



FORMIKE ELECTRONIC CO.,LTD

PRODUCT SPECIFICATION

TFT LCD Module

MODEL : KWH080TG06-F03_{v 1.0}

【 ◆ 】 Preliminary Specification

【 】 Finally Specification

CUSTOMER'S APPROVAL	
SIGNATURE:	DATE:

APPROVED BY	PM REVIEWD	PD REVIEWD	PREPARED BY
Deng	/	Stephen	Roy

Prepared By :

FORMIKE ELECTRONIC CO.,LTD

Address :Room 14H, HanKing Building, 23# DengLiang Road, NanShan District, ShenZhen, 518054, China.

TEL:(86) 755 88306921,88306931 FAX:(86) 755 88304615

Http:// www.wandisplay.com

- This specification is subject to change without notice.Please contact FORMIKE or it's representative before designing your product based on this specification.

Issued Date: Feb-1-2012



Table of Contents	2
Record of Revision.....	3
1 General Specifications	4
2 Input/Output Terminals	5
3 Absolute Maximum Ratings	7
4 Electrical Characteristics.....	8
5 Timing Chart.....	11
6 Optical Characteristics	14
7 Environmental / Reliability Test	17
8 Mechanical Drawing.....	18
9 Packing drawing.....	19
10 Precautions for Use of LCD Modules.....	20

Formike Electronic Co., Ltd.



Record of Revision

Version	Issued Date	Page	Content	Created or Modified by
1.0	2012-2-1	All	New Creation	Deng

Formike Electronic CO., Ltd.



1. GENERAL DESCRIPTION

1.1 Description

KWH080TG06-F03 is a Transmissive type color active matrix liquid crystal display (LCD), which uses amorphous thin film transistor (TFT) as switching devices. This product is composed of a TFT LCD panel, driver ICs, FPC, a backlight unit and touch screen. The following table described the features of FORMIKE KWH080TG06-F03

1.2 Application

Armariium, Mobile Internet Device(MID), Multimedia products, GPS. Navigation device and other electronic Products

Etc.

1.3 Features:

Feature	Description
Size	8.0 inches (Diagonal)
Display Mode	Normally White, Transmissive
Surface Treatment	Anti Glare
Resolution	800 (RGB) x 600
Display Format	R.G.B. Stripe
Color Depth	16.7M
Inteface	RGB 24bits with T-con
Technology Type	a-Si
Outline Dimension (W x H x D) (mm)	183 x 141 x 7.1
Active Area(W x H mm)	162 x 121.5
Pixel pitch(mm)	202.5 x 202.5
With/Without TSP	With TSP
Weight (g)	TBD



2 Input/Output Terminals

2.1 CN1 of FPC

Pin No.	Symbol	I/O	function	Remarks
1	NC	-	No connection	-
2	NC	-	No connection	
3	NC	-	No connection	
4	NC	-	No connection	
5	GND	P	Power ground	
6	V _{COM}	I	Common voltage	
7	VCC	P	Power for digital circuit	-
8	MODE	I	DE/SYNC mode select	
9	DE	I	DATA INPUT Enable	
10	VS	I	VERTICAL SYNC INPUT	
11	HS	I	Horizontal Sync Input	
12	B7	I	Blue data(MSB)	
13	B6	I	Blue data	
14	B5	I	Blue data	
15	B4		Blue data	
16	B3	I	Blue data	
17	B2	I	Blue data	
18	B1		Blue data	
19	B0	I	Blue data(LSB)	
20	G7	I	Green data(MSB)	
21	G6	I	Green data	
22	G5	I	Green data	
23	G4	I	Green data	
24	G3	I	Green data	
25	G2	I	Green data	
26	G1	I	Green data	
27	G0	I	Green data(LSB)	
28	R7	I	RED data(MSB)	
29	R6	I	RED data	
30	R5	I	RED data	
31	R4	I	RED data	
32	R3	I	RED data	
33	R2	I	RED data	
34	R1	I	RED data	
35	R0	I	RED data(LSB)	
36	GND	P	Power ground	



37	DCLK	I	Sample clock
38	GND	I	Power ground
39	L/R	I	Left/right selection
40	U/D	I	Up/down selection
41	V _{GH}	P	Gate on voltage
42	V _{GL}	P	Gate off voltage
43	AV _{DD}	P	Power for analog circuit
44	RESET	I	Global reset pin
45	NC	-	No connection
46	V _{COM}	I	Common voltage
47	DITHB	I	Dithering function
48	GND	P	Power ground
49	NC	-	No connection
50	NC	-	No connection

Note: I/O definition.

