



# CUSTOMER APPROVAL SHEET

|                          |                       |
|--------------------------|-----------------------|
| <b>Company Name</b>      |                       |
| <b>MODEL</b>             | <b>A080SN03 V0</b>    |
| <b>CUSTOMER APPROVED</b> | Title :<br><br>Name : |

- APPROVAL FOR SPECIFICATIONS ONLY (Spec. Ver.\_\_\_\_)
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- CUSTOMER REMARK :

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|----------------|------------|
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| Date :         | 2010/01/25 |

# Product Specification

## 8" COLOR TFT-LCD MODULE

**Model Name :** **A080SN03 V0**

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**Planned Lifetime:** From 2010/Jan To 2011/Jan

**Phase-out Control:** From 2010/July To 2011/Dec

**EOL Schedule:** 2011/Jan

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<  > Preliminary Specification

<  > Final Specification

Note: The content of this specification is subject to change.

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Record of Revision

| Version | Revise Date | Page      | Content  |
|---------|-------------|-----------|--|
| 0.0     | 2009/11/25  | All       | First Draft.                                   |
| 0.1     | 2010/01/07  | P3        | Modify Panel Power Consumption                 |
|         |             | P4,5      | Modify drawing                                 |
|         |             | P6        | Modify Pin Description                         |
|         |             | P10       | Modify DC Charateristics & Current Consumption |
|         |             | P11       | Add Gamma voltage & Vcom buffer                |
|         |             | P16       | Modify Serial Interface Setting Table          |
|         |             | P18       | Modify Power On/Off Characteristics            |
|         |             | P19       | Modify Optical Specification                   |
| 0.2     | 2010/01/13  | P3        | Modify Overall Dimension & Weight              |
|         |             | P4,5      | Modify drawing                                 |
| 0.3     | 2010/01/15  | P3        | Revise Backlight Power Consumption             |
|         |             | P11,12,19 | Revise LED Lightbar current/ Power Consumption |
| 0.4     | 2010/01/25  | P9        | Add Input signal voltage                       |
|         |             | P10       | Revise VCOM                                    |
|         |             | P27       | Add Application Circuit                        |
|         |             |           |  |
|         |             |           |  |
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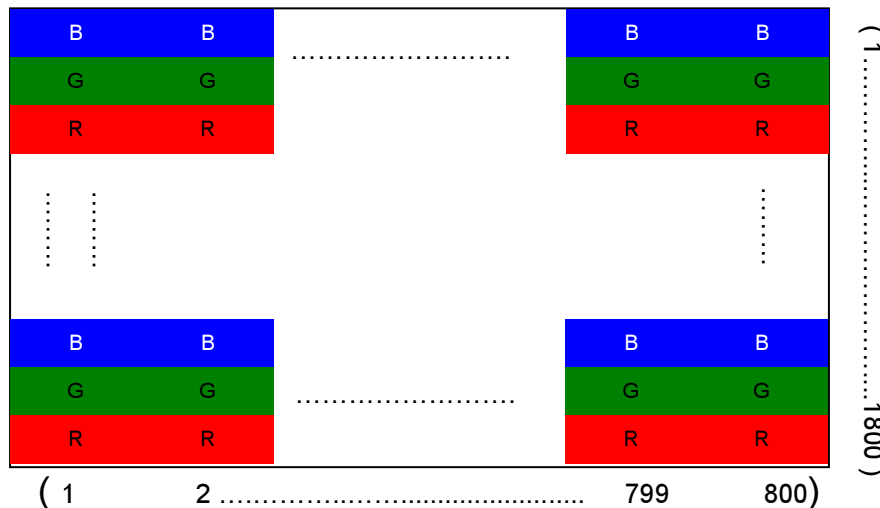
### A. General Information

This product is for portable DVD and digital photo frame application.

| NO. | Item                        | Unit | Specification              | Remark |
|-----|-----------------------------|------|----------------------------|--------|
| 1   | Screen Size                 | inch | 8(Diagonal)                |        |
| 2   | Display Resolution          | dot  | 800(W)x600RGB(H)           |        |
| 3   | Overall Dimension           | mm   | 183(W)x141(H)x4.9(D)       | Note 1 |
| 4   | Active Area                 | mm   | 162(W)x121.5(H)            |        |
| 5   | Pixel Pitch                 | mm   | 0.2025(W)x0.2025(H)        |        |
| 6   | Color Configuration         | --   | Tri-Gate                   | Note 2 |
| 7   | Color Depth                 | --   | 16.2M Colors               | Note 3 |
| 8   | NTSC Ratio                  | %    | 50                         |        |
| 9   | Display Mode                | --   | Normally White             |        |
| 10  | Panel surface Treatment     | --   | Anti-Glare, 3H             |        |
| 11  | Weight                      | g    | 225 ±10                    |        |
| 12  | Panel Power Consumption     | mW   | 189                        | Note 4 |
| 13  | Backlight Power Consumption | W    | 1.58                       |        |
| 14  | Viewing direction           |      | 6 o'clock (gray inversion) |        |

Note 1: Not include backlight cable and FPC. Refer next page to get further information.

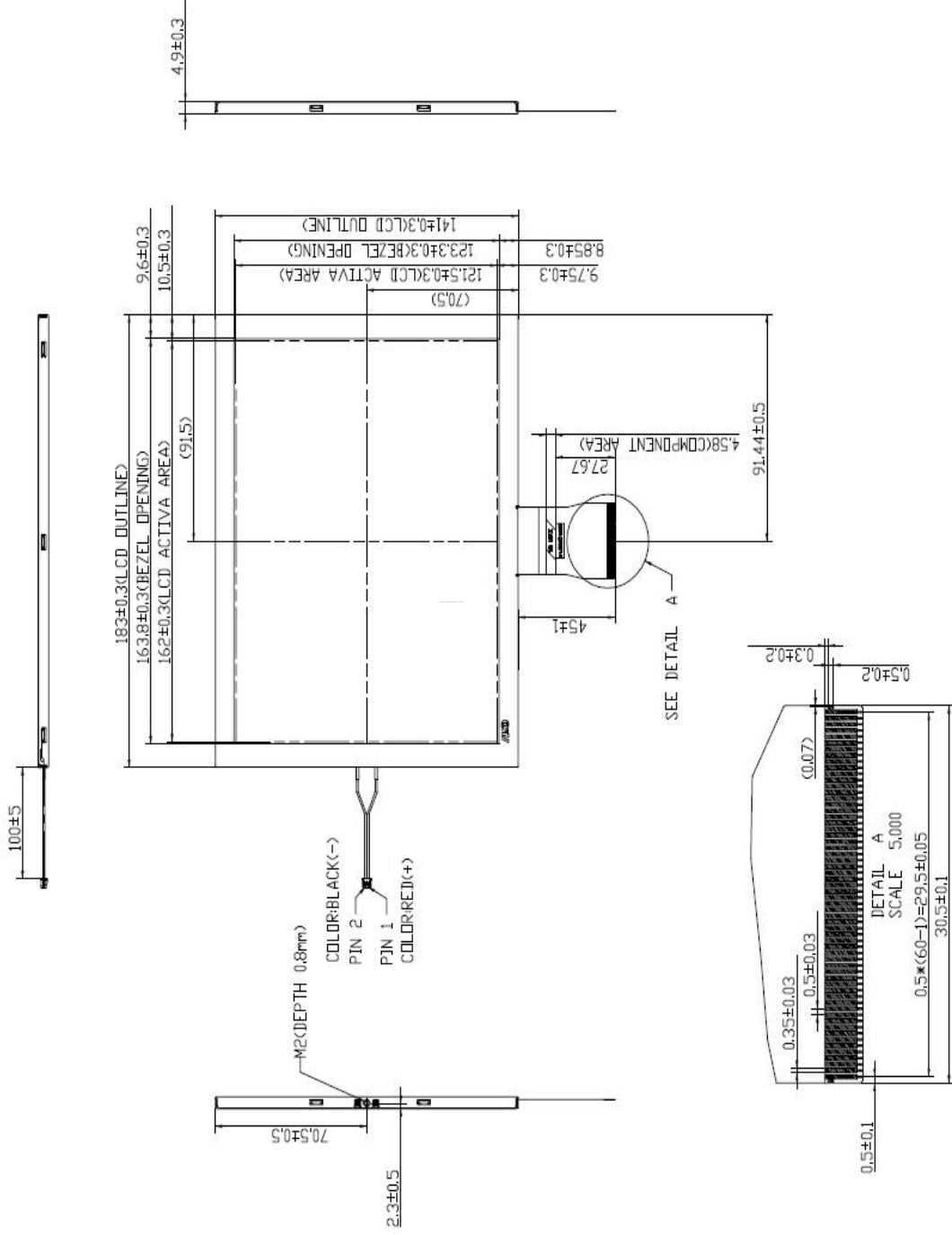
Note 2: Below figure shows dot stripe arrangement.



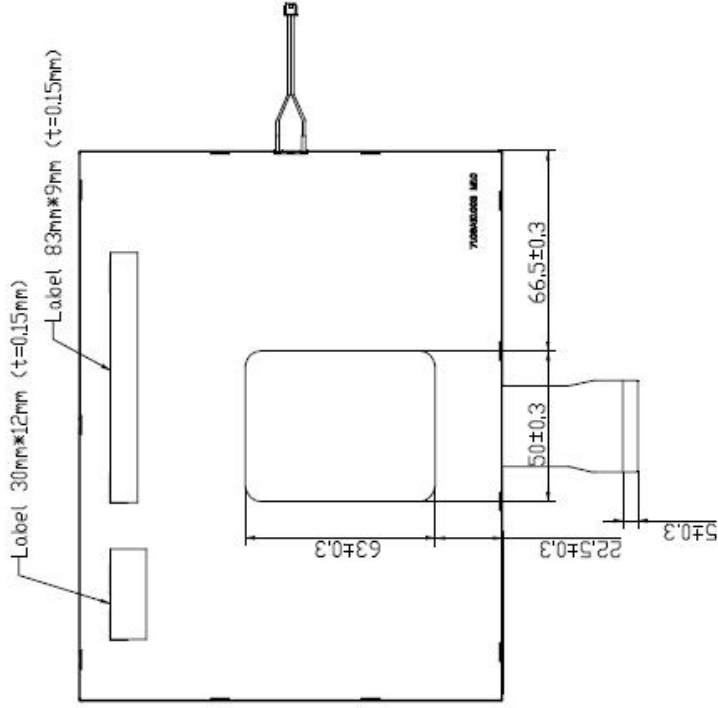
Note 3: The full color display depends on 24-bit data signal (pin 33~40, 42~49, 51~58).

Note 4: Please refer to Electrical Characteristics chapter.

**B. Outline Dimension**  
**1. TFT-LCD Module – Front View**



## 2. TFT-LCD Module – Rear View



- NOTES:
- 1.GENERAL TOLERANCE±0.3mm
  - 2.LED LIGHTBAR CONNECTOR:H20K-P02N-02B (MOLEX 51021-0200 COMPATIBLE)
  - 3.FPC CONNECTOR:XTE2M-6015-1AH BY ORZ
  - 4.THE BENDING RADIUS OF FPC SHOULD BE LARGER THAN 0.6mm.
  - 5.IT WAS FORBIDDEN TO BEND FPC UPWARD TO THE PANEL SURFACE.

