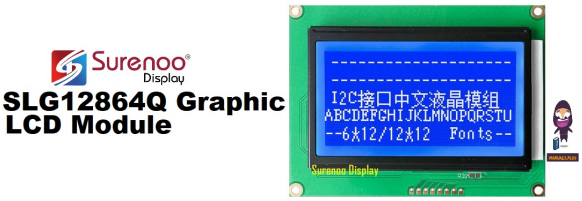


Surenoo SLG12864Q Graphic LCD Module User Manual

Contents

Surenoo SLG12864Q Graphic LCD Module

Product Usage Instructions

Outline Drawing

- Include a detailed outline drawing of the SL3AG12864Q model for reference.

Electrical Connection

- Connect the module to the appropriate power source as per the specified voltage requirements (3.3V / 5.0V).
- Ensure proper grounding of the module to avoid electrical issues.
- Verify the connection interface (4P/2.54 IIC) and make secure connections.

Display Operation

- Power on the module and observe the display.
- Use the provided controller (ST7567) to interact with the display.
- Follow the graphic LCD Selection Guide for detailed instructions on utilizing different display features.

FAQ

Q: What should I do if I encounter an image sticking on the display?

A: To resolve image sticking issues, try turning off the module for a few minutes and then power it back on. If the problem persists, contact customer support for further assistance.

ORDERING INFORMATION

Order Number

Model No.	Display	Size	Outline Size (MM)	Viewing Area (MM)	Area Area (MM)	Interface	Voltage	Controller	MARK	Color Valid	Image
SLG12864Q COG	128*64	2.2"	56.00*44.60	50.80*27.00	48.62*24.93	4P/2.54 IIC	3.3V 5.0V	ST7567		SURENOO SURENOO SURENOO	

Image

SPECIFICATION

Display Specification

Item	Standard Value	Unit
Display Format	128 x 64	Dots
Display Connector	Pin Header	—
Operating Temperature	-10~ +60	℃
Storage Temperature	-20 ~ +70	℃

Mechanical Specification

Item	Standard Value	Unit
Outline Dimension	56.00(W) x 44.60(H)x 9.00 (T)	mm
Visual Area	50.80(W) x 27.00(H)	mm
Active Area	48.62(W) x 24.30(H)	mm
Dot Size	0.36×0.36	mm
Dot Pitch	0.38×0.38	mm

Electrical Specification

Item	Standard Value	Unit
IC Package	COG	—
Controller	ST7567	—
Interface	I ^{2}C	—

Optical Specification

Item	Standard Value	Unit
LCD Type	Refer to 1.1 SLG12864Q Series Table	—
Viewing Angle Range	6:00	
Backlight Color	Refer to 1.1 SLG12864Q Series Table	
LCD Duty	1/64	degree
LCD Bias	1/9	—

OUTLINE DRAWING

SLG12864Q LCD Module

NOTE:

1. DISPLAY TYPE: FSTN/NEGATIVE
2. POLARIZER MODE: TRANSMISSIVE
3. VIEWING DIRECTION: 6:00'CLOCK
4. OPERATING VOLTAGE:VDD=3.3V, LCM PIN1(VCC) inpput Voltage:3.3~5V
5. DRIVE METHOD: 1/65 DUTY; 1/9 BIAS
6. OPERATING TEMP: -10° C TO +60° C
7. STORAGE TEMP: -20° C TO +70° C
8. CONNECTOR: COG
9. BACKLIGHT TYPE: LED/SIDE
10. Backlight Color: White
11. IC: ST7567S
12. Interface:IIC

PIN	DESCRIPTION
1	GND
2	VCC
3	SCL
4	SDA

SHEET: 1 of 1

APPROVALS	DATE
DWN ZJP	2022-03-28
CHK	
APP	

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.

