

TFT-Display Datenblatt

Modell FG080070DSSWBG01

Kurzdaten

Hersteller	Datamagic
Diagonale	8,0" / 20,3cm
Format	4:3
Auflösung	800x600
Backlight	LED/250cd/m ²
Temperatur	-20...+70°C (Betrieb)



DATA IMAGE CORPORATION

TFT Module Specification Preliminary

ITEM NO.: FG080070DSSWBG01

Table of Contents

1. COVER & CONTENTS	1
2. RECORD OF REVISION	2
3. APPLICATION.....	3
4. GENERAL SPECIFICATIONS	3
5. ABSOLUTE MAXIMUM RATINGS.....	3
6. ELECTRICAL CHARACTERISTICS	3
7. TIMING CHARACTERISTICS	5
8. PIN CONNECTIONS	7
9.. OPTICAL CHARACTERISTIC	10
10. QUALITY ASSURANCE	13
11. LOT NUMBERING SYSTEM	14
12. LCM NUMBERING SYSTEM	14
13. PRECAUTIONS IN USE LCM	15
14. OUTLINE DRAWING	16
15. PACKAGE INFORMATION	17

Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	JACK	ERIC	PAUL	HELEN
Approved by	Version:	Issued Date:	Sheet Code:	Total Pages:
	1	2010/4/1		17

3. APPLICATION

Digital equipments which need color display, such as P.O.S, medical equipments and industrial equipments.

4. GENERAL SPECIFICATIONS

Parameter	Specifications	Unit
Display resolution	800(W) x 600(H)	dot
Active area	162(W) x 121.5(H)	mm
Screen size	8.0"(Diagonal)	inch
Dot pitch	0.0675(W) x 0.2025(H)	mm
Color configuration	R.G.B. Stripe	
Overall dimension	183(W) x 141(H) x 6.3(D)	mm
Weight	258	g
Surface treatment	Anti-glare	
View Angle direction	6 o'clock	
Our components and processes are compliant to RoHS standard		

5. ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	MIN.	MAX.	Unit	Remark
Power supply voltage	V _{CC}	-0.3	5.0	V	Ta=25°C
	AVDD	-0.5	13.5	V	
	V _{GH}	13.0	19.0	V	
	V _{GL}	-12.0	-2.0	V	
	V _{GH-VGL}	--	31.0	V	
Operating temperature	Top	-20	70	°C	
Storage temperature	Tst	-30	80	°C	

6. ELECTRICAL CHARACTERISTICS

Ta=25°C

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage	V _{CC}	3.0	3.3	3.6	V	Note 2
	AVDD	10.2	10.4	10.6	V	
	V _{GH}	15.3	16.0	16.7	V	
	V _{GL}	-7.7	-7.0	-6.3	V	
Input signal voltage	V _{COM}	3.5	3.7	3.9		
Input logic high voltage	V _{IH}	0.7V _{CC}	--	V _{CC}		Note 3
Input logic low voltage	V _{IL}	0	--	0.3V _{CC}		

Note 1: Be sure to apply VCC and VGL to the LCD first, and then apply VGH.

Note 2: VCC setting should match the signals output voltage (refer to Note 3) of customer's system board .

Note 3: R0~R7,G0~G7,B0~B7,DCLK,HS,VS, RESET, U/D,L/R,MODE,DITHB,DE.

6.1 Current Consumption

(GND=AVSS=0V)

Parameter	Symbol	min	TYP.	MAX	Unit	Remark
Current for Driver	I_{GH}	--	0.2	0.5	mA	$V_{GH} = 16V$
	I_{GL}	--	0.2	1.0	mA	$V_{GL} = -7.0V$
	I_{CC}	--	5.5	10.0	mA	$V_{CC} = +3.3V$
	I_{AVDD}	--	32.0	50.0	mA	$AV_{DD} = +10.4V$

6.2 Backlight Driving for Power Consumption

Ta= 25 °C

Parameter	Symbol	4.8	Typ.	Max.	Unit	Remark
VLED voltage	V_L	9.3	9.9	10.5	V	Note 1
LED current	I_L	162	180	198	mA	
LED Life Time decay to 50%		20000	--	--	hr	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25 and IL =180mA.

