SPECIFICATIONS FOR LCD MODULE

CUSTOMER	神達
MODEL	WD-F2440VB-EFLWb VER. 04
CUSTOMER APPROVED	

APPROVED BY	CHECKED BY	ORGANIZED BY
LCM產品部 2010/12/31 王天男	LCM產品部 2010/12/31 楊浩偉	LCM產品部 2010/12/31 陸曉琴

☒ APPROVAL FOR SPECIFICATIONS ONLY

☐ APPROVAL FOR SPECIFICATIONS AND SAMPLE

10, Jianguo Rd., Tanzih Township, Taichung County 427, TAIWAN R.O.C.

TEL:886-4-25318899,FAX:886-4-25310868

History of Version

Version	Contents	Date	Note
a1	New Version	07.Jun.2010	SPEC.
a2	Change as follow by Customer : a. Modify 3.1 Mechanical Diagram: b. Modify 2.1 Electro-optical Characteristics: Veiw angle--> 6:00	01.Jul.2010	SPEC.
a3	Change as follow by Customer : a. Modify 1.1 Absolute Maximum Ratings: TST-->-40~+85℃ b. Modify 1.3 Interface Pin Function & 1.4 Power Supply for LCD Module & 3.2-1. Data About LED Backlight & 3.2-2. Internal Circuit Diagram: Change back light to 5 LEDs in series. c. Modify 3.1 Mechanical Diagram: Add barcode. d. Modify 4.1 Specification of Quality Assurance: AQL--> Major defects=0.4, Minor defects=0.65, Total defects=0.65	06.Jul.2010	SPEC.
a4	Change as follow by Customer : a. Modify 1.1 Absolute Maximum Ratings: TST-->-40~+75℃ b. Modify 2.1 Electro-optical Characteristics c. Modify 4.1-6. Inspection specification	10.Jul.2010	SPEC.
a5	Change as follow by Customer : a. Modify 3.1 Mechanical Diagram	30.Jul.2010	SPEC.
a6	Change as follow by Customer : a. Add 1.5-3. Initialization Table	18.Aug.2010	SPEC.
a7	Change as follow by Wintek : a. Modify 1.2 Electrical Characteristics: Add *ICI & *IDD b. Modify 1.5-3. Initialization Table	18.Oct.2010	SPEC.
a8	For sample Change as follow by Customer : a. Modify 3.1 Mechanical Diagram	02.Nov.2010	SPEC.& Sample
a9	Change as follow by Customer : a. Modify 1.5-3. Initialization Table b. Modify 1.7 Power ON/OFF SEQUENCE c. Modify 3.1 Mechanical Diagram	15.Nov.2010	SPEC.& Sample
a10	Change as follow by Customer : a. Modify 1. 6 Timing Characteristic b. Modify 1.7 Power ON/OFF SEQUENCE	22.Nov.2010	SPEC.& Sample
b1	Change as follow by Customer : a. Modify 1.3 Interface Pin Function	23.Nov.2010	SPEC.
b2	Change as follow by Customer : a. Modify 1.2 Electrical Characteristics	02.Dec.2010	SPEC.
b3	Change as follow by Customer : a. Modify 1.2 Electrical Characteristics	17.Dec.2010	SPEC.
b4	Change as follow by Customer : a. Modify 1.7 Power ON/OFF SEQUENCE	31.Dec.2010	SPEC.

Contents Page

(1) Electronic Units

1.1 Absolute Maximum Ratings

ITEM	SYMBOL	MIN	TYP	MAX	UNIT
Operating Temperature	TOP	-20	-	+70	℃
Storage Temperature	TST	-40	-	+75	℃
Supply Voltage for Analog	VCI-VSS	-0.3	-	+4.8	V
Supply Voltage for Digital	VDD-VSS	-0.3	-	+4.8	V
Static Electricity	Be sure that you are grounded when handing LCM.				

1.2 Electrical Characteristics

(Ta=25℃)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage for Analog	VCI	-	2.9	3.0	3.3	V
Supply Voltage for Digital	VDD	-	2.9	3.0	3.3	V
Input Signal High Voltage	VIH	VDD= 1.65 ~ 3.3V	0.7xVDD	-	VDD	V
Input Signal Low Voltage	VIL	VDD= 1.65 ~ 3.3V	-0.3	-	0.3xVDD	V
Output Signal High Voltage	VOH	IOH = -0.1 mA	0.8xVDD	-	-	V
Output Signal Low Voltage	VOL	VDD= 1.65 ~ 2.4V IOL = 0.1mA	-	-	0.2xVDD	V
Supply Current for Analog	*ICI	-	-	-	23	mA
Supply Current for Digital	*IDD	-	-	-	1	mA
Used IC	HX8352B					
INTERFACE	18-bit RGB interface					

*ICI Measurement condition is for all pixels on
*IDD Measurement condition is for all pixels on

1.3 Interface Pin Function

CN1:

