FindLcd GEMINI Technology Co., Ltd.
www.FindLCD.com

SPECIFICATION
FOR
LCM MODULE

MODULE NO.: CGG064064A00-FHN-R
DOC.REVISION: 00

Customer Approval:

www.FindLCD.com

	SIGNATURE	DATE
PREPARED BY (RD ENGINEER)		
PREPARED BY (QA ENGINEER)		
CHECKED BY		
APPROVED BY		

DOCUMENT REVISION HISTORY

Version	DATE	DESCRIPTION	CHANGED BY
00	Feb-27-2010	First issue	

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1. FUNCTIONS & FEATURES

1.1. Format : 64x64 Dots
1.2. LCD mode : FSTN/Positive/Transflective
1.3. Viewing direction : 6 o'clock
1.4. Driving scheme : 1/68 Duty cycle, 1/9 Bias
1.5. Power supply voltage (V_{DD}) : 3.0V
1.6. LCD driving voltage (VLCD) : 8.7V(Reference voltage)
1.7. Operation temp : -20~70℃
1.8. Storage temp : -30~80℃
1.9. RoHS compliant.

2. MECHANICAL SPECIFICATIONS

2.1. Module size : 25.0mm(L)*33.0mm (W)*2.9mm(H) (Excluding Lcd Pin length 10.0mm)
2.2. Viewing area : 22.0mm(L)*22.0mm(W)
2.3. Dot pitch : 0.297mm(L)*0.297mm(W)
2.4. Dot size : 0.277mm(L)*0.277mm(W)
2.5. Weight : Approx.

3. BLOCK DIAGRAM

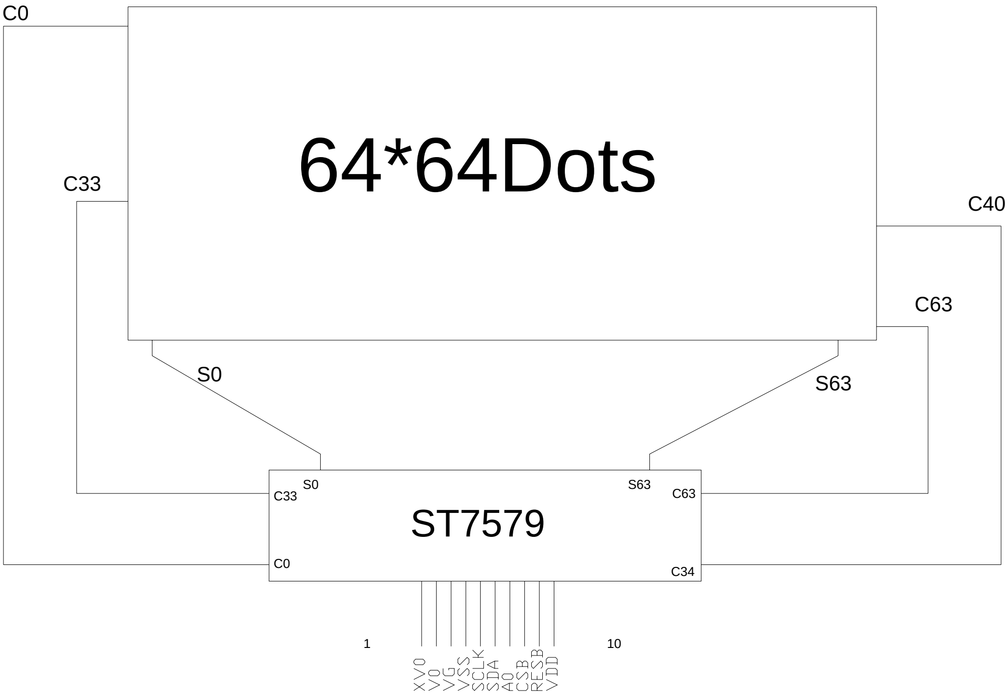
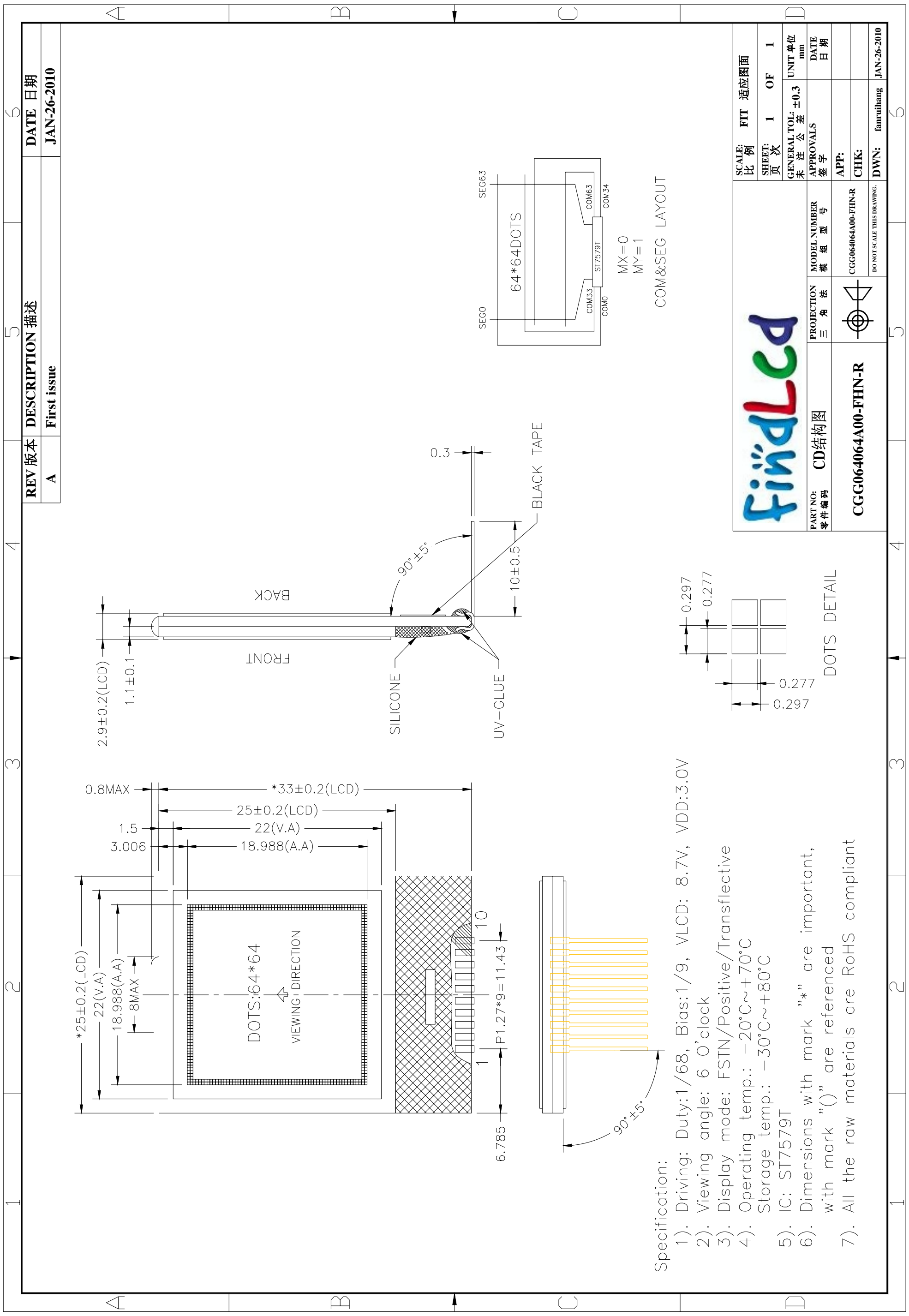

