■ **Preliminary Specification**
□ **Approval Specification**

# SPECIFICATION FOR LCD MODULE

Customer: _____
Product Model: IE-K-1819CH04MP-CB-1
Sample code: _____

| Designed by | Checked by | Approved by |
|---|---|---|
| | | |

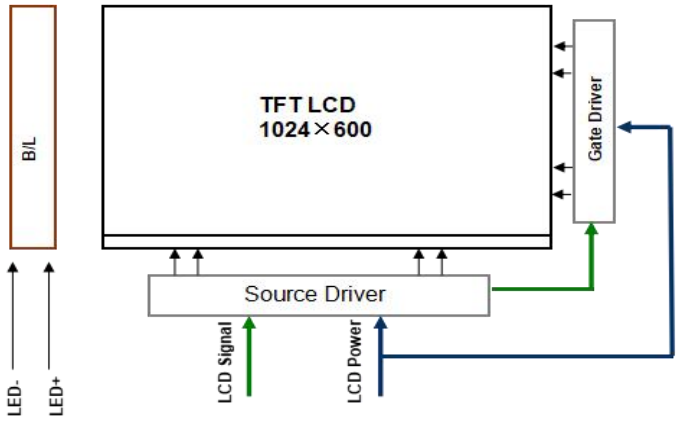
## Final Approval by Customer

| | |
|---|---|
| □ LCM Machinery OK<br>**Checked By** | □ LCM OK |
| □ LCM Display OK<br>**Checked By** | □ NG，Problem survey:<br>**Approved By** |

# Revision History

| *Version | *Contents | *Date | Note |
|---|---|---|---|
| A0 | Original | 2024-10-25 | |

## 2. Block Diagram




## 3. Technology Specifications

### 3.1 Features

This single-display module is suitable for use in MID products. The LCD adopts one backlight with High brightness white LED. Construction: 10.1″ a -Si color TFT-LCD ,With HKC Cell, White LED backlight、FPC AND TCON.

### 3.2 General Specifications

| No. | Item | Specification |
|---|---|---|
| 1 | LCD size (Inch ) | 7.00 |
| 2 | Resolution | 1024(H)*600(W) mm |
| 3 | Display mode | Normally Black |
| 4 | Pixel pitch | 0.1506 (H) x 0.1432(V) |
| 5 | Active area | 154.2100(H)*85.9200(V) mm |
| 6 | Module size(TPM) | 182.0000(H)*113.0000(V)*2.6100(T) mm |
| 7 | Pixel arrangement | RGB Vertical stripe |
| 8 | Surface Treatment | HC |
| 9 | Interface | MIPI |
| 10 | Brightness (Tpy, cd/㎡) | 350 |
| 11 | TP Bonding Mode | 全贴合 |
| 12 | Backlight power consumption (Tpy, W) | 1.782 |

# 4. Interface Pin Assignment

## 4.1 LCM Pin Assignment

| Pin No | Symbol | Function |
|---|---|---|
| 1 | NC | NC |
| 2 | GND | Power Ground |
| 3 | 5v | Power for BL+AVDD |
| 4 | GND | Power Ground |
| 5 | 3v3 | Power Supply |
| 6 | LCD_EN | wLED driver IC enable (Active high) |
| 7 | TP_RST | Reset signal for CTP |
| 8 | TP_INT | Interrupt signal for CTP |
| 9 | TP_VDD | Power supply for CTP |
| 10 | GND | Power Ground |
| 11 | TP_SCL | I2C clock signal for CTP |
| 12 | TP_SDA | I2C data input signal for CTP |
| 13 | GND | Power Ground |
| 14 | PWM | Backlight on/off control pin |
| 15 | LCD_RST | Global reset pin |
| 16 | GND | Power Ground |
| 17 | CLKN | MIPI CLK input |
| 18 | CLKP | MIPI CLK input |
| 19 | GND | Power Ground |
| 20 | 0M | MIPI Data lane0 input |
| 21 | 0P | MIPI Data lane0 input |
| 22 | GND | Power Ground |
| 23 | 1M | MIPI Data lane1 input |
| 24 | 1P | MIPI Data lane1 input |
| 25 | GND | Power Ground |
| 26 | 2M | MIPI Data lane2 input |
| 27 | 2P | MIPI Data lane2 input |
| 28 | GND | Power Ground |
| 29 | 3M | MIPI Data lane3 input |
| 30 | 3P | MIPI Data lane3 input |

# 5. Operation Specifications

## 5.1 Absolute Max. Rating

| Item | Symbol | Values | | Unit | Remark |
|---|---|---|---|---|---|
| | | Min. | Max. | | |
| Operation Temperature | TOP | -10 | 60 | °C | |
| Storage Temperature | TST | -20 | 70 | °C | |
| Backlight forward | ILED | / | 20 | mA | |
| Operation Temperature | TOP | / | / | °C | |
| Storage Temperature | TST | / | / | °C | |

Note 1:The absolute maximum rating values of this product are not allowed to be exceeded at any times.Should a module be used with any of the absolute maximum ratings exceeded,the characteristics of the module may not be recovered,or in an extreme case,the module may be permanently destroyed.

## 5.2 Typical Operation Conditions

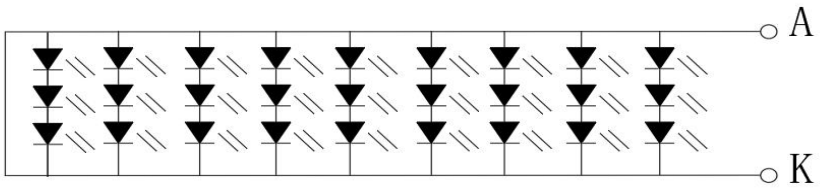
| Item | Symbol | Values | | | Unit | Remark |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Power Voltage | VDD | 1.7 | 1.8 | 1.8 | V | |

**Note 1:**

Frame Rate=60Hz ; Operating at 25℃ at white pattern.