Note 2: The “ LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25 and IL =180mA. The LED lifetime could be decreased if operating IL is larger than 180 mA.

7. Timing Characteristics

7.1 AC Electrical Characteristics

Item	Symbol	Values			Unit.	Remark
		min	Typ	Max		
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	Tdsu	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	

7.2 Timing

Item	Symbol	Values			Unit.	Remark
		min	Typ	Max		
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	

Item	Symbol	Values			Unit.	Remark
		min	Typ	Max		
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	

7.3 Timing Diagram

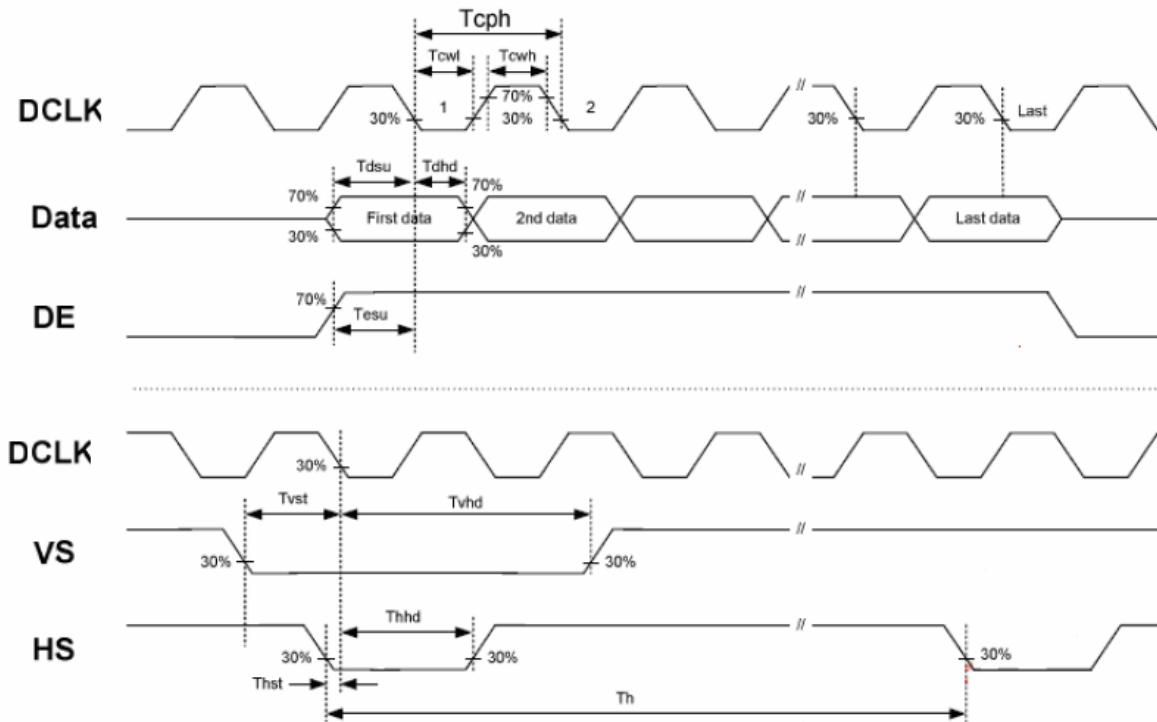


Figure 7.1 Input Clock and Data Timing Diagram

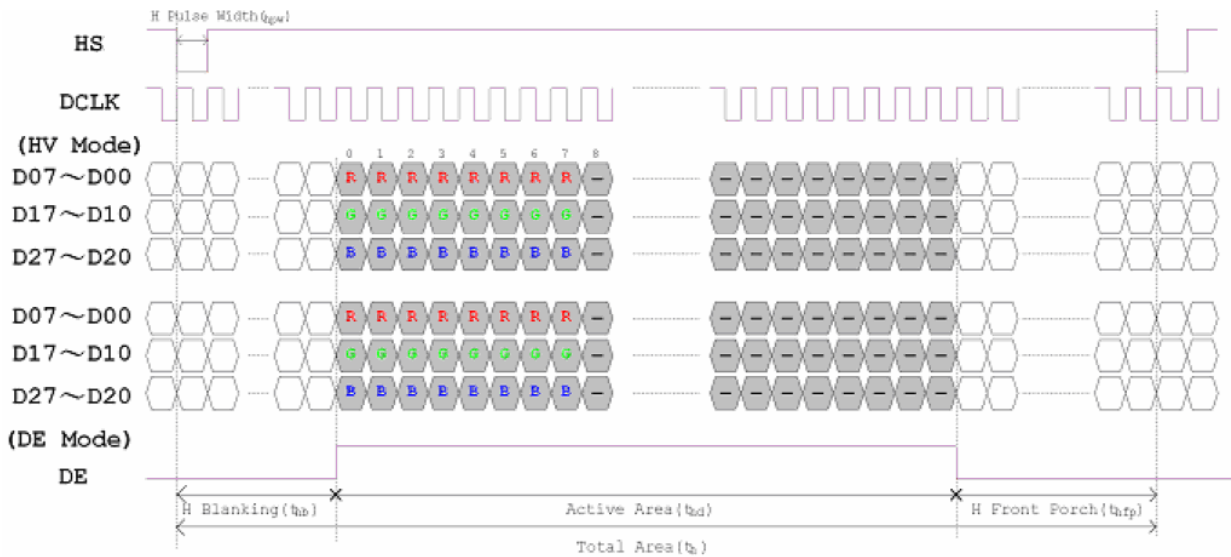


Figure 7.2 Horizontal input timing diagram

8. PIN CONNECTIONS

8.1 Input Pins Function

Pin No.	Symbol	Function	Remark
1	NC	No connection	
2	NC	No connection	
3	NC	No connection	
4	NC	No connection	
5	GND	Power ground	
6	VCOM	Common voltage	
7	VCC	Power for Digital circuit	
8	MODE	DE/SYNC mode select	Note3
9	DE	Data Input Enable	
10	VS	Vertical Sync Input	
11	HS	Horizontal Sync Input	
12	B7	Blue data(MSB)	
13	B6	Blue data	
14	B5	Blue data	
15	B4	Blue data	
16	B3	Blue data	