I---Input pin, O---Output pin, P--- Power/Ground, N--- No Connection

2.2 CN2 of LED BLU Connector

Matching Connector of BHSR-02VS-1

Pin	Symbol	I/O	Description	Remark
1	LED+	P	LED Anode	Red Cable
2	LED-	P	LED Cathode	White Cable

2.3 U/D R/L Function Description

Scan Control Input		Scanning Direction
UPDN	SHLR	
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



3 Absolute Maximum Ratings

AGND= GND=0V, Ta = 25°C

Item	Symbol	Min	Max	Unit	Remark
Power Voltage	VCC	-0.5	5.0	V	
	AVDD	-0.5	13.5	V	
	VGH	-0.3	+42	V	
	VGL	VGH-42	+0.3	V	
Backlight Forward Current	I _{LED}	-	25	mA	For each LED
Operating Temperature	T _{OPR}	-20	70	°C	
Storage Temperature	T _{STG}	-30	80	°C	

Formike Electronic Co., Ltd.



4 Electrical Characteristics

4.1 Recommended Operating Condition

AGND=GND=0V, Ta = 25°C

Item	Symbol	Min	Typ	Max	Unit	Remark	
Digital Supply Voltage	VCC	-	3.3	-	V		
Analog Supply Voltage	AVDD	-	12.5	-	V		
Gate On Voltage	VGH	-	22	-	V		
Gate Off Voltage	VGL	-	-7	-	V		
Common Electrode Driving Signal	VCOM	3.5	TBD	4.5	V		
Input Level Of Gamma Voltage	V1~V5	-	TBD	-	V		
	V6~V10	-	TBD	-	V		
Logic Supply Voltage	DVDD	(2.8)	3.3	(3.6)	V		
Input Signal Voltage	Low Level	V _{IL}	0	TBD	0.3*DVDD	V	R0~R7,G0~G7,B0~B7,DE, DCLK,HSD,VSD,MODE, RSTB,STBYB,SHLR,UPDN, VCOM,DITH,V1~V10
	High Level	V _{IH}	0.7*DVDD	TBD	DVDD	V	
Output Signal Voltage	Low Level	V _{OL}	-	TBD	GND+0.4	V	
	High Level	V _{OH}	DVDD-0.4	TBD	-	V	

Note: The value is for design stage only.

4.2 Recommended Driving Condition for Backlight

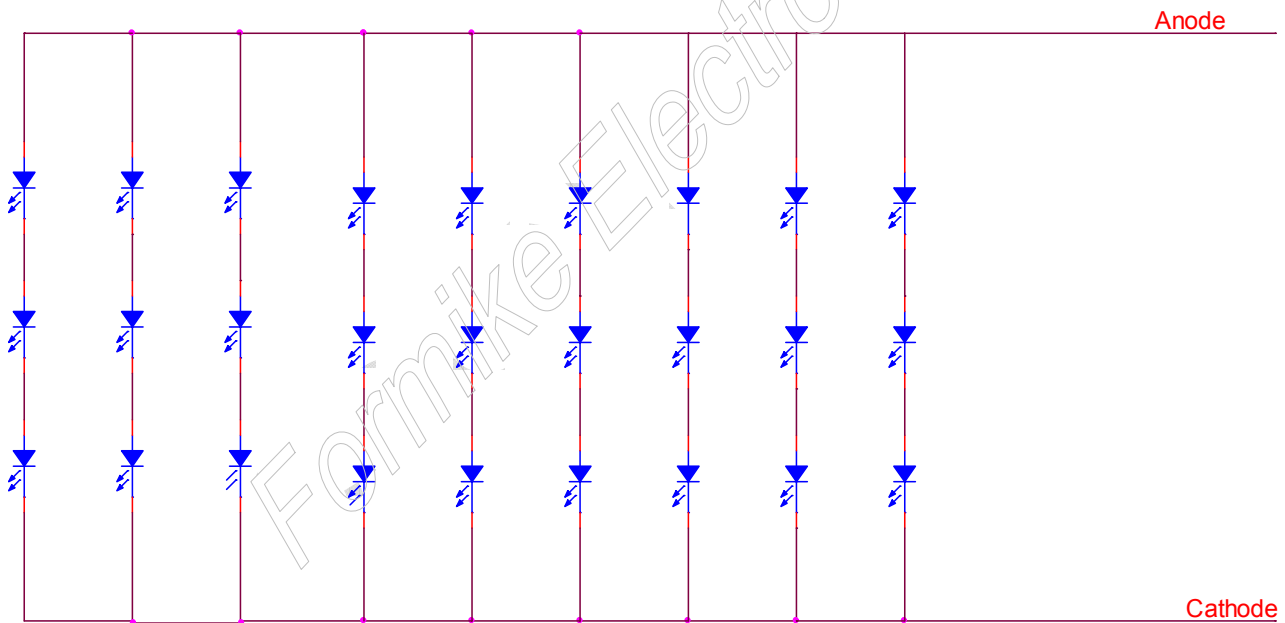
Ta=25°C

Item	Symbol	Min	Typ	Max	Unit	Remark
Forward Current	I_F	-	20	25	mA	27 LEDs (3 LED Serial, 9 LED Parallel)
Forward Voltage	V_F	-	9.6	-	V	
Backlight Power Consumption	W_{BL}	-	1.728	-	W	
Operating Life Time	-	-	-	-	Hrs	

Note1: The LED driving condition is defined for each LED module (3 LED Serial, 9 LED Parallel). For each LED: $I_F (1/9) = 20\text{mA}$, $V_F (1/3) = 3.2\text{V}$.

