TFT Module Specification

MODEL: 13-080GIEB0HD0-S

< ◇ >   PRELIMINARY SPECIFICATION
< ◆ >   APPROVAL SPECIFICATION

CUSTOMER

APPROVED BY

_____

DATE: _____

DESIGNED	CHECKED	APPROVED
RD 2018.09.07 趙長慶	PM 2018.09.07 呂家祥	批准 2018.09.07 PM

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RECORD OF REVISION

Version	Revised Date	Page	Content
V1.0	2018/09/07	--	First Issued

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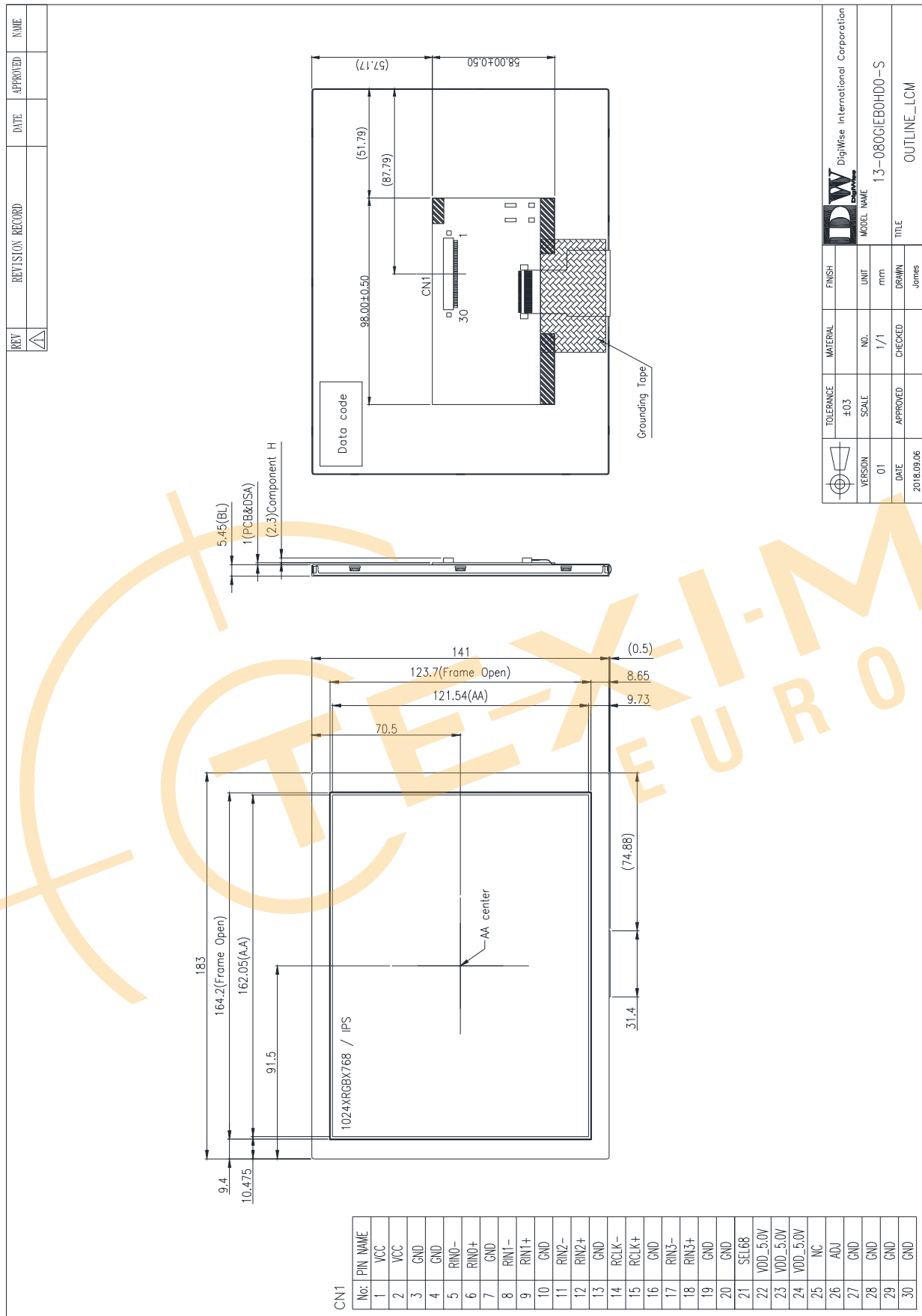
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1. GENERAL DESCRIPTION

1.1 Description

The specification is model 13-080GIEB0HD0-S is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit, a backlight system. This TFT LCD has an 8.0 (4:3) inch diagonally measured active display area with XGA (1024 horizontal by 768 vertical pixels) resolution.

1.2 Features:

No.	Item	Specification	Unit
1	Panel Size	8.0"	Inch
2	Number of Pixels	1024 (W) x RGB x 768 (H)	Pixels
3	Active Area	162.05 (W) × 121.54 (H)	mm
4	Pixel Pitch	0.15825 (W) x 0.15825(H)	mm
5	Outline Dimension	183 (W) × 141 (H) × 5.45 (T)	mm
6	Number of Colors	262K/16.7M	- -
7	Display Mode	IPS / Normally Black / Transmissive	- -
8	View Direction	Free of direction	- -
9	Display Format	RGB vertical stripe	- -
10	Surface Treatment	Hard coating	- -
11	Contrast Ratio	800 (Typ.)	- -
12	Luminance (cd/m^2)	600 (Typ.)	cd/m2
13	Interface	LVDS 6/8 bit Interface	- -
14	Backlight	White LED	- -
15	Operation Temperature	-20 ~ 70	°C
16	Storage Temperature	-30 ~ 80	°C
17	Weight	(TBD)	g

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2. MECHANICAL SPECIFICATION

(Drawing title block, DigiWise International Corporation)

MODEL NAME: 13-080GIEB0HD0-S
TITLE: OUTLINE_LCM
TOLERANCE ±0.3
SCALE
MATERIAL
FINISH
UNIT: mm
NO. 1/1
DRAWN: Jones
CHECKED
APPROVED
VERSION 01
DATE 2018.09.06