17	B2	Blue data	
18	B1	Blue data	
19	B0	Blue data(LSB)	
20	G7	Green data (MSB)	
21	G6	Green data	
22	G5	Green data	
23	G4	Green data	
24	G3	Green data	
25	G2	Green data	
26	G1	Green data	
27	G0	Green data (LSB)	
28	R7	Red data (MSB)	
29	R6	Red data	
30	R5	Red data	
31	R4	Red data	
32	R3	Red data	
33	R2	Red data	
34	R1	Red data	
35	R0	Red data (LSB)	
36	GND	Power ground	
37	DCLK	Sample clock	
38	GND	Power ground	
39	L/R	Right/ left selection	Note2,5
40	U/D	Up/down selection	Note2,5
41	VGH	Gate ON voltage	

42	VGL	Gate OFF voltage	
43	AVDD	Power for Analog circuit	
44	RESET	Global reset pin.	Note 1
45	NC	No connection	
46	VCOM	Common voltage	
47	DITHB	Dithering function	Note 4
48	GND	Power ground	
49	NC	No connection	
50	NC	No connection	

I: input, O: output, P: Power

Note 1: Global reset pin. Active Low to enter Reset State. Suggest to connecting with an RC reset circuit for stability. Normally pull high.

Note 2: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	R/L	
GND	Vcc	Up to down, left to right
Vcc	GND	Down to up, right to left
GND	GND	Up to down, right to left
Vcc	Vcc	Down to up, left to right

Note 3: DE/SYNC mode select, Normally pull high.

H: DE mode.

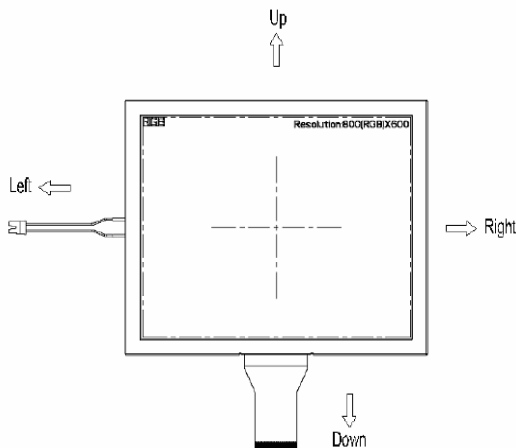
L: HS/VS mode.