Note2: Under LCM operating, the stable forward current should be inputted. And forward voltage is for reference only.

Note3: I_F is defined for one channel LED. Optical performance should be evaluated at $T_a = 25^\circ\text{C}$ only. If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.



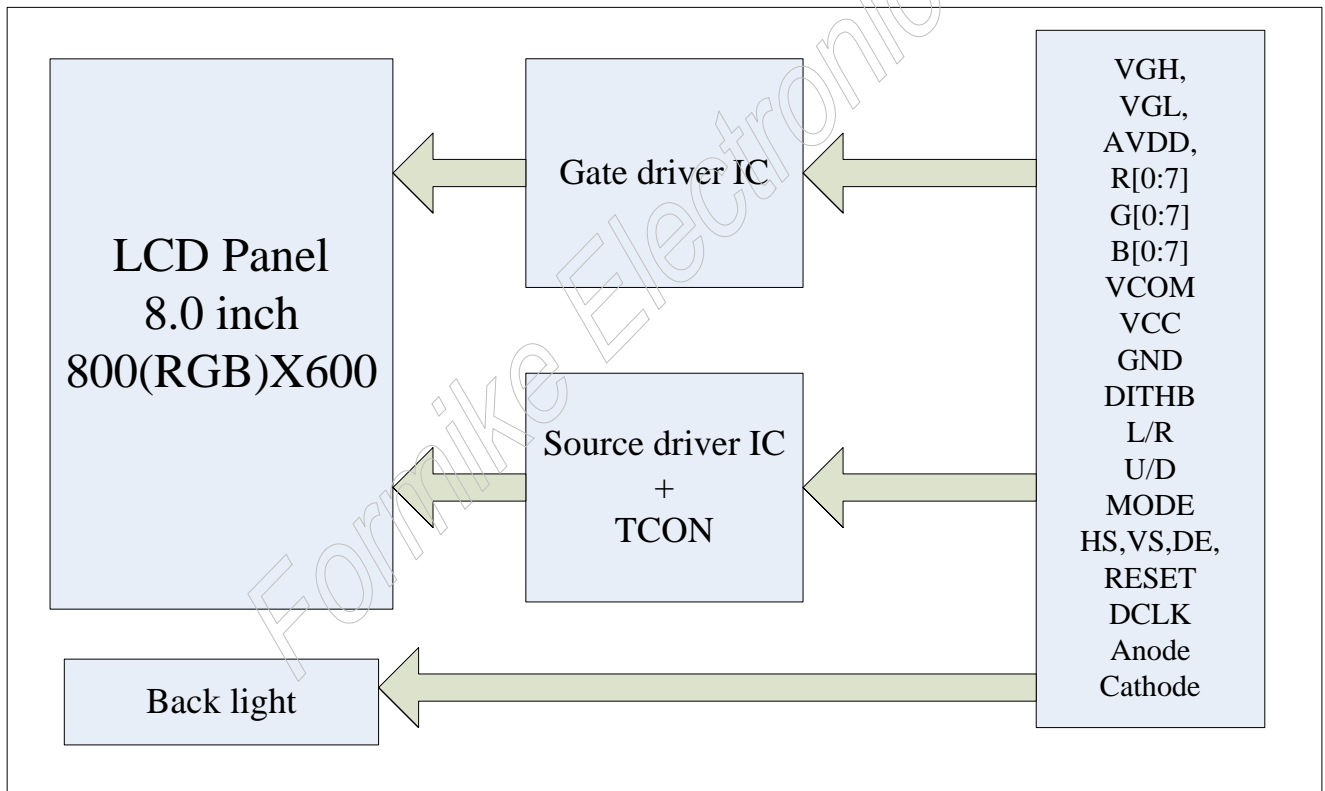
Note4: The LED driving condition is defined for each LED module.

