

TFT-Display Datenblatt

Modell FG080071DSSWAGT1

Kurzdaten

Hersteller	Datamagic
Diagonale	8,0" / 20,3 cm
Format	4:3
Auflösung	800 x 600
Backlight	LED / 200 cd/m ²
Temperatur	-20...+70°C (Betrieb)

DATA IMAGE CORPORATION

TFT Module Specification

Preliminary

ITEM NO.: FG080071DSSWAGT1

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Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	JACK	ERIC	PAUL	HELEN
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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 9.5(D)	mm
Weight	TBD	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 _{DD}	-0.3	5.0	V	Ta=25°C
Operating temperature	Top	-10	60	°C	
Storage temperature	Tst	-30	70	°C	

6. ELECTRICAL CHARACTERISTICS

Ta=25°C

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage	V _{DD}	3.0	3.3	3.6	V	
Power Supply Current	I _{DD}	--	--	350	mA	V _{DD} = 3.3V
Input logic high voltage	V _{IH}	0.7 V _{DD}	-	V _{DD}		
Input logic low voltage	V _{IL}	0	-	0.3 V _{DD}		

6.1 Backlight Driving for Power Consumption

Ta= 25 °C

Parameter	Symbol	min	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 Input signal characteristics

7.1.1 AC Electrical Characteristics

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Data setup time	T_{dsu}	8	-	-	ns
Data hold time	T_{dhd}	8	-	-	ns
DEN setup time	T_{esu}	8	-	-	ns

7.1.2 Resolution : 800x600

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
CLK frequency	F_{CPH}	30.5	40	42	MHz
CLK period	T_{CPH}	23.81	25	32.79	ns
CLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH}+T_{DEL}$	862	1056	1200	T_{CPH}
DE pulse width	T_{DH}	-	800	-	T_{CPH}
DE frame blanking	T_{DEB}	24	35	100	$T_{DEH}+T_{DEL}$
DE frame width	T_{DE}	-	600	-	$T_{DEH}+T_{DEL}$

