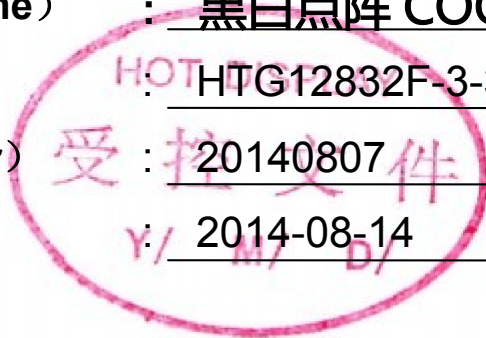




HTG12832F-3-35W-28K08

产品名称 (Product name) : 黑白点阵 COG
型号 (Model) : HTG12832F-3-35W-28K08
编号 (Part number) : 20140807
日期 (Date) : 2014-08-14



深圳市鑫洪泰电子科技有限公司
Shenzhen Hot Display Technology Co.,Ltd

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|-------------------|------------------|-------------------|
| 编制 Prepared by | 审核 Checked by | 核准 Approved by |
| | | |

编码: QR-R-011 A/0

序号:

| Rev. | Descriptions | Date |
|------|-------------------|------------|
| 01 | Prelimiay Release | 2014-08-14 |
| | | |
| | | |

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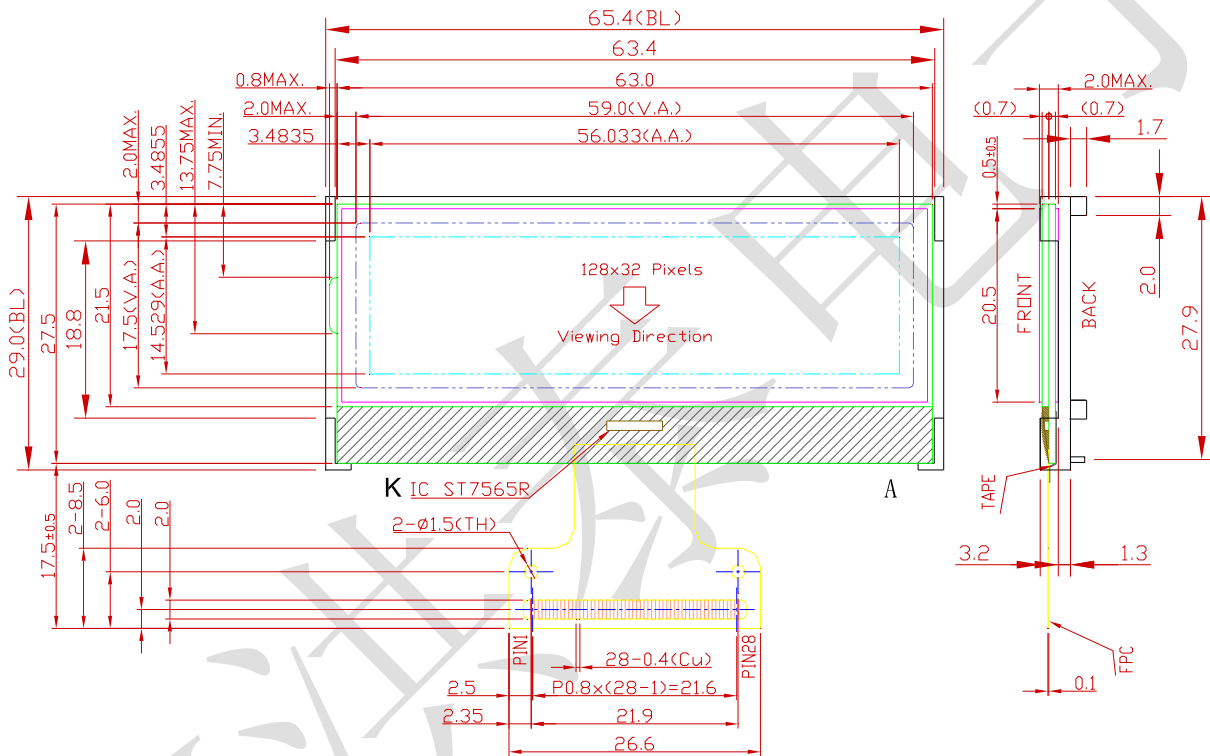
1. Basic Specifications

1.1 Display Specifications

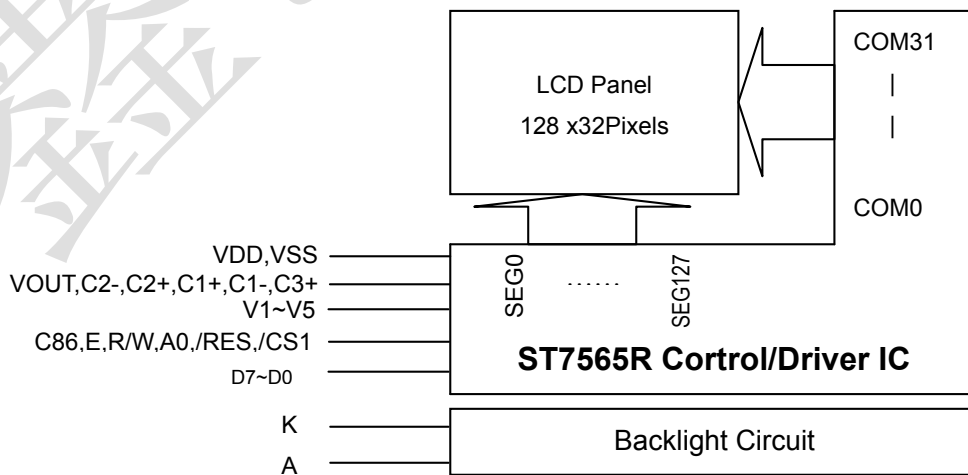
- 1>LCD Display Mode : FSTN, Positive, Transmissive
- 2>Viewing Angle : 12H
- 3>Driving Method : 1/33 Duty, 1/6 Bias
- 4>Backlight : White