### 5.3 LED Back Light Specification

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage | Vf | IF=180mA | 8.10 | 9.00 | 9.90 | V |



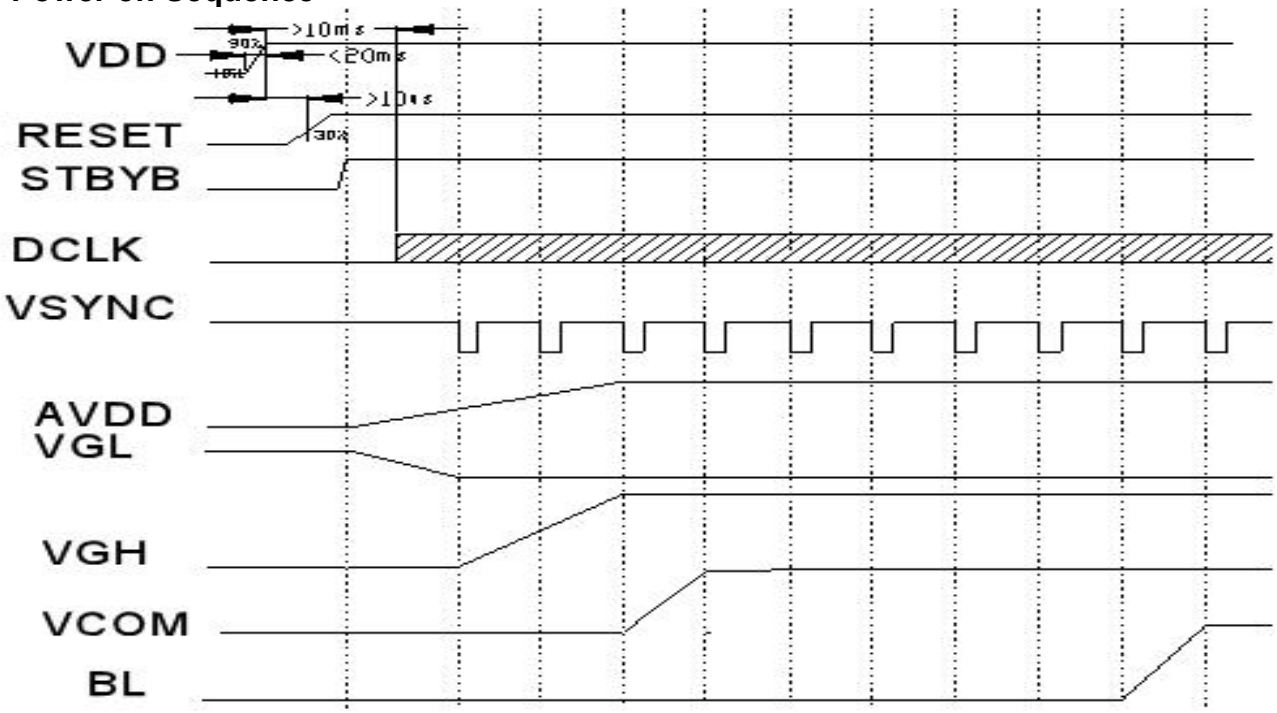

LED CIRCUIT DIAGRAM

Vf=8.1-9.9V(If=180mA)

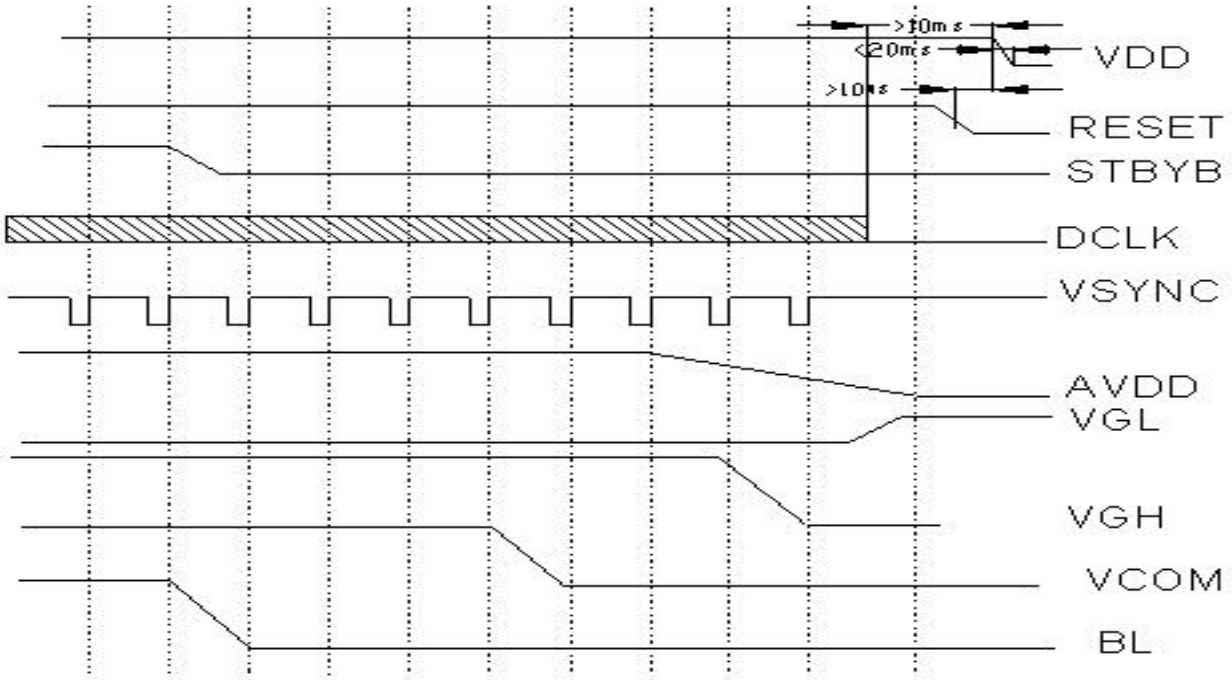
## 6. Signal Timing Characteristics (see IC spec for details)