7.2 Timing Controller Timing Chart

6.2.1 Clock and Data input waveforms

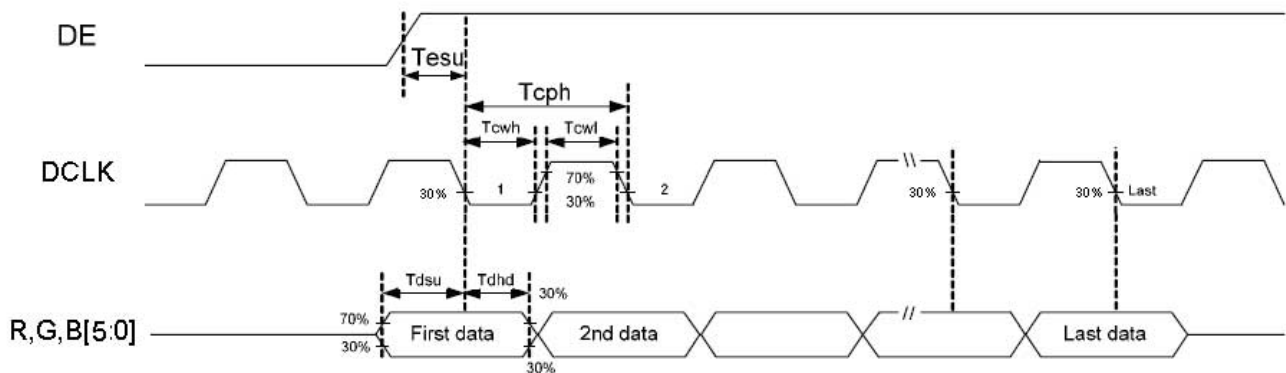
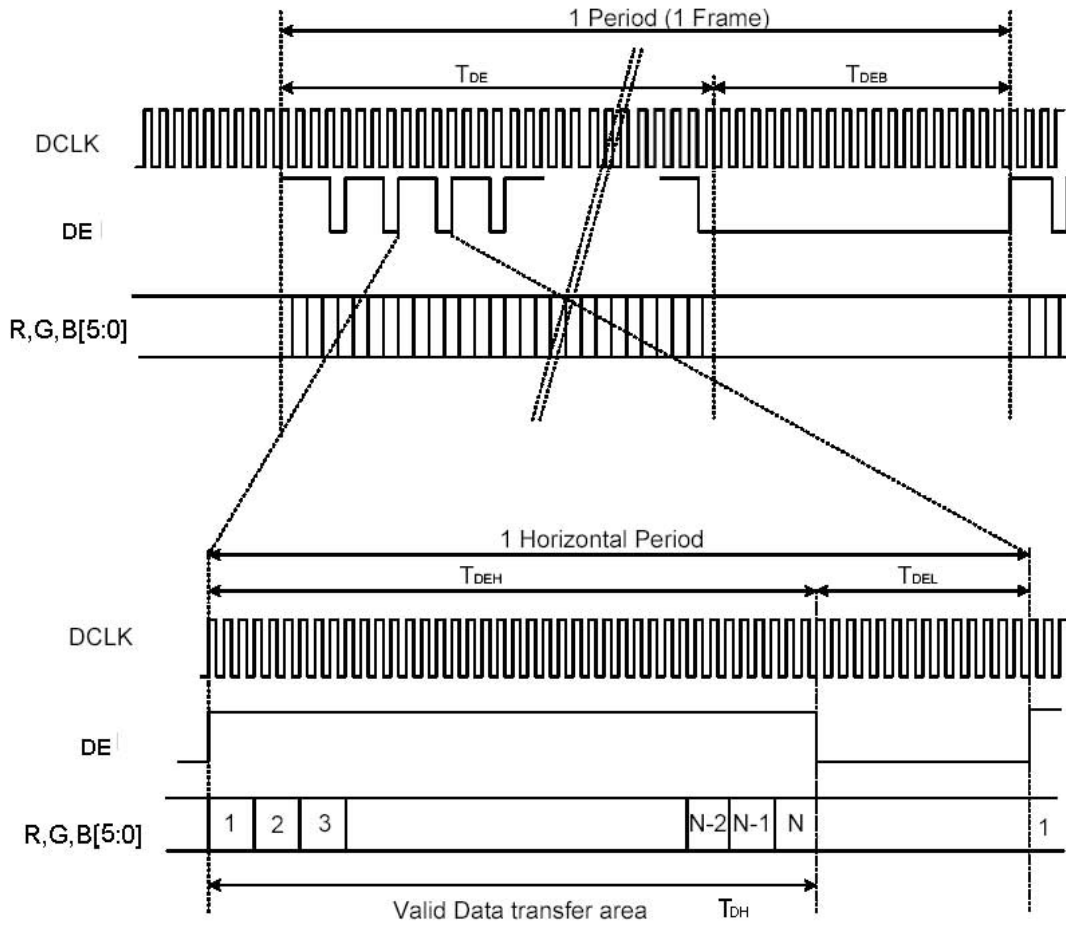


Figure 1 Clock and Data input waveforms.



N=800

Figure 2 DE Mode Data Format

7.3 Color Data Input Assignment

Color		Data Signal																	
		Red						Green						Blue					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	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	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(63)	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 (61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue (62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

8. PIN CONNECTIONS

8.1 Input Pins Function

Pin No.	Symbol	Function	Remark
1	GND	Power ground	
2	GND	Power ground	
3	NC	No connection	
4	VDD	Power for Digital circuit	
5	VDD	Power for Digital circuit	
6	VDD	Power for Digital circuit	
7	VDD	Power for Digital circuit	
8	NC	No connection	
9	DE	Data Input Enable	
10	GND	Power ground	
11	GND	Power ground	
12	GND	Power ground	
13	B5	Blue data	
14	B4	Blue data	
15	B3	Blue data	
16	GND	Power ground	
17	B2	Blue data	
18	B1	Blue data	
19	B0	Blue data(LSB)	
20	GND	Power ground	
21	G5	Green data	
22	G4	Green data	
23	G3	Green data	
24	GND	Power ground	
25	G2	Green data	
26	G1	Green data	
27	G0	Green data (LSB)	
28	GND	Power ground	
29	R5	Red data	
30	R4	Red data	
31	R3	Red data	
32	GND	Power ground	
33	R2	Red data	
34	R1	Red data	
35	R0	Red data (LSB)	
36	GND	Power ground	
37	GND	Power ground	
38	DCLK	Sample clock	
39	GND	Power ground	
40	GND	Power ground	

