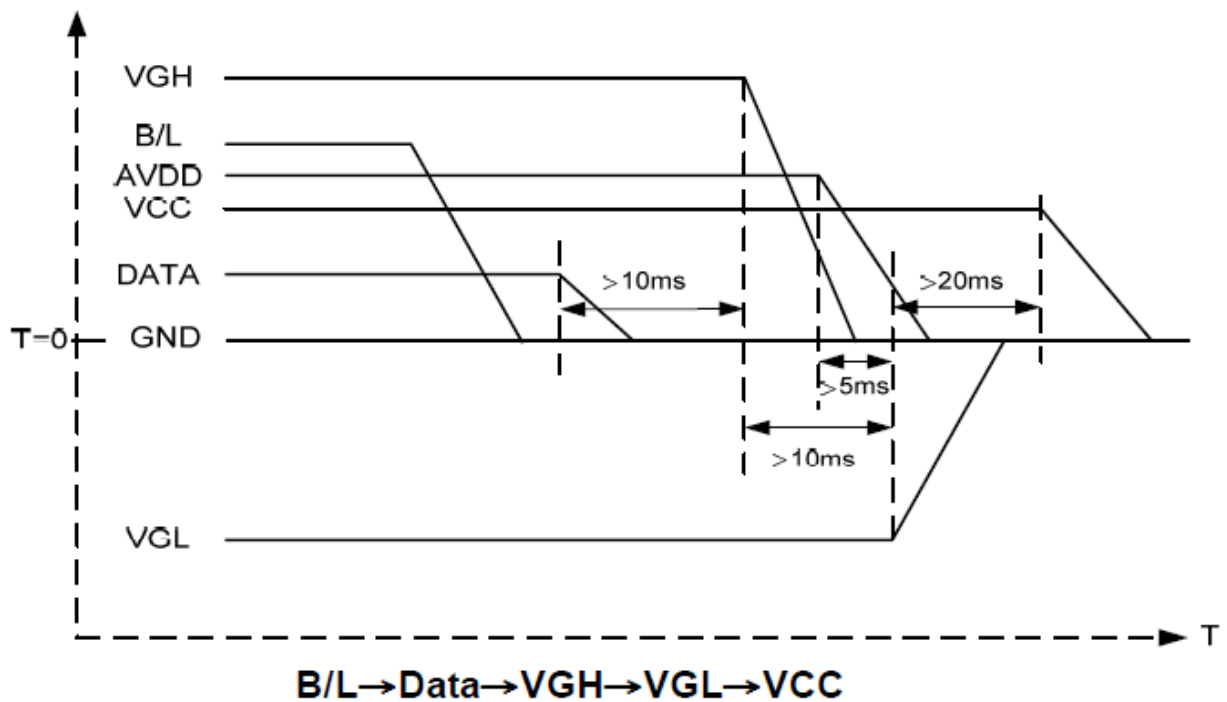
Note: Data include R0~R5, B0~B5, G0~G5, STLR,UPDN, DCLK, HS,VS,DE.

8. Backlight Characteristic

Pin No.	Symbol	I/O	Function	Remark
1	V_{LED+}	P	Power for LED backlight anode	Pink
2	V_{LED-}	P	Power for LED backlight cathode	Black

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	V_L	9.3	9.9	10.5	V	Note 1
Current for LED backlight	I_L	-	**200**	-	mA	
LED life time	-	20,000	-	-	Hr	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and
IL =200mA.

Note 2: The "LED life time" is defined as the module brightness decrease to 50% original
brightness at Ta=25℃ and IL =200mA. The LED lifetime could be decreased if
Operating IL is larger than 200mA.

9. Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR>10)	Horizontal	θL	70	80	-	degree	(1),(2),(6)
		θR	70	80	-		
	Vertical	θT	70	80	-		
		θB	70	80	-		
Center Luminance of White	Lc		150	200	-	cd/m^2	
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	-	Typ. +0.05	-	(1), (6)
	Red y			-		-	
	Green x			-		-	
	Green y			-		-	
	Blue x			-		-	
	Blue y			-		-	
	White x			0.310		-	
	White y			0.330		-	

