



§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No **Lx06405Pxx-FDR**

Description: **6.4" Color TFT-LCD Analogy Interface Module**

SPEC No.: **SAS-1211004**

Version: **1.0**

Issue Date: **September 2, 2013**

※ This approval sheet contains 15 pages including the cover and appendix.

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

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| APPROVED BY: | CHECKED BY: | DESIGNED BY: |
| _____ | _____ | _____ |



FLAT DISPLAY TECHNOLOGY

6.4" TFT LCD Analog Interface Module

- LD06405Pxx-FDR
- LM06405Pxx-FDR

1. General Description

1.1 Features

- 6.4" Color TFT LCD Panel
- Ultra Compact
- DC/DC Video Decoder All In One
- NTSC/PAL Video Auto Switch
- Up / Down Display Reverse
- Left / Right Display Reverse
- Single Operation Voltage 12V

1.2 Applications

- Security
- Video Game
- Door Phone
- Video Phone
- Portable TV
- Instrument Display

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.

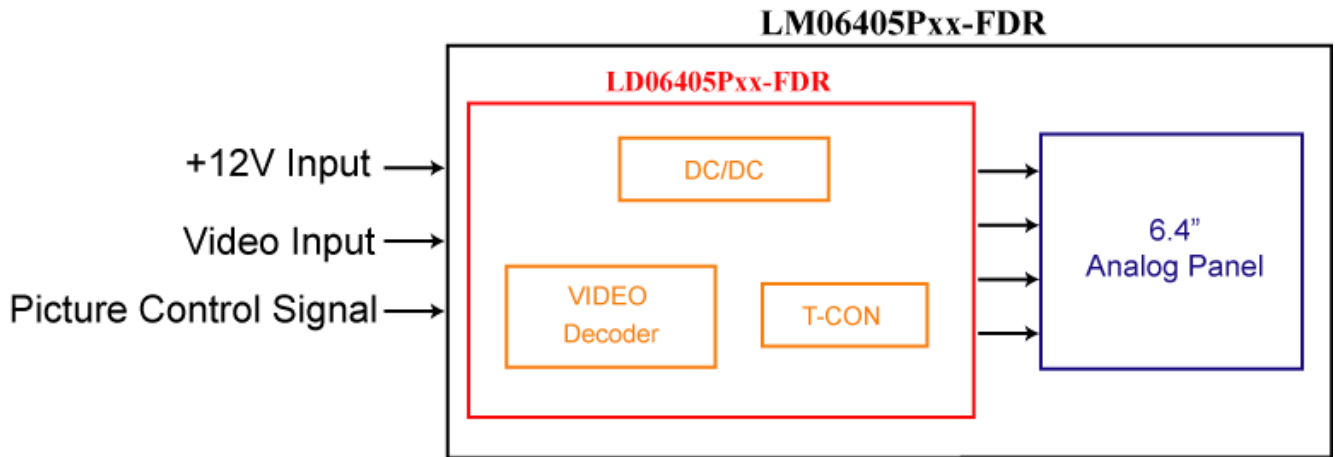
The other application that demands high reliability and functionality should first contact a sales representative.

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3. Block Diagram

3.1 Block Diagram



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4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

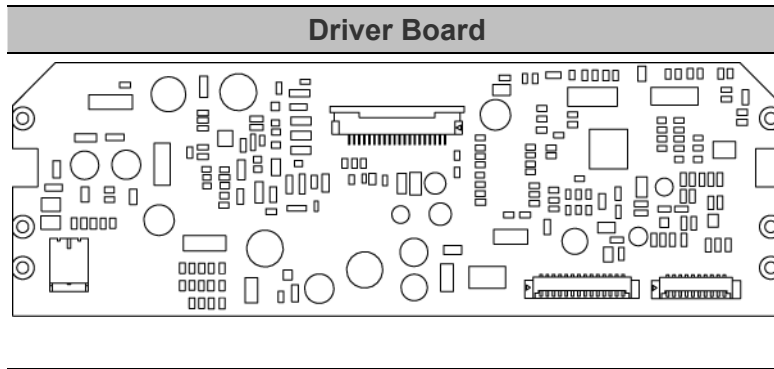
| Parameter | Specifications | Unit |
|---------------------|---|------|
| Screen Size | 6.4 (diagonal) | inch |
| Display Format | 320 x (R.G.B) x 234 | dot |
| Active Area | 129.6 (H) x 97.34 (V) | mm |
| Pixel Pitch | 0.405 (H) x 0.416 (V) | mm |
| Pixel Configuration | Stripe | |
| Outline Dimension | 156.3 (W) x 119.8 (H) x 14.3 (D) (typ.) | mm |
| Surface Treatment | Anti-Glare + WV Film | |
| Weight | 226 ±10 | g |

