



# SPECIFICATIONS

**CUSTOMER** : \_\_\_\_\_




**MODEL NO.** : **GFE122032F-YPNE-01**

**VERSION** : **C**

**DATE** : **2017.03.24**

**CERTIFICATION** : **ROHS**

**CUSTOMER SIGN** : \_\_\_\_\_

QA Approved By	Approved By	Prepared By	Prepared By
			

晶發科技股份有限公司  
GI FAR TECHNOLOGY CO.,LTD

新北市樹林區東豐街 81 號

No. 81, Dongfeng St, Shulin District, 23874, New Taipei City, Taiwan, R.O.C.

TEL: +886-2-8684-1188 FAX: +886-2-8684-8532



## Revision Record

Data(y/m/d)	Ver.	Description	Note	page
2010.12.16	A	New		
2015.07.07	B	更新規格書格式，修正圖面同樣品		
2017.03.24	C	修改公司抬頭、格式統一		



## CONTENTS

1. Scope	-----	4
2. Product Specifications	-----	4
2.1 General	-----	4
2.2 Mechanical Characteristics	-----	4
2.3 Absolute Maximum Ratings	-----	5
2.4 Electrical Characteristics	-----	5
2.5 Optical Characteristics Absolute maximum ratings	-----	5
2.6 Optical Characteristics	-----	6
3. Reliability	-----	7
4. Operating Instructions	-----	8
4.1 Input signal Function	-----	8
4.2 Voltage Generator Circuit	-----	8
4.3 Timing Diagram	-----	9
4.4. Display Command	-----	10
5 Notes	-----	11
6 Operation Precautions	-----	11
7 LCM Dimensions	-----	12



## 1. SCOPE

This specification covers the engineering requirements for the GFE122032F-YPNE-01 liquid crystal module.

## 2. PRODUCT SPECIFICATIONS

### 2.1 General

- 122 × 32 dot matrix LCD
- STN(Y/G), Positive mode LCD panel
- Transflective , Wide temperature type
- 6 o'clock
- Multiplexing driving : 1/32duty, 1/6bias
- Controller IC : SBN1661G\*2
- Backlight: No

### 2.2 Mechanical Characteristics

Item	Value	Unit
Number of dots	122X32	Dot
Dot size	0.33 X0.36	mm
Dot pitch	0.37X0.40	mm
Module dimension	55.9(W) X 28.2(H) X 3.5(T)	mm
Viewing Area	50.3 (W) X 19.05 (H)	mm
Active Area	45.1 (W) X 13.72(H)	mm
Module	With Sponge	
Remark	-	



## 2.3 Absolute Maximum Ratings (Without LED back-light)

Characteristic	Symbol	Unit	Value
Operating Voltage (logic)	$V_{DD}$	V	-0.3 to +5.0
Input Voltage	$V_{IN}$	V	-0.3 to $V_{DD}+0.3$

Note 1: Referenced to  $V_{SS}=0V$

## 2.4 Electrical Characteristics (Without LED back-light)

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Voltage(logic)	$V_{DD}-V_{SS}$	--	4.7	5.0	5.3	V
Input Voltage	$V_{IH}$	--	$0.8V_{DD}$	--	$V_{DD}$	V
	$V_{IL}$	--	$V_{SS}$	--	$0.2V_{DD}$	
Output Voltage	$V_{OH}$	$I_{OH}=-0.1mA$	$0.8V_{DD}$	--	$V_{DD}$	V
	$V_{HL}$	$I_{OL}=0.1mA$	$V_{SS}$	--	$0.2V_{DD}$	

## 2.5 Optical Characteristics Absolute maximum ratings

Item	Symbol	Rating	Unit
Operating temperature range	Top	-20~70	°C
Storage temperature range	Tst	-30~80	°C

