



**Display Future Ltd**

www.displayfuture.com

## **LCD MODULE SPECIFICATION**

**Model: DF-GON0312-B-E2**

**This module uses ROHS materials**

### **For customer acceptance**

Customer		date
Approved		
Comments		

The standard product specification may change without prior notice in order to improve performance or quality. Please contact Display Future Ltd for updated specification and product status before design for the standard product or release of the order.

Revision	1.0
Engineering	
Date	2018/01/31
Our Reference	

## 1. SPECIFICATION

### 1. Display Specification

ITEM	STANDARD VALUE	UNIT
Dot matrix	256x64	--
Display Connector	Pin Header	--
Operating Temperature	-30 ~ +85	°C
Storage Temperature	-40 ~ +90	°C
Touch Panel Optional	N/A	--
Font Chip Optional	N/A	--
Sunlight Readable	No	--

### 2. Mechanical Specification

ITEM	STANDARD VALUE	UNIT
Diagonal Size	3.2	inch
Outline Dimension	100.5(w)x33.5(H)x6.3Max(T)	mm
Visual Area	78.78(W)x21.18(H)	mm
Active Area	76.78(W)x19.18(H)	mm
Dot Size	0.28(W)x0.28(H)	mm
Dot Pitch	0.30(W)x0.30(H)	mm
Net Weight	25.0	g

### 3. Electrical Specification

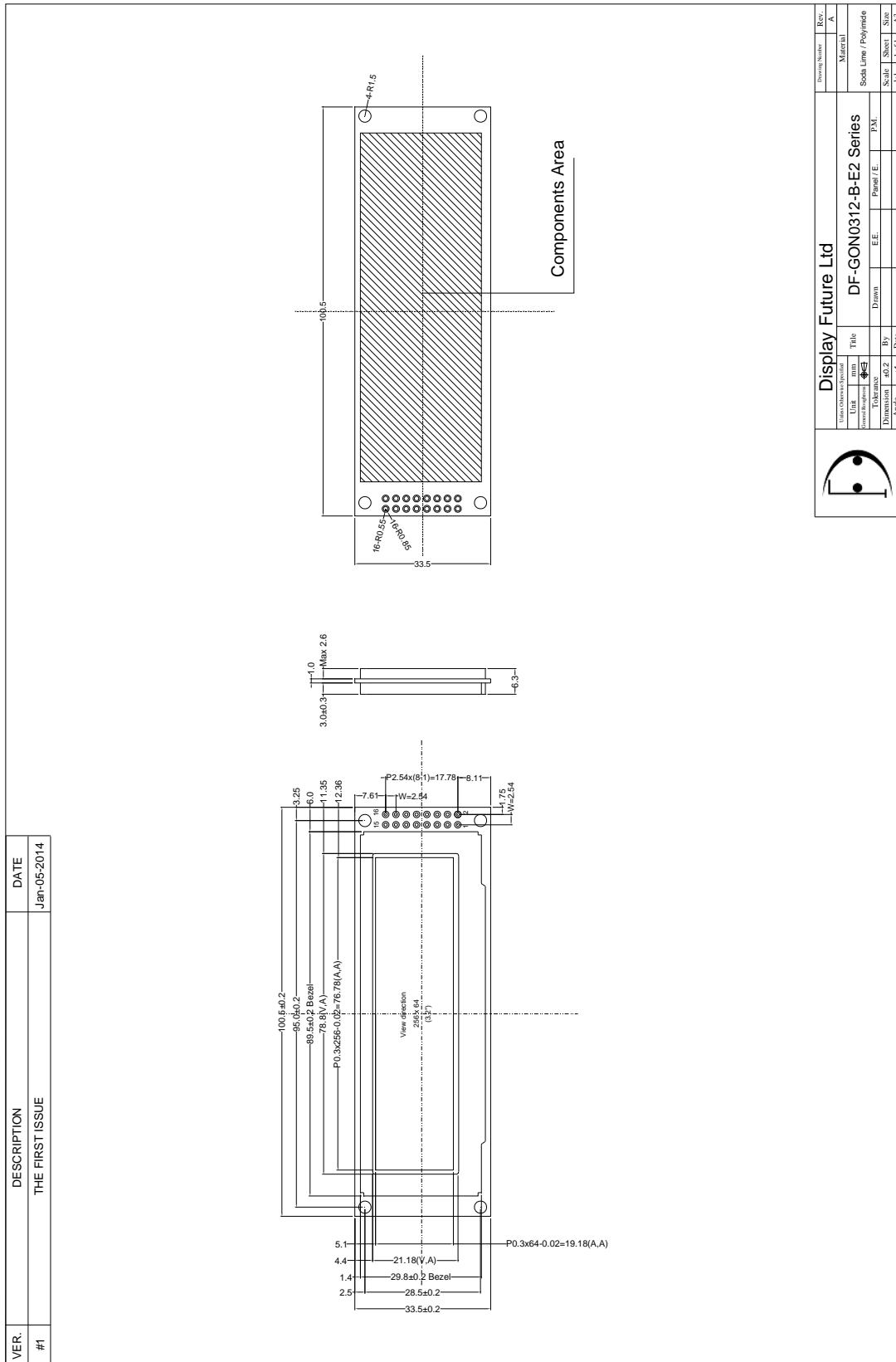
ITEM	STANDARD VALUE	UNIT
IC Package	COB	--
Controller	SSD1322	--
Interface	8-Bit 6800/8080 Parallel, 3/4-Wire Serial SPI	--