4.2 TFT-LCD Optical Characteristics

| Parameter | Symbol | Condition | Min | Typ | Max | Unit | Remark |
|--------------------|------------|----------------------------|------|-------|------|------|--------|
| Viewing Angle | Horizontal | Left | 60 | 70 | - | deg | |
| | | Right | 60 | 70 | - | deg | |
| | Vertical | Top | 40 | 50 | - | deg | |
| | | Bottom | 45 | 55 | - | deg | |
| Contrast Ratio | CR | At optimized Viewing angle | 400 | 600 | - | --- | |
| Response time | Rise Fall | Tr | - | 15 | 30 | ms | |
| | | Tf | - | 25 | 50 | ms | |
| Uniformity | U | | 75 | 80 | - | --- | |
| Brightness | | | 300 | 400 | - | --- | |
| White Chromaticity | x | $\theta = 0^\circ$ | 0.26 | 0.30 | 0.34 | | |
| | y | $\theta = 0^\circ$ | 0.27 | 0.31 | 0.35 | | |
| Lamp Life Time | | +25°C | - | 30000 | - | Hr | |

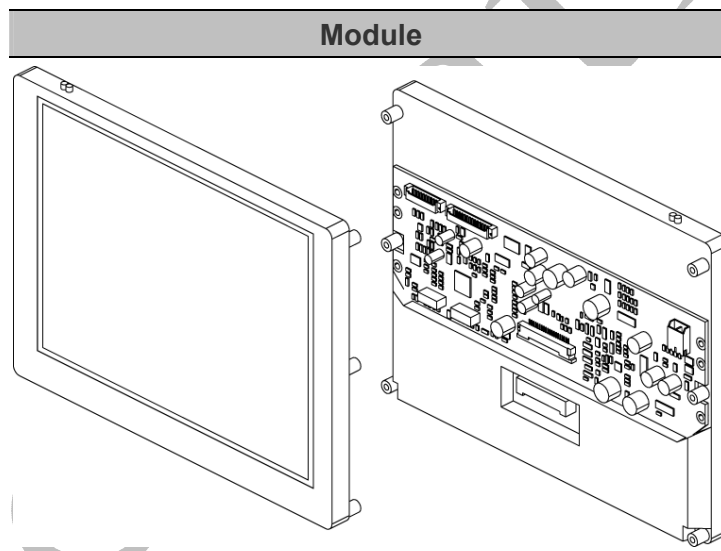
5. Order Information

5.1 Driver Board



| Order Part Number | NTSC | PAL | NTSC/PAL | Master RGB Mode | Slave RGB Mode |
|-------------------|------|-----|----------|-----------------|----------------|
| LD06405PN0-FDR | ◎ | | | | |
| LD06405PP0-FDR | | ◎ | | | |
| LD06405PS0-FDR | | | ◎ | | |

