DM-TFTR34-478-1

3.4" 800 X 800 Round 16.7M All View TFT - MIPI

RECORD OF REVISION

Version	Revised Date	Page	Content
V1.0	2022/11/22	--	First Issued

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1. GENERAL DESCRIPTION

1.1 Description

DM-TFTR34-478-1 is a 3.4 inch diagonally measured active display with high resolution 800X800 display and high brightness. This model is composed of an a-Si TFT LCD panel, backlight system and HDMI Converter. It is designed to make Raspberry Pi usage easy. You can simply use this TFT display with your Raspberry Pi, or also you can use this as computer display with any device which has HDMI output.

1.2 Features:

No.	Item	Specification	Unit
1	Panel Size	3.4"	Inch
2	Number of Pixels	800 (W) x RGB x 800(H)	Pixels
3	Active Area	Φ 87.6	mm
4	Pixel Pitch	0.0365(H)x 0.1095 (V)	mm
5	Outline Dimension	94.9(W) × 96.95 (H)	mm
6	Number of Colors	16.7M	- -
7	Display Mode	Normally Black / Transmissive	- -
8	View Direction	Free direction	- -
9	Display Format	RGB stripe	- -
10	Surface Treatment	Glare	- -
11	Contrast Ratio	1200 (Typ.)	- -
12	Luminance (cd/m^2)	300(Typ.)	cd/m2
13	Video Input Interface	HDMI (Compliance HDMI V1.4)	- -
14	Touch panel		- -
15	Backlight	White LED	- -
16	Operation Temperature	-20 to 70	℃
17	Storage Temperature	-30 to 80	℃
18	Weight	(TBD)	g

