

## ***TFT-Display Datenblatt***

Modell FG070100DSSWNG01

### **Kurzdaten**

Hersteller	Data Image
Diagonale	7" / 17,8 cm
Format	wide
Auflösung	1280 x 800
Backlight	LED / 400 cd/m <sup>2</sup>
Interface	LVDS
Touchscreen	nein
Temperatur	-10°... +60°C (Betrieb)



Confidential Document

# DATA IMAGE CORPORATION

## TFT Module Specification Preliminary

ITEM NO.: FG070100DSSWNG01

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### 3. GENERAL SPECIFICATIONS

Parameter	Specifications	Unit
Screen Size	6.95 (diagonal)	inch
Display Format	1280(H) x (R,G,B) x 800(V)	dot
Driver Element	a-si TFT active matrix	
Pixel Pitch	0.117 (H) x 0.117 (V)	mm
Pixel Arrangement	RGB vertical stripe	
Outline Dimension	161(W) x 107(H) x 2.5 (D)	mm
Surface treatment	Hard coating (3H), Glare	
Back-light	LED	
Display mode	Normally Black	
Weight	TBD	g

### 4. ABSOLUTE MAXIMUM RATINGS

#### 4.1 ABSOLUTE RATINGS OF ENVIRONMENT

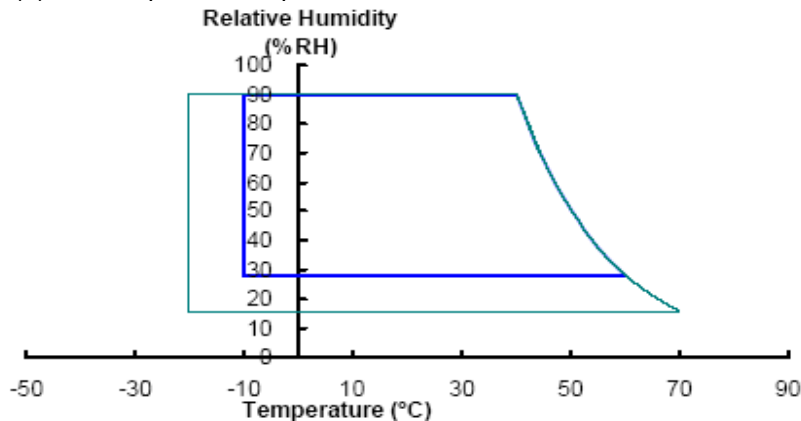
Parameter	Symbol	MIN.	MAX.	Unit	Remark
Storage temperature	Tst	-20	70	°C	Note(1)
Operating temperature	Top	-10	60	°C	Note(1),(2)

Note (1) (a) 90 %RH Max. ( $T_a \leq 40$  °C).

(b) Wet-bulb temperature should be 39 °C Max. ( $T_a > 40$  °C).

(c) No condensation.

Note (2) The temperature of panel surface should be -10 °C min. and 70 °C max.



#### 4.2 ELECTRICAL ABSOLUTE RATINGS

##### TFT LCD MODULE

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Driver Digital Power	VCCS	-0.3	-	5	V	
Data Driver Analog power	AVDD	-0.5	-	15	V	
TFT Turn-on Voltage	VGG	-0.3	-	40	V	
TFT Turn-off Voltage	VEE	-20	-	0.3	V	
Supply range, VGG-VEE	VGG-VEE	-0.3	-	40	V	
Digital Input Voltage	VI	-0.3	-	4	V	
VCOM Voltage	VCOM	-	(4)	-	V	

Note (1) Stresses beyond those listed in above "ELECTRICAL ABSOLUTE RATINGS" may cause permanent damage to the device. Normal operation should be restricted to the conditions described in "ELECTRICAL CHARACTERISTICS".

## 5. ELECTRICAL CHARACTERISTICS

### 5.1 LCD ELETRONICS SPECIFICATION

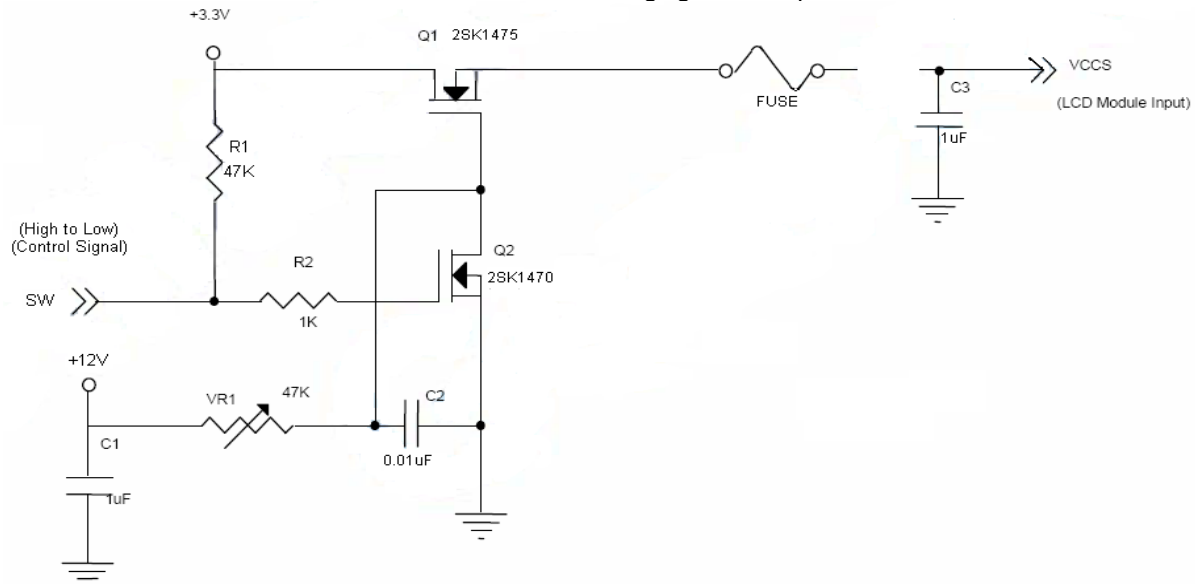
Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage	VCCS	3.0	3.3	3.6	V	Note(1)
Ripple Voltage	V <sub>RP</sub>	-	50	-	mV	Note(1)
CABC_EN, CE_EN H_Rev, V_Rev Input Voltage	High Level	V <sub>IH</sub>	2.3	-	3.6	V
	Low Level	V <sub>IL</sub>	0	-	0.5	V
Inrush Current	I <sub>RUSH</sub>	-	-	1.5	A	Note(1),(2)
Power Supply Current	Mosaic	-	(249)	(272)	mA	Note(3)a
	White	-	(273)	(300)	mA	Note(3)b

Note (1) The ambient temperature is  $T_a = 25 \pm 2 \text{ }^\circ\text{C}$ .

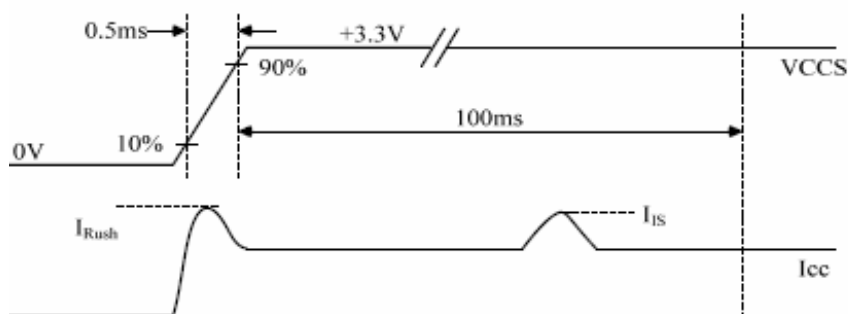
Note (2) I<sub>RUSH</sub>: the maximum current when VCCS is rising

I<sub>IS</sub>: the maximum current of the first 100ms after power-on

Measurement Conditions: Shown as the following figure. Test pattern: black.