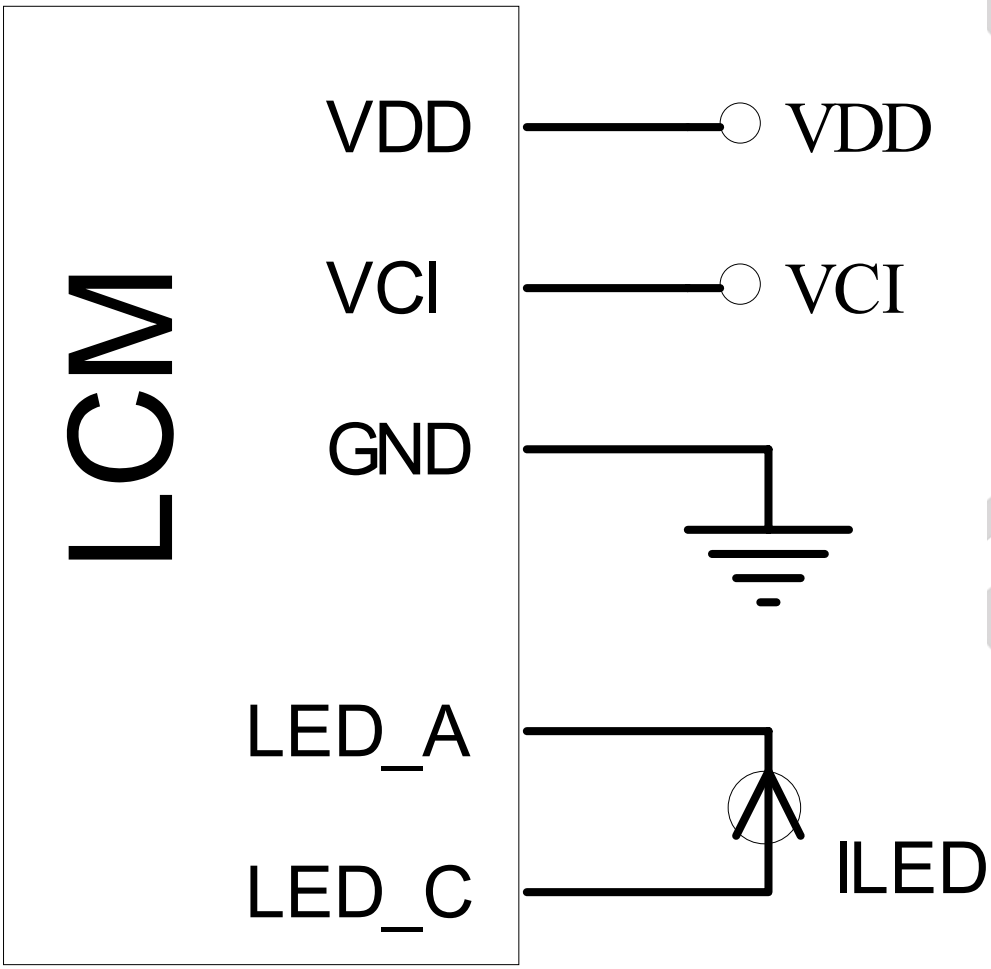
NO	SYMBOL	I / O	FUNCTION
1.	LED_C	P	LED cathode
2.	NC	-	Not connect
3.	NC	-	Not connect
4.	LED_A	P	LED anode
5.	NC	-	Not connect
6.	GND	P	Ground
7.	B0	I	(RGB-IF) Data
8.	B1	I	(RGB-IF) Data
9.	B2	I	(RGB-IF) Data
10.	B3	I	(RGB-IF) Data
11.	B4	I	(RGB-IF) Data
12.	B5	I	(RGB-IF) Data
13.	G0	I	(RGB-IF) Data
14.	G1	I	(RGB-IF) Data
15.	G2	I	(RGB-IF) Data
16.	G3	I	(RGB-IF) Data
17.	G4	I	(RGB-IF) Data
18.	G5	I	(RGB-IF) Data
19.	R0	I	(RGB-IF) Data
20.	R1	I	(RGB-IF) Data
21.	R2	I	(RGB-IF) Data
22.	R3	I	(RGB-IF) Data
23.	R4	I	(RGB-IF) Data
24.	R5	I	(RGB-IF) Data
25.	XRES	I	Device Reset Signal
26.	ENABLE	I	(RGB-IF) Display Data enable
27.	GND	P	Ground
28.	PCLK	I	(RGB-IF) Data clock
29.	GND	P	Ground
30.	HSYNC	I	(RGB-IF) Horizontal synchronous signal
31.	VSYNC	I	(RGB-IF) Vertical synchronous signal
32.	A0	I	Bus Data Identification Signal
33.	SDI	I	(MPU-Serial-IF) Data
34.	XCS	I	Chip select signal
35.	SCL	I	(MPU-Serial-IF)Serial clock
36.	VDD	P	Power supply for I/O logic
37.	VCI	P	Power supply for system

38.	VCI	P	Power supply for system
39.	ID	-	Pull-low with 30K ohm 1%
40.	GND	P	Ground
41.	GND	P	Ground
42.	NC	-	Not connect
43.	NC	-	Not connect
44.	NC	-	Not connect
45.	NC	-	Not conncet

CN2:

1.	YT	I	TP signal : Y_Top
2.	XR	I	TP signal : X_Right
3.	YB	I	TP signal : Y_Bottom
4.	XL	I	TP signal : X_Left

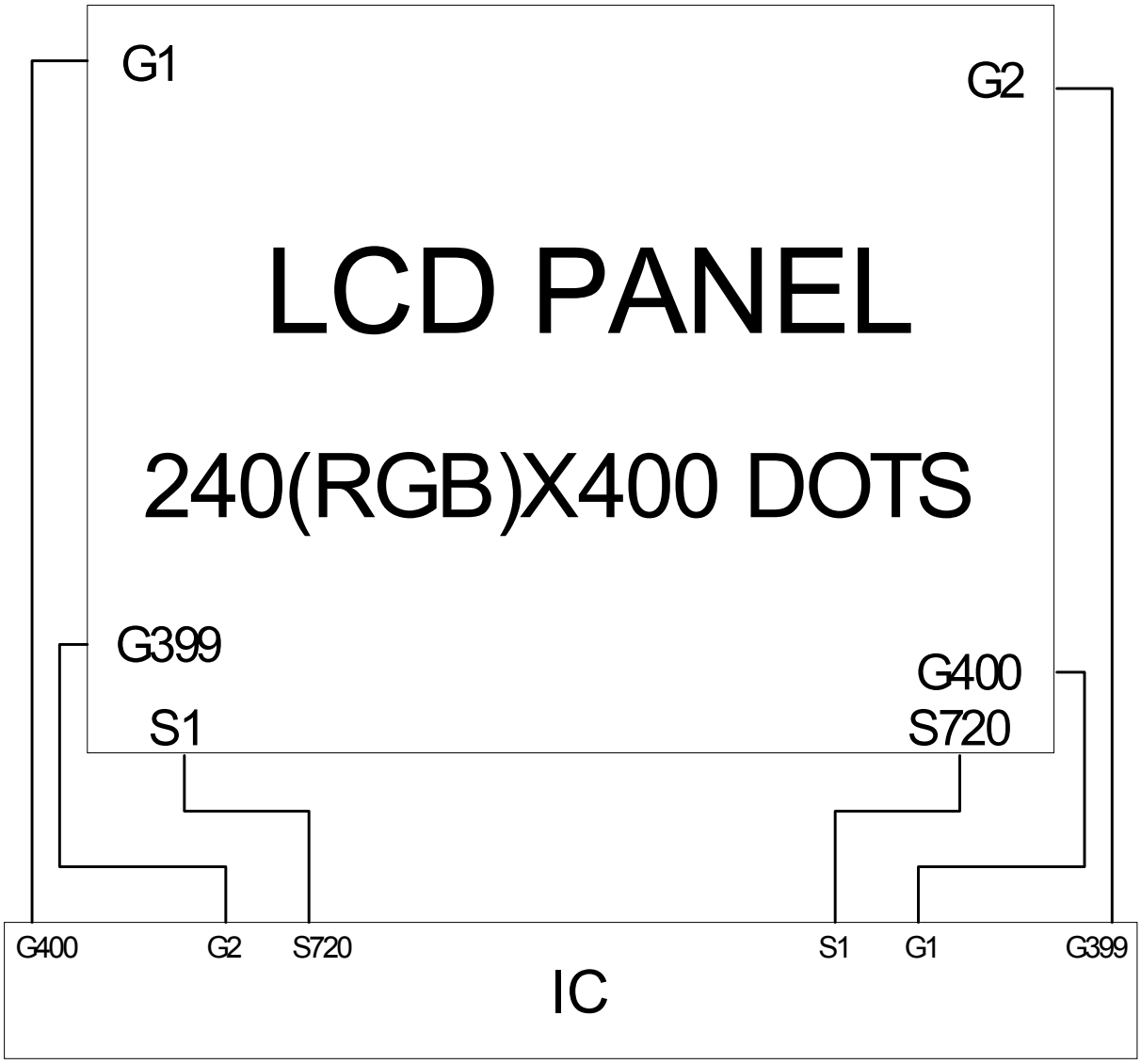
1.4 Power Supply for LCD Module



Note: VDD=VCI=3.0V ILED=20mA

1.5 Block Diagram with Display RAM Address

1.5-1. Block Diagram



1.5-2. Display Data RAM:

S/G pins	S1	S2	S3	S4	S5	S6	S7	S8	S9	---	S709	S710	S711	S712	S713	S714	S715	S716	S717	S718	S719	S720
G1	000000h			000001h			000002h			---	000ECh			00013Dh			00013Eh			00013Fh		
G2	001000h			001001h			001002h			---	001ECh			00113Dh			00113Eh			00113Fh		
G3	002000h			002001h			002002h			---	002ECh			00213Dh			00213Eh			00213Fh		
G4	003000h			003001h			003002h			---	003ECh			00313Dh			00313Eh			00313Fh		
G5	004000h			004001h			004002h			---	004ECh			00413Dh			00413Eh			00413Fh		
G6	005000h			005001h			005002h			---	005ECh			00513Dh			00513Eh			00513Fh		
G7	006000h			006001h			006002h			---	006ECh			00613Dh			00613Eh			00613Fh		
G8	007000h			007001h			007002h			---	007ECh			00713Dh			00713Eh			00713Fh		
G9	008000h			008001h			008002h			---	008ECh			00813Dh			00813Eh			00813Fh		
⋮	⋮			⋮			⋮			---	⋮			⋮			⋮			⋮		
G422	1A6000h			1A6001h			1A6002h			---	1A6ECh			1A6EDh			1A6EEh			1A6EFh		
G423	1A7000h			1A7001h			1A7002h			---	1A7ECh			1A7EDh			1A7EEh			1A7EFh		
G424	1A8000h			1A8001h			1A8002h			---	1A8ECh			1A8EDh			1A8EEh			1A8EFh		
G425	1A9000h			1A9001h			1A9002h			---	1A9ECh			1A9EDh			1A9EEh			1A9EFh		
G426	1AA000h			1AA001h			1AA002h			---	1AAECh			1AAEDh			1AAEEh			1AAEFh		
G427	1AB000h			1AB001h			1AB002h			---	1ABECh			1ABEDh			1ABEEh			1ABEFh		
G428	1AC000h			1AC001h			1AC002h			---	1ACECh			1ACEDh			1ACEEh			1ACEFh		
G429	1AD000h			1AD001h			1AD002h			---	1ADECh			1ADEDh			1ADEEh			1ADEFh		
G430	1AE000h			1AE001h			1AE002h			---	1AEECh			1AEEDh			1AEEEh			1AEEFh		
G431	1AF000h			1AF001h			1AF002h			---	1AFECh			1AFEDh			1AFEEh			1AFEFh		

Table 6.7 GRAM address and display panel position (GS=L, 240RGBx432 dot)

S/G pins	S1	S2	S3	S4	S5	S6	S7	S8	S9	---	S709	S710	S711	S712	S713	S714	S715	S716	S717	S718	S719	S720
G431	000000h			000001h			000002h			---	000ECh			00013Dh			00013Eh			00013Fh		
G430	001000h			001001h			001002h			---	001ECh			00113Dh			00113Eh			00113Fh		
G429	002000h			002001h			002002h			---	002ECh			00213Dh			00213Eh			00213Fh		
G428	003000h			003001h			003002h			---	003ECh			00313Dh			00313Eh			00313Fh		
G427	004000h			004001h			004002h			---	004ECh			00413Dh			00413Eh			00413Fh		
G426	005000h			005001h			005002h			---	005ECh			00513Dh			00513Eh			00513Fh		
G425	006000h			006001h			006002h			---	006ECh			00613Dh			00613Eh			00613Fh		
G424	007000h			007001h			007002h			---	007ECh			00713Dh			00713Eh			00713Fh		
G423	008000h			008001h			008002h			---	008ECh			00813Dh			00813Eh			00813Fh		
⋮	⋮			⋮			⋮			---	⋮			⋮			⋮			⋮		
G10	1A6000h			1A6001h			1A6002h			---	1A6ECh			1A6EDh			1A6EEh			1A6EFh		
G9	1A7000h			1A7001h			1A7002h			---	1A7ECh			1A7EDh			1A7EEh			1A7EFh		
G8	1A8000h			1A8001h			1A8002h			---	1A8ECh			1A8EDh			1A8EEh			1A8EFh		
G7	1A9000h			1A9001h			1A9002h			---	1A9ECh			1A9EDh			1A9EEh			1A9EFh		
G6	1AA000h			1AA001h			1AA002h			---	1AAECh			1AAEDh			1AAEEh			1AAEFh		
G5	1AB000h			1AB001h			1AB002h			---	1ABECh			1ABEDh			1ABEEh			1ABEFh		
G4	1AC000h			1AC001h			1AC002h			---	1ACECh			1ACEDh			1ACEEh			1ACEFh		
G3	1AD000h			1AD001h			1AD002h			---	1ADECh			1ADEDh			1ADEEh			1ADEFh		
G2	1AE000h			1AE001h			1AE002h			---	1AEECh			1AEEDh			1AEEEh			1AEEFh		
G1	1AF000h			1AF001h			1AF002h			---	1AFECh			1AFEDh			1AFEEh			1AFEFh		

Table 6.8 GRAM address and display panel position (GS=H , 240RGBx432 dot)

1.5-3. Initialization Table:

NO	Document Number	Attachment file
1	DF2440VB-IN1-103	

Double-Click the "Attachment Icon" above for opening attachment file.

