PRODUCT SPECIFICATION

MONO LCD MODULE
MODEL: EZ0101A3TTNFE-B0 Ver:1.0

< ◇> Preliminary Specification

< ◆> Finally Specification

CUSTOMER'S APPROVAL	
CUSTOMER :	
SIGNATURE:	DATE:

APPROVED BY	PM REVIEWED	PD REVIEWED	PREPARED BY
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Revision Status

Version	Revise Date	Page	Content	Modified By
Ver.1.0	**2018-04-17**		**First issued**	

Table of Contents

No. Contents Page

1. FEATURES

The features of LCD are showed as follows

* Display mode : ECB /Transmissive /Positive
* Driver/Controller IC : Without
* Display format : Segment
* Driving Method :1/1DUTY,1/1BIAS
* Viewing Direction : 3 O'clock and 9 O'clock
*Sample NO. : -

2. MECHANICAL SPECIFICATIONS

Item	Specification	Unit
Module Size	312.91(H) x 181.92(V) x 0.60(D)	mm
Viewing Area	309.91(H) x 175.92(V)	mm

3. ELECTRICAL SPECIFICATIONS

3-1 ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C)

Item	Symbol	Standard Value			Unit
		Min.	Typ.	Max.	
Operating Temp.	Top	-20	-	+70	°C
Storage Temp.	Tst	-30	-	+80	°C

*****NOTE: The response time will be extremely slow when the operating temperature is around -10℃, and the back ground will become darker at high temperature operating.

3-2 ELECTRICAL CHARACTERISTICS

Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit
LCD Drive	V_{LCD}	Ta = 25 °C	2.5	2.7	2.9	V

3-3Optical Characteristics

ITEM	Symbol	Condition
-45° E-cell on/off bri.ratio	E-cell+ 2*pol.(0")	<12%
45° E-cell on/off bri.ratio		
b*	E-cell only	<2
transmittance	E-cell only	>87%

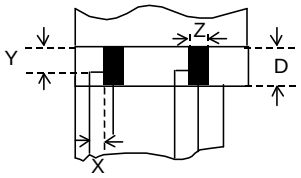
4. TERMINAL FUNCTIONS

PIN NO.	SYMBOL	FUNCIONS
1~2	SEG	SEG pin
3~4	COM	COM pin

5. QUALITY SPECIFICATIONS

Sampling Plan and Acceptance

5-1. Flexible Printed Circuit (FPC)

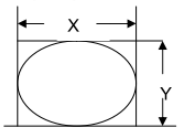
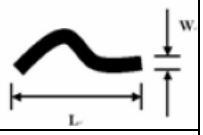
Defect	Inspection Item	Inspection Standards	
Minor	Tilted soldering	Within the angle +5°	Acceptable
Minor	Uneven solder joint /bump		Reject
Minor	Hole $\Phi = \frac{L + W}{2}$	Expose the conductive line	Reject
		Φ > 1.0mm	Reject
Minor	Position shift 	Y > 1/3D	Reject
		X > 1/2Z	Reject

5- 2. Electric Inspection

Defect	Inspection Item	Inspection Standards	
Major	Short		Reject
Major	Open		Reject

5-3. Inspection Specification of LCD

- Ambient light : 1200±200 Lux or 800±200 Lux(Backlight On); 150~200 Lux(Backlight Off).
- Distance between E-cell and eyes of inspector : 30~35cm.
- Viewing tme for judgement : 3 seconds max for small artifacts; 15 seconds max for larger areas with black and gray backgrounds patterns.
- Viewing angle : upper angle、lower angle、left and right angle shall be 45° to E-cell.

	Items	Criteria	Note
Backlight On	Spots (dark & bright)	Small-size: D ≤ 0.1mm, ignore Medium-size: 0.1 < D ≤ 0.3mm, N ≤ 3 Large-size: D > 0.3mm, N ≤ 1 TTL: N < 5	
Backlight Off	Scars	Line type: W<0.07mm, ignore 0.07mm ≤ W < 0.1mm, N < 6 0.10mm≤W, not allowed Dot type: d<0.25mm, ignore; 0.25mm≤D<0.4mm, N< 7 0.4mm≤D, not allowed	
	Extensive Crack	N=0	
	Dent / fish eye (Spot)	D>0.5mm, N<6	D=(X+Y)/2, where 
	Newton ring	Not allowable	
	Scratches	W > 0.1mm, L > 5.0mm, N < 3	
	Mura	Not allowable	
	Bubble	Not allowable	
	FPC pad broken	Not allowable	

6. RELIABILITY

No	Item	Condition	Quantity	Criteria
1	High Temperature Operating	70℃, 96Hrs	2	GB/T2423.2 -2008
2	Low Temperature Operating	-20℃, 96Hrs	2	GB/T2423.1 -2008
3	High Humidity	60℃, 90%RH, 96Hrs	2	GB/T2423.3 -2006
4	High Temperature Storage	80℃, 96Hrs	2	GB/T2423.2 -2008
5	Low Temperature Storage	-30℃, 96Hrs	2	GB/T2423.1 -2008
6	Thermal Cycling Test	-20℃, 60min~70℃, 60min, 20 cycles.	2	GB/T2423.22 -2012
7	Packing vibration	Frequency range:10Hz~50Hz Acceleration of gravity:5G X,Y,Z 30 min for each direction.	2	GB/T5170.14 -2009
8	Electrical Static Discharge	Air:±8KV 150pF/330Ω 5 times	2	GB/T17626.2 -2006
		Contact:±4KV 150pF/330Ω 5 times		
9	Drop Test(Packaged)	Height:80 cm,1 corner, 3 edges, 6 surfaces.	2	GB/T2423.8 -1995

Note: 1) Above conditions are suitable for our company standard products.
2) For restrict products, the test conditions listed as above must be revised.

7. HANDLING PRECAUTION

(1) Mounting Method

The panel of the LCD Module consists of two thin glass plates with polarizers which easily get damaged since the Module is fixed by utilizing fitting holes in the printed circuit board. Extreme care should be taken when handling the LCD Modules.

(2) Caution of LCD handling & cleaning

When cleaning the display surface, use soft cloth with solvent (recommended below) and wipe lightly.

- Isopropyl alcohol
- Ethyl alcohol
- Trichloro trifloro thane

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

Do not use the following solvent:

- Water
- Ketone
- Aromatics

(3) Caution against static charge

The LCD Module use C-MOS LSI drivers, so we recommend that you connect any unused input terminal to VDD or VSS, do not input any signals before power is turned on. And ground your body, Work/assembly table. And assembly equipment to protect against static electricity.

(4) Packaging

- Modules use 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 directly to sunshine or high temperature/humidity.

(5) Caution for operation

- It is indispensable to drive LCD's within the specified voltage limit since the higher voltage than the limit shorten LCD life. An electrochemical reaction due to direct current causes LCD deterioration, Avoid the use of direct current drive.
- Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show 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 operating temperature range.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the relative condition of 40°C, 50%RH or less is reequired.

(6) Storage

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 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 is. Keeping temperature in the specified 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)

(7) Safety

- It is recommendable to crash damaged or unnecessary LCD into pieces and wash off liquid crystal by using solvents such as acetone and ethanol.

Which should be burned up later.

When any liquid crystal leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water.

8. OUTLINE DIMENSION

NOTE: The dimension with"( )" is reference