FLAT DISPLAY TECHNOLOGY

This product is RoHS compliant

# § SPECIFICATION APPROVAL SHEET §

Preliminary

| | |
|---|---|
| Fdt Tech Module No | LT080A1xA0-FDR |
| Description: | 8” Digital TFT-LCD Module |
| SPEC No.: | SAS-1105005 |
| Version: | 0.3 |
| Issue Date: | October 30, 2013 |

※ This approval sheet contains 17 pages including the cover and appendix.

| Customer: | APPROVED BY: |
|---|---|
| Date: / / 13 | |

| APPROVED BY: | CHECKED BY: | DESIGNED BY: |
|---|---|---|
| | | |

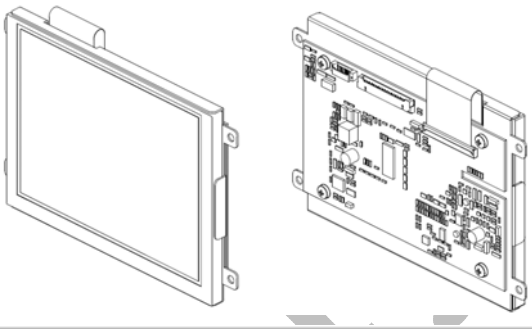
Copyright © 2011 FLAT Display Technology Corporation. All rights reserved.

Add: No.85, Sec. 1, Fuxing Rd., South Dist., Taichung City 402, Taiwan (R.O.C.) http:// www.fdt.com.tw E-mail: fdt@fdt.com.tw

Tel: 886-4-22619577, Fax: 886-4-22623978

FLAT DISPLAY TECHNOLOGY

*8” Digital TFT-LCD Module*



## ■ LT080A1xA0-FDR

# *1. General Descriptions*

### *1.1 Features*

- Aspect Ratio: 4:3
- 24bits LVDS interface
- LED Backlight Circuit Operation Voltage: +5V
- Support Touch Screen Function (Option)

### *1.2 Applications*

- Portable product
- Industrial
- Hand-held
- Security
- Instrument Display
- Office Electronics

### *1.3 Application Precautions*

Do not use the products herein for the following equipment which demands extremely high performance in terms of functionality, reliability, or accuracy.

- Aerospace equipment
- Communication equipment for trunk lines.
- Control equipment for the nuclear power industry.
- Medical equipment related to life support, etc.

The other application that demands high reliability and functionality should first contact a sales representative.

Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

## 2. Contents


| Contents | Page |
|---|---|
| *1. General Description* | 1 |
| 1.1 Features | 1 |
| 1.2 Applications | 1 |
| 1.3 Application Precautions | 1 |
| *2. Contents* | 2 |
| *3. Block Diagram* | 3 |
| 3.1 Block Diagram | 3 |
| *4. TFT-LCD Information* | 4 |
| 4.1 TFT-LCD Mechanical Specifications | 4 |
| 4.2 TFT-LCD Optical Characteristics | 4 |
| *5. Order Information* | 5 |
| 5.1 Unit | 5 |
| *6. Dimension Information* | 6-8 |
| 6.1 Unit (LT080A10A0-FDR) | 6 |
| 6.2 Unit (LT080A11A0-FDR) | 7 |
| 6.3 Unit (LT080A12A0-FDR) | 8 |
| *7. Pin Description* | 9-10 |
| 7.1 J204：LVDS I/O Terminals (Pitch 1.25mm 20Pin, Side Entry Type) | 9 |
| 7.2 J203: Pin Assignment of Inverter (Pitch 1.25mm 6Pin, Side Entry Type) | 10 |
| 7.3 J301C：Pin Assignment of Touch USB (USBA-Female 2.0mm, Side Entry Type )(Option) | 10 |
| 7.4 J301D：Pin Assignment of Touch RS232 (D-SUB 9 MALE)(Option) | 10 |
| *8. Absolute Maximum Ratings* | 11 |
| 8.1 Absolute Maximum Ratings | 11 |
| *9. Recommended Operating Conditions* | 11 |
| 9.1 Electrical Characteristics | 11 |
| *10.Interface Timing* | 12 |
| 10.1 Timing Parameters | 12 |
| *11. 4W Resistance Touch Panel Characteristics* | 13-15 |
| 11.1 Electrical Performance | 13 |
| 11.2 Optical Performance | 13 |
| 11.3 Mechanical Performance | 13 |
| 11.4 Durability Performance | 13 |
| 11.5 Touch Screen Integration Design Guide | 14 |
| 11.6 Mechanical Design Notice For Touch Panel | 15 |
| *12. Operation Manual* | 16 |
| 12.1 Driver Board Manual | 16 |