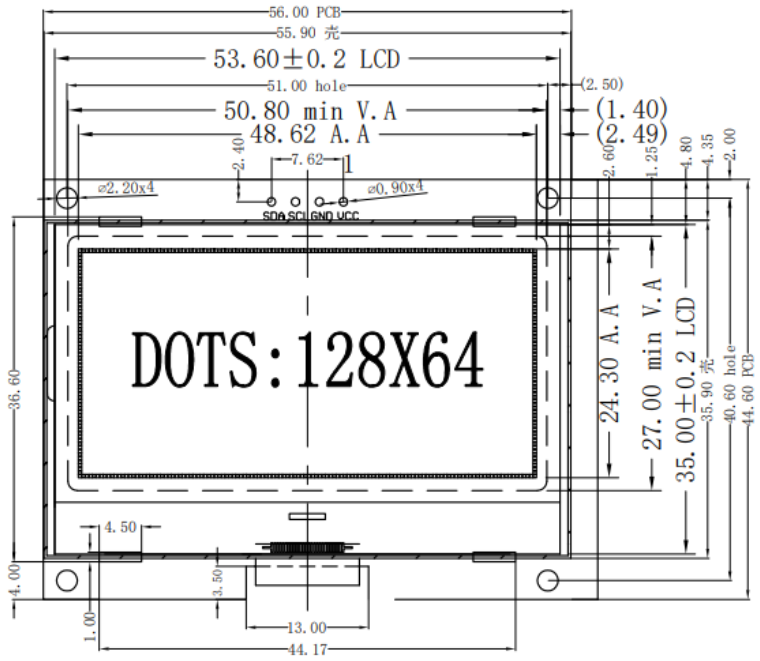
MODEL NUMBER : **SLG12864Q**

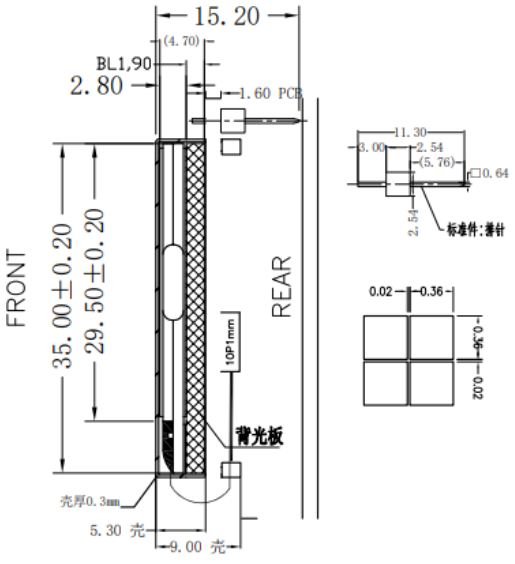
SCALE: 1:1 | UNITS: MM | GENERAL TOL:± 0.2 | DO NOT SCALE THIS DRAWING.

All Pages Of This Edition Approved

Signature: Date:

REV.	DESCRIPTION OF MODIFY	MODIFY BY	DATE
1.0	1'ST DESIGN	JIM	Dec-03-2020





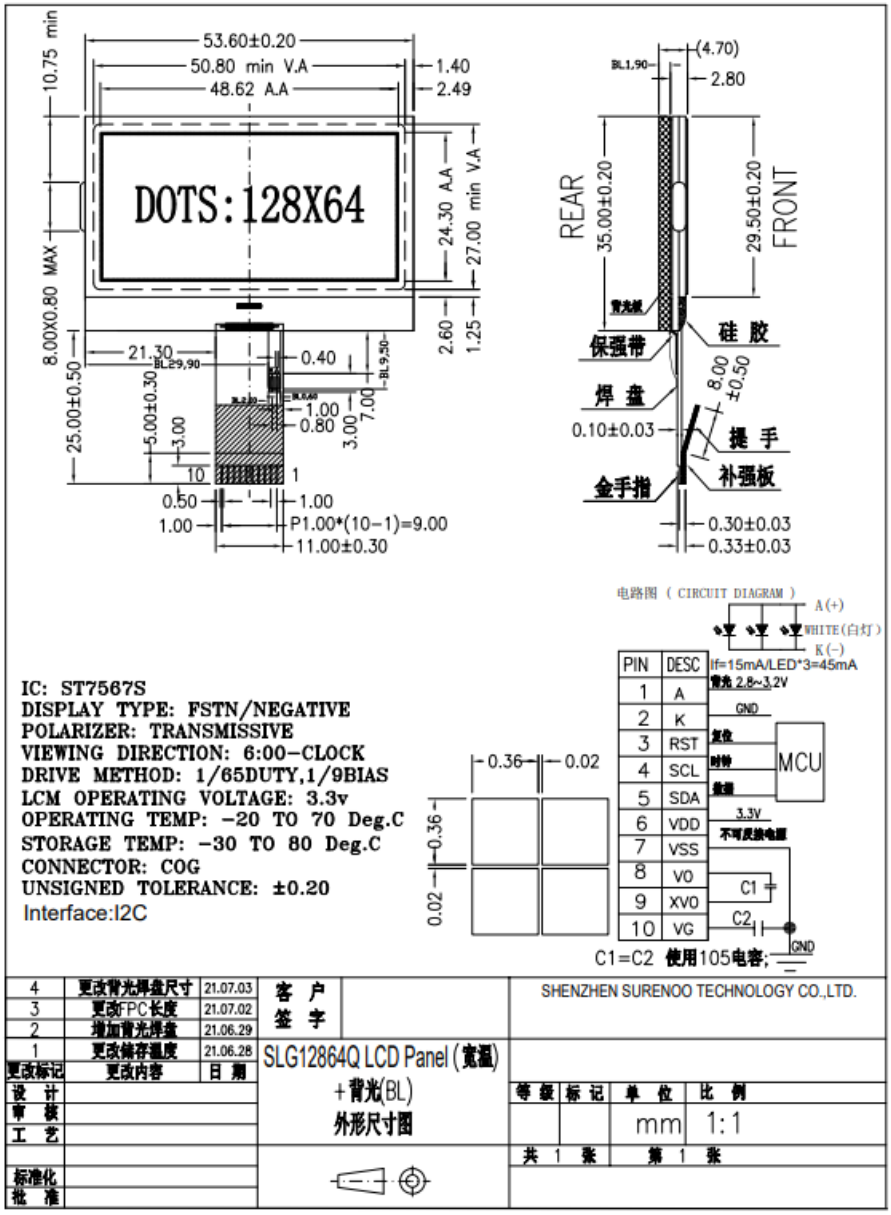
1.Unit: mm
2.OD=Outline Dimension
3.VA=Visual Area
4.AA=Active Area

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.