2. MECHANICAL SPECIFICATION
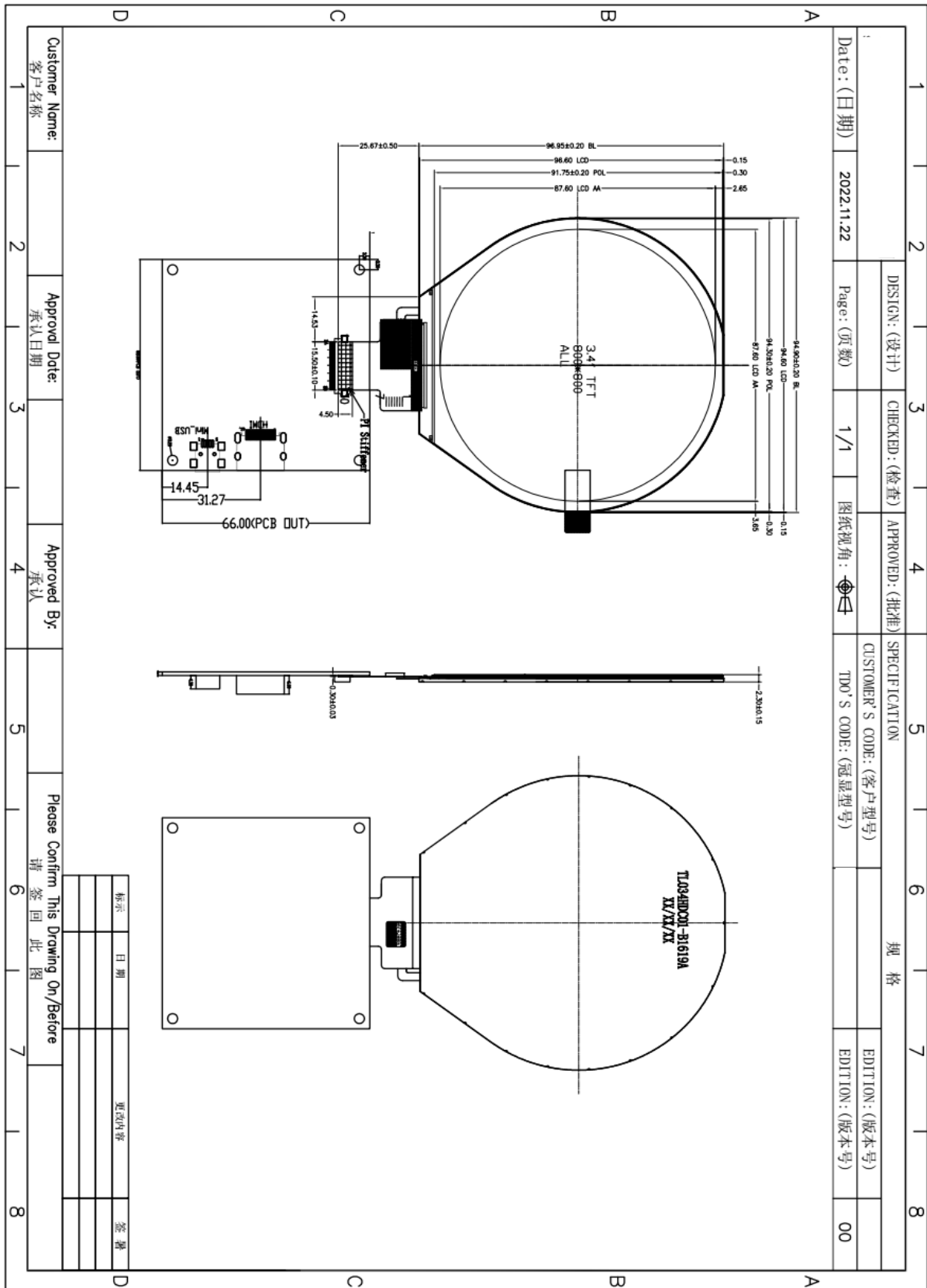
3. PIN DESCRIPTION

3.1 Power Input (J2)—Mini USB

Pin No.	Symbol	I/O	Function
1	5V	P	Power Supply +5V, Current Max 620mA
2	USB-	P	NC
3	USB+	P	NC
4	NC	P	Ground
5	GND	P	Ground

3.2 HDMI (CN1) [HDMI A TYPE: PHD0911A2301E or compatible]

Pin No.	Symbol	I/O	Function	Note
1	TMDS 2+	I	TMDS Data2+	
2	GND	P	TMDS Data2 Shield	
3	TMDS 2-	I	TMDS Data2–	
4	TMDS 1+	I	TMDS Data1+	
5	GND	P	TMDS Data1 Shield	
6	TMDS 1-	I	TMDS Data1–	
7	TMDS 0+	I	TMDS Data0+	
8	GND	P	TMDS Data0 Shield	
9	TMDS 0-	I	TMDS Data0–	
10	TMDS CLK+	I	TMDS Clock+	
11	GND	P	TMDS Clock Shield	
12	TMDS CLK-	I	TMDS Clock–	
13	CEC	I	CEC	
14	N.C.	-	N.C.	
15	DDC_SCL	I	IIC SCL to EDID ROM	
16	DDC_SDA	I/O	IIC SDA to EDID ROM	
17	GND	P	DDC/CEC Ground	
18	HD_5V	P	+5V Power	
19	HPD	O	Hot Plug Detect	

