DATA IMAGE CORPORATION

TFT Module Specification

PRELIMINARY

ITEM NO.: FG080421DSSWDG01

Table of Contents

Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	JACK	JOE	GARY	KEN
Approved by	Version:	Issued Date:	Sheet Code:	Total Pages:
	1	28/MAY/12’		18

2. RECORD OF REVISION

Rev	Date	Item	Page	Comment
1	28/MAY/12’			Initial PRELIMINARY

3. GENERAL SPECIFICATIONS

Parameter	Specifications	Unit
Screen Size	8.4 (diagonal)	inch
Display Format	800(H) x (R,G,B) x 600(V)	dot
Active Area	170.4(H) x 127.8 (V)	mm
Pixel Pitch	0.213 (H) x 0.213 (V)	mm
Pixel Configuration	R.G.B.-Stripe	
Outline Dimension	203(W) x 145.9(H) x5.7(D)	mm
Back-light	LED	
Display mode	Normally white	
Weight	218	g
View Angle direction	12 o'clock (gray scale inversion direction)	
Our components and processes are compliant to RoHS standard		

4. ABSOLUTE MAXIMUM RATINGS

GND= 0V

Parameter	Symbol	MIN.	MAX.	Unit	Remark
Power supply voltage	V_{CC}	-0.3	+5.0	V	-
LED driving voltage	Vled	-0.3	+17	V	
Logic input voltage	VIN	-0.3	VCC+0.3	V	-
Operating temperature	Top	-20	70	°C	Note1,2,3
Storage temperature	Tst	-30	80	°C	
Humidity	-	-	90	%RH	Note4

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Operation Ta=70℃ & -20℃ ≦ 240Hrs.

Note 4 : Operation Ta=60℃ & H=90% ≦ 240Hrs.

5. ELECTRICAL CHARACTERISTICS

A) Module

Ta=25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Remark
Power Voltage for LCD	V_{CC}	3.0	3.3	3.6	V	
	I_{CC}	-	210	-	mA	Note1
Input signal voltage	V_{IH}	$0.7V_{CC}$	-	V_{CC}	V	Note2
	V_{IL}	0	-	$0.3V_{CC}$	V	

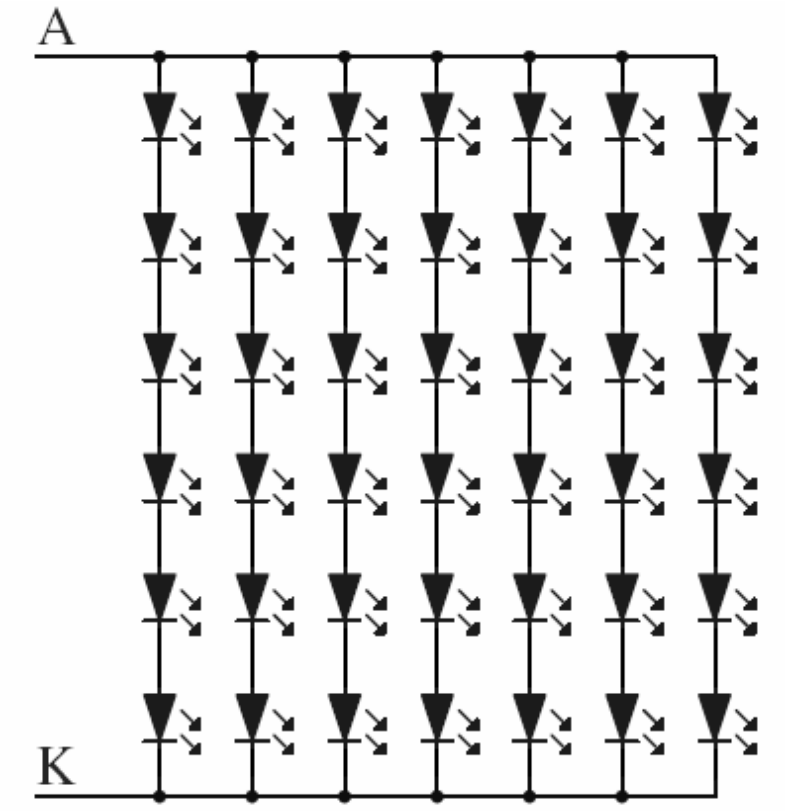
Note1:Test Pattern: all black.

Note2: HSYNC, VSYNC, DE, Digital data.