## C. Electrical Specifications

### 1. TFT LCD Panel Pin Assignment

Recommended connector : XF2M-6015-1AH

| NO. | Symbol  | I/O | Description                                    | Remark |
|-----|---------|-----|--|--------|
| 1   | VCOM    | I   | Common electrode driving voltage               |        |
| 2   | VGL     | P   | Negative power supply voltage for Gate driver  |        |
| 3   | VGH     | P   | Positive power supply voltage for Gate driver  |        |
| 4   | VGH     | P   | Positive power supply voltage for Gate driver  |        |
| 5   | VDPA    | P   | Positive power supply voltage for analog power |        |
| 6   | VDNA    | P   | Negative power supply voltage for analog power |        |
| 7   | GND     | P   | Ground   |        |
| 8   | DRV_BLU | O   | CABC PWM_SIGNAL output via an output buffer    |        |
| 9   | CABC_EN | I   | CABC function enable                           |        |
| 10  | U/D     | I   | Up/Down selection.                             | Note2  |
| 11  | R/L     | I   | Left/Right selection                           | Note2  |
| 12  | GRB     | I   | H/W global reset                               | Note1  |
| 13  | V10     | I   | Gamma correction voltage reference             |        |
| 14  | V9      | I   | Gamma correction voltage reference             |        |
| 15  | V8      | I   | Gamma correction voltage reference             |        |
| 16  | V7      | I   | Gamma correction voltage reference             |        |
| 17  | V6      | I   | Gamma correction voltage reference             |        |
| 18  | V5      | I   | Gamma correction voltage reference             |        |
| 19  | V4      | I   | Gamma correction voltage reference             |        |
| 20  | V3      | I   | Gamma correction voltage reference             |        |
| 21  | V2      | I   | Gamma correction voltage reference             |        |
| 22  | V1      | I   | Gamma correction voltage reference             |        |
| 23  | VDDIO   | P   | Digital interface supply voltage of digital    |        |
| 24  | VDDIO   | P   | Digital interface supply voltage of digital    |        |
| 25  | CS      | I   | Chip select (Low active) of SPI                |        |
| 26  | SDA     | I/O | Data input/output of SPI                       |        |
| 27  | SCL     | I   | Clock input of SPI                             |        |
| 28  | GND     | P   | Ground   |        |
| 29  | DCLK    | I   | Data clock input                               |        |
| 30  | GND     | P   | Ground   |        |
| 31  | DE      | I   | Data enable Input (High active)                |        |
| 32  | GND     | P   | Ground   |        |
| 33  | DB7     | I   | Blue data Input (MSB)                          |        |
| 34  | DB6     | I   | Blue data Input                                |        |



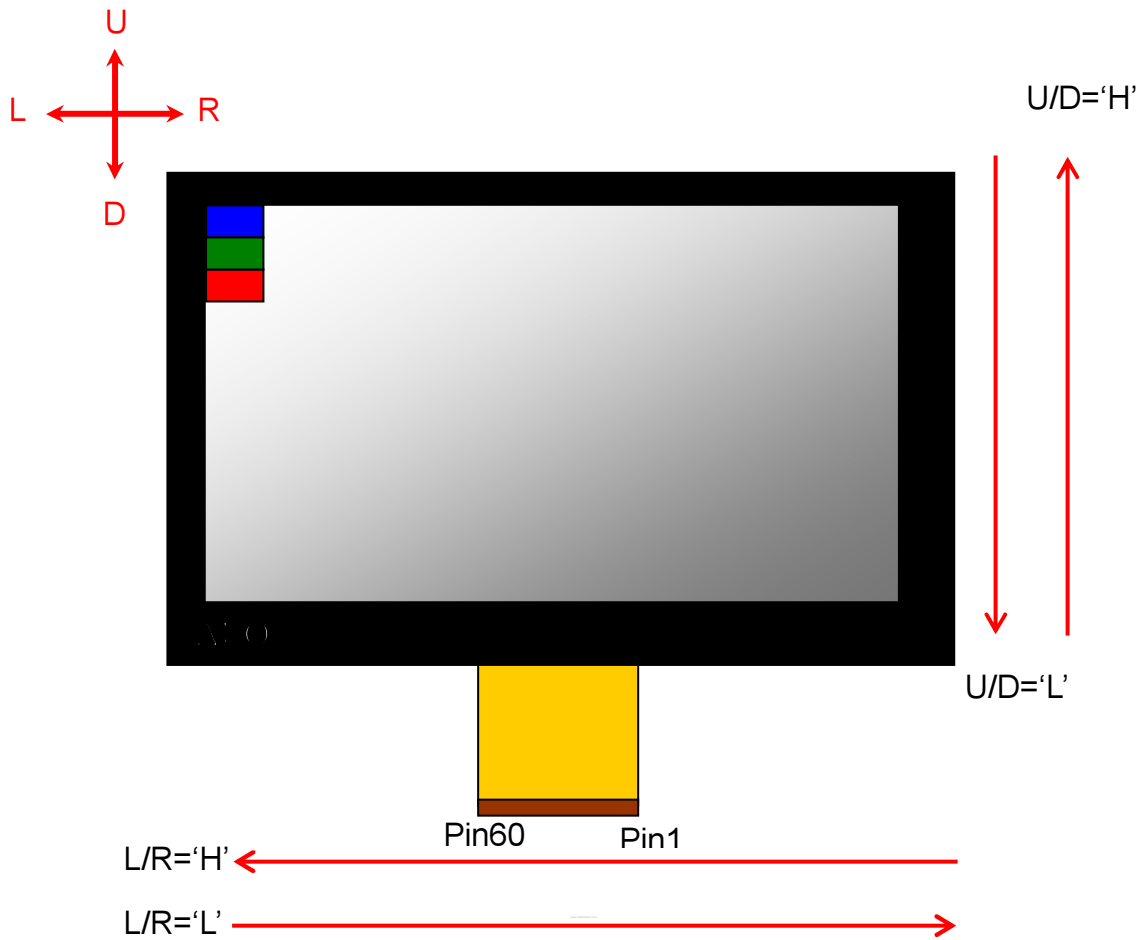
|    |      |   |                                  |  |
|----|------|---|----------------------------------|--|
| 35 | DB5  | I | Blue data Input                  |  |
| 36 | DB4  | I | Blue data Input                  |  |
| 37 | DB3  | I | Blue data Input                  |  |
| 38 | DB2  | I | Blue data Input                  |  |
| 39 | DB1  | I | Blue data Input                  |  |
| 40 | DB0  | I | Blue data Input (LSB)            |  |
| 41 | GND  | P | Ground                           |  |
| 42 | DG7  | I | Green data Input (MSB)           |  |
| 43 | DG6  | I | Green data Input                 |  |
| 44 | DG5  | I | Green data Input                 |  |
| 45 | DG4  | I | Green data Input                 |  |
| 46 | DG3  | I | Green data Input                 |  |
| 47 | DG2  | I | Green data Input                 |  |
| 48 | DG1  | I | Green data Input                 |  |
| 49 | DG0  | I | Green data Input (LSB)           |  |
| 50 | GND  | P | Ground                           |  |
| 51 | DR7  | I | Red data Input (MSB)             |  |
| 52 | DR6  | I | Red data Input                   |  |
| 53 | DR5  | I | Red data Input                   |  |
| 54 | DR4  | I | Red data Input                   |  |
| 55 | DR3  | I | Red data Input                   |  |
| 56 | DR2  | I | Red data Input                   |  |
| 57 | DR1  | I | Red data Input                   |  |
| 58 | DR0  | I | Red data Input (LSB)             |  |
| 59 | GND  | P | Ground                           |  |
| 60 | VCOM | I | Common electrode driving voltage |  |

I: Input; P: Power

Note1: Global reset, normally pulled high. Suggest to connecting with an RC (R=10K ohm, C=1uF)reset circuit for stability. Normally pull high.

Note2:

| U/D | Direction | L/R | Direction |
|-----|-----------|-----|-----------|
| H   | D → U     | H   | R → L     |
| L   | U → D     | L   | L → R     |



## 2. Backlight Pin Assignment

Recommended connector : H201K-P02N-02B (MOLEX 51021-0200 COMPATIBLE)

| NO. | Symbol | I/O | Description                                    | Remark |
|-----|--------|-----|--|--------|
| 1   | HI     | I   | Power supply for backlight unit (High voltage) |        |
| 2   | GND    | -   | Ground for backlight unit                      |        |

## 3. Absolute Maximum Ratings

| Item          | Symbol    | Condition | Min. | Max. | Unit | Remark |
|---------------|-----------|-----------|------|------|------|--------|
| Power Voltage | VDDIO     | GND=0     | -0.5 | 5    | V    |        |
|               | VDPA      | GND=0     | -0.5 | 5.9  | V    |        |
|               | VDNA      | GND=0     | -5.9 | 0.5  | V    |        |
|               | VGH       | GND=0     | VDPA | --   | V    |        |
|               | VGL       | GND=0     | --   | VDNA | V    |        |
|               | VGH - VGL |           | -    |      | 32   | V      |

|                       |                    |       |          |           |    |        |
|-----------------------|--------------------|-------|----------|-----------|----|--------|
| Input signal voltage  | V <sub>i</sub>     | GND=0 | -0.3     | VDDIO+0.3 | V  | Note 1 |
|                       | V <sub>COM</sub>   | GND=0 | -3.5     | 0         | V  |        |
|                       | V <sub>1~V5</sub>  | GND=0 | 0        | VDPA-0.2  | V  |        |
|                       | V <sub>6~V10</sub> | GND=0 | VDNA+0.2 | 0         | V  |        |
| Operating temperature | T <sub>opa</sub>   |       |          |           | °C |        |
| Storage temperature   | T <sub>stg</sub>   |       |          |           | °C |        |

Note 1: DE, Digital Data.

Note 2: Functional operation should be restricted under ambient temperature (25°C).

Note 3: Maximum ratings are those values beyond which damages to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics chapter.