1.2 Mechanical Specifications

- 1>Outline Dimension : 65.4x 29.0 x 5.0mm (See attached Outline Drawing for Details)



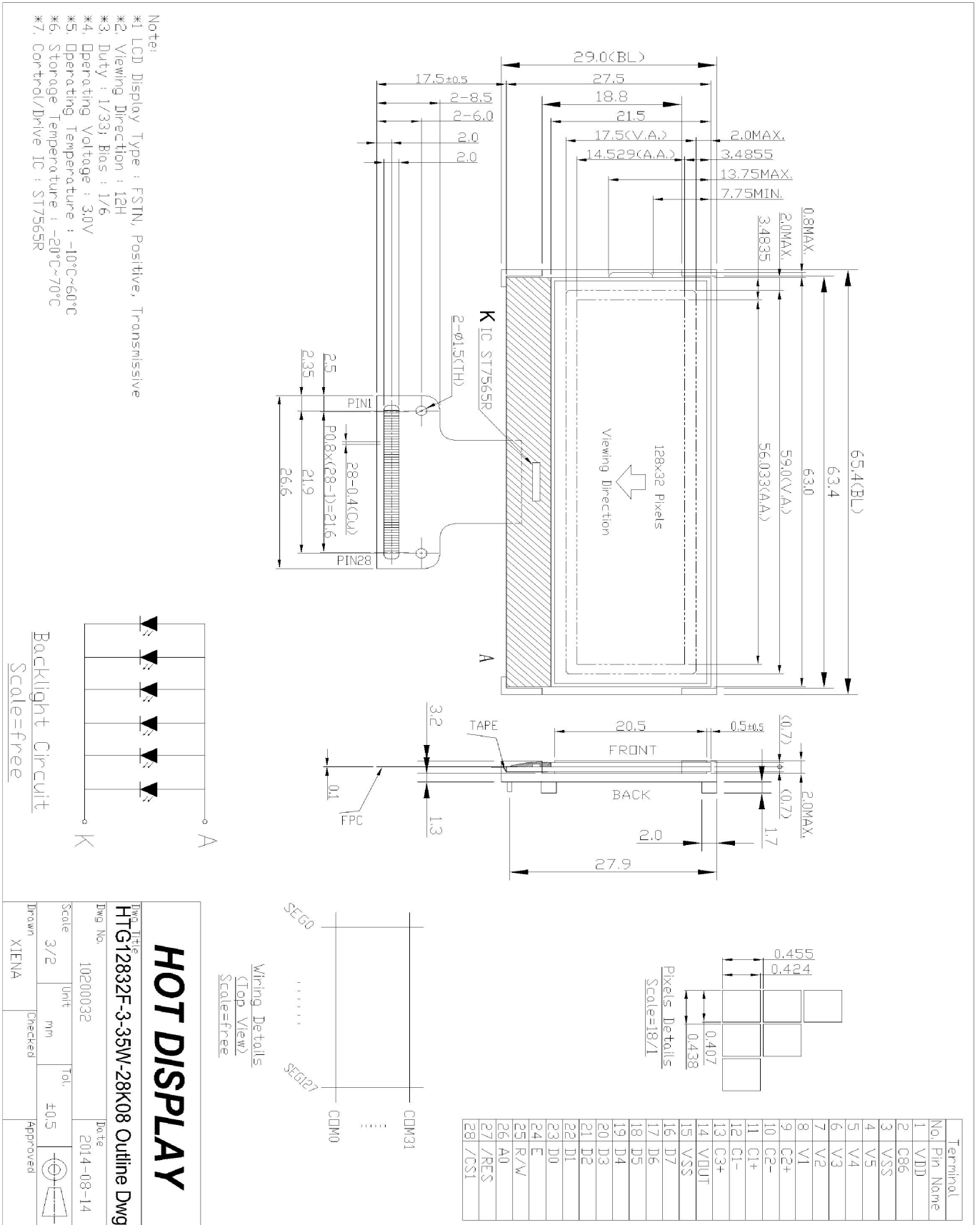
1.3 Circuit Diagram



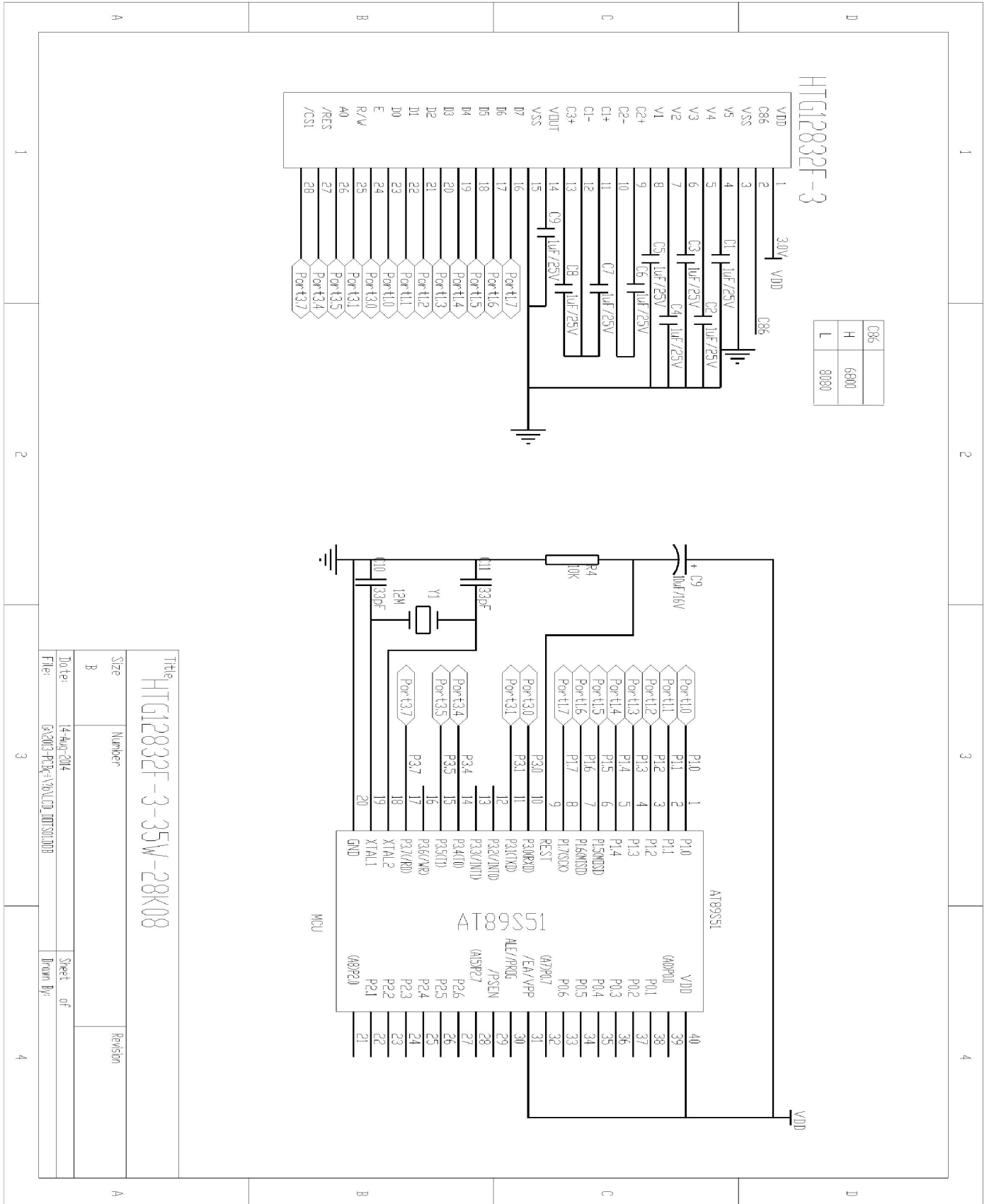
1.4 Terminal Function

| Pin No. | Pin Name | Function |
|---------|----------|--|
| 1 | VDD | Power supply |
| 2 | C86 | This is the MPU interface selection pin. C86 = "H": 6800 Series MPU interface. C86 = "L": 8080 Series MPU interface. |
| 3 | VSS | Power supply (Negative) |
| 4~8 | V5~V1 | This is a multi-level power supply for the liquid crystal drive. The voltage Supply applied is determined by the liquid crystal cell, and is changed through the use of a resistive voltage divided or through changing the impedance using an op. amp. Voltage levels are determined based on Vss, and must maintain the relative magnitudes shown below. $V1 \geq V2 \geq V3 \geq V4 \geq V5$ |
| 9 | C2+ | When internal DC-DC voltage converter is used, external capacitor is connected between these pins. |
| 10 | C2- | |
| 11 | C1+ | |
| 12 | C1- | |
| 13 | C3+ | |
| 14 | VOUT | Positive voltage supply pin of the chip. |
| 15 | VSS | Negative power supply,0V |
| 16~23 | D7~D0 | 8bit Date bus, |