1.6 Timing Characteristic

Serial interface characteristics

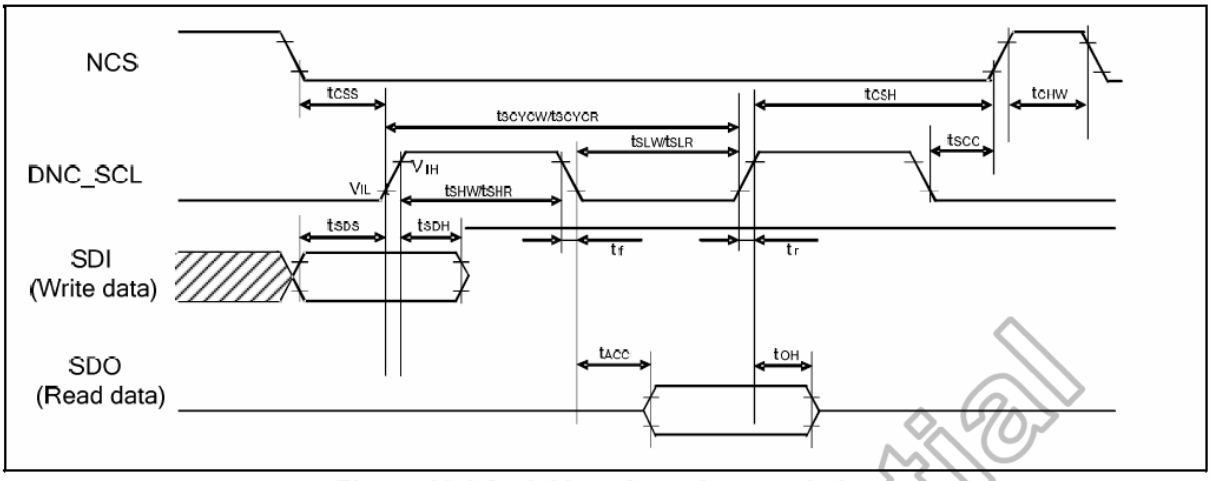


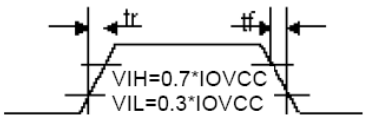
Figure 11.4 Serial interface characteristics

(T_A = -40 to 85℃)

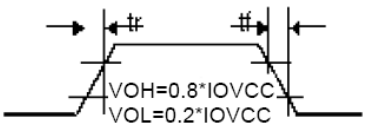
Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
Serial clock cycle (Write) DNC _SCL "H" pulse width (Write) DNC _SCL "L" pulse width (Write)	tSCYCW tSHW tSLW	DNC_SCL	100 35 35	- - -	- - -	ns
Data setup time (Write) Data hold time (Write)	tSDS tSDH	SDI	30 30	- -	- -	ns
Serial clock cycle (Read) DNC _SCL "H" pulse width (Read) DNC _SCL "L" pulse width (Read)	tSCYCR tSHR tSLR	DNC _SCL	150 60 60	- - -	- - -	ns
Access Time	tACC	SDA for maximum CL=30pF For minimum CL=8pF	15	-	100	ns
Output disable time	tOH	SDO For maximum CL=30pF For minimum CL=8pF	15(3)	-	100(3)	ns
DNC _SCL to Chip select	tSCC	DNC _SCL, NCS	15(3)	-	-	ns
NCS "H" pulse width	tCHW	NCS	45	-	-	ns
Chip select setup time Chip select hold time	tCSS tCSH	NCS	60 65	- -	- -	ns

Note: (1)The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.
(2)Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.
(3) tACC and tOH are defined by IOVCC=1.65V~1.95V.

Input Signal Slope



Output Signal Slope



RGB interface characteristics

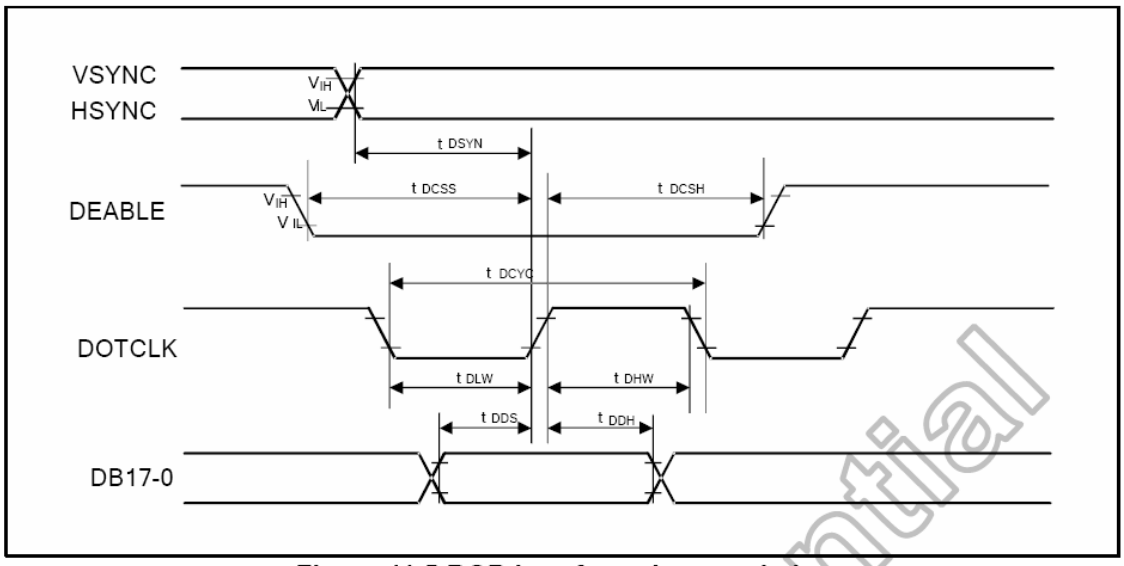


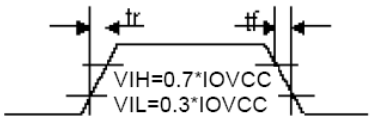
Figure 11.5 RGB interface characteristics

(T_A = -40 to 85℃)

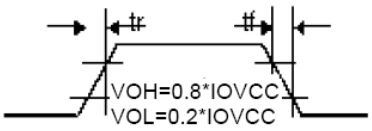
Symbol	Parameter	Conditions	Related Pins	Spec.			Unit
				Min.	Typ.	Max.	
t_{DCYC}	PCLK cycle time	VRR = Min . 50 Hz Max. 65 Hz	PCLK	77(2)	-	226(3)	ns
t_{DLW} t_{CHW}	PCLK Low time PCLK High time	-		15 15	- -	- -	ns
t_{DDS} t_{DDH}	RGB Data setup time RGB Data hold time	-	PCLK, DB17-DB0	15 15	- -	- -	ns
t_{DCSS} t_{DCSH}	DE setup time DE hold Time	-	DE	15 15	-	-	ns
t_{DSYN}	SYNC setup time	-	PCLK, HS, VS	15	-	-	ns

Note: (1) The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.
(2) 13 MHz
(3) 4.4MHz

