# SPECIFICATION

## CUSTOMER :

## MODEL NO. : WL0F00101000JGDAASA00

| APPROVED BY:<br><br>( FOR CUSTOMER USE ONLY ) | |
|---|---|

| SALES BY | APPROVED BY | CHECKED BY | PREPARED BY |
|---|---|---|---|
| | | Eason Chang<br>Robert Wong<br>Jason Ni | Jason Chan |

| VERSION | DATE | REVISED PAGE NO. | SUMMARY |
|---|---|---|---|
| B | 2023/09/12 | 7<br>11 | Revised Communication Interface content and con definition |

TFT Display Inspection Specification: https://www.winstar.com.tw/technology/download.html

Precaution in use of TFT module: https://www.winstar.com.tw/technology/download/declaration.html

# Winstar Display Co., LTD
## 華凌光電股份有限公司

## RECORDS OF REVISION

**DOC. FIRST ISSUE**

| VERSION | DATE | REVISED PAGE NO. | SUMMARY |
|---------|------|------------------|---------|
| 0 | 2022/05/4 | | First issue |
| A | 2023/04/11 | 7 | Remove extra module info.<br>Add brightness |
| B | 2023/09/12 | 7<br>11 | Revised Communication Interface content and con definition |
| | | | |
| | | | |

# Contents

# 1.  Smart Display Classification Information

| W | L | 0F | 001010 | 00J | G | D | AA | S | A | 00 |
|---|---|----|--------|-----|---|---|----|----|----|----|
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ |

| | | | |
|---|---|---|---|
| ① | W: WINSTAR products | | |
| ② | Type: L:Standard   K:Customization | | |
| ③ | Display Type: | Standard: | 0H: Character STN |
| | | | 0X: Graphic STN (TAB/COF) |
| | | | 0F: TFT |
| | | | EH: Character OLED |
| | | | EX: OLED (TAB/COF) |
| | | | 0G: Graphic STN |
| | | | 0P: Graphic STN (COG) |
| | | | EG: Graphic OLED |
| | | | EP: OLED (COG) |
| | | Customization: | DH: Character   DG: Graphic STN |
| | | | DN: Graphic   0J: TFT |
| | | | ED: OLED |
| ④ | Display size: (diagonal) / Display format: (resolution) | Character STN: Graphic STN: | e.g., 8x1: 000801   16x2: 001602   24x4: 002404 |
| | | | e.g., 128x64: 012864   320x240: 320240 |
| | | TFT Size (inch): | 000096-0.96" / 000350-3.5" / 000430-4.3" / 000570-5.7" |
| | | | 000700-7.0" / 000800-8.0" / 001020-10.2" / 001210-12.1" |
| | | | (The last two digits are two digits after the decimal point) |
| | | OLED: | e.g., 128x64: 012864 Customization: 0001XX |
| ⑤ | Serial No: | 0A1 ~ 0ZZ | Customization STN: 000 |

| | | | | |
|---|---|---|---|---|
| ⑥ | Touch Panel Type: | N: Without TP  T: RTP  G: CTP | | |
| ⑦ | Model Interface: | A: CAN | H: HDMI | X: Combined |
| | | B: Bluetooth | R: Memory Specified | Y: Proprietary interface |
| | | C:Controller Specified | N: Ethernet | |
| | | D: RS485 | J: Analog I/O | |
| | | E: RS232 | K: USB | |
| | | F: USART | L: WIFI | |
| | | G: Logic I/O | M: Zigbee | |
| ⑧ | Interface Serial No.: | AA ~ ZZ | | |
| ⑨ | Control Category: | S: Smart Display   E: Entry   N: Non-specified | | |
| ⑩ | Special Code: | A → Generic   B → Industrial   C →Automotive   D →Medical | | |
| ⑪ | Model code: | 00 ~ ZZ | | |