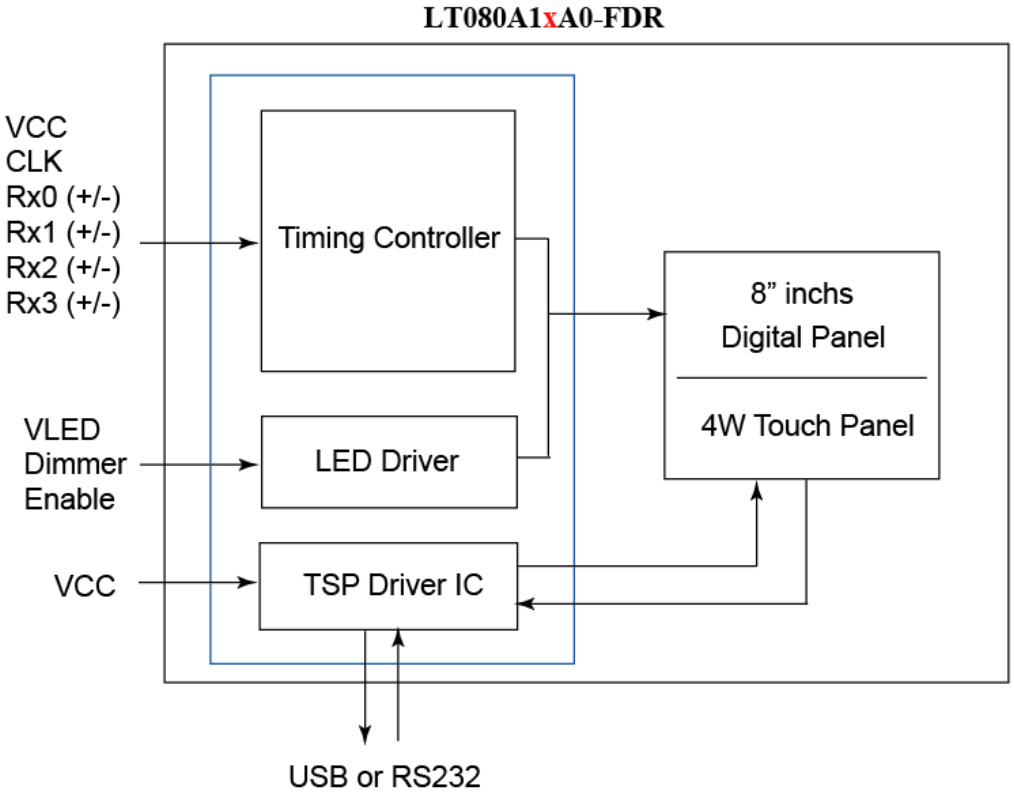


Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw

This technical specification is subject to change without notice.

# 3. Block Diagram

## 3.1 Block Diagram




Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

# 4. TFT-LCD Information

## 4.1 TFT-LCD Mechanical Specifications

| Parameter | Specifications | Unit |
|---|---|---|
| Screen Size | 8 (Diagonal) | inch |
| Display Format | 800 x (R.G.B) x 600 | dot |
| Active Area | 162.0 (W) x 121.5 (H) | mm |
| Pixel Pitch | 0.0675 (W) x 0.2025 (H) | mm |
| Surface Treatment | Anti-glare | |

## 4.2 TFT-LCD Optical Characteristics

| Parameter | | Symbol | Condition | Min | Typ | Max | Unit | Remark |
|---|---|---|---|---|---|---|---|---|
| Viewing Angle | Horizontal | Left | CR >10 | 60 | 70 | --- | deg | |
| | | Right | | 60 | 70 | --- | | |
| | Vertical | Top | | 40 | 50 | --- | deg | |
| | | Bottom | | 60 | 70 | --- | deg | |
| Contrast Ratio | | CR | At optimized Viewing angle | 400 | 500 | --- | --- | |
| Brightness | | L | | 200 | 250 | --- | cd/㎡ | |
| Brightness with TSP | | L | | 160 | 200 | --- | cd/㎡ | |
| LED Life Time | | | 25℃ | 20000 | --- | --- | Hr | |

Preliminary

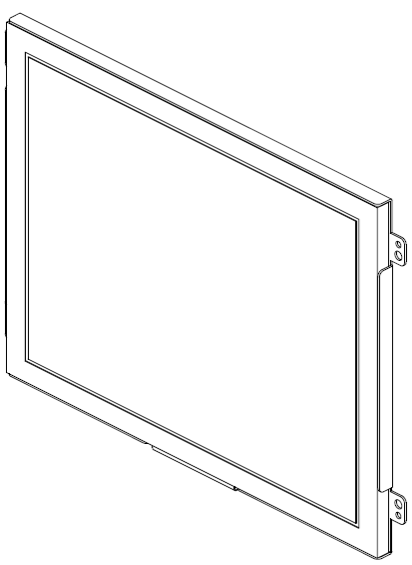


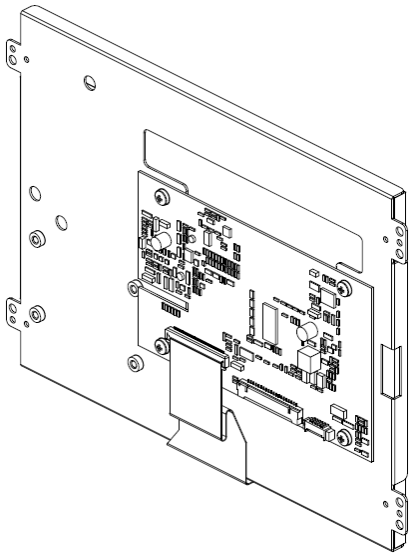
Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

# 5. Order Information

## 5.1 Unit

**Unit**





| Parameter | LT080A10A0-FDR | LT080A11A0-FDR | LT080A12A0-FDR | Unit |
|---|---|---|---|---|
| Signal Input Connector | 20 PIN | 20 PIN | 20 PIN | |
| Touch Panel Type | - | 4W Resistive | 4W Resistive | |
| Touch Screen Interface | - | USB | RS-232 | |
| Bracket | ◎ | ◎ | ◎ | |
| Weight | 433.5 | 522 | 522 | g |

Note: 1.The assembling of panel and bracket is aimed for delivery, packaging and experiment If the demand of shockproof and long-term fix, pls. have it into consideration of mechanism design.