| 24 | E | <ul style="list-style-type: none"> When connected to 8080 series MPU, this pin is treated as the "/RD" signal of the 8080 MPU and is LOW-active. The data bus is in an output status when this signal is "L". When connected to 6800 series MPU, this pin is treated as the "E" signal of the 6800 MPU and is HIGH-active. This is the enable clock input terminal of the 6800 Series MPU. |
| 25 | R/W | When R/W = "H": Read. When R/W = "L": Write. |
| 26 | A0 | This is connect to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or command. A0 = "H":Indicates that D0 to D7 are display data. A0 = "L": Indicates that D0 to D7 are control data |
| 27 | /RES | Reset input pin |
| 28 | /CS1 | Chip selection input |

1.5 Product Outline



1.6 Schematic Diagram



| | | | |
|-------|--------------------------------------|-----------------------|----|
| Title | | HTG12832F-3-35W-28K08 | |
| Size | Number | Revision | |
| B | | | |
| Date: | 14-Aug-2014 | Sheet | of |
| File: | G:\2013-PROJ-AT89S51_LCD_MONITOR\JOB | Drawn By: | |

2. Absolute Maximum Ratings

| Items | Symbol | MIN. | MAX. | Unit | Condition |
|-----------------------|-----------------|------|----------------------|------|----------------------|
| Supply Voltage | V _{DD} | -0.3 | +3.6 | V | V _{SS} = 0V |
| Input Voltage | V _{IN} | -0.3 | V _{DD} +0.3 | V | V _{SS} = 0V |
| Operating Temperature | T _{OP} | -20 | +70 | °C | No Condensation |
| Storage Temperature | T _{st} | -30 | +80 | °C | No Condensation |