REV
REVISION RECORD
DATE
APPROVED
NAME

Dimensions shown on drawing:
58.00±0.50
(57.17)
(51.79)
(87.79)
98.00±0.50
CN1
1
30
Data code
Grounding Tape

5.45(BL)
1(PCB&DSA)
(2.3)Component H

141
123.7(Frame Open)
121.54(AA)
70.5
(0.5)
8.65
9.73
(74.88)
31.4
AA center
183
164.2(Frame Open)
162.05(A.A)
91.5
1024XRGBX768 / IPS
9.4
10.475

CN1 Pin assignment:

No.	PIN NAME
1	VCC
2	VCC
3	GND
4	GND
5	RIN0-
6	RIN0+
7	GND
8	RIN1-
9	RIN1+
10	GND
11	RIN2-
12	RIN2+
13	GND
14	RCLK-
15	RCLK+
16	GND
17	RIN3-
18	RIN3+
19	GND
20	GND
21	SEL68
22	VDD_5.0V
23	VDD_5.0V
24	VDD_5.0V
25	NC
26	ADJ
27	GND
28	GND
29	GND
30	GND

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3. PIN DESCRIPTION

3.1 TFT LCD Module (CN1) (Connector Part No: MSAKT2407P30_HA or equivalent)

Pin No.	Symbol	I/O	Function	Remark
1	VCC	P	Power Supply Logic voltage +3.3V	
2	VCC	P	Power Supply Logic voltage +3.3V	
3	GND	P	Ground	
4	GND	P	Ground	
5	RIN0-	I	Negative LVDS differential data input	
6	RIN0+	I	Positive LVDS differential data input	
7	GND	P	Ground	
8	RIN1-	I	Negative LVDS differential data input	
9	RIN1+	I	Positive LVDS differential data input	
10	GND	P	Ground	
11	RIN2-	I	Negative LVDS differential data input	
12	RIN2+	I	Positive LVDS differential data input	
13	GND	P	Ground	
14	RCLK-	I	Negative LVDS differential clock input	
15	RCLK+	I	Positive LVDS differential clock input	
16	GND	P	Ground	
17	RIN3-	I	Negative LVDS differential data input	
18	RIN3+	I	Positive LVDS differential data input	
19	GND	P	Ground	
20	GND	P	Ground	
21	SEL68	I	6bit/8bit mode select	Note1
22	VDD_5V	P	Power Supply of LED DRIVER	
23	VDD_5V	P	Power Supply of LED DRIVER	
24	VDD_5V	P	Power Supply of LED DRIVER	
25	NC	-	No connection	
26	ADJ	I	Back-light Dimming control	
27	GND	P	Ground	
28	GND	P	Ground	
29	GND	P	Ground	
30	GND	P	Ground	

Note 1:

If LVDS input data is 6 bits, SELB must be set to High;

If LVDS input data is 8 bits, SELB must be set to Low.

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4. ABSOLUTE MAXIMUM RATINGS

4.1 Electrical Absolute Rating

4.1.1 TFT LCD Module

Item	Symbol	Values		Unit	Note
		Min	Max.		
Power supply voltage	VCC	-0.3	5.0	V	
	VDD_5V	0	6.0	V	

4.1.2 Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min	Typ	Max.		
Operating Temperature	Topa	-20		70	°C	Ambient temperature
Storage Temperature	Tstg	-30		80	°C	

5. BLOCK DIAGRAM
5.1 TFT LCD Module

| 1024 x RGB x 768 | Backlight Unit |

Source IC+Gate IC

DC/DC Circuit

VCC
GND

RIN1-
RIN1+

RIN3-
RIN3+

VDD_5V
ADJ
GND

RIN0-
RIN0+

RIN2-
RIN2+

CLK-
CLK+

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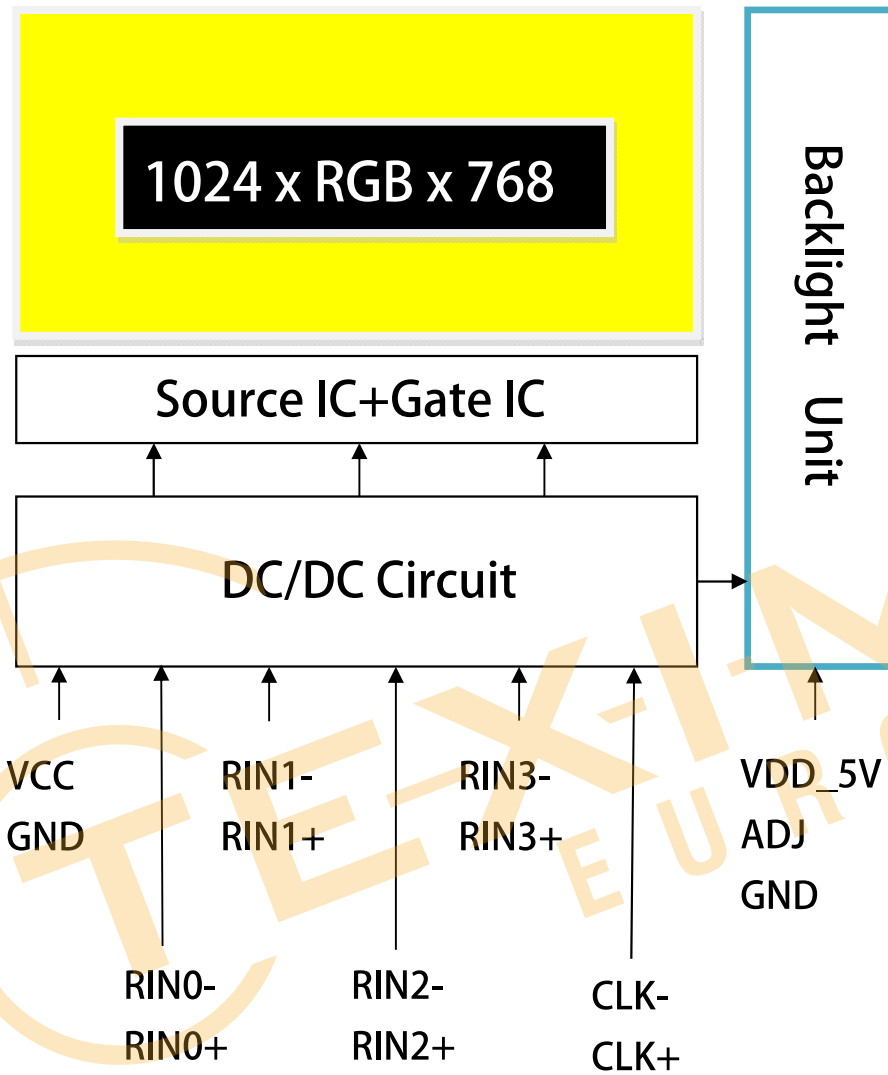
6. Relationship Between Displayed Color and Input