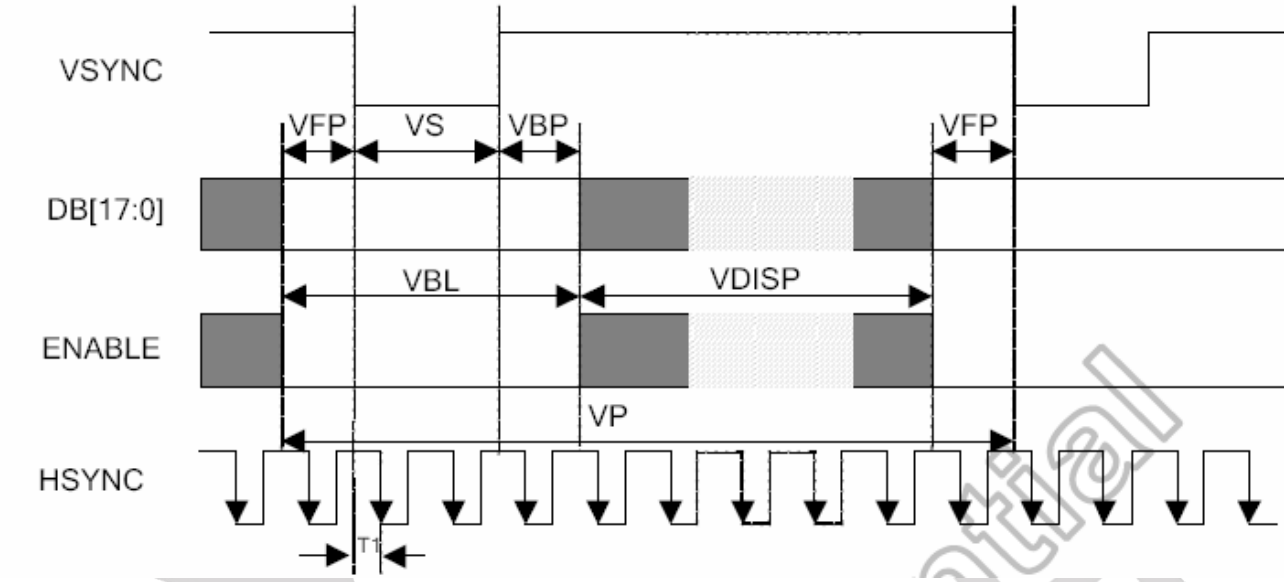
Input Signal Slope



Output Signal Slope



Vertical timings for RGB I/F

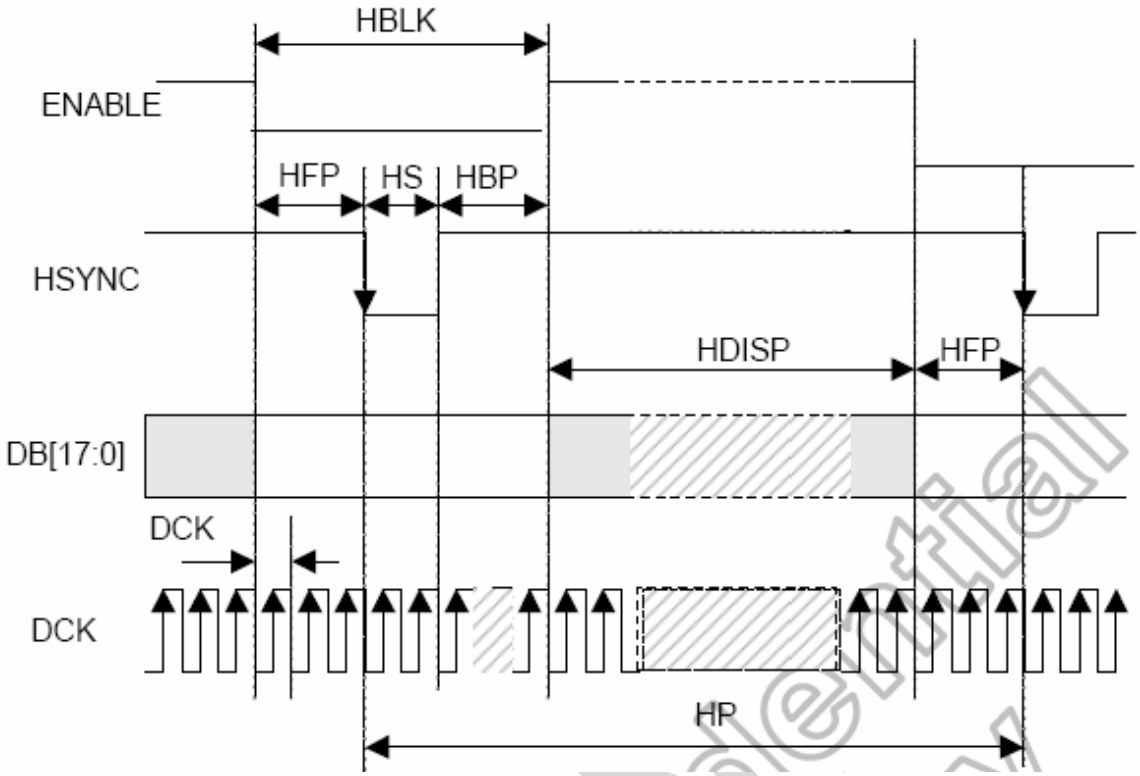


(T_A=-40 to 85℃)

Item	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
VSYNC Low Pulse Width	VS	-	1	4	16	Line
Vertical Back Porch	VBP	-	1	4	63	Line
Vertical Front Porch	VFP	-	1	2	63	Line
Vertical Blanking period	VBL	VS + VBP + VFP	3	35	142	Line
Vertical Active Area	VDISP	-	320	400	432	Line
VSYNC Cycle	VP	-	323	450	574	Line

Note: (1) The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.
(2) Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.
(3) The frequence of DOTCLK do not limited by frame rate.
(4) The recommmadn setting: Frame rate operate within 55Hz ~ 65Hz.