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.
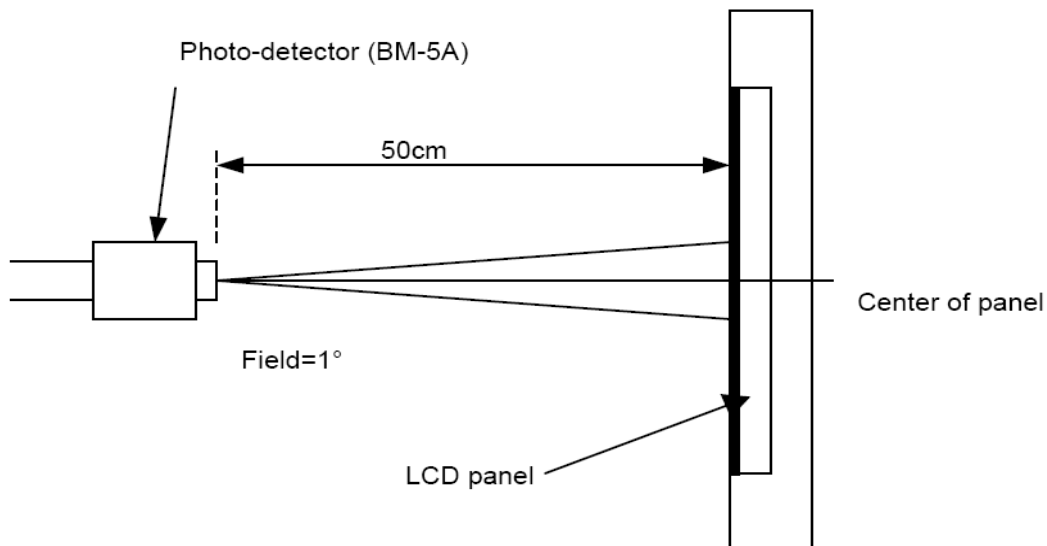
Note (2) Definition of Viewing Angle
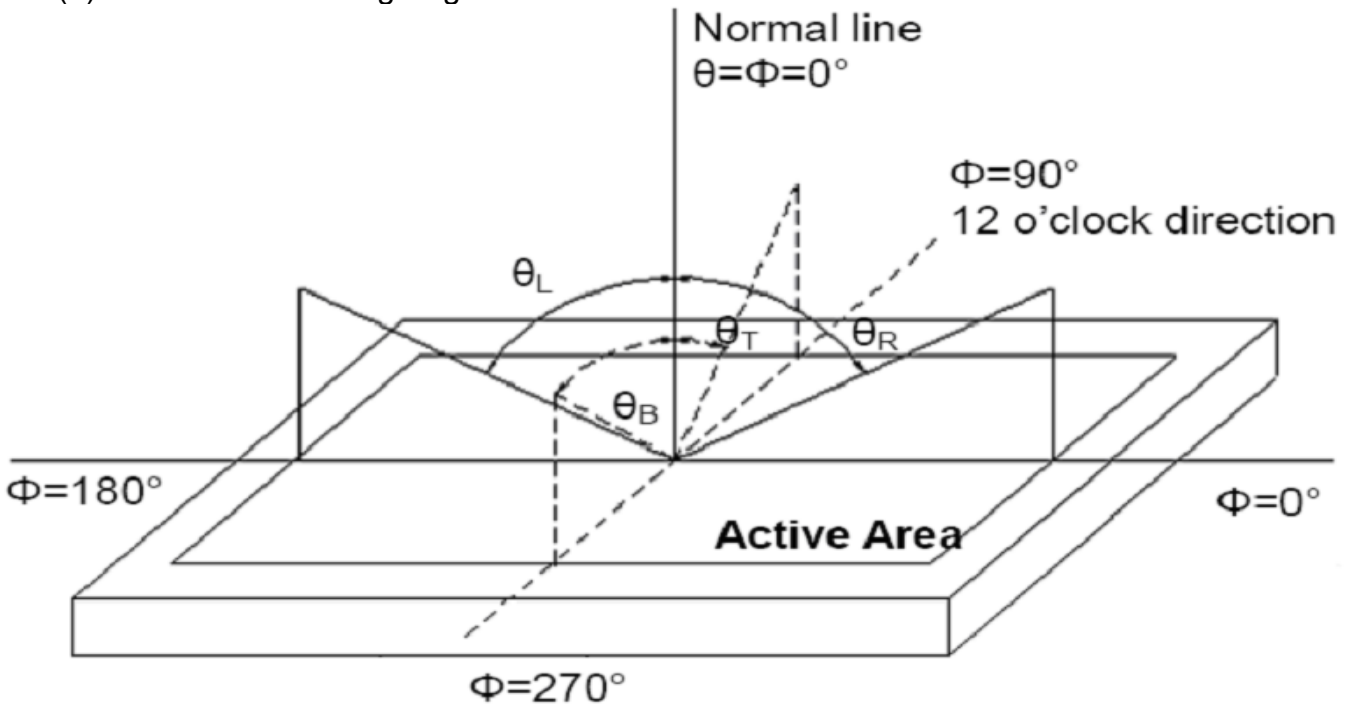
Note (3) Definition of Contrast Ratio (CR)
    The contrast ratio can be calculated by the following expression
    Contrast Ratio (CR) = L63 / L0
    L63: Luminance of gray level 63, L0: Luminance of gray level 0
Note (4) Definition of response time
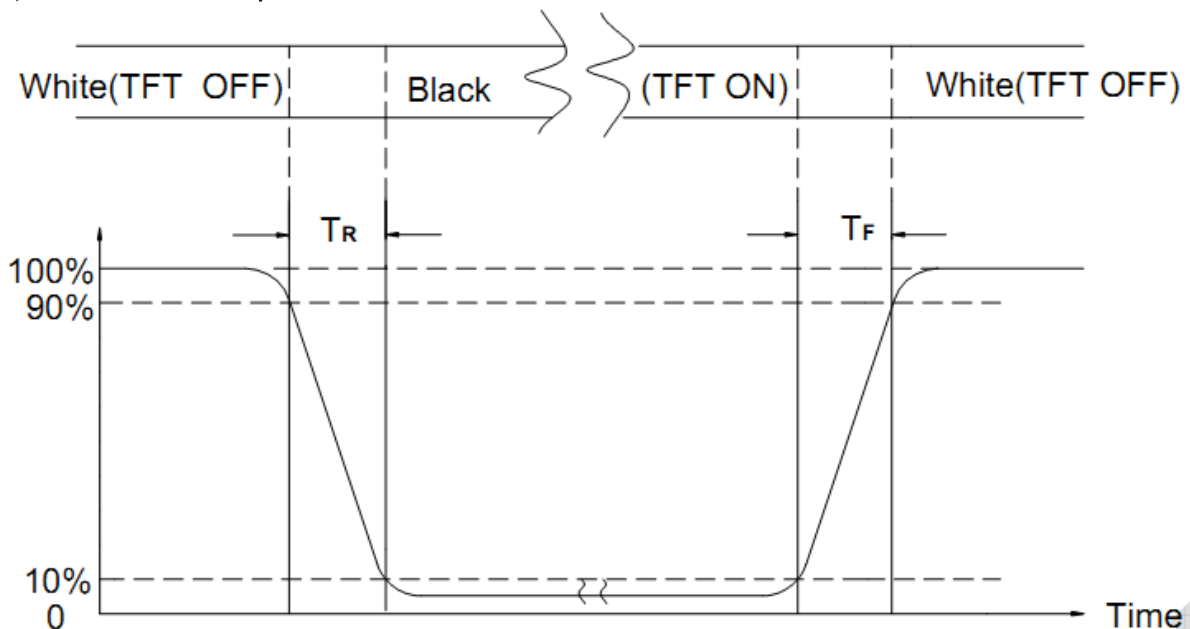
Note (5) Definition of Transmittance (Module is without signal input)
    Transmittance = Center Luminance of LCD / Center Luminance of Back Light x 100%