Note 4: Dithering function enable control. Normally pull high.

DITHB=" 1" ,Disable internal dithering function. For 18bit RGB interface, connect two LSB bits of all the R/G/B data buses to GND.

DITHB=" 0" ,Enable internal dithering function, For TTL 24bit parallel RGB image data input.

Note 5: Definition of scanning direction. Refer to the figure as below:

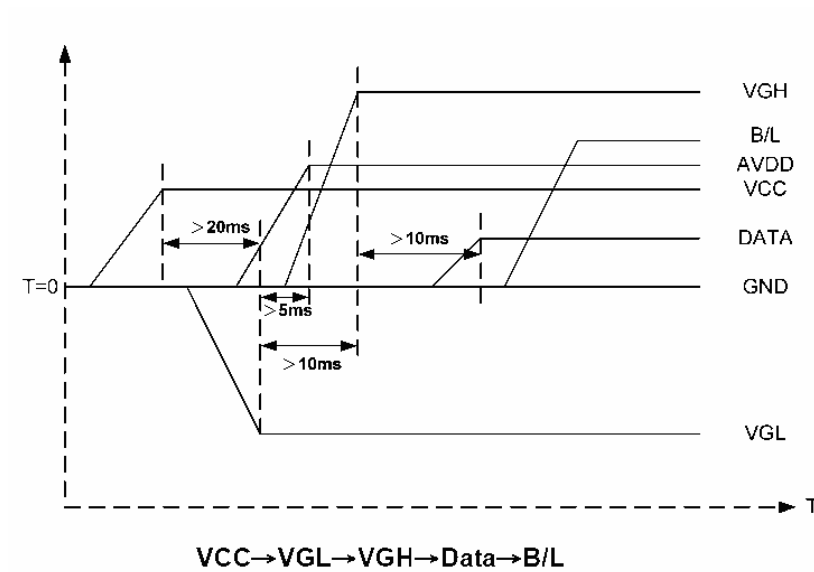


8.2 Backlight Unit Section

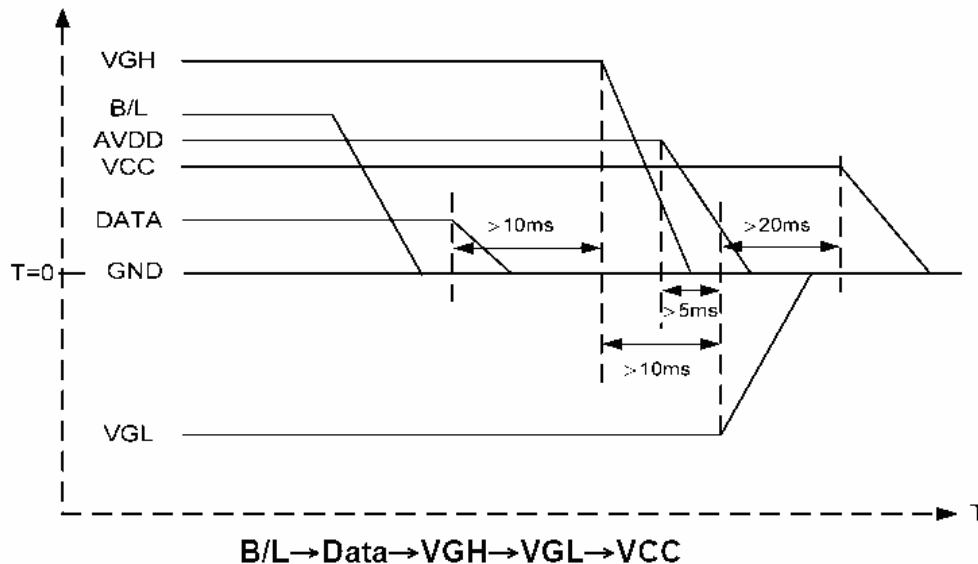
Pin No	Symbol	I/O	Description	Remark
1	V _{LED+}	P	Power for LED backlight anode	Pink
2	V _{LED-}	P	Power for LED backlight cathode	Black