C0
C33
64*64Dots
C40
C63
S0
S63
C33
S0
S63
C63
ST7579
C0
C34
1
10
XV0
V0
VG
VSS
SCLK
SDA
A0
CSB
RESB
VDD

Figure 1.Block diagram

4. DIMENSIONAL OUTLINE


REV 版本
A
DESCRIPTION 描述
First issue
DATE 日期
JAN-26-2010
64*64DOTS
SEG63
SEG0
COM63
COM34
ST7579T
COM33
COM0
MX=0
MY=1
COM&SEG LAYOUT
0.3
BLACK TAPE
90°±5°
10±0.5
BACK
FRONT
SILICONE
UV-GLUE
2.9±0.2(LCD)
1.1±0.1
0.297
0.277
0.277
0.297
DOTS DETAIL
0.8MAX
*33±0.2(LCD)
25±0.2(LCD)
1.5
22(V.A)
3.006
18.988(A.A)
*25±0.2(LCD)
22(V.A)
18.988(A.A)
8MAX
DOTS:64*64
VIEWING DIRECTION
10
1
P1.27*9=11.43
6.785
90°±5°
SCALE: 比例
FIT 适应图面
SHEET: 页次
1 OF 1
GENERAL TOL: 未注公差 ±0.3
UNIT 单位 mm
APPROVALS 签字
DATE 日期
APP:
CHK:
DWN: fanruihang
JAN-26-2010
PART NO: 零件编码
CD结构图
CGG064064A00-FHN-R
PROJECTION 三角法
MODEL NUMBER 模组型号
CGG064064A00-FHN-R
DO NOT SCALE THIS DRAWING.
A
B
C
D
1
2
3
4
5
6

Specification:
1). Driving: Duty:1/68, Bias:1/9, VLCD: 8.7V, VDD:3.0V
2). Viewing angle: 6 O'clock
3). Display mode: FSTN/Positive/Transflective
4). Operating temp.: −20°C~+70°C
Storage temp.: −30°C~+80°C
5). IC: ST7579T
6). Dimensions with mark "*" are important, with mark "()" are referenced
7). All the raw materials are RoHS compliant

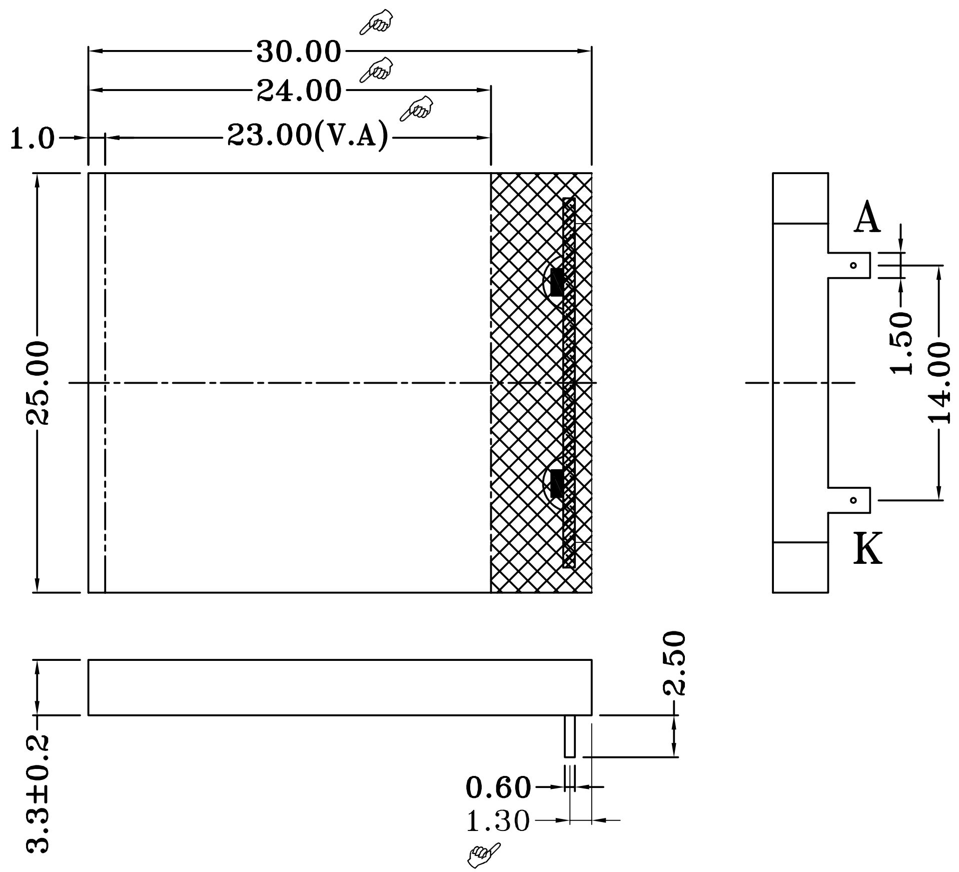
Figure2. Dimensional outline

REF??	DATE??	DESCRIPTION??	NAME ???

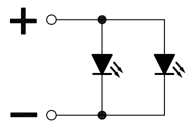
试做图

????		DATE ??	2010.01.27	PAGE ??	1

注：按ROHS要求制作

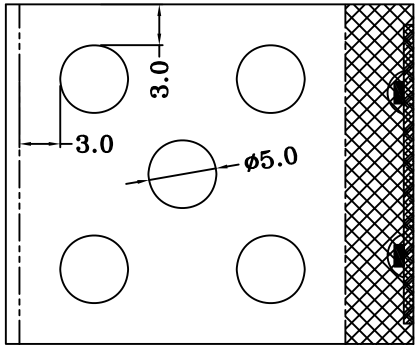


电路图:



*亮度值是 5 个测量点的平均值，亮度最小值比最大值乘以100%一般大于75%使用BM-7亮度色度仪测量，测量光圈 ø5 mm.