6.1 Data Mapping
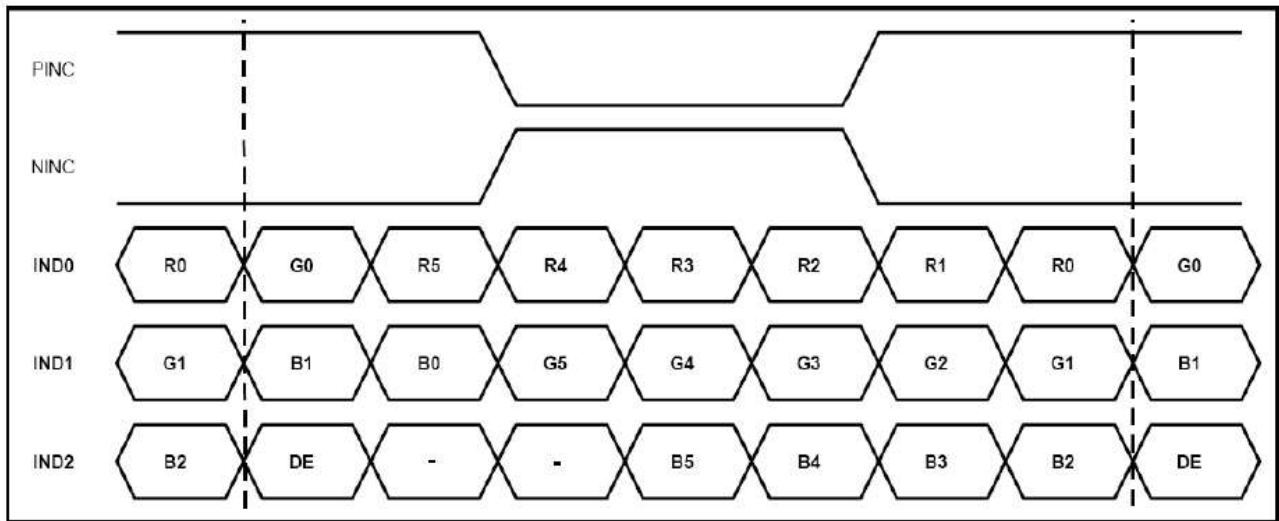
6bit LVDS input

8bit LVDS input

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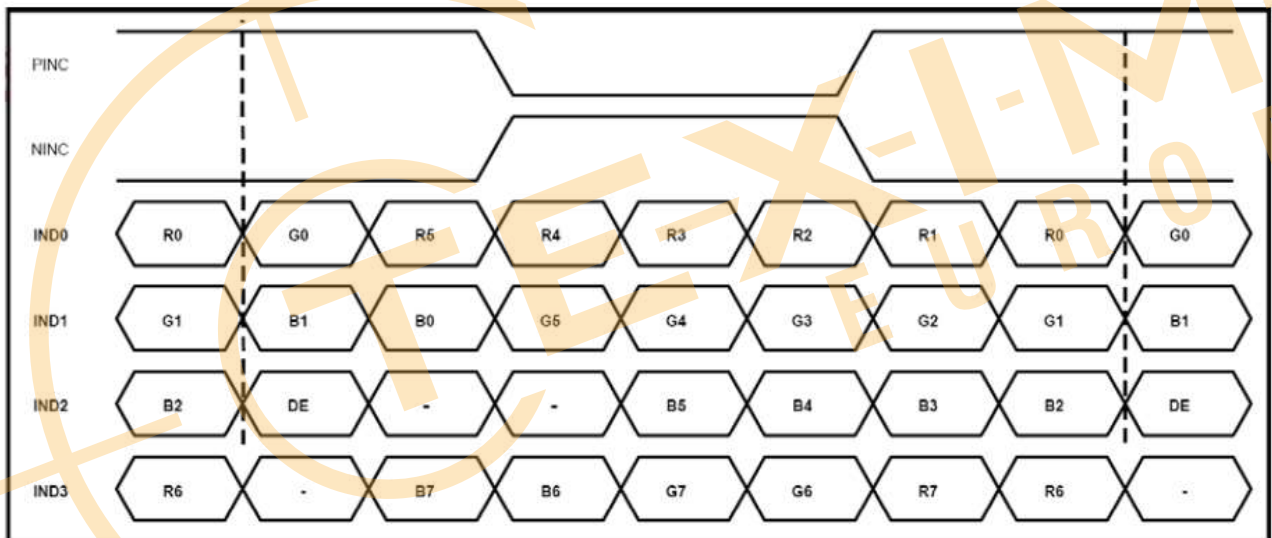
7. ELECTRICAL CHARACTERISTICS

7.1 TFT LCD Module

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Power supply		VCC	3.0	3.3	3.6	V	
		VDD_5V	4.5	5.0	5.5	V	
Input Voltage for logic	Differential Input High Threshold	VTH			+100	mV	
	Differential Input Low Threshold	VTL	-100			mV	
Magnitude differential Input Voltage		[Vid]	200	-	600	mV	Note 2
Input voltage range (singled-end)		RxVIN	0	-	2.4	V	Note 2
Differential input common mode voltage		RxVcm	|VID|/2	-	2.4-|VID|/2	V	Note 2
Differential input leakage current		RVxliz	-10	-	+10	uA	
ADJ frequency			19K	20K	21K	Hz	
Power Supply current		ICC	-	(230)	(280)	mA	Note 1
		IDD	-	(650)	(750)		
LED Life Time (25℃)			(40000)	-	-	hr	