5.2 Module



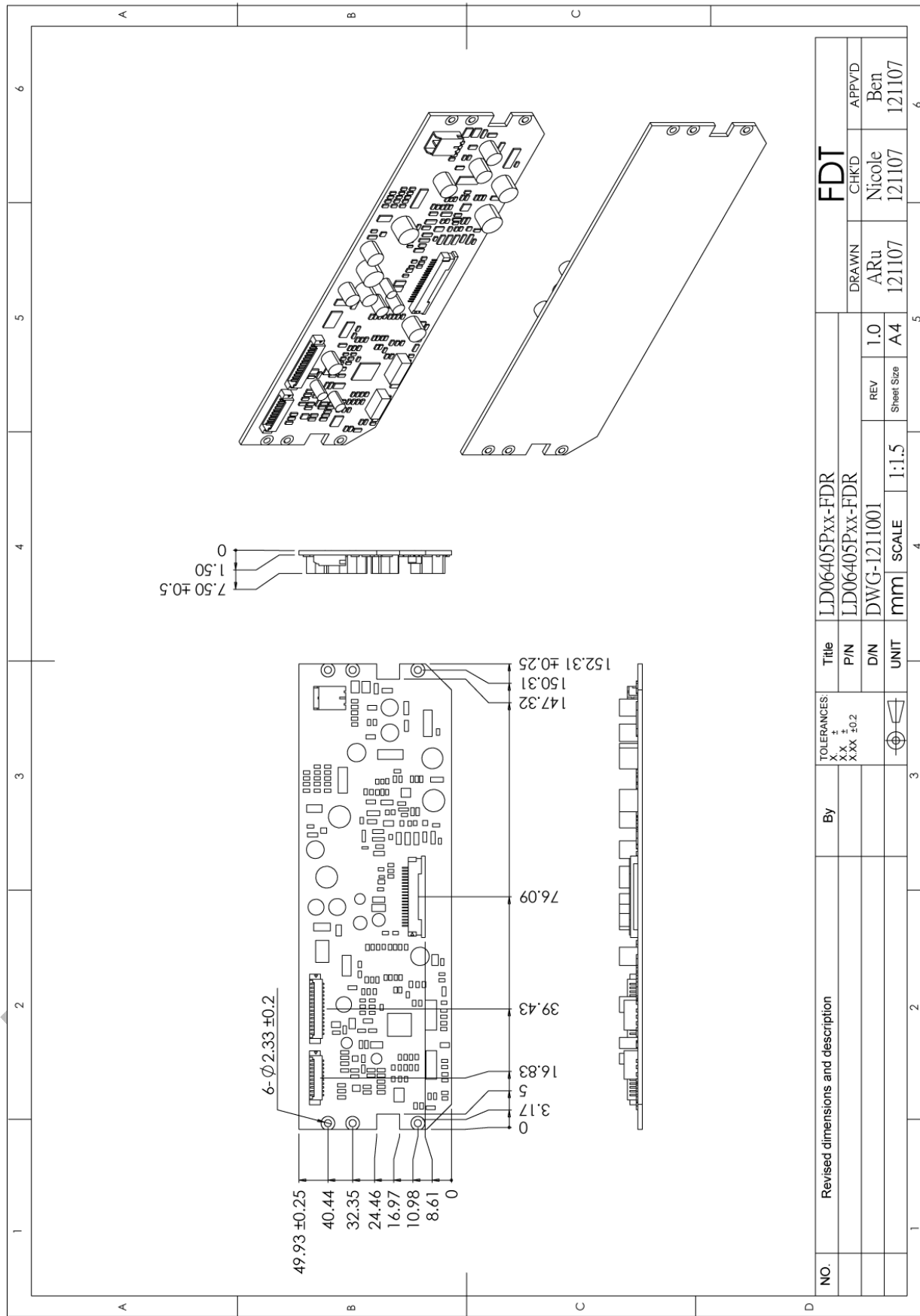
| Order Part Number | NTSC | PAL | NTSC/PAL | Master RGB Mode | Slave RGB Mode | TFT-LCD Panel PA064DS5 |
|-------------------|------|-----|----------|-----------------|----------------|---------------------------|
| LM06405PN0-FDR | ◎ | | | | | ◎ |
| LM06405PP0-FDR | | ◎ | | | | ◎ |
| LM06405PS0-FDR | | | ◎ | | | ◎ |

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■ LD06405Pxx-FDR ■ LM06405Pxx-FDR V1.0 