The Master Screen's luminance is the averagevalue of 5 points,and The Lvmin./Lvmax*100%.is more than 75% TypicalThmeasurement instrument is BM-7luminanceColorimeter.The aperture is ø5 mm.



Notes:
1.Unit:mm.
1.单位:毫米
2.Do not scale drawing.
2.未按比例画图
3.All without tolerances±0.2.
3.未注公差±0.2
4. ⚠ Modification rev.number.
4. ⚠ 是修改标记
5.Color:Yellow-Green
5.颜色：黄绿色

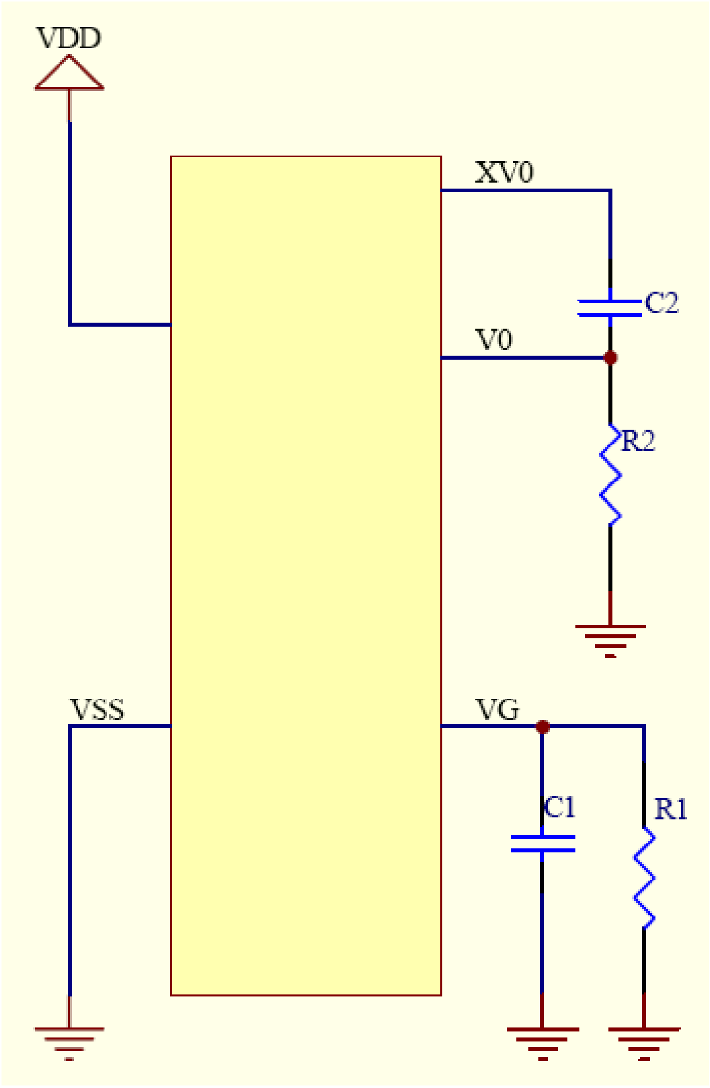
NO.	TITLE	QUANTITY
6.	PCB(线路板)	1
5.	LED(灯)	2
4.	Light Shield Tape(????)	1
3.	Side Shield Tape(?????)	1
2.	Diffuser Tape(????)	1
1.	Light Guide(???)	1

?? Item	?? Symbol	Min	Typ	Max	?? Unit	???? Condition
???? Forward Voltage	Vf	1.9	2.1	2.3	V	If= 30 mA
???? Reverse Current	Ir	═══	═══	20	uA	Vr= 5 V
???? Peak Wavelengh	λρ	570		575	nm	If= 30 mA
亮度 Luminance	Lv	25	═══	═══	cd/m²	
??? Uniformity	Δ	70	═══	═══	%	
???? Operating Temperature	Topr	-25	═══	70	°C	═══
???? Storage Temperature	Tstg	-35	═══	80	°C	═══

GEMINI Technology Co., Ltd

CUSTOMER'S NAME ? ? ? ?	CUSTOMER'S CODE ? ? ? ?	EDITION ??
集美电子	/	A
BRT.CODE 产品编号	PRODUCT.CODE 产品编号	EDITION ??
BP0950	BP0950YG02A	A
DESIGN 设计	CHECK 审核	REVIEW 确认
田 鹏		

5. LCD DRIVING VOLTAGE GENERATOR AND BIAS REFERENCE CIRCUIT



C1=0.1uF~1uF (Non-Polar/6V, default 0.1uF)
C2=0.1uF~1uF (Non-Polar/16V, default 0.1uF)
R1=47KΩ~100KΩ (default 47KΩ)
R2=500KΩ~1MΩ (default 500KΩ)

Figure3. Reference circuit

6. PIN DESCRIPTION

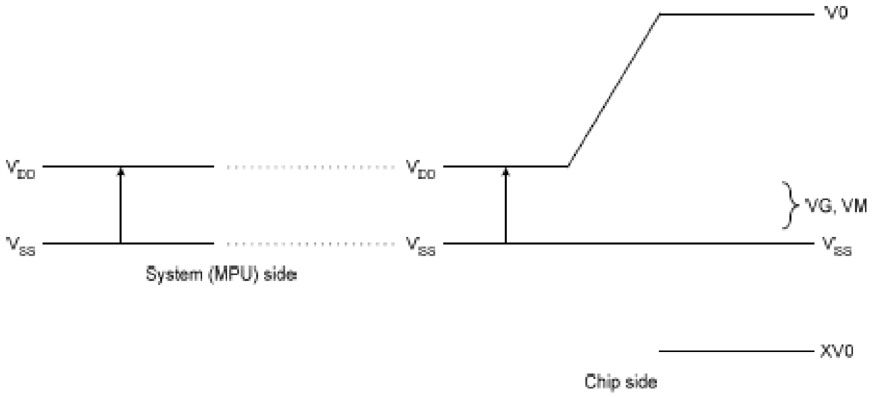
No.	Symbol	Function
1	XV0	XV0 is the LCD driving voltage for common circuits at positive frame.
2	V0	V0 is the LCD driving voltage for common circuits at negative frame.
3	VG	VG is the LCD driving voltage for segment circuits.
4	VSS	Power ground (0V)
5	SLCK	The Serial clock input terminal
6	SDA	The Serial Data input terminal
7	A0	It determines whether the access is related to data or command. A0="H" : Indicates that signals on D[7:0] are display data. A0="L" : Indicates that signals on D[7:0] are command. A0 is not used in 3-line SPI interface and should fix to "H" by VDD1
8	CSB	Chip select input pin. Interface access is enabled when CSB is"L". When CSB is non-active (CSB="H"), D[7:0] pins are high impedance.
9	RESB	Reset input pin. When RSTB is "L", internal initialization is executed
10	VDD	Power supply for logic(+3.0V)

7. MAXIMUM ABSOUTE LIMIT

Maximum Ratings (Voltage Reference to VSS)(for IC)

In accordance with the Absolute Maximum Rating System; please refer to notes 1 and 2.