Note 1: frame =60Hz, Ta=25°C, Display pattern: White pattern
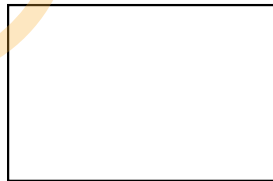
Note 2:
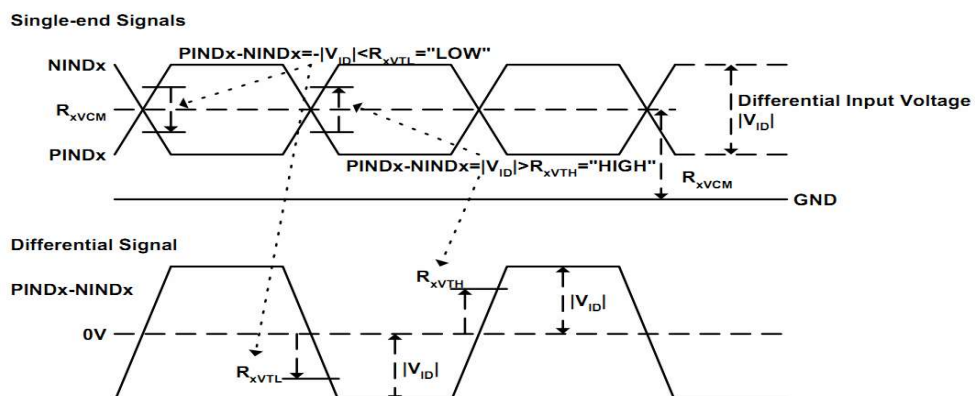
Note 3: The "LED life time" is defined as the module brightness decrease to 50% original brightness that the ambient temperature is 25℃ 60% RH.

7.2 INTERFACE SPECIFICATIONS

7.2.1 AC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit.	Note
Clock frequency	RxFCLK	20	-	71	MHz	
Input data skew margin	TRSKM	500	-	-	ps	
Clock high time	TLVCH	-	4/(7*RxFCLK)	-	ns	
Clock low time	TLVCL	-	3/(7* RxFCLK)	-	ns	

7.2.2 Input Clock and Data Timing Diagram
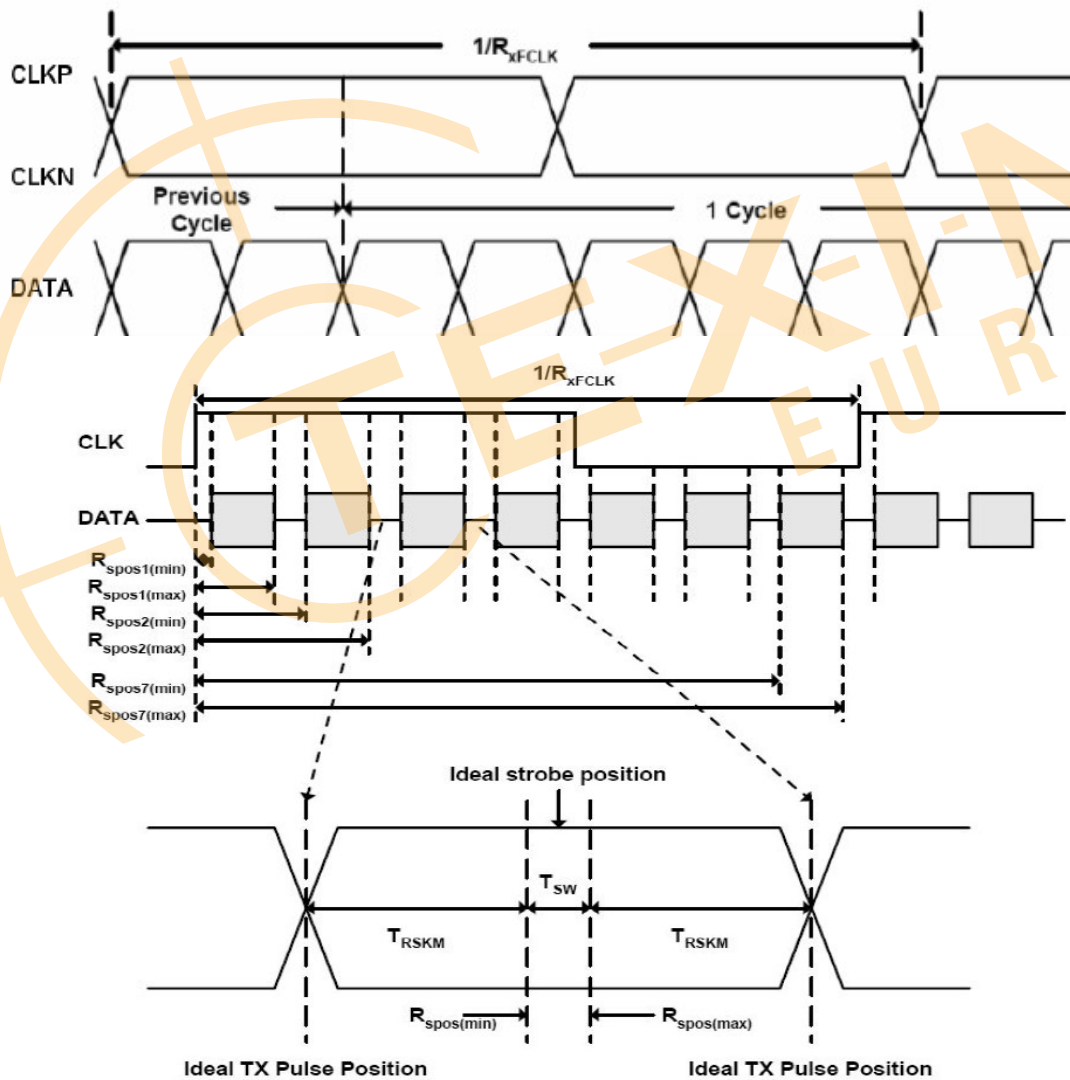
T_{RSKM}: Receiver strobe margin
R_{SPOS}: Receiver strobe position
T_{SW} : Strobe width (Internal data sampling window)