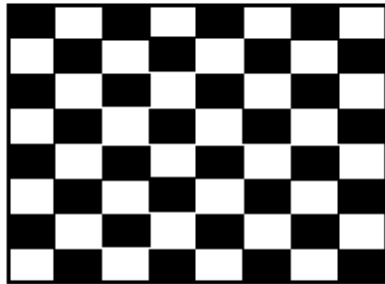


**VCCS rising time is 0.5ms**



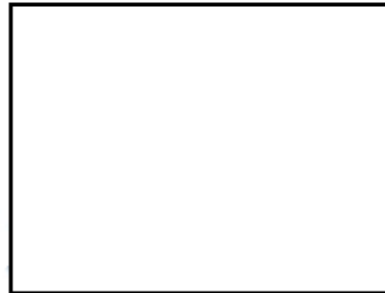
Note (3) The specified power supply current is under the conditions at VCCS = 3.3 V, Ta = 25 ± 2 °C, DC Current and fv = 60 Hz, whereas a power dissipation check pattern below is displayed.

a. Mosaic Pattern



Active Area

b. White Pattern

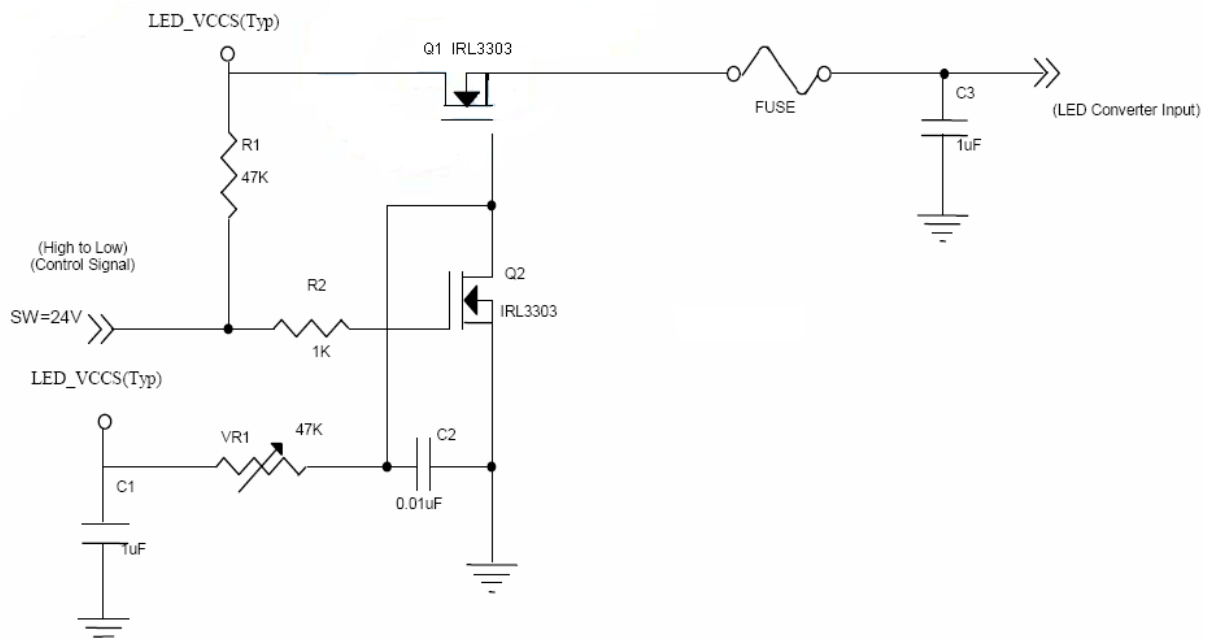


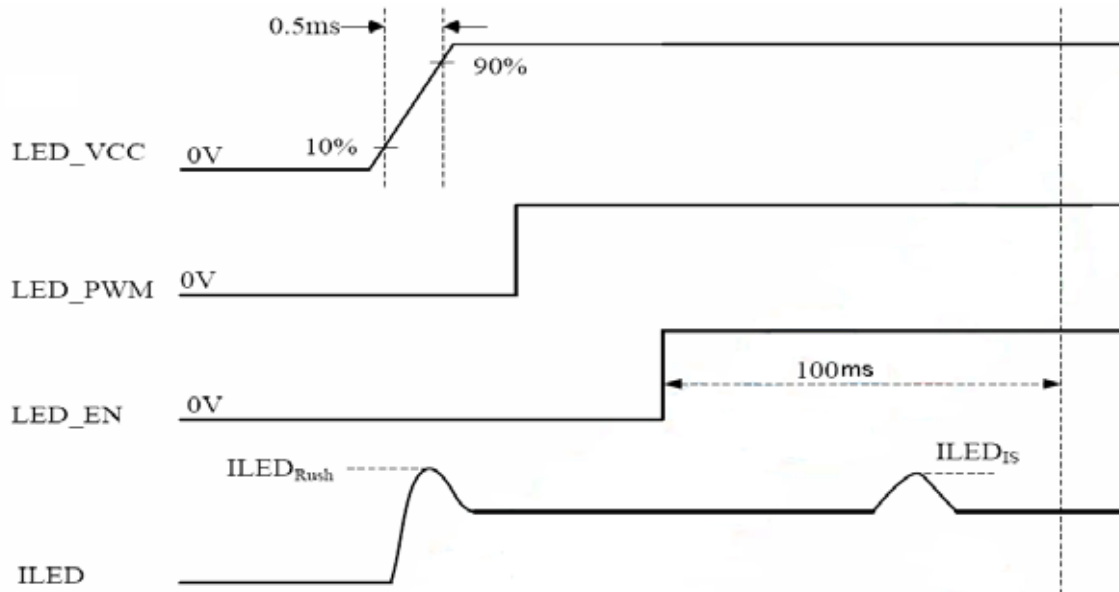
Active Area

### 5.2 LED CONVERTER SPECIFICATION

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark	
Converter Input power supply voltage	LED_Vccs	6.0	12.0	21.0	V		
Converter Inrush Current	I <sub>LED_RUSH</sub>	-	-	1.5	A	Note(1)	
EN Control Level	Backlight On	2.3	-	5.0	V		
	Backlight Off	0	-	0.5	V		
PWM Control Level	PWM High Level	2.3	-	5.0	V		
	PWM Low Level	0	-	0.5	V		
PWM Control Duty Ratio		10	-	100	%		
PWM Control Permissive Ripple Voltage	V <sub>PWM_pp</sub>	-	-	100	mV		
PWM Control Frequency	f <sub>PWM</sub>	190	-	20K	Hz	Note(2)	
LED Power Current	LED_VCCS =Typ.	I <sub>LED</sub>	83	104	125	mA	Note(3)

Note (1) I<sub>LED\_RUSH</sub>: the maximum current when LED\_VCCS is rising,  
 I<sub>LEDIS</sub>: the maximum current of the first 100ms after power-on,  
 Measurement Conditions: Shown as the following figure. LED\_VCCS = Typ, Ta = 25 ± 2 °C,  
 Fpwm = 200 Hz, Duty=100%.