8.2 Backlight Unit Section

Pin No	Symbol	I/O	Description	Remark
1	A	P	Power for LED backlight anode	Pink
2	K	P	Power for LED backlight cathode	Black

8.3 Power Signal Sequence

Remarks:

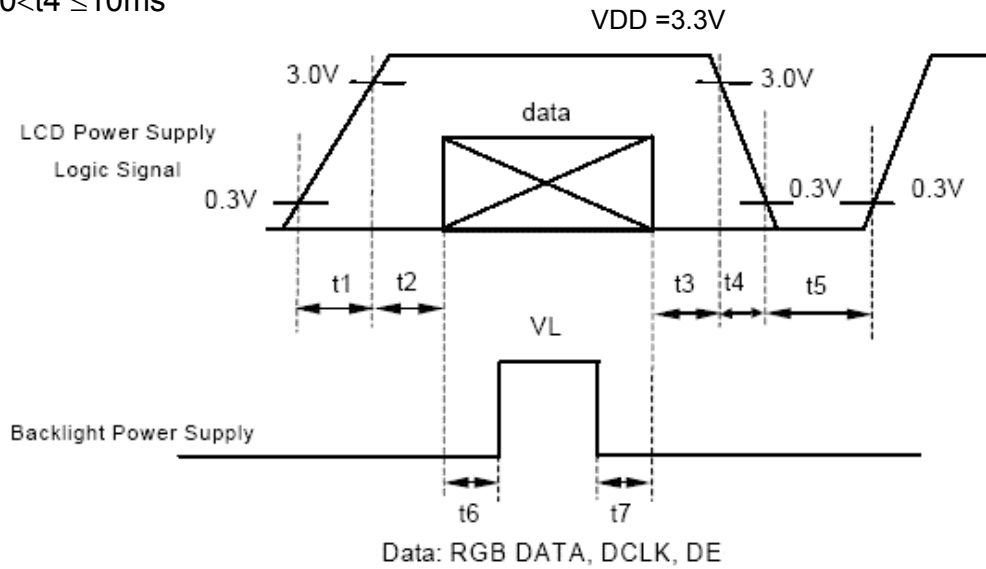
*1) Power Signal sequence:

$t1 \leq 10ms$: $1 \text{ sec} \leq t5$

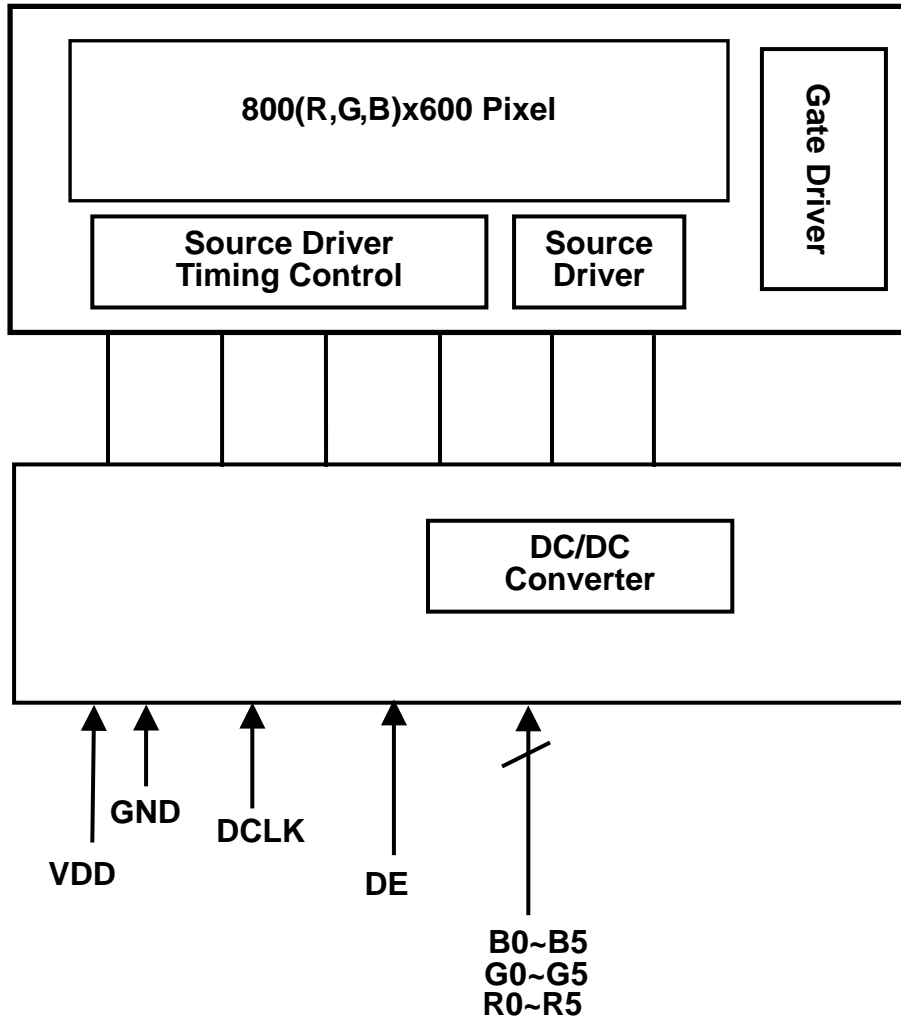
$50ms \leq t2$: $200ms \leq t6$

$0 < t3 \leq 50ms$: $200ms \leq t7$

$0 < t4 \leq 10ms$



9. BLOCK DIAGRAM



10. OPTICAL CHARACTERISTIC

10.1. 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			320	400			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 $\theta=\Phi=0^\circ$	160	200	--	cd/m ²	Note 6	
Uniformity			70	75		%	Note 7	
Image sticking	tis	2 hours			2	Sec	Note 8	

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

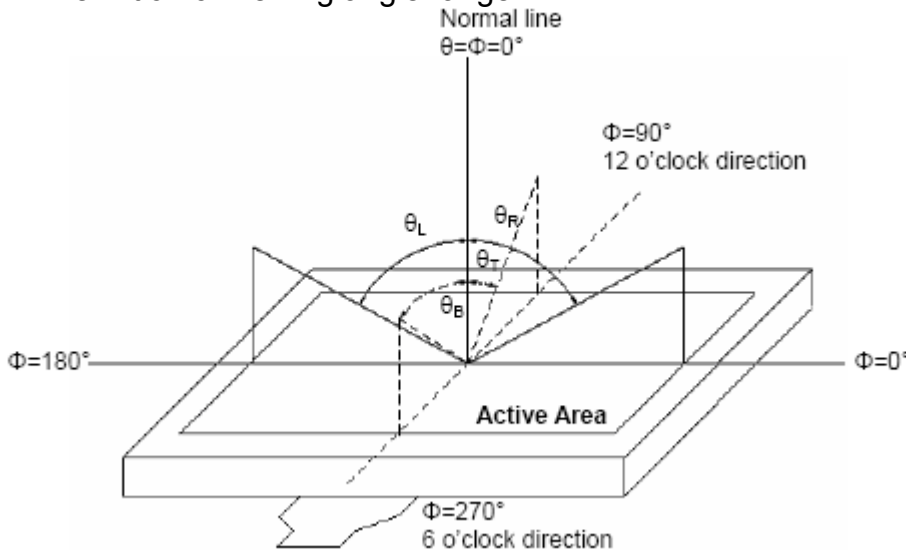


Fig.10-1 Definition of viewing angle

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.)