Horizontal timings for RGB I/F

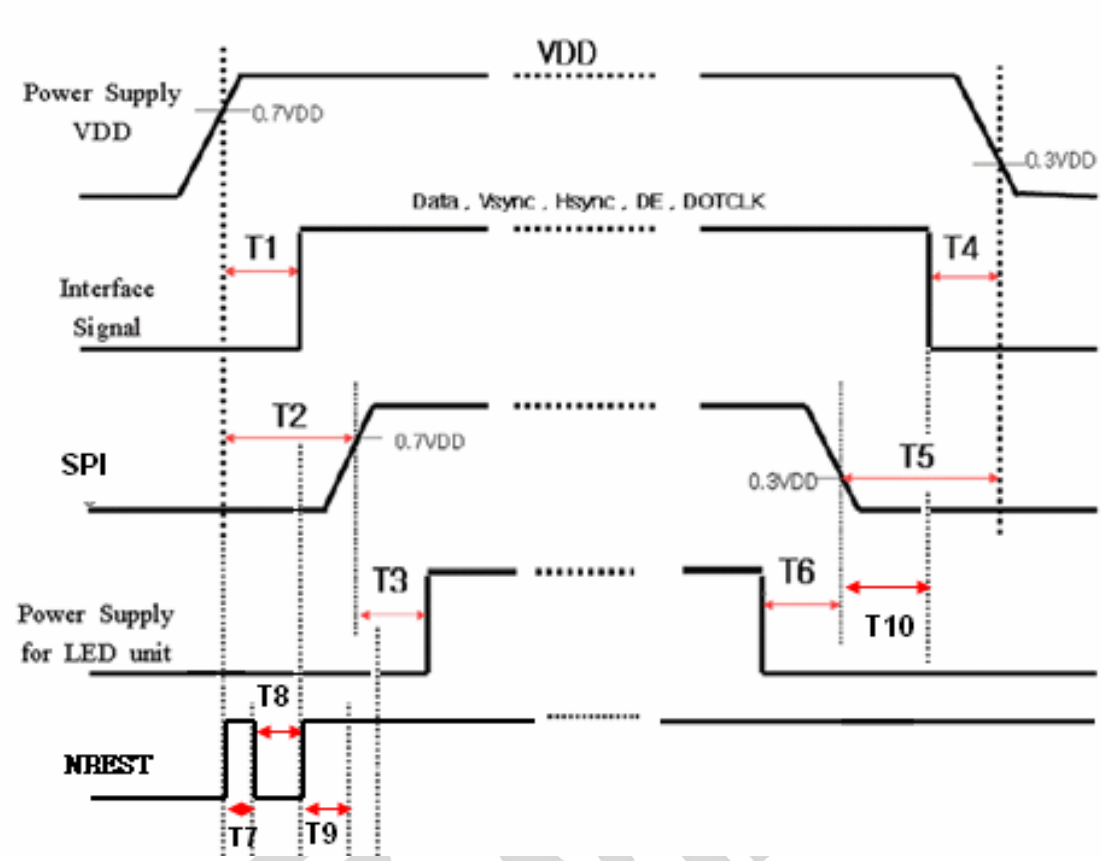


(VSSA=0V, IOVCC=1.65V to 3.3V, VCC=2.3V TO 3.3V, VCI=2.3V to 4.8V, T_A=-40 to 85℃)

Item	Symbol	Condition	Spec. Min.	Spec. Typ.	Spec. Max.	Unit
HSYNC Low Pulse Width	HS	R17h=0x5Xh, R17h=0x6Xh.	1	5	53	DCK
		R17h=0x4Xh.	3			
Horizontal Back Porch	HBP	R17h=0x5Xh, R17h=0x6Xh.	1	42	53	DCK
		R17h=0x4Xh.	3			
Horizontal Front Porch	HFP	R17h=0x5Xh, R17h=0x6Xh.	1	6	53	DCK
		R17h=0x4Xh.	3			
Horizontal Blanking period	HBLK (4)	R17h=0x5Xh, R17h=0x6Xh.	3	10	159	DCK
		R17h=0x4Xh.	9			
Horizontal Active Area	HDISP	-	-	240	-	DCK
HSYNC Cycle	HP	R17h=0x5Xh, R17h=0x6Xh.	243	300	399	DCK
		R17h=0x4Xh.	249			

Note: (1) The input signal rise time and fall time (tr, tf) is specified at 15 ns or less.
(2) Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.
(3)The frequence of DOTCLK do not limited by frame rate.
(4) HBLK = HS + HBP + HFP.

1.7 Power ON/OFF SEQUENCE



Symbol	Specification	Note
T1	T1 > 60ms,T1 < T2	
T2	110ms < T2	
T3	6 frames < T3	
T4	10ms < T4 < T5	
T5	(10 frames + T4) < T5	
T6	T6 < (-1frames) i.e. 先進入 standby mode後1 frame再關掉	
T7	10ms	
T8	50ms	
T9	50ms	
T10	0<=T10	

(2) Electro-optical Units

2.1 Electro-optical Characteristics

ITEM	SYMBOL		CONDITION	MIN.	TYP.	MAX.	UNIT
View Angle (Transmissive)	ψ= 90 ° (12H)		CR>=10		60	-	deg.
	ψ= 270 ° (6H)				45	-	deg.
	ψ= 180 ° (9H)				40	-	deg.
	ψ= 0 ° (3H)				60	-	deg.
Contrast Ratio (Transmissive)	CR		Ta=25℃		180	-	-
Contrast Ratio (Reflective)	CR		Ta=25℃	-	6	-	-
Response Time	Tr		Ta=25℃	-	6	9	ms
	Td			-	25	37	ms
Color Coordinate (Transmissive)	Red	Rx	Ta=25℃	0.49	0.54	0.59	-
		Ry		0.27	0.32	0.37	
	Green	Gx		0.27	0.32	0.37	
		Gy		0.48	0.53	0.58	
	Blue	Bx		0.11	0.16	0.21	
		By		0.09	0.14	0.19	
	White	Wx		0.26	0.31	0.36	
		Wy		0.28	0.33	0.38	
	NTSC				37		%
Color Coordinate (Reflective)	Red	Rx	Ta=25℃	0.34	0.39	0.44	-
		Ry		0.27	0.32	0.37	
	Green	Gx		0.25	0.3	0.35	
		Gy		0.32	0.37	0.42	
	Blue	Bx		0.17	0.22	0.27	
		By		0.18	0.23	0.28	
	White	Wx		0.26	0.31	0.36	
		Wy		0.29	0.34	0.39	
	NTSC				5.0		%
LCD Type	TFT , (POSITIVE / Transflective)						
Viewing Direction	6:00						

Notes：All the optical data should be measured when the display's driven under the TYP. condition.

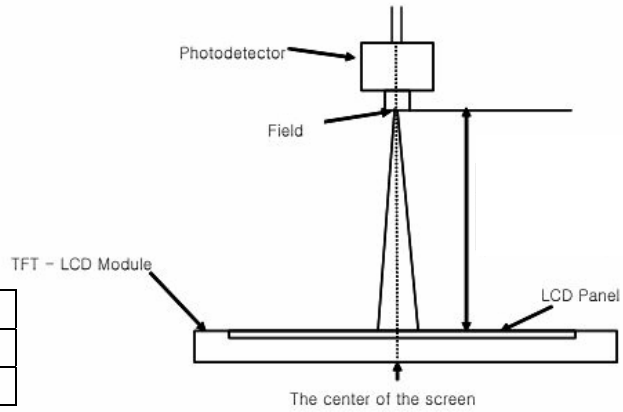
2.1-1 Optical Measure

Condition(1)

Note (1) After stabilizing and leaving the panel alone at a given temperature for 10 min, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. 10 min after lighting the back-light. This should be measured in the center of screen.