4.3 Power Consumption

AGND=GND=0V, Ta = 25°C

Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
Digital Supply Current	I_{VCC}	VCC=3.3V	-	TBD	-	mA	
Analog Supply Current	I_{AVDD}	AVDD=12.5V	-	TBD	-	mA	
Gate On Current	I_{VGH}	VGH=22.0V	-	TBD	-	mA	
Gate Off Current	I_{VGL}	VGL=-7.0V	-	TBD	-	mA	
Power Consumption	Panel&Gamma		-	TBD	-	W	
	Backlight		-	1.728	-	W	
	Total		-	TBD	-	W	

4.4 Block Diagram





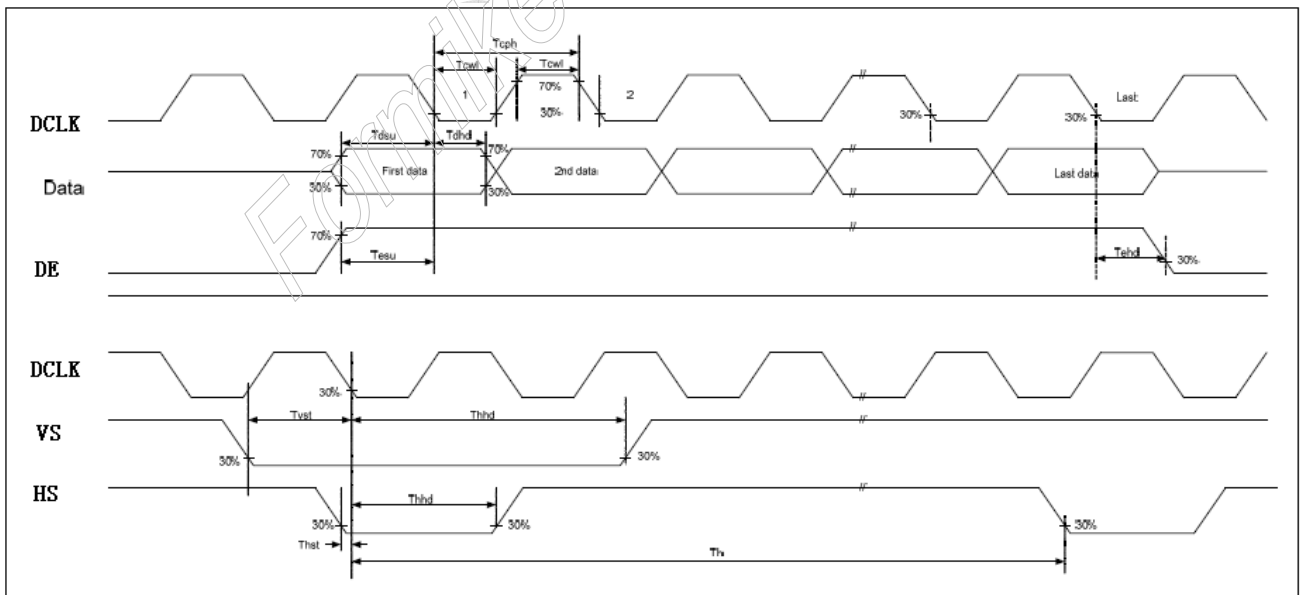
5 Timing Chart

5.1 TFT-LCD Input Timing

VCC=3.3V, AVDD=12.5V, AGND=GND=0V, Ta=25°C

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
DCLK Frequency	Fclk	-	40	50	MHz	
DCLK Cycle Time	Tcph	-	25	20	ns	
DCLK Pulse Width	Tcw	40%	50%	60%	Tcph	
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 to DCLK
Data Hold Time	Tdhd	8	-	-	ns	Data to DCLK
DE Setup Time	Tesu	8	-	-	ns	
DE Hold Time	Tehd	8	-	-	ns	

Input Clock and Data timing Diagram:



5.2 Recommended Timing Setting Of TCON

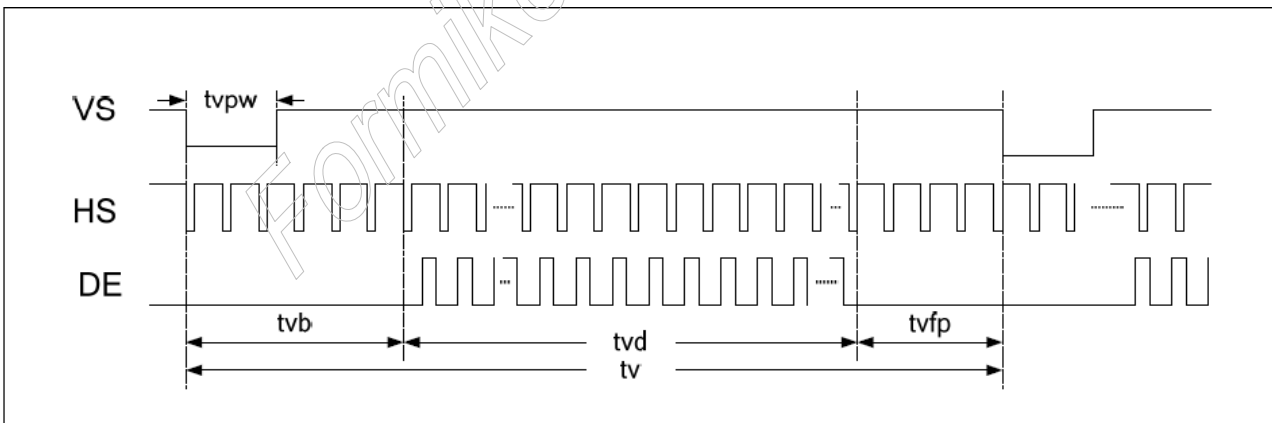
TCON (Embedded In Source IC) Input Timing (DCLK, HSD, VSD, DE)