WEB: www.surenoo.com Email: info@surenoo.com

APPROVALS	DATE	MODEL NUMBER : SLG12864Q Series	GENERAL TOL.
APP			SCALE: N.T.S.
CHK			
DWN JIM	Dec-03-20	DO NOT SCALE THIS DRAWING.	PROJECTION SHEET:

SLG12864Q LCD Panel (Inside LCD)

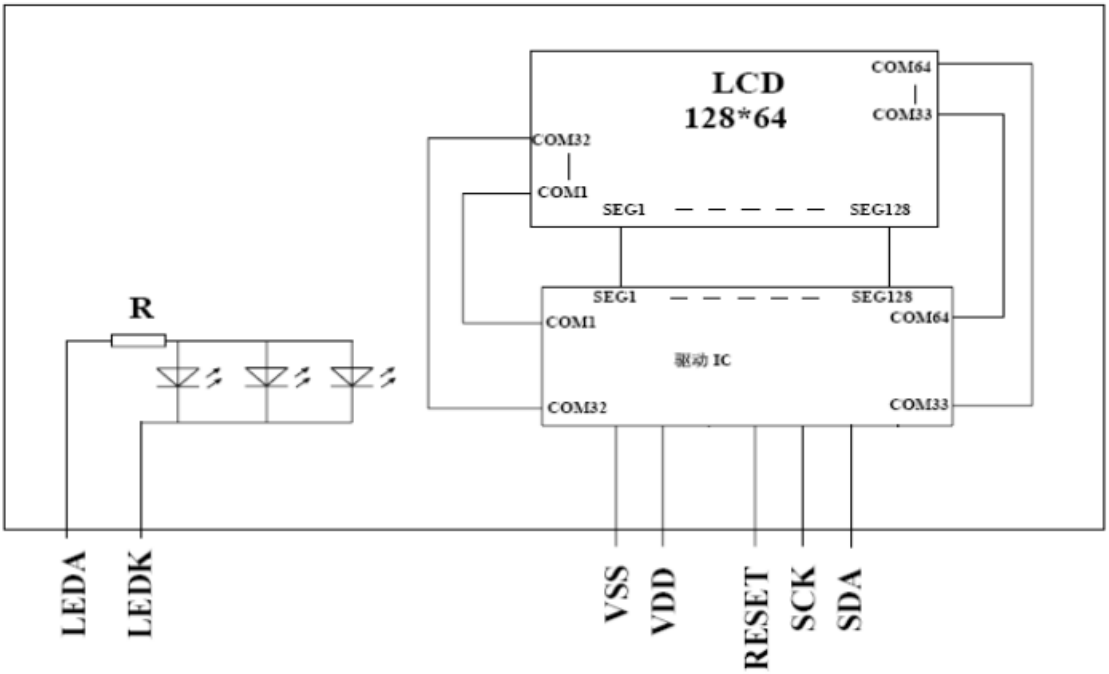


ELECTRICAL SPEC

P in Configuration

PIN	SYMBOL	Descriptions
1	GND	The ground of Logic Circuit
2	VDD	This is a voltage supply pin. It must be connected to an external source.
4	SCK	Serial clock input.
5	SDA	Serial data input.

Block Diagram



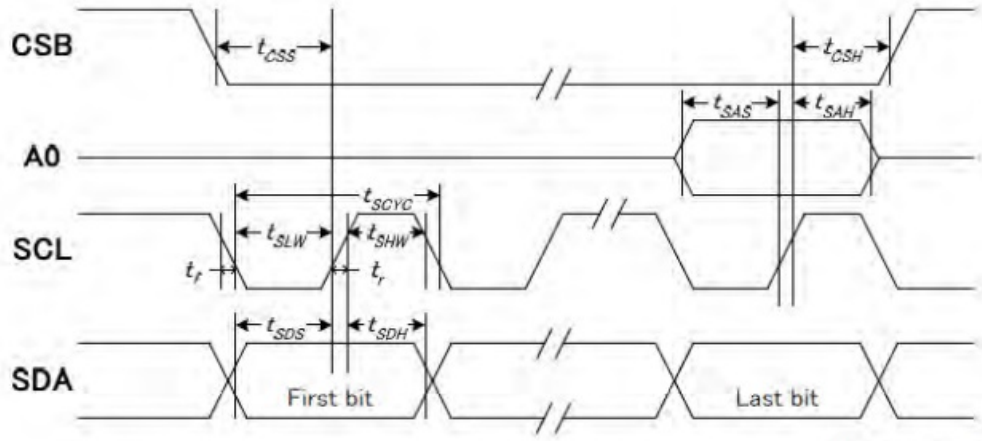
Absolute Maximum Ratings

PARAMETER	SYMBOL	RATING	TEST CONDITIONS	UNIT
Operating temperature range	TOPR		Ta=25℃	℃
Storage temperature range	TSTR		Ta=25℃	℃