# 2. <u>Summary</u>

**10.1 Inch Smart Display (RS485 series) Features**

1. +12V power supply input, the power consumption is around 6W.
2. Self-testing after booting function.
3. RS485 communication interface.
4. Built in flash memory, store the font and Object Dictionary Data.
5. Support capacitive touch panel (CTP).
6. Embedded buzzer controlled by Master Device.
7. Demo set HOST can be used on multiple platforms, such as Computer (with USB to RS-485 Dongle), MCU.
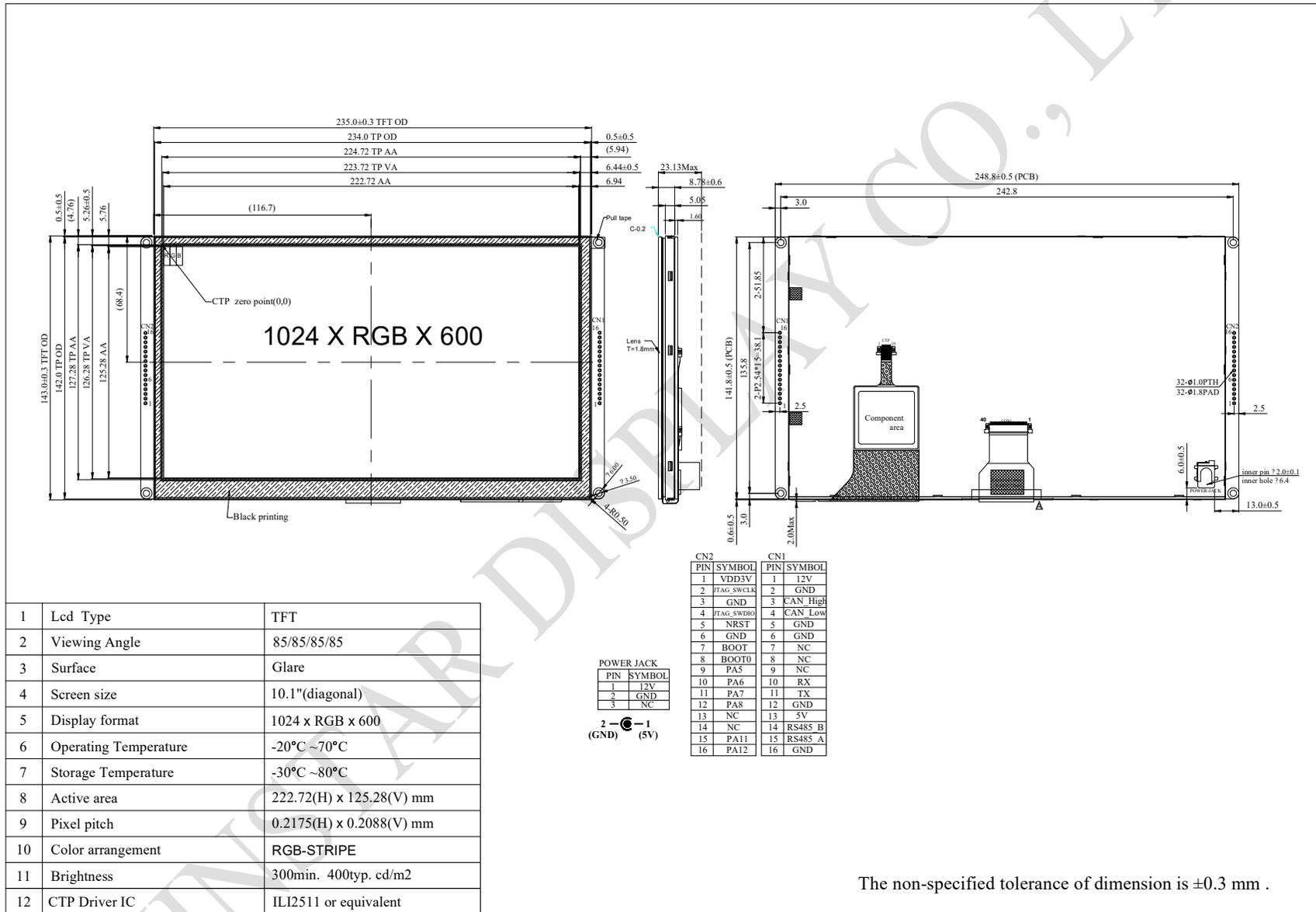
# 3. Product information