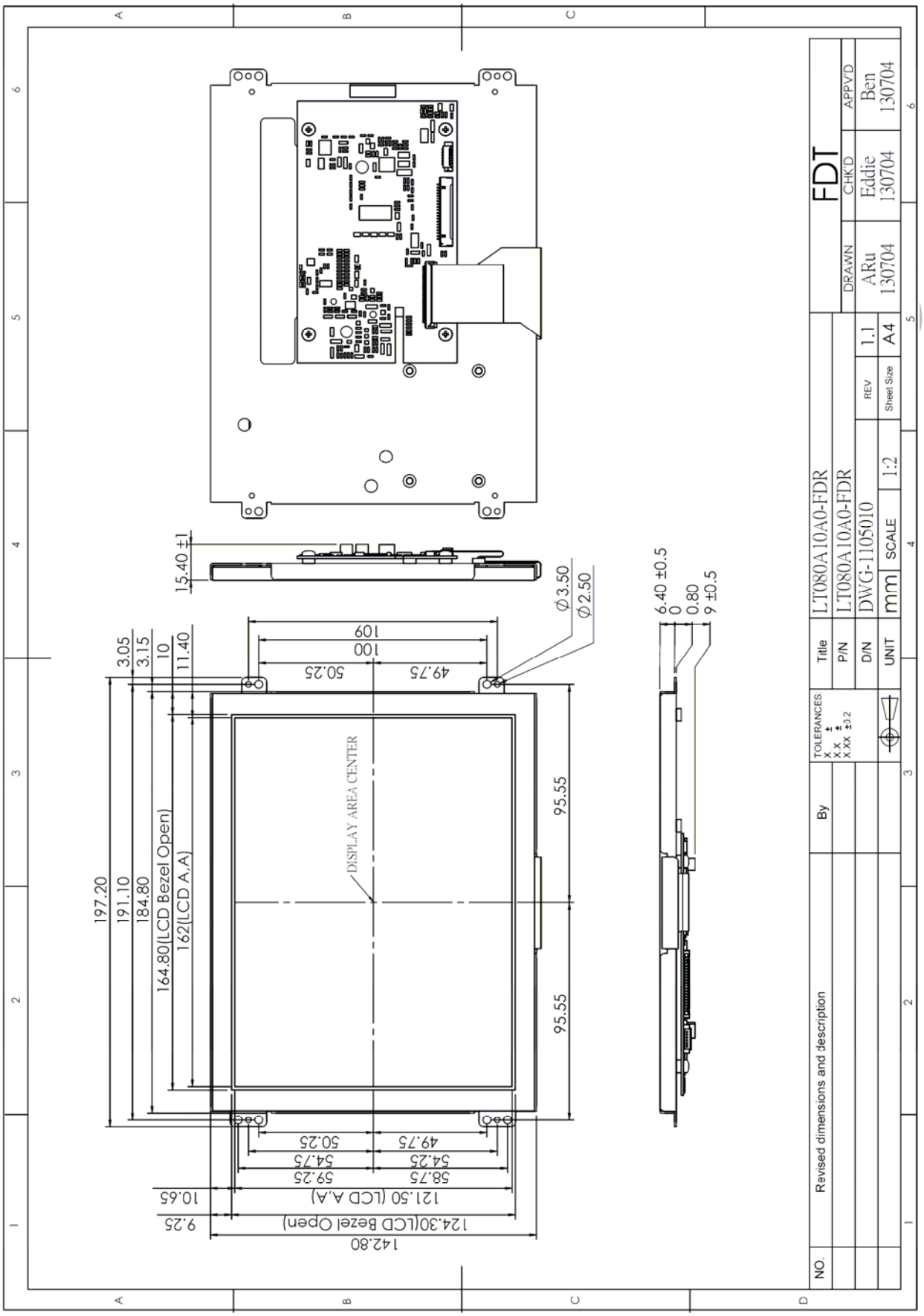
Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

# 6. Dimension Information

## 6.1 Unit (LT080A10A0-FDR)



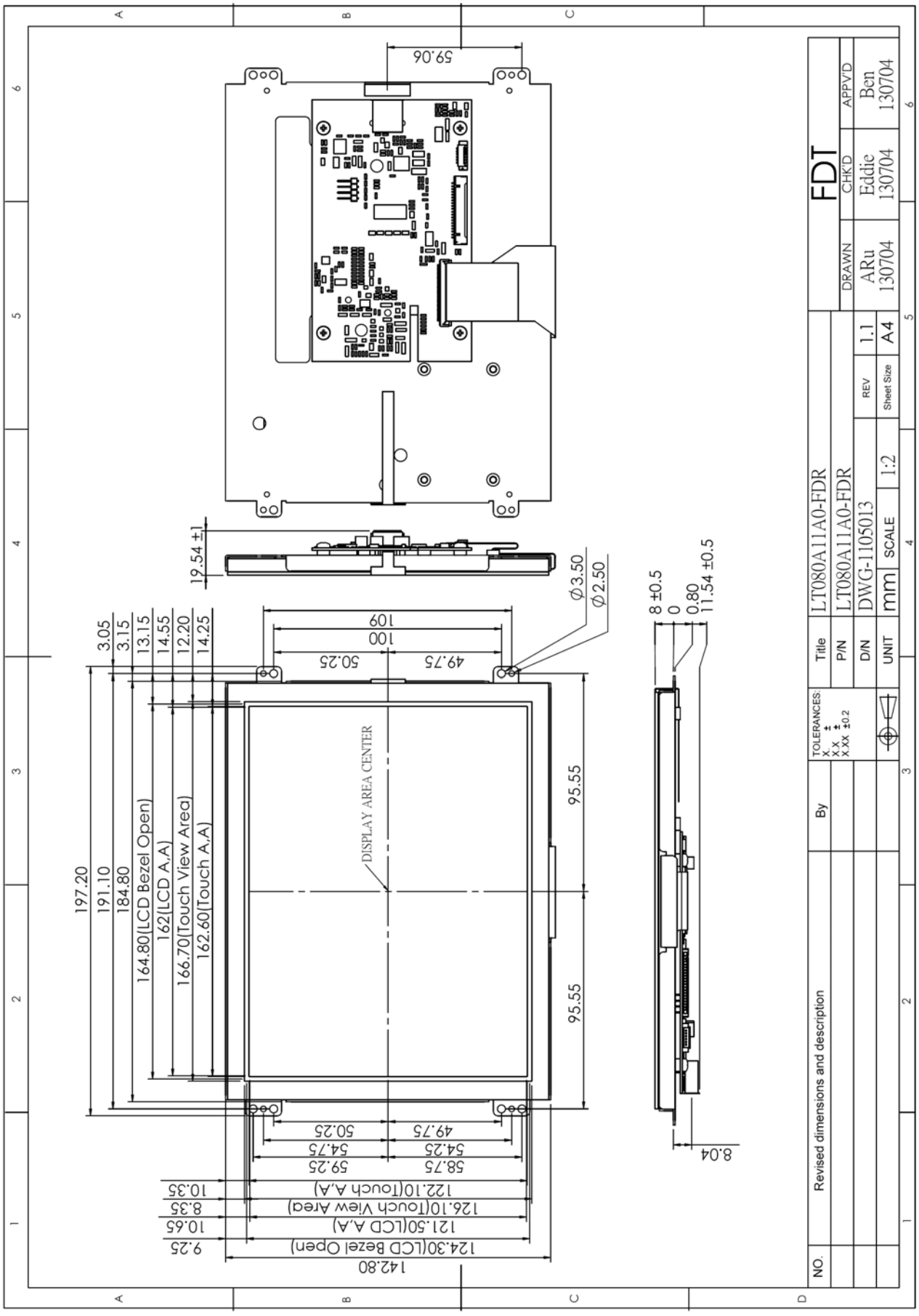




Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw

This technical specification is subject to change without notice.