Note (2) If PWM control frequency is applied in the range less than 1KHz, the “waterfall” phenomenon on the screen may be found. To avoid the issue, it’s a suggestion that PWM control frequency should follow the criterion as below.

$$\text{PWM control frequency } f_{\text{PWM}} \text{ should be in the range } (N+0.33)*f \text{ to } (N+0.66)*f$$

N : Integer ) (N = 3)  
f : Frame rate

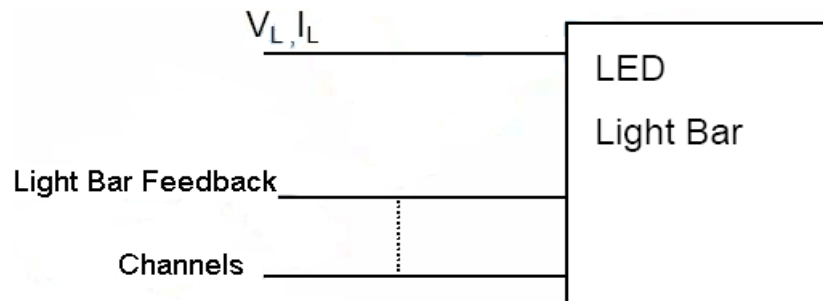
Note (3) The specified LED power supply current is under the conditions at “LED\_VCCS = Typ.”,  $T_a = 25 \pm 2 \text{ }^\circ\text{C}$ ,  $f_{\text{PWM}} = 200 \text{ Hz}$ , Duty=100%.

### 5.3 Backlight Unit

$T_a = 25 \pm 2 \text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Light Bar Power Supply Voltage	$V_L$	22.5	26.1	27	V	Note(1),(2)
LED Light Bar Power Supply Current	$I_L$	38	40	42	mA	
Power Consumption	$P_L$	0.86	1.04	1.13	W	Note(3)
LED dice life time	$L_{\text{BL}}$	12000	-	-	Hrs	Note(4)

Note (1) LED current is measured by utilizing a high frequency current meter as shown below



Note (2) For better LED light bar driving quality, it is recommended to utilize the adaptive boost converter with current balancing function to drive LED light-bar.

Note (3)  $P_L = I_L \times V_L$  (Without LED converter transfer efficiency)

Note (4) The lifetime of LED is defined as the time when it continues to operate under the conditions at  $T_a = 25 \pm 2 \text{ }^\circ\text{C}$  and  $I_L = 20 \text{ mA}$ (Per EA) until the brightness becomes 50% of its original value.

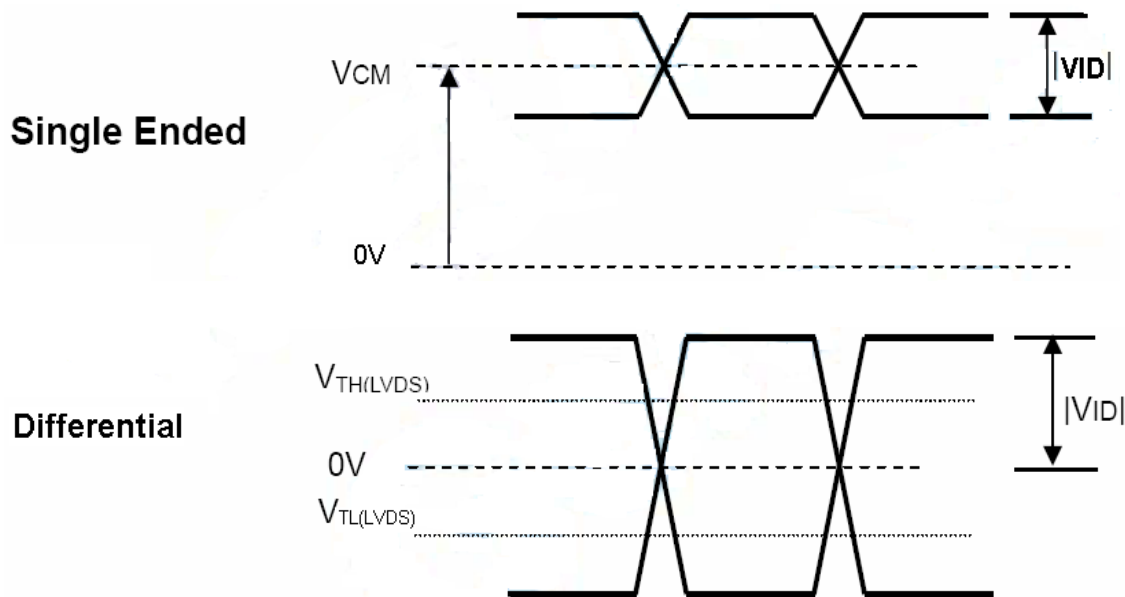
## 6. INPUT SIGNAL CHARACTERISTICS

### 6.1 LVDS INPUT SIGNAL TIMING SPECIFICATIONS

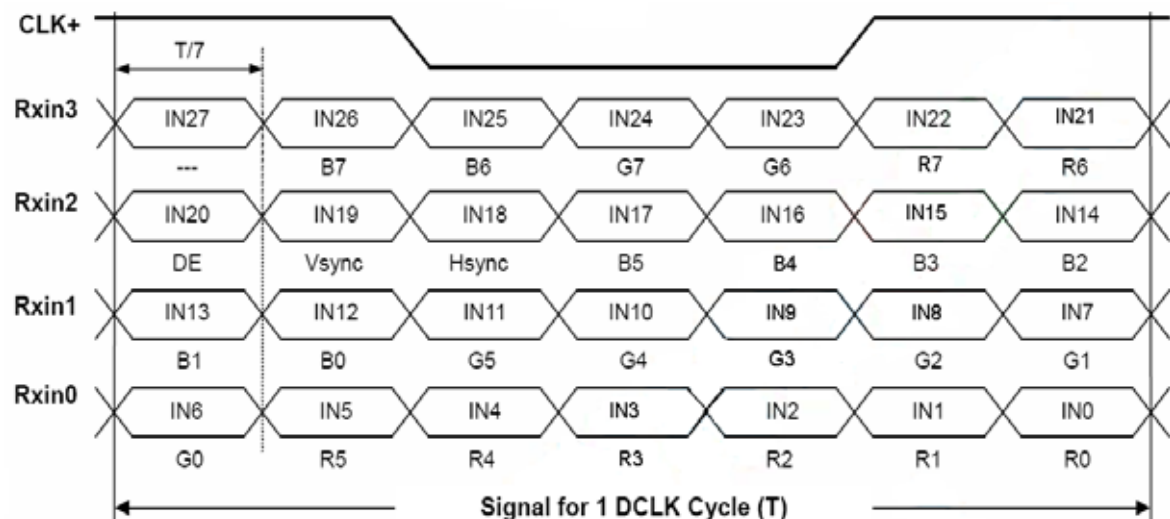
#### 6.1.1 LVDS DC SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LVDS Differential Input High Threshold	$V_{TH(LVDS)}$	-	-	100	mV	Note(1), $V_{CM}=1.2V$
LVDS Differential Input Low Threshold	$V_{TL(LVDS)}$	-100	-	-	mV	
LVDS Common Mode Voltage	$V_{CM}$	1.125	-	1.375	V	Note(1)
LVDS Differential Input Voltage	$ V_{ID} $	100	-	600	mV	Note(1)
LVDS Terminating Resistor	$R_T$	-	100	-	Ohm	-

Note (1) The parameters of LVDS signals are defined as the following figures.