B) Backlight Driving Conditions

Ta=25°C

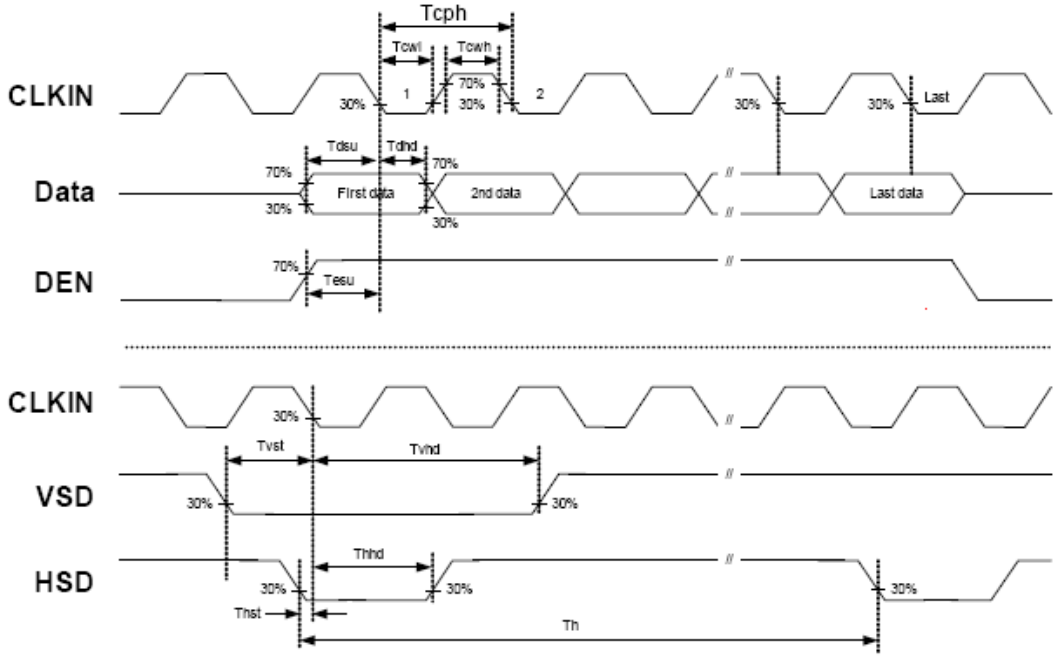
Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Remark
LED Driving Voltage	V_{led}	4.5	5	15	V	
	I_{led}	-	690	-	mA	
ADJ Input Analog Dimming	-	0.7	-	1.4	V_{DC}	
ADJ Input PWM Dimming	-	1.4	-	5.0	V_{P-P}	
ADJ frequency	-	100	-	1000	Hz	

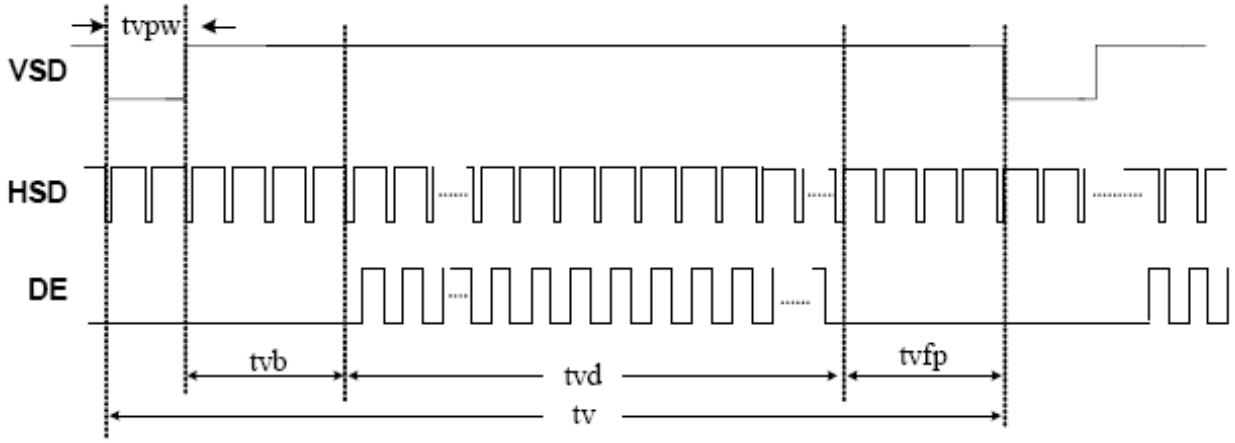


6. INTERFACE SPECIFICATIONS

6.1 Input signal characteristics

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
DCLK cycle time	Tcph	20			ns
DCLK frequency	Fclk		40	50	MHz
DCLK pulse duty	Tcwh	40	50	60	%
VSD setup time	Tvst	8			ns
VSD hold time	Tvhd	8			ns
HSD setup time	Thst	8			ns
HSD hold time	Thhd	8			ns
Data setup time	Tdsu	8			ns
Data hold time	Tdhd	8			ns
DE setup time	Tesu	8			ns
DE hold time	Tehd	8			Ns
Horizontal display area	Thd		800		Tcph
HSD period time	Th		1000		Tcph
HSD pulse width	Thpw	1	48		Tcph
HSD back porch	Thb		40		Tcph
HSD front porch	Thfp		112		Tcph
Vertical display area	Tvd		600		th
VSD period time	Tv		660		th
VSD pulse width	Tvpw		3		th
VSD back porch	Tvb		36		th
VSD front porch	tvfp		21		th




tvpw
VSD
HSD
DE
tvb
tvd
tvfp
tv

7. OPTICAL CHARACTERISTIC

7.1. Specification:

Ta=25℃

Parameter		Symbol	Conditions	Specifications				REMARK
				Min.	Typ.	Max.	Unit	
Response Time		TF	T=0	-	2	4	ms	Note 2
		TR		-	6	12	ms	
Contrast Ratio		CR	Viewing Normal Angle θx=θy =0°	450	600	-	ms	Note 1
Chromaticity	White	XW		0.26	0.30	0.34	-	Note 4
		YW		0.28	0.32	0.36	-	
Viewing Angle	Hor.	θx+	Viewing Normal Angle θx=θy =0° CR≧10	65	75	-	Deg.	Note 3
		θx-		65	75	-		
	Ver.	θy+		60	70	-		
		θy-		50	60	-		
Luminance		L	ADJ=1.4V_{DC}	360	400	-	cd/m2	
Luminance uniformity		YU		70	-	-	%	Note 5