4. ABSOLUTE MAXIMUM RATINGS

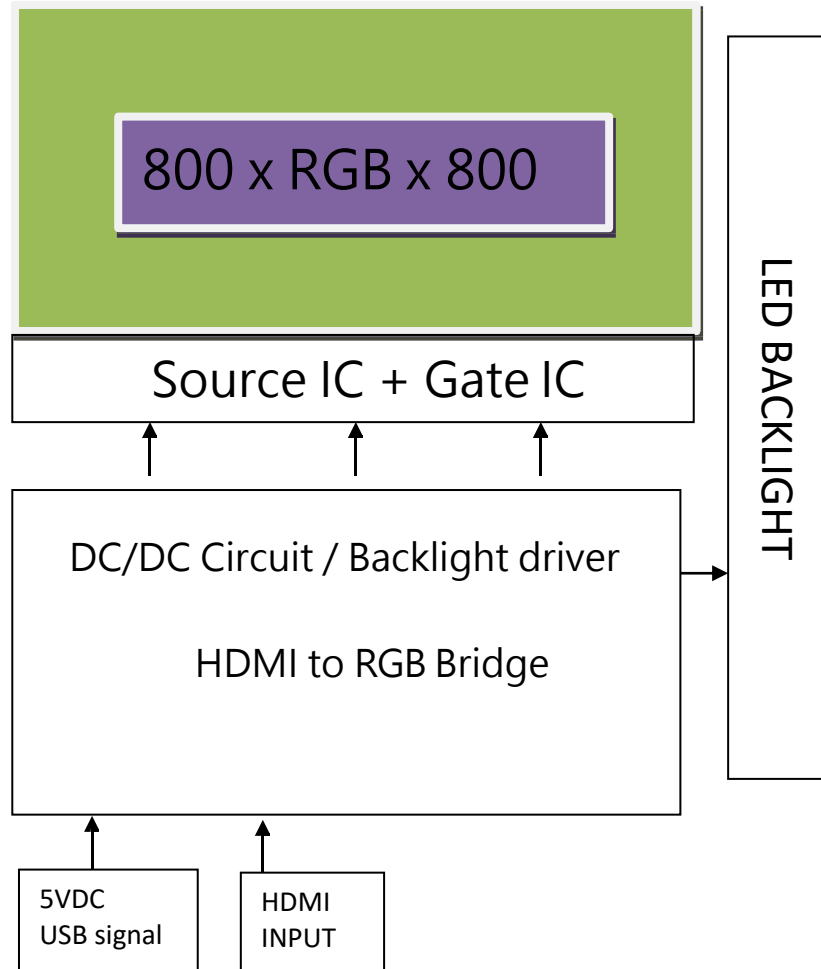### 4.1 Electrical Absolute Rating

4.1.1 TFT LCD Module

Item	Symbol	Values		Unit	Note
		Min	Max.		
Power supply voltage	5	4.5	6	V	

4.1.2 Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min	Typ	Max.		
Operating Temperature	Top	-20		70	℃	Ambient
Storage Temperature	Tst	-30		80	℃	temperature