8.3 Power Sequence

8.3.1 Power on:



8.3.22 Power off:



Note: Data include R0~R7,G0~G7,B0~B7,DCLK,HS,VS, RESET, U/D,L/R,MODE,DITHB,DE

9. OPTICAL CHARACTERISTIC

9.1. Specification:

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Response time	Rise	T _{ON}	Normal $\theta=\Phi=0^\circ$	-	10	20	ms	Note 3
	Fall	T _{OFF}		-	15	30	ms	
Contrast ratio	CR			400	500			Note 4
White chromaticity	X			0.26	0.31	0.36		Note2,5,6
	y		0.28	0.33	0.38			
Viewing angle	θ_L	$\Phi=180^\circ$ (9 o'clock)	60	70	-	Deg.	Note 1	
	θ_R	$\Phi=0^\circ$ (3 o'clock)	60	70	-			
	θ_T	$\Phi=90^\circ$ (12 o'clock)	40	50	-			
	θ_B	$\Phi=270^\circ$ (6 o'clock)	60	70	-			
Brightness		Normal $\theta=\Phi=0^\circ$	200	250	--	cd/m ²	Note 6	
Uniformity			70	75		%	Note 7	

Test Conditions:

- VCC=3.3V, IL=180mA (Backlight current), the ambient temperature is 25 .
- The test systems refer to Note 2.

Note 1: Definition of viewing angle range

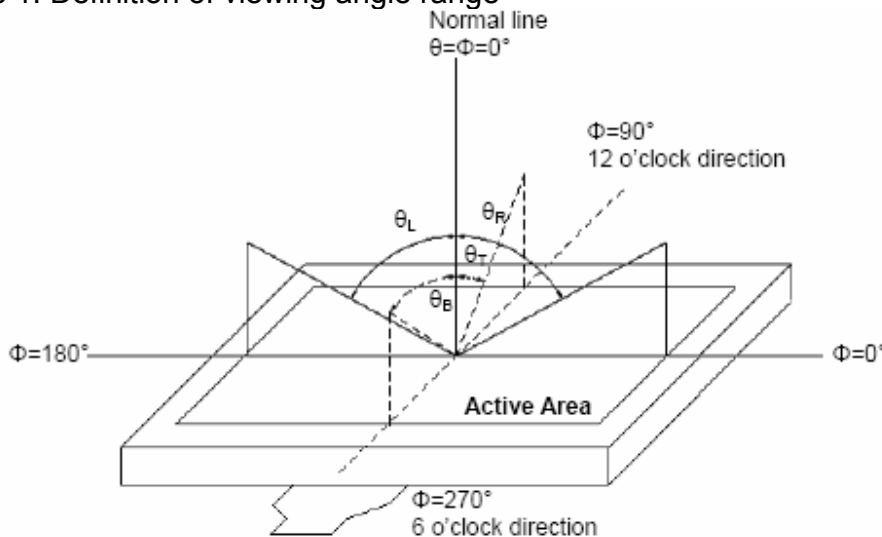


Fig.9-1 Definition of viewing angle

Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7A, other items are measured by BM-7A/Field of view: 1° /Height: 500mm.)

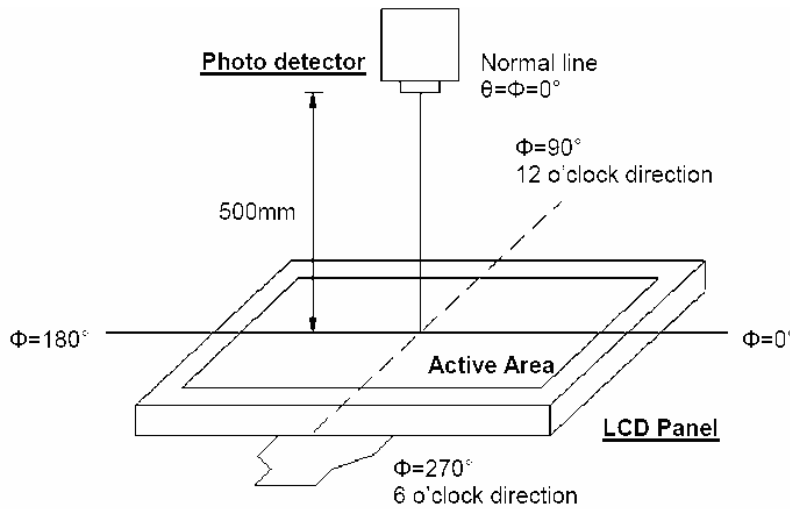


Fig. 9-2 Optical measurement system setup

Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between “ White” state and “ Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.