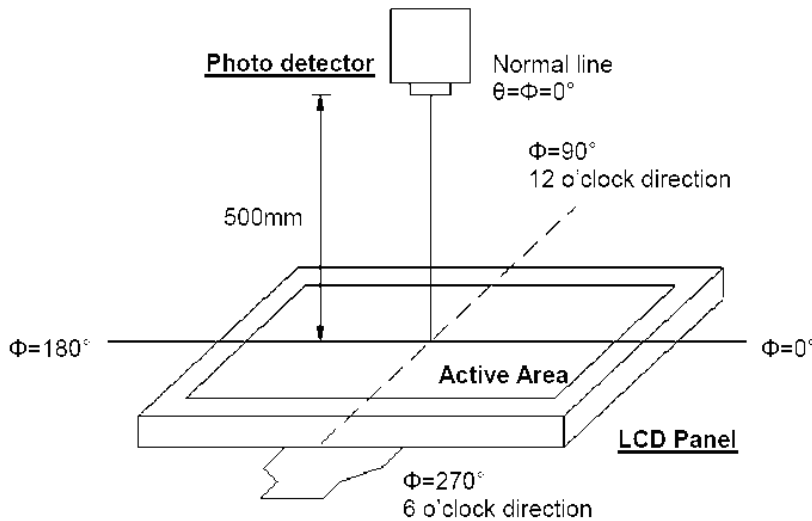


Fig. 10-2 Optical measurement system setup

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%.

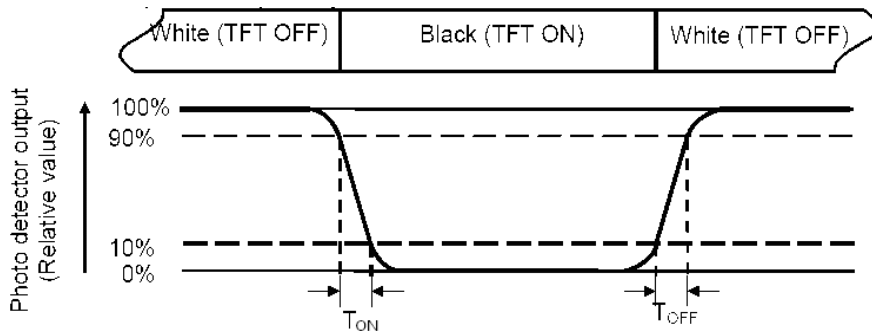


Fig. 10-3 Definition of response time

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

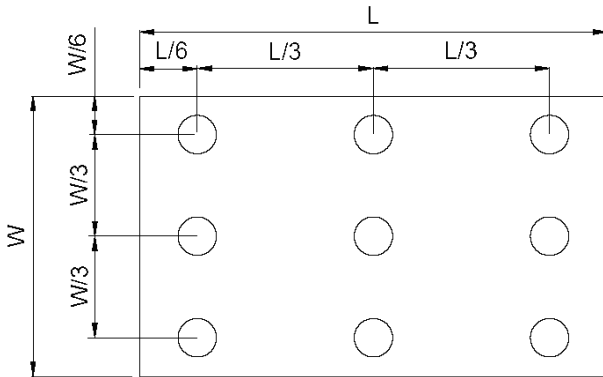


Fig. 10-4 Definition of measuring points

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

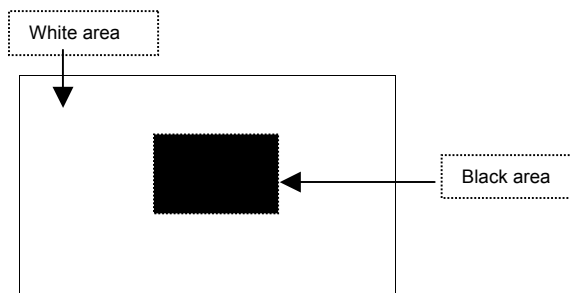
B_{min} : The measured minimum luminance of all measurement position.

Note 8: Definition of Image sticking (tis):

Continuously display the test pattern shown in the figure below for 2 hours. Then display a completely white screen. The

previous image shall not persist more than 2 sec at 25 °C

Image sticking pattern



11. TOUCH PANEL CHARACTERISTICS

1. Input Method and Activation Force

Input Method	Average Activation Force
1.6mm dia. Delrin stylus	50gf Max.
16mm dia. Silicon "finger"	50gf Max.

2. Typical Optical Characteristics

ITEM	Parameter
Visible Light Transmission	82% typ.
Haze	5% typ.