## 4. Electrical DC Characteristics

### a. DC Characteristics

| Item                   | Symbol  | Min.     | Typ.      | Max.     | Unit      | Remark |
|------------------------|---------|----------|-----------|----------|-----------|--------|
| Power supply           | VDDIO   | 3        | 3.3       | 3.6      | V         |        |
|                        | VDPA    | TBD      | 5         | 5.5      | V         |        |
|                        | VDNA    | -5.5     | -5        | TBD      | V         |        |
|                        | VGH     |          | 14        |          | V         |        |
|                        | VGL     |          | -14       |          | V         |        |
| VCOM                   | Vcdc    | -1.6     | -1.9      | -2.2     | V         |        |
| Input signal voltage   | H Level | Vih      | 0.7xVDDIO | --       | VDDIO     | Note 1 |
|                        | L Level | Vil      | 0         | --       | 0.3xVDDIO |        |
| Pull-up/down impedance | Rin     | --       | 800k      | --       |           |        |
| Input level of V1~V5   | Vx      | GND      | --        | VDPA-0.2 | V         | Note 2 |
| Input level of V6~V10  | Vx      | VDNA+0.2 | --        | GND      | V         | Note 2 |

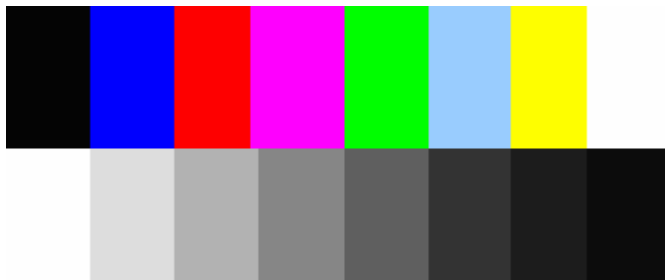
Note 1: DE, Digital Data

Note 2 : VDPA > V1 > V2 > V3 > V4 > V5 > V6 > V7 > V8 > V9 > V10 > VDNA

### b. Current Consumption (AGND=GND=0V)

| Parameter               | Symbol | Condition          | Min. | Typ.  | Max.  | Unit | Remark |
|-------------------------|--------|--------------------|------|-------|-------|------|--------|
| Input current for VDDIO | IVDDIO | VDDIO=3.3V         | -    | 6.45  | 7     | mA   | Note 1 |
| Input current for VDPA  | IVDPA  | VDPA=5V            | -    | 5.58  | 12.9  | mA   | Note 1 |
| Input current for VDNA  | IVDNA  | VDNA=-5V           | -    | -5.68 | -13.4 | mA   | Note 1 |
| Input current for VGH   | IVGH   | VGH=14V            | -    | 3.96  | 5     | mA   | Note 1 |
| Input current for VGL   | IVGL   | VGL=-14V           | -    | -4.04 | -5    | mA   | Note 1 |
| Input Leakage Current   | Iin    | Digital input pins | -    | -     | ±1    | uA   | Note 2 |

Note 1: The test pattern use the following pattern.

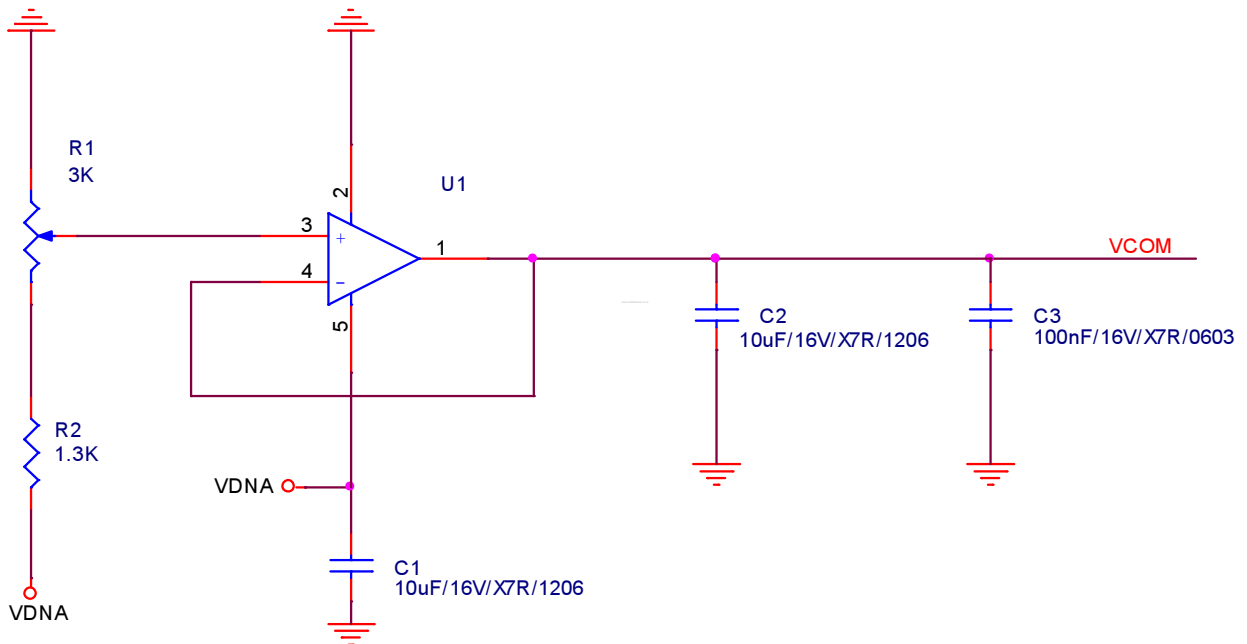


Note 2: except for pull-up, pull-down pins.

**c. Gamma voltage suggested circuit is as follows**

|     |         |
|-----|---------|
| V1  | 4.296V  |
| V2  | 2.929V  |
| V3  | 2.358V  |
| V4  | 2.012V  |
| V5  | 1.003V  |
| V6  | -1V     |
| V7  | -1.958V |
| V8  | -2.35V  |
| V9  | -2.853V |
| V10 | -4.3V   |

**d. Vcom buffer suggested circuit is as follows**

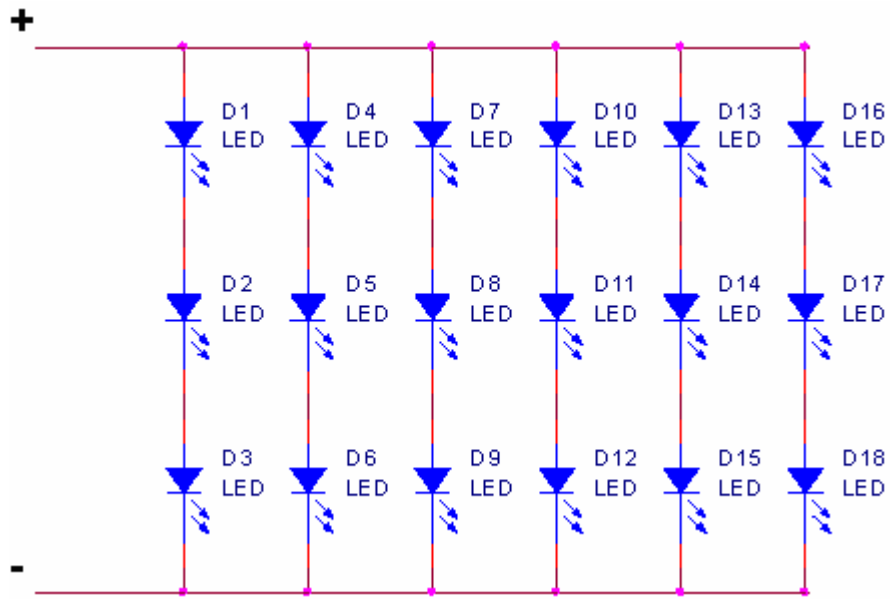


**e. Backlight Driving Conditions**

| Parameter              | Symbol | Min.   | Typ. | Max. | Unit | Remark          |
|------------------------|--------|--------|------|------|------|-----------------|
| LED Lightbar current   | $I_L$  | -      | 150  | -    | mA   | Note 1, 2       |
| Power consumption      | P      |        | 1.58 | 1.68 | W    |                 |
| LED Lightbar life time |        | 10,000 | -    | -    | Hr   | Note 1, 2, 3, 4 |

Note 1: LED backlight is LED lightbar type(18 pcs of LED).

Note 2: Definition of "LED Lifetime": brightness is decreased to 50% of the initial value. LED Lifetime is restricted under normal condition, ambient temperature = 25°C and LED lightbar current= 150mA



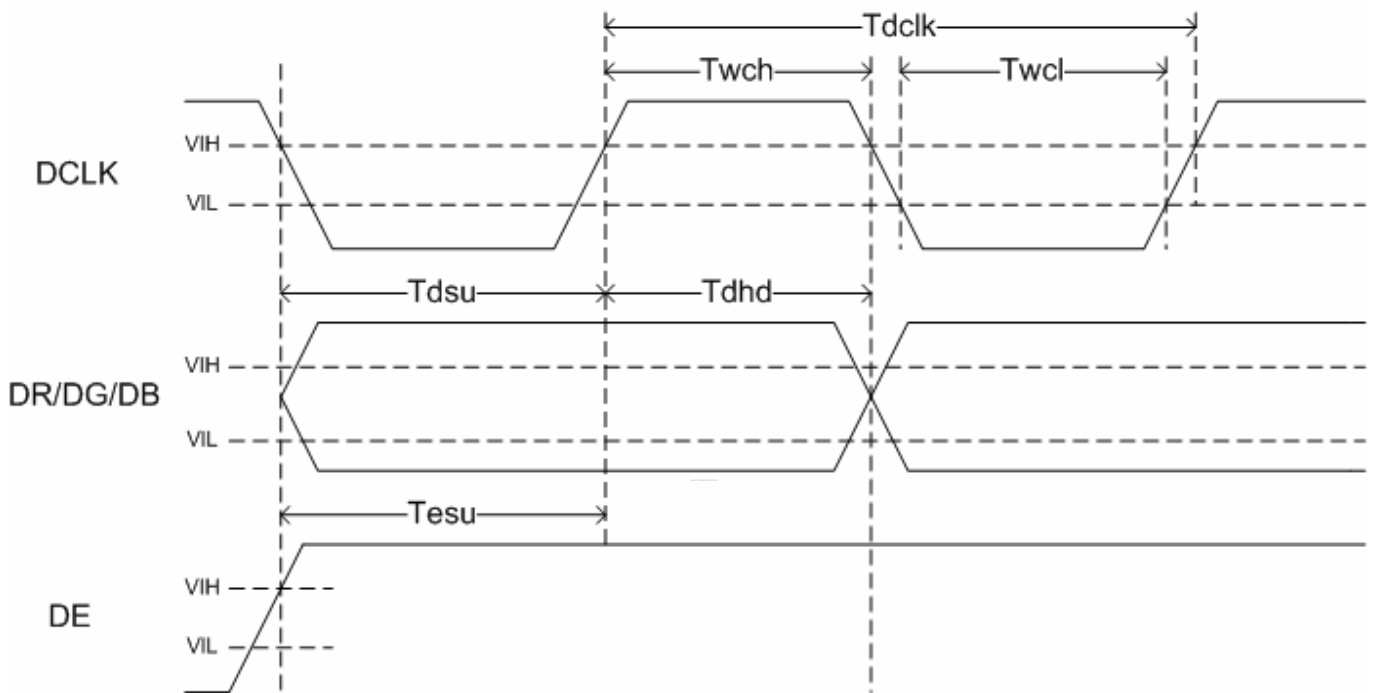
Note 3: The value is only for reference.

Note 4: If it operates with LED lightbar voltage more than 150mA, it may decrease LED lifetime.