5. BLOCK DIAGRAM

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┌─────────────────────────────────┐      ┌──────────┐
│                                 │      │          │
│   ┌─────────────────────────┐   │      │          │
│   │                         │   │      │          │
│   │    800 x RGB x 800      │   │      │  L       │
│   │                         │   │      │  E       │
│   └─────────────────────────┘   │      │  D       │
│                                 │      │          │
└─────────────────────────────────┘      │  B       │
│         Source IC + Gate IC     │      │  A       │
└─────────────────────────────────┘      │  C       │
      ↑          ↑          ↑            │  K       │
┌─────────────────────────────────┐      │  L       │
│                                 │      │  I       │
│  DC/DC Circuit / Backlight      │─────→│  G       │
│  driver                         │      │  H       │
│                                 │      │  T       │
│  HDMI to RGB Bridge             │      │          │
│                                 │      │          │
└─────────────────────────────────┘      └──────────┘
      ↑          ↑
┌──────────┐  ┌──────────┐
│ 5VDC     │  │ HDMI     │
│ USB      │  │ INPUT    │
│ signal   │  │          │
└──────────┘  └──────────┘
```

6. OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Brightness		--	Note1, Note 3, (θ= 0°, Normal Viewing Angle)	290	300	--	cd/m2
Uniformity		B-uni		75	80	-	%
Contrast Ratio		CR		1000	1200	--	--
Response Time		Tr		--	30	35	ms
		Tf		--	30	35	ms
Chromaticity	White	Wx		0.262	0.292	0.322	--
		Wy		0.303	0.333	0.363	--
	Red	Wx		0.637	0.667	0.697	
		Wy		0.293	0.323	0.353	
	Green	Wx		0.241	0.271	0.301	
		Wy		0.561	0.591	0.621	
	Blue	Wx		0.104	0.134	0.164	
		Wy		0.091	0.121	0.151	
View angle	Horizontal	θx+	Center CR 10	80	85	--	degree
		θx-		80	85	--	degree
	Vertical	θY+		80	85	--	degree
		θY-		80	85	--	degree