3. Electrical Characteristics

3.1 DC Characteristics

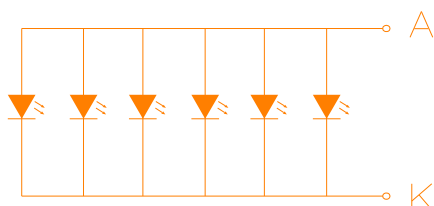
V_{SS} = 0V, Top = 25°C

| Items | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|---------------------|-----------------|-----------------------|------|-----------------------|------|-----------------------|
| Operating Voltage | V _{DD} | 3.0 | 3.3 | 3.6 | V | V _{DD} |
| Input High Voltage | V _{IH} | 0.8 x V _{DD} | - | V _{DD} | V | /CS1,/RES,A0,E , |
| Input Low Voltage | V _{IL} | V _{SS} | - | 0.2 x V _{DD} | V | R/W,D0~D7,C86 |
| Output High Voltage | V _{OH} | 0.8 x V _{DD} | - | V _{DD} | V | D0~D7 |
| Output Low Voltage | V _{OL} | V _{SS} | - | 0.2 x V _{DD} | V | D0~D7 |
| Operation Current | I _{op} | 100 | - | 220 | μA | V _{DD} =3.0V |
| Sleep mode | I _{DD} | - | 0.1 | 4 | μA | T _a =25°C |
| Standby mode | I _{DD} | - | 5 | 10 | μA | T _a =25°C |

3.2 LED Backlight Circuit

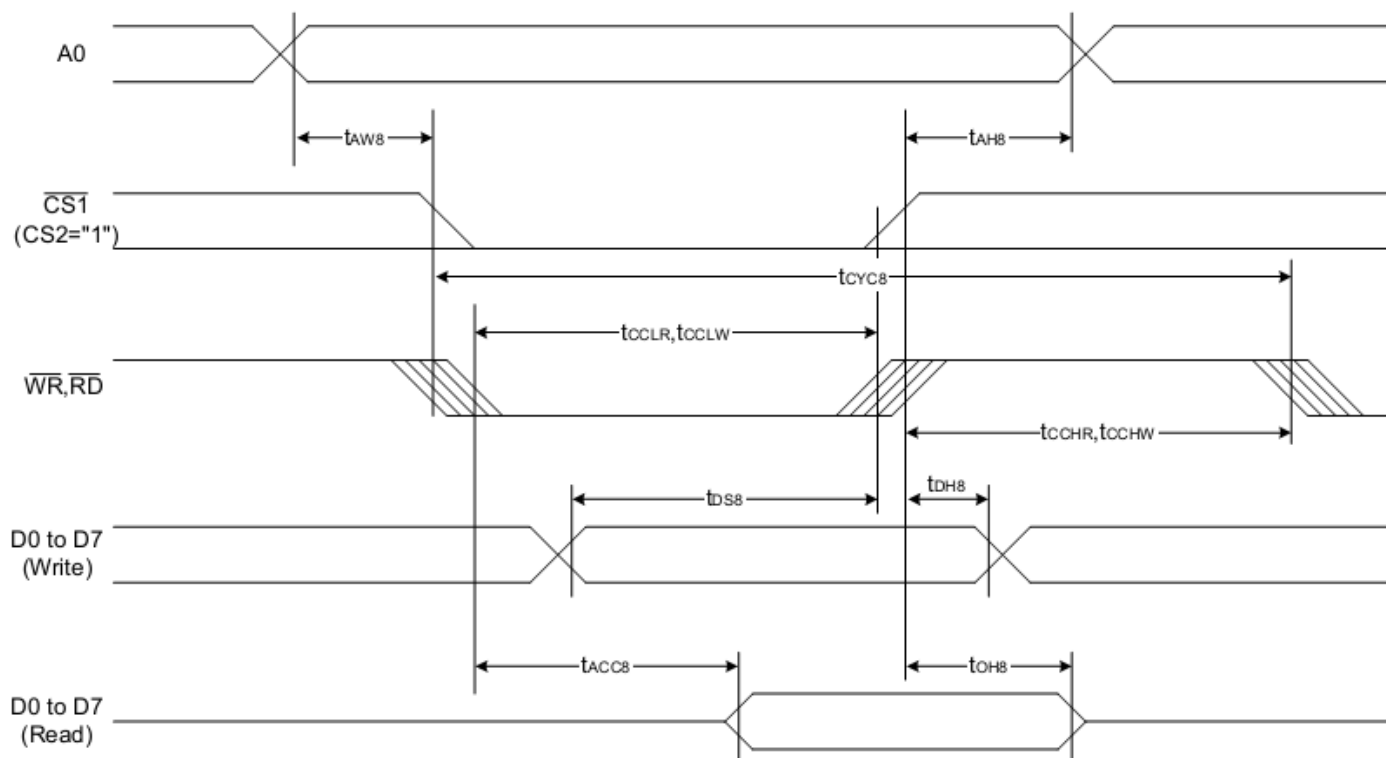
V_{SS} = 0V, Top = 25°C

| Items | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|-----------------|--------------------|------|------|------|------|-----------------|
| Forward Voltage | V _f BLA | - | 3.1 | - | V | V _{DD} |
| Forward Current | I _f BLA | - | 90 | 95 | mA | V _{DD} |



