

Specification

Module No. : GEA-156B01-DC9521-G020

Version No. : A2

| Client Confirmation | Approved by | Prepared by |
|---------------------|-------------|-------------|
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Issue History

| Version | History | Date | Remarks |
|---------|----------------------------|------------|---------|
| A1 | First Issue | 2021/03/23 | |
| A2 | Updated mechanical drawing | 2022/01/04 | |
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CONTENTS

| | |
|--|----|
| 1. Overview | 4 |
| 2. Feature | 5 |
| 2.1 Module Structure | 5 |
| 2.2 General Specifications | 5 |
| 3. Interface Definition | 6 |
| 3.1 Touch Panel Interface Connection | 6 |
| 3.2 Display Interface Connection | 7 |
| 4. Reliability Test | 8 |
| 5. General Precaution | 9 |
| 5.1 Handling | 9 |
| 5.2 Operating Precautions | 10 |
| 5.3 Storage Precautions | 10 |
| 5.4 Others | 10 |
| 6. Packing | 11 |
| 7. Mechanical Drawing | 12 |

1. Overview

This specification document is issued for the 15.6" TFT Liquid Crystal Display bonded with Capacitive-Type Touch Panel delivered by General Electrical Touch Co., Limited. This document defined the general provisions for the specific module listed at the front page of this document. In the event of conflict between this document and other documents, this document including the attachments and drawing, is highest-level specification for this products.

2. Feature

2.1 Module Structure

| Main Component | Materials | Remarks |
|------------------|---------------------------------|---------------------|
| Cover Glass | 2mm chemical strengthened glass | black printed board |
| Adhesive | SCA | 0.25 mm |
| Touch Sensor | 0.7mm DITO glass + COF FPC | SIS9521 Controller |
| Air Bonding Tape | 3M 4905 | 0.50 mm |
| Display | TFT LCD | INNOLUX G156HCE-L01 |

2.2 General Specifications

| Item | Specifications | Remark |
|---------------------------|---|--------|
| Display Active Area | 344.16(H) × 193.59(V) mm | |
| Display Resolution | 1920(H) × R.G.B. × 1080(V) | |
| Pixel Pitch | 0.17925 × 0.17925 mm | |
| Pixel Arrangement | R.G.B. Vertical Stripe | |
| Display Colors | 16.2M colors | |
| Display Brightness | 450 cd/m ² | Typ. |
| Display Mode | Normally Black | |
| Display Surface Treatment | AG type, 3H hard coating | |
| Electrical Interface | Display: 2ch- LVDS | |
| | Touch: USB and I ² C | |
| Touch Activation | Multi-finger touch | |
| Touch Resolution | 36X, 63Y | |
| Touch Controller | SIS9521 | |
| Bonding Method | CG to touch sensor: optical bonding TP module to display: tape bonding | |
| Outline Dimension | 392.20(H) × 241.50(V) × 12.75(Max) mm | |

3. Interface Definition

3.1 Touch Panel Interface Connection

Connector type: USB-MINI-B and Molex 53261-1071.

The Molex connector interface pin assignments are listed in below table:

| Pin | Definition | Description |
|-----|-----------------|---------------------------------------|
| 1 | V _{CC} | 5V |
| 2 | USB Data+ | |
| 3 | USB Data- | |
| 4 | SDA | I ² C serial data |
| 5 | SCL | I ² C serial clock |
| 6 | INT/CHG | Interrupt pin sending request to HOST |
| 7 | Reset | Low active power on reset signal |
| 8 | GPIO0 | General purpose input/output port |
| 9 | GND | |
| 10 | GND-Shielding | |

3.2 Display Interface Connection

The LVDS connector interface pin assignments are listed in below table.

