

SPECIFICATION FOR LCD MODULE

MODULE NO: BG-12864A-FDWA-J-G-B00
Doc.Version: 01

Filled in by customer:

Check list item:

- 1.Viewing area:
- 2.Module dimension:
- 3.Module thickness:
- 4.Appearance:
- 5.Viewing angle:
- 6.Background color:
- 