Note: Please refer to our interfacing document for how to switch to different interface.

### 4. Optical Specification

ITEM	STANDARD VALUE	UNIT
DISPLAY Type	OLED Display	--
DISPLAY Color	Refer to Page 4	--
Duty	1/64	--

## 2. OUTLINE DRAWING



### 3. ELECTRICAL SPEC

#### 1. Pin Configuration

Pin No	Symbol	I/O	Description
1	Vss	P	Ground of Logic Circuit This is a ground pin, It also acts as a reference for the logic pins,It must be connected to external ground.
2	VBAT	3.3-5V	Power Supply for Display Module Circuit This is a Voltage supply pin. It Connected to external Source
3	NC	-	Please let it Float.
4-11	DB0-DB7	I/O	Host Data Input/Output Bus These pins are 8-bit bi-directional data bus to be connected to the microprocessor's data bus, When serial mode is selected,D1 will be the serial data input SDIN and DO will be the serial clock input SCLK.
12	/RD	I	Read/Write Enable or Read This pin is MCU interface input, When interfacing to an 68xx-series microprocessor, this pin will be used as the Enable (E) signal, Read/Write operation is initiated when this pin is pulled high and the CS is pulled low, When connecting to an 80xx-microprocessor,this pin receives the Read(RD) signal, Data read operation is initiated when this pin is pulled low CS is pulled low.
13	/WR	I	Read/Write Select or Write This pin is MCU interface input, When interfacing to an 68xx-series microprocessor, this pin will be used as Read/Write(R/W) selection input, Pull this pin to "High" for read mode and pull it to "low" for write mode, When 80xx interface mode is selected, this pin will be the write (WR) input, Data write operation is initiated when this pin is pulled low and the CS is pulled low.

Pin No	Symbol	I/O	Description
14	/DC	I	<b>Data/Command Control</b> This pin is Data/Command control pin, When the pin is pulled high, the input at D7~D0 is treated as display data, When the pin is pulled low, the input at D7~D0 will be transferred to the command register. For detail relationship to MCU interface signals, please refer to the Timing Characteristics Diagrams.
15	/Reset	I	<b>Power Reset for Controller and Driver</b> This pin is reset signal input, When the pin is low; initialization of the chip is executed.
16	/CS	I	<b>Chip Select</b> This pin is the chip select input; The chip is enabled for MCU communication only when CS# is pulled low.

Note: Please refer to our interfacing document for how to switch to different interface.  
The default interface is 8-bit 8080 parallel.

2. Absolute Maximum Ratings

ITEM	SYMBOL	MIN.	MAX.	UNIT	NOTES
Power Supply Voltage	VBAT	3.0	+5.5	V	-
Logic signal voltage	VDDIO	2.5	3.3	V	1,2
Driver Supply voltage	Vcc	0	15	V	1,2
Vcc Supply Current	Icc	-	55	mA	1,2
operating temperature	Top	-30	+85	° C	-
storage temperature	TST	-40	+90	° C	-
Humidity	RH	-	90%(Max60C)	RH	-

Note 1: All the above voltages are on the basis of “VSS = 0V”.

2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section 4.3.“Electrical Characteristics”. If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.