Electrical Characteristics DC CHARACTERISTICS

ITEM	symbol	STANDARD VALUE			TEST CONDITION	UNIT
		MIN	TYP	MAX		
Supply Voltage For Logic	VDD	2.7	3.0	3.3	———-	V
LCD Bias Voltage	VOP	8.80	9.00	9.20	VLCD=V0-VSS	
Current Consumption	IDD	—	—	0.75	V_{DD}=3.0V±5%	mA

AC CHARACTERISTICS



(VDD1 = 3.3V , Ta =25°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period	SCLK	tSCYC		50	—	ns
SCLK "H" pulse width		tSHW		25	—	
SCLK "L" pulse width		tSLW		25	—	
Address setup time	A0	tSAS		20	—	
Address hold time		tSAH		10	—	
Data setup time	SDA	tSDS		20	—	
Data hold time		tSDH		10	—	
CSB-SCLK time	CSB	tCSS		20	—	
CSB-SCLK time		tCSH		40	—	

INSPECTION CRITERIA

Acceptable Quality Level

Each lot should satisfy the quality level defined as follows

Partition	AQL	Definition
A. Major	0.4%	Functional defective as product
B. Minor	1.5%	Satisfy all functions as a product but not satisfy a cosmetic standard

Definition of Lot

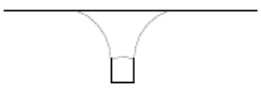
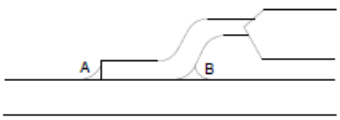
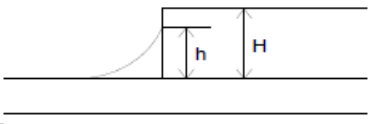
- One lot means the delivery quantity to the customer at one time.

Condition of Cosmetic Inspection

- **INSPECTION AND TEST**
  - FUNCTION TEST
  - APPEARANCE INSPECTION
  - PACKING SPECIFICATION
- **INSPECTION CONDITION**
  - Put under the lamp (20W) at a distance of 100mm from
  - Tilt upright 45 degrees by the front (back) to inspect Panel appearance.
- **AQL INSPECTION LEVEL**

- **SAMPLING METHOD:** MIL-STD-105D
- **SAMPLING PLAN**: SINGLE
- **MAJOR DEFECT:** 0.4% (MAJOR)
- **MINOR DEFECT:** 1.5% (MINOR)
- **GENERAL LEVEL:** II/NORMAL

Module Cosmetic Criteria

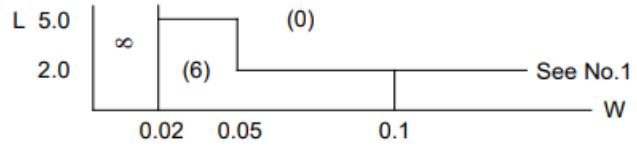
No.	Item	Judgment Criterion	Partition
1	Difference in Spec.	None allowed	Major
2	Pattern Peeling	No substrate pattern peeling and floating	Major
3	Soldering Defects	No soldering missing	Major
		No soldering bridge	Major
		No cold soldering	Minor
4	Resist Flaw on Substrate	Invisible copper foil(¢ 0.5mm or more)on substrate pattern	Minor
5	Accretion of Metallic Foreign Matter	No soldering dust	Minor
		No accretion of metallic foreign matters(Not exceed ¢ 0.2mm)	
6	Stain	No stain to spoil cosmetic badly	Minor
7	Plate Discoloring	No plate fading, rusting and discoloring	Minor
8	Solder Amount 1.Lead Parts	a. Soldering side of PCB Solder to form a' Filet' all around t Solder should not hide the lead form  b.Components side (In case of 'Through Hole PCB') Solder to reach the Components side of PCB 	Minor
	2.Flat Packages	Either 'toe' (A) or 'heal' (B) of the lead to be covered by Filet'  Lead form to be assume over solder.	Minor
	3.Chips	(3/2) H≥h≥(1/2)H 	Minor

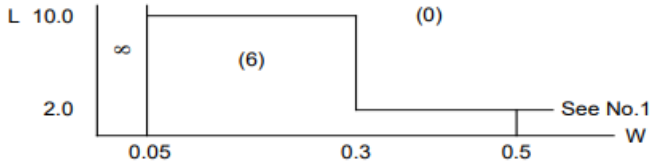
9	Backlight Defects	1. Light fails or flickers. (Major) 2. Color and luminance do not correspond to specifications. (Major) 3. Exceeds standards for display blemishes, foreign matter, dark lines , or scratches. (Minor)	See list ←
10	PCB Defects	Oxidation or contamination on connectors.* 2. Wrong parts, missing parts, or parts not in specification.* 3. Jumpers are set incorrectly. (Minor) 4. Solder(if any)on bezel, LED pad, zebra pad, or screw hole pad is n ot smooth. (Minor) *Minor if display functions correctly. Major if the display fails.	See list ←
11	Soldering Defects	1. Unmelted solder paste. 2. Cold solder joints, missing solder connections, or oxidation.* 3. Solder bridges causing short circuits.* 4. Residue or solder balls. 5. Solder flux is black or brown. *Minor if display functions correctly. Major if the display fails.	Minor