Note 1: Definition Of Contrast Ratio(CR):

The contrast ratio can be calculated by the following expression

Contrast Ratio (CR)=L63/L0

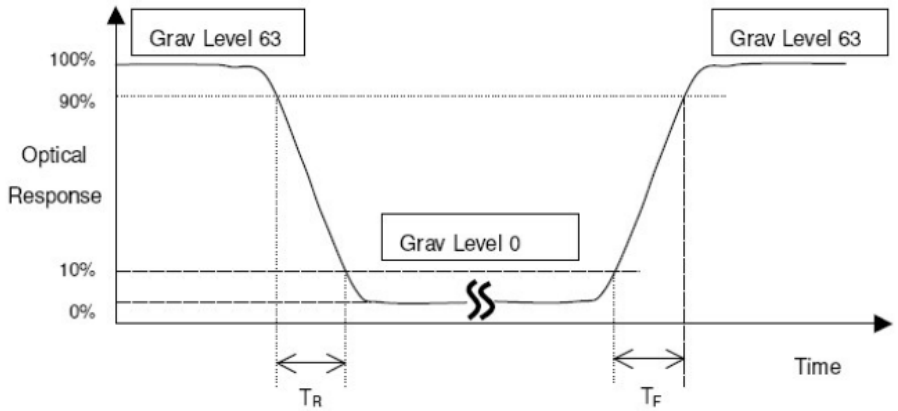
L63:Luminance of gray level 63

L0:Luminance of gray level 0

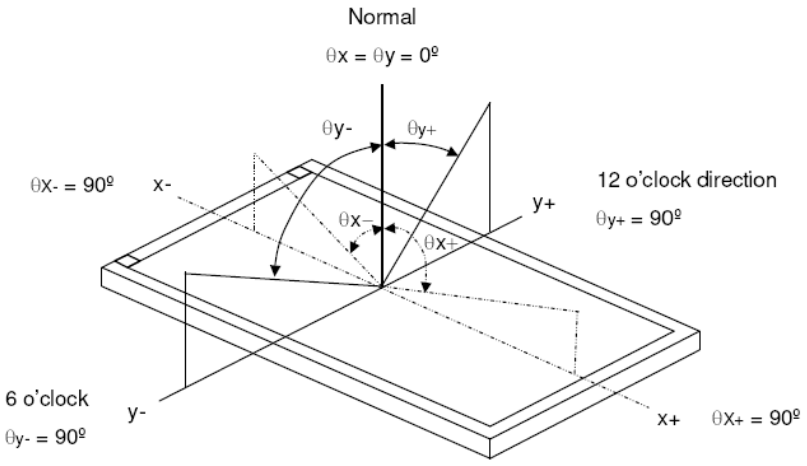
CR=CR(5)

CR(X) is corresponding to the contrast ratio of the point X at figure in Note(5)

Note 2: Definition Of Response Time(TR,TF):

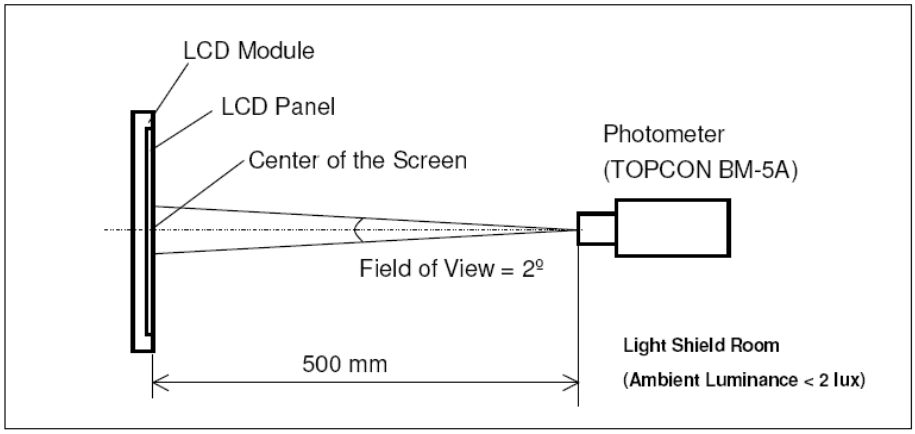


Note 3: Definition Of Viewing Angle

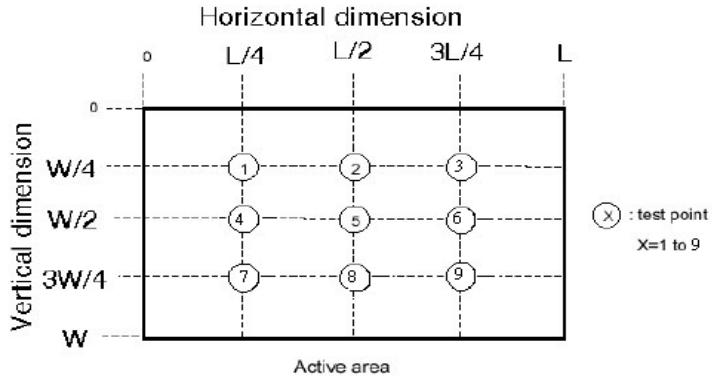


Note 4: Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring.In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note 5:



$$1-\left(\frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}}\right) \text{X}100\% \geqq 70\%$$