### 6.1 Power On/Off Sequence

**Power on Sequence**




**Power off Sequence**




## 6.2 Timing Conditions

## 7. Optical specifications

| Item | Symbol | Condition | Values | | | Unit | Remark |
|---|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | | |
| Viewing angle (CR≥ 10) | $\theta_L$ | Φ=180° (9 o'clock) | - | 85 | - | degree | Note 1 |
| | $\theta_R$ | Φ=0° (3 o'clock) | - | 85 | - | | |
| | $\theta_T$ | Φ=90° (12 o'clock) | - | 85 | - | | |
| | $\theta_B$ | Φ=270° (6 o'clock) | - | 85 | - | | |
| Response time Rise+Fall | $T_{RT}$ | Normal θ=Φ=0° | - | 13 | 20 | msec | Note 3 |
| Contrast ratio | CR | | 600 | 800 | - | - | Note 4 |
| Color chromaticity | $W_X$ | | 0.2600 | 0.2900 | 0.3200 | - | Note 2 Note 5 Note 6 |
| | $W_Y$ | | 0.2800 | 0.3100 | 0.3400 | - | |
| NTSC | Ratio | | - | 50.00 | - | % | |
| Luminance | L | | 300 | 350 | - | - | Note 6 |
| Luminance uniformity | $Y_U$ | 9 点测试 | 75 | 80 | - | % | ${LU_REMARK} |

Note 1: Definition of viewing angle range

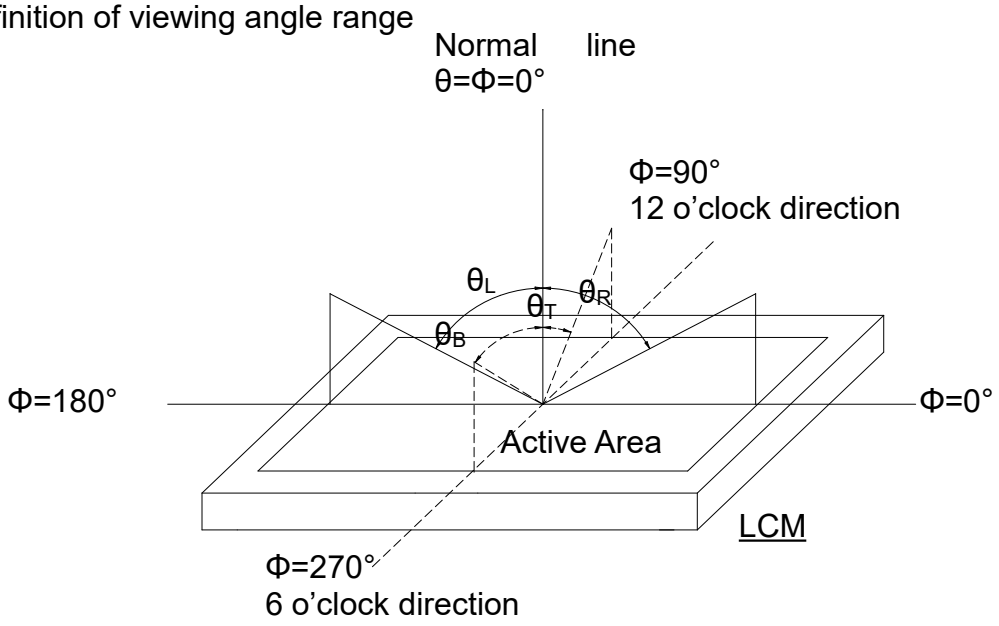



Fig. 4-1 Definition of viewing angle

Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm ,Response time is measured by Photo detector TOPCON BM-5A, other items are measured by BM-7A/Field of view: 1° /Height: 500mm.)

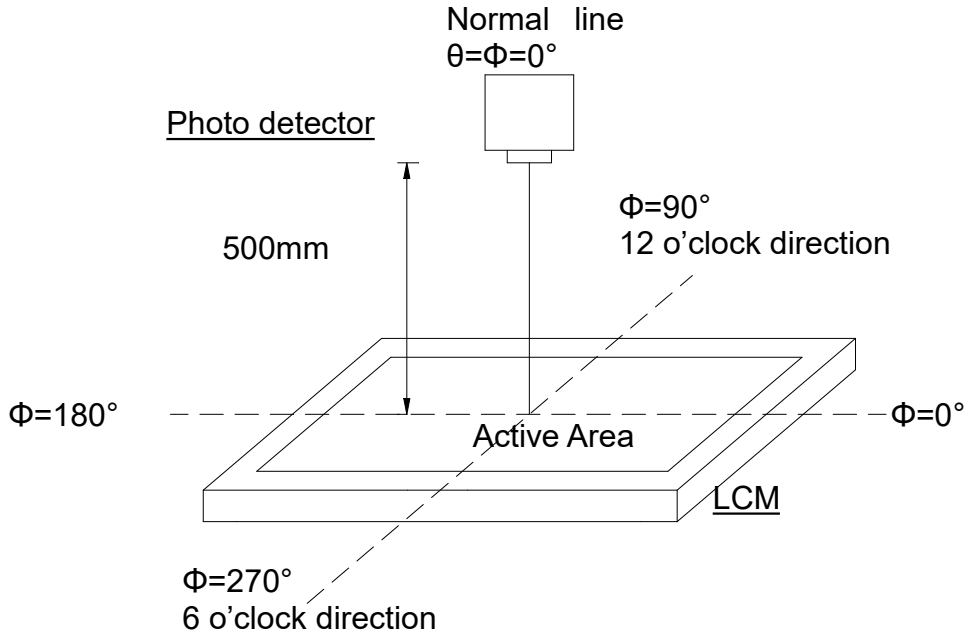



Fig. 4-2 Optical measurement system setup

Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time ($T_{ON}$) is the time between photo detector output intensity changed from 90% to 10%. And fall time ($T_{OFF}$) is the time between photo detector output intensity changed from 10% to 90%.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