VCC=3.3V, AVDD=12.5V, AGND=GND=0V, Ta=25°C

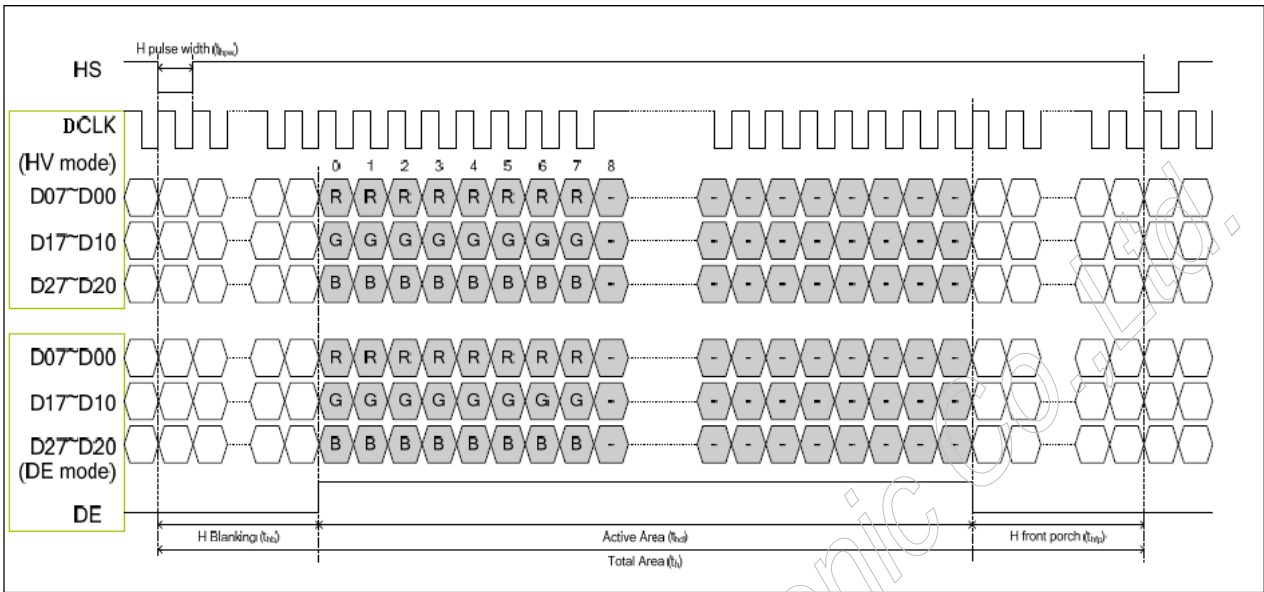
Parameter	Symbol	Min	Typ	Max	Unit	Remark
DCLK	Fclk	-	40	50	MHZ	
	tclk	20	25	-	ns	
HSD	th	-	1000	-	tclk	
	thd	-	800	-	tclk	
	thpw	1	48	-	th	
	thb	-	88	-	th	
	thfp	-	112	-	th	
VSD	tv	-	660	-	th	
	tvd	-	600	-	th	
	tvpw	-	3	-	th	
	tvb	-	39	-	th	
	tvfp	-	21	-	th	

Note: DE timing refer to HSD, VSD input timing.