8. PIN CONNECTIONS

8.1 TFT LCD Panel Driving Section

PIN No.	SIGNAL	FUNCTION	Remark
1	VCC	Power Supply For Digital Circuit	
2	VCC	Power Supply For Digital Circuit	
3	U/D	Vertical Display Mode Select Signal Up / Down Scan Control Input.	Note1
4	L/R	Horizontal Display Mode Select Signal Left / Right Scan Control Input.	Note1
5	RxIN0-	Differential Clock Input,CH0(Negative)	
6	RxIN0+	Differential Clock Input,CH0(Positive)	
7	GND	Ground	
8	RxIN1-	Differential Clock Input,CH1(Negative)	
9	RxIN+	Differential Clock Input,CH1(Positive)	
10	GND	Ground	
11	RxIN2-	Differential Clock Input,CH2(Negative)	
12	RxIN2+	Differential Clock Input,CH2(Positive)	
13	GND	Ground	
14	RxIN-	Differential Clock Input(Negative)	
15	RxIN+	Differential Clock Input(Positive)	
16	GND	Ground	
17	Vled	Power Supply for LED Driver Circuit(5V)	
18	Vled	Power Supply for LED Driver Circuit(5V)	
19	GND	Ground	
20	ADJ	Adjust The Back Light Brightness	Note2,3

Note1:

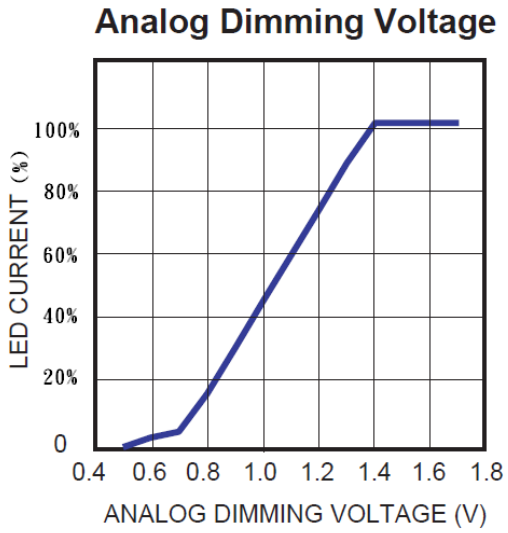
L/R=L U/D=H

L/R=H U/D=H

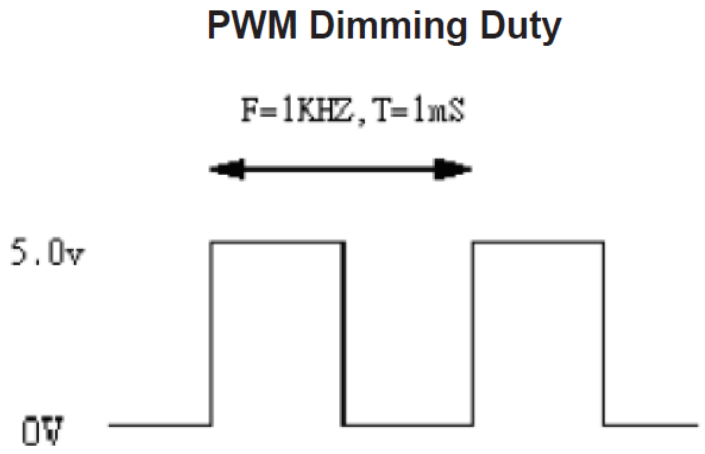
L/R=L U/D=L

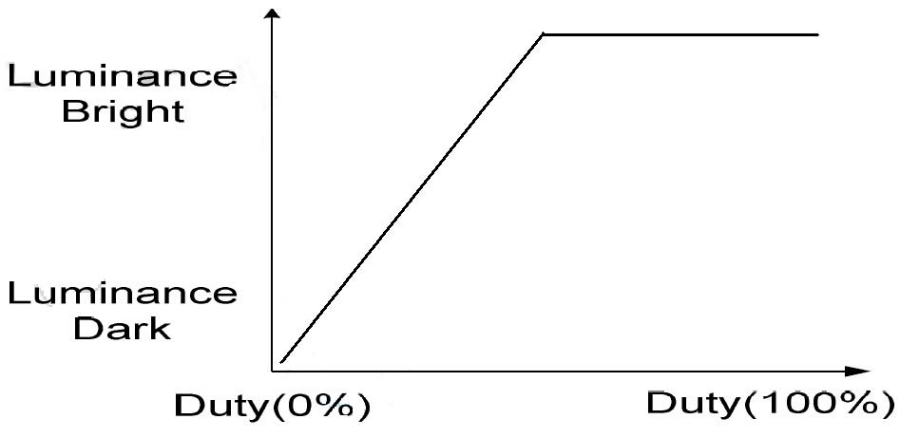
L/R=H U/D=L

Note2: When the ADJ pin voltage rises from 0.7VDC to 1.4VDC,the LED current will change from 0% to 100% of the maximum LED current.