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
①	High Temperature Storage	Keep in 80°C ±5℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.
②	Low Temperature Storage	Keep in -30°C ±5℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.
③	High Temperature / High Humidity Storage Test	Keep in 50 ℃ / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)
④	Temperature Cycling Storage Test	-20°C → +25℃ → 70°C → +25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle Surrounding temperature, then storage at normal condition 4hrs.
⑤	ESD Test	Air Discharge: Apply 2 KV with 5 times Discharge for each polarity +/-　　Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/- 1. Temperature ambiance : 15℃～35℃ 2. Humidity relative : 30%～60% 3. Energy Storage Capacitance(Cs + Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330Ω±10% 5. Discharge, mode of operation : Single Discharge (time between successive discharges at least 1 sec)　　(Tolerance if the output voltage indication : ±5%)
⑥	Vibration Test (Packaged)	1. Sine wave 10～55 Hz frequency (1 min/sweep) 2. The amplitude of vibration :1.5 mm 3. Each direction (X、Y、Z) duration for 2 Hrs
⑦	Drop Test (Packaged)	Packing Weight (Kg) / Drop Height (cm) table below. Drop Direction :※1 corner / 3 edges / 6 sides each 1time

Packing Weight (Kg)	Drop Height (cm)
0 ~ 45.4	122
45.4 ~ 90.8	76
90.8 ~ 454	61
Over 454	46

11. Inspection Standard

11.1. QUALITY :

THE QUALITY OF GOODS SUPPLIED TO PURCHASER SHALL COME UP TO THE FOLLOWING STANDARD.