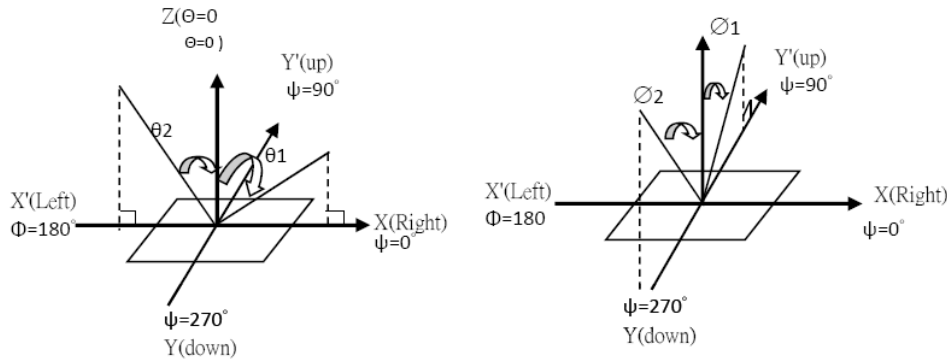


## 2.6. Optical Characteristics

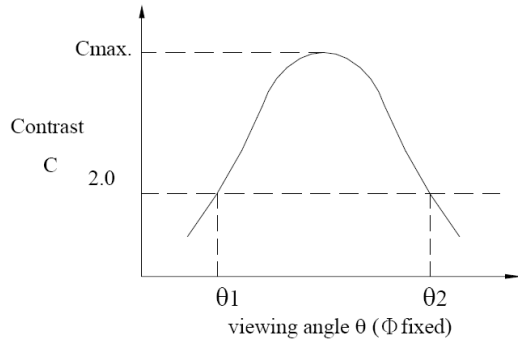
1/32 duty, 1/6 bias, Vop=4.6V, Ta=25°C

Item	Symbol	Conditions	Min.	Typ.	Max	Reference
Driving voltage	Vop=VDD-VO		--	4.6	--	
Viewing angle	$\theta_1$ 、 $\theta_2$	$C \geq 2.0, \varnothing = 0^\circ$ C	30°	-		Notes 1 & 2
Contrast	C	$\theta = 5^\circ, \varnothing = 0^\circ$	2.0	-	-	Note 3
Response time(rise)	t <sub>on</sub>	$\theta = 5^\circ, \varnothing = 0^\circ$	-		TBD	Note 4
Response time(fall)	t <sub>off</sub>	$\theta = 5^\circ, \varnothing = 0^\circ$	-	-	TBD	Note 4

Note 1: Definition of angles  $\theta$  and  $\varnothing$

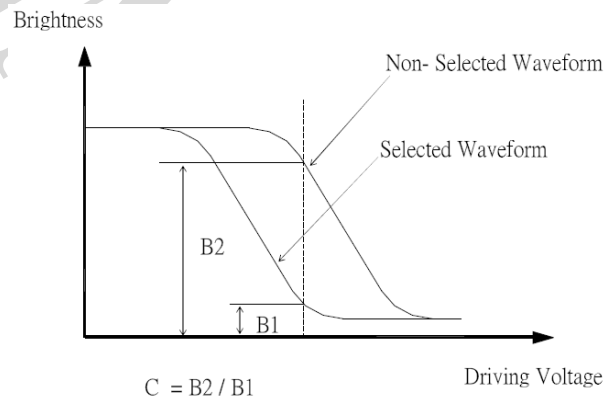


Note 2: Definition of viewing angles  $\theta_1$  and  $\theta_2$

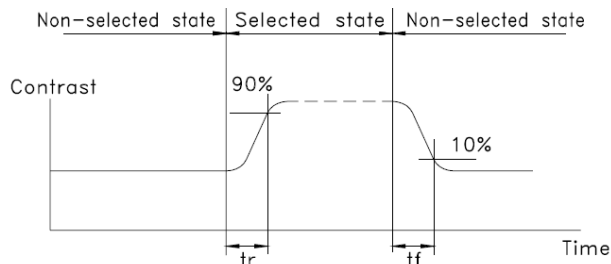


Note : Optimum viewing angle with the naked eye and viewing angle  $\theta$  at Cmax. Above are not always the same