Note3: ADJ signal Vp-p =1.4~5.0V ,operation frequency: 100Hz ~ 1kHz





8.2 Power Signal Sequence

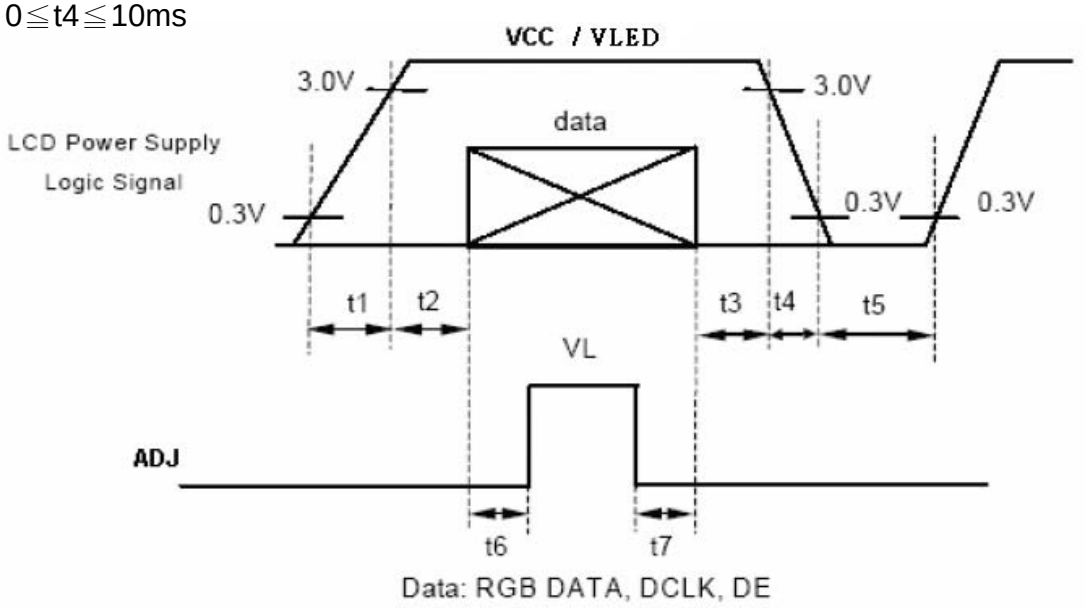
Power Signal Sequence:

t1≦10ms ; 1sec≦t5

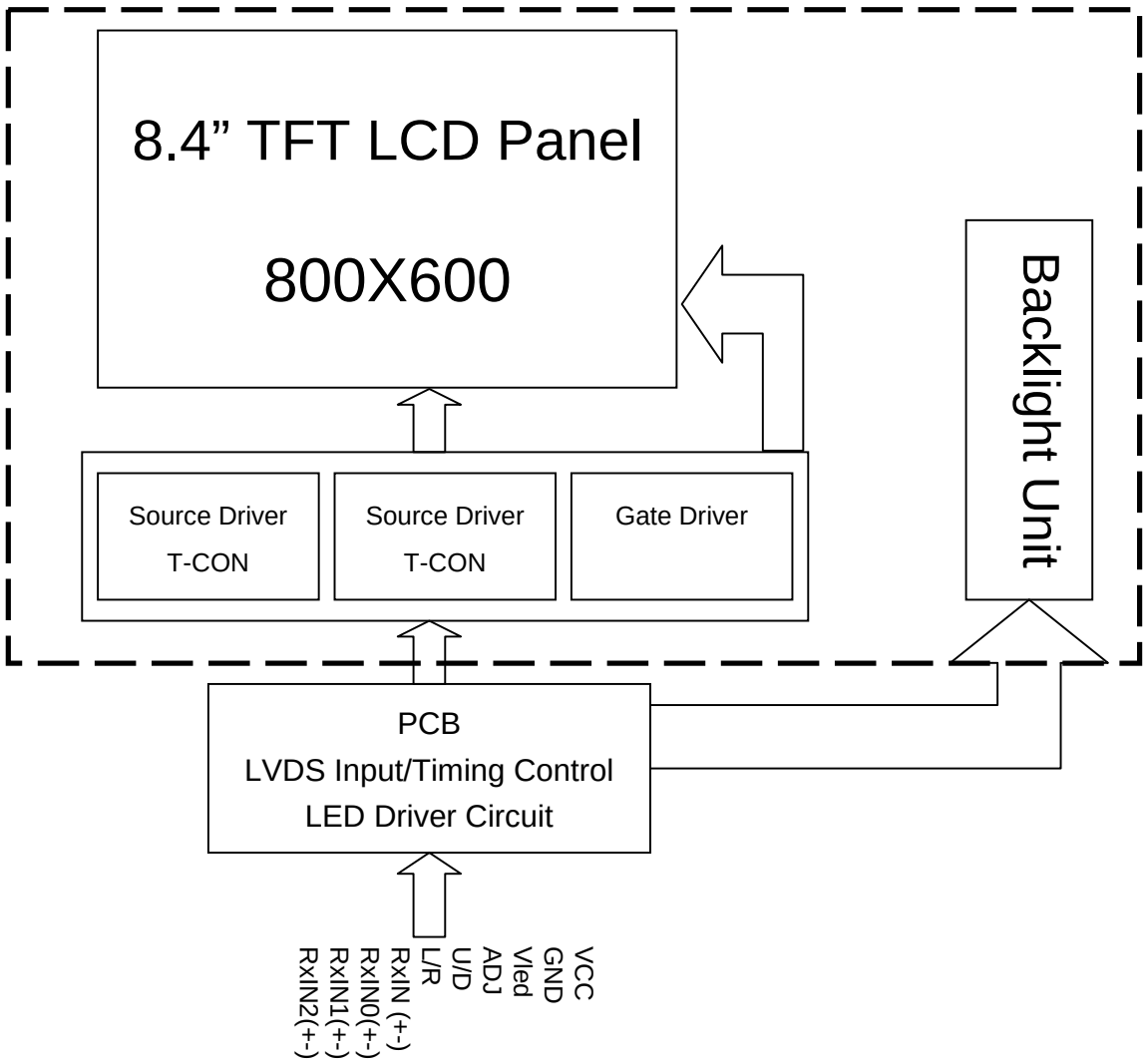
200ms≦t2 ;200ms≦t6

0≦t3≦50ms ;200ms≦t7

0≦t4≦10ms



9. BLOCK DIAGRAM



10. QUALITY ASSURANCE

10.1 Test Condition

10.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25 ± 5°C

Humidity : 65 ± 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

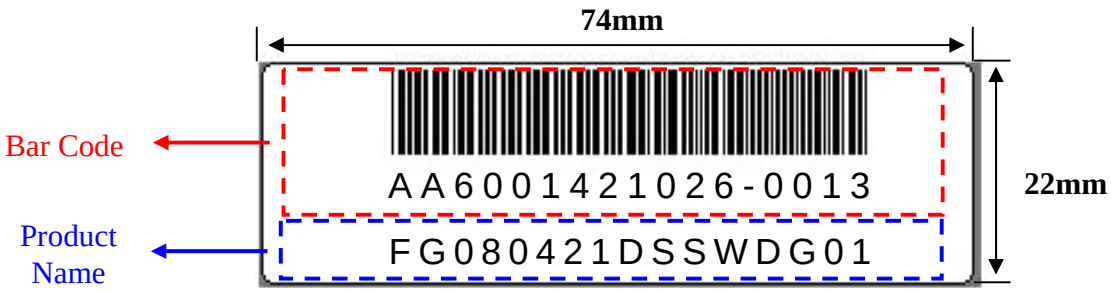
In case of related to deterioration such as shock test. It will be conducted only once.

10.1.5 Test Method

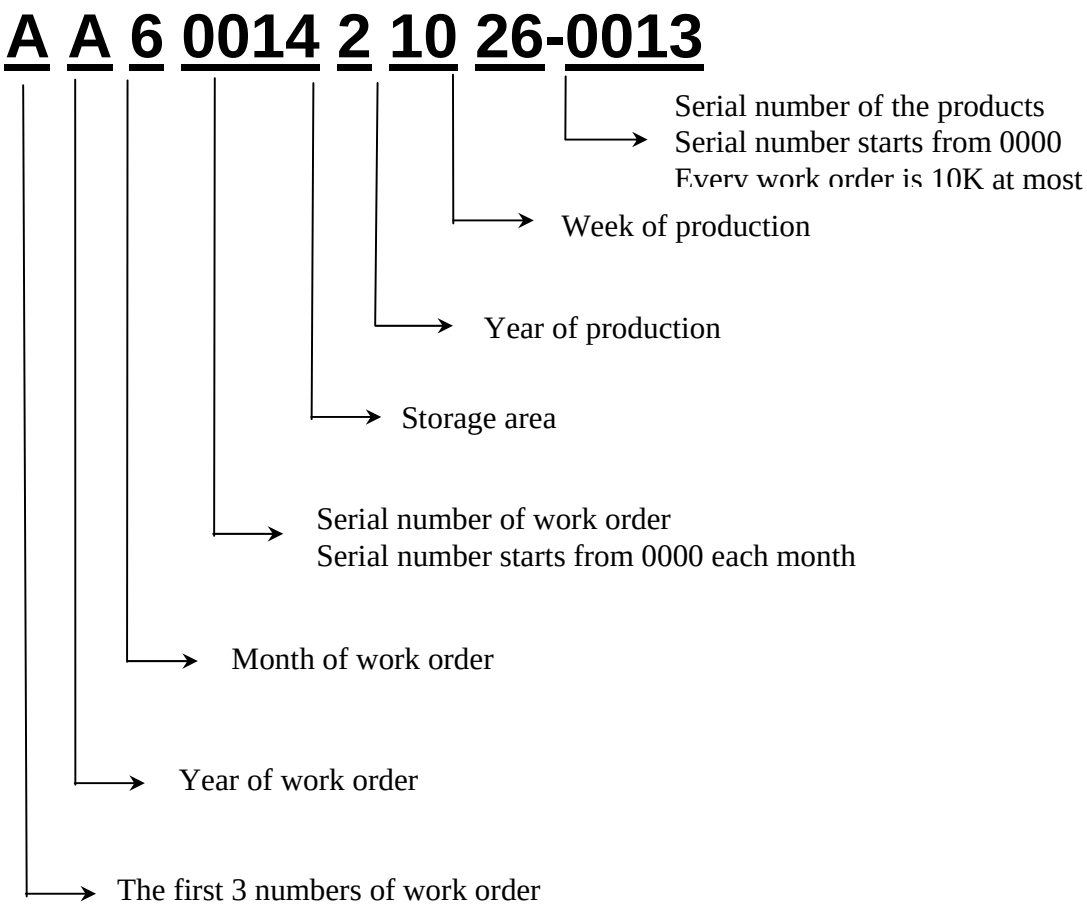
No.	Reliability Test Item & Level	Test Level
1	High Temperature Storage Test	T=80°C,240hrs
2	Low Temperature Storage Test	T=-30°C,240hrs
3	High Temperature Operation Test	T=70°C,240hrs
4	Low Temperature Operation Test	T=-20°C,240hrs
5	High Temperature and High Humidity Operation Test	T=60°C,90% RH,240hrs
6	Thermal Cycling Test (No operation)	-30°C → +25°C → +80°C, 100Cycles 30 min 5min 30 min