## *6.2 Unit (LT080A11A0-FDR)*



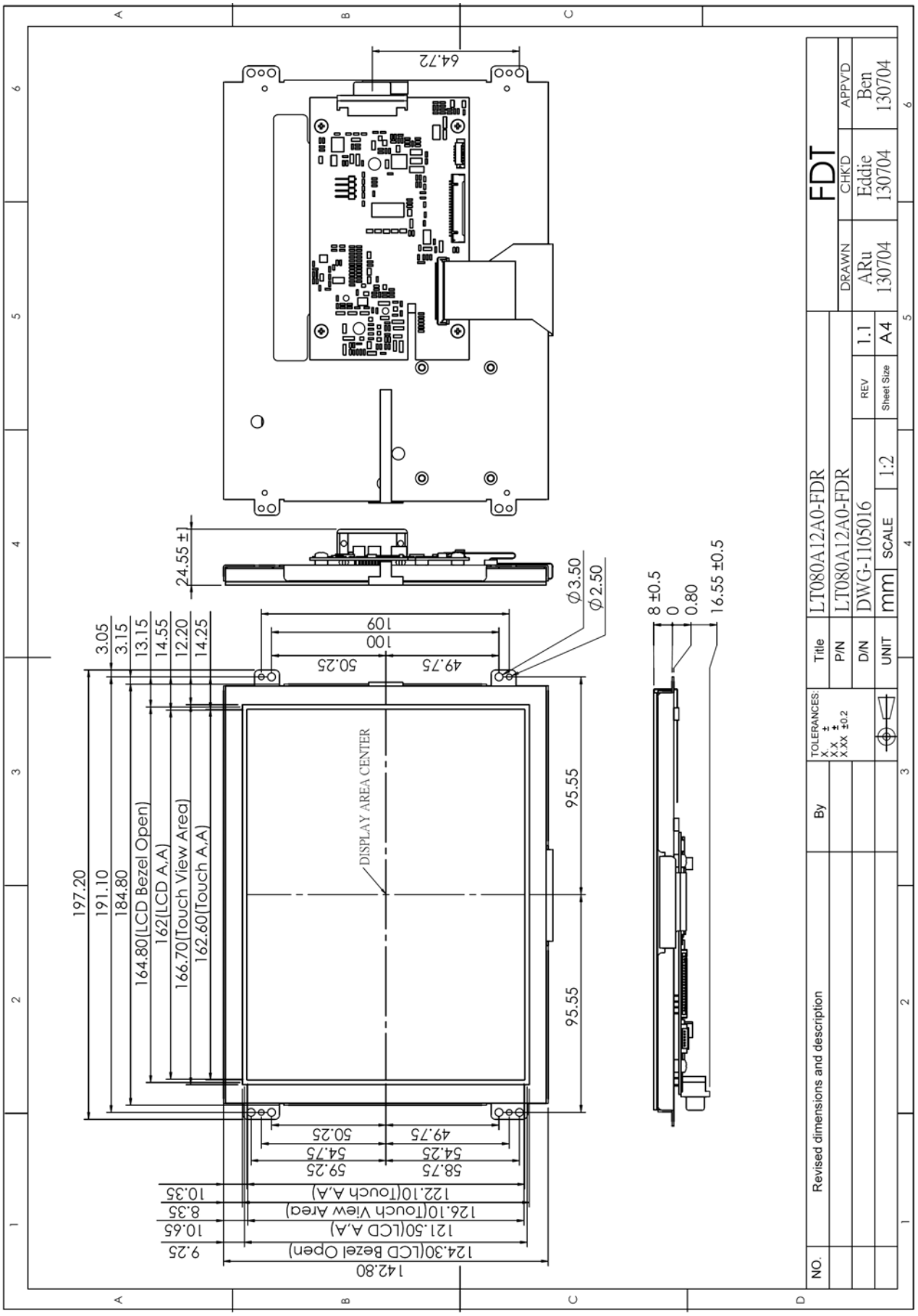




Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw

This technical specification is subject to change without notice.

## *6.3 Unit (LT080A12A0-FDR)*







Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw

This technical specification is subject to change without notice.

# 7. Pin Description

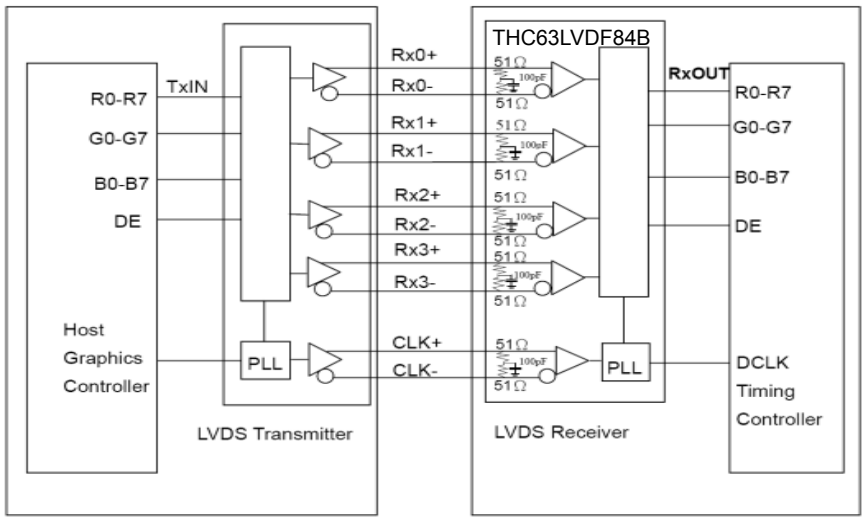
## 7.1 J204：LVDS I/O Terminals (Pitch 1.25mm 20Pin, Side Entry Type)