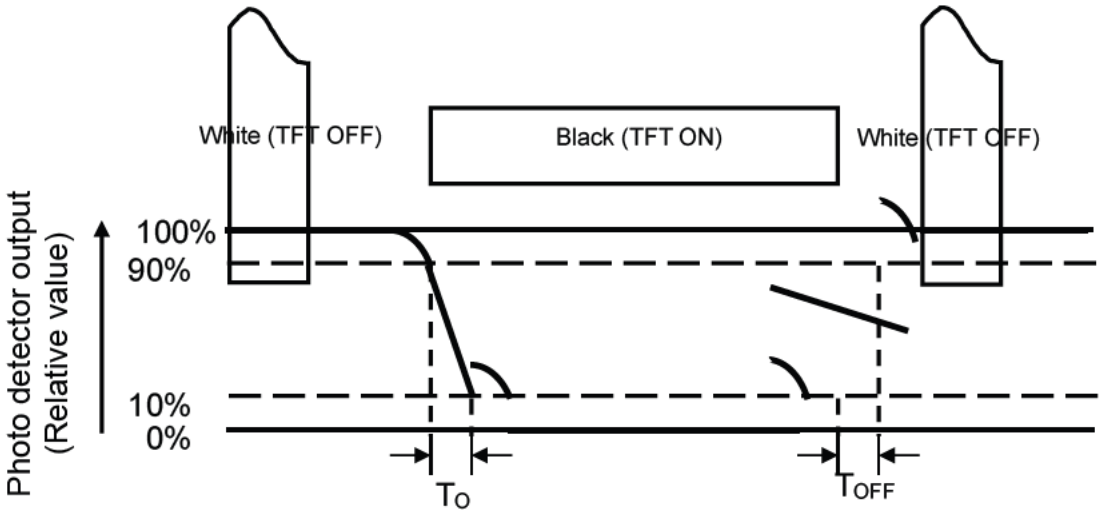



Fig. 4-3 Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)Color coordinates measured at center point of LCD.

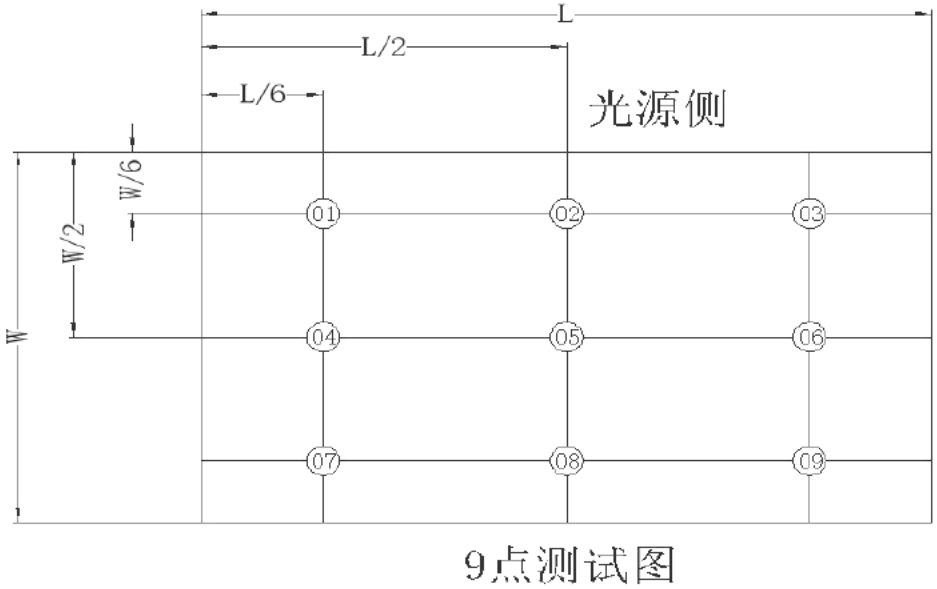
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is $I_{LED}$= 180.0 mA.

Note 7: Definition of Luminance Uniformity

Active area is divided into measuring areas (Refer to Fig. 4-4 ).Every measuring point is placed at the center of each measuring area.

$$Luminance\ \ Uniformity\ (Yu) = \frac{B_{min}}{B_{max}}$$

W-------Active area length H----- Active area width




9点测试图

Fig. 4-4 Definition of measuring points

$B_{max}$: The measured maximum luminance of all measurement position.

$B_{min}$: The measured minimum luminance of all measurement position.

## 8. Reliability Test Conditions And Methods

| Item | Test Conditions | Remark |
|---|---|---|
| High Temperature Storage | Ta=70.0℃ 72.0hrs | |
| Low Temperature Storage | Ta=-20.0℃ 72.0hrs | |
| High Temperature Operation | Ts=60.0℃ 72.0hrs | |
| Low Temperature Operation | Ta=-10.0℃ 72.0hrs | |
| Operate at High Temperature and Humidity | 60.0℃,90.0%RH max 72.0hrs | Operation |
| Thermal Shock | -20.0 ℃ ~60.0 ℃ 100.0cycles 1.0Hrs/cycle | Non-operation |
| Electrostatic Discharge | Contact=±8.0KV,classB<br>Air=±15.0KV,class B | |

Note1: In the standard condition,there shall be no practical problem that may affect the display function.After the reliability test,the product only guaranteesoperation,but don't guarantee all of the cosmetic specification.

Note2: Before cosmetic and function test,the product must have enough recovery time,at least 2 hours at room temperature.