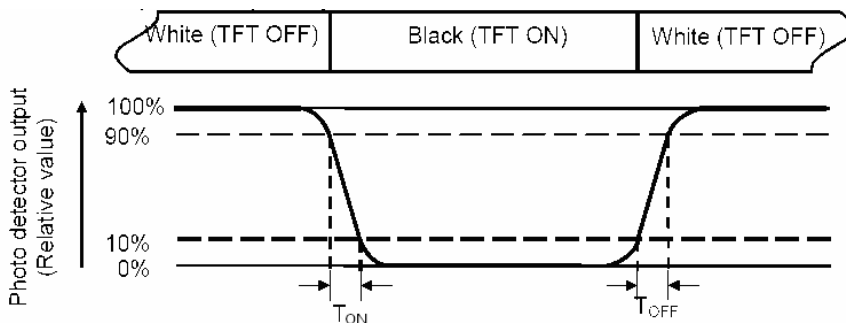


Fig. 8-3 Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is IL=180mA .

Note 7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to Fig. 9-4).Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{min}}{B_{max}}$$

L-----Active area length W----- Active area width

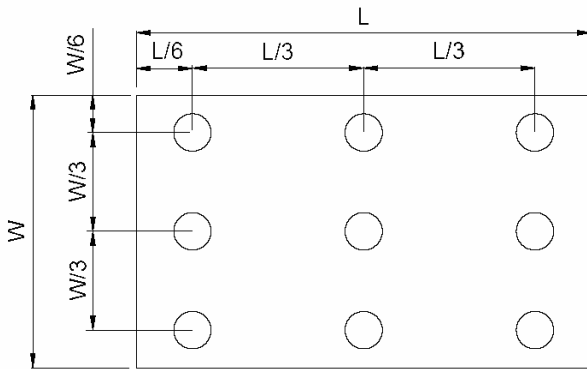


Fig. 9-4 Definition of measuring points

B_{max} : The measured maximum luminance of all measurement position.

B_{min} : The measured minimum luminance of all measurement position.

10. QUALITY ASSURANCE

No.	Item	Test Conditions	Remark
1	High Temperature Storage	Ta = 80 240 hrs	Note 1, 4
2	Low Temperature Storage	Ta = -30 240hrs	Note 1,4
3	High Temperature Operation	Ts = 70 240hrs	Note 2,4
4	Low Temperature Operation	Ta = -20 240hrs	Note 1,4
5	Operate at High Temperature and Humidity	+40 , 90%RH 240 hrs	Note 4
6	Thermal Shock	-30 /30 min ~ + 80 /30 min for a total 100 cycles, Start with cold temperature and end with high temperature	Note 4
7	Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
8	Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction	
9	Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	
10	Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 surfaces	
11	Electro Static Discharge	± 2KV, Human Body Mode, 100pF/1500Ω	

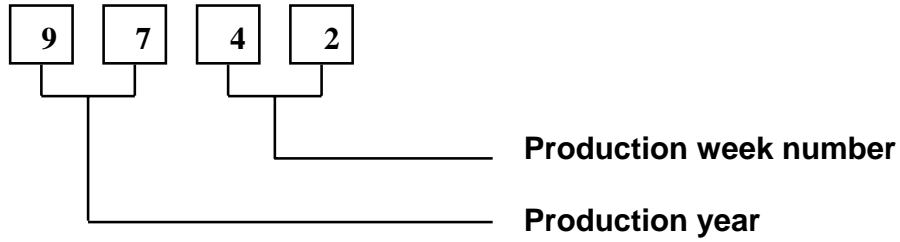
Note 1: Ta is the ambient temperature of samples.