#### 6.1.2 LVDS DATA FORMAT





## 6.2 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																	
		Red					Green					Blue							
		R7	R6	...	R2	R1	R0	G7	G6	...	G2	G1	G0	B7	B6	...	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(255)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
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:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Green(253)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0	
Green(254)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	
Green(255)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	
Gray Scale Of Blue	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	
Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	

Note (1) 0: Low Level Voltage, 1: High Level Voltage

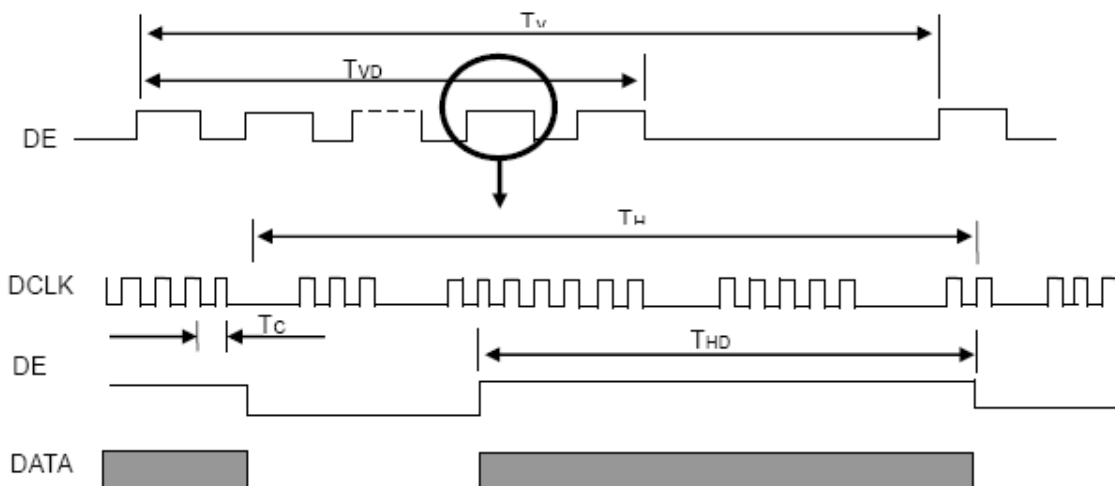
### 6.3 DISPLAY TIMING SPECIFICATIONS

The input signal timing specifications are shown as the following table and timing diagram.

SIGNAL	ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
DCLK	Frequency	1/Tc	67.55	71.11	78.22	MHz
DE	Vertical Total Time	TV	813	823	833	TH
	Vertical Active Display Period	TVD	800	800	800	TH
	Vertical Active Blanking Period	TVB	TV-TVD	23	TV-TVD	TH
	Horizontal Total Time	TH	1410	1440	1470	Tc
	Horizontal Active Display Period	THD	1280	1280	1280	Tc
	Horizontal Active Blanking Period	THB	TH-THD	160	TH-THD	Tc

Note (1) Because this module is operated by DE only mode, Hsync and Vsync are ignored.

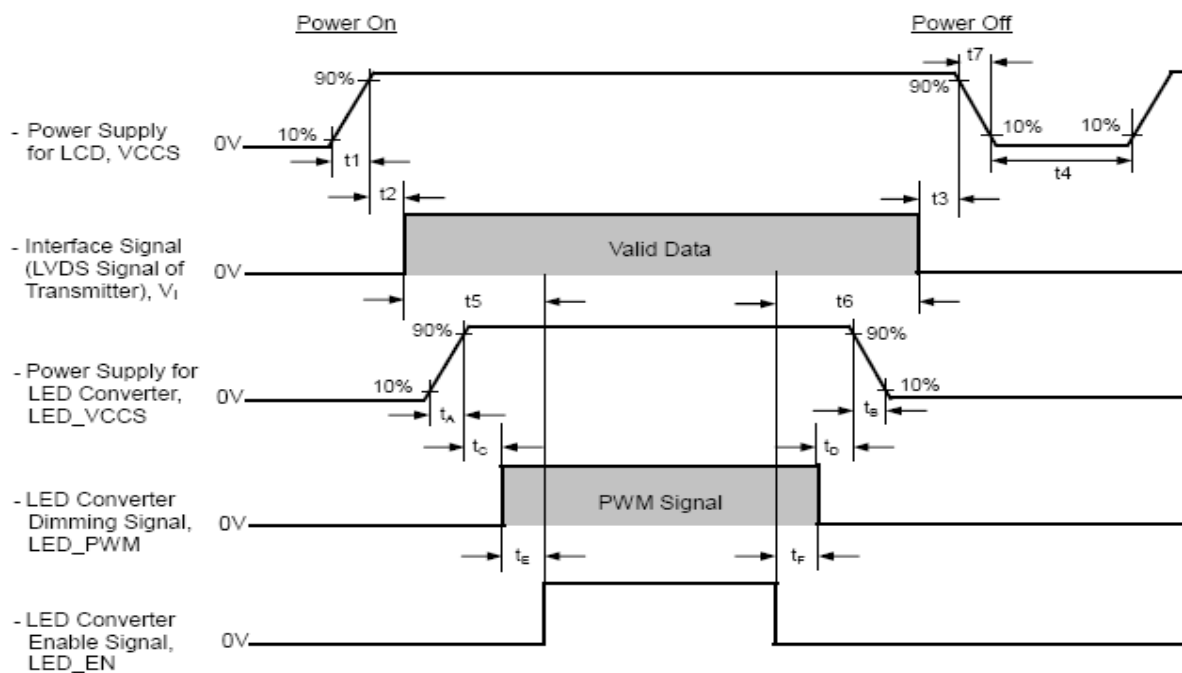
#### INPUT SIGNAL TIMING DIAGRAM



## 6.4 POWER ON/OFF SEQUENCE

The power sequence specifications are shown as the following table and diagram.

Symbol	Min.	Typ.	Max.	Unit	Remark
t1	0.5	-	10	ms	
t2	0	-	50	ms	
t3	0	-	50	ms	
t4	500	-	-	ms	
t5	200	-	-	ms	
t6	200	-	-	ms	
t7	0.5	-	10	ms	
tA	0.5	-	10	ms	
tB	0	-	10	ms	
tC	10	-	-	ms	
tD	10	-	-	ms	
tE	10	-	-	ms	
tF	10	-	-	ms	



Note (1) Please don't plug or unplug the interface cable when system is turned on.

Note (2) Please avoid floating state of the interface signal during signal invalid period.

Note (3) It is recommended that the backlight power must be turned on after the power supply for LCD and the interface signal is valid.