Note 3: Definition of contrast C



Note 4: Definition of response time

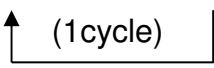


Note: Measured with a transmissive LCD panel which is displayed 1 cm<sup>2</sup>

V<sub>OPR</sub> : Operating voltage      f<sub>FRM</sub> : Frame frequency  
t<sub>ON</sub> : Response time (rise)    t<sub>OFF</sub> : Response time (fall)



### 3. RELIABILITY

NO.	ITEM	CONDITION		STANDARD	NOTE
1	High Temp. Storage	80°C	120 hrs	Appearance Without defect	
2	Low Temp. Storage	-30°C	120 hrs	Appearance Without defect	
3	High Temp. & High Humi. Storage	40°C 90% RH	120 hrs	Appearance Without defect	
4	High Temp. Operating Display	70°C	120 hrs	Appearance Without defect	
5	Low Temp. Operating Display	-20°C	120 hrs	Appearance Without defect	
6	Thermal Shock	-20°C, 30min. → 70°C, 30min. 		Appearance Without defect	10 cycles

\*\* Dissipation current, contrast and display functions

\*\* Polarizing filter deterioration, other appearance defects

\*\* The function test shall be conducted after 4hours storage at the normal temperature and humidity after remove from the test chamber.

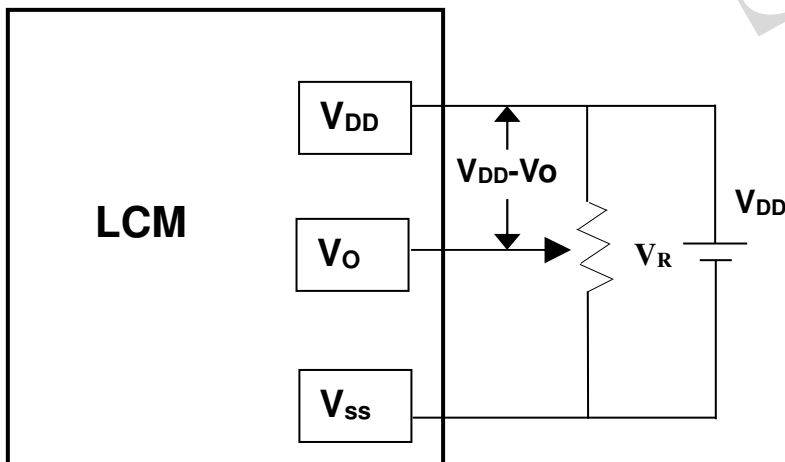


## 4. OPERATING INSTRUCTIONS

### 4.1 Input signal Function

Pin No	Symbol	Function
1	Vdd	Power supply for logic (+5V)
2	Vss	Signal ground (GND)
3	Vo	Operating voltage for LCD (variable)
4	RES	Reset signal
5	E1	Chip1 enable (segment 1 to segment 64),Active high
6	E2	Chip2 enable (segment 65 to segment 128),Active high
7	R/W	Data read & write
8	A0	Start enable signal to read or write the data
9-12	DB0~DB3	Four low order bi-directional three-state data bus lines. Used for data transfer between the MPU and the LCD module.
13-16	DB4~DB7	Four high order bi-directional three-state data bus lines. Used for data transfer between the MPU and the LCD module. DB7 can be used as a busy flag.
17	A	LED backlight drive voltage V+
18	K	LED backlight drive voltage ground