Note 2: Ts is the temperature of panel's surface.

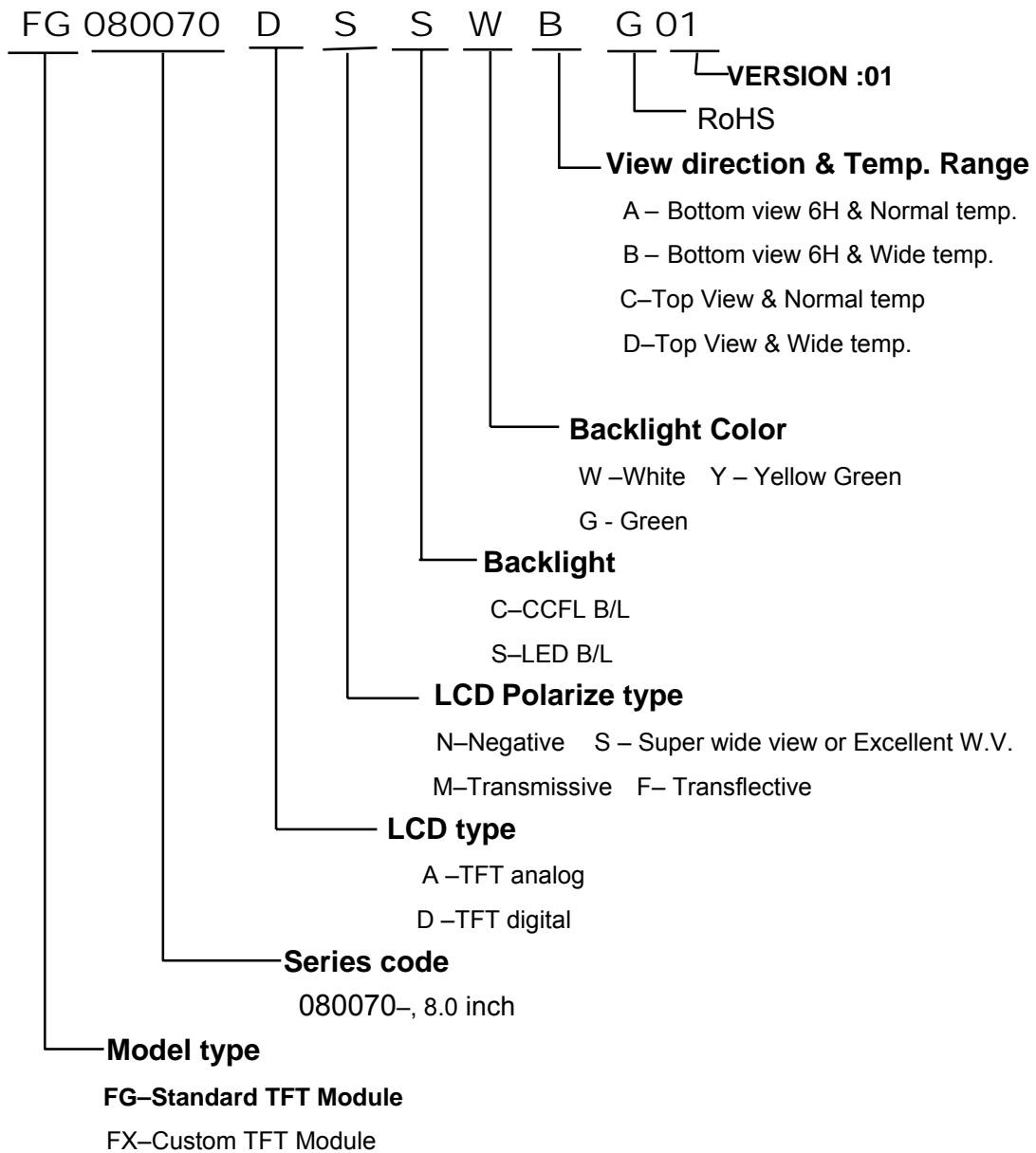
Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

Note 4: Before cosmetic and function tests, the product must have enough recovery time, at least 2 hours at room temperature.