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7.2.3 Timing

Signal	Parameter	Symbol	Min.	Typ.	Max.	Unit.	Remark
DCLK	CLK frequency	Fclk	52	65	71	MHz	
HSYNC	Horizontal Line	Th	1114	1344	1400	CLK	
	HS Display Area	Thd	-	1024	-	CLK	
	HS Blanking	Thb+thfp	90	320	376	CLK	
VSYNC	VS Period Time	Tv	778	806	845	th	
	VS Display Area	Tvd	-	768	-	th	
	VS Blanking	Tvb+Tvfp	10	38	77	th	
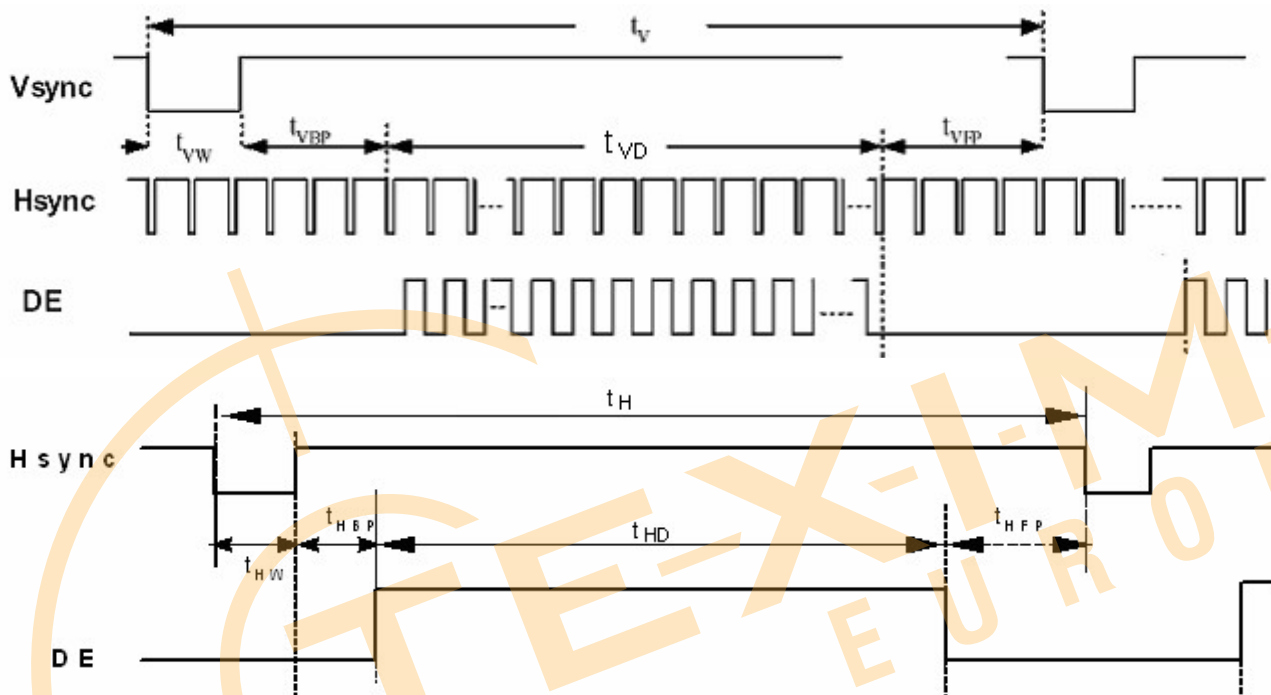
7.3 Power On / Off Sequence
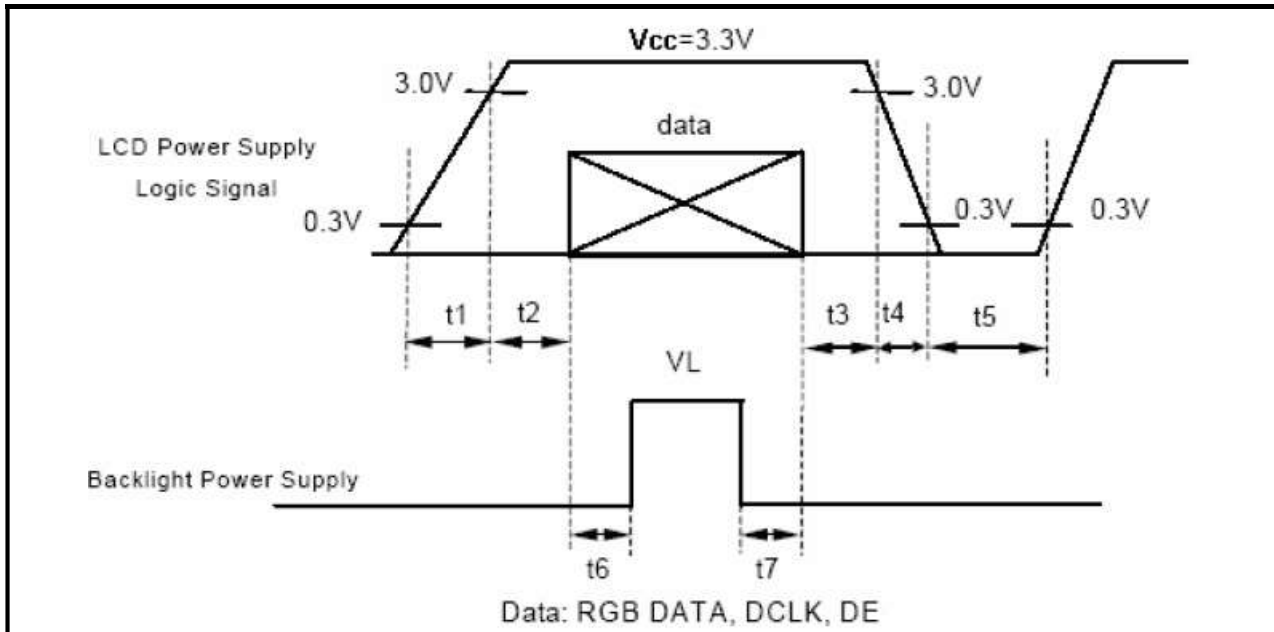
t1 $\leq$10ms : 1 sec$\leq$ t5

50ms$\leq$ t2 : 200ms $\leq$t6

0<t3 $\leq$50ms: 200ms$\leq$ t7

0<t4 $\leq$10ms

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8. OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Brightness		--	Note1, Note 3, ($\theta = 0°$, Normal Viewing Angle)	480	600	--	cd/m2
Uniformity		B-uni		70	75	-	%
Contrast Ratio		CR		600	800	--	--
Response Time		Tr		--	10	20	ms
		Tf		--	15	30	ms
Color Chromaticity	White	Wx		0.238	0.288	0.338	--
		Wy		0.276	0.326	0.376	--
View angle	Horizontal	θx+	Center CR≥10	75	85	--	
		θx-		75	85	--	
	Vertical	θY+		75	85	--	
		θY-		75	85	--	

Note：The following optical specifications shall be measured in a darkroom or equivalent state(ambient luminance ≤1 lux, and at room temperature). The operation temperature is 25°C±2°C. The measurement method is shown in Note1.