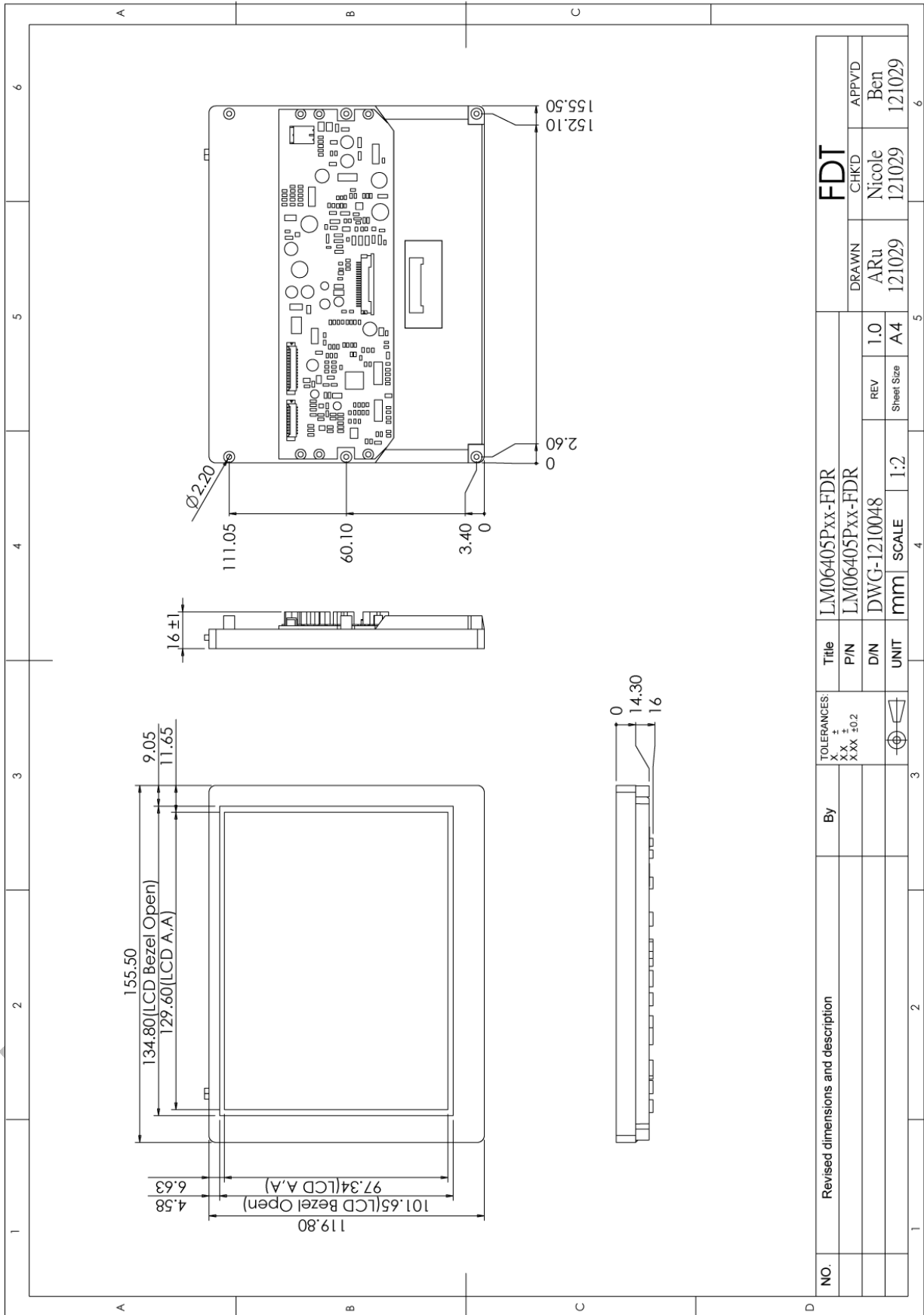
6. Dimension Information

6.1 Driver Board (LD06405Pxx-FDR)



| | | | | | | | | | |
|-----|------------------------------------|--|----|--|-------|----------------|-------|------------|--------|
| NO. | Revised dimensions and description | | By | TOLERANCES: X X ± X X ± X X ± 0.2 | Title | LD06405Pxx-FDR | | FDT | |
| | | | | | P/N | LD06405Pxx-FDR | | DRAWN | CHK'D |
| | | | | | D/N | DWG-1211001 | | ARu | Nicole |
| | | | | | UNIT | mm | SCALE | 1:1.5 | REV |
| | | | | | | | | Sheet Size | A4 |
| | | | | | | | | | |
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6.2 Module (LM06405Pxx-FDR)