### 7. OPTICAL CHARACTERISTIC

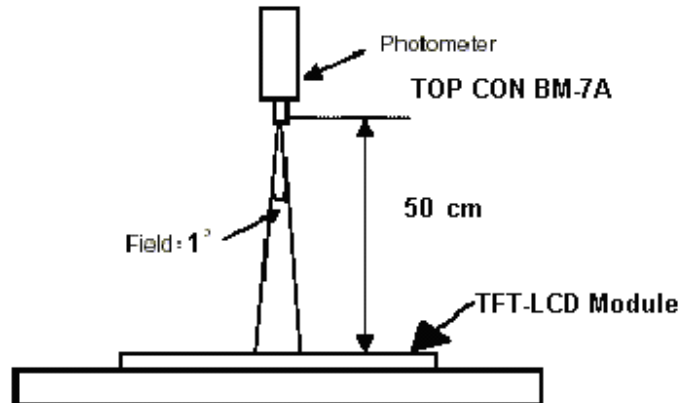
Parameter		Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remarks
Viewing Angle	Horizontal	$\Theta_y$	(CR $\geq$ 10)	--	89	--	deg	Note 1,4
	Vertical	$\Theta_x$		--	89	--		
Contrast Ratio		CR	$\theta_x=\theta_y =0^\circ$	600	800	--	--	Note 1,3
Response time		Tr		--	14	17	ms	Note 1,6
		Tf		--	11	14		
Uniformity		B-uni		70	80	--	%	Note1,5
Brightness		L		340	400	--	cd/m <sup>2</sup>	Note 1,2
Chromaticity		$x_W$	Center $\theta_x=\theta_y =0^\circ$	0.278	0.308	0.338		Note 1,7
		$y_W$		0.294	0.324	0.354		
		$x_R$		0.566	0.596	0.626		
		$y_R$		0.310	0.340	0.370		
		$x_G$		0.275	0.305	0.335		
		$y_G$		0.538	0.568	0.598		
		$x_B$		0.117	0.147	0.177		
		$y_B$		0.090	0.120	0.150		

The following optical specifications shall be measured in a darkroom or equivalent state (ambient luminance $\leq$ 1 lux, and at room temperature).

The operation temperature is 25°C $\pm$ 2°C and LED Backlight Current IL=20mA.

The measurement method is shown in Note1.

Note1: The method of optical measurement:

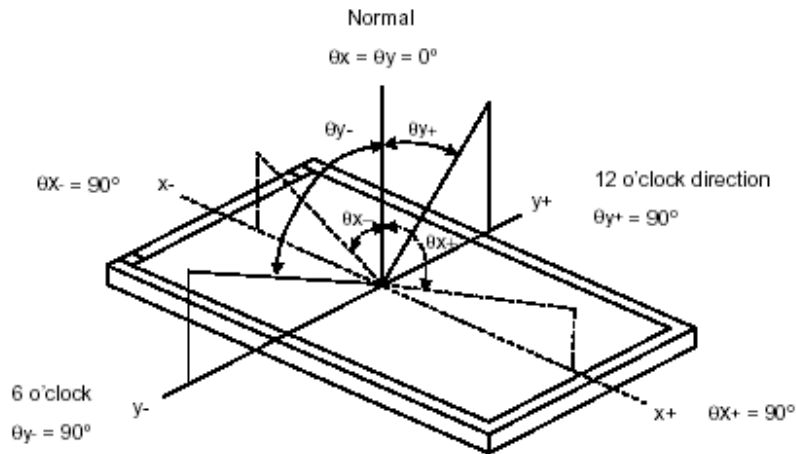


Note2: Measured at the center area of the panel and at the viewing angle of the  $\theta_x = \theta_y = 0^\circ$

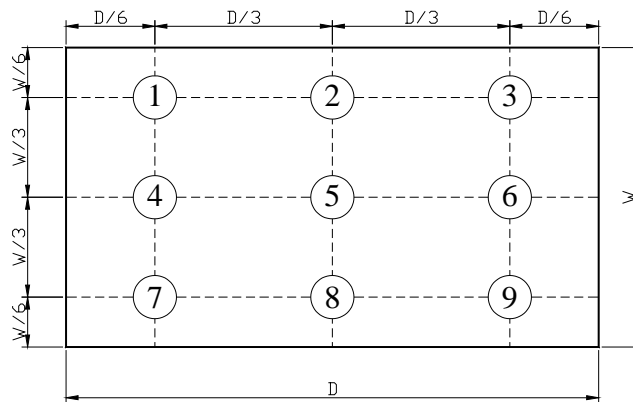
Note3: Definition of Contrast Ratio (CR):

$$CR = \frac{\text{Luminance with all pixels in white state}}{\text{Luminance with all pixels in Black state}}$$

Note4: Definition of Viewing Angle



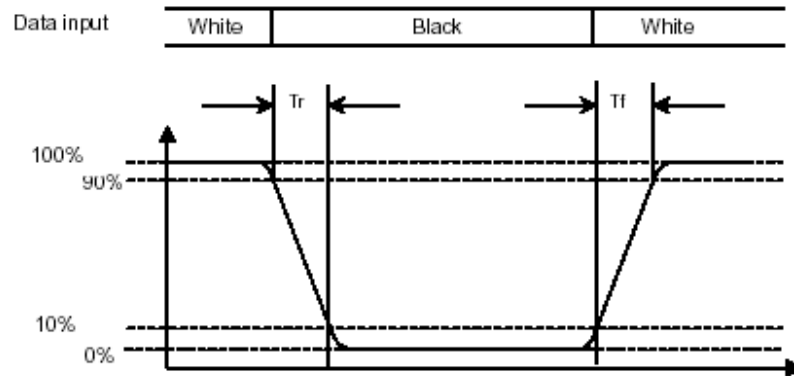
Note 5: Definition of Brightness Uniformity (B-uni):



$$B\text{-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9 points}} \quad (\text{Note 5}).$$

Note6: Definition of Response Time:

The Response Time is set initially by defining the "Rising Time ( $T_r$ )" and the "Falling Time ( $T_f$ )" respectively.  $T_r$  and  $T_f$  are defined as following figure.



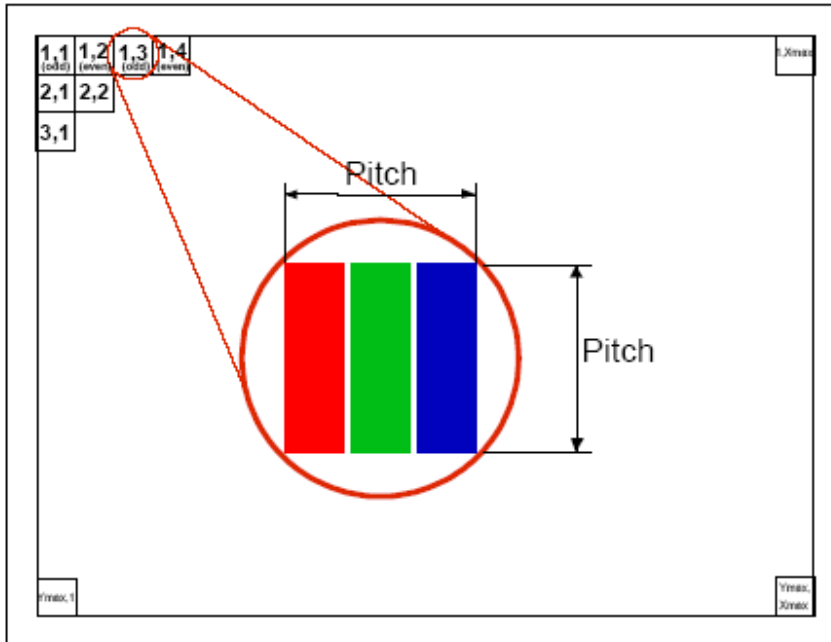
Note 7: Definition of Chromaticity:

The color coordinates  $(x_w, y_w)$ ,  $(x_r, y_r)$ ,  $(x_g, y_g)$ , and  $(x_b, y_b)$  are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