## General information

| Item | Standard Value | Unit |
|---|---|---|
| Operating voltage | 12 | Vdc |
| Communication Interface | RS485 differential | - |
| MCU | STM32F746 | N/A |
| Flash Memory | 16 | MB |
| SDRAM Frequency | 166 | MHz |
| LCD display size | 10.1 | inch |
| Dot Matrix | 1024 x RGBx600(TFT) | dots |
| Module dimension | 248.8(W) x 143(H) x 23.13(D) | mm |
| Active area | 222.72 (H) x 125.28(V) | mm |
| Pixel pitch | 0.2175(W) x 0.2088(H) | mm |
| Brightness | Min: 300; Typ: 400 | cd/m$^2$ |
| LCD type | TFT, Normally Black, Transmissive | |
| View Direction | 85/85/85/85 | |
| Aspect Ratio | 16:9 | |
| With /Without TP | With CTP | |
| Surface | Glare | |

# 4. Contour Drawing



| 1 | Lcd Type | TFT |
|---|---|---|
| 2 | Viewing Angle | 85/85/85/85 |
| 3 | Surface | Glare |
| 4 | Screen size | 10.1"(diagonal) |
| 5 | Display format | 1024 x RGB x 600 |
| 6 | Operating Temperature | -20°C ~70°C |
| 7 | Storage Temperature | -30°C ~80°C |
| 8 | Active area | 222.72(H) x 125.28(V) mm |
| 9 | Pixel pitch | 0.2175(H) x 0.2088(V) mm |
| 10 | Color arrangement | RGB-STRIPE |
| 11 | Brightness | 300min. 400typ. cd/m2 |
| 12 | CTP Driver IC | ILI2511 or equivalent |

1024 X RGB X 600

CTP zero point(0,0)

Pull tape

Black printing

Lens T=1.8mm

Component area

POWER-JACK

| CN2 | | CN1 | |
|---|---|---|---|
| PIN | SYMBOL | PIN | SYMBOL |
| 1 | VDD3V | 1 | 12V |
| 2 | JTAG_SWCLK | 2 | GND |
| 3 | GND | 3 | CAN_High |
| 4 | JTAG_SWDIO | 4 | CAN_Low |
| 5 | NRST | 5 | GND |
| 6 | GND | 6 | GND |
| 7 | BOOT | 7 | NC |
| 8 | BOOT0 | 8 | NC |
| 9 | PA5 | 9 | NC |
| 10 | PA6 | 10 | RX |
| 11 | PA7 | 11 | TX |
| 12 | PA8 | 12 | GND |
| 13 | NC | 13 | 5V |
| 14 | NC | 14 | RS485_B |
| 15 | PA11 | 15 | RS485_A |
| 16 | PA12 | 16 | GND |

| POWER JACK | |
|---|---|
| PIN | SYMBOL |
| 1 | 12V |
| 2 | GND |
| 3 | NC |

2 —(●)— 1
(GND)    (5V)

The non-specified tolerance of dimension is ±0.3 mm .

# 5. <u>Absolute Maximum Ratings</u>

| Item | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Operating Temperature | TOP | -20 | — | +70 | ℃ |
| Storage Temperature | TST | -30 | — | +80 | ℃ |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above
1. Temp. ≦60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃

# 6. <u>Electrical Characteristics</u>

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Supply Voltage | VCC | — | 11.4 | 12 | 12.6 | V |
| Supply LCM current | I(mA) | - | - | 435 | - | mA |

# 7. <u>BOM</u>

| Item | Description | Remark |
|---|---|---|
| LCM | WF101JTYAHLNB0# | |
| PCBA | SV100101000JA00N0100 | |