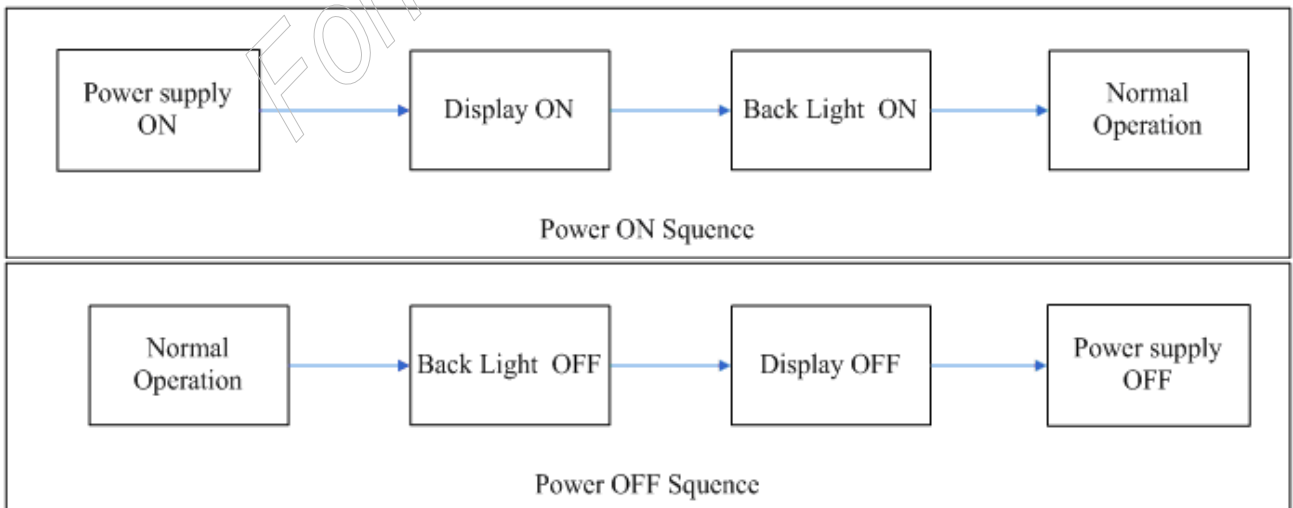
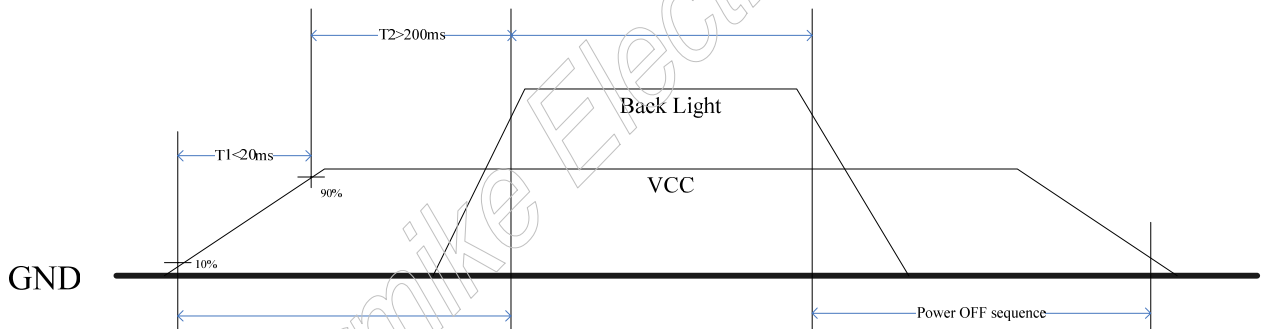
Vertical input timing Diagram:



Horizontal input timing Diagram:



5.3 POWER ON/OFF SEQUENCE





6 Optical Characteristics

Ta=25°C

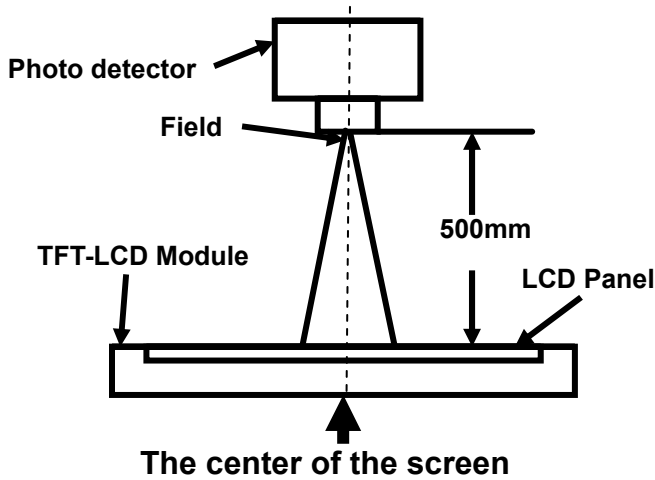
Item	Symbol	Condition	Min	Typ	Max	Unit	Remark	
View Angles	θT	$CR \geq 10$	(40)	50	-	Degree	Note 2	
	θB		(60)	70	-			
	θL		(60)	70	-			
	θR		(60)	70	-			
Contrast Ratio	CR	$\theta=0^\circ$	(400)	500	-		Note3	
Response Time	T_{ON}	25°C	-	25	-	ms	Note1	
	T_{OFF}						Note4	
Chromaticity	White	Backlight is on	(0.260)	0.310	(0.360)		Note1 Note5	
			y	(0.280)	0.330			(0.380)
	Red		x	-	TBD			-
			y	-	TBD			-
	Green		x	-	TBD			-
			y	-	TBD			-
	Blue		x	-	TBD			-
			y	-	TBD			-
Uniformity	U		-	75	-	%	Note1 Note6	
NTSC			-	50	-	%	Note 5	
Luminance	L		(200)	250	-	cd/m ²	Note1 Note7	

Test Conditions:

1. $I_F=20mA$, $V=9.6V$, and the ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

Note 1: Definition of optical measurement system.