## 8. PIN CONNECTIONS

Pin NO.	SYMBOL	DESCRIPTION	REMARK
1	VCCS	Power Supply (3.3V typ.)	
2	VCCS	Power Supply (3.3V typ.)	
3	VEDID	DDC 3.3V power	
4	NC	No Connection (Reserved for CMI test)	
5	CLKEDID	DDC clock	
6	DATAEDID	DDC data	
7	Rxin0-	LVDS differential data input	R0-R5, G0
8	Rxin0+	LVDS differential data input	
9	VSS	Ground	
10	Rxin1-	LVDS differential data input	G1~G5, B0, B1
11	Rxin1+	LVDS differential data input	
12	VSS	Ground	
13	Rxin2-	LVDS Differential Data Input	B2-B5,HS,VS, DE
14	Rxin2+	LVDS Differential Data Input	
15	VSS	Ground	
16	RxCLK-	LVDS differential clock input	LVDS CLK
17	RxCLK+	LVDS differential clock input	
18	VSS	Ground	
19	Rxin3-	LVDS Differential Data Input	R[6], R[7], G[6], G[7], B[6], B[7]
20	Rxin3+	LVDS Differential Data Input	
21	VSS	Ground	
22	CE_EN	Color Engine Function Enable	Note (3)
23	NC	No Connection (Reserve)	
24	VSS	Ground	
25	NC	No Connection (Reserve)	
26	NC	No Connection (Reserve)	
27	VSS	Ground	
28	H_Rev	Reverse Scanning Display in Horizontal	Note (2)
29	V_Rev	Reverse Scanning Display in Vertical	Note (2)
30	LED_GND	LED Ground	
31	LED_GND	LED Ground	
32	LED_GND	LED Ground	
33	NC	No Connection (Reserve)	
34	LED_PWM	PWM Control Signal of LED Converter	
35	LED_EN	Enable Control Signal of LED Converter	Note (3)
36	CABC_EN	CABC Enable Input	Note (3)
37	LED_VCCS	LED Power Supply	
38	LED_VCCS	LED Power Supply	
39	LED_VCCS	LED Power Supply	

Note (1) The first pixel is odd as shown in the following figure.



Note (2) The scanning display setting of H\_Rev and V\_Rev function are as follows.

Pin	Hi	Lo or Open
H_Rev	From Right to Left in Horizontal	From Left to Right in Horizontal
V_Rev	From Bottom to Top in Vertical	From Top to Bottom in Vertical

Hi = High level, Lo = Low level.

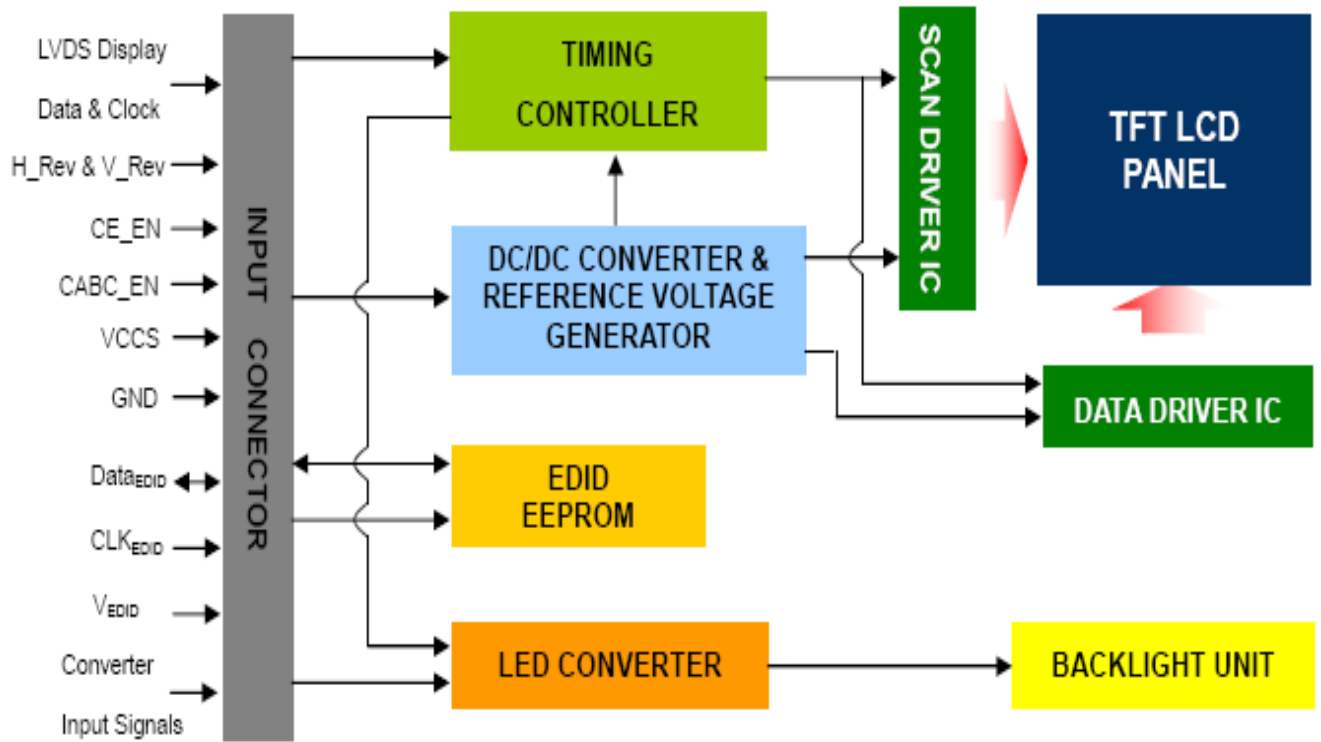
Note (3) The setting of CE/CABC function are as follows.

Pin	Enable	Disable
CE_EN	Hi	Lo or Open
LED_EN	Hi	Lo or Open
CABC_EN	Hi	Lo or Open

Hi = High level, Lo = Low level.



### 9. BLOCK DIAGRAM



## 10. QUALITY ASSURANCE

### 10.1 Test Condition

#### 10.1.1 Temperature and Humidity(Ambient Temperature)

Temperature :  $25 \pm 5^{\circ}\text{C}$

Humidity :  $65 \pm 5\%$

#### 10.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

#### 10.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

#### 10.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

#### 10.1.5 Test Method

Reliability Test Item & Level		Test Level
No.	Test Item	
1	High Temperature Storage Test	T=70 ,240hrs
2	Low Temperature Storage Test	T=-20 ,240hrs
3	High Temperature Operation Test	T=60 ,240hrs
4	Low Temperature Operation Test	T=-10 ,240hrs
5	High Temperature and High Humidity Operation Test	T=60 ,90%RH,96hrs
6	Thermal shock Storage Test	-20°C, 0.5hour 70 , 0.5hour; 100cycles, 1hour/cycle
7	ESD Test (Operation)	150pF, 330 , 1sec/cycle Condition 1 : Contact Discharge, $\pm 8\text{KV}$ Condition 2 : Air Discharge, $\pm 15\text{KV}$

### 10.2 Judgment standard

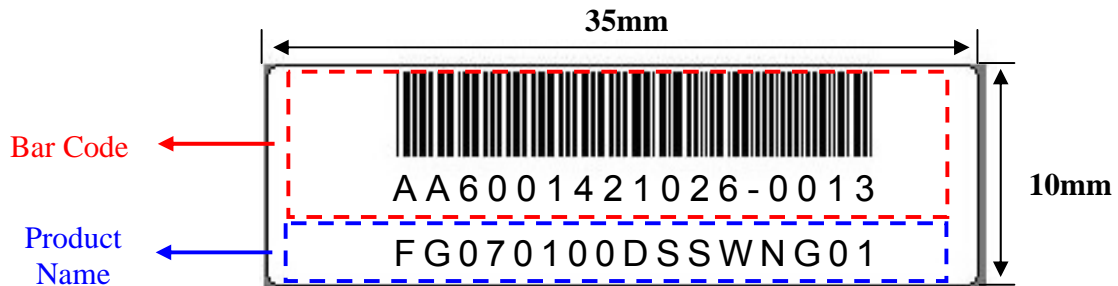
The Judgment of the above test should be made after exposure in room temperature for two hours as follow:

Pass: Normal display image with no obvious non-uniformity and no line defect. Partial transformation of the module parts should be ignored.