## 9. Handling Precautions

### 9.1Mounting method

The LCD panel of K&D LCD module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

### 9.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent [recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

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

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Salfur (S)

If goods were sent without being silicon coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (Cl), Salfur (S) from customer, Responsibility is on customer.

### 9.3 Caution against static charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to Vdd or Vss, do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

### 9.4 packing

- Module employ 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

**9.5 Caution for operation**

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

**9.6 storage**

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

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

[It is recommended to store them as they have been contained in the inner container at the time of delivery from us

**9.7 Safety**

- It is recommendable to crash damaged or unnecessary LCD's into pieces and 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 with soap and water

## 10. Precaution for use

**10.1**

A limit sample should be provided by the both parties on an occasion when the both parties agreed its necessity. Judgment by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

**10.2**

On the following occasions, the handing of problem should be decided through discussion and agreement between responsible of the both parties.

- When a question is arisen in this specification
- When a new problem is arisen which is not specified in this specifications
- When an inspection specifications change or operating condition change in customer is reported to K&D , and some problem is arisen in this specification due to the change
- When a new problem is arisen at the customer's operating set for sample evaluation in the customer site.

# 11. Package Drawing

## Packing Procedure


First step

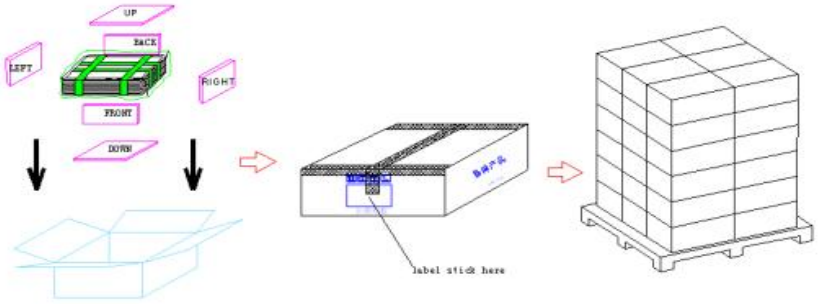
Putting products into the tray,
LCD A.A faces Upward,
(pay attention to the direction )

Second step

Neighbouring trays should be staggered 180° while stacking up.
on the top,there is an empty tray without product
the quality of layers please refer to

Third step

Taping up the tray after inspection,and put them into a PE bag




Fourth step

Putting EPE foams and products with trays into the carton;
Close the carton box

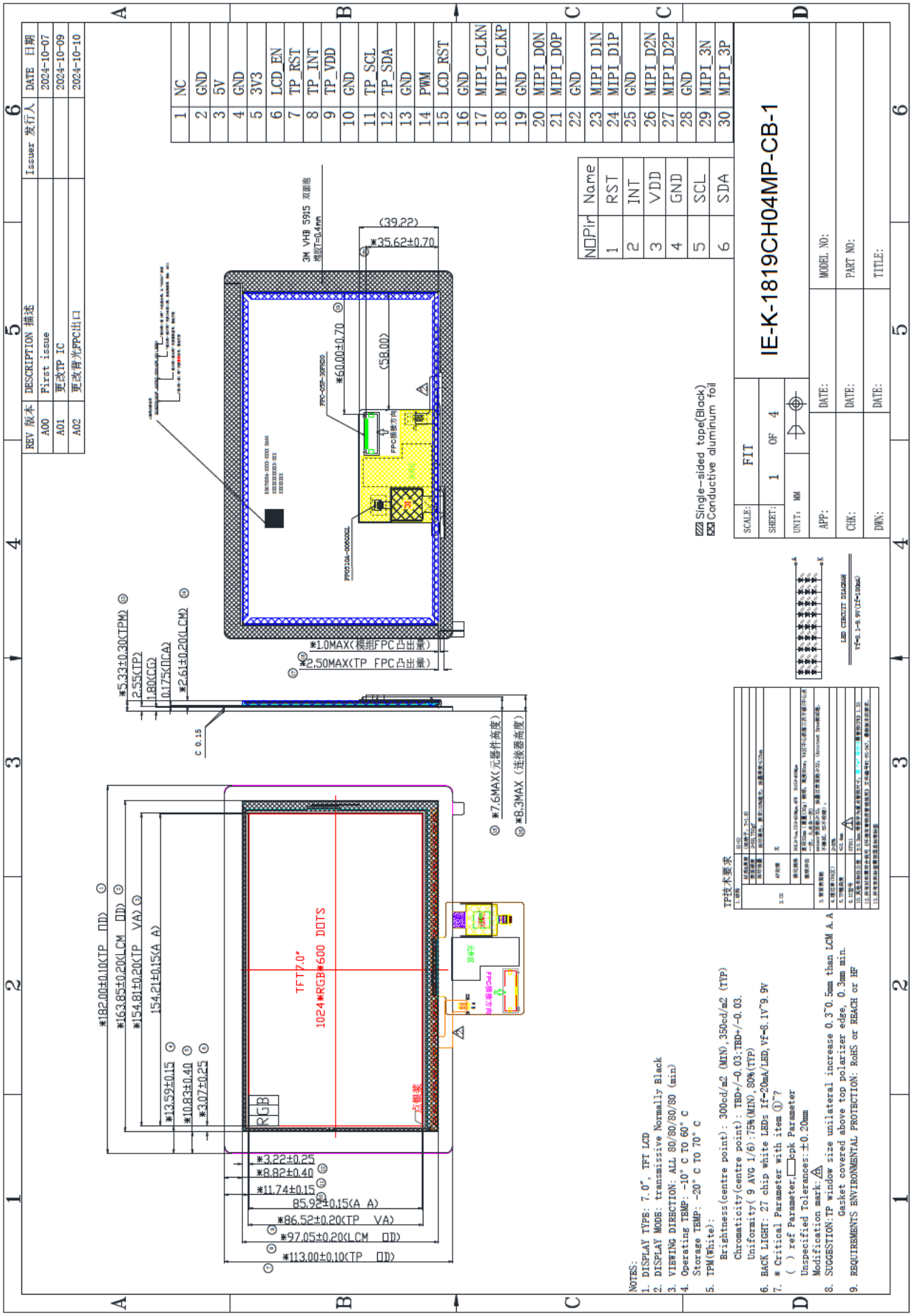
fifth step

Sealing the carton with cellulose tape ;
Stick on a carton label,

sixth step

Placing the boxes together on a pallet (6 layers at most),

# 12. Outline Dimension




| REV 版本 | DESCRIPTION 描述 | Issuer 发行人 | DATE 日期 |
|---|---|---|---|
| A00 | First issue | | 2024-10-07 |
| A01 | 更改TP IC | | 2024-10-09 |
| A02 | 更改背光FPC出口 | | 2024-10-10 |