7. Pin Description

7.1 J202 : LCD Panel I/O Terminals (FPC I/O 20pin Below Contact Type)

| Pin No | Symbol | I/O | Description | Remark |
|--------|--------|-----|---|--------|
| 1 | HSY | I/O | Horizontal Sync. Input / Output | |
| 2 | POLC | O | Video Polarity Alternating Signal | |
| 3 | CSY | I | Composite Sync. Signal | |
| 4 | VGH | I | Gate On Voltage | |
| 5 | VGL | I | Gate On Voltage | |
| 6 | VB | I | Video Input B | |
| 7 | VR | I | Video Input R | |
| 8 | VG | I | Video Input G | |
| 9 | GND | - | GND | |
| 10 | VDD | I | Digital Power Input | |
| 11 | Vcc | I | Analogue Power Input For Source Driver | |
| 12 | GND | - | GND | |
| 13 | CKC | I | Select Pin For Internal / External Clock Mode | |
| 14 | VSX | I/O | Vertical Sync. Input / Output | |
| 15 | PSI | I | Synchronize Pulse For Decoder | |
| 16 | COMPS | I | Select Pin for Composite Sync. Mode & Sync. Separate Mode | |
| 17 | VIY | I | Vertical Sync. Input Pin For Sync. Separate Mode | |
| 18 | U / D | I | Up / Down Control For Gate Driver | |
| 19 | R / L | I | Left / Right Control For Source Driver | |
| 20 | N / P | I | NTSC / PAL Input | |

7.2 J201 : Pin Assignment of Signal Input (Pitch1.25mm 14Pin , Side Entry Type)

※ FDT Connector Part No.: MS240114R (STM) [Same as 53261-1419(MOLEX)]

※ FDT Matching Connector Part No.: P240114 (STM) [Same as 51021-1400(MOLEX)]

| Pin No | Symbol | I/O | Description | Remark |
|--------|--------------|-----|---------------------------------|--------|
| 1 | Vin | - | +12V Voltage DC Input | |
| 2 | GND | - | Power Ground | |
| 3 | GND | - | Power Ground | |
| 4 | GND | - | Signal Ground | |
| 5 | Video in | I | Video Input | |
| 6 | +5V | O | +5V DC Output Voltage | Note 1 |
| 7 | Bright | I | Bright Control | |
| 8 | Contrast | I | Contrast Control | |
| 9 | Color | I | Color Control | |
| 10 | Tint | I | TINT Control | Note 2 |
| 11 | NTSC / PAL | O | Auto Detect Video System Output | Note 3 |
| 12 | Left / Right | I | Left / Right Reverse | Note 4 |
| 13 | Up / Down | I | Up / Down Reverse | Note 4 |
| 14 | Dimmer | I | Backlight Brightness Control | |

Note1: The +5V DC supply external control circuit. (Max, out is 10mA)

Note2: The TINT is only operating in NTSC system.

Note3: The output High for NTSC mode and Low for PAL mode.

Note4: Default is reversed scanning (High) and Low is for normal scanning.

Please do force this pin to ground for normal scan.

7.3 J101 : Pin Assignment Of RGB Mode(Pitch 1.25mm 10P ,Side Entry Type)(option)

※ FDT Connector Part No.: MS240110R (STM) [Same as 53261-1019(MOLEX)]