3. Electrical Characteristics

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power supply voltage	VBAT(Note1)	3.3	-	5.0	V
Logic signal voltage	VDDIO(Note2)	2.8	-	3.3	
Input voltage'H'level	VIH	0.8xVDDIO	-	VDDIO	V
Input voltage'L'level	VIL	0	-	0.2xVDDIO	V
Logic Current	IVBAT (Note3)	-	250	--	mA
Display Voltage	VCC(Note2)	11.5	12.0	12.5	V
Brightness(Yellow)	Lbr	60	90	-	Cd/m2
C.I.E.(Yellow)	(X)	0.44	0.48	0.52	
	(Y)	0.46	0.50	0.54	
Dark Room Contrast	CR	-	>2000:1	-	
View Angle		>160	-	-	degree

Note1: This is a voltage supply pin. It must be connected to external source

Note2: From to internally DC/DC Circuit. No need external supply.

Note3: VDD=3.3V, VCC=12.0V (VDD, VCC Supply by the module internal generate) 100% Display Area Turn on.

## I. QUALITY CONTROL

### I.1 Display Future Environment Required

Customer's test & measurement are required to be conducted under the following conditions:

Temperature:	23±5°C
Humidity:	55±15% RH
Fluorescent Lamp:	30W
Distance between the Panel & Lamp:	≥50cm
Distance between the Panel & Eyes of the Inspector:	≥30cm

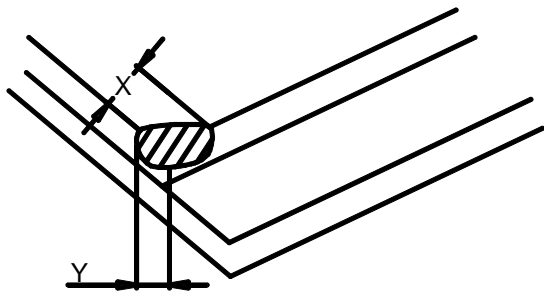
Finger glove (or finger cover) must be worn by the inspector.

Inspection table of jig must be anti-electrostatic.

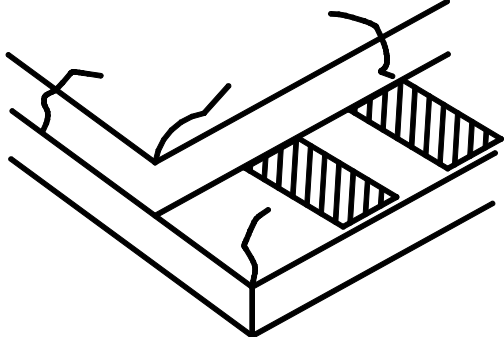

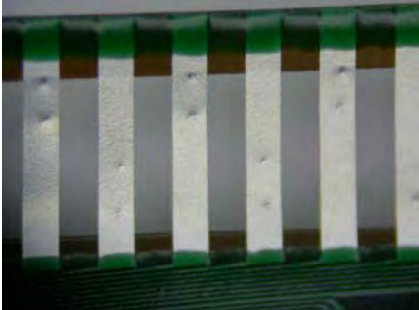
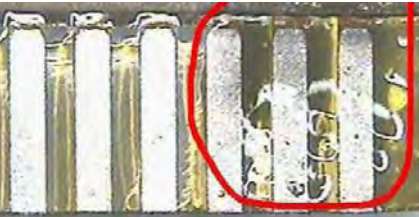
### I.2 Display Future OLED Display Criteria & Acceptable Quality Level

Partition	AQL	Definition
Major	0.65	Defects in Pattern Check (Display On)
Minor	1.0	Defects in Cosmetic Check (Display Off)

#### I.2.1 Display Future Cosmetic Check (Display Off) in Non-Active Area

Check Item	Classification	Criteria
Panel General Chipping	Minor	<p>X&gt;6mm (Along with Edge) Y&gt;1mm (Perpendicular to edge)</p> 

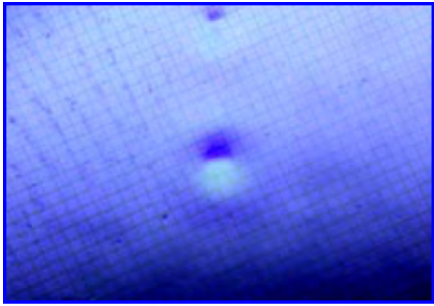
I.2.2 Display Future Cosmetic Check (Display Off)in Non-Active Area (Continued)