Screen Cosmetic Criteria (Non-Operating)

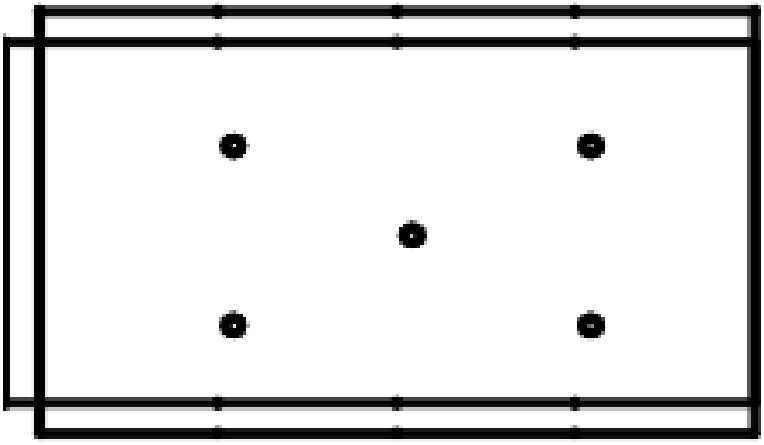
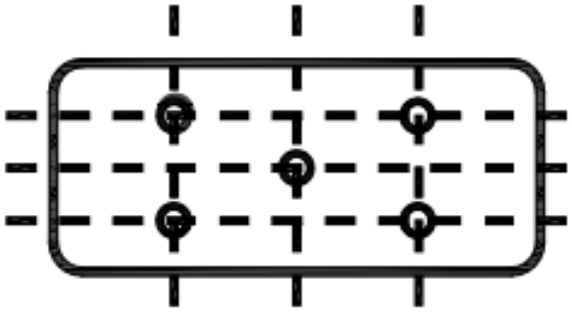
<table>
<tr><th>No.</th><th>Defect</th><th colspan="2">Judgment Criterion</th><th>Partition</th></tr>
<tr><td>1</td><td>Spots</td><td colspan="2">In accordance with Screen Cosmetic Criteria (Operating) No.1.</td><td>Minor</td></tr>
<tr><td>2</td><td>Lines</td><td colspan="2">In accordance with Screen Cosmetic Criteria (Operation) No.2.</td><td>Minor</td></tr>
<tr><td rowspan="4">3</td><td rowspan="4">Bubbles in Polarizer</td><td colspan="2"></td><td rowspan="3">Minor</td></tr>
<tr><td>Size: d mm</td><td>Acceptable Qty in the active area</td></tr>
<tr><td>d≦0.3
0.3<d≦1.0
1.0<d≦1.5
1.5<d</td><td>Disregard 3
1
0</td></tr>
<tr><td colspan="2"></td><td></td></tr>
<tr><td>4</td><td>Scratch</td><td colspan="2">In accordance with spots and lines operating cosmetic criteria, When the light reflects on the panel surface, the scratches are not to be remarkable.</td><td>Minor</td></tr>
<tr><td>5</td><td>Allowable density</td><td colspan="2">The above defects should be separated more than 30mm from each other.</td><td>Minor</td></tr>
<tr><td>6</td><td>Coloration</td><td colspan="2">Not no noticeable coloration in the viewing area of the Graphic panels.
Back-lit type should be judged with back-lit on state only.</td><td>Minor</td></tr>
<tr><td>7</td><td>Contamination</td><td colspan="2">Not to be noticeable.</td><td>Minor</td></tr>
</table>

Screen Cosmetic Criteria (Operating)

<table>
<tr><th>No.</th><th>Defect</th><th>Judgment Criterion</th><th>Partition</th></tr>
<tr><td>1</td><td>Spots</td><td>A) Clear
<table>
<tr><th>Size:d mm</th><th>Acceptable Qty in active area</th></tr>
<tr><td>d≦0.1</td><td>Disregard</td></tr>
<tr><td>0.1<d≦0.2</td><td>6</td></tr>
<tr><td>0.2<d≦0.3</td><td>2</td></tr>
<tr><td>0.3<d</td><td>0</td></tr>
</table>
Note: Including pin holes and defective dots which must be within one pixel Size.
Unclear
<table>
<tr><th>Size:d mm</th><th>Acceptable Qty in active area</th></tr>
<tr><td>d≦0.2</td><td>Disregard</td></tr>
<tr><td>0.2<d≦0.5</td><td>6</td></tr>
<tr><td>0.5<d≦0.7</td><td>2</td></tr>
<tr><td>0.7<d</td><td>0</td></tr>
</table></td><td>Minor</td></tr>
<tr><td>2</td><td>Lines</td><td>A) Clear
 