※ FDT Matching Connector Part No.: P240110 (STM) [Same as 51021-1000(MOLEX)]

| Pin No | Symbol | I/O | Description | Remark |
|--------|---------------|-----|---|--------|
| 1 | EXT. R | I | External R Signal Input (0.7Vp-p / 75Ω) | |
| 2 | EXT. G | I | External G Signal Input (0.7Vp-p / 75Ω) | |
| 3 | EXT. B | I | External B Signal Input (0.7Vp-p / 75Ω) | |
| 4 | EXT-SW | I | Switch Video (low) / R.G.B (High) Mode | Note 1 |
| 5 | CSYI | I | Composite Sync. Input | Note 2 |
| 6 | INT-VIDEO-CSY | O | Internal Composite Sync. Output | Note 3 |
| 7 | HSY | O | Horizontal Sync. Output | Note 4 |
| 8 | VSY | O | Vertical Sync. Output | Note 4 |
| 9 | GND | - | Ground | |
| 10 | SVHS-C | I | Chroma Signal Input | Note 5 |

* This connector is optional. If you use EXT R.G. B or Y/C Video input mode

Please contact FDT to modify some components of the interface board.

Note1: EXT-SW is High for external R.G.B. input (15.75Khz), Low is Composite video input.

Note2: CSYI must be positive sync. signal input.

Note3: If EXT-SW is low the INT-VIDEO-CSY switch to CSYI.

CSYI is composite sync of RGB mode when EXT-SW is high.

Note4: HSY and VSX is negative sync. Signal output for On Screen Display(OSD).

CSYI connect with INT-VIDEO-CSY when external RGB signal synchronize video sync.

Note5: SVHS-C is option.

8. Absolute Maximum Ratings

8.1 Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit | Remark |
|-----------------------|----------|------|------|------|--------|
| Input Voltage | Vin | +9 | +15 | V | |
| Video Input Signal | Video in | 0.5 | 2.0 | Vp-p | @75Ω |
| Digital Input Signal | TTL | +0.3 | +5.3 | V | |
| Storage Temperature | | -20 | +70 | °C | |
| Operating Temperature | | -10 | +60 | °C | |

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9. Recommended operating conditions

9.1 Electrical Characteristics

| Parameter | Symbol | I/O | Min | Typ | Max | Unit | Note |
|--------------------|------------------------|-----|------|------|------|------------------|----------|
| Input Voltage | V _{in} | I | +10 | +12 | +14 | V | |
| Total Current | I _{in} (+12V) | I | | 287 | | mA | ±15% |
| Power Consumption | | I | | 3.44 | | W | @+12v |
| Video Input Signal | Video in | I | | 1.0 | | V _{p-p} | @75Ω |
| Output Voltage | +5VA | O | | +5V | | V | 10mA |
| Brightness Adjust | Bright | I | 1.88 | 1.93 | 2.06 | V | |
| Contrast Adjust | Contrast | I | 2.11 | 2.59 | 3.12 | V | |
| Color Adjust | Color | I | 2.18 | 2.42 | 2.75 | V | |
| Tint Adjust | Tint(NTSC Only) | I | 1.5 | 2.98 | 3.7 | V | |
| Video Auto Detect | NTSC/ PAL | O | | TTL | | V | |
| Screen Reverse | Left / Right | I | | TTL | | V | |
| Screen Reverse | UP / Down | I | | TTL | | V | |
| Dimmer Adjust | Dimmer | I | 0 | - | +3.3 | V | Negative |