Check Item	Classification	Criteria
Panel Crack	Minor	Any crack is not allowable 
Copper Exposed (Even Pin or Film)	Minor	Not Allowable by Naked Eye Inspection
Film or Trace Damage	Minor	
Termial Lead Prober Mark	Acceptable	
Glue or Contamination on Pin	Minor	
Ink marking on Back Side of Panel (Exclude on Film)	Acceptable	Ignore for Any



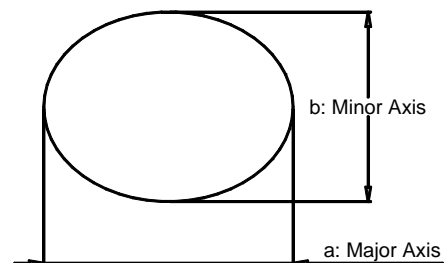
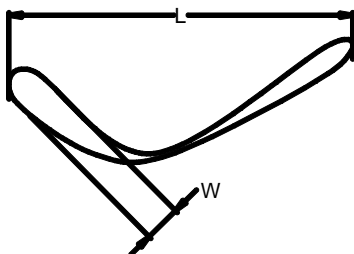
I.2.3 Display Future Cosmetic Check (Display Off) in Active Area

Display Future recommends to execute in clear environment (class 10k) if actual in necessary.


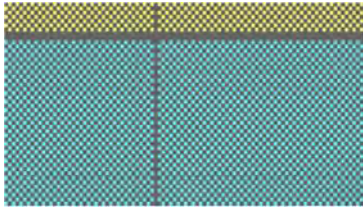
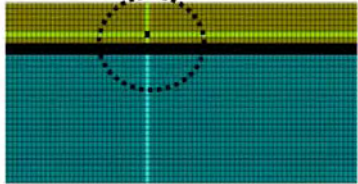
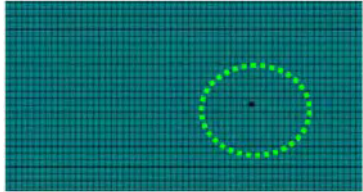
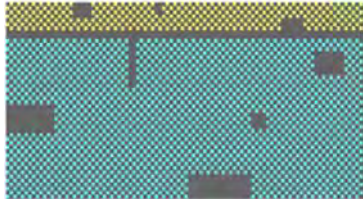

Check Item	Classification	Criteria
Any Dirt & Scratch on Polarizer's Protective Film	Acceptable	Ignore for not Affect the Polarizer
Scratches,Fiber,Line-Shape Defect (On Polarizer)	Minor	$W \leq 0.1$ Ignore $W > 0.1$ $L \leq 2$ $n \leq 1$ $L > 2$ $n = 0$
Dirt, Black Spot, Foreign Material (On Polarizer)	Minor	$\Phi \leq 0.1$ Ignore $0.1 < \Phi \leq 0.25$ $n \leq 1$ $0.25 < \Phi$ $n = 0$
Dent,Bubbles,White Spot (Any Transparent Spot on Polarizer)	Minor	$\Phi \leq 0.5$ Ignore if no Influence on Display $0.5 < \Phi$ $n = 0$ 
Fingerprint ,Flow Mark (On Polarizer)	Minor	Not Allowable

\* Protective film should not be tear off when cosmetic check.

\* Definition of W & L &  $\Phi$ (Unit:mm):  $\Phi = (a+b)/2$



I.2.4 Display Future Pattern Check (Display On) in Active Area

Check Item	Classification	Criteria
No Display	Major	
Missing Line	Major	
Pixel Short	Major	
Darker Pixel	Major	
Wrong Display	Major	
Un-uniform	Major	