Environment condition: Ta = 25 ± 2°C

Back-Light On condition



Photodetector	Field
BM-7	DF2440VB-AS1-102
PR-705	1°

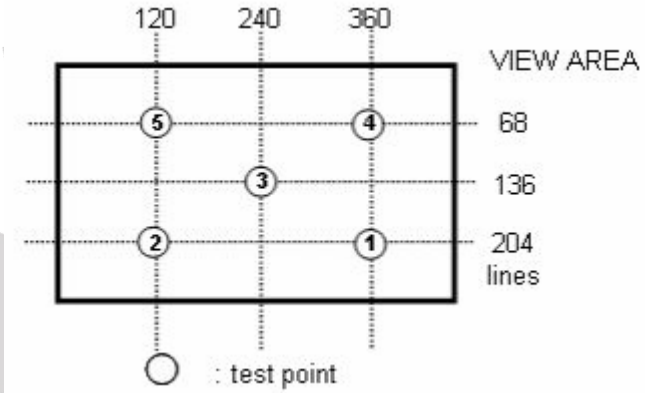
Note (2) Definition of Contrast Ration (C/r)：Ratio of gray max (Gmax) & gray min (Gmin) at the center point

$$CR = \frac{Gmax}{Gmin}$$

*Gmax：Luminance with all pixels white

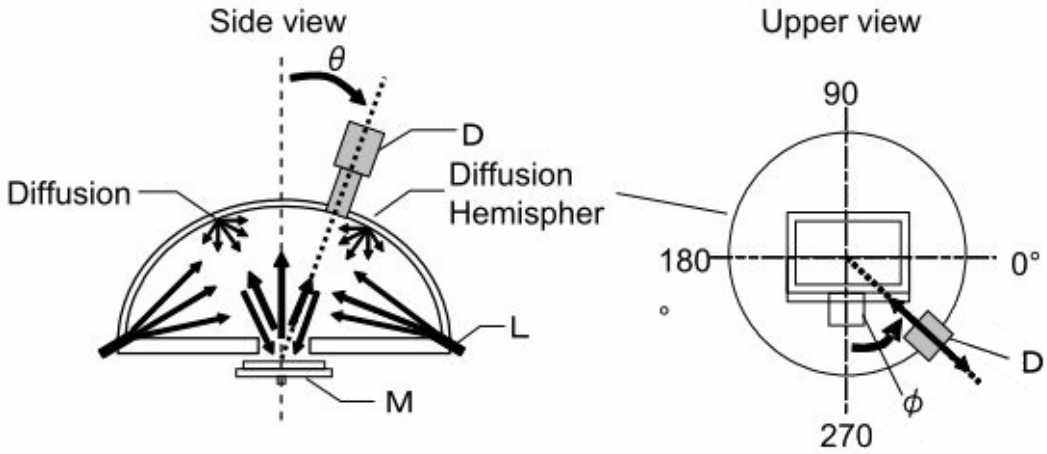
*Gmin：Luminance with all pixels black

Note (3) Definition of Luminance of White：Luminance of white at the center point (@③)



Condition(2)

Note (4) Optical system



L：

Light source

M：LCD module

D：Measurement instruments

[Instruments and it's measurement conditions]

Instrument：Spectro photometer DMS803

Measurement distance：122mm

Measurement aperture：3.0mm

Light Source：D65

Lighting method：Integrating hemisphere inner surface

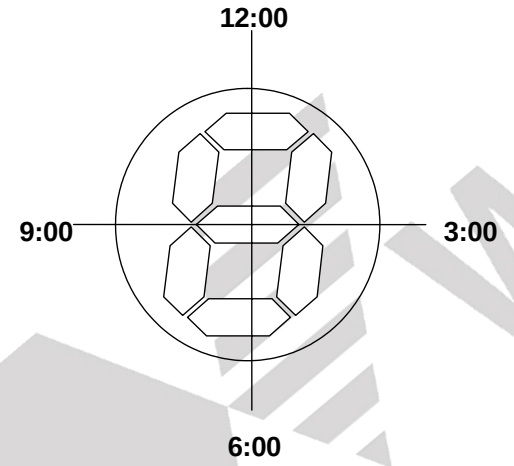
Hemisphere~LCD distance：3mm

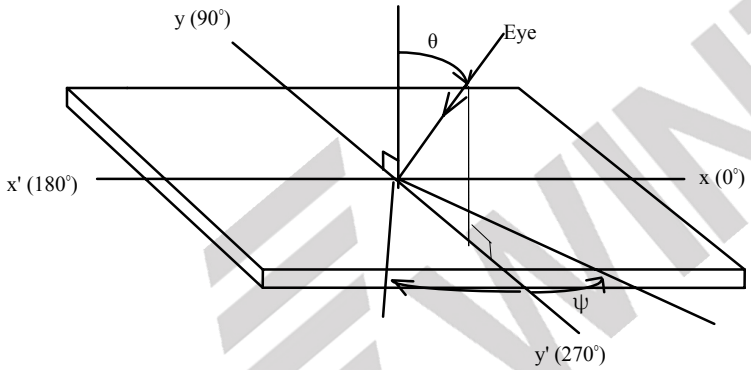
Measurement field angle：±2.1°(Spot diameter: ψ3mm)

Measurement angle：θ=0°，ψ=270°

Measurement point：The center of the active area

2.2 Optical Definitions





View Angle

(3) Mechanical Units

3.1 Mechanical Diagram

NO	Document Number	Attachment file
1	DF2440VB-AS1-107	

Double-Click the "Attachment Icon" above for opening attachment file.

3.2 Back-light Specification

LED Backlight Styles:

The LED chips are distributed over the whole light area of the illumination unit, which gives the most uniform light.

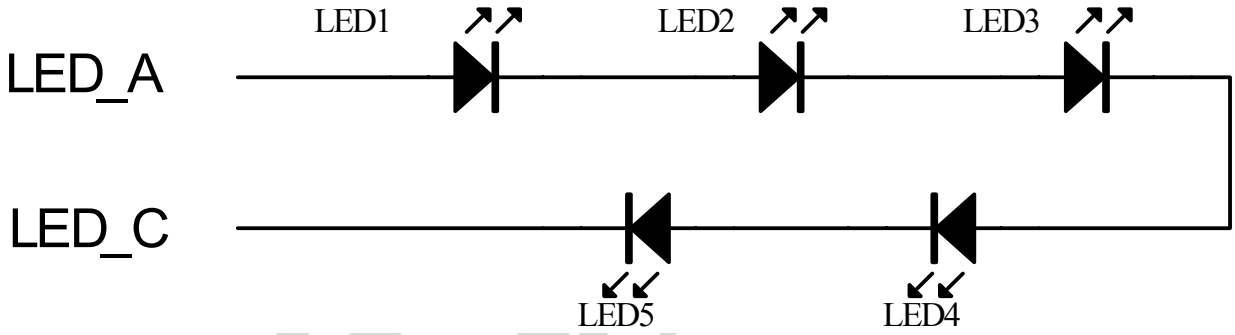
3.2-1. Data About LED Backlight

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
Backlight Type							-
Supply Current	ILED	-	20	-	mA	VLED<=17.5 V	-
Reverse Voltage (Single chip)	VR	-	-	5.0	V	-	-
Luminous Intensity	IV	125	170	-	cd/m2	-	-
Luminous Intensity Ratio	-	70			%	-	-