Parameter	Symbol	Conditions	Unit
Digital Power Supply Voltage	VDD1	-0.3 ~ 3.6	V
Analog Power supply voltage	VDD2	-0.3 ~ 3.6	V
LCD Power supply voltage	V0-XV0	-0.3~15	V
LCD Power driving voltage	VG, VM	-0.3 ~ VDD2	V
Operating temperature	TOPR	–30 to +85	°C
Storage temperature	TSTR	–65 to +150	°C



Notes

1. Stresses above those listed under Limiting Values may cause permanent damage to the device.
2. Parameters are valid over operating temperature range unless otherwise specified. All voltages are with respect to VSS unless otherwise noted.
3. Insure the voltage levels of V0, VDD2, VG, VM, VSS and XV0 always match the correct relation: $V0 \geq VDD2 > VG > VM > VSS \geq XV0$

8. ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS

VDD1=1.8V to 3.3V, VSS=0V; Tamb = -30˚C to +85˚C; unless otherwise specified.

Item	Symbol	Condition	Rating			Unit	Applicable Pin
			Min.	Typ.	Max.		
Operating Voltage (1)	VDD1		1.7	—	3.4	V	VDD1
Operating Voltage (2)	VDD2		2.4	—	3.4	V	VDD2
Input High-level Voltage	V_{IHC}		0.7 x VDD1	—	VDD1	V	MPU Interface
Input Low-level Voltage	V_{ILC}		VSS	—	0.3 x VDD1	V	MPU Interface
Output High-level Voltage	V_{OHC}	I_{OUT}=1mA, VDD1=1.8V	0.8 x VDD1	—	VDD1	V	D[7:0]
Output Low-level Voltage	V_{OLC}	I_{OUT}=-1mA, VDD1=1.8V	VSS	—	0.2 x VDD1	V	D[7:0]
Input Leakage Current	I_{LI}		-1.0	—	1.0	µA	MPU Interface
Output Leakage Current	I_{LO}		-3.0	—	3.0	µA	MPU Interface
Liquid Crystal Driver ON Resistance	R_{ON}	Ta=25˚C Vop=9V, △V=0.9V	—	0.7	—	KΩ	COMx
		VG=2V, △V=0.2V	—	0.7	—	KΩ	SEGx
Frame Frequency	FR	FR default (1,0,0), 1/68 Duty Ta = 25°C	68	73	81	Hz	

Note:

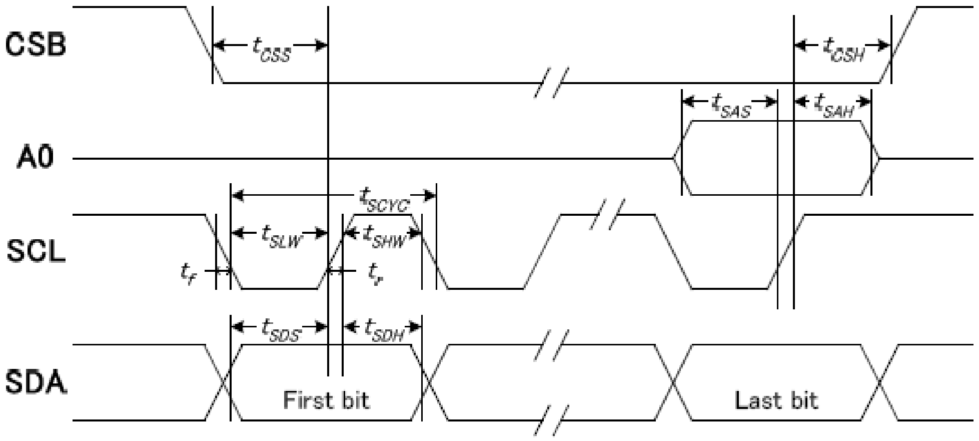
1. Recommend application Vop range : 4V ~ 9.5V.
2. LCD module size : 1.8" (max).

Current consumption: During Display, with internal power system, current consumed by whole IC (bare die).

Test Pattern	Symbol	Condition	Rating			Unit	Note
			Min.	Typ.	Max.		
Display Pattern: SNOW (Static)	ISS	VDD1=VDD2=3.0V, Booster X5 V_{OP} = 9.0 V, Bias=1/9 Ta=25˚C	—	110	150	µA	
Power Down	ISS	VDD1=VDD2=3.0V, Ta=25˚C	—	1	10	µA	

9. TIMING CHARACTERISTICS

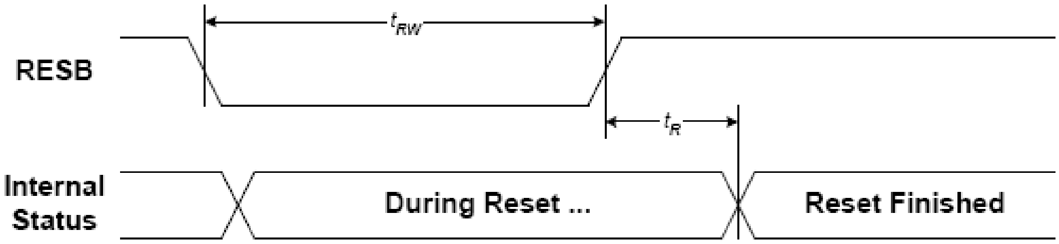
Serial Interface (4-Line Interface)


CSB
A0
SCL
SDA
t_{CSS}
t_{CSH}
t_{SAS}
t_{SAH}
t_{SCYC}
t_{SLW}
t_{SHW}
t_f
t_r
t_{SDS}
t_{SDH}
First bit
Last bit

(VDD = 3.3V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period	SCLK	tSCYC		120	—	ns
SCLK "H" pulse width		tSHW		60	—	
SCLK "L" pulse width		tSLW		60	—	
Address setup time	A0	tSAS		20	—	
Address hold time		tSAH		90	—	
Data setup time	SDA	tSDS		20	—	
Data hold time		tSDH		10	—	
CSB-SCLK time	CSB	tCSS		20	—	
CSB-SCLK time		tCSH		120	—	