Note: () – Acceptable Qty in active area
L - Length (mm)
W -Width(mm)
∞-Disregard
B) Unclear
 
</td><td>Minor</td></tr>
<tr><td colspan="4">Clear' = The shade and size are not changed by Vo.
Unclear' = The shade and size are changed by Vo.</td></tr>
</table>

No.	Defect	Judgment Criterion	Partition
3	Rubbing line	Not to be noticeable.	Minor
4	Allowable density	The above defects should be separated more than 10mm from each other.	Minor
5	Rainbow	Not to be noticeable.	Minor
6	Dot size	To be 95%~105% of the dot size (Typ.) in the drawing. Partial defects of each dot (ex. pin-hole) should be treated as spots. (see Screen Cosmetic Criteria (Operating) No.1)	Minor

7	Brightness (only back-lit Module)	Brightness Uniformity must be BMAX/BMIN≦2 – BMAX: Max. value by measure in 5 points – BMIN: Min. value by measure in 5 points Divide the active area into 4 vertically and horizontally. Measure 5 poin ts shown in the following figure. 	Minor
8	Contrast Unifor mity	Contrast Uniformity must be BmAX/BMIN≦2 Measure 5 points shown in the following figure. Dashed lines divide the active area into 4 vertically and horizontally. M easuring points are located at the intersections of the dashed line. Note: BMAX – Max. value by measure in 5 points. BMIN – Min. value by measure in 5 points. O – Measuring points in 10mm. 	Minor
Note: (1) Size: d=(long length + short length)/2 (2) The limit samples for each item have priority. (3) Complexed defects are defined item by item, but if the number of defects is defined in the above table, the t otal number should not exceed 10.			

Operating Precautions

- DO NOT plug or unplug the Surenoo module when the system is powered up.
- Minimize the cable length between the Surenoo module and the host MPU.
- For models with backlights, do not disable the backlight by interrupting the HV line. Unload inverters produce

voltage extremes that may arc within a cable or at the display.
- Operate Surenoo module within the limits of the modules temperature specifications.

Mechanical/Environmental Precautions

- Improper soldering is the major cause of module difficulty. The use of flux cleaners is not recommended as they may seep under the electrometric connection and cause display failure.
- Mount Surenoo module so that it is free from torque and mechanical stress.
- The surface of the Graphic panel should not be touched or scratched. The display front surface is an easily scratched, plastic polarizer. Avoid contact and clean only when necessary with soft, absorbent cotton dampened with petroleum benzene.
- Always employ an anti-static procedure while handling the Surenoo module.
- Prevent moisture build-up upon the module and observe the environmental constraints for storage tem
- Do not store in direct sunlight
- If leakage of the liquid crystal material should occur, avoid contact with this material, particularly ingestion. If the body or clothing becomes contaminated by the liquid crystal material, wash thoroughly with water and soap.

Storage Precautions

- When storing the Graphic modules, avoid exposure to direct sunlight or the light of fluorescent lamps.
- Keep Surenoo modules in bags (avoid high temperature / high humidity and low temperatures below 0 ºC.
- Whenever possible, Surenoo Graphic modules should be stored in the same conditions in which they were shipped from our company.

Others

- 363B360B357BLiquid crystals solidify under low temperatures (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white).
- Air bubbles may also be generated if the module is subject to a low temperature. If Surenoo Graphic modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear.
- A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
- To minimize the performance degradation of the Graphic modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.
- The exposed area of the printed circuit board.
- Terminal electrode sections.
- In case of ‘concentration’, even the spots or the lines of ‘disregarded’ size should not be allowed. The following three situations should be treated as ‘concentration’.
- 7 or over defects in a circle of 5mm.
- 10 or over defects in a circle of 10mm
- 20 or over defects in a circle of 20mm

PRECAUTIONS FOR USING

Handling Precautions

- This device is susceptible to electrostatic discharge (ESD) damage. Observe Anti-Static precautions.
- Surenoo display panel is made of glass. Do not subject it to a mechanical shock by dropping it or impact.
- If the Surenoo display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
- Do not apply excessive force to the Surenoo display surface or the adjoining areas since this may cause the color tone to vary.
- The polarizer covering the Surenoo display surface of the Graphic module is soft and easily scratched. Handle this polarizer carefully.
- If the Surenoo display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten a cloth with one of the following Isopropyl or alcohol.
- Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the Water.
- Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation, or a current flow in a high-humidity environment.
- Install the Surenoo Graphic Module by using the mounting holes. When mounting the Graphic module make sure it is free of twisting, warping, and distortion. In particular, do not forcibly pull or bend the cable or the backlight cable.
- Do not attempt to disassemble or process the Surenoo Graphic module.
- NC terminal should be open. Do not connect anything.
- If the logic circuit power is off, do not apply the input signals.
- To prevent the destruction of the elements by static electricity, be careful to maintain an optimum work environment.
- Be sure to ground the body when handling Surenoo Graphic modules.
- Tools required for assembling, such as soldering irons, must be properly grounded.
- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
- The Graphic module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

Power Supply Precautions

Identify and, at all times, observe absolute maximum ratings for both logic and LC drivers. Note that there is some variance between models.