3. Electrical Specification

ITEM	Parameter
Operating Voltage	DC 7V Max.
Circuit close resistance	X 300~1100Ω
	Y 150~650Ω
Circuit open resistance	≥20MΩ at 25V DC
Contact bounce	≤10ms
Linear Test	≤1.5%

4. Linearity

ITEM	Parameter
Linear Test Specification Direction	X ≤1.5%
	Y ≤1.5%

5. Specification

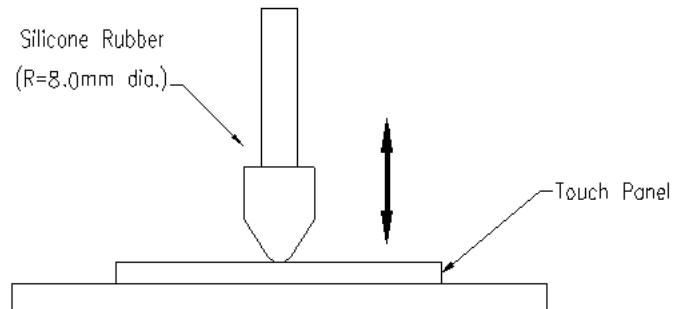
ITEM	Parameter
Operating Temperature	-10°C~+60°C
Storage Temperature	-30°C~+70°C

6. Durability test:

6.1 Finger touches

Touch panel is hit 1 millions times with a silicone rubber of R8 finger, hitting rate is by 200g at 2 times per second. The measurement must satisfy the following:

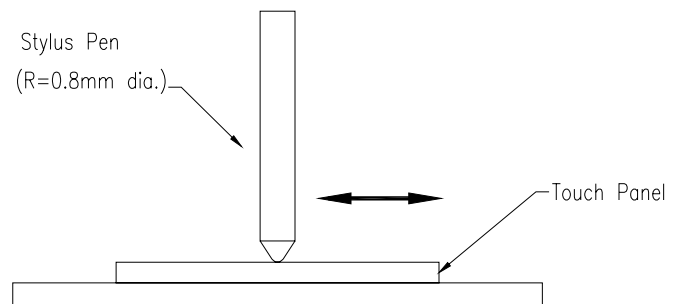
- Circuit close resistance: x 300~1100Ω ;
y 150~650Ω
- Circuit open resistance: ≥20MΩ at 25V DC
- Contact bounce: ≤10ms
- Linearity test: ≤3%



6.2 Stylus writing

Touch panel is drawn by R0.8 Delrin stylus pen, at 250g forces, repeat one inch by 100k times. The measurement must satisfy the following:

- Circuit close resistance: x 300~1100Ω ;
y 150~650Ω
- Circuit open resistance: ≥20MΩ at 25V DC
- Contact bounce: ≤10ms
- Linearity test: ≤3%