11. LCM Product Label Define

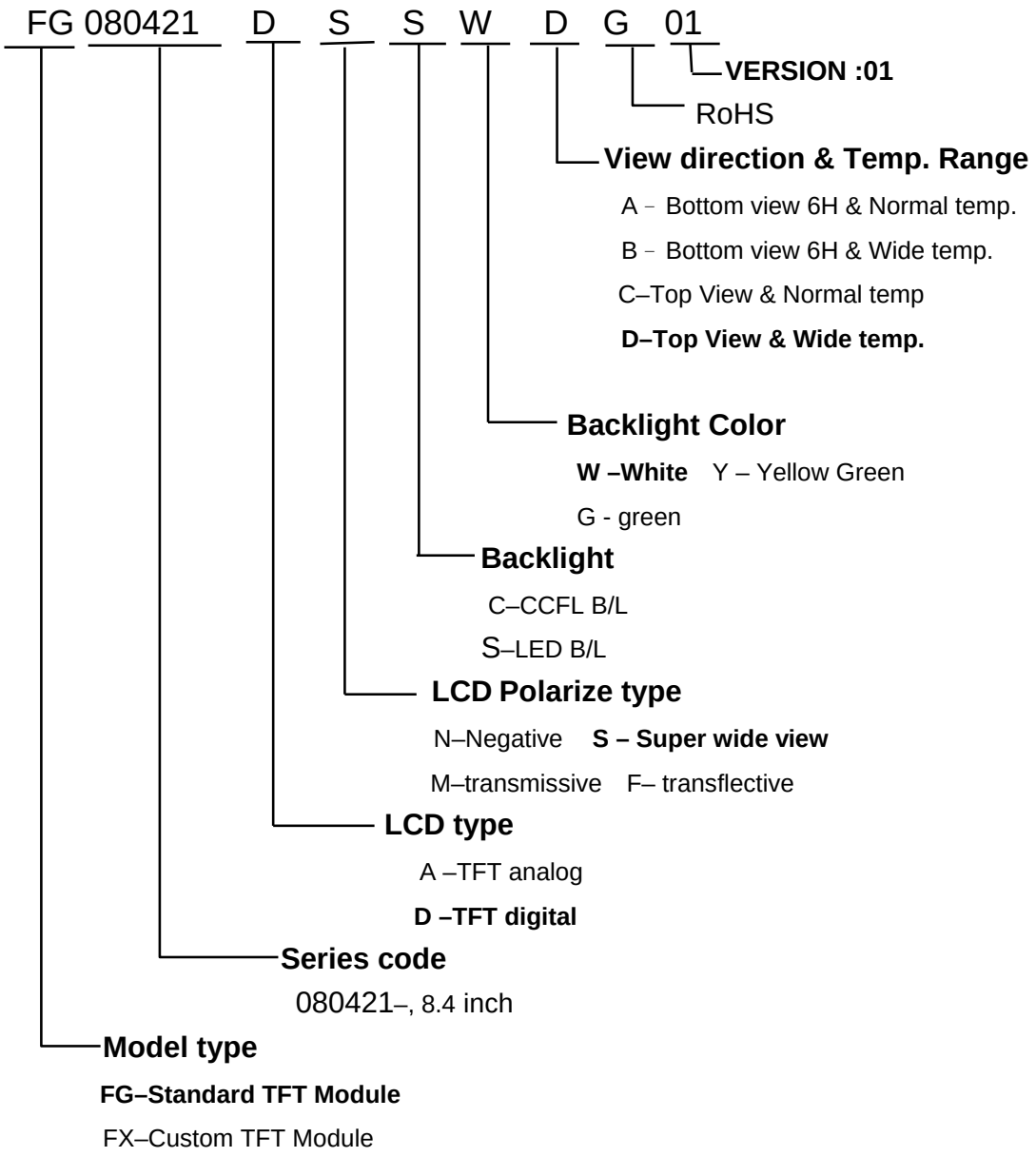
Product Label style:



BarCode Define:



Product Name Define:

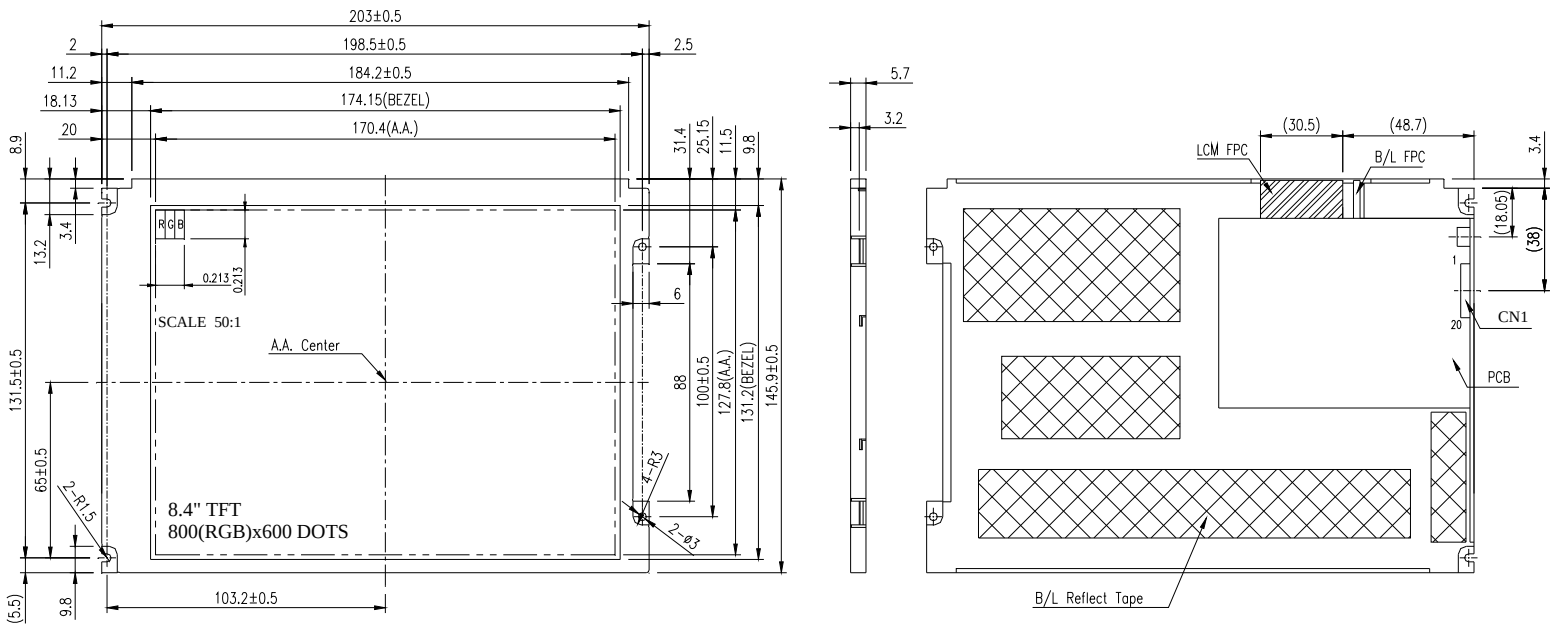


12. PRECAUTIONS IN USE LCM

1. ASSEMBLY PRECAUTIONS
   (1) You must mount a module using holes arranged in four corners or four sides.
   (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
   (3) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
   (4) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
   (5) Do not open the case because inside circuits do not have sufficient strength.
   (6) Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
   (7) Please do not touch metal frames with bare hands and soiled gloves. A color change of the metal frames can happen during a long preservation of soiled LCD modules.
   (8) Please pay attention to handling lead wire of backlight so that it is not tugged in connecting with inverter.
2. OPERATING PRECAUTIONS
   (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
   (2) Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification
   (3) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
   (4) When fixed patterns are displayed for a long time, remnant image is likely to occur.
   (5) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
   (6) Please consider that LCD backlight takes longer time to become stable of radiation characteristics in low temperature than in room temperature.
3. ELECTROSTATIC DISCHARGE CONTROL
   (1) The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such the copper leads on the PCB and the interface terminals with any parts.
   (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.
4. STORAGE PRECAUTIONS
   (1) When you store LCDs for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
   (2) Please do not leave the LCDs in the environment of high humidity and high temperature such as 60°C 90%RH
   (3) Please do not leave the LCDs in the environment of low temperature; below -20°C.
5. OTHERS
   (1) A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight Land strong UV rays
   (2) Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
   (3) For the packaging box, please pay attention to the followings:
      a. Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
      b. Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
      c. Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)
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.

13. OUTLINE DRAWING



CN1 PIN FUNCTION

1. VCC	6. RxIN0+	11. RxIN2−	16. GND
2. VCC	7. GND	12. RxIN2+	17. Vled
3. U/D	8. RxIN1−	13. GND	18. Vled
4. L/R	9. RxIN1+	14. RxIN−	19. GND
5. RxIN0−	10. GND	15. RxIN+	20. ADJ

NOTE:

1. For RoHS
2. CN1 Connector : STM MSB24013P20
   Matching Connector : STM P24013P20
3. Without Tolerance : ±0.3

AUTH	DESCRIPTION	DATE	APPROVED

REVISIONS

DATE:	2012/05/14
DRAWN:	
CHECK:	
APPROVE:	

TITLE: LCM OUTLINE DIMENSION

DWG. NO.	FG080421G01		
UNITS M M		REV.	1
SCALE 1 / 1	SHEET 1 OF 1		

DATA IMAGE

14. PACKAGE INFORMATION

TBD