9.2 LED Backlight Data

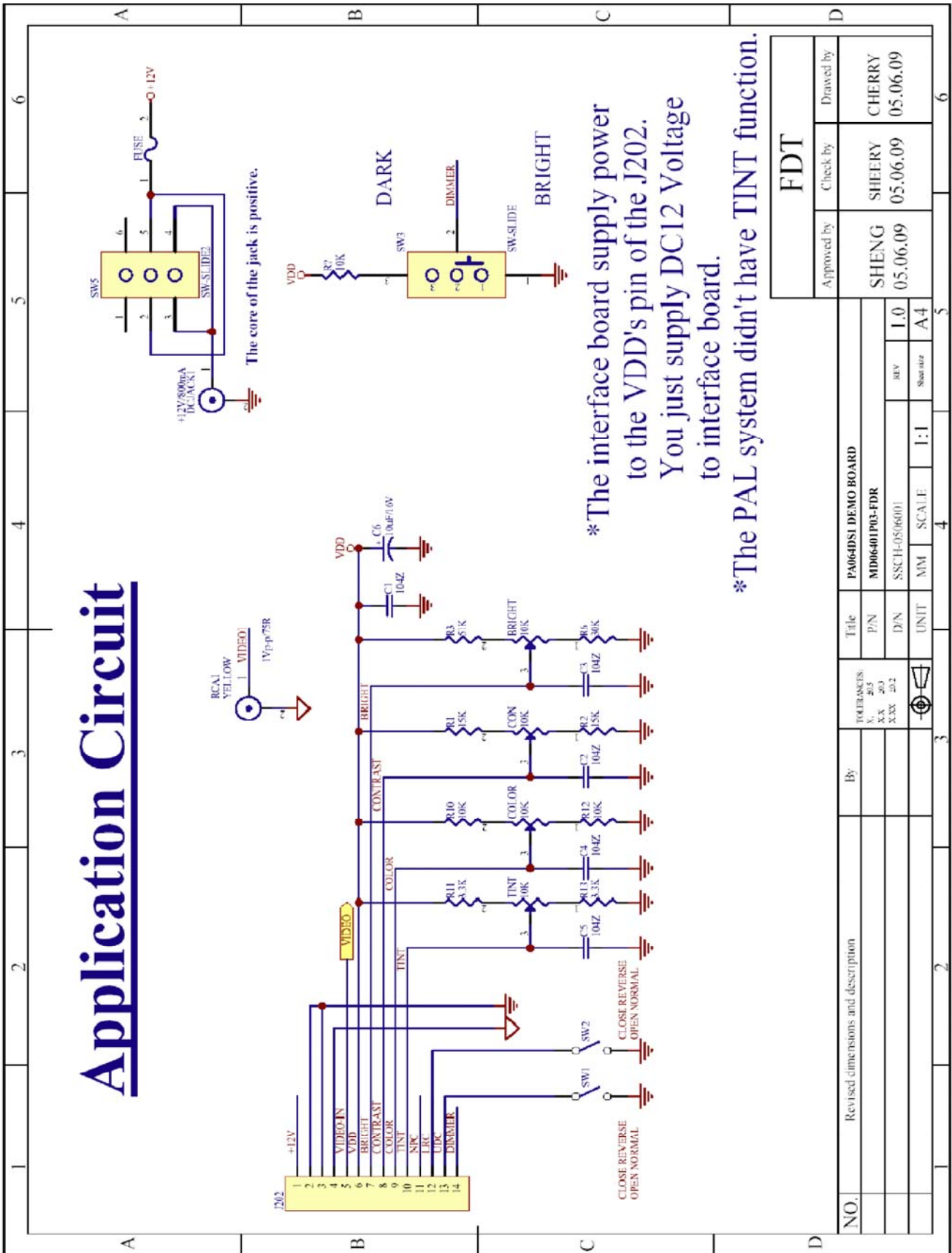
| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|-----------------------|------------------|-----|-----|-------|------|-----------------------------------|
| LED Backlight Voltage | V _{LED} | - | - | 10.65 | V | I _{LED} = 20mA x 6series |
| LED Backlight Current | I _{LED} | - | 20 | 30 | mA | = 120mA (±10%) |

Note: T_a = 25°C @+12V

10. Application Schematic Diagram

10.1 Application Circuit

Application Circuit



| | | | | | | | | | | | | | |
|-----|------------------------------------|----|---|----------------|------|----|-------|-----|------------|----|-------------|------------|-----------|
| NO. | Revised dimensions and description | By | Title | | UNIT | MM | SCALE | I:1 | Sheet size | A4 | Approved by | Checked by | Drawed by |
| | | | PA064DSI DEMO BOARD | MD06401P03-FDR | | | | | | | | | |
| | | | TOLEANCES: X. .#0.3 XX .#0.2 XXX .#0.1 | P/N | | | | | | | SHENG | SHERRY | CHERRY |
| | | | | D/N | | | | | | | 05.06.09 | 05.06.09 | 05.06.09 |

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11. R.G.B Function Application Block

11.1 R.G.B Function Application Block