3.3 AC Characteristics

3.3.1 8080 Mode System Bus Timing



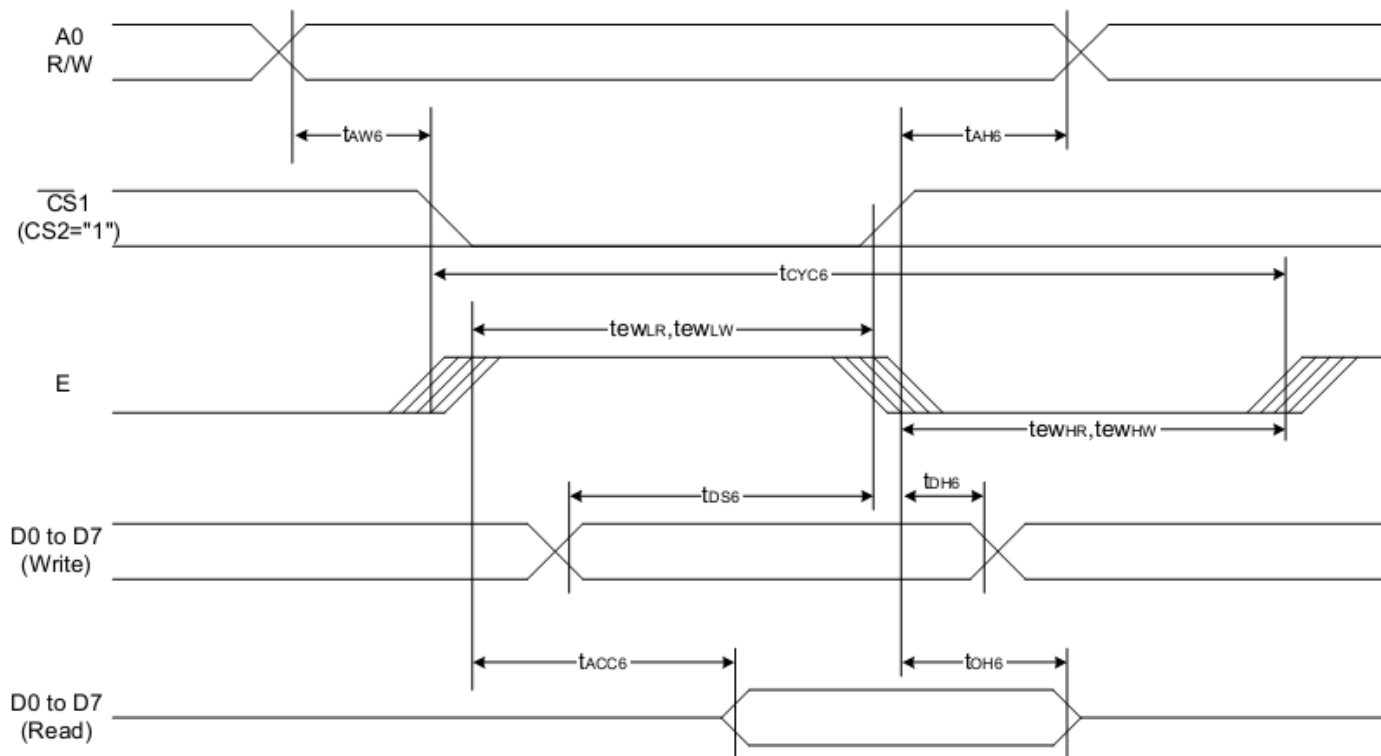
V_{ss} = 0V, T_{op} = 25°C

| Items | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|------------------------------|--------|------|------|------|------|-----------|
| System cycle time | Tcyc8 | 500 | - | - | ns | - |
| Address setup time(A0) | Taw8 | 10 | - | - | ns | - |
| Address hold time(A0) | Tah8 | 10 | - | - | ns | - |
| Control Low Pulse wide(/RD) | tcclr | 275 | - | - | ns | - |
| Control Low Pulse wide(/WR) | tcclw | 275 | - | - | ns | - |
| Control High Pulse wide(/RD) | tcchr | 225 | - | - | ns | - |
| Control High Pulse wide(/WR) | tcchw | 225 | - | - | ns | - |
| Data setup time | Tds8 | 50 | - | - | ns | - |
| Data hold time | Tdh8 | 10 | - | - | ns | - |
| /RD access time(*a) | Tacc8 | - | - | 200 | ns | - |
| Output disable time(*a) | Tch8 | 15 | - | 150 | ns | - |

Note:

*a. all timing is using 20% and 80% of V_{DD} as the reference.

3.3.2 6800 Mode System Bus Timing



V_{ss} = 0V, T_{op} = 25°C

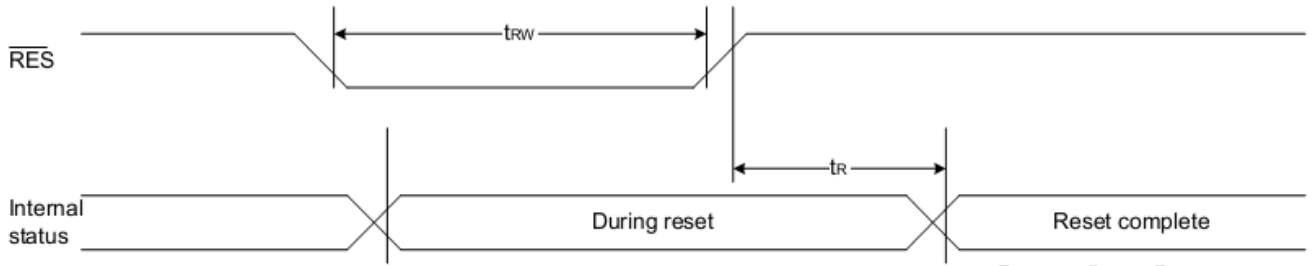
| Items | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|------------------------------|--------|------|------|------|------|-----------|
| System cycle time | Tcyc6 | 500 | - | - | ns | - |
| Address setup time(A0) | Taw6 | 10 | - | - | ns | - |
| Address hold time(A0) | Tah6 | 10 | - | - | ns | - |
| Control Low Pulse wide(/RD) | tcclr | 275 | - | - | ns | - |
| Control Low Pulse wide(/WR) | tcclw | 275 | - | - | ns | - |
| Control High Pulse wide(/RD) | tcchr | 225 | - | - | ns | - |
| Control High Pulse wide(/WR) | tcchw | 225 | - | - | ns | - |
| Data setup time | Tds6 | 50 | - | - | ns | - |
| Data hold time | Tdh6 | 10 | - | - | ns | - |
| /RD access time(*a) | Tacc6 | - | - | 200 | ns | - |
| Output disable time(*a) | Tch6 | 15 | - | 150 | ns | - |

Note:

*a. all timing is using 20% and 80% of VDD as the reference.