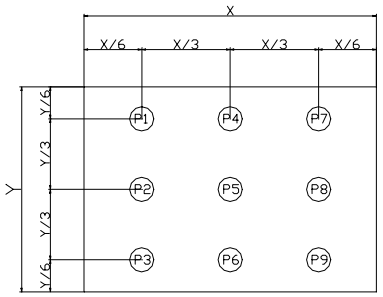
NOTE：1. Average Luminous Intensity of P1 – P9

2. Luminous Intensity Ratio = (MIN. / MAX.)*100%

3.2-2. Internal Circuit Diagram



3.2-3. MEASURED METHOD (X*Y: Light Area)



(Effective spatial Distribution)

Hole Diameter φ3mm;1 to 9 per Position Measured Luminous Intensity Ratio

3.3 Packing Method

NO	Document Number	Attachment file
1	DF2440VB-M1-01	

Double-Click the "Attachment Icon" above for opening attachment file.

(4) Quality Units

4.1 Specification of Quality Assurance

4.1-1.Purpose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by WINTEK CORPORATION (Supplier).

4.1-2.Standard for Quality Test

a. Inspection :

Before delivering, the supplier should take the following tests, and affirm the quality of product.

b. Electro-Optical Characteristics:

According to the individual specification to test the product.

c. Test of Appearance Characteristics:

According to the individual specification to test the product.

d. Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

e. Delivery Test:

Before delivering, the supplier should take the delivery test.

(i) Test method: According to **ANSI/ASQC Z1.4-2003.General Inspection Level Ⅱ take a single time.**

(ii) The defects classify of AQL as following:

Major defect: AQL= 0.4

Minor defect: AQL= 0.65

Total defects: AQL= 0.65

4.1-3.Nonconforming Analysis & Deal With Manners

a. Nonconforming analysis:

(i) Purchaser should supply the detail data of non-conforming sample and the non-suitable state.

(ii) After accepting the detail data from purchaser, the analysis of nonconforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before two weeks.

b. Disposition of nonconforming:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of nonconforming when the reason of nonconforming is not sure.

4.1-4. Agreement items

Both sides should discuss together when the following problems happen.

a. There is any problem of standard of quality assurance, and both sides think that it must be modified.

b. There is any argument item which does not record in the standard of quality assurance.

c. Any other special problem.

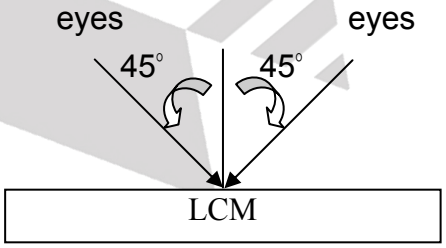
4.1-5. Standard of The Product Appearance Test

a. Manner of appearance test:

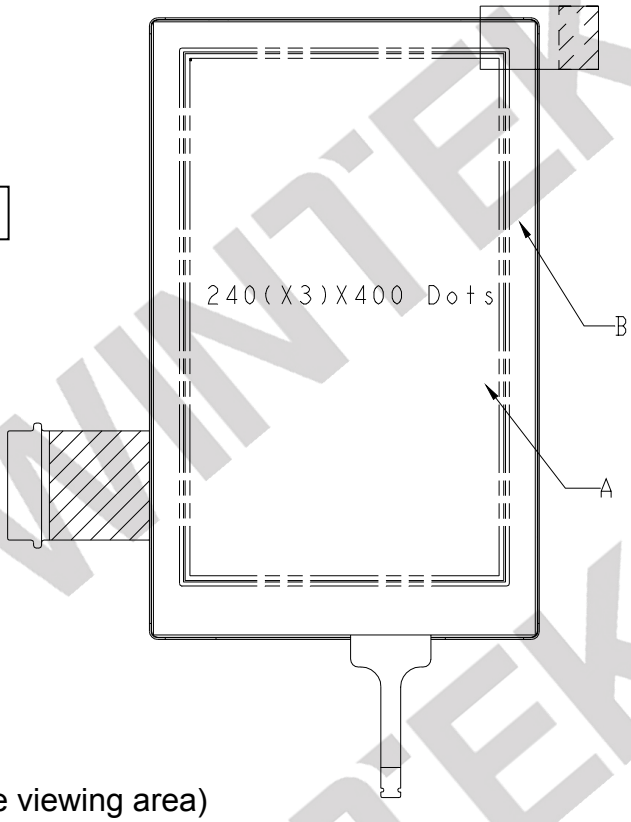
(i) The test must be under 20W ㄨ 2 or 40W fluorescent light, and the distance of view must be at 30 cm.

(ii) When display on use front-light test, while display off use back-light test.

(iii)The test direction is base on about around 45° of vertical line.



(iv) Definition of area:



A Area : Viewing area.

B Area : Out of viewing area (Outside viewing area)

Any defect at area B could be ignored. If customer has particular requirement, this requirement should be clearly defined in inspection specification. If inspection specification has defined other criteria, the final judgement should follow the inspection specification .

b. Basic principle:

(i) It will accord to the AQL when the standard can not be described.

(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

(iii) Must add new item on time when it is necessary.

c. Standard of inspection:(Unit: mm)

4.1-6. Inspection specification

NO	Document Number	Attachment file
1	DF2440VB-QC-101	

Double-Click the "Attachment Icon" above for opening attachment file.

4.2 Standard Specification for Reliability

NO	Document Number	Attachment file
1	M3ET090001	

Double-Click the "Attachment Icon" above for opening attachment file.

4.3 Precautions in Use of LCM

4.3-1 Handling of LCM

- Don't give external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.

4.3-2 Storage

- Store in an ambient temperature of 5℃ to 45℃, and in a relative humidity of 40% to 60%. Don't expose to sunlight or fluorescent light.
- Storage in a clean environment, free from dust, active gas, and solvent.
- Store in anti-static electricity container.
- Store without any physical load.

4.3-3 Soldering

- Use the Sn-Ag-Cu (96.5, 3.0, 0.5) solder
- Iron : Temperature 300℃ and less than 5-6 sec during soldering.
- Rewiring : no more than 3 times.

4.3-4 Assembly

- The front polarizer is covered with a protective foil which should be removed before use.

(5) Substance Management Units

5.1 Product Substances Management Documentation

NO	Document Number	Attachment file
1	Environment management standard(EMS-P-017-01)	

Double-Click the "Attachment Icon" above for opening attachment file.