11.1.1. 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.

11.1.2. 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 SINGLE PLAN.

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

11.1.3. 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
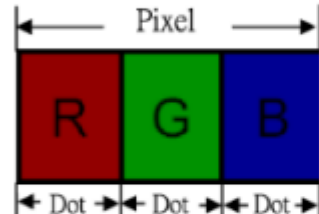
11.2.1.CHECKING DIRECTION SHALL BE IN THE 45 DEGREE AREA TO FACE THE SAMPLE.
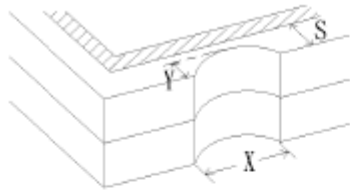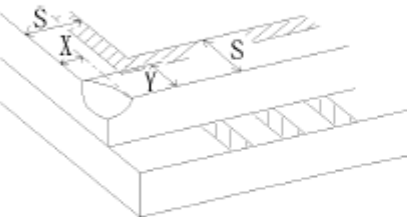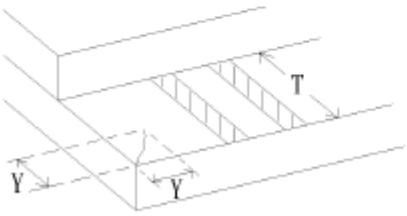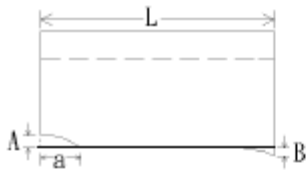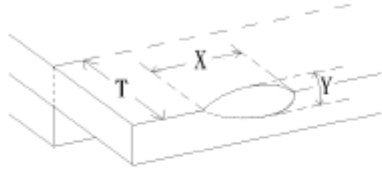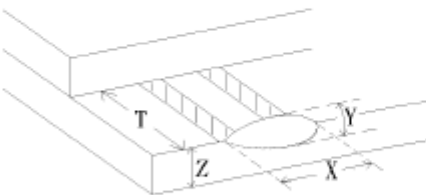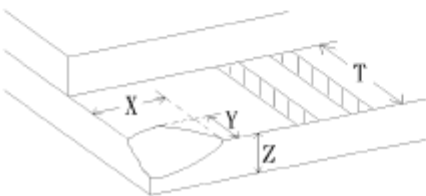
11.2.2.CHECKER SHALL SEE OVER 300±25 mm. WITH BARE EYES FAR FROM SAMPLE AND USING 2 PCS. OF 20W FLUORESCENT LAMP.

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

11.4. STANDARD OF VISUAL INSPECTION

NO.	CLASS	ITEM	JUDGEMENT
11.4.1	MINOR	BLACK AND WHITE SPOT FOREIGN MATERIEL DUST IN THE CELL BLEMISH SCRATCH	(A) ROUND TYPE:
11.4.2	MINOR	BUBBLE IN POLARIZER DENT ON POLARIZER	
11.4.3	MINOR	Dot Defect	

(A) ROUND TYPE: unit : mm.

DIAMETER (mm.)	ACCEPTABLE Q'TY
$\Phi \leq 0.2$	DISREGARD
$0.2 < \Phi \leq 0.4$	3 (Distance>5mm)
$0.4 < \Phi$	0

NOTE: Φ=(LENGTH+WIDTH)/2

(B) LINEAR TYPE: unit : mm.

LENGTH	WIDTH		ACCEPTABLE Q'TY
------		$W \leq 0.05$	DISREGARD
$L \leq 5.0$	$0.05 <$	$W \leq 0.08$	3 (Distance>5mm)
------	$0.08 <$	W	FOLLOW ROUND TYPE

unit : mm.

DIAMETER	ACCEPTABLE Q'TY
$\Phi \leq 03$	DISREGARD
$03 < \Phi \leq 0.6$	3 (Distance>7mm)
$0.6 < \Phi$	0

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Items	ACC. Q'TY
Bright dot	$N \leq 5$
Dark dot	$N \leq 5$

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.

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>1.5mm. 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