Note1: The method of optical measurement:
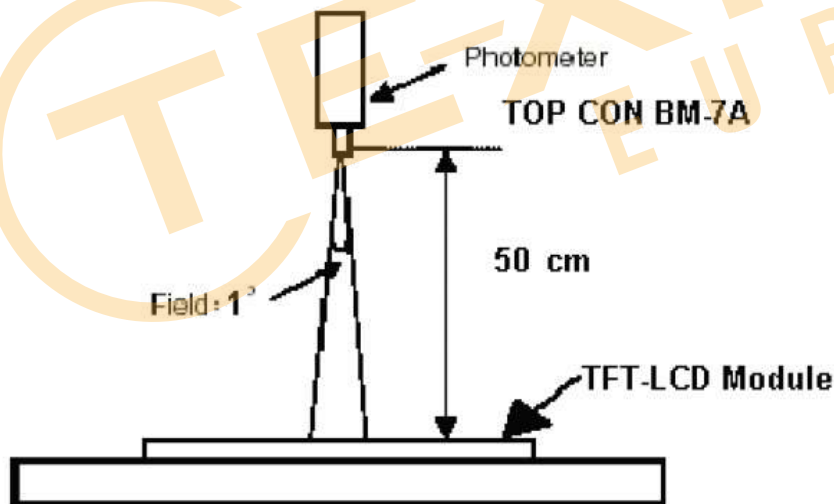
Note2: Measured at the center area of the panel and at the viewing angle of the θx=θy =0°

Note3: Definition of Contrast Ratio (CR):

CR = Luminance with all pixels in white state ÷ Luminance with all pixels in Black state

Note 4: Definition of Viewing Angle:
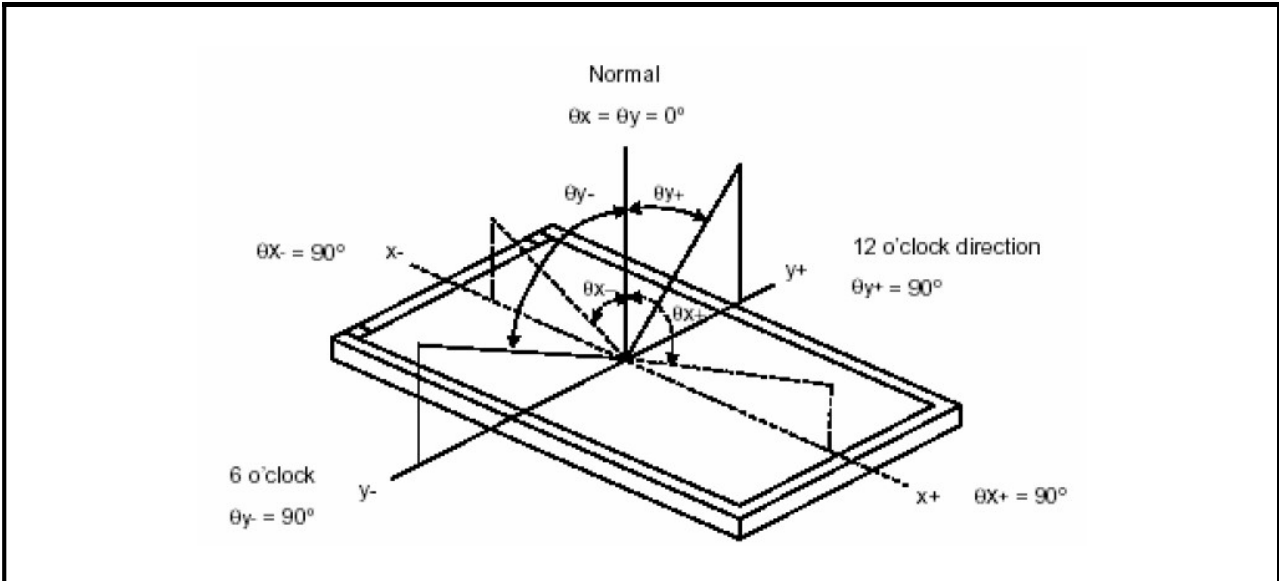
Note 5: Definition of Brightness Uniformity (B-uni):
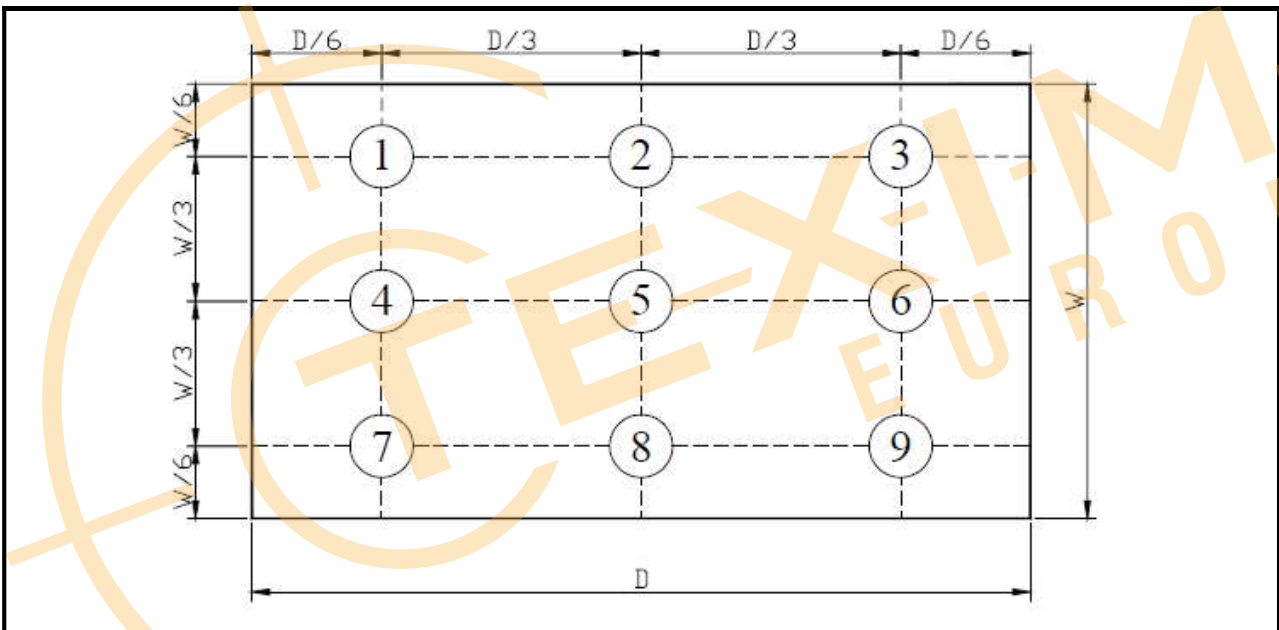
B-uni ＝(Minimum luminance of 9 points÷Maximum luminance of 9points)X100%