Hardware Reset Timing


RESB
t_{RW}
t_R
Internal Status
During Reset ...
Reset Finished

(VDD = 3.3V , Ta =-30~85°C)

Item	Symbol	Condition	Min.	Max.	Unit
Reset time	tR		—	1.5	us
Reset "L" pulse width	tRW		1.5	—	

10. CONTROL AND DISPLAY INSTRUCTION

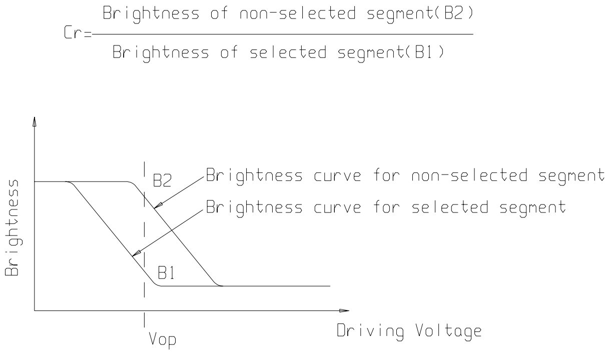
INSTRUCTION	A0	R/W (RWR)	COMMAND BYTE								DESCRIPTION
			D7	D6	D5	D4	D3	D2	D1	D0	
H[1:0] Independent Instruction											
NOP	0	0	0	0	0	0	0	0	0	0	No operation
Reserved	0	0	0	0	0	0	0	0	0	1	Do not use
Function Set	0	0	0	0	1	MX	MY	PD	H1	H0	Power down; entry mode; Select instruction table
Read Status	0	1	PD	0	0	D	E	MX	MY	DO	Read status byte
Read Data	1	1	D7	D6	D5	D4	D3	D2	D1	D0	Read data to RAM
Write Data	1	0	D7	D6	D5	D4	D3	D2	D1	D0	Write data to RAM
H[1:0] = (0,0)											
Reserved	0	0	0	0	0	0	0	0	1	X	Do not use
Set V0 Range	0	0	0	0	0	0	0	1	0	PRS	V0 range L/H select
END	0	0	0	0	0	0	0	1	1	0	Release read/modify/write
Read-modify-Write	0	0	0	0	0	0	0	1	1	1	RAM address at R:+0 , W:+1
Display Control	0	0	0	0	0	0	1	D	0	E	Sets display configuration
Reserved	0	0	0	0	0	1	0	0	X	X	Do not use
Set Y Address of RAM	0	0	0	1	0	0	Y3	Y2	Y1	Y0	Sets Y address of RAM $0 \le Y \le 9$
Set X Address of RAM	0	0	1	X6	X5	X4	X3	X2	X1	X0	Sets X address of RAM $0 \le X \le 101$
H[1:0] = (0,1)											
Reserved	0	0	0	0	0	0	0	0	1	X	Do not use
Display Configuration	0	0	0	0	0	0	1	DO	X	X	Top/bottom row mode set data order
Bias System	0	0	0	0	0	1	0	BS2	BS1	BS0	Set bias system (BSx)
Set Start Line (high)	0	0	0	0	0	0	0	1	0	S6	Specify the initial display line S6
Set Start Line (low)	0	0	0	1	S5	S4	S3	S2	S1	S0	Specify the initial display line to realize vertical scrolling
Set V0	0	0	1	V_{OP6}	V_{OP5}	V_{OP4}	V_{OP3}	V_{OP2}	V_{OP1}	V_{OP0}	Set V_{OP} parameter to register
H[1:0] = (1,0)											
Reserved	0	0	0	0	0	0	0	0	1	X	Do not use
Partial Screen Mode	0	0	0	0	0	0	0	1	0	PS	Partial screen enable
Partial Screen Size	0	0	0	0	0	0	1	0	0	WS	Set partial screen size
Display Part	0	0	0	0	0	1	0	DP2	DP1	DP0	Set display part for partial screen mode
H[1:0] = (1,1)											
Reserved	0	0	0	0	0	0	0	0	0	X	Do not use
RESET	0	0	0	0	0	0	0	0	1	1	Software reset
Frame Control	0	0	0	0	0	0	1	FR2	FR1	FR0	Frame rate control
N-Line Inversion	0	0	0	1	0	NL4	NL3	NL2	NL1	NL0	Sets N-Line inversion
Booster Efficiency & Booster Stage	0	0	1	0	0	1	BE1	BE0	PC1	PC0	Booster Efficiency Set
Reserved	0	0	1	X	X	X	X	X	X	X	Do not use

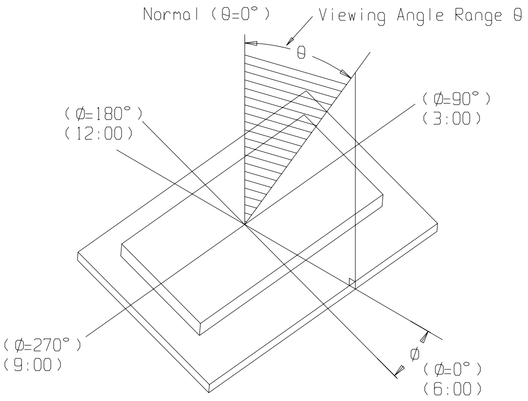
11. ELECTRO-OPTICAL CHARACTERISTICS

(V_{DD} = 3.0V, Ta = 25°C)

Item	Symbol	Condition	Min	Typ	Max	Unit
Operating Voltage for LCD	Vop	Ta =-10°C	8.9	9.1	9.3	V
		Ta = 25°C	8.4	8.6	8.8	
		Ta = 60°C	8.0	8.2	8.4	
Response time	Tr	Ta = 25°C	---	250	500	ms
	Tf		---	300	600	ms
Contrast	Cr	Ta = 25°C	2	4	---	---
Viewing angle range	θ	Cr⩾2	-35	---	+35	deg
	Φ		-35	---	+40	deg

The following charts is for your reference of the data in the above form.




Normal (θ=0°)
Viewing Angle Range θ
θ
(Ø=180°)
(12:00)
(Ø=90°)
(3:00)
(Ø=270°)
(9:00)
Ø
(Ø=0°)
(6:00)

12. PRECAUTION FOR USING LCD/LCM

After reliability test, recovery time should be 24 hours minimum. Moreover, functions, performance and appearance shall be free from remarkable deterioration within 50,000 hours(average) under ordinary operating and storage conditions room temperature (20±8°C), normal humidity (below 65% RH), and in the area not exposed to direct sun light. Using LCM beyond these conditions will shorten the life time.