12. QUALITY ASSURANCE

12.1 Test Condition

12.1.1 Temperature and Humidity(Ambient Temperature)

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

Humidity : $65 \pm 5\%$

12.1.2 Operation

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

12.1.3 Container

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

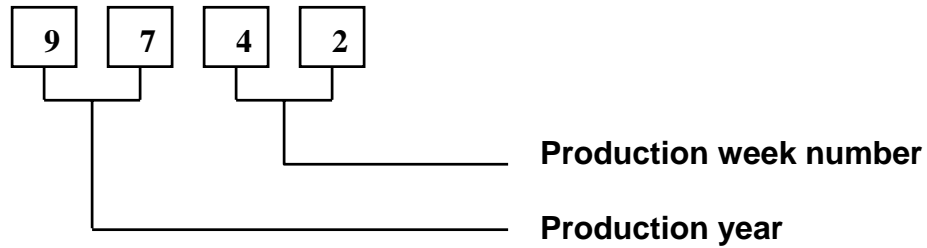
12.1.4 Test Frequency

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

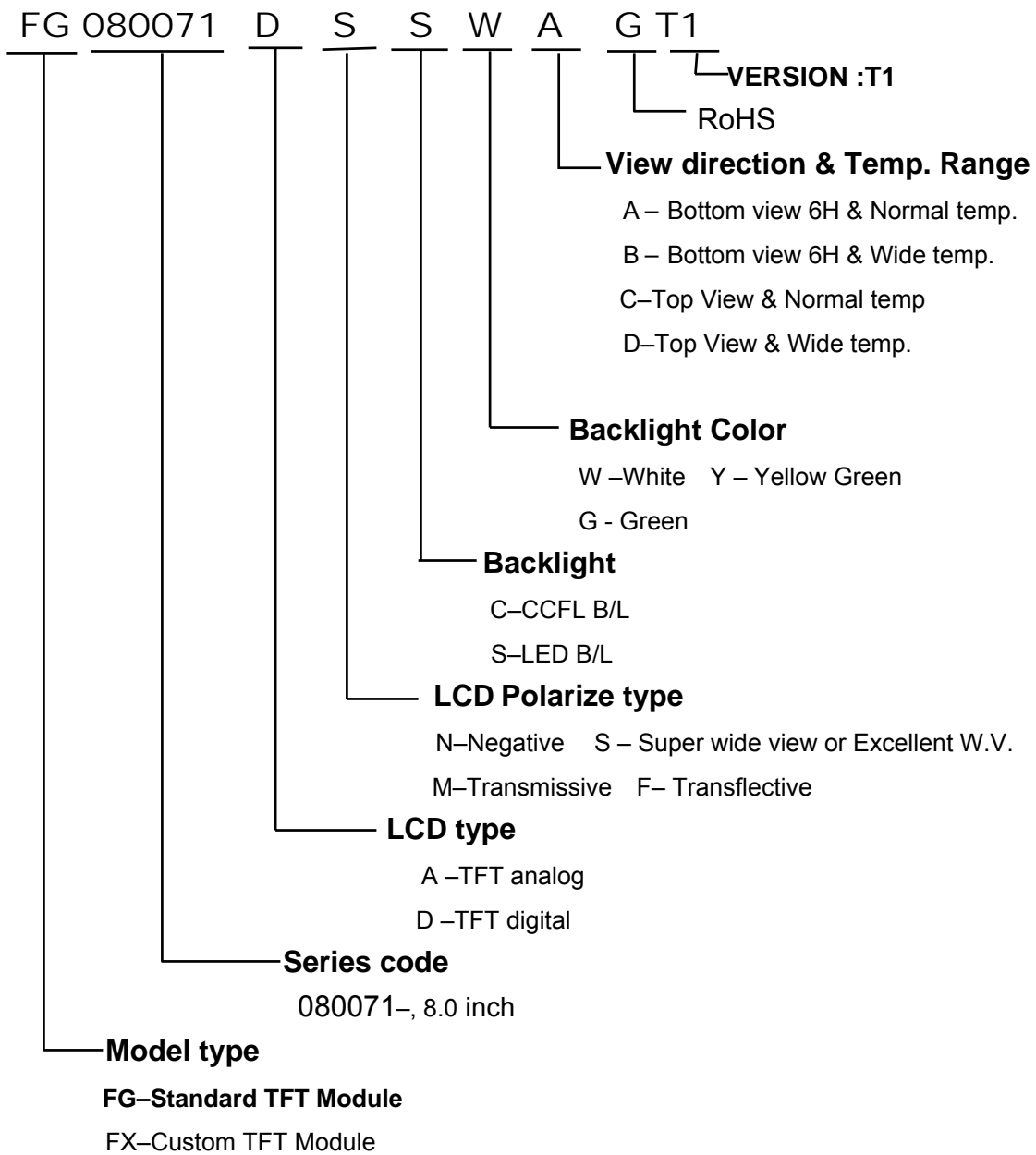
12.1.5 Test Method

Reliability Test Item & Level		Test Level
No.	Test Item	
1	High Temperature Storage Test	T=70 ,240hrs
2	Low Temperature Storage Test	T=-30 ,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=40 ,90%RH,240hrs
6	Thermal Cycling Test (No operation)	-30 → +25 → +70 ,100 Cycles 30 min 5 min 30 min
7	Vibration Test (No operation)	Frequency : 10 ~ 55 Hz Amplitude : 1.5 mm Sweep Time : 11mins Test Period : 6 cycles for each Direction of X,Y,Z
8	Shock Test (No operation)	100G, 6ms Direction : $\pm X, \pm Y, \pm Z$ Cycle : 3 times

13. LOT NUMBERING SYSTEM



14. LCM NUMBERING SYSTEM



15. 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".