*b. CL = 100p

3.3 Reset Timing



(VDD = 3.3V, Ta = -30 to 85°C)

| Item | Signal | Symbol | Condition | Rating | | | Units |
|-----------------------|--------|--------|-----------|--------|------|------|-------|
| | | | | Min. | Typ. | Max. | |
| Reset time | | tR | | — | — | 1.0 | us |
| Reset "L" pulse width | /RES | tRW | | 1.0 | — | — | us |

Table 37

(VDD = 2.7V, Ta = -30 to 85°C)

| Item | Signal | Symbol | Condition | Rating | | | Units |
|-----------------------|--------|--------|-----------|--------|------|------|-------|
| | | | | Min. | Typ. | Max. | |
| Reset time | | tR | | — | — | 2.0 | us |
| Reset "L" pulse width | /RES | tRW | | 2.0 | — | — | us |

Table 38

(VDD = 1.8V, Ta = -30 to 85°C)

| Item | Signal | Symbol | Condition | Rating | | | Units |
|-----------------------|--------|--------|-----------|--------|------|------|-------|
| | | | | Min. | Typ. | Max. | |
| Reset time | | tR | | — | — | 3.0 | us |
| Reset "L" pulse width | /RES | tRW | | 3.0 | — | — | us |

Note:

*a. all timing is using 20% and 80% of VDD as the reference.

4. Function specifications

4.1 The Parallel Interface

| Shared | 6800 Mode | | 8080 Mode | | Function |
|--------|-----------|-----|-----------|-----|-------------------------|
| | R/W | E | /RD | /WR | |
| A0 | H | H | L | H | Reads the display data |
| H | L | H→L | H | L→H | Writes the display data |
| L | H | H | L | H | Status read |
| L | L | H→L | H | L→H | Write Command data |

4.2 Basic Setting

To drive the LCD module correctly and provide normally display, please use the following setting

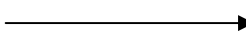
- 1> ADC = 0 (normal)
- 2> SHL select = 1(reverse)
- 3> LCD Bias Select = 1/9
- 4> Initial Display Line = 0
- 5> Entire Display ON/OFF = OFF(normal)
- 6> Reverse Display ON/OFF = OFF(normal)
- 7> Set Power Control Set:
Voltage follower = ON,voltage converter = ON,Voltage regulator = ON
- 8> Display ON/OFF =ON

4.3 Resetting the LCD module

The LCD module should be initialized bu using /RES terminal.

While turning on the VDD and VSS power supply, maintain /RES terminal at LOW level, After the Power supply stabilized, release the reset terminal(/RES = High)

4.4 Display Memory Map

| Page address | data | LCD Display (front view) | |
|----------------|---------------|---|--|
| 0 | D0 : D7 | <div style="border: 1px solid black; padding: 10px; display: inline-block;"> 128 × 32 </div> | |
| 1 | D0 : D7 | | |
| 2 | D0 : D7 | | |
| 3 | D0 : D7 | | |
| Column Address | |  | |

4.5 Display Commands

| No. | Instrctions | Code | | | | | | | | | | | | Function |
|-----|-----------------------------------|------|-----|-----|------------|----|--------------------------|----|--------------|-------|----|----|--|---|
| | | A0 | /RD | /WR | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | |
| 1 | Display ON/OFF | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | DON | DON=0,display off DON=1,display on |
| 2 | Display start line set | 0 | 1 | 0 | 0 | 1 | Display start address | | | | | | Set the display RAM display start line address | |
| 3 | Set Page Address | 0 | 1 | 0 | 1 | 0 | 1 | 1 | Page address | | | | | Set the display RAM Page address |
| 4 | Ser Column Address (Upper-4 bits) | 0 | 1 | 0 | 0 | 0 | 0 | 1 | Col. Add | | | | | Set the upper-4-bit of column address counter |
| | Ser Column Address (Lower-4 bits) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | Col. Add | | | | | Set the low-4-bit of column address counter |
| 5 | Read Staus | 0 | 0 | 1 | Status | | | | 0 | 0 | 0 | 0 | | Read the status data |
| 6 | Write Display Data | 1 | 1 | 0 | Write Data | | | | | | | | Write data into the display RAM | |
| 7 | Read Display Data | 1 | 0 | 1 | Read Data | | | | | | | | Read data from the display RAM | |
| 8 | ADC Select | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | ADC | Set the display RAM address SEG output Correspondence ADC = 0,Normal. ADC = 1,Reverse |
| 9 | Normal/Reverse Display | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | | REV | REV = 0, Normal REV = 1, Reverse |
| 10 | Entire Display ON/OFF | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | | EON | EON = 0, Normal EON = 1, Entire display ON |
| 11 | Set LCD Bias | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | | BIAS | Bias = 0, 1/9 Bias Bias = 1, 1/7 Bias |
| 12 | Set Read-Modify-Write | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | | Enter the "Read-Modify-Write" mode |
| 13 | Reset Read-Modify-Write | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | | Clear the "Read-Modify-Write" mode |
| 14 | Reset | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | | Resets the LCD module |
| 15 | SHL S elect | 0 | 1 | 0 | 1 | 1 | 0 | 0 | SHL | * | * | * | | Set the COM scanning direction SHL = 0, Normal SHL = 1, Flipped in y-direction * = don't care terms |
| 16 | Power Control Set | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | VC | VR | VF | | Set the power circuit operation mode VF : LCD Supply Voltage Follower VR : LCD Supply Voltage Regulator VF : LCD Supply Voltage Converter (1 = ON, 0 = OFF) |
| 17 | Regulator Resistor Select | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | Ratio | | | | Set the built-in resistor ratio (Rb/Ra) |
| 18 | Electronic volume mode set | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | Set reference voltage mode |
| | Electronic volume register set | 0 | 1 | 0 | * | * | Electronic Control value | | | | | | Set reference voltage register | |
| 19 | Power Save | | - | - | - | - | - | - | - | - | - | - | | Compound instruction Display OFF + Entire Display ON |
| 20 | NOP | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | | Non-operation command |