| | |
|---|---|
| 1 | NC |
| 2 | GND |
| 3 | 5V |
| 4 | GND |
| 5 | 3V3 |
| 6 | LCD_EN |
| 7 | TP_RST |
| 8 | TP_INT |
| 9 | TP_VDD |
| 10 | GND |
| 11 | TP_SCL |
| 12 | TP_SDA |
| 13 | GND |
| 14 | PWM |
| 15 | LCD_RST |
| 16 | GND |
| 17 | MIPI_CLKN |
| 18 | MIPI_CLKP |
| 19 | GND |
| 20 | MIPI_DON |
| 21 | MIPI_DOP |
| 22 | GND |
| 23 | MIPI_D1N |
| 24 | MIPI_D1P |
| 25 | GND |
| 26 | MIPI_D2N |
| 27 | MIPI_D2P |
| 28 | GND |
| 29 | MIPI_3N |
| 30 | MIPI_3P |

| NO | Pin | Name |
|---|---|---|
| 1 | | RST |
| 2 | | INT |
| 3 | | VDD |
| 4 | | GND |
| 5 | | SCL |
| 6 | | SDA |

# Capacitive Touch Panel Specification

# Contents

## Revision Record

| Version | Date | Summary of Changes | Owner |
|---|---|---|---|
| A00 | 2019-12-5 | Summary of Changes | - |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# 1. Scope

This Specification applies to P/N Projected Capacitive touch panel for reference edition.

# 2. Structure Characteristics

| Item | | Contents |
|---|---|---|
| 2-1 | VA Size | 7.0 Inch |
| 2-2 | Outline Dimension | 182.000*113.000*182.000mm |
| 2-3 | Structure | GG |
| 2-4 | Materials | |
| 2-5 | Colour | black |
| 2-6 | Total Weight | 54g |

# 3. Electrical Characteristics

| Item | | Content |
|---|---|---|
| 3-1 | IC Type | GT911 |
| 3-2 | IC Package | QFN52 |
| 3-3 | Channel Number | 26*14 |
| 3-4 | Interface | I2C |
| 3-5 | Touch of points | 5 Points |
| 3-6 | Input Mode | Finger |
| 3-7 | Input Accuracy | center area:±1.50mm<br>edge area:±1.50mm |
| 3-8 | Operating Voltage(AVDD;TYP) | 3.30V |
| 3-9 | Interface Voltage (DVDD;TYP) | 1.80V |

| | | |
|---|---|---|
| 3-10 | Report Rate | 100Hz |
| 3-11 | Current Consumption | 14mA |

## 4. Optical Characteristics

| | | | |
|---|---|---|---|
| 4-1 | Transparency | 摄像孔区 | 无 |
| 4-1 | Transparency | 指示灯孔 | 无 |
| 4-1 | Transparency | 视窗区 | 85 |
| 4-2 | Haze | | 无 |

## 5. Environmental Characteristics

| | | | |
|---|---|---|---|
| 5-1 | OperatingTemperature | -60~+96℃ | **Humidity:**<br>No dew condensation allowed. |
| 5-2 | Storage Temperature | --10~+96℃ | |

## 6. Reliability Test Conditions

| Item | | Conditions |
|---|---|---|
| 6-1 | High-temperature Storage | T=70℃,96H |
| 6-2 | Low-temperature Storage | T=-20℃,96H |
| 6-3 | High-temperature<br>High-humidity Operation | T=60℃,90%,96H |
| 6-4 | Temperature Shock | -10℃(30.00)min⬅(35min Max.)➡60℃(30.00min)<br>50 cycles |
| 6-5 | High-temperature Operation | 70℃,96H |
| 6-6 | Low-temperature Operation | -20℃,96H |
| 6-7 | Electro Static Discharge | 湿度：30%~50%;接触阻容：100PF+1500ohm;空气阻容：150PF+330ohm；测试次数：正负各 10 次；<br>接触放电：±2KV;空气放电：±4KV |
| 6-8 | Hardness | ≥7H(750g) |

**Note:**① After the test is conducted under the above reliability conditions, the test pieces should be stored in the standard environment for 24 hours and the accuracy of input position given in para4-2 should be satisfied.

②The reliability test should be performed with no D.C. power supplied and the touch panel stored on the flat plate.

③The standard condition presents 25±10℃ of the temperature, 55±30%of the relative humidity, and 96±10 kPa of the atmospheric pressure.

④The reliability test should be performed on the touch panel by itself.

# 7. Regulation on environment

## 7-1. RoHS directive RoHS

This product is corresponded to RoHS directive.
"Corresponded to RoHS directive" is judged based on EU Directive RoHS 2011/65/EU.

## 7-2. Other

Requirement for the other restricted material needs to be cleared and it should be decided on discussion between our customer and us.