# Block diagram
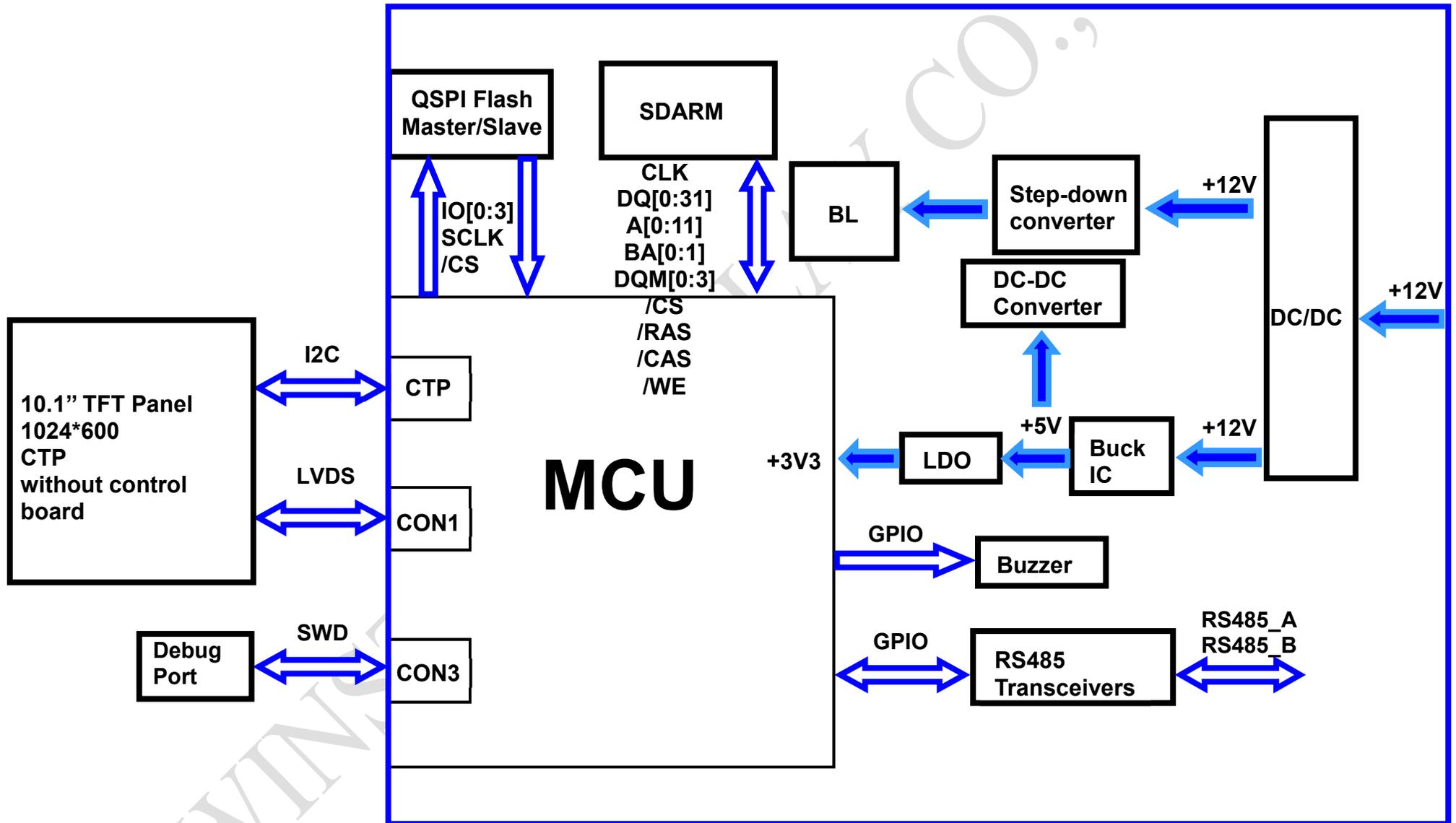
# 9. Interface

**CON1 definition:**

| Pin | Symbol | Function | Remark |
|-----|--------|----------|--------|
| 1 | 12V | Power supply 12V input | Power |
| 2 | GND | Power supply GND input | Power |
| 3 | – | – | – |
| 4 | – | – | – |
| 5 | GND | Power supply GND input | Power |
| 6 | GND | Power supply GND input | Power |
| 7 | – | – | – |
| 8 | – | – | – |
| 9 | NC | – | – |
| 10 | – | – | – |
| 11 | – | – | – |
| 12 | GND | GND | GND |
| 13 | 5V | Power supply 5V output | Power |
| 14 | RS485_B | RS485 DATA- | I/O |
| 15 | RS485_A | RS485 DATA+ | I/O |
| 16 | GND | GND | GND |