Fail: No display image, obvious non-uniformity, or line defect.

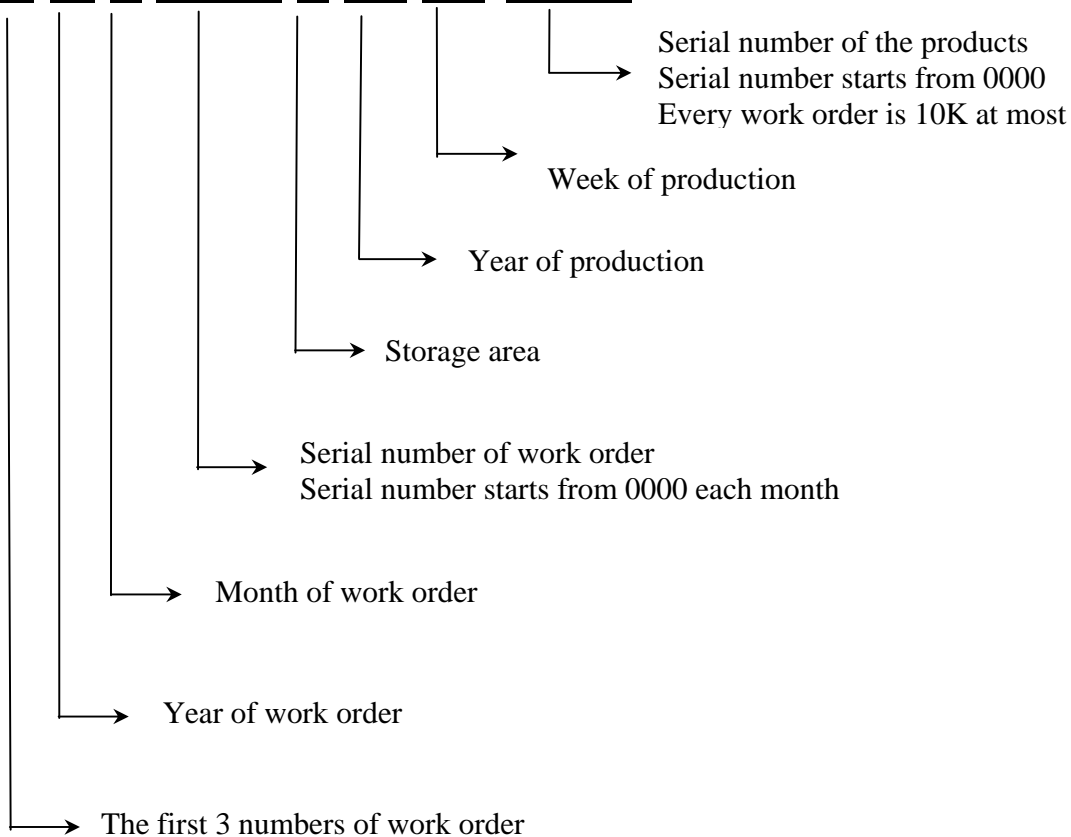
## 11. LCM PRODUCT LABEL DEFINE

### Product Label style:

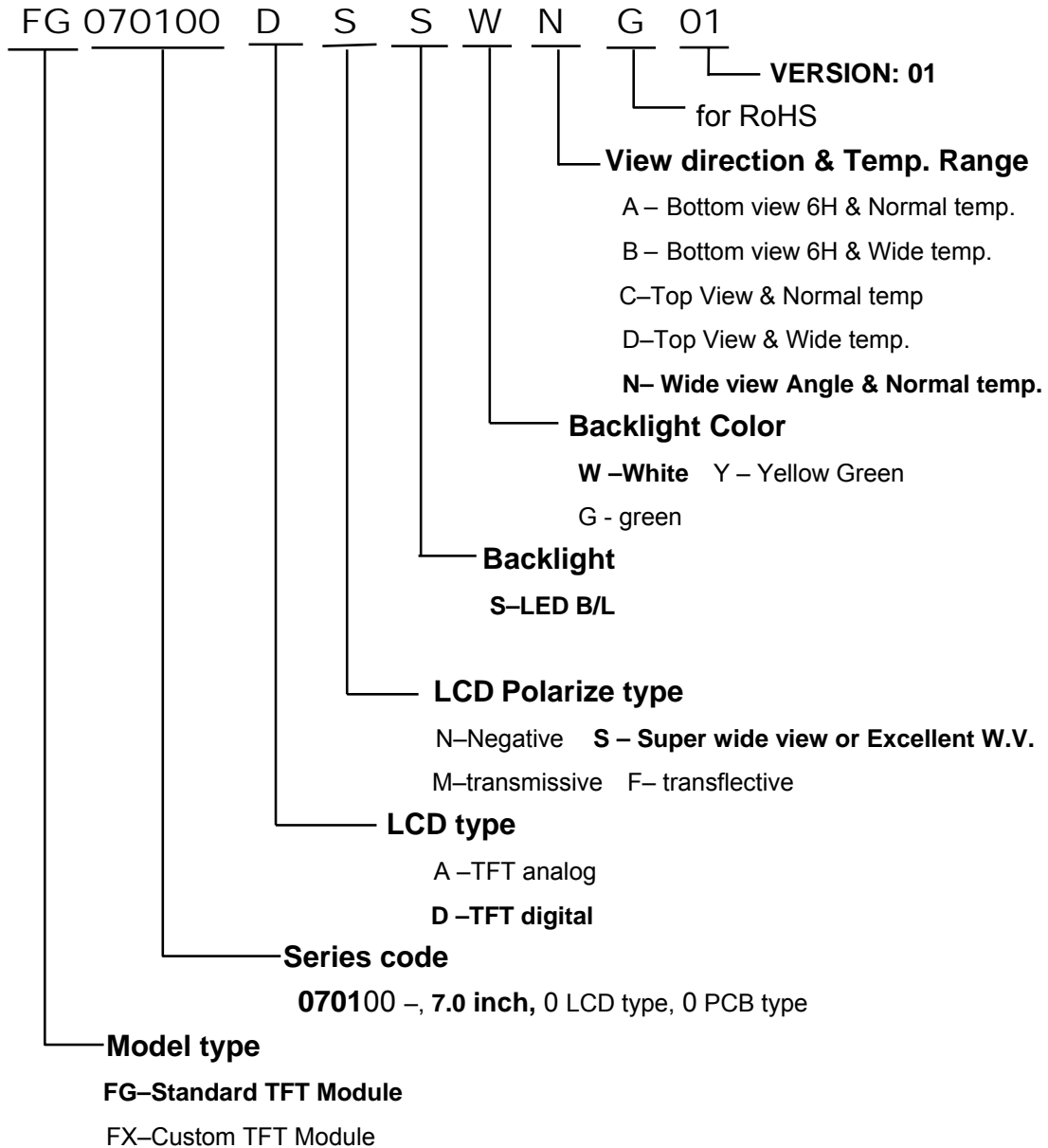


### BarCode Define:

**A A 6 0014 2 10 26-0013**



**Product Name Define:**



## 12. PRECAUTIONS IN USE LCM

### 1. LIQUID CRYSTAL DISPLAY (LCD)

LCD is made up of glass, organic sealant, organic fluid, and polymer based polarizers. The following precautions should be taken when handling,