# 8. Operating Precautions

## 8-1. Chassis Mechanical Design

a. Please use the touch panel as a replaceable unit when you are designing your product. (Please do not consider the touch panel as an permanent item.).

b. Assuming input method for customers' use, design the chassis so that no chassis strain or the like has an influence on the touch panel by the hand placed on the chassis, for example.

c. Select insulation material when considering construction material for the chassis. It may lead to a cause of false operation when conductive material is used as the chassis.

d. When inserting a spacer (such as a cushioning material) between the touch panel and chassis for the purpose of dust proofing, pay attention to the following:

(1) Fix a spacer to the chassis side: avoid bonding it to the touch panel.

(2) Select insulation materials as the spacer and locate it outside of key area.

e. When distance with the touch panel is near to LCD, Touch panel may malfunction by the influence of the noise from LCD; the touch panel's structure may be different according to the LCD's type.When using a VCOM type LCD, A shielding Layer is recommend.

f. Pay attention for not to make any stress of deformation.

g. Avoid performing adhesion with the touch panel inclined or uneven.
This inclination and shift may lead to positional deviation at input.

## 8-2. Flexible Connector FPC

The effective part for the attachment of flexible connector and the touch panel main body

should be the deflection of R=3.0mm or more.

b. For flexible connector arrangement, R=2.0mm or more should be maintained so that the circuitry will not crease.

c. Please do not bend the chip mounting area.
d. For the connector side of the FPC:

(1) If the pressure in the contact part of circuit side connector and flexible connector wiring is too large, there may arise deflection in the wiring, that could cause contact failure; it is ,therefore, necessary to verify the impact of the connector on the FPC as well as the influence of thermal stress, etc. Using the actual machine before selecting the connector;
(2) After checking the applicable conductor, select the circuit side connector.
The general connector for FPC is designed, assuming the metallic wiring; some connectors are large in pressure in the contact part and sharp in shape.

## 8-3. Touch Panel Handling

| | |
|---|---|
| Handing | (1) Do not lift up the product by holding the flexible connector. |
| Installation | (1) Since the glass substrate has some sharp edges, use fingerstalls or gloves, etc., and handle with special care.<br>(2) Note that if the flexible connector is pressed against the glass edge, electrode disconnection or burnout may occur. |
| Unpacking | (1) Always remove the touch panel for maintenance after satisfactory cooling. |
| Cleaning | (1) When re-adhering the protecting film, check for stains. These stains can be transferred.<br>(2) If the touch panel is stored with the protecting film attached for a long period of time, the pressure sensitive adhesive of protecting film may stick to the touch panel as stains. Lightly wipe out the stains with a soft moistened cloth in ethanol.<br>(3) Do not apply water or chemicals other than alcohol such as ethanol to the touch panel. In particular, do not allow liquid put on the touch panel face side. |
| Storage | (1)Store the touch panel indoor in the packing case (in the condition in which it was delivered) at 10℃ or higher, 40℃ Max. and below 60% in humidity. The glue of touch panel protecting film may possibly be transferred as stains. |

| | |
|---|---|
| | (2) Do not store the touch panel in a high temperature and humidity for a long period of time and avoid storage in the environment where condensation could arise. |
| Other | (1) Do not store nor use under outside and UV exposing environment like mercury light bulb, permanently because serious performance damage may occur. Touch panel has a certain life, so life is different depending on your usage circumstance.<br><br>(2)Be careful of dew occurring in case there is difference of temperature between outside and inside of device (i.e. display monitor). If dew may occur, electrical shortage between electrode. And/or deterioration of conductive layer may happen.<br><br>(3)Operating temperature is under installed inside equipment without relating on or off status. Non operating temperature means the status of touch panel alone. |

# 9. Items concerning business

## 9-1. Warranty Period and Warranty Range

(1) Warranty period

One year after the date of delivery.

(2) Warranty range

If Touch Panel is failed and damaged due to our company's cause within the warranty period, we will repair or replace it.

As far as compensation, repair or replacement should be limited to our delivered touch panel itself. Damage induced due to delivered touch Panel failure is out of our warranty. The repair or replacement in the field are also out of our warranty.

The assurance range and time of environmental characteristics reference to reliability conditions of the No.7.

The following cases are excluded from the warranty range:

(a) Failure and damage caused by handling nonconformities, such as drop and shocks during transportation (movement) after delivery

(b) Failure and damage caused by disasters

(c) Repair and modification at other than our company

(d) Failure and damage caused by handling contrary to “Touch Panel Operating Precautions” described in this Specification.

## 9-2. Remarks

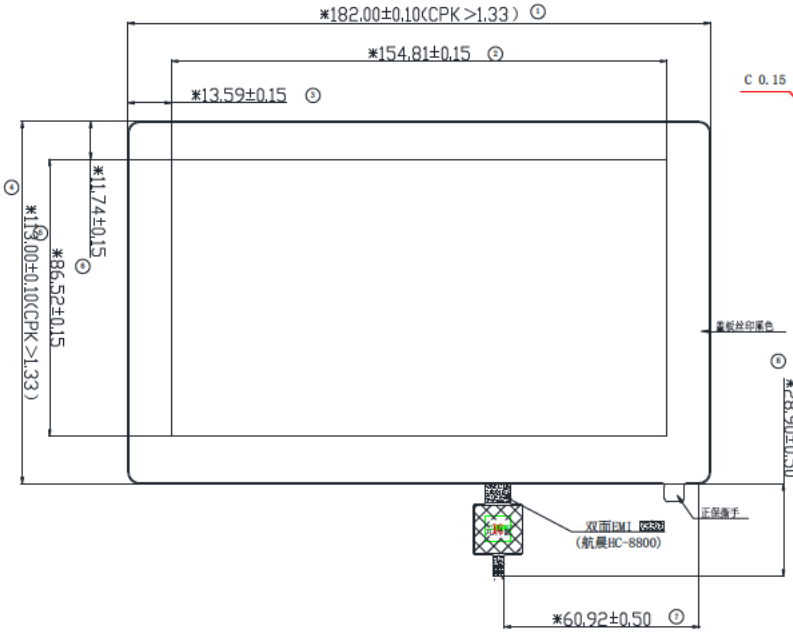
(1) Once your company receive this specification, if no confirmation and signing back without reasonable notice within 15 days, we will consider it to be self-executing.