### 4.2 Voltage Generator Circuit

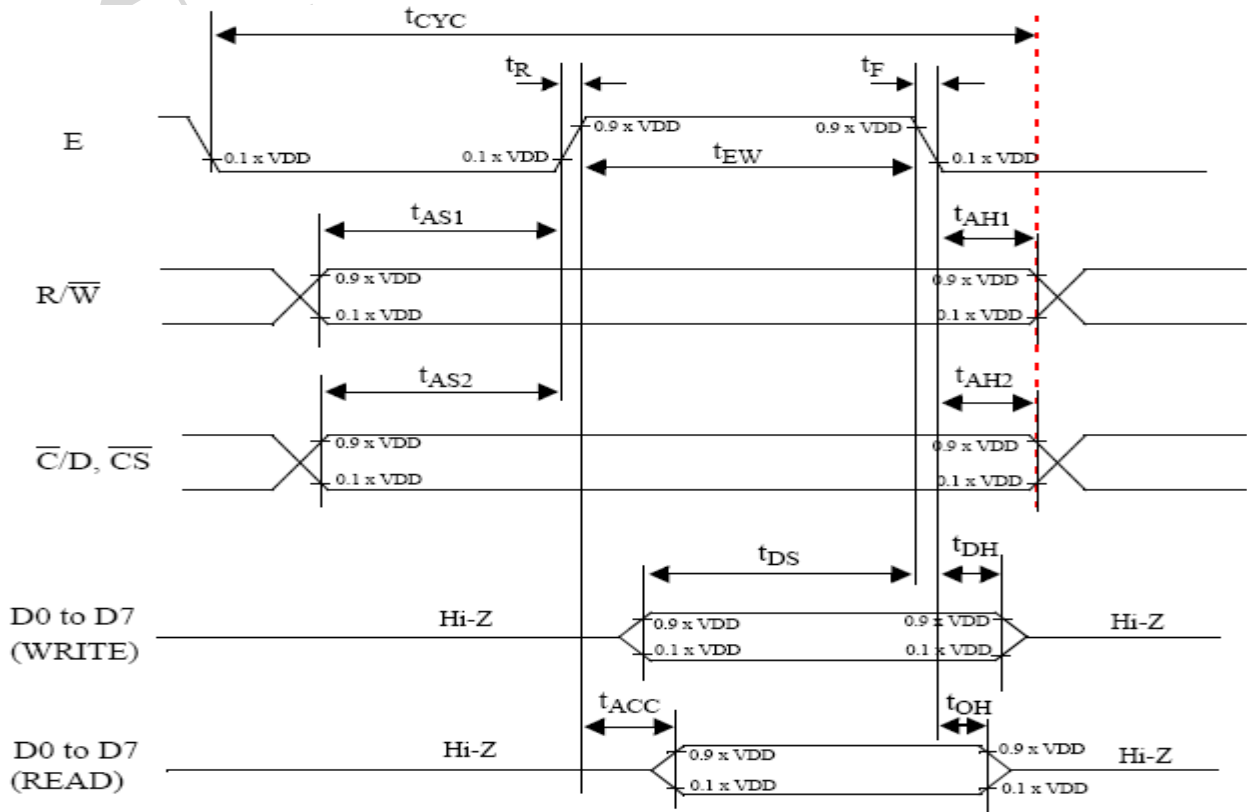


**V<sub>DD-Vo</sub> : LCD Driving Voltage**  
**V<sub>R</sub> : 10K~20K**





### 4.3 Timing Diagram



symbol	parameter	min.	max.	test conditons	unit
t <sub>AS1</sub>	Address set-up time with respect to R/W	20			ns
t <sub>AS2</sub>	Address set-up time with respect to C/D, CS	20			ns
t <sub>AH1</sub>	Address hold time with respect to R/W	10			ns
t <sub>AH2</sub>	Address hold time respect with to C/D, CS	10			ns
t <sub>F</sub> , t <sub>R</sub>	Enable (E) pulse falling/rising time		15		ns
t <sub>CYC</sub>	System cycle time	1000		Note 1	ns
t <sub>EWR</sub>	Enable pulse width for READ	100			ns
t <sub>EWW</sub>	Enable pulse width for WRITE	80			ns
t <sub>DS</sub>	Data setup time	80			ns
t <sub>DH</sub>	Data hold time	10			ns
t <sub>ACC</sub>	Data access time		90	CL= 100 pF.	ns
t <sub>OH</sub>	Data output hold time	10	60	Refer to Fig. 23.	ns
t <sub>AS1</sub>	Address set-up time with respect to R/W	40			ns
t <sub>AS2</sub>	Address set-up time with respect to C/D, CS	40			ns
t <sub>AH1</sub>	Address hold time with respect to R/W	20			ns
t <sub>AH2</sub>	Address hold time respect with to C/D, CS	20			ns
t <sub>F</sub> , t <sub>R</sub>	Enable (E) pulse falling/rising time		15		ns
t <sub>CYC</sub>	System cycle time	2000		Note 1	ns
t <sub>EWR</sub>	Enable pulse width for READ	200			ns
t <sub>EWW</sub>	Enable pulse width for WRITE	160			ns
t <sub>DS</sub>	Data setup time	160			ns
t <sub>DH</sub>	Data hold time	20			ns
t <sub>ACC</sub>	Data access time		180	CL= 100 pF.	ns
t <sub>OH</sub>	Data output hold time	20	120	Refer to Fig. 23.	ns