Note 6: Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (Tr)" and the "Falling Time (Tf)" respectively. Tr and Tf are defined as following figure
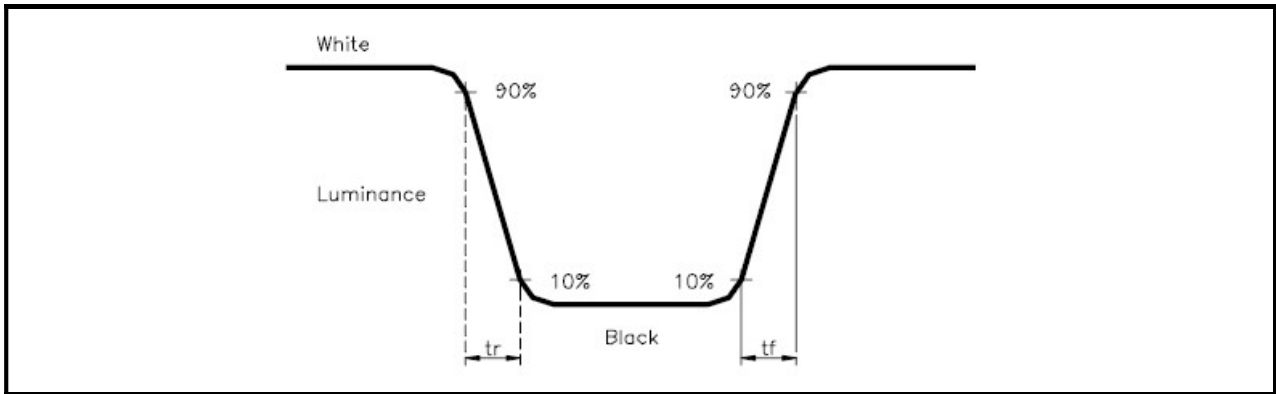
Note 7: Definition of Chromaticity:

The color coordinates (Wx,Wy),(Rx,Ry),(Gx,Gy),and (Bx,By) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

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9. RELIABILITY

9.1 Test Condition

9.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25 ± 5°C

Humidity : 65 ± 5%

9.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

9.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

9.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

9.2 TESTS

No.	ITEM	CONDITION CRITERION
1	High Temperature Storage	80°C, 120 hrs
2	Low Temperature Storage	-30°C, 120 hrs
3	High Temperature Operating	70°C, 120 hrs
4	Low Temperature Operating	-20°C, 120 hrs
5	High Temperature/Humidity Non-Operating	50°C, 90%RH, 120 hrs
6	Temperature Shock Non-Operating	-20°C ←→ 70°C (0.5hr each), 25 cycles
7	Vibration Test Non-Operating	Frequency:0 ~ 55 Hz Amplitude:1.5 mm Sweep Time:11min Test Period:6 Cycles for each Direction of X,Y,Z

Note1: The test sample have recovery time for 24 hours at room temperature before the function check. In the standard conditions, there is no any touch panel function NG issue occurred.

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9.3 JUDGMENT STANDARD

The judgment of the above test should be made as follow:

Pass: Normal display image with no obvious non-uniformity and no line defect. Partial transformation of the module parts should be ignored.

Fail: No display image, obvious non-uniformity, or line defects.

9.4 INCOMING INSPECTION STANDARDS

No.	Parameter	Criteria
1	Operating	Display function: No Display malfunction (Major) Contrast ratio (Black, White): Does not meet specified range in the spec. (Major) (Note:3) Line Defect: No obvious Vertical and Horizontal line defect in bright, dark and colored. (Major) (Note:1) Point Defect : Active area ≤ 5 dots (Minor) (Note:1) (see Point Defect table below) Non-uniformity: Visible through 5%ND filter. (Minor) Foreign material in Black or White spots shape (W>1/4L) (see Foreign material spots table below) Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4) (see Foreign material line table below)
2	External Inspection (non-operating)	Dimension: Outline (Major) Bezel appearance: uneven (Minor) Scratch on the polarize: (Note:2) (see Scratch table below) Dent or bubble on the polarize (Note:2) (see Dent or bubble table below)

Point Defect : Active area ≤ 5 dots (Minor) (Note:1)

Item	Acceptable number — Active Area	Total
Bright	2	5
Dark	4	

Foreign material in Black or White spots shape (W>1/4L)

Zone / Dimension	Acceptable number	Class Of Defects	AQL Level
D> 0.5	0	Minor	1.5
0.3 < D ≤ 0.5	5		
D ≤ 0.3	*		

D = (Long + Short) / 2   * : Disregard

Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4)

L (mm)	W(mm) Zone	Acceptable number	Class Of Defects	AQL Level
L >5	W>0.1	0	Minor	1.5
0.5 < L ≤ 5	0.03 < W≤0.1	5		
L ≤0.5	W≤0.03	*		

L : Length   W : Width   * : Disregard

Scratch on the polarize: (Note:2)

L (mm)	W(mm) Zone	Acceptable number	Class Of Defects	AQL Level
--	W>0.1	0	Minor	1.5
L ≤ 3	W≤0.1	3		

L : Length   W : Width   * : Disregard

Dent or bubble on the polarize (Note:2)

Zone / Dimension	Acceptable number	Class Of Defects	AQL Level
D≤0.3	*	Minor	1.5
D≤0.5	3		

D = (Long + Short) / 2   * : Disregard

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Class of defects	Major	AQL 0.65%	**Definition** It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
	Minor	AQL 1.5%	It is a defect that will not result in functioning problem with deviation classified.