(2) The discription above is translated from Chinese version. If you have any questions, please kindly refer to the Chinese version. Any inconvenience,please kindly forgive us.

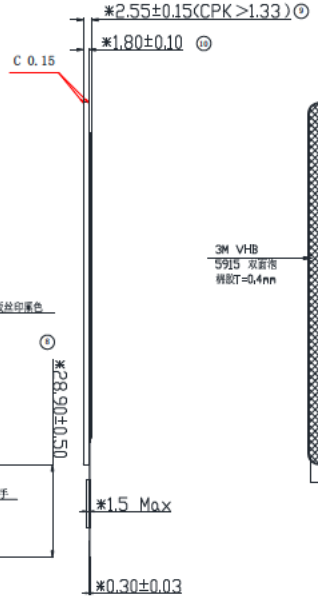
10. Structur

| REV 版本 | DESCRIPTION 描述 | Issuer 发行人 | DATE 日期 |
|---|---|---|---|
| A00 | First issue | | 2021-02-01 |
| | | | |

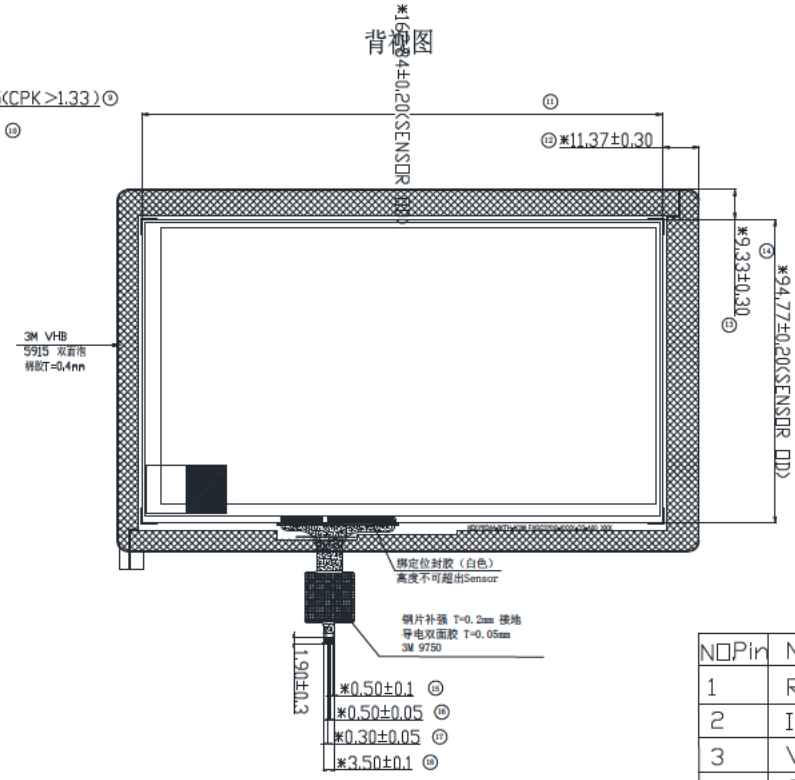
正视图




侧视图




背视图




| NO.Pin | Name |
|---|---|
| 1 | RST |
| 2 | INT |
| 3 | VDD |
| 4 | GND |
| 5 | SCL |
| 6 | SDA |

技术要求

| | | |
|---|---|---|
| 1. 结构 | | G+G |
| 2. CG | 材质&厚度 | 旭硝子;T=1.8mm |
| | 表面硬度 | 2=7H, 750gf |
| | 丝印油墨 | 背面丝印黑色 阻抗2=1000 M? |
| | AF处理 | 无 |
| | 强化规格 | CS:2=450Mpa, DOL:2=10um; 4PS:2=450Mpa(依不同材质，不同规格) |
| | 落球冲击 | 直径32mm（重量130g）钢球，高度80cm，VA区中心四强三次不破（中心点一次，五点各一次，九点各一次等，或测试条件依客户要求） |
| 3. 背面表面粗 | | sensor表面粗2=32；油墨区表面粗2=32；(Arcotest Dyna测试笔，不擦拭，SS不收缩)； |
| 4. 透过率(VA区) | | 2=85% |
| 5. TP图曲度 | | <0.3mm |
| 6. IC型号 | | GT911; |
| 10. 其他未标注公差 | | ±0.2mm;带数字为重点管控尺寸，在"*"每尺寸需管控(CPK) 1.33 |
| 12. 所有材料需符合我州《环境有害物质管理规范》文件编号WI-PG-047，最新版本的要求。 | | |
| 13. 所有来料标签需按国是标准标签 | | |

| DIMENSION | TOLERANCE |
|---|---|
| Lens外形，孔形状 | ±0.10 |
| 丝印位置 | ±0.15 |
| 丝印大小 | ±0.10 |
| FPC形状 | ±0.15 |
| FPC位置 | ±0.50 |

可靠性试验要求：

| 编号 | 测试项目 | 测试条件 | 测试时间（H） |
|---|---|---|---|
| 1 | 冷热冲击 | -30° C~75° C | 100cycles |
| 2 | 高温存储 | 75° C | 240 |
| 3 | 高温运行 | 60° C | 240 |
| 4 | 高温高湿储存 | 60° C,90%RH | 240 |
| 5 | 低温储存 | -30° C | 240 |
| 6 | 低温运行 | -20° C | 240 |

备注：

| | | | |
|---|---|---|---|
| SCALE: | FIT | | |
| SHEET: | 1 OF 1 | | |
| UNIT: MM | | | |
| APP: | DATE: | MODEL NO: | |
| CHK: | DATE: | PART NO: | |
| DWN: | DATE: | TITLE: | TP图 |