※ FDT Connector Part No.: MS240420G (STM) [Same as DF14-20P-1.25H (HIROSE)] ;

FDT Matching Connector Part No.: P240420 (STM) [Same as DF14-20S-1.25C (HIROSE)].

| Pin No | Symbol | I/O | Description | Remark |
|---|---|---|---|---|
| 1 | VCC | I | Power Supply ( 3.3 V ) | |
| 2 | VCC | I | Power Supply ( 3.3 V ) | |
| 3 | GND | P | Ground | |
| 4 | GND | P | Ground | |
| 5 | RX0- | I | Differential Data Input, CH0 ( Negative ) | R0 ~ R5, G0 |
| 6 | RX0+ | I | Differential Data Input, CH0 ( Positive ) | |
| 7 | GND | P | Ground | |
| 8 | RX1- | I | Differential Data Input, CH1 ( Negative ) | G1 ~ G5, B0, B1 |
| 9 | RX1+ | I | Differential Data Input , CH1 ( Positive ) | |
| 10 | GND | P | Ground | |
| 11 | RX2- | I | Differential Data Input , CH2 ( Negative ) | B2 ~ B5, DE, Hsync, Vsync |
| 12 | RX2+ | I | Differential Data Input , CH2 ( Positive ) | |
| 13 | GND | P | Ground | |
| 14 | CLK- | I | Differential Clock Input ( Negative ) | LVDS Level Clock |
| 15 | CLK+ | I | Differential Clock Input ( Positive ) | |
| 16 | GND | P | Ground | |
| 17 | RX3- | I | Differential Data Input , CH3 ( Negative ) | R6,R7,G6,G7,B6,B7 |
| 18 | RX3+ | I | Differential Data Input , CH3 ( Positive ) | |
| 19 | GND | P | Ground | |
| 20 | GND | P | Ground | |

LVDS Interface Block Diagram







Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw

This technical specification is subject to change without notice.

### 7.2 J203: Pin Assignment of Inverter (Pitch 1.25mm 6Pin, Side Entry Type)

※ FDT Connector Part No.: MS24016R (STM) [Same as 53261-0619 (MOLEX)];

FDT Matching Connector Part No.: P24016 (STM) [Same as 51021-0600 (MOLEX)].

| Pin No | Symbol | I/O | Description | Remark |
|---|---|---|---|---|
| 1 | VLED | - | Power Voltage For LED Backlight Circuit (+5V) | |
| 2 | VLED | - | Power Voltage For LED Backlight Circuit (+5V) | |
| 3 | DIMMER | I | Backlight Brightness Adjust | |
| 4 | ENABLE | I | Enable For LED Backlight | |
| 5 | GND | - | Power Ground | |
| 6 | GND | - | Power Ground | |

### 7.3 J301C：Pin Assignment of Touch USB (USBA-Female 2.0mm, Side Entry Type )(Option)

| Pin No | Symbol | I/O | Description | Remark |
|---|---|---|---|---|
| 1 | DGND | - | Digital Ground | |
| 2 | D+ | - | DATA (+) | |
| 3 | D- | - | DATA (-) | |
| 4 | VBUS | - | USB VCC | |

### 7.4 J301D：Pin Assignment of Touch RS232 (D-SUB 9 MALE)(Option)

| Pin No | Symbol | I/O | Description | Remark |
|---|---|---|---|---|
| 1 | NC | - | No Connection | |
| 2 | RXD | - | Receive Data | |
| 3 | TXD | - | Transmit Data | |
| 4 | NC | - | No Connection | |
| 5 | GND | - | Ground | |
| 6 | NC | - | No Connection | |
| 7 | NC | - | No Connection | |
| 8 | NC | - | No Connection | |
| 9 | NC | - | No Connection | |

Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

# 8. Absolute Maximum Ratings

## 8.1 Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit | Remark |
|---|---|---|---|---|---|
| Input Voltage | Vcc | +3 | +3.6 | V | |
| LED Driver Input Voltage | VLED | +4.5 | +5.8 | V | |
| Digital Input Signal | TTL | Vcc-0.5 | Vcc+0.5 | V | U/D, R/L |
| LVDS Receiver Input Voltage | | -0.3 | Vcc+0.3 | V | |
| Operating Temperature | | -20 | +60 | ℃ | |
| Storage Temperature | | -30 | +70 | ℃ | |
| Operating Temperature With TSP | | -10 | +60 | ℃ | |
| Storage Temperature With TSP | | -30 | +70 | ℃ | |

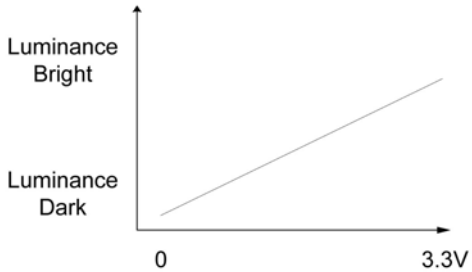
# 9. Recommended Operating Conditions

## 9.1 Electrical Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit | Note | Remark |
|---|---|---|---|---|---|---|---|
| Input Voltage | Vcc | +3.0 | +3.3 | +3.5 | V | | |
| Total Current | Icc(+3.3V) | - | 203 | - | mA | | ±15% |
| LED Driver Input Voltage | VLED | +4.8 | +5 | +5.5 | V | (Note 1) | |
| LED Driver Current | ILED | - | 350 | - | mA | | @+5V |
| LED Driver Power Consumption | | - | 1.65 | - | W | | @+5V |
| Digital Input Signal | TTL | Vcc-0.3 | Vcc | Vcc+0.3 | V | | U/D, R/L |
| Differential Input High Threshold | VTH | - | - | 100 | mV | (Note 3) | VCM=1.2V |
| Differential Input Low Threshold | VTL | -100 | - | - | mV | | VCM=1.2V |
| Dimmer Adjust | Dimmer | 0(Dark) | - | +3.3(Bright) | V | Floating:1/2 VCC (Note 2) | Positive |
| Enable Backlight | Enable | 0 | | +3.3 | V | Enable Threshold：1.2~1.8V<br>Disable Threshold：0~0.2V<br>(Note 1) | 1: Enable<br>0: Disable |

Note 1: Vcc power input is recommended firstly. Till TFT-LCD is settled, backlight power can then turned on to avoid the unstable performance of TFT-LCD at initial.