- (1). Keep the temperature within range of use and storage. Excessive temperature and humidity could cause polarization degradation, polarizer peel off or bubble.
- (2). Do not contact the exposed polarizers with anything harder than an HB pencil lead. To clean dust off the display surface, wipe gently with cotton, chamois or other soft material soaked in petroleum benzine.
- (3). Wipe off saliva or water drops immediately. Contact with water over a long period of time may cause polarizer deformation or color fading, while an active LCD with water condensation on its surface will cause corrosion of ITO electrodes.
- (4). Glass can be easily chipped or cracked from rough handling, especially at corners and edges.
- (5). Do not drive LCD with DC voltage.

### 2. Liquid Crystal Display Modules

#### 2.1 Mechanical Considerations

LCM are assembled and adjusted with a high degree of precision. Avoid excessive shocks and do not make any alterations or modifications. The following should be noted.

- (1). Do not tamper in any way with the tabs on the metal frame.
- (2). Do not modify the PCB by drilling extra holes, changing its outline, moving its components or modifying its pattern.
- (3). Do not touch the elastomer connector, especially insert a backlight panel (for example, EL).
- (4). When mounting a LCM make sure that the PCB is not under any stress such as bending or twisting. Elastomer contacts are very delicate and missing pixels could result from slight dislocation of any of the elements.
- (5). Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels.

#### 2.2. Static Electricity

LCM contains CMOS LSI's and the same precaution for such devices should apply, namely

- (1). The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- (2). The modules should be kept in antistatic bags or other containers resistant to static for storage.
- (3). Only properly grounded soldering irons should be used.
- (4). If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.

- (5) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended.
- (6). Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.

#### 2.3 Soldering

- (1). Solder only to the I/O terminals.
- (2). Use only soldering irons with proper grounding and no leakage.
- (3). Soldering temperature :  $280^{\circ}\text{C} \pm 10^{\circ}\text{C}$
- (4). Soldering time: 3 to 4 sec.
- (5). Use eutectic solder with resin flux fill.
- (6). If flux is used, the LCD surface should be covered to avoid flux spatters. Flux residue should be removed after wards.

#### 2.4 Operation

- (1). The viewing angle can be adjusted by varying the LCD driving voltage  $V_0$ .
- (2). Driving voltage should be kept within specified range; excess voltage shortens display life.
- (3). Response time increases with decrease in temperature.
- (4). Display may turn black or dark blue at temperatures above its operational range; this is (however not pressing on the viewing area) may cause the segments to appear "fractured".
- (5). Mechanical disturbance during operation (such as pressing on the viewing area) may cause the segments to appear "fractured".

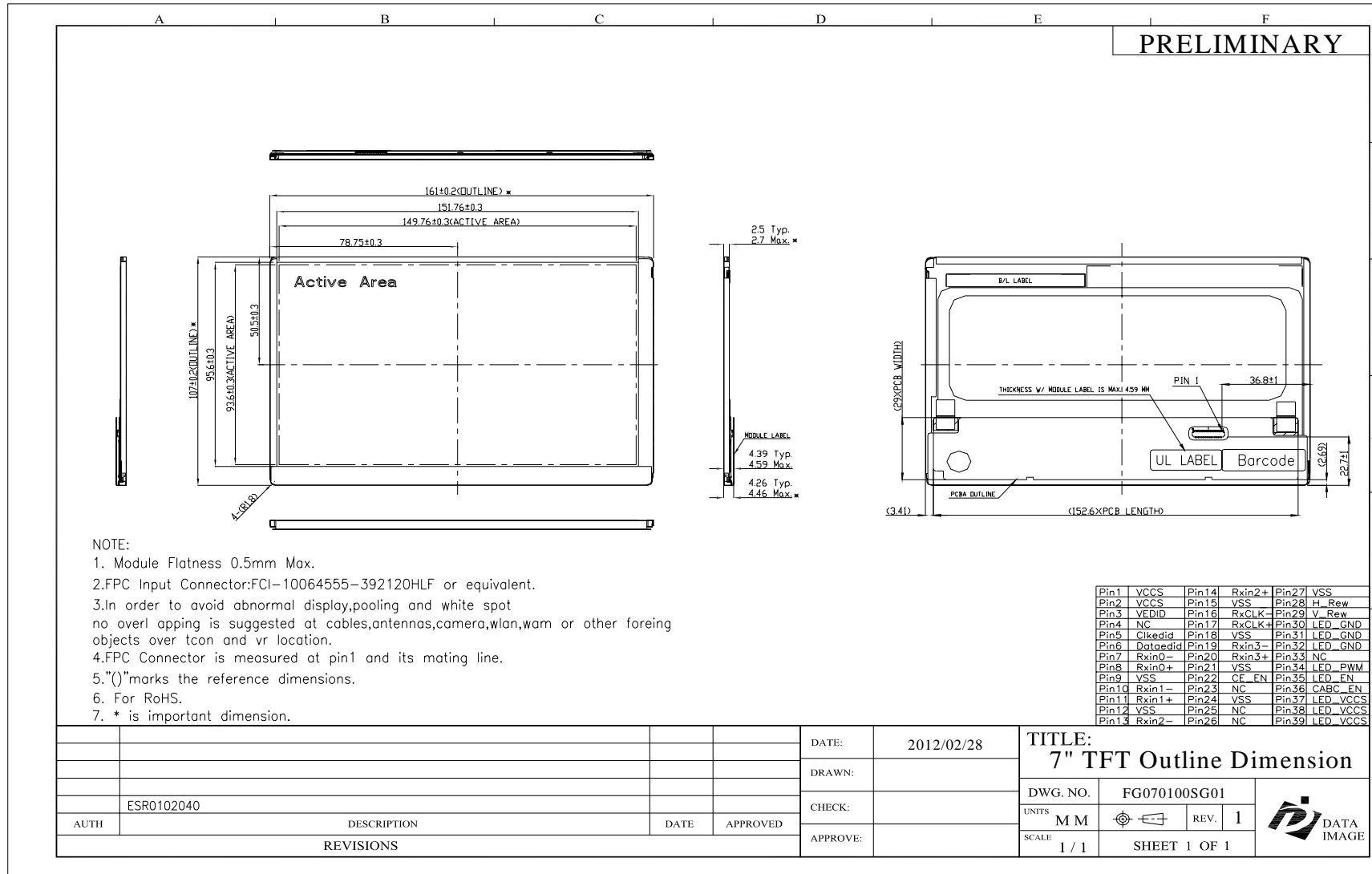
#### 2.5 Storage

If any fluid leaks out of a damaged glass cell, wash off any human part that comes into contact with soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all the time.

#### 2.6 Limited Warranty

Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not be responsible for any subsequent or consequential events.

### 13. OUTLINE DRAWING



## 14. PACKAGE INFORMATION

TBD