Precaution for using LCD/LCM

LCD/LCM is assembled and adjusted with a high degree of precision. Do not attempt to make any alteration or modification. The followings should be noted.

General Precautions:

1. LCD panel is made of glass. Avoid excessive mechanical shock or applying strong pressure onto the surface of display area.
2. The polarizer used on the display surface is easily scratched and damaged. Extreme care should be taken when handling. To clean dust or dirt off the display surface, wipe gently with cotton, or other soft material soaked with isoproply alcohol, ethyl alcohol or trichlorotriflorothane, do not use water, ketone or aromatics and never scrub hard.
3. Do not tamper in any way with the tabs on the metal frame.
4. Do not made any modification on the PCB without consulting Gemini.
5. When mounting a LCM, make sure that the PCB is not under any stress such as bending or twisting. Elastomer contacts are very delicate and missing pixels could result from slight dislocation of any of the elements.
6. Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels and also cause rainbow on the display.
7. Be careful not to touch or swallow liquid crystal that might leak from a damaged cell. Any liquid crystal adheres to skin or clothes, wash it off immediately with soap and water.

Static Electricity Precautions:

1. CMOS-LSI is used for the module circuit; therefore operators should be grounded whenever he/she comes into contact with the module.
2. Do not touch any of the conductive parts such as the LSI pads; the copper leads on the PCB and the interface terminals with any parts of the human body.
3. Do not touch the connection terminals of the display with bare hand; it will cause disconnection or defective insulation of terminals.

4. The modules should be kept in anti-static bags or other containers resistant to static for storage.
5. Only properly grounded soldering irons should be used.
6. If an electric screwdriver is used, it should be grounded and shielded to prevent sparks.
7. The normal static prevention measures should be observed for work clothes and working benches.
8. Since dry air is inductive to static, a relative humidity of 50-60% is recommended.

Soldering Precautions:

1. Soldering should be performed only on the I/O terminals.
2. Use soldering irons with proper grounding and no leakage.
3. Soldering temperature: 330°C±10°C
4. Soldering time: 3 to 4 second.
5. Use eutectic solder with resin flux filling.
6. If flux is used, the LCD surface should be protected to avoid spattering flux.
7. Flux residue should be removed.

Operation Precautions:

1. The viewing angle can be adjusted by varying the LCD driving voltage Vo.
2. Since applied DC voltage causes electro-chemical reactions, which deteriorate the display, the applied pulse waveform should be a symmetric waveform such that no DC component remains. Be sure to use the specified operating voltage.
3. Driving voltage should be kept within specified range; excess voltage will shorten display life.
4. Response time increases with decrease in temperature.
5. Display color may be affected at temperatures above its operational range.
6. Keep the temperature within the specified range usage and storage. Excessive temperature and humidity could cause polarization degradation, polarizer peel-off or generate bubbles.
7. For long-term storage over 40°C is required, the relative humidity should be kept below 60%, and avoid direct sunlight.

Limited Warranty

Gemini LCDs and modules are not consumer products, but may be incorporated by Gemini's customers into consumer products or components thereof, Gemini does not warrant that its LCDs and components are fit for any such particular purpose.

1. The liability of Gemini is limited to repair or replacement on the terms set forth below. Gemini will not be responsible for any subsequent or consequential events or injury or damage to any personnel or user including third party personnel and/or user. Unless otherwise agreed in writing between Gemini and the customer, Gemini will only replace or repair any of its LCD which is found defective electrically or visually when inspected in accordance with Gemini general LCD inspection standard . (Copies available on request)
2. No warranty can be granted if any of the precautions state in handling liquid crystal display above has been disregarded. Broken glass, scratches on polarizer mechanical damages as well as defects that are caused accelerated environment tests are excluded from warranty.
3. In returning the LCD/LCM, they must be properly packaged; there should be detailed description of the failures or defect.

13. LCM TEST CRITERIA

1. Objective

The criteria is made for customer and company to check on delivery LCM end product, guarantee the production quality to meet with customer's demand.

2. Range

2.1 Suit for our company's LCD end production.

3. Testing equipment

Function tester、sliding calipers、microscope、visual magnifying glass、ESD arm protector、finger cover、label、 high-low temperature experiment case、refrigerator、fixed-voltage power supply（DC），table lamp and so on.

4. Sampling plan and quote superscript

4.1.1 According to GB/T 2828.1---2003/ISO2859-1:1999，normal check of one sampling plan, general level of inspection II.

Testing item	Sample quantity	AQL judgment
cosmetic	II one time sample	MA=0.4 MI=1.5
scale	N=3	C=0
function	II one time sample	MA=0.4 MI=1.5

4. 1. 2 GB/T 2828.1---2003/ISO2859-1:1999 check and count the sampling procedure and table one by one.

4. 1. 3 GB/T 1619.96 Test method of twisting out LCD device.

4. 1. 4 GB/T 12848.91 General standard of super-out LCD device.

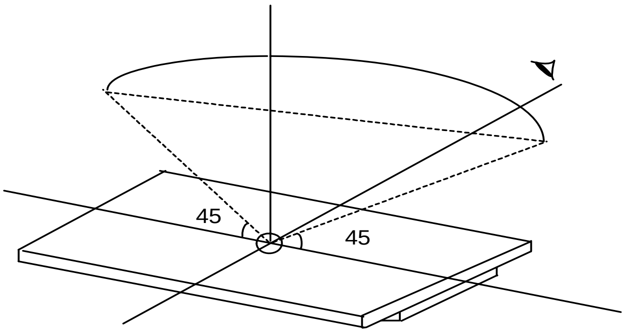
4. 1. 5 GB2421-89 Basic experience environment of electrical and electronic products

4. 1. 6 IPC-A-610C Check condition of electrical assemblies.

5. Test condition and basis

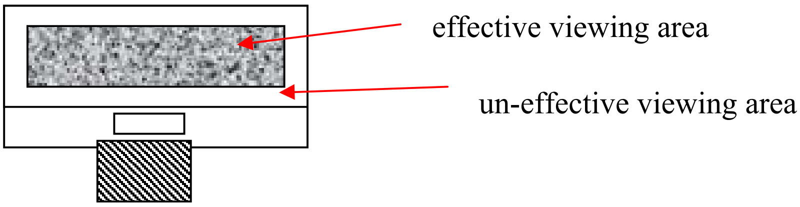
5. 1 visual：General under the condition of 25±5℃，45±20%RH，with enough light（>300cd/cm2），the distance between operator and LCD is 30cm， use the method of reflective to test is normal，the backlight products, must test under the condition of luminance smaller than 100cd/cm2，and lit up the backlight.