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:
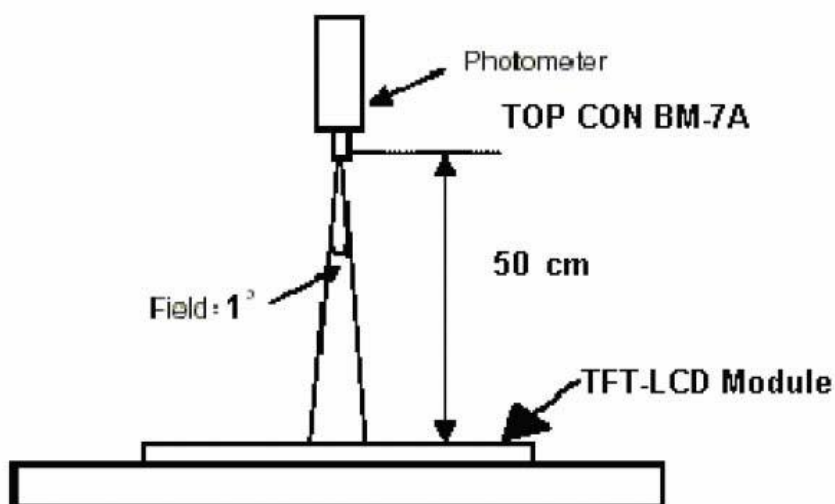
Note2: Measured at the center area of the panel and at the viewing angle of the θx = θy =0°

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):
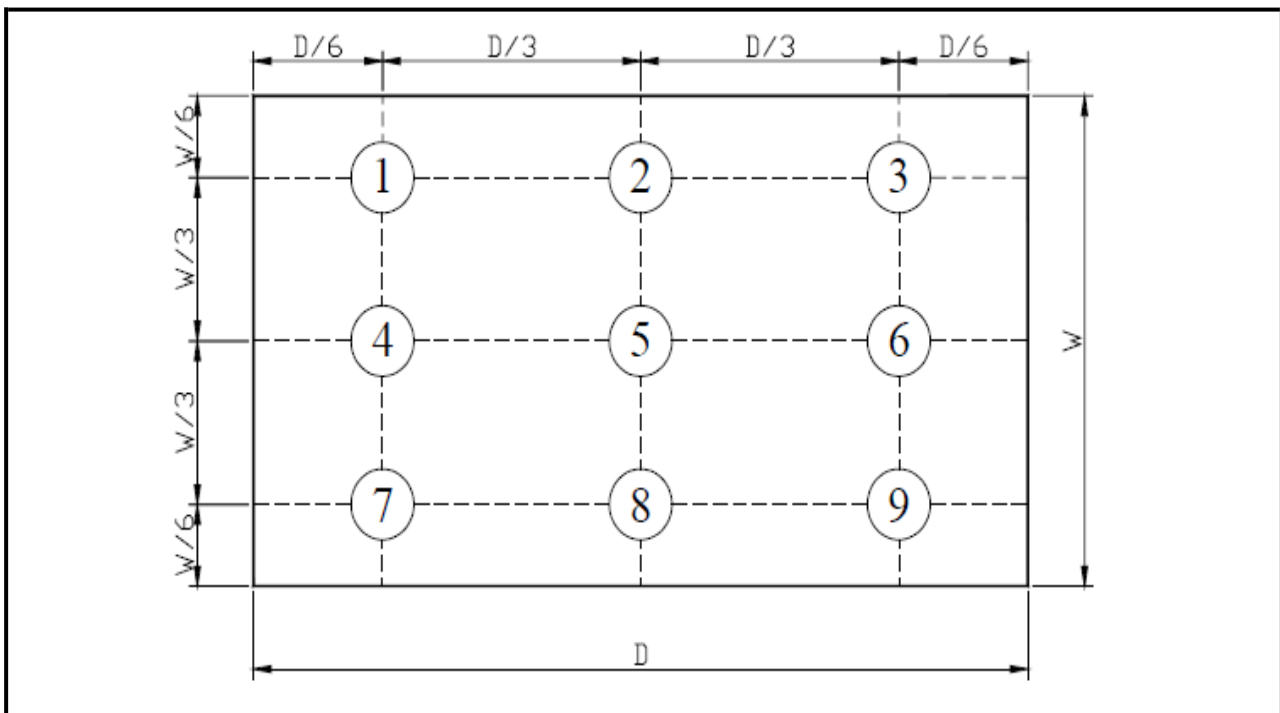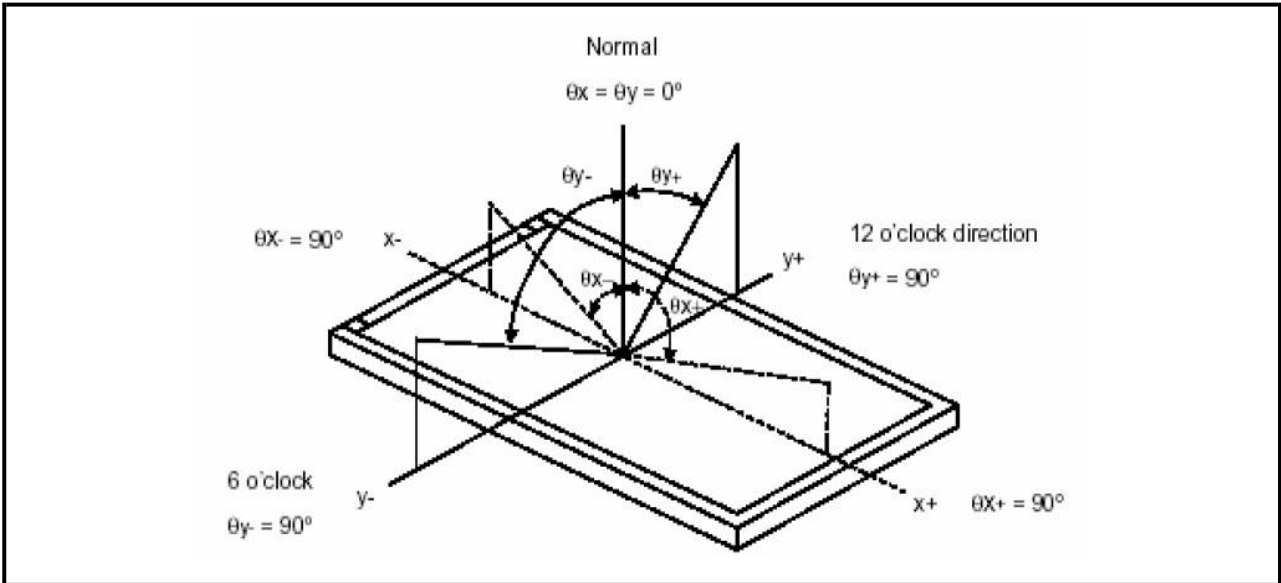
B-uni ＝ (Minimum luminance of 9 points ÷ Maximum luminance of 9points) X 100%

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
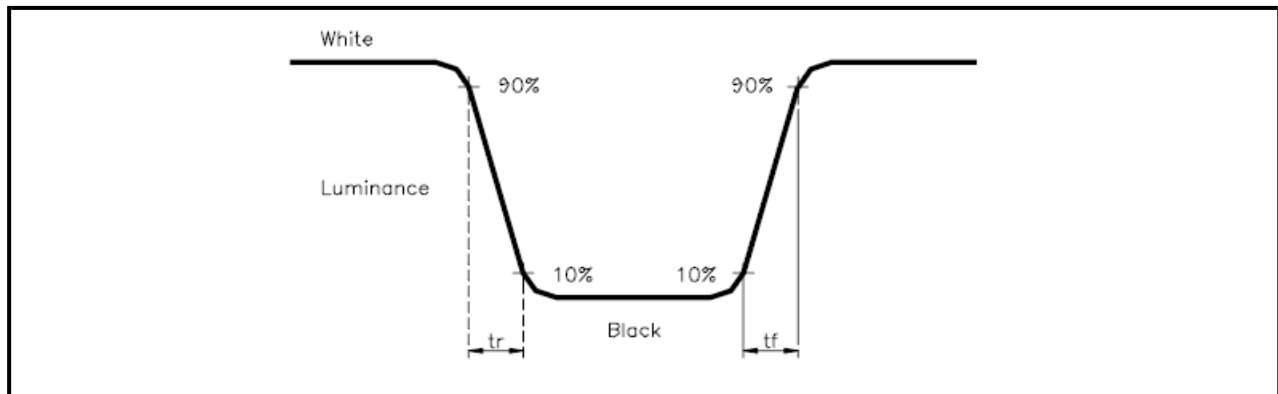
Note 7: Definition of Chromaticity:

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.

7. RELIABILITY

7.1 Test Condition

7.1.1 Temperature and Humidity (Ambient Temperature)
Temperature: 20 ± 5℃
Humidity: 70 ± 5%

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

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

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

7.2 TESTS

No.	ITEM	CONDITION CRITERION
1	High Temperature Storage	80℃, 240 hrs
2	Low Temperature Storage	-30℃, 240 hrs
3	High Temperature Operating	70℃, 240 hrs
4	Low Temperature Operating	-20℃, 240 hrs
5	High Temperature/Humidity Non-Operating	40℃, 90%RH, 120 hrs
6	Temperature Shock Non-Operating	-30℃ 30 min~ +70℃ 30 min, Change time: 0.5 hour ← 5 min → 0.5 hour.10 Cycle
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
8	Electro-static Discharge	C=150pF, R=330Ω, 5point/panel Air: ±8Kv, 5 times; Contact: ±4Kv, 5times (Environment:15℃~35℃, 30%~60%.86Kpa~106Kpa)

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.

7.3 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.

7.4 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) Non-uniformity: Visible through 5%ND filter. (Minor) Foreign material in Black or White spots shape (W>1/4L) Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4)
2	External Inspection (non-operating)	Dimension: Outline (Major) Bezel appearance: uneven (Minor) Scratch on the polarize: (Note:2) Dent or bubble on the polarize (Note:2)