#### 4.4. Display Command

COMMAND	Code											FUNCTION			
	A	R	W	D	D	D	D	D	D	D	D				
	0	D	R	7	6	5	4	3	2	1	0				
Display On/Off	0	1	0	1	0	1	0	1	1	1	0/1	Turns display on or off 1:ON,0:OFF			
Display start line	0	1	0	1	1	0	Display start address (0 to 31)					Specifies RAM line corresponding to top line of display.			
Set page address	0	1	0	1	0	1	1	1	0	Page(0 to 3)	Sets display RAM page in page address register.				
Set column (Segment) address	0	1	0	0	Column address (0 to 79)							Sets display RAM column address in column address register.			
Read status	0	0	1	B	A	O	R	N	E	S	0	0	0	0	Reads the following status: BUSY 1:Busy 0:Ready ADC 1:CCW output 0:CCW output ON/OFF 1: Display off 0:Display on RESET 1:Being reset 0:Normal
Write display data	1	1	0	Write data											Writes data from data bus into display RAM.
Read display data	1	0	1	Read data											Reads data from display RAM onto data bus.
Select ADC	0	1	0	1	0	1	0	0	0	0	0/1	0:CCW output,1:CCW output			
Static drive ON/OFF	0	1	0	1	0	1	0	0	1	0	0/1	Selects static driving operation 1:Static drive,0:Normal driving			
Select duty	0	1	0	1	0	1	0	1	0	0	0/1	Selects LCD duty cycle 1:1/32,0:1/16			
Read-Modify-Write	0	1	0	1	1	1	0	0	0	0	0	Read-modify-write ON			
End	0	1	0	1	1	1	0	1	1	1	0	Read-Modify-Write OFF			
Reset	0	1	0	1	1	1	0	0	0	1	0	Software reset			



## 5. NOTES

### ▪ Safety

- If the LCD panel breaks, be careful not to get the liquid crystal in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and plenty of water.

### Handling

- Avoid static electricity as this can damage the CMOS LSI.
- The LCD panel is plate glass; do not hit or crush it.
- Do not remove the panel or frame from the module.
- The polarizing plate of the display is very fragile; handle it very carefully

### Mounting and Design

- Mount the module by using the specified mounting part and holes.
- To protect the module from external pressure, leave a small gap by placing transparent plates (e.g. acrylic or glass) on the display surface, frame, and polarizing plate
- Design the system so that no input signal is given unless the power-supply voltage is applied.
- Keep the module dry. Avoid condensation, otherwise the transparent electrodes may break.

### Storage

- Store the module in a dark place where the temperature is  $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$  and the humidity below 65% RH.
- Do not store the module near organic solvents or corrosive gases.
- Do not crush, shake, or jolt the module (including accessories).