- Prevent the application of reverse polarity to VDD and VSS, however briefly.
- Use a clean power source free from transients. Power-up conditions are occasionally jolting and may exceed the maximum ratings of Surenoo modules.
- The VDD power of the Surenoo module should also supply the power to all devices that may access the display. Don’t allow the data bus to be driven when the logic supply to the module is turned off.

USING Graphic MODULES

Liquid Crystal Display Modules

- Surenoo Display is composed of glass and a polarizer. Pay attention to the following items when handling.
- Please keep the temperature within the specified range for use and storage. Polarization degradation, bubble generation, or polarizer peel-off may occur with high temperature and high humidity.
- Do not touch, push, or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.).
- N-hexane is recommended for cleaning the adhesives used to attach front/rear polarizers and reflectors made of organic substances that will be damaged by chemicals such as acetone, toluene, ethanol, and isopropyl alcohol.
- When the Surenoo display surface becomes dusty, wipe gently with absorbent cotton or other soft material like chamois soaked in petroleum benzene. Do not scrub hard to avoid damaging the display surface.
- Wipe off saliva or water drops immediately, contact with water over a long time may cause deformation or color fading.
- Avoid contacting oil and fats.
- Condensation on the surface and contact with terminals due to cold will damage, stain, or dirty the polarizers. After products are tested at low temperatures they must be warmed up in a container before coming in contact with room-temperature air.
- Do not put or attach anything on the Surenoo display area to avoid leaving marks on.
- Do not touch the display with bare hands. This will stain the display area and degrade insulation between terminals (some cosmetics are determined to the polarizers).
- As glass is fragile. It tends to become or chipped during handling, especially on the edges. Please avoid dropping.

Installing Graphic Modules

- Cover the surface with a transparent protective plate to protect the polarizer and LC cell.
- When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements.
- The measurement tolerance should be±0.1mm.

Precaution for Handling Graphic Modules

- Since Surenoo LCM has been assembled and adjusted with a high degree of precision; avoid applying excessive shocks to the module or making any alterations or modifications to it.
- Do not alter, modify, or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape, or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Do not modify the zebra rubber strip (conductive rubber) or heat seal connector.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend, or twist LCM.

Electro-Static Discharge Control

- Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC.
- Make certain that you are grounded when handing LCM.
- Before removing LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential.
- When soldering the terminal of LCM, make certain the AC power source for the soldering iron does not leak.
- When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.
- As far as possible make the electric potential of your work clothes and that of the workbench the ground potential.
- To reduce the generation of static electricity be careful that the air in the work is not too dry. A relative humidity of 50%-60% is recommended.

Precaution for Soldering to Surenoo LCM

- Observe the following when soldering lead wire, connector cable, etc. to the LCM.
- **Soldering iron temperature:** 280℃±10℃
- **Soldering time:** 3-4 sec.
- **Solder:** eutectic solder.
- If the soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation. (This does not apply in the case of a non-halogen type of flux.)
- It is recommended that you protect the Panel surface with a cover during soldering to prevent any damage due to flux spatters.
- When soldering the electroluminescent panel and PC board, the panel and board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.
- When removing the electroluminescent panel from the PC board, be sure the solder has completely melted, the soldered pad on the PC board could be damaged.

Precaution for Operation

- Driving the Surenoo Graphic the voltage above the limit shortens its life.
- Response time is greatly delayed at temperatures below the operating temperature range. However, this does not mean the Panel will be out of the order. It will recover when it returns to the specified temperature range.
- If the Surenoo display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.
- Condensation on terminals can cause an electrochemical reaction disrupting the terminal circuit. Therefore, it must be used under the relative condition of 40℃, 50% RH.
- When turning the power on, input each signal after the positive/negative voltage becomes stable.

Limited Warranty

- 449B419B446B416B443B413BUnless agreed between Surenoo and the customer, Surenoo will replace or

repair any of its Graphic modules that are found to be functionally defective when inspected under Surenoo Graphic acceptance standards (copies available upon request) for one year from the date of shipments. Cosmetic/visual defects must be returned to Surenoo within 90 days of shipment. Confirmation of such date shall be based on freight documents.

- The warranty liability of Surenoo is limited to repair and/or replacement on the terms set forth above. Surenoo will not be responsible for any subsequent or consequential events.

Return Policy

- 22B419B416BNo warranty can be granted if the precautions stated above have been disregarded.

The typical examples of violations are:

- Broken Graphic glass.
- PCB eyelet damaged or modified.
- PCB conductors damaged.
- Circuit modified in any way, including the addition of components.
- PCB is tampered with by grinding, engraving, or painting varnish.
- Soldering to or modifying the bezel in any manner.
- Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with a sufficient description of the failures or defects.
- Any connectors or cables installed by the customer must be removed completely without damaging the PCB eyelets, conductors, and terminals.