5. 2　The test left and right direction is 45°,up and down view angle is 0-45°



（STN depends on -20-55°）to have a test，as follows：

5. 3　Viewing area definition



5. 4　Naked eye examination（except with assistant of magnifying glass to do defect test）.

5. 5　Electricity property

Testing use self-made/professional LCM test installation: contrast with the products file and designed drawing, ask for the display content and parameters accord with the document, and the result in line with the pattern

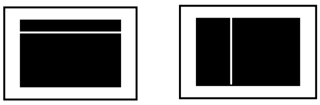
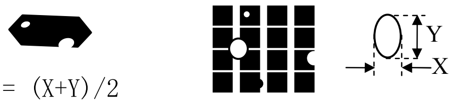
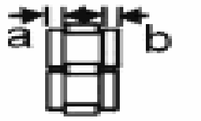
5. 5. 1　Testing voltage（V）：Refer to the requirement of test device，customer have no special statement, think the external circuit adjustable, effect controlled in agreed voltage fluctuation（without special agreement，accord to LCD driving voltage at 9V or bellowed control in±0.3V, above 9V, at least is LCD driving voltage ±3%），to the products with special voltage demand, assurance display effect through circuit adjust，when necessary made the maximum and minimum receivable samples.

5. 5. 2　Power consumption of electric current（I）：refer to product document or designed blueprint identify.

6．Defective item and testing criteria

6. 1　Scale：To the whole cosmetic scale and which could influence the assemble position , should accord to the drawing, main defect.

6. 2　capacity test:

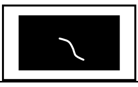
order	item	description	MAJ	MIN	Accept standard
6. 2. 1	Segment missing	SEG/COM showed line or spot missing caused by line break/bad connection，i8nner short 	√		reject
6. 2. 3	No display/no action	Normal connection, no display	√		reject
6. 2. 4	mistake/abnormal	Accord to common scanner procedure, picture and order inconsistent with requirement	√		reject
6. 2. 5	Viewing angle mistake	The clearest direction inconsistent with requirement	√		reject
6. 2. 6	Display dark/light	Normal display the whole ratio too light or dark	√		Over voltage standard,reject
6. 2. 7	Slow reflect	Reflection of lit or off on part dose not uniform with others.	√		reject
6. 2. 8	Show more symbol, more lines and rows	due to lack of matching unrightenousness or etched caused alignment or logo when lit display of symbols, row or line.		√	refer to spot/line standard
6. 2. 9	light/dim segment	On the condition of normal voltage, the display contrast is not uniformed		√	Reject or refer to samples
6. 2. 10	PI black/white spot	Poor connect in LCD lead to black/white spot in word change procedure		√	Suspended screen , refer to spot/line，others OK
6. 2. 11	pinhole/white spot	ITO missing lead to picture incomplete when lit up  d = (X+Y)/2		√	refer to spot/line standard
6. 2. 12	word deformed	Mistaken match caused the display width dose not conform to standard, then lead to convex or air leakage: |Ia-Ib|≤1/4W(W is the normal width) 		√	accept |Ia-Ib|>1/4W, reject
6.2.13	High current	LCM current exceed requirement		√	reject

6.3 LCD visual defect

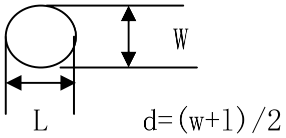
6. 3. 1 spot defect(controlled in viewing area, in un-viewing area, OK)

Defective item	average diameter （d）	Accept number	MAJ	MIN
Spot defect （black spot, impurity, pinhole,, contain LC defect）	d≤0.2	3		√
	0.2<d≤0.25	2		
	0.25<d≤0.30	1		

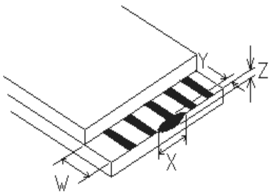
6. 3. 2 Line defect(controlled in viewing area, in un-viewing area, OK)

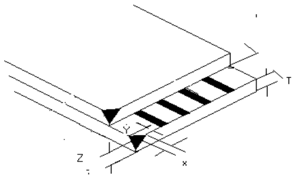
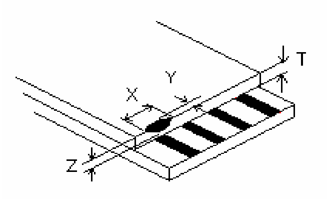
Defective item	length(L)	width(W)	Accept number	MAJ	MIN
line defect (segment, impurity) 	≤5.0	≤0.02	3		√
	≤3.0	≤0.03	3		
	≤3.0	≤0.05	1		
note： 1.when width is bigger than 0.1, it needs to handle as line defect。					

6. 3. 3 polarizer air bubble (controlled in viewing area, in un-viewing area, OK)

Defective item	average diameter（d）	Accept number	MAJ	MIN
polarizer air bubble、 convex point 	d≤0.3	3		√
	0.3<d≤0.5	2		
	0.5<d≤0.8	1		

6. 3. 4 Damaged(LCD edge reveal without mental frame, contain COG,H/S, deduct BL directly)

order	item	Permit standard		MAJ	MIN
6. 3. 4. 1	Conductor chips 		（mm）		√
		X	≤1/8L		
		Y	≤1/3W		
		Z	≤1/2t		
		Accept number	2		
		When Y≤0.2mm, neglect the length of X, un-conductor chips， depend on X≤1/10L， Y≤1/2W。			
6. 3. 4. 2	chips(ITO lead position)		（mm）	MAJ	MIN
		X	Not enter into frit or do not attach the conductor		√
		Y			

		Z	≤t		
		Accept number	2		
		Seal position refer to 6.3.4.3，do not enter into frame black edge. Chips damage the conducing，refer to 6.3.4.1			
6.3.4.3	interface seal rubber crack (outer crack) 		（mm）	MAJ	MIN
		X	≤1/8 L		√
		Y	≤1/2H		
		z	≤ 1/2t		
		Accept number	2		
		Seal edge rubber inner crack conform to the standard of outer. when the back of stage cracked refer to 6.3.4.1.			
note: t---glass thickness, L---length, H---distance. W—glass stage width					

6.3.5 others

order	item	description	MAJ	MIN	Accept standard
6.3.5.1	coloration/background	One product, different color		√	Reject or refer to limited sample
6.3.5.2	Leak ink(LC)	/	√		reject
6.3.5.3	Without protect film	/		√	reject