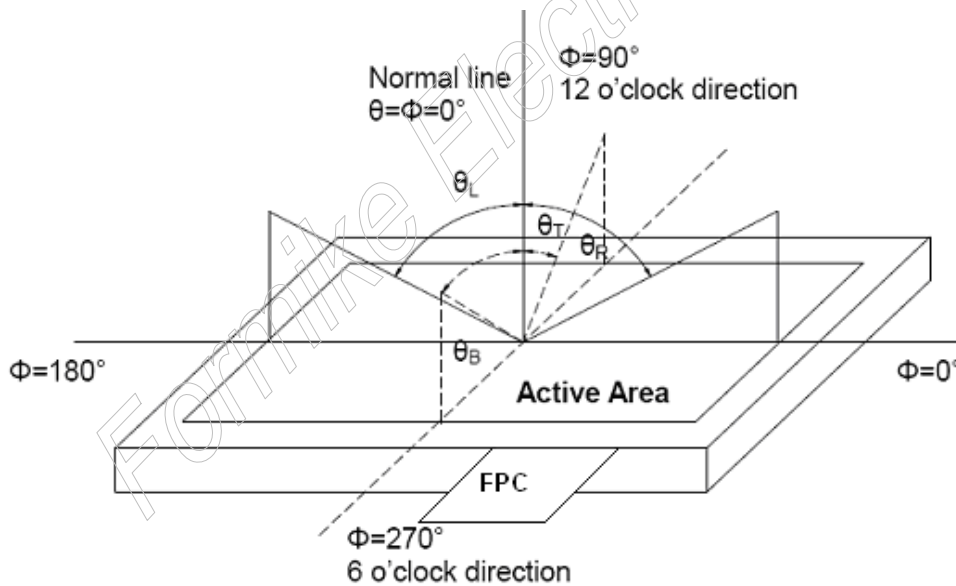
The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).



Note 3: Definition of contrast ratio

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

“White state “: The state is that the LCD should drive by V_{white} .

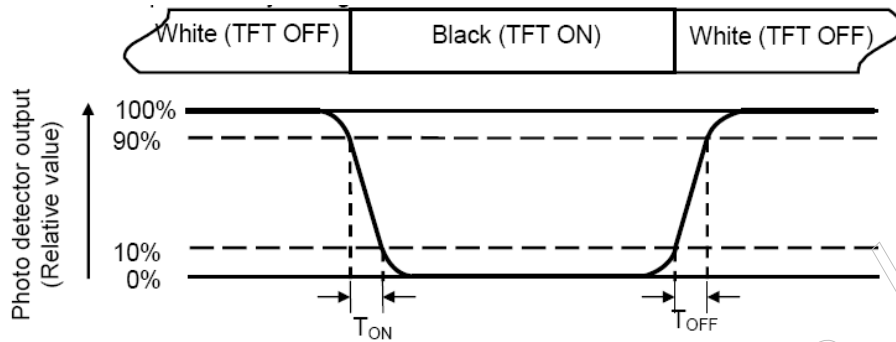
“Black state”: The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and

“Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

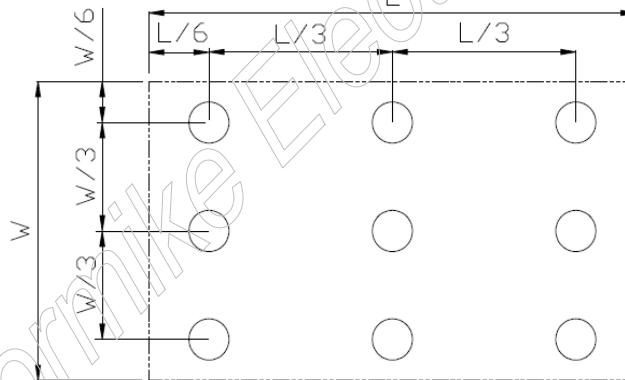
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = L_{\min} / L_{\max}$$

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



L_{\max} : The measured Maximum luminance of all measurement position.

L_{\min} : The measured Minimum luminance of all measurement position.

Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

**7 Environmental / Reliability Test**

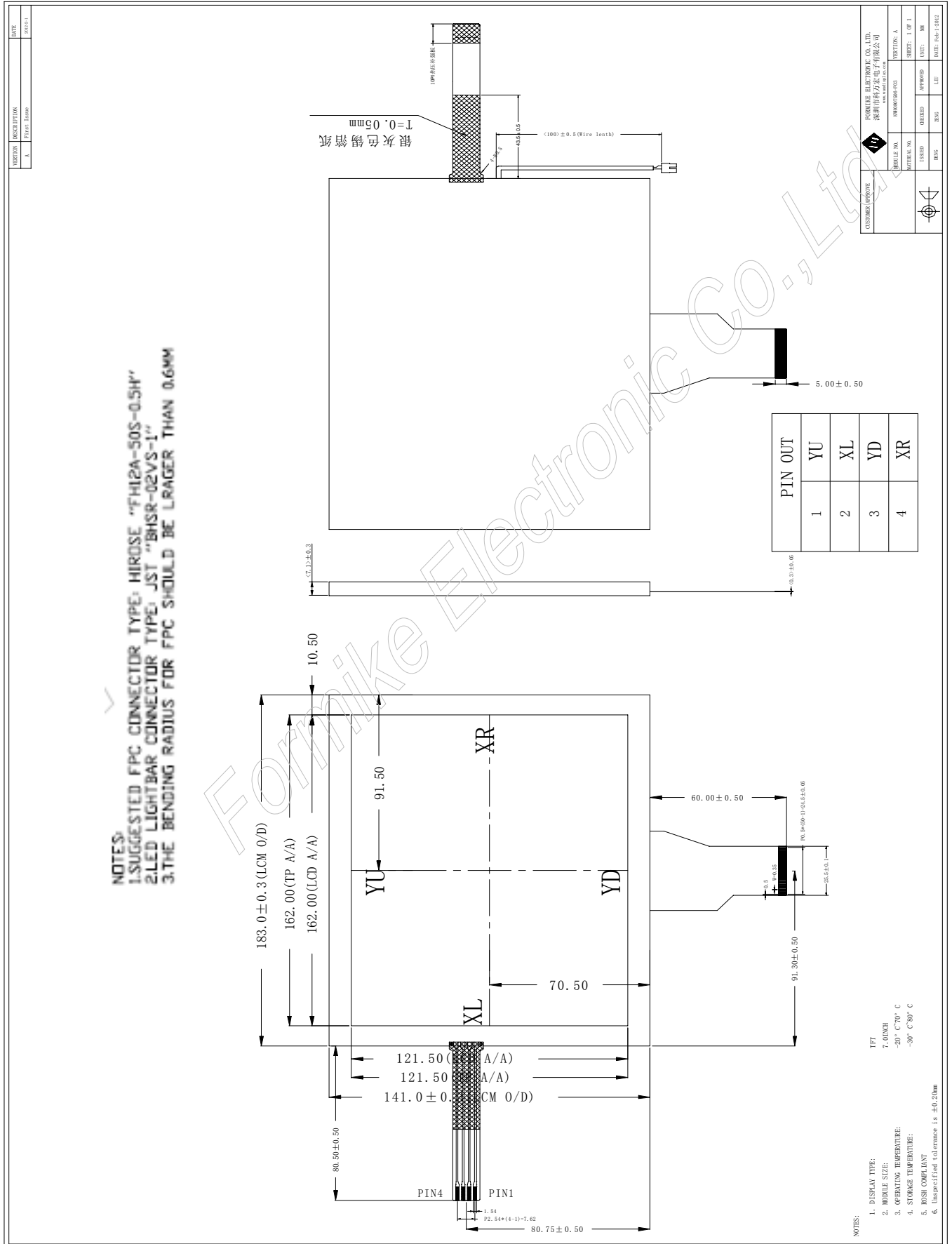
No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts = +70°C, 240 hours (Note1)	
2	Low Temperature Operation	Ta = -20°C, 240 hours (Note2)	
3	High Temperature Storage	Ta = +80°C, 240 hours	
4	Low Temperature Storage	Ta = -30°C, 240 hours	
5	Storage at High Temperature and Humidity	Ta = +60°C, 90% RH max,240hours	
6	Thermal Shock (non-operation)	-30°C 30 min~+80°C 30 min, Change time:5min, 100 Cycle	
7	ESD	C=150pF,R=330Ω,5point/panel Air:±8Kv,5times; Contact:±4Kv,5times (Environment:15°C-30°C 30%~60%.86Kpa~106Kpa)	
8	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)	
9	Mechanical Shock (Non Op)	Half Sine Wave 100G 6ms, ±X,±Y,±Z 3times for each direction	
10	Package Drop Test	Height:60cm, 1corner,3edges,6surfaces	

Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of samples.



8 Mechanical Drawing





9 Packing drawing

TBD

Formike Electronic Co., Ltd.



10 Precautions for Use of LCD Modules

10.1 Handling Precautions

10.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

10.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

10.1.6 Do not attempt to disassemble the LCD Module.

10.1.7 If the logic circuit power is off, do not apply the input signals.

10.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1 Be sure to ground the body when handling the LCD Modules.

10.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of

10.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0°C ~ 40°C, Relatively humidity: ≤80%

10.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 Transportation Precautions

10.3.1 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.