## 5. Electrical AC Characteristics

### a. Signal AC Characteristics

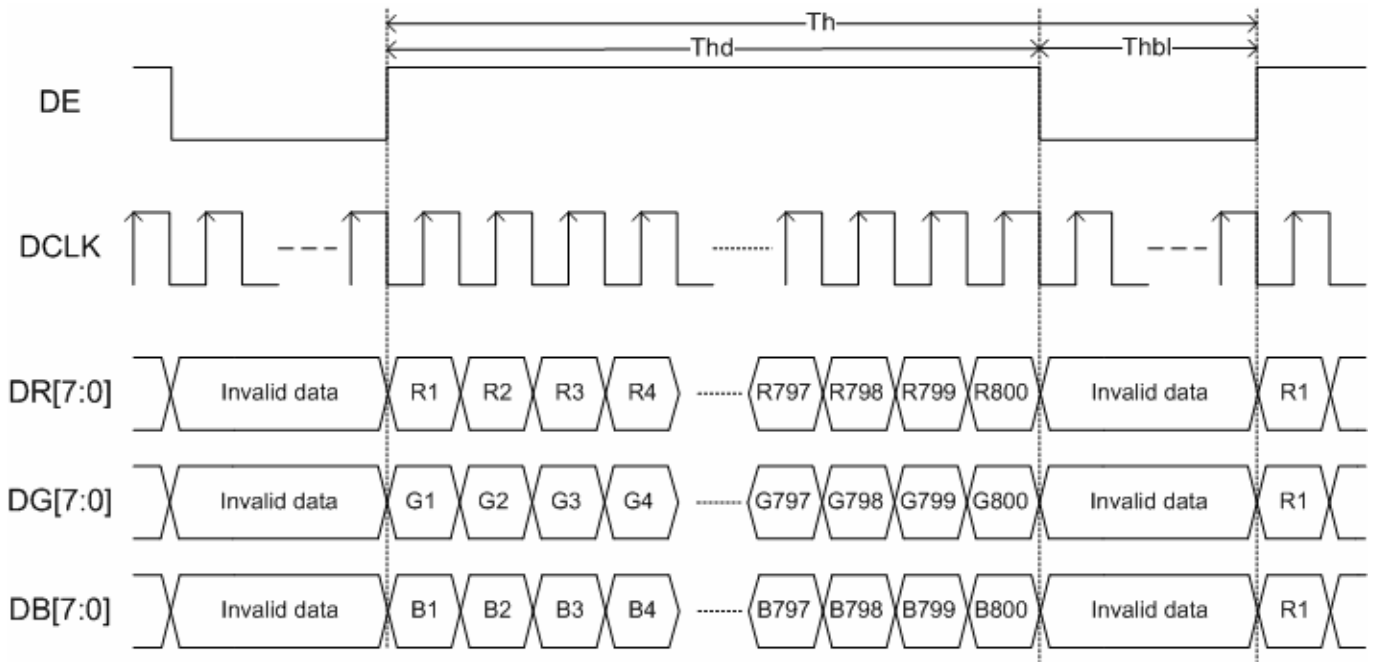
| Parameter               | Symbol | Min. | Typ. | Max. | Unit. | Remark |
|-------------------------|--------|------|------|------|-------|--------|
| Clock High time         | Twcl   | 8    | --   | --   | ns    |        |
| Clock Low time          | Twch   | 8    | --   | --   | ns    |        |
| Data setup time         | Tdsu   | 5    | --   | --   | ns    |        |
| Data hold time          | Tdhd   | 10   | --   | --   | ns    |        |
| Data enable set-up time | Tesu   | 4    | --   | --   | ns    |        |



### b. Input Timing Setting

Horizontal timing:

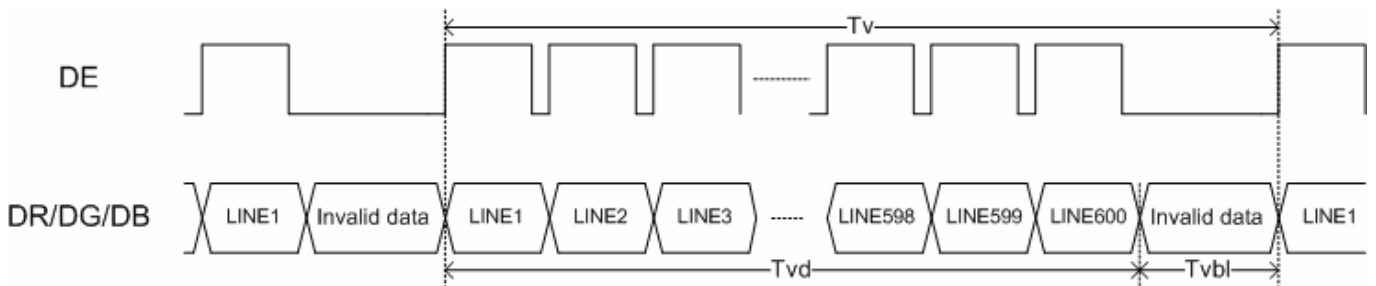
| Parameter                   | Symbol | Min. | Typ. | Max. | Unit. | Remark |
|-----------------------------|--------|------|------|------|-------|--------|
| DCLK frequency              | Fdclk  | 36.7 | 40   | 45.1 | MHz   |        |
| DCLK period                 | Tdclk  | 22   | 25   | 27   | ns    |        |
| Hsync period (= Thd + Thbl) | Th     | 986  | 1056 | 1183 | DCLK  |        |
| Active Area                 | Thd    | --   | 800  | --   | DCLK  |        |
| Horizontal blanking         | Thbl   | 186  | 256  | 383  | DCLK  |        |



**Horizontal input timing**

Vertical timing:

| Parameter                   | Symbol | Min. | Typ. | Max. | Unit. | Remark |
|-----------------------------|--------|------|------|------|-------|--------|
| Vsync period (= Tvd + Tvbl) | Tv     | 620  | 628  | 635  | Th    |        |
| Active lines                | Tvd    | --   | 600  | --   | Th    |        |
| Vertical blanking           | Tvbl   | 20   | 28   | 35   | Th    |        |



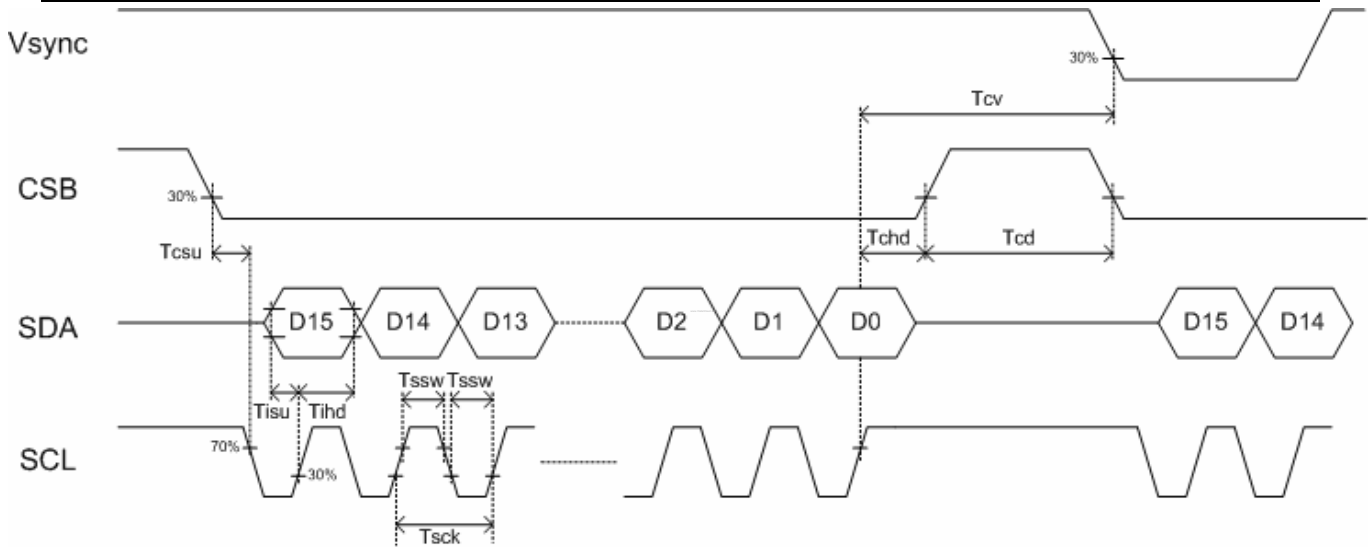
**Vertical timing**



## 6. Serial Interface Characteristics

### a. Serial Control Interface AC Characteristic

| Parameter               | Symbol | Min. | Typ. | Max. | Unit. | Remark |
|-------------------------|--------|------|------|------|-------|--------|
| Serial clock            | Tsck   | 320  | --   | --   | ns    |        |
| SCL pulse duty          | Tscw   | 40%  | 50%  | 60%  | Tsck  |        |
| Serial data setup time  | Tisu   | 120  | --   | --   | ns    |        |
| Serial data hold time   | Tihd   | 120  | --   | --   | ns    |        |
| Serial clock high/low   | Tssw   | 120  | --   | --   | ns    |        |
| CSB setup time          | Tcsu   | 120  | --   | --   | ns    |        |
| CSB hold time           | Tchd   | 120  | --   | --   | ns    |        |
| Delay from CSB to VSYNC | Tcv    | 1    | --   | --   | us    |        |
| Chip select distinguish | Tcd    | 1    | --   | --   | us    |        |



AC serial interface write mode timings

### b. Register Bank

A totally 16-bit register including 7-bit address D[15:9], 1-bit Read bit D[8], and 8-bit data D[7:0] can be set via 3-wire serial peripheral interface. Beflow figure is for a detail description of the parameters.

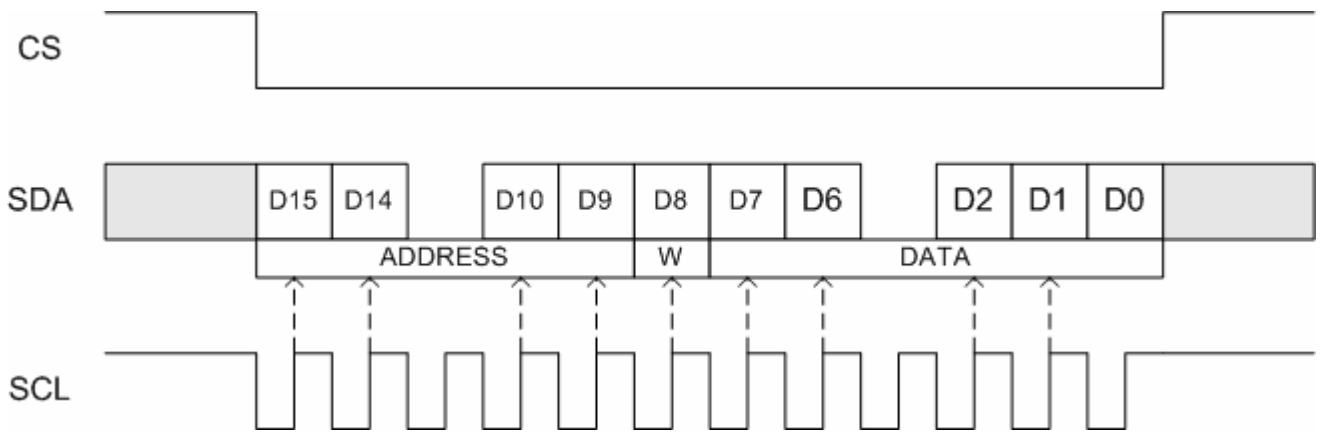


Figure. Serial interface read sequence

- (1) Each serial command consists of 16bits of data which is loaded one bit a time at the rising edge of serial slock SCL.
- (2) Command loading operation starts from the falling edge of CS and is completed at the next rising edge of CS.
- (3) The serial control block is operational after power on reset, but commands are established by the following rising edge of End Frame. If command is transferred multiple times for the same resgister, the last command before the following rising edge of the End Frame is valid, except for some special registers (ex. GRB, etc.).
- (3) If less the 16 bits of SCL are input while CS is low, the transferred data is ignored. The read operation interrupt.
- (4) If 16 bits or more of SCL are input while CS is low, the first 16 bits of transferred data in the duration of CS="L" are valid data.
- (5) Serial block operates with the SCL clock
- (6) Serial data can be accepted in the standby(power save) mode.
- (7) It is suggested that DE, DCLK always exists in the same time.
- (8) When GRB is activated through the serial interface, all register are cleared, except the GRB value.
- (9) The register setting values are rewritten by the influence of static electricity, a noise, etc. to unsuitable value, incorrect operating may occur. It is suggested that the SPI interface will setup as frequently as possible.