### Cleaning

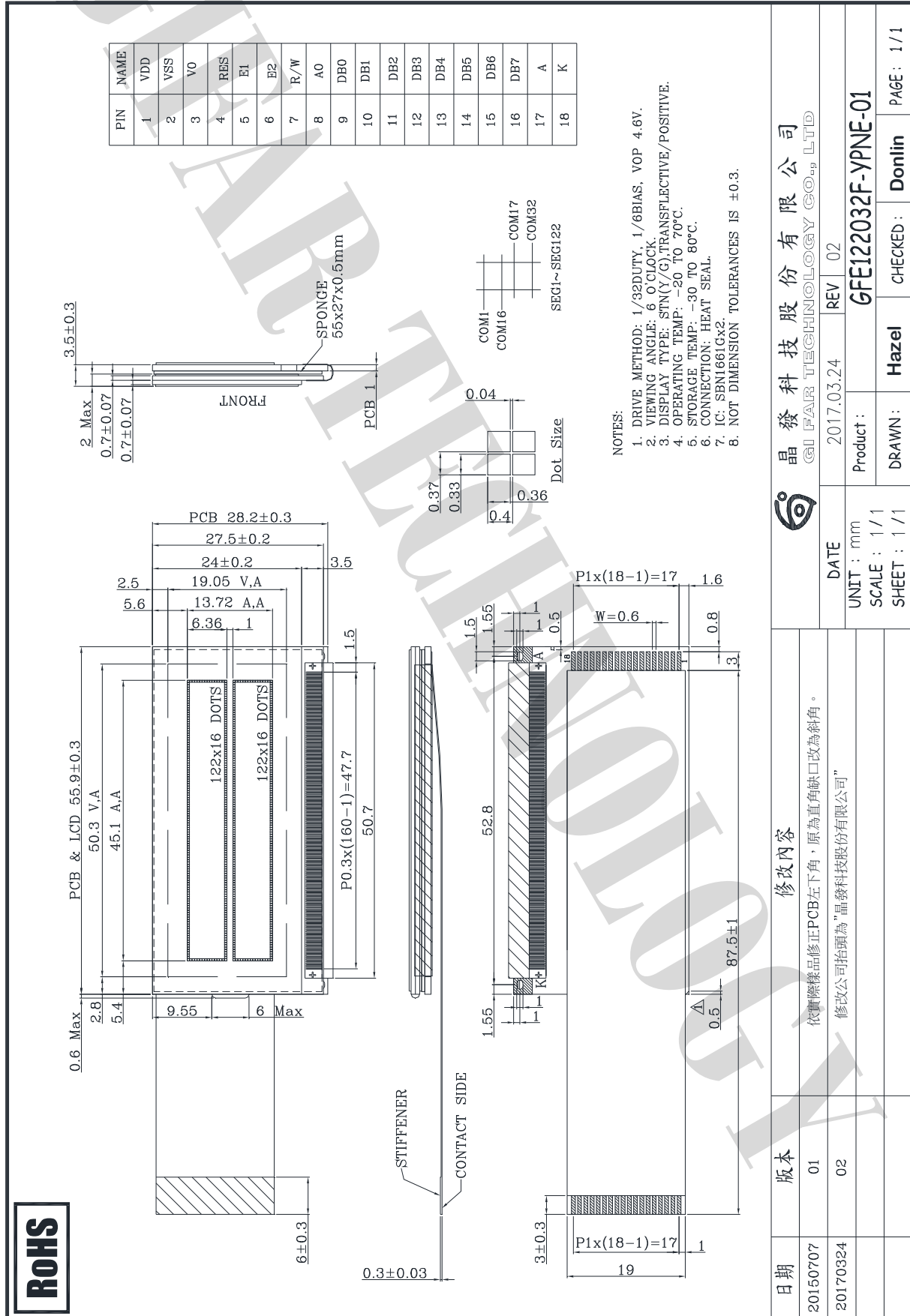
- Do not wipe the polarizing plate with a dry cloth, as it may scratch the surface.
- Wipe the module gently with soft cloth soaked with a petroleum benzine.
- Do not use ketonic solvents (ketone and acetone) or aromatic solvents (toluene and xylene), as they may damage the polarizing plate.

## 6. OPERATION PRECAUTIONS

Any changes that need to be made in this specification or any problems arising from it will be dealt with quickly by discussion between both companies.



## 7. LCM Dimension



**ROHS**

日期	20150707	版本	01	修改內容	依實際樣品修正PCB左下角，原為直角缺口改為斜角。
	20170324		02		修改公司抬頭為「晶發科技股份有限公司」
DATE		REV		Product	
2017.03.24		02		GFE122032F-YPNE-01	
UNIT : mm		DRAWN :		CHECKED :	
SCALE : 1 / 1		Hazel		Donlin	
SHEET : 1 / 1				PAGE : 1 / 1	