IMAGE STICKING

What is Image Sticking?

If you maintain a fixed image on a Graphic Display for a long period, you may experience a phenomenon called Image Sticking. Image Sticking – sometimes also called “image retention” or “ghosting”- is a phenomenon where a faint outline of a previously displayed image remains visible on the screen when the image is changed. It can occur at variable levels of intensity depending on the specific image makeup, as well as the amount of time the core image elements are allowed to remain unchanged on the screen. In POS applications, for example, a button menu that remains fixed, or in which the
“frame” elements (core image) remain fixed and the buttons may change, and may be susceptible to image sticking. It is important to note that if the screen is used exclusively for this application, the user may never notice this phenomenon since the screen never displays other content. `It is only when an image other than the “retained” image is shown on the screen that this issue becomes evident. Image stacking is different from the “burn-in” effect commonly associated with phosphor-based devices.

What causes Image Sticking?

Image sticking is an intrinsic behavior of Graphic displays due to the susceptibility to a polarization of the interior materials (liquid crystals) when used under static, charged conditions (continuously displaying the same image). The individual liquid crystals in a Graphic panel have unique electrical properties. Displaying a fixed pattern – such as the POS menu described above – over prolonged periods can cause a parasitic charge build-up (polarization) within the liquid crystals which affects the crystals’ optical properties and ultimately prevents the liquid crystal from returning to their normal, relaxed state when the pattern is finally changed. This effect takes place at a cellular level within the Panel, and the effect can cause charged crystal alignment at the bottom or top of a crystal cell in

the “z” axis, or even crystal migration to the edges of a cell, again based on their polarity. These conditions can cause images to stick over an entire area, or at boundaries of distinct color change respectively. In either case, when the liquid crystals in the pixels and sub-pixels utilized to display the static image are polarized such that they can not return fully to their “relaxed” state upon deactivation, the result is a faint, visible, retained image on the panel upon presentation of a new, different image. The actual rate of image retention depends on variation factors such as the specific image, how long it is displayed unchanged, the temperature within the panel, and even the specific panel brand due to manufacturing differences amongst panel manufacturers.

How to Avoid Image Sticking?

- Try not to operate the Graphic with a “fixed” image on the screen for more than 2 hours.
- If you are operating the monitor in an elevated temperature environment and with a displayed image that is contrary to the recommendations in “For Software Developers” below, an image stick can occur in as little as 30 minutes.
- Adjust your screen-saver settings accordingly.
- Power down the unit during prolonged periods of inactivity such as the hours a store is closed or a shift during which the piece of equipment isn’t used.
- Use a screensaver with a black or medium gray background that is automatically set to come on if the device is inactive for more than 5-10 minutes.
- Avoid placing the monitor in poorly ventilated areas or in areas that will create excess heat around the monitor for software developers.
- In defining the icons, buttons, or windows on the screen, try to utilize block patterns instead of distinct lines as borders for dividing the display into distinct areas.
- If it is necessary to display a static image, try to use colors that are symmetric to the middle grey level at the boundary of two different colors, and slightly shift the borderline once in a while.
- Try to utilize medium gray hues for those areas that will have prolonged display times or remain static as other menu elements change.

How to Fix the Image Sticking?

Unlike the usually irreversible “burn-in” effects commonly associated with direct-view phosphor display devices such as CRTs, an image retained on a Graphic display can be reversed – often to a point of total invisibility. However, the severity of the underlying causes (as described above) of the image retained on a specific display, as well as the variation factors (see “For Software Developers” above) under which the retained image was created, will dictate the final level of retention reversal. One way to erase a retained image on a panel is to run the screen (monitor “on”) in an “all black” pattern for 4-6 hours. It is also helpful to do this in an elevated temperature environment of approximately 35º to 50ºC. Again, utilizing a dynamic screen saver with an all-black background during prolonged idle display periods is a good way to avoid image retention issues.

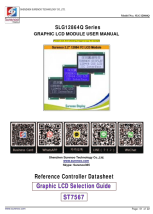
Is Image Sticking Covered by Surenoo RMA Warranty?

Image stacking is a phenomenon inherent to Graphic Display technology itself, and as such, the occurrence of this “ghosting” effect is considered normal operation by the manufacturers of the Graphic display modules that are integrated into today’s monitor solutions. Surenoo does not warrant any display against the occurrence of image sticking. We strongly advise that you follow the operating recommendations listed above to avoid the occurrence of this phenomenon.

- **www.surenoo.com**
- **Shenzhen Surenoo Technology Co.,Ltd. www.surenoo.com**

- **Skype: Surenoo365**

Documents / Resources

	Surenoo SLG12864Q Graphic LCD Module [pdf] User Manual SLA3 G12864Q, SLG12864Q, SLG12864Q Graphic LCD Module, SLG12864Q, Graphic LCD Module, LCD Module, Module

References

- Surenoo Display
- User Manual