## II. PRECAUTIONS for USING

### II.1 Handling Precautions

- 1) Since the Display Future OLED display panel is being made of glass, do not apply mechanical impacts such as dropping from a high position.
- 2) If the display panel is broken by some accident and the internal organic substance leaks out, be careful not to inhale nor lick the organic substance.
- 3) If pressure is applied to the display surface or its neighborhood of the Display Future OLED display module, the cell structure may be damaged and be careful not to apply pressure to these sections.
- 4) The polarizer covering the surface of the OLED display module is soft and easily scratched. Please be careful when handling the OLED display module.
- 5) When the surface of the polarizer of the OLED display module has soil, clean the surface. It takes advantage of by using following adhesion tape.
  - \* Scotch Mending Tape No. 810 or an equivalentNever try to breathe upon the soiled surface nor wipe the surface using cloth containing solvent such as ethyl alcohol, since the surface of the polarizer will become cloudy. Also, pay attention that the following liquid and solvent may spoil the polarizer:
  - \* Water
  - \* Ketone
  - \* Aromatic Solvents
- 6) Hold Display Future OLED display module very carefully when placing OLED display module into the system housing. Do not apply excessive stress or pressure to OLED display module. And, do not over bend the film with electrode pattern layouts. These stresses will influence the display performance. Also, secure sufficient rigidity for the outer cases.
- 7) Do not apply stress to the driver IC and the surrounding molded sections.
- 8) Do not disassemble nor modify the OLED display module.
- 9) Do not apply input signals while the logic power is off.
- 10) Pay sufficient attention to the working environments when handling Display Future OLED display modules to prevent occurrence of element breakage accidents by static electricity.
  - \* Be sure to make human body grounding when handling OLED display modules.
  - \* Be sure to ground tools to use or assembly such as soldering irons.
  - \* To suppress generation of static electricity, avoid carrying out assembly work under dry environments.

\* Protective film is being applied to the surface of the display panel of the OLED display module.  
Be careful since static electricity may be generated when exfoliating the protective film.

11) Protection film is being applied to the surface of the display panel and removes the protection film before assembling it. At this time, if the Display Future OLED display module has been stored for a long period of time, residue adhesive material of the protection film may remain on the surface of the display panel after removed of the film. In such case, remove the residue material by the method introduced in the above Section 5).

12) If electric current is applied when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may be corroded and be careful to avoid the above.

## II.2 Storage Precautions

- 1) When storing Display Future OLED display modules, put them in static electricity preventive bags avoiding exposure neither to direct sun light nor to lights of fluorescent lamps. and, also, avoiding high temperature and high humidity environment or low temperature (less than 0°C) environments. (We recommend you to store these modules in the packaged state as when they were shipped from Display Future.) At that time, be careful not to let water drops adhere to the packages or bags nor let dewing occur with them.
- 2) If electric current is applied when water drops are adhering to the surface of the OLED display module, when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may be corroded and be careful about the above.

## II.3 Designing Precautions

- 1) The absolute maximum ratings are the ratings which cannot be exceeded for OLED display module, and if these values are exceeded, panel damage may be happen.
- 2) To prevent occurrence of malfunctioning by noise, pay attention to satisfy the VIL and VIH specifications and, at the same time, to make the signal line cable as short as possible.
- 3) We recommend you to install excess current preventive unit (fuses, etc.) to the power circuit (VDD).  
(Recommend value: 0.5A)
- 4) Pay sufficient attention to avoid occurrence of mutual noise interference with the neighboring devices.
- 5) As for EMI, take necessary measures on the equipment side basically.
- 6) When fastening the OLED display module, fasten the external plastic housing section.

7) If power supply to the Display Future OLED display module is forcibly shut down by such errors as taking out the main battery while the OLED display panel is in operation, we cannot guarantee the quality of this OLED display module.

#### II.4 Precautions when disposing of the Display Future OLED display modules

1) Request the qualified companies to handle industrial wastes when disposing of the OLED display modules. Or, when burning them, be sure to observe the environmental and hygienic laws and regulations.

#### II.5 Other Precautions

1) When an OLED display module is operated for a long of time with fixed pattern may remain as an after image or slight contrast deviation may occur. Nonetheless, if the operation is interrupted and left unused for a while, normal state can be restored. Also, there will be no problem in the reliability of the module.

2) To protect OLED display modules from performance drops by static electricity rapture, etc., do not touch the following sections whenever possible while handling the OLED display modules.

- \* Pins and electrodes

- \* Pattern layouts such as the FPC

3) With this OLED display module, the OLED driver is being exposed. Generally speaking, semiconductor elements change their characteristics when light is radiated according to the principle of the solar battery. Consequently, if this OLED driver is exposed to light, malfunctioning may occur.

- \* Design the product and installation method so that the OLED driver may be shielded from light in actual usage.

- \* Design the product and installation method so that the OLED driver may be shielded from light during the inspection processes.

4) Although this OLED display module stores the operation state data by the commands and the indication data, when excessive external noise, etc. enters into the module, the internal status may be changed. It therefore is necessary to take appropriate measures to suppress noise generation or to protect from influences of noise on the system design.

5) We recommend you to construct its software to make periodical refreshment of the operation statuses (re-setting of the commands and re-transference of the display data) to cope with catastrophic noise.

**That's the end of the datasheet.**