6.4 backlight components

order	item	description	MAJ	MIN	Accept standard
6.4.1	Backlight unlit, wrong color	/	√		reject
6.4.2	Color deviation	Lit up, color differ from the sample, or do not match the drawing after testing		√	Refer to sample and drawing
6.4.3	Brightness deviation	Lit up, lightness differ from the sample, or do not match the drawing after testing, or over the sample range of±30%.		√	Refer to sample and drawing
6.4.4	LED uneven	Lit up, brightness uneven, exceed the drawing specification.		√	Refer to sample and drawing
6.4.5	Spot/line segment	There are tainted, segment when lit up.		√	Refer to 6.3.1/6.3.2

6.5 Mental frame

order	item	description	MAJ	MIN	Accept standard
6.5.1	material/surface	Mental frame/surface approach inconsistent with specification.	√		reject
6.5.2	Twist un-quality/without twisting	Twist method/direction default,	√		reject
6.5.3	oxidation, paint stripping, discoloration, dent ,segment	The surface of the mental frame dose not appear oxidation, front surface paint stripping and segment to bottom≤0.8mm, exceed 3 point, length≤5.0mm, width≤0.05mm line defect exceed 2 point, positive dent, bubble and side surface have paint stripping and segment to bottom≤1.0mm exceed 3 point, width≤0.05mm line defect exceed 3 point.		√	reject
6.5.4	prick	Prick is too long, enter into viewing area		√	reject

6.6 PCB/COB part

order	item	description	MAJ	MIN	Accept standard
6.6.1	Seal rubber defect	1. COB inner round white remark line have PAD out reveal.. 2. height exceed the document/drawing specification. 3. COB seal rubber should in white remark, the largest out scale can not exceed remark radius 2MM 4. COB surface has clear lien assemble mark, some even through the pinhole. 5. COB surface pinhole diameter over 0.25mm or have tainted..		√	reject
6.6.2	PCB cosmetic defect	1. PCB golden figure surface can not have oxidation, dirt. 2. PCB can not appear bubble caused by reflow. 3. PCB green oil drop /segment lead to leak copper. Use mending, circuit diameterψ can not over 1.3mm, other diameterψ can not over 2.6mm, total less than 10 point. otherwise reject.		√	reject

6.6.3	Components mistake	1. PCB components inconsistent with drawing. Find wrong pitch, more or less pitch, polar reverse（LCD voltage side circuit/BL current limit resistance modify, only if customer have special require, otherwise do not control） 2. The JUMP of PCB shot need refer to the structure picture, appear more or less soldering. 3. customer have special require on the component, mode specification and supplier should conform to technique demand. Otherwise reject.	√	√	reject

6.7 SMT part (vague parts refer to IPC-A-610C)

Order	Item	Description	MAJ	MIN	Accept standard
6.7.1	Soldering defect	Cold solder, fake solder, missing solder，crack， tin un-dissolved		√	reject
6.7.2	Solder ball/bridge	Solder ball/bridge drop lead to spot short.		√	reject
6.7.3	DIP parts	DIP parts， keypad， connection appear flowing and tilted.		√	reject
6.7.4	Spot shape	Inner dent， can not form to cover solder or less solder, otherwise reject		√	reject
6.7.5	Component out reveal	After cutting, just left 0.5mm~2mm,can not damage solder surface and covered the component foot. Otherwise reject.		√	reject
6.7.6	Cosmetic defect	Solder residues appear tawny or coke black. PCB solder spot remained white mist residues after clean.		√	reject

6.8 Thermal press part（contain H/S， FPC）

Order	item	description	MAJ	MIN	Accept standard
6.8.1	Model specifications do not match		√		reject
6.8.2	Scale/position	Material scale must in the drawing specification range， the contact area of dielectric material and the body（ITO，PDA） should be above 1/2， and the dislocation must control in specification		√	Accept
6.8.3	Thermal press dirt	Thermal area tainted can not lead to short,		√	accept

		OK，in through position， dirt area is smaller than 50%，OK。			
6.8.4	creases			√	Refer to limited sample

6.9 connection and other parts

order	item	description	MAJ	MIN	Accept standard
6.9.1	Specification un-matched	Connection and other components do not conform to drawing requirement	√		reject
6.9.2	Position and order	Solder position should consistent with the drawing .		√	reject
6.9.3	cosmetic	1. the body of our connect component and the PIN foot have solder-helping. 2. PIN connection PIN deformation bigger than PIN width 1/2.		√	reject

6.10 General visual

order	item	description	MAJ	MIN	Accept standard
6.10.1	Connect material	FPC golden figure or H/S,FFC out part of PIN leak copper or material, have damaged. FPC,FFC,COF,H/S connected material curved（except for original）. FPC、PCB golden figure bigger than 1PIN width. FPC/FFC material segment, crease exceed the specification.		√	reject
6.10.2	Protect defect	Protect film do not cover circuit totally（如 H/S，FFC，FPC） or not contact with interface, or add on PIN outer part.		√	reject
6.10.3	Visual dirty	The surface of end products have dirt, rubber，PCB/COB un-welding area has solder ball. The defective remark or label do not clean.		√	reject
6.10.4	Assembly black spot	Add backlight，taint and black spot		√	Refer to 6.3.1
6.10.5	Product remark	Model defer from approved remark and technique requirement、 position, vague and leak.		√	reject
6.10.6	Inner product packing	Packing inconsistent with requirement，segment short，wrong amount. And inconsistent with shipment remark/ order demand.		√	reject

7. Reality test

Test item	Condition	Time(hrs)	Accept standard
high temp storage	80°C	120	Before and after test, function and cosmetic is qualified.
high temperature operating	70°C	120	
low temperature storage	-30°C	120	
low temperature operating	-20°C	120	
temperature& humility test	40°C/ 90%RH	120	
temperature shock	-20°C ← 25°C →+70°C (30 min ← 5 min → 30min)	10 cycles	

Note：If customer have requirement, please put forward on the item development.（high/low temperature storage and experiment, the temperature refer to specific requirement），±5℃ deviation could be accept.

8. Packing

8.1 Product design must meet the requirement of packing design and check on delivery. Besides the product name, specification, model, quantity and date on the label, the quality chapter is necessary after checked by QA. Incomplete or mistake, is not qualified.

8.2 When the safety of the packing (earthquake, moisture-proof, anti-static, anti-squeezed) exist problem, not qualified.

8.3 When customer’s special requirement is confirmed and accepted by interior, carry it out and check on delivery.

8.4 Environment protected and unprotected products must have obvious distinguished remark. The present remark adopts “RoHS”. If customer have special requirement, use the appointed remark or label.

9. Others

9.1 No-provision or compromised item, depend on two side agreement and limited prototype.