Note1:

(a)Bright point defect is defined as point defect of R,G,B with area >1/2 pixel respectively

(b)Dark point defect is defined as visible in full white pattern.

(c)Definition of distribution of point defect is as follows:

   -minimum separation between dark point defects should be larger than 5mm.

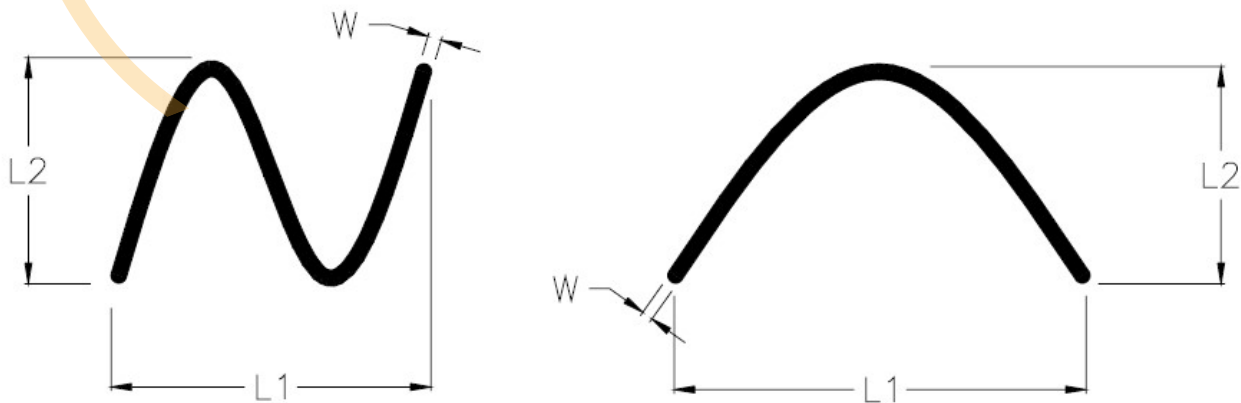   -minimum separation between bright point defects should be larger than 5mm.

(d)Definition of joined bright point defect and joined dark point defect are as follows:

   -Two or more joined bright point defects must be nil.

   -Three joined dark point defects must be nil.

   -Coupling of one dark and one bright point in junction is counted as one dark and bright spot with 1 pair maximum.

   -Two Joined dark point is counted as two dark points with 2 pair maximum.

Note2: The external inspection should be conducted at the distance 30± 5cm between the eyes of inspector and the panel.

Note3: Luminance measurement for contrast ratio is at the distance 50± 5cm between the detective head and the panel with ambient luminance less than 1 lux. Contrast ratio is obtained at optimum view angle.

Note4: W-Width in mm , L-length of Max.(L1,L2) in mm.

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9.5 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

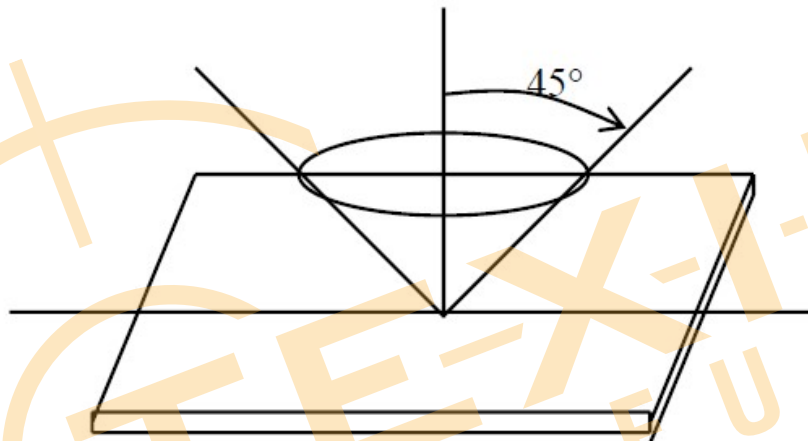Sampling type: normal inspection, single sampling

Sampling table: MIL-STD-105E

Inspection level: Level II

9.6 Inspection conditions

The LCD shall be inspected under 40W white fluorescent light.

$\theta \leq 45°$ inspection under non-operating condition.

$\theta \leq 5°$ inspection under operating condition

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10. PRECAUTION RELATING PRODUCT HANDLING

10.1 SAFETY

10.1.1   If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

10.1.2   If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

10.2 HANDLING

10.2.1   Avoid any strong mechanical shock which can break the glass.

10.2.2   Avoid static electricity which can damage the CMOS LSI—When working with the module, be sure to ground your body and any electrical equipment you may be using.

10.2.3   Do not remove the panel or frame from the module.

10.2.4   The polarizing plate of the display is very fragile. So , please handle it very carefully, Do not touch, push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

10.2.5   Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.

10.2.6   Do not touch the display area with bare hands , this will stain the display area.

10.2.7   Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

10.2.8   To control temperature and time of soldering is 280 ± 10°C and 3-5 sec.

10.2.9   To avoid liquid (include organic solvent) stained on LCM.

10.3 STORAGE

10.3.1   Store the panel or module in a dark place where the temperature is 25°C ± 5°C and the humidity is below 65% RH.

10.3.2   Do not place the module near organics solvents or corrosive gases.

10.3.3   Do not crush, shake, or jolt the module.

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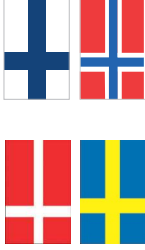F: +39 (0)395 967 226
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