**c. Serial Interface Setting Table.**

| Reg | ADDRESS |     |     |     |     |     |    | R | DATA |    |    |    |    |    |    |    |
|-----|---------|-----|-----|-----|-----|-----|----|---|------|----|----|----|----|----|----|----|
|     | D15     | D14 | D13 | D12 | D11 | D10 | D9 |   | D8   | D7 | D6 | D5 | D4 | D3 | D2 | D1 |
| R0  | 0       | 0   | 0   | 0   | 0   | 0   | 0  | 0 | --   | -- | -- | -- | -- | -- | 0  | 1  |
| R1  | 0       | 0   | 0   | 0   | 0   | 0   | 1  | 0 | --   | -- | -- | -- | 00 |    | 00 |    |
|     |         |     |     |     |     |     |    |   |      |    |    |    |    |    |    |    |
|     |         |     |     |     |     |     |    |   |      |    |    |    |    |    |    |    |

#### d. Register Description

##### R0 setting

| Address | Bit   | Discription |                      | Default |
|---------|-------|-------------|----------------------|---------|
| 000000  | 7 - 2 | --          | AUO internal use     | 000111  |
|         | 1     | STB         | Standby mode setting | 0       |
|         | 0     | GRB         | S/W global reset     | 1       |

| Bit 1 | STB                                   |
|-------|---------------------------------------|
| 0     | Nomal operation <b>(default)</b>      |
| 1     | Standby mode. Register data are kept. |

| Bit 0 | GRB   |
|-------|---|
| 0     | S/W global reset. Reset all register to default value. H/W GRB has higher priority. |
| 1     | Normal operation. <b>(default)</b>  |

##### R1 Settings

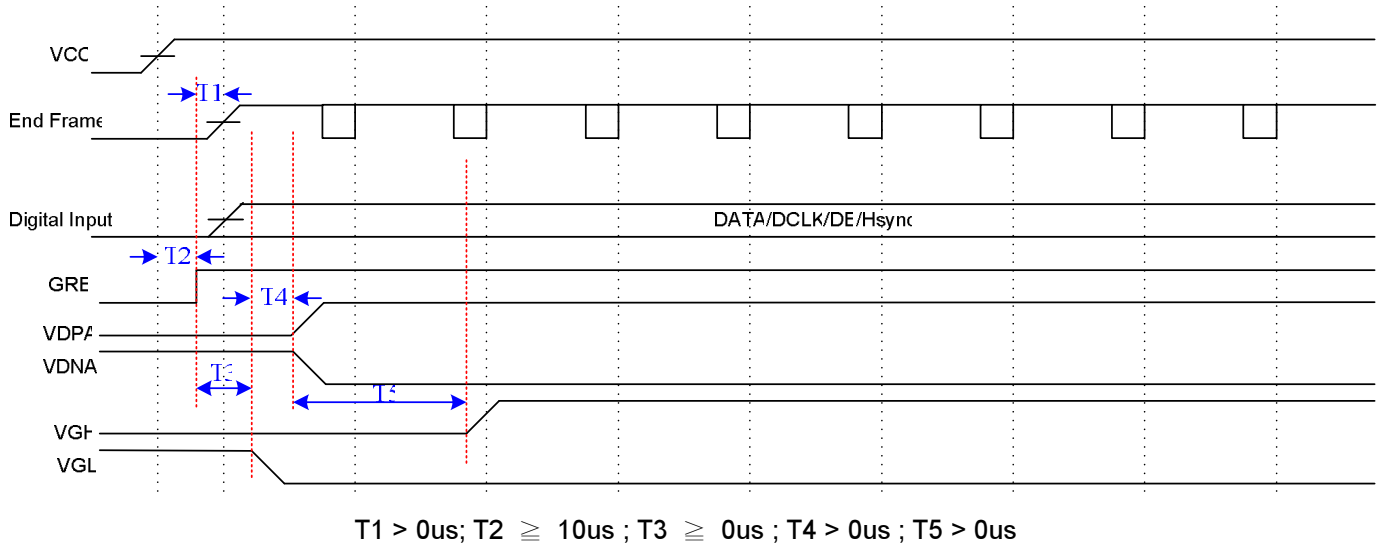
| Address | Bit   | Discription |                                   | Default |
|---------|-------|-------------|-----------------------------------|---------|
| 000001  | 7 - 4 | --          | AUO internal use                  | 0000    |
|         | 3 - 2 | CHUD        | Vertical scan direction setting   | 00      |
|         | 1 - 0 | CHLR        | Horizontal scan direction setting | 00      |

| Bit 3 - 2 | CHUD  |
|-----------|---|
| 0x        | Accoring to H/W pin U/D setting. <b>(default)</b> |
| 10        | Vertical scan direction is from up to down.       |
| 11        | Vertical scan direction is from down to up.       |

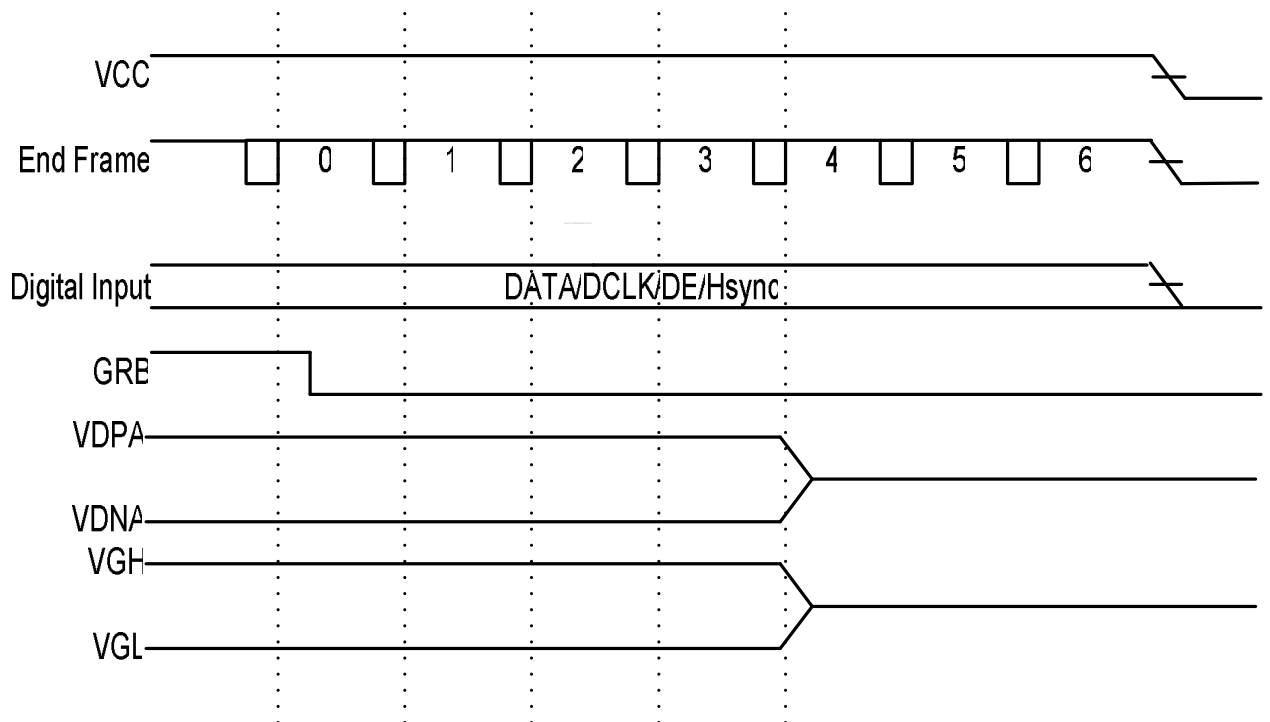
| Bit 1 - 0 | CHLR  |
|-----------|---|
| 0x        | Accoring to H/W pin L/R setting. <b>(default)</b> |
| 10        | Horizontal scan direction is from left to right.  |
| 11        | Horizontal scan direction is from right to left.  |

## 7. Power On/Off Characteristics

### a. Recommended Power On Sequence



### b. Power Off Sequence



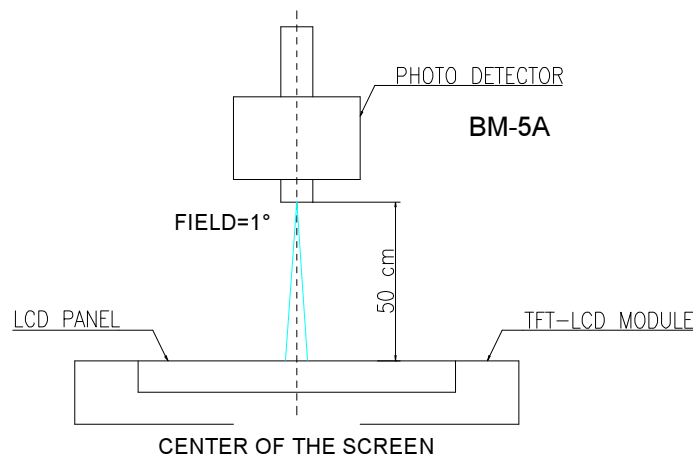
## D. Optical Specification

All optical specification is measured under typical condition (Note 1, 2)

| Item           | Symbol       | Condition                  | Min.             | Typ. | Max. | Unit     | Remark |
|----------------|--------------|----------------------------|------------------|------|------|----------|--------|
| Response Time  |              |                            |                  |      |      |          |        |
| Rise           | Tr           | $\theta=0^\circ$           | --               | 12   | 24   | ms       | Note 3 |
| Fall           | Tf           |                            | --               | 18   | 36   |          |        |
| Contrast ratio | CR           | At optimized viewing angle | 400              | 500  | --   |          | Note 4 |
| Viewing Angle  | Top          | $CR \geq 10$               | 40               | 60   |      | deg.     | Note 5 |
|                | Bottom       |                            | 50               | 65   |      |          |        |
|                | Left         |                            | 60               | 70   |      |          |        |
|                | Right        |                            | 60               | 70   |      |          |        |
| Brightness     | $Y_L$        | $V_L = 12V$                | 200              | 250  | --   | $cd/m^2$ | Note 6 |
| Chromaticity   | White        | X                          | $\theta=0^\circ$ | 0.26 | 0.31 | 0.36     |        |
|                |              | Y                          | $\theta=0^\circ$ | 0.28 | 0.33 | 0.38     |        |
|                | Red          | X                          | $\theta=0^\circ$ | 0.56 | 0.61 | 0.66     |        |
|                |              | Y                          | $\theta=0^\circ$ | 0.30 | 0.35 | 0.40     |        |
|                | Green        | X                          | $\theta=0^\circ$ | 0.27 | 0.32 | 0.37     |        |
|                |              | Y                          | $\theta=0^\circ$ | 0.51 | 0.56 | 0.61     |        |
|                | Blue         | X                          | $\theta=0^\circ$ | 0.10 | 0.15 | 0.20     |        |
|                |              | Y                          | $\theta=0^\circ$ | 0.07 | 0.12 | 0.17     |        |
| Uniformity     | $\Delta Y_L$ | %                          | 70               | 75   | --   | %        | Note 7 |

Note 1 : To be measured in the dark room. Ambient temperature =25°C, and LED lightbar current  $I_L = 150mA$ .