Point Defect table:

Item	Acceptable number Active Area	Total
Bright	2	5
Dark	4	

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

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

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

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

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

L : Length   W : Width   * : Disregard

Scratch on the polarize: (Note:2):

L (mm) \ Zone	W(mm)	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):

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

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

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.
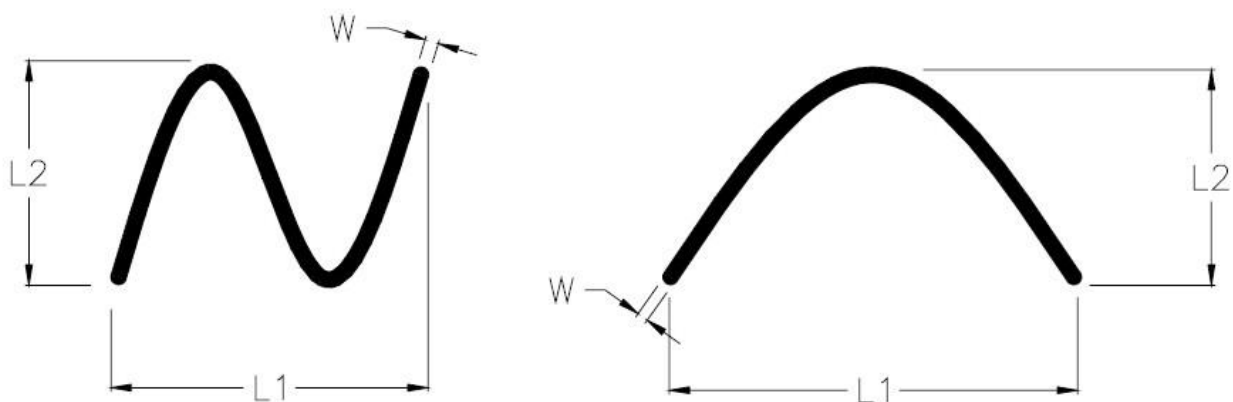
7.5 Sampling Condition

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 table:
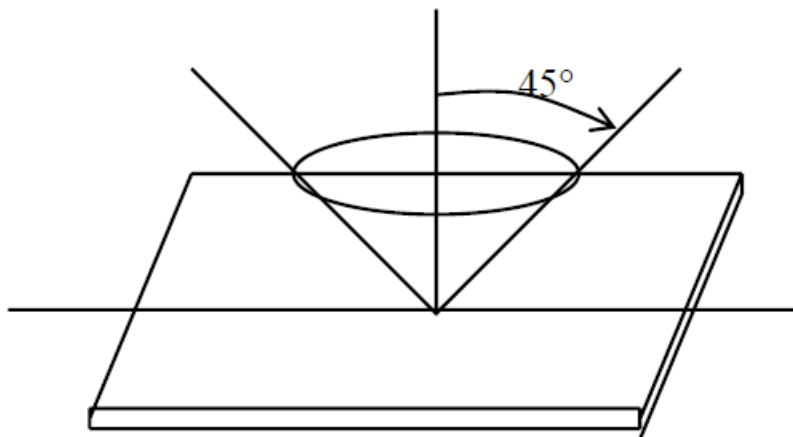
MIL-STD-105E

Inspection level: Level II

7.6 Inspection conditions

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

θ≤45° inspection under non-operating condition.

θ≤5° inspection under operating condition

8. PRECAUTION RELATING PRODUCT HANDLING

8.1 SAFETY

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

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

8.2 HANDLING

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

8.2.2 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.

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

8.2.4 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.)

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

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

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

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

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

8.3 STORAGE

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

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

Do not crush, shake, or jolt the module