Note 2: Adjust Brightness.



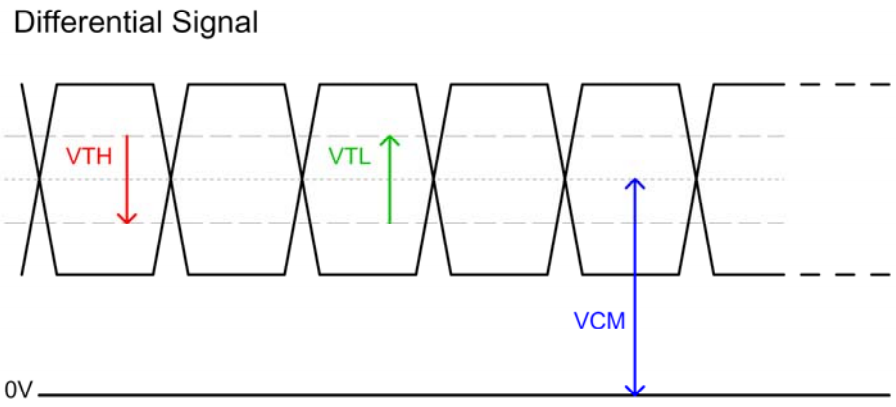

1. This illustration is only for reference but not a real case.

2. 3.3V to Dimmer Pin is required to maintain normal luminance.



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

**Note 3:**




## *10.Interface Timing*

### *10.1 Timing Parameters*

| Parameter | Symbol | Min | Typ | Max | Unit | Remark |
|---|---|---|---|---|---|---|
| HS setup time | Thst | 8 | - | - | ns | |
| HS hold time | Thhd | 8 | - | - | ns | |
| VS setup time | Tvst | 8 | - | - | ns | |
| VS hold time | Tvhd | 8 | - | - | ns | |
| Data setup time | Tdhd | 8 | - | - | ns | |
| Data hole time | Tdhd | 8 | - | - | ns | |
| DE setup time | Tesu | 8 | - | - | ns | |
| DE hole time | Tehd | 8 | - | - | ns | |
| VDD Power On Slew rate | Tpor | - | - | 20 | ms | |
| RSTB pulse width | TRst | 10 | - | - | us | |
| CLKIN cycle time | Tcoh | 20 | - | - | ns | |
| CLKIN pulse duty | Tcwh | 40 | 50 | 60 | % | |
| Output stable time | Tsst | - | - | 6 | Us | |

| DE Mode | Symbol | Min | Typ | Max | Unit | Remark |
|---|---|---|---|---|---|---|
| Horizontal Display Area | Thd | - | 800 | - | Dclk | |
| DCLK Frequency | Fclk | - | 40 | 50 | MHz | |
| One Horizontal Line | Th | 862 | 1056 | 1200 | Dclk | |
| HS pulse width | Thpw | 1 | - | 40 | Dclk | |
| HS Back Porch (Blanking) | Thb | 46 | 46 | 46 | Dclk | |
| HS Front Porch | Thfp | 16 | 210 | 354 | Dclk | |

Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

| HV Mode | Symbol | Min | Typ | Max | Unit | Remark |
|---|---|---|---|---|---|---|
| Vertical Display Area | Tvd | - | 600 | - | Th | |
| VS period time | Tv | 624 | 635 | 700 | Th | |
| VS pulse width | Tvpw | 1 | - | 20 | Th | |
| VS Back Porch(Blanking) | Tvb | 23 | 23 | 23 | Th | |
| VS Front Porch | tvfp | 1 | 12 | 77 | Th | |

## *11. 4W Resistance Touch Panel Characteristics*

### *11.1 Electrical Performance*

| Parameter | Symbol | Min | Typ | Max | Unit | Remark |
|---|---|---|---|---|---|---|
| Terminal Resistance | X | 300 | | 1100 | Ω | |
| | Y | 150 | | 650 | Ω | |
| Linearity | | - | - | 1.5 | % | |
| Insulation Impedance | | 20 | - | - | MΩ | DC 25V |
| Response Time | | - | - | 10 | ms | |

### *11.2 Optical Performance*

| Parameter | Specifications |
|---|---|
| Light Transmittance | 82% Typ. |
| Haze | 5.0% Typ. |

### *11.3 Mechanical Performance*

| Parameter | Specifications |
|---|---|
| Input Method | Finger or stylus pen |
| Operating Force | ≦50g |
| Surface Hardness | 3H or more |

Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

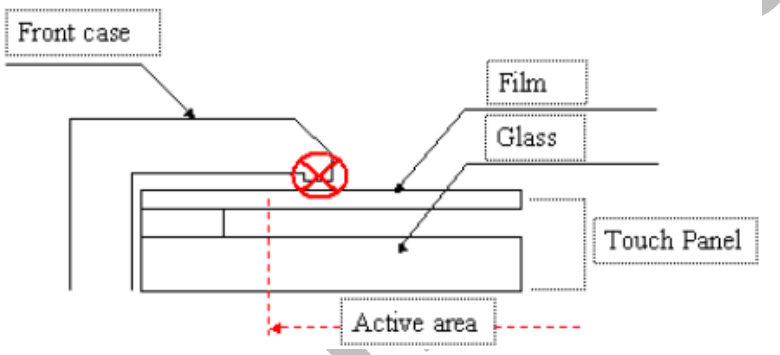
## *11.4 Durability Performance*

| Parameter | Specifications |
|---|---|
| **Hitting Durability** | **≧1000000 times, with R8.0 mm silicon rubber,200g, 5Hz** |
| **Sliding Durability** | **≧100000 words, with R0.8 mm polyacetal stylus, 250g, 60 mm / sec** |