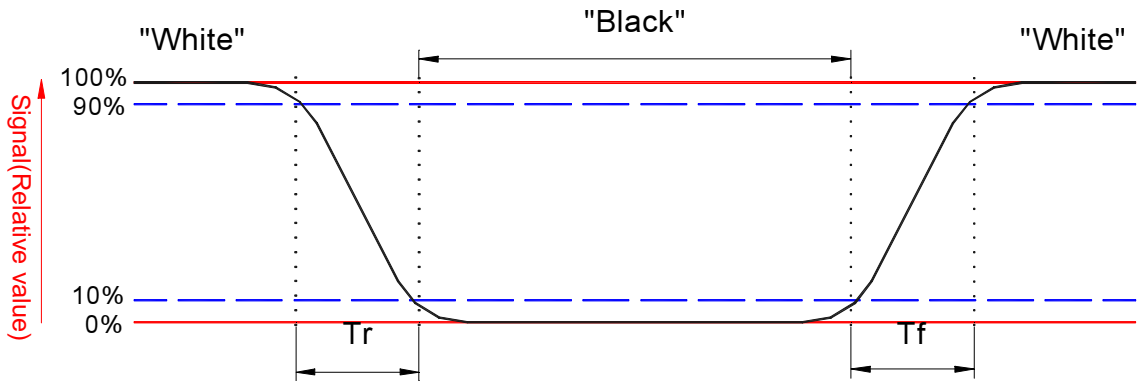
Note 2 :To be measured on the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-5A, after 15 minutes operation.



**Note 3: Definition of response time:**

The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively.

The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.

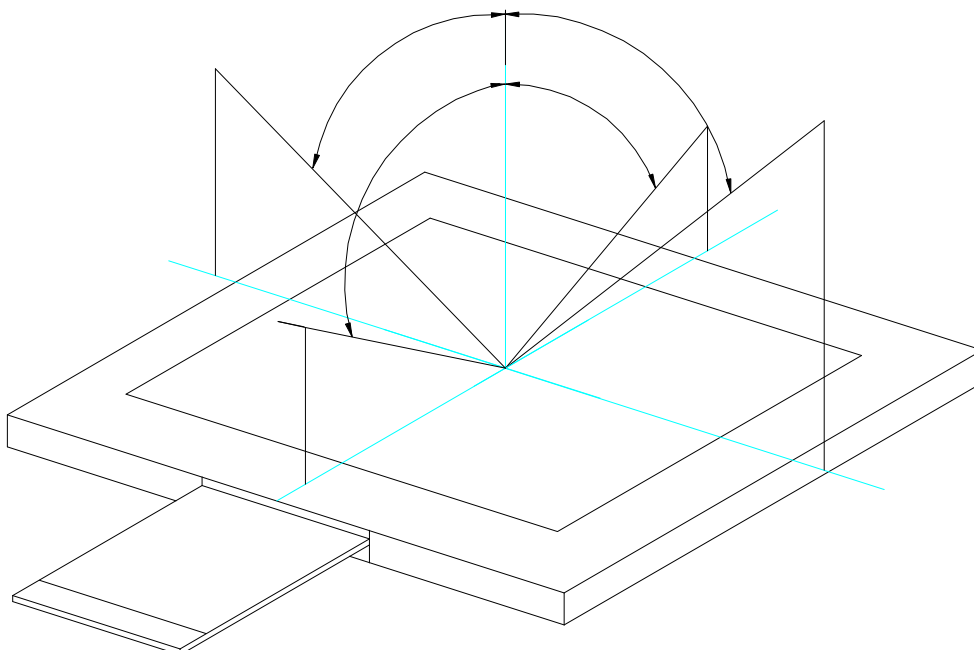


**Note 4. Definition of contrast ratio:**

Contrast ratio is calculated with the following formula.

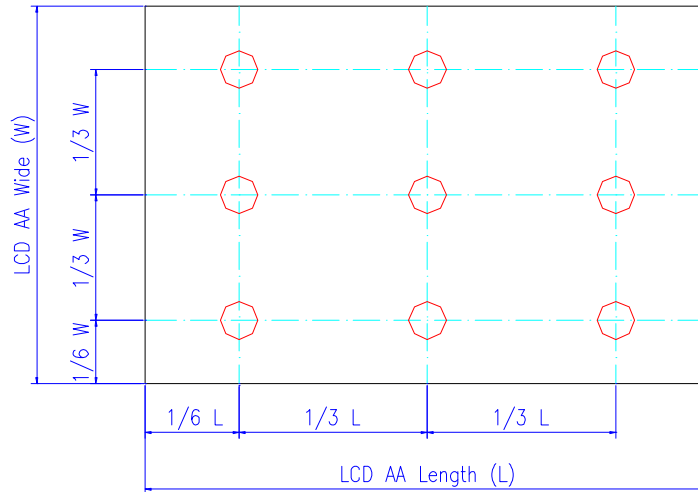
$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" status}}{\text{Photo detector output when LCD is at "Black" status}}$$

**Note 5. Definition of viewing angle,  $\theta$ , Refer to figure as below.**



Note 6. Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 7: Luminance Uniformity of these 9 points is defined as below:



$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

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## E. Reliability Test Items

| No. | Test items                       | Conditions   | Remark  |
|-----|----------------------------------|--|---|
| 1   | High Temperature Storage         | Ta= 70□ 240Hrs   |   |
| 2   | Low Temperature Storage          | Ta= -30□ 240Hrs  |   |
| 3   | High Ttemperature Operation      | Tp= 60□ 240Hrs   |   |
| 4   | Low Temperature Operation        | Ta= -10□ 240Hrs  |   |
| 5   | High Temperature & High Humidity | Tp= 50□. 80% RH 240Hrs   | Operation   |
| 6   | Heat Shock                       | -10□~60□, 100 cycle, 1Hrs/cycle  | Non-operation   |
| 7   | Electrostatic Discharge          | Contact = ± 4 kV, class B<br>Air = ± 8 kV, class B   | Note 4  |
| 8   | Image Sticking                   | 25□, 4hrs  | Note 5  |
| 9   | Vibration                        | Frequency range : 10~55Hz<br>Stoke : 1.5mm<br>Sweep : 10 ~ 55 ~ 10Hz<br>2 hours for each direction of X,Y,Z<br>(6 hours for total) | Non-operation<br>JIS C7021, A-10<br>condition A<br>: 15 minutes |
| 10  | Mechanical Shock                 | 100G . 6ms, ±X,±Y,±Z<br>3 times for each direction   | Non-operation<br>JIS C7021,<br>A-7<br>condition C               |
| 11  | Vibration (With Carton)          | Random vibration:<br>0.015G <sup>2</sup> /Hz from 5~200Hz<br>-6dB/Octave from 200~500Hz  | IEC 68-34   |
| 12  | Drop (With Carton)               | Height: 60cm<br>1 corner, 3 edges, 6 surfaces  |   |
| 13  | Pressure                         | 5kg, 5sec  | Note 6  |

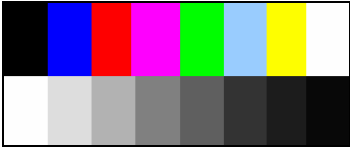
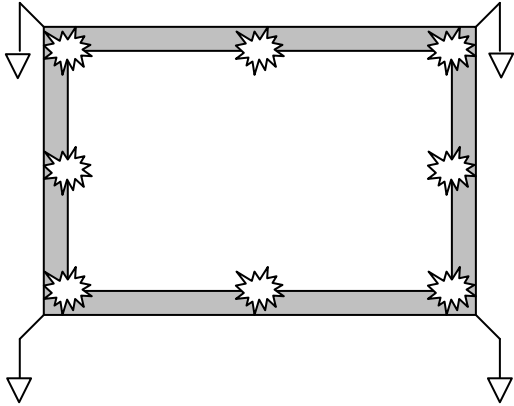
Note 1: Ta: Ambient Temperature. Tp: Panel Surface Temperature

Note 2: In the standard conditions, there is not display function NG issue occurred. All the cosmetic specification is judged before the reliability stress.

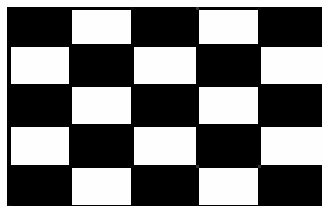
Note 3: All the cosmetic specification is judged before the reliability stress.



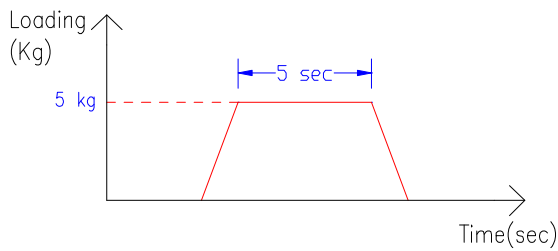
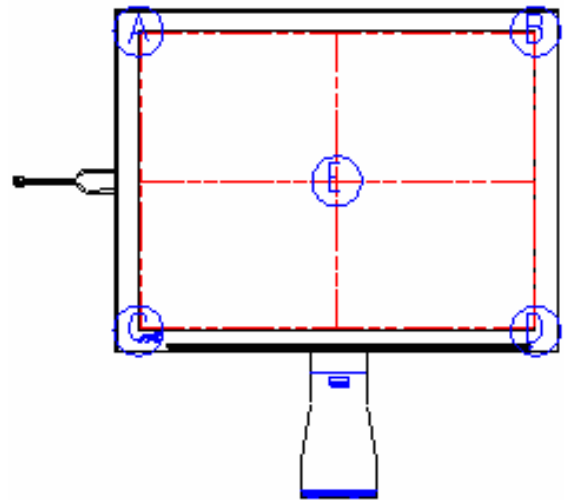
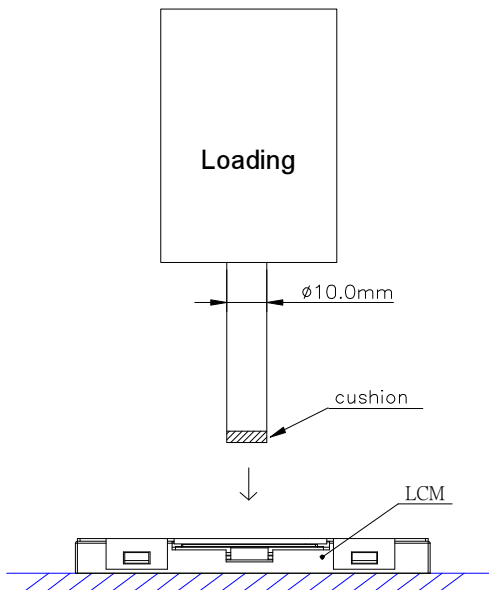
Note4 : All test techniques follow IEC6100-4-2 standard.

| Test Condition                     |   | Note |
|------------------------------------|---|------|
| <p><b>Pattern</b></p>              |    |      |
| <p><b>Procedure And Set-up</b></p> | <p>Contact Discharge : 330Ω, 150pF, 1sec, 8 point, 25times/point<br/>           Air Discharge : 330Ω, 150pF, 1sec, 8 point, 25times/point</p>  |      |
| <p><b>Criteria</b></p>             | <p>B – Some performance degradation allowed. No data lost.<br/>           Self-recoverable hardware failure.</p>  |      |
| <p><b>Others</b></p>               | <p>1. Gun to Panel Distance<br/>           2. No SPI command, keep default register settings.</p>   |      |

Note 5: Operate with 5x5 chess board pattern as figure and lasting time and temperature as the conditions. Then judge with 50% gray level after waiting 20 min, the mura is less than JND 2.5.