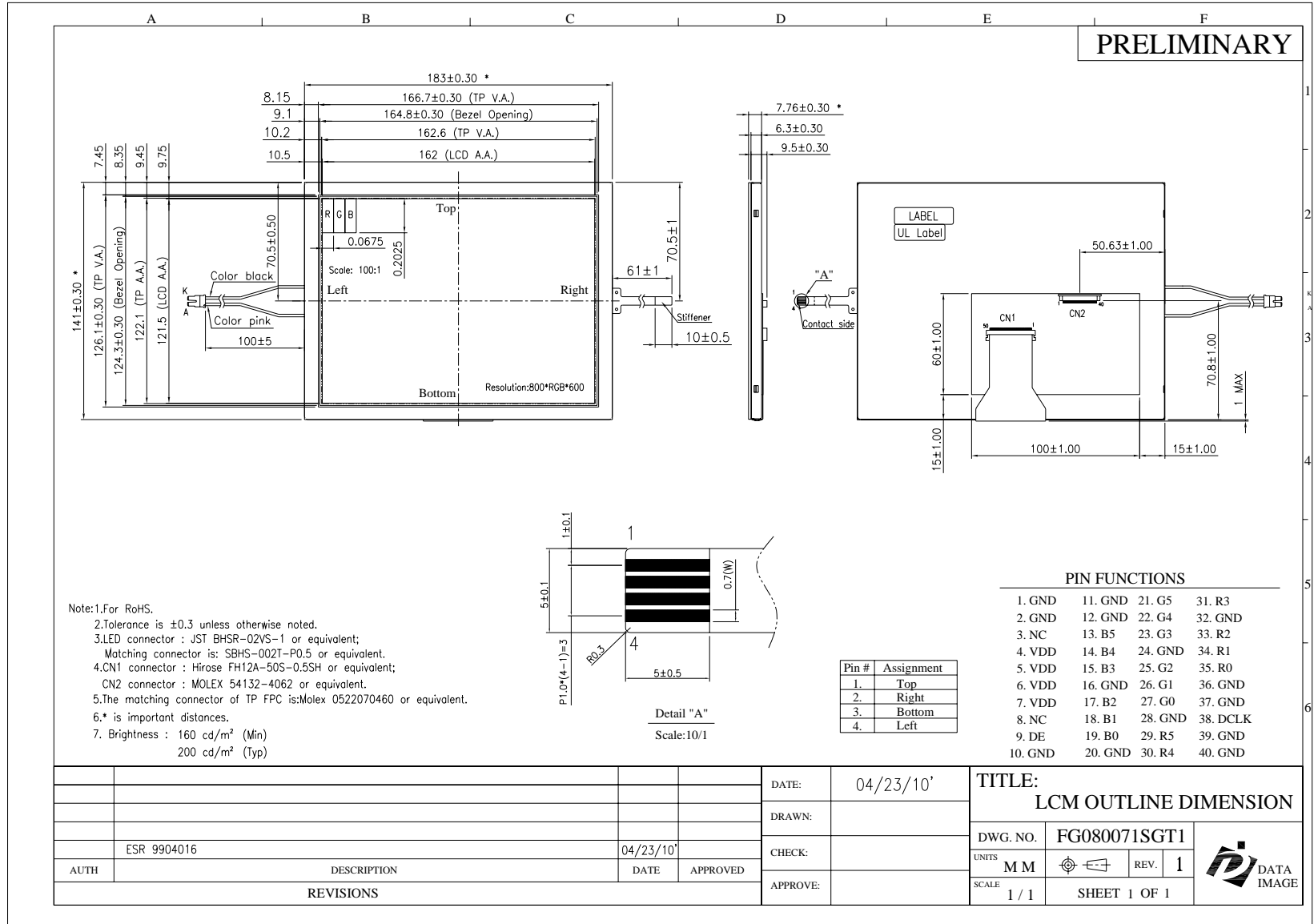
2.5 Storage

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.

16. OUTLINE DRAWING



16. PACKAGE INFORMATION

TBD