11. LOT NUMBERING SYSTEM



12. LCM NUMBERING SYSTEM



13. 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 benzin.
- (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 an 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 V0.
- (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".

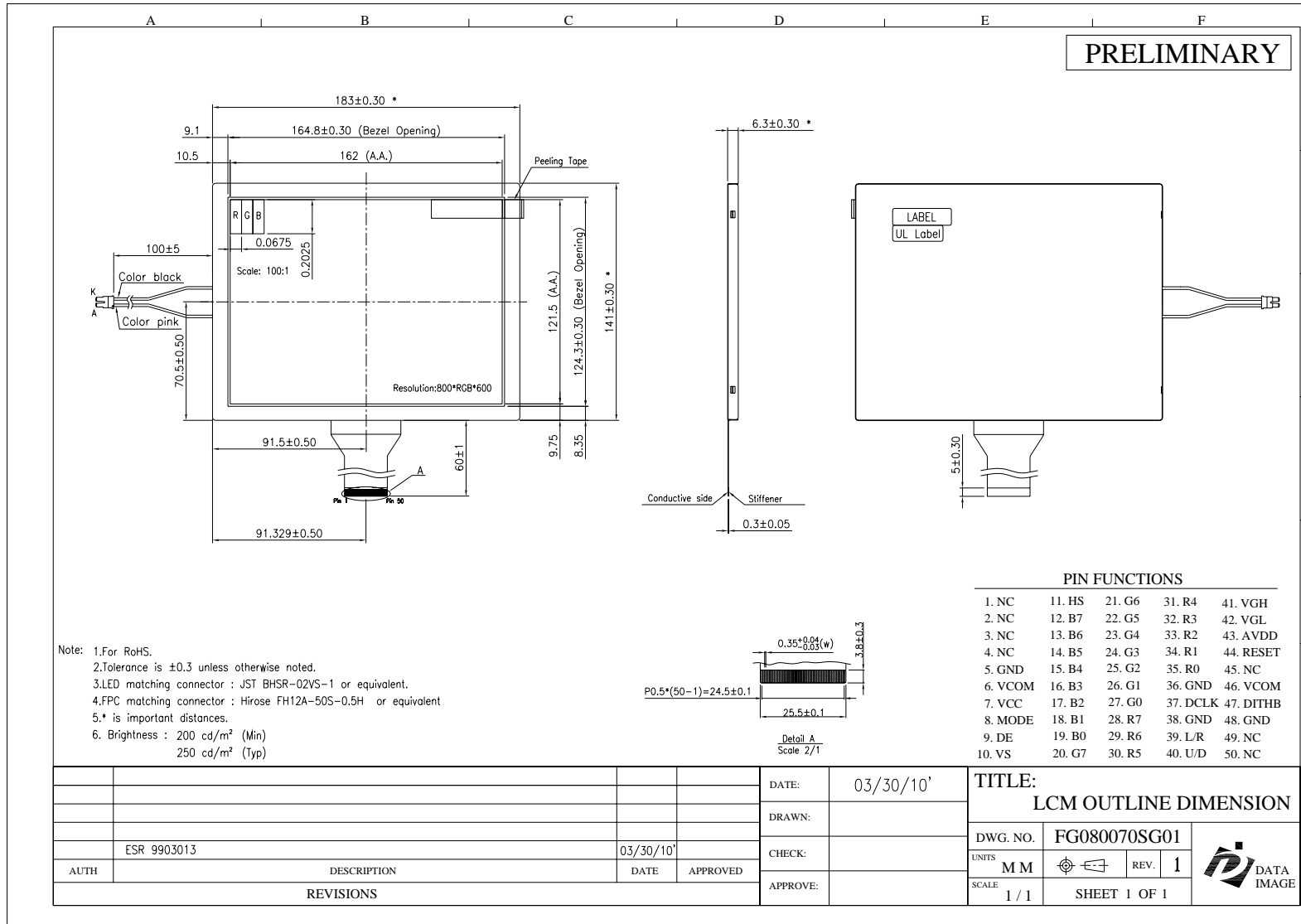
2.5 Storage

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 responsible for any subsequent or consequential events.

14. OUTLINE DRAWING



15. PACKAGE INFORMATION

TBD