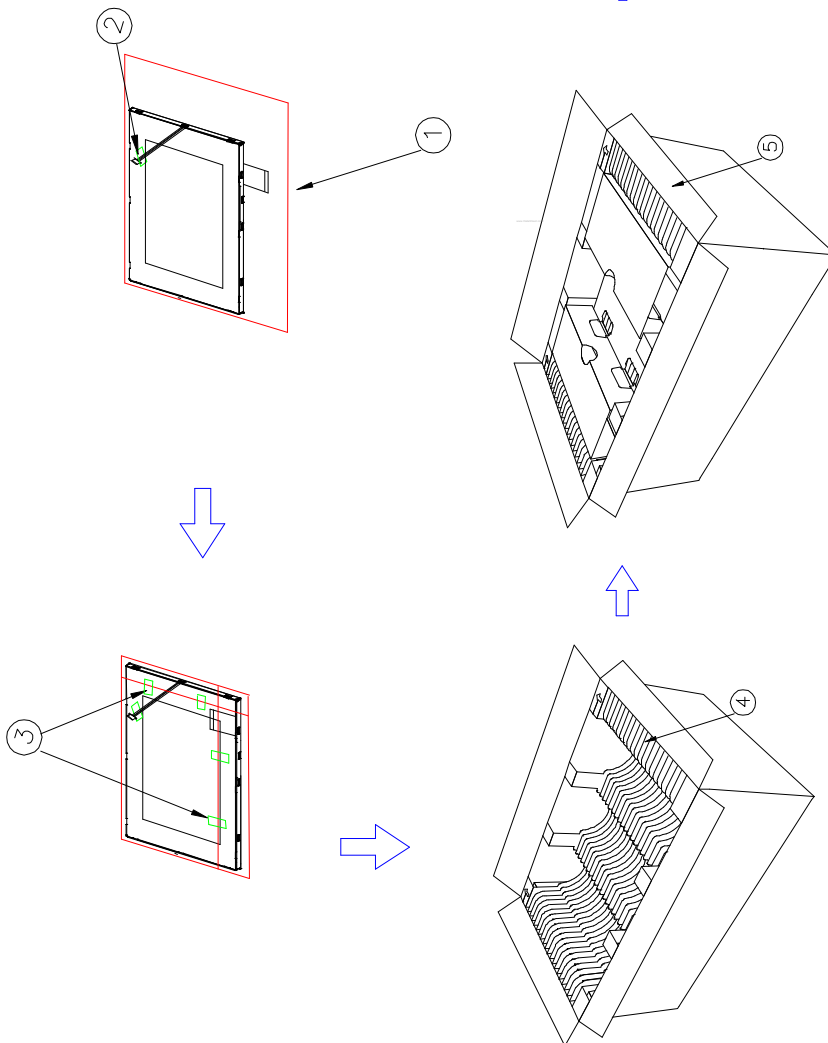
Note 6: The panel is tested as figure. The jig is  $\phi$  10 mm made by Cu with rubber and the loading speed is 3mm/min on position A~E. After the condition, no glass crack will be found and panel function check is OK.( no guarantee LC mura \ LC bubble)



## F. Packing and Marking

### 1. Packing Form

| No. | Part Name                 | Part No.     |
|-----|---------------------------|--------------|
| 1   | A/S BAG A080FW01          | 79.08A02.001 |
| 2   | S291 TAPE                 | 84.01A04.001 |
| 3   | TAPE CREPED TAPE          | 80.07C01.004 |
| 4   | CUSHION PACKAGING         | 83.08A07.001 |
| 5   | CARTON AB ORG 520*340*250 | 81.01A09.003 |
| 6   | CARTON BLANK LABEL        | 82.17B02.001 |



Max. capacity: 30 modules  
 Max. Weight : 7kg  
 Carton outline : 520 x 340 x 250 mm

## 2. Module/Panel Label Information

The module/panel (collectively called as the "Product") will be attached with a label of Shipping Number which represents the identification of the Product at a specific location. Refer to the Product outline drawing for detailed location and size of the label. The label is composed of a 22-digit serial number and printed with code 39/128 with the following definition:

ABCDEFGHIJKLMNOPQRSTUV

- For internal system usage and production serial numbers.
- AUO Module or Panel factory code, represents the final production factory to complete the Product
- Product version code, ranging from 0~9 or A~Z (for Version after 9)
- Week Code, the production week when the product is finished at its production process

## 3. Carton Label Information

The packing carton will be attached with a carton label where packing Q'ty, AUO Model Name, AUO Part Number, Customer Part Number (Optional) and a series of Carton Number in 13 or 14 digits are printed. The Carton Number is appearing in the following format:

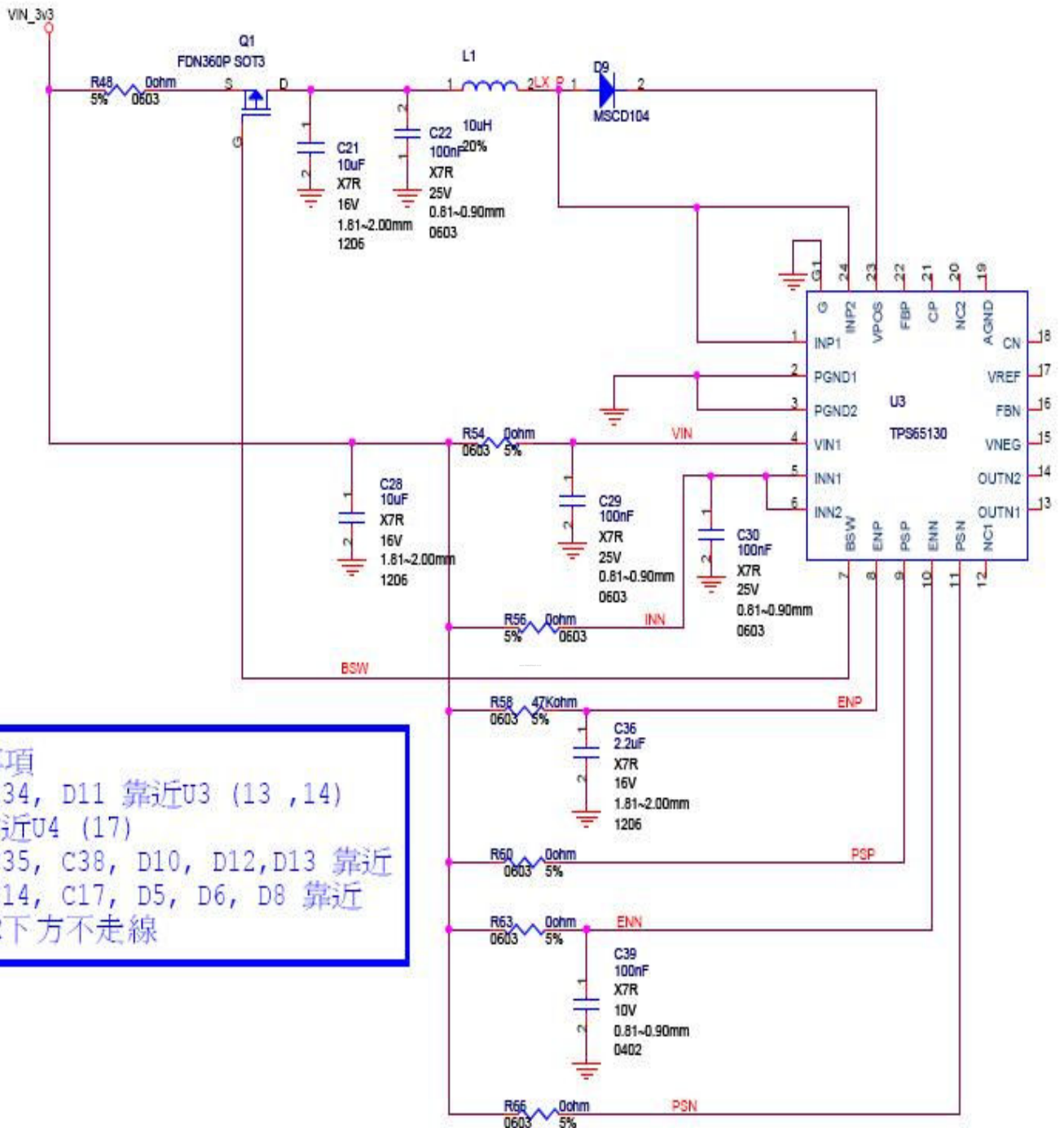
ABC-DEFG-HIJK-LMN

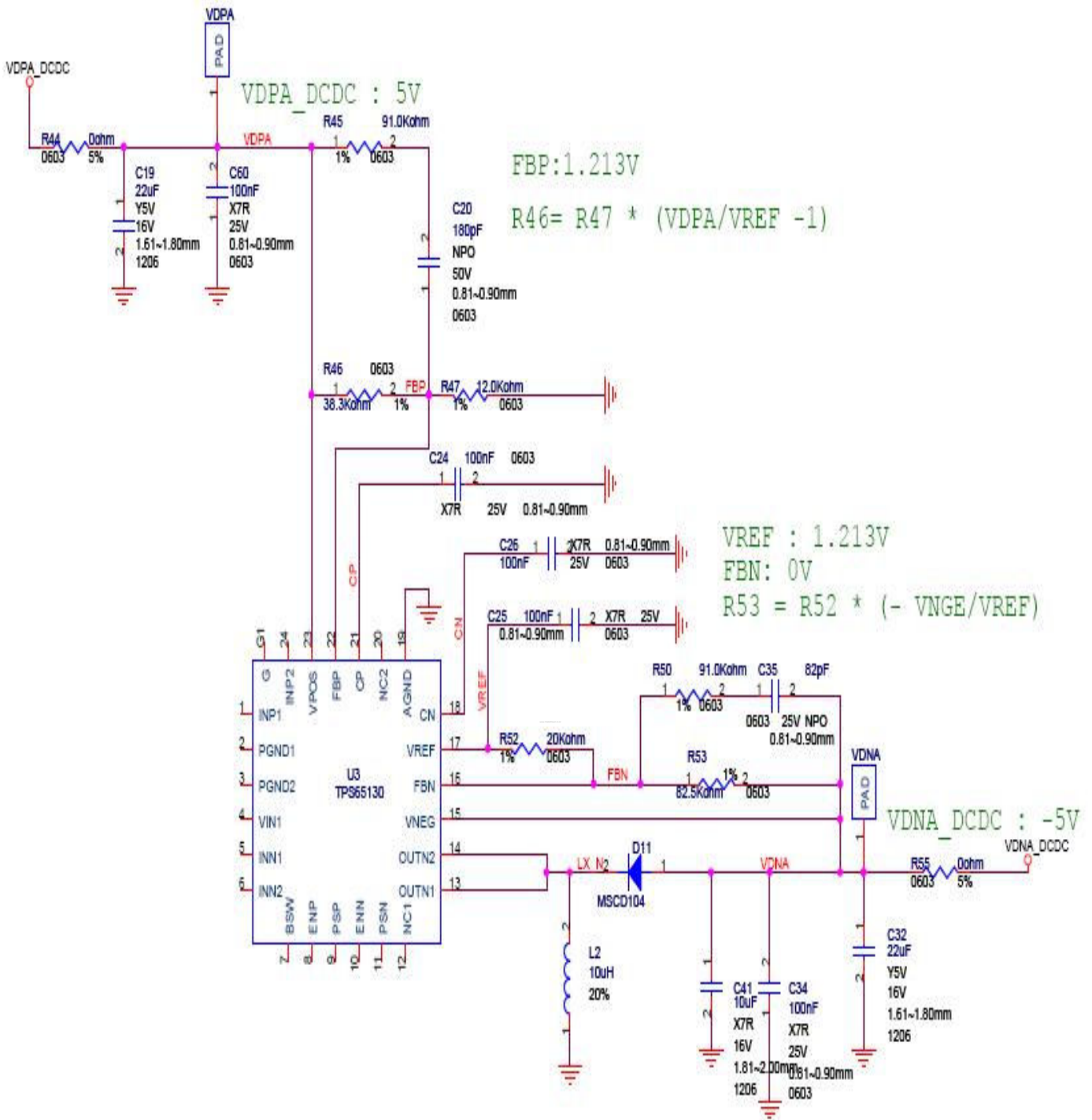
- DEFG appear after first "-" represents the packing date of the carton
  - Date from 01 to 31
  - Month, ranging from 1~9, A~C. A for Oct, B for Nov and C for Dec.
  - A.D. year, ranging from 1~9 and 0. The single digit code represents the last number of the year

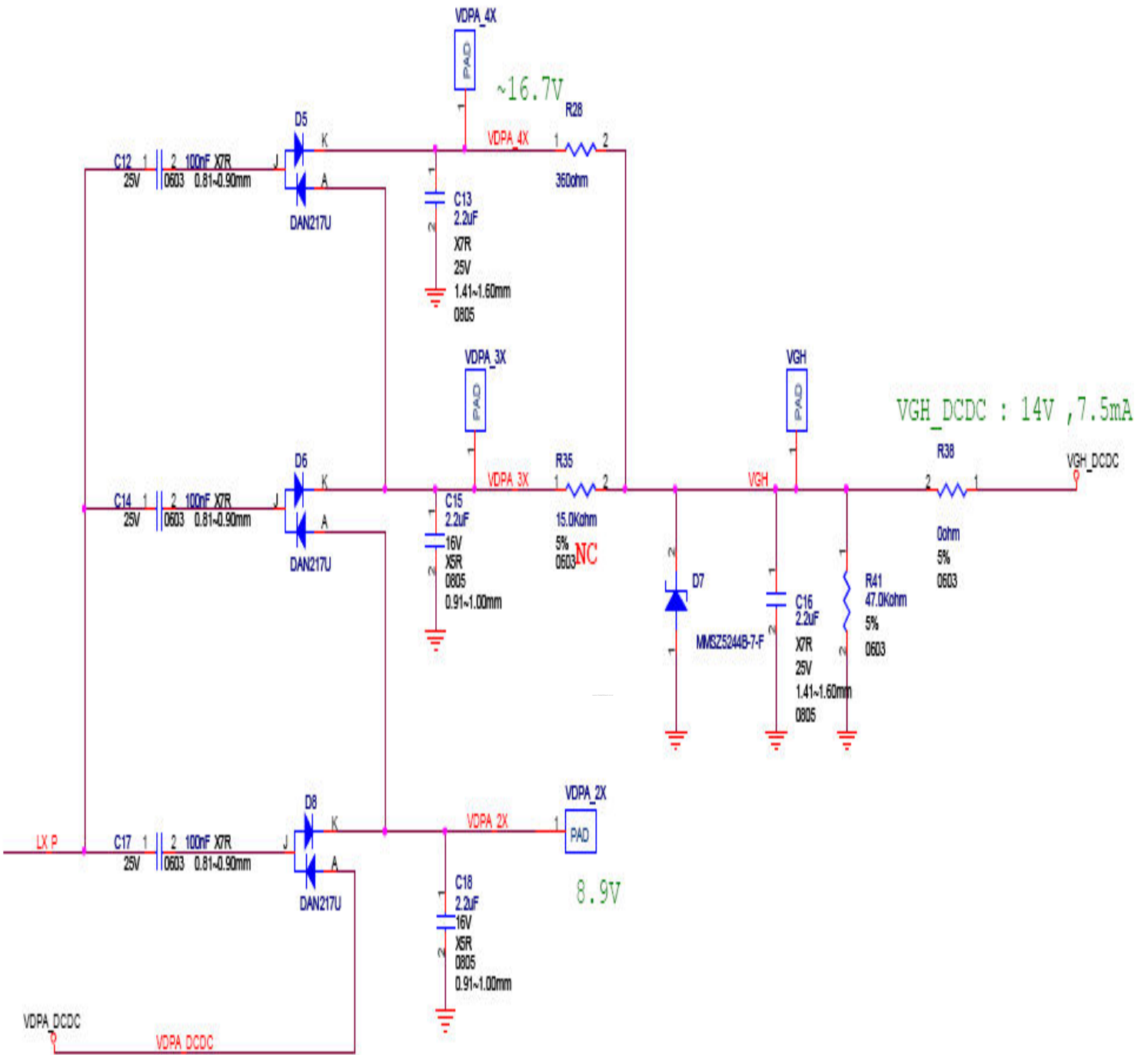
Refer to the drawing of packing format for the location and size of the carton label.

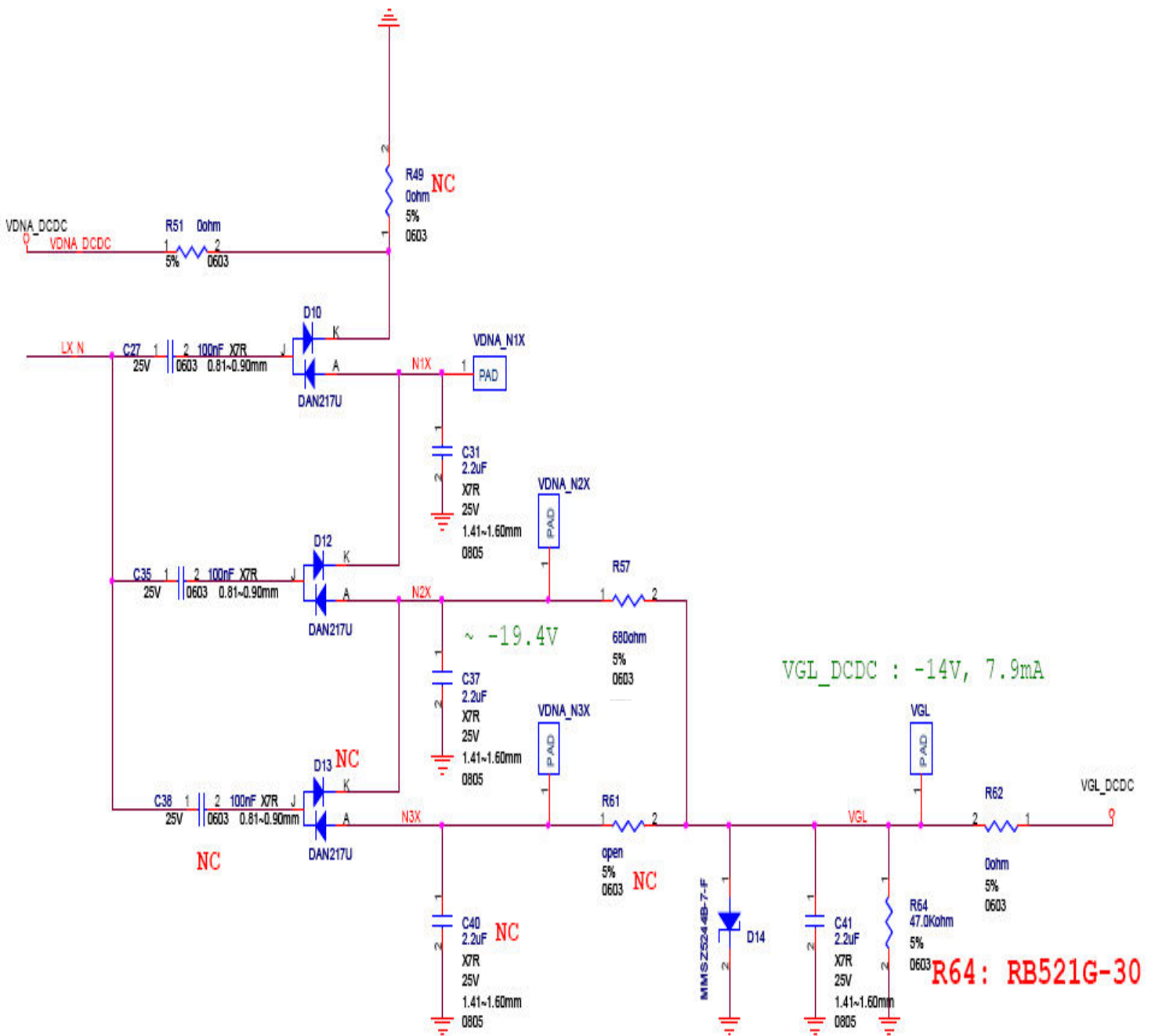
## G. Application Note

### 1. Application Circuit













## 2. CABC function block

TBD

## H. Precautions

1. Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
2. Adopt measures for good heat radiation. Be sure to use the module with in the specified temperature.
3. Avoid dust or oil mist during assembly.
4. Follow the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
5. Less EMI: it will be more safety and less noise.
6. Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
7. Avoid to display the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image sticking.
8. Be sure to turn off the power when connecting or disconnecting the circuit.
9. Polarizer scratches easily, please handle it carefully.
10. Display surface never likes dirt or stains.
11. A dewdrop may lead to destruction. Please wipe off any moisture before using module.
12. Sudden temperature changes cause condensation, and it will cause polarizer damaged.
13. High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
14. Acetic acid or chlorine compounds are not friends with TFT display module.
15. Static electricity will damage the module, please do not touch the module without any grounded device.
16. Do not disassemble and reassemble the module by self.
17. Be careful do not touch the rear side directly.
18. No strong vibration or shock. It will cause module broken.
19. Storage the modules in suitable environment with regular packing.
20. Be careful of injury from a broken display module.
21. Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the display non-uniformity or other function issue.