**CON2 definition:**

| Pin | Symbol | Function | Remark |
|-----|--------|----------|--------|
| 1 | VDD3V | 3.3V power for JTAG interface | Output |
| 2 | JTAG_SWCLK | CLK pin for JTAG interface | Input |
| 3 | GND | GND for JTAG interface | Output |
| 4 | JTAG_SWDIO | Data pin for JTAG interface | I/O |
| 5 | NRST | Reset pin for JTAG interface | Input |
| 6 | GND | GND | Output |
| 7 | BOOT | Reserve | |
| 8 | BOOT0 | Reserve | |
| 9 | PA5 | Reserve | |
| 10 | PA6 | Reserve | |
| 11 | PA7 | Reserve | |
| 12 | PA8 | Reserve | |
| 13 | NC | – | |
| 14 | NC | – | |
| 15 | PA11 | Reserve | |
| 16 | PA12 | Reserve | |

# 10. <u>Reliability</u>

Content of Reliability Test (Wide temperature, -20℃~70℃)

| Environmental Test | | | |
|---|---|---|---|
| Test Item | Content of Test | Test Condition | Note |
| High Temperature storage | Endurance test applying the high storage temperature for a long time. | 80℃ 200hrs | 2 |
| Low Temperature storage | Endurance test applying the low storage temperature for a long time. | -30℃ 200hrs | 1,2 |
| High Temperature Operation | Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time. | 70℃ 200hrs | ___ |
| Low Temperature Operation | Endurance test applying the electric stress under low temperature for a long time. | -20℃ 200hrs | 1 |
| High Temperature/ Humidity Operation | The module should be allowed to stand at 60℃,90%RH max | 60℃,90%RH 96hrs | 1,2 |
| Thermal shock resistance | The sample should be allowed stand the following 10 cycles of operation<br><br>-20℃ 25℃ 70℃<br>←<br>⟶<br>30min 5min 30min<br>1 cycle | -20℃/70℃ 10 cycles | ___ |
| Vibration test | Endurance test applying the vibration during transportation and using. | Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes | 3 |
| Static electricity test | Endurance test applying the electric stress to the terminal. | VS=±2KV~±6KV(contact),±2KV~±8KV (air), RS=330Ω CS=150pF 10 times | ___ |

Note1: No dew condensation to be observed.
Note2: The function test shall be conducted after 4 hours storage at the normal
        Temperature and humidity after remove from the test chamber.
Note3: The packing have to including into the vibration testing.

# 11. Product inspection check list

**Check samples by meter V<sub>IN</sub>, I<sub>system</sub>**

| Item | No 1 | No 2 | No 3 | Note |
|---|---|---|---|---|
| $V_{IN}$ (V) | 12.1 | 12.1 | 12.1 | |
| $I_{System}$(mA) | 0.445 | 0.449 | 0.447 | |

**Check sample Reliability Test**

| Item | Result | Note |
|---|---|---|
| Thermal shock | _ | -20℃/70℃ 10 cycles |
| High Temperature Operation | _ | 70℃<br>200hrs |
| Low Temperature Operation | _ | -20℃<br><br>200hrs |
| Static electricity test | _ | VS=±2KV~±6KV(contact),±2KV~±8KV (air),<br>RS=330Ω<br>CS=150pF<br>10 times |
| Vibration test | _ | Total fixed amplitude : 1.5mm<br>Vibration Frequency : 10~55Hz<br>One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes |

- Prepare sets for testing