## *11.5 Touch Screen Integration Design Guide*

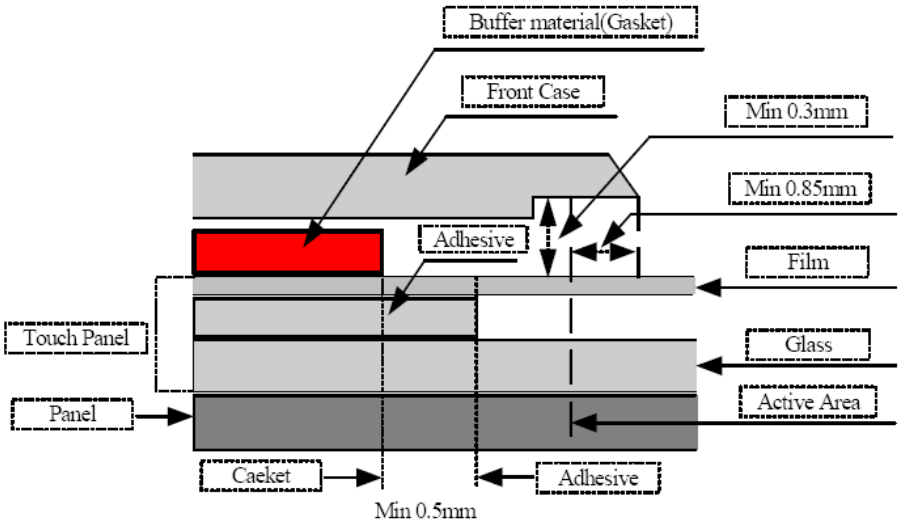
Avoid the design that Front-case overlap and press on the active area of the touch-panel.

Give enough gap (over 0.5mm at compressed) between the front case and touch-panel to protect wrong operating.




Use a buffer material (Gasket) between the touch-panel and front-case to protect damage and wrong operating.

Avoid the design that buffer material overlap and press on the inside of touch-panel viewing area.



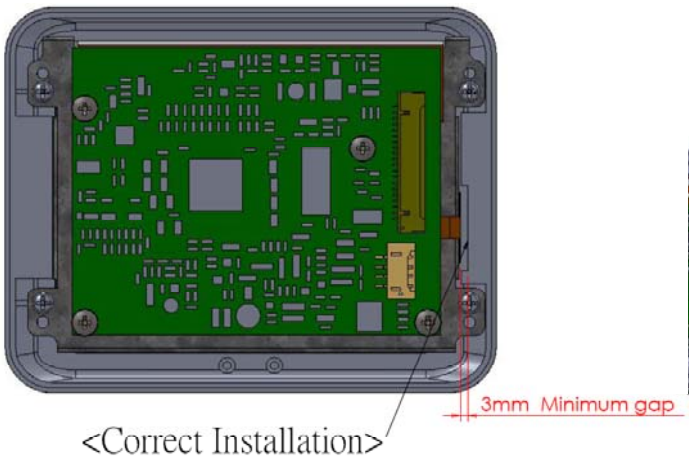
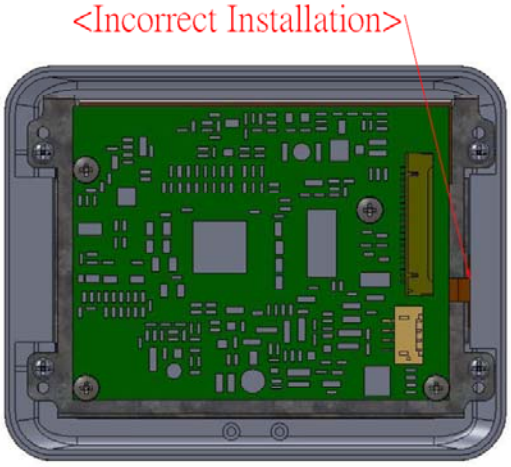
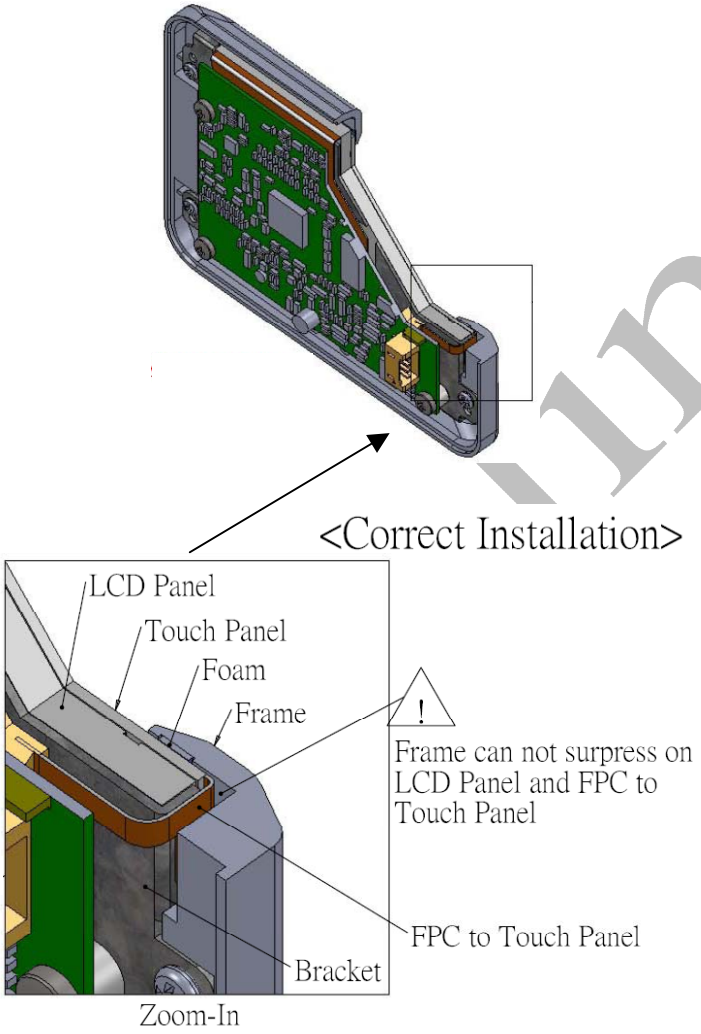
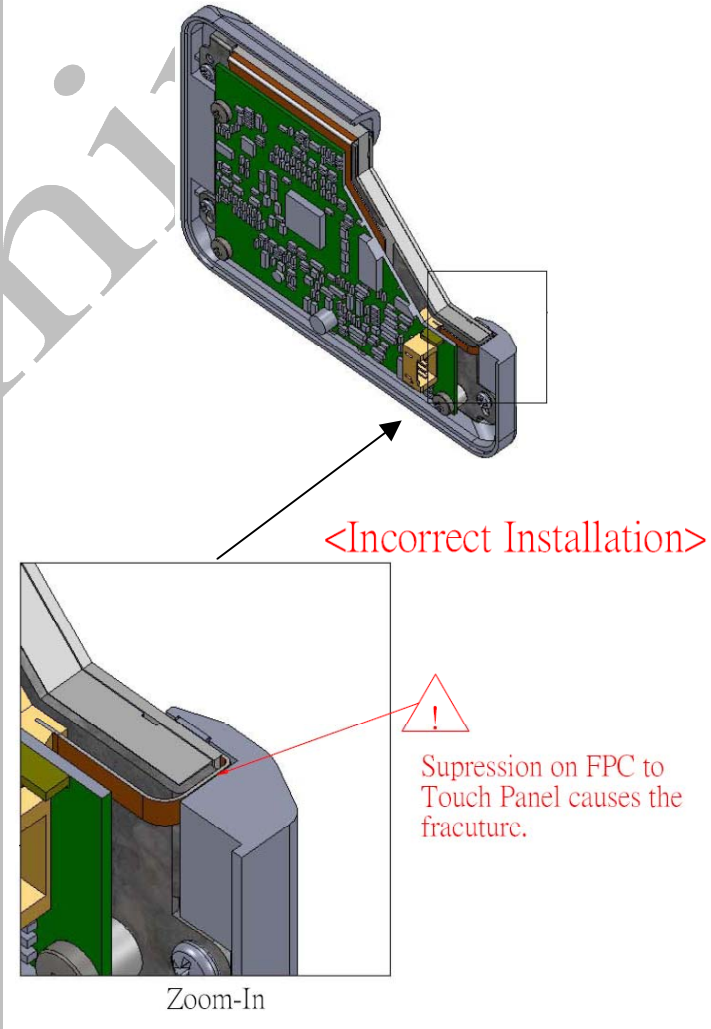