Connector model number: 20455-040E-76

Manufacturer: I-PEX

| Pin | Name | Description |
|-----|---------|--|
| 1 | LED_Vcc | +12V Vi power supply |
| 2 | LED_Vcc | +12V Vi power supply |
| 3 | LED_Vcc | +12V Vi power supply |
| 4 | LED_Vcc | +12V Vi power supply |
| 5 | GND | Ground |
| 6 | GND | Ground |
| 7 | GND | Ground |
| 8 | GND | Ground |
| 9 | LED_EN | Enable pin |
| 10 | LED_PWM | Backlight Adjust |
| 11 | LCD_VCC | LCD logic and driver power 3.3V |
| 12 | LCD_VCC | LCD logic and driver power 3.3V |
| 13 | LCD_VCC | LCD logic and driver power 3.3V |
| 14 | NC | Not connection, this pin should be open |
| 15 | NC | Not connection, this pin should be open |
| 16 | NC | Not connection, this pin should be open |
| 17 | LCD GND | LCD logic and driver ground |
| 18 | RX00- | Negative LVDS differential data input. Channel O0 (odd) |
| 19 | RX00+ | Positive LVDS differential data input. Channel O0 (odd) |
| 20 | RX01- | Negative LVDS differential data input. Channel O1 (odd) |
| 21 | RX01+ | Positive LVDS differential data input. Channel O1 (odd) |
| 22 | RX02- | Negative LVDS differential data input. Channel O2 (odd) |
| 23 | RX02+ | Positive LVDS differential data input. Channel O2 (odd) |
| 24 | LCD GND | LCD logic and driver ground |
| 25 | RXOC- | Negative LVDS differential clock input. (odd) |
| 26 | RXOC+ | Positive LVDS differential clock input. (odd) |
| 27 | LCD GND | LCD logic and driver ground |
| 28 | RX03- | Negative LVDS differential data input. Channel O3(odd) |
| 29 | RX03+ | Positive LVDS differential data input. Channel O3 (odd) |
| 30 | RXE0- | Negative LVDS differential data input. Channel E0 (even) |
| 31 | RXE0+ | Positive LVDS differential data input. Channel E0 (even) |
| 32 | RXE1- | Negative LVDS differential data input. Channel E1 (even) |
| 33 | RXE1+ | Positive LVDS differential data input. Channel E1 (even) |
| 34 | LCD GND | LCD logic and driver ground |
| 35 | RXE2- | Negative LVDS differential data input. Channel E2 (even) |
| 36 | RXE2+ | Positive LVDS differential data input. Channel E2 (even) |
| 37 | RXEC- | Negative LVDS differential clock input. (even) |
| 38 | RXEC+ | Positive LVDS differential clock input. (even) |
| 39 | RXE3- | Negative LVDS differential data input. Channel E3 (even) |
| 40 | RXE3+ | Positive LVDS differential data input. Channel E3 (even) |

4. Reliability Test

The reliability test items and its conditions are shown in below.

| No | Test Items | Conditions |
|----|---|---|
| 1 | High temperature storage test | Ta =80℃, 240 hrs |
| 2 | Low temperature storage test | Ta =-30℃, 240 hrs |
| 3 | High temperature & high humidity operation test | Ta =60℃, 90%RH, 240hrs |
| 4 | High temperature operation test | Ta =70℃, 240hrs |
| 5 | Low temperature operation test | Ta =-20℃, 240hrs |
| 6 | Thermal shock | Ta = -30℃ ↔ 80℃ (0.5hr), 100 cycle |
| 7 | Vibration test | Frequency: 10~50 Hz Stoke: 1.5mm Sweep: 10~55~10 Hz |
| 8 | Impact Resistance | Steel ball: 64 g Height: 30 cm |

5. General Precaution

5.1 Handling

1. Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
2. Please make sure to avoid external forces applied to the Source PCB or FPC and D-IC during the process of handling or assembling. If not, It causes panel damage or malfunction.
3. Do not pull or fold the source D-IC which connect the source PCB or FPC and the panel. Do not pull or fold the LED wire.
4. After removing the protective film, when the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with alcohol or purified water.
5. Since the Touch-LCD module is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it falls from a high place or receives a strong shock, the glass may be broken.
6. Do not disassemble the module.
7. If the customer's set presses the main parts of the LCD, the LCD may show the abnormal display. But this phenomenon does not mean the malfunction of the LCD and should be pressed by the way of mutual agreement.
8. Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly. Keep products as far away from static electricity as possible.
9. Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.
10. Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from panel surface, If possible, under ESD control device like ion blower, and the humidity of working room should be kept over 50%RH to reduce the risk of static charge.
11. In handling the LCD, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary.

5.2 Operating Precautions

1. Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
2. Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimized the interference.
3. Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.
4. Connectors are precise devices for connecting PCB and transmitting electrical signals. Operators should insert and unplug MDL in parallel when assembling MDL.
5. Do not connect or disconnect the cable to/ from the module at the "Power On" condition.

5.3 Storage Precautions

When storing modules as spares for a long time, the following precautions are necessary.

- It is recommended that they be stored in the container in which they were shipped.
Temperature: 5 ~ 40℃
- Humidity: 35 ~ 75%RH
- Period: 6 months
- Control of ventilation and temperature is necessary.
- Please make sure to protect the product from strong light exposure, water or moisture.
Be careful for condensation.
- Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.
- Do not store the LCD near organic solvents or corrosive gasses.

5.4 Others

1. When returning the module for repair or etc., Please pack the module not to be broken.
We recommend to use the original shipping packages.
2. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.
3. For the crash damaged or unnecessary LCD, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol and should be burned up later.
4. If you should swallow the liquid crystal, first, wash your mouth thoroughly with water, then drink a lot of water and induce vomiting, and then, consult a physician.
5. If the liquid crystal should get in your eyes, flush your eyes with running water for at least fifteen minutes.

6. Packing

TBD

12 / 12