Note:

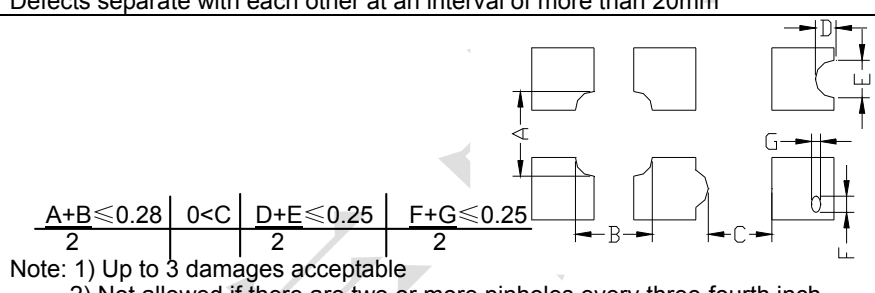
*a. For the details of the Display Commands, please refer to ST7565R data sheet

4.6 Basic Operating Sequence

Initialization Sequence

| | Code Function | | | | | | | | | | Note | |
|--|---------------|--------------|----|----|----|----|----|----|----|-----|------|---|
| | A0 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | hex | | |
| Turn on Power Supply VDD & VSS While maintaining /RES at LOW | - | - | - | - | - | - | - | - | - | - | - | |
| Wait until power supply is stabilized | - | - | - | - | - | - | - | - | - | - | - | |
| Release the /RES Reset Signal (/RES = High) | - | - | - | - | - | - | - | - | - | - | - | See AC Characteristics section for timing details |
| LCD Bias = 1/9 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | A2H | LCD Characteristics |
| ADC = Normal | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | A0H | No flip on x-direction (SEG) |
| SHL = Reverse | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | C8H | Flip on y- direction (COM) |
| Initial Display Line = 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40H | i.e. Display RAM "Page 0-D0" Matched to top line of the LCD |
| Power Control Voltage Follower = OFF Voltage Regulator = OFF Voltage Converter = ON Delay 50ms | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 2CH | Turn on the internal Voltage Converter and wait until VOUT stable |
| | - | - | - | - | - | - | - | - | - | - | - | |
| Power Control Voltage Follower = OFF Voltage Regulator = OFF Voltage Converter = ON Delay 50ms | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 2EH | Turn on the internal Voltage Regulator and wait until VOUT stable |
| | - | - | - | - | - | - | - | - | - | - | - | |
| Power Control Voltage Follower = OFF Voltage Regulator = OFF Voltage Converter = ON Delay 50ms | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 2FH | Turn on the internal Voltage Follower and wait until VOUT stable |
| | - | - | - | - | - | - | - | - | - | - | - | |
| Regulator Resistor Select | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 25H | Set the built-in resistor ratio to middle |
| Set Reference Voltage Mode Set Reference Voltage Resistor | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 81H | Set to the middle of the range it may be adjusted For achieving the best display contrast |
| | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 22H | |
| Display ON | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | AFH | Turn on the LCD display |
| Set Page Address = 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | B0H | Specify the display data RAM page address to 00H |
| Set Column Address (Upper -4bit = 0) Set Column Address (Lower-4bit =4) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 10H | Specify the display data RAM column address to 00H |
| | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 01H | |
| Write Display Data | 1 | Display Data | | | | | | | | | - | |
| Write Other Display Data | | | | | | | | | | | | |

5. Inspection Standards

| Item | Criterion for defects | Defect type |
|--|---|-------------|
| 1) Display on inspection | (1) Non display (2) Vertical line is deficient (3) Horizontal line is deficient (4) Cross line is deficient | Major |
| 2) Black / White spot | Size Φ (mm) Acceptable number $\Phi \leq 0.3$ Ignore (note) $0.3 < \Phi \leq 0.45$ 3 $0.45 < \Phi \leq 0.6$ 1 $0.6 < \Phi$ 0 | Minor |
| 3) Black / White line | Length (mm) Width (mm) Acceptable number $L \leq 10$ $W \leq 0.03$ Ignore $5.0 \leq L \leq 10$ $0.03 < W \leq 0.04$ 3 $5.0 \leq L \leq 10$ $0.04 < W \leq 0.05$ 2 $1.0 \leq L \leq 10$ $0.05 < W \leq 0.06$ 2 $1.0 \leq L \leq 10$ $0.06 < W \leq 0.08$ 1 $L \leq 10$ $0.08 < W$ follows 2) point defect Defects separate with each other at an interval of more than 20mm | Minor |
| 4) Display pattern |  <p>Note: 1) Up to 3 damages acceptable 2) Not allowed if there are two or more pinholes every three-fourth inch.</p> | Minor |
| 5) Spot-like contrast irregularity | Size Φ (mm) Acceptable Number $\Phi \leq 0.7$ Ignore (note) $0.7 < \Phi \leq 1.0$ 3 $1.0 < \Phi \leq 1.5$ 1 $1.5 < \Phi$ 0 Note: 1) Conformed to limit samples. 2) Intervals of defects are more than 30mm. | Minor |
| 6) Bubbles in polarizer | Size Φ (mm) Acceptable Number $\Phi \leq 0.4$ Ignore (note) $0.4 < \Phi \leq 0.65$ 2 $0.65 < \Phi \leq 1.2$ 1 $1.2 < \Phi$ 0 | Minor |
| 7) Scratches and dent on the polarizer | Scratches and dent on the polarizer shall be in the accordance with "2) Black/white spot", and "3) Black/White line". | Minor |
| 8) Stains on the surface of LCD panel | Stains which cannot be removed even when wiped lightly with a soft cloth or similar cleaning. | Minor |
| 9) Rainbow color | No rainbow color is allowed in the optimum contrast on state within the active area. | Minor |
| 10) Viewing area encroachment | Polarizer edge or line is visible in the opening viewing area due to polarizer shortness or sealing line. | Minor |
| 11) Bezel appearance | Rust and deep damages that are visible in the bezel are rejected. | Minor |
| 12) Defect of land surface contact | Evident crevices that are visible are rejected. | Minor |
| 13) Parts mounting | (1) Failure to mount parts (2) Parts not in the specifications are mounted (3) For example: Polarity is reversed, HSC or TCP falls off. | Minor |
| 14) Part alignment | (1) LSI, IC lead width is more than 50% beyond pad outline. (2) More than 50% of LSI, IC leads is off the pad outline. | Minor |
| 15) Conductive foreign matter (solder ball, solder hips) | (1) $0.45 < \Phi$, $N \geq 1$ (2) $0.3 < \Phi \leq 0.45$, $N \geq 1$, Φ : Average diameter of solder ball (unit: mm) (3) $0.5 < L$, $N \geq 1$, L : Average length of solder chip (unit: mm) | Minor |
| 16) Bezel flaw | Bezel claw missing or not bent | Minor |
| 17) Indication on name plate (sampling indication label) | (1) Failure to stamp or label error, or not legible.(all acceptable if legible) (2) The separation is more than 1/3 for indication discoloration, in which the characters can be checked. | Minor |

6. Handling Precautions

6.1 Mounting method

A panel of LCD module made by our company consists of two thin glass plates with polarizers that easily get damaged. And since the module is so constructed as to be fixed by utilizing fitting holes in the printed circuit board (PCB), extreme care should be used when handling the LCD modules.

6.2 Cautions of LCD handling and cleaning

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

- Isopropyl alcohol
- Ethyl alcohol
- Trichlorotrifluoroethane

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

Do not use the following solvent:

- Water
- Ketene
- Aromatics

6.3 Caution against static charge

The LCD module uses C-MOS LSI drivers. So we recommend you:

Connect any unused input terminal to V_{dd} or V_{ss} . Do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

6.4 Packaging

- Module employs LCD elements, and must be treated as such. Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity.

6.5 Caution for operation

-It is an indispensable condition to drive LCD module within the limits of the specified voltage since the higher voltage over the limits may cause the shorter life of LCD module.

-An electrochemical reaction due to DC (direct current) causes LCD undesirable deterioration so that the uses of DC (direct current) drive should be avoided.

-Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD module may show dark color in them. However those phenomena do not mean malfunction or out of order of LCD module, which will come back in the specified operating temperature.

6.6 Storage

In the case of storing for a long period of time, the following ways are recommended:

- Storage in polyethylene bag with the opening sealed so as not to enter fresh air outside in it. And with not desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light is. Keeping the storage temperature range.
- Storing with no touch on polarizer surface by anything else.

6.7 Safety

-It is recommendable to crush damaged or unnecessary LCD into pieces and to wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.

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

7. Packaging Specifications

| | | Packaging Specifications HTG12832F-3 | | | Approved | Canceled | Desigend |
|------------------------|----------------------|---|------------------|----------|--------------|----------|----------|
| 7.1 Packaging Material | | | | | | | |
| No | Item | Dimensions (mm) | 1PCS Weight (KG) | Quantity | Total Weight | | |
| 1 | COG | 63.0*27.5*4.3 | 0.028 | 300 | 8.4 | | |
| 2 | PE Bag | 100*50 | 0.001 | 300 | 0.3 | | |
| 3 | Foam Rubber Cushion | 310*170 | 0.0175 | 12 | 0.21 | | |
| 4 | Partition A1 | 310*170*100 | 0.30 | 6 | 1.8 | | |
| 5 | Product Box | 330*180*120 (neutral packing) | 0.45 | 6 | 2.7 | | |
| 6 | Carton | 480*390*330 (neutral packing) | 0.9 | 1 | 0.9 | | |
| 7 | Tape | | | AR | | | |
| 8 | Label Specifications | | | 1 | | | |
| 9 | Label Rohs | | | 1 | | | |
| 10 | Label ESD | | | 1 | | | |

7.2. Total LCD Weight in carton: 14.3 KG±10%

7.3. Packaging Specifications and Quantity:

(1) Quantity Of Spacer: A1*6

(2) Total LCM quantity in carton: quantity per box 50* no of boxes 6 = 300