**Note: We strongly suggest to follow above design guide to avoid the linear defect happened on the touch panel.**

Preliminary



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.

## *11.6 Mechanical Design Notice For Touch Panel*

| Correct Installation | Incorrect Installation |
|---|---|
|  |  |
|  |  |

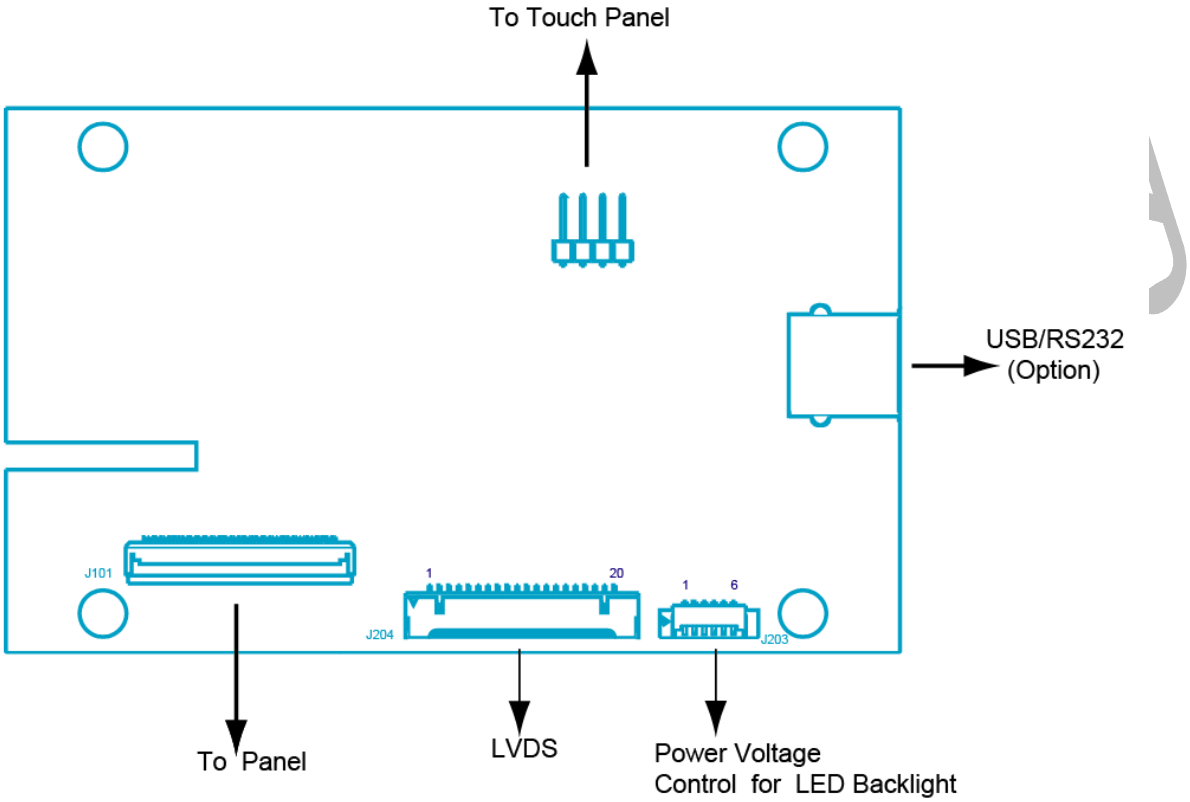


Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw

This technical specification is subject to change without notice.

# 12.Operation Manual

## 12.1 Driver Board Manual




Preli



Copyright © 2011 FDT http:// www.fdt.com.tw, E-mail- fdt@fdt.com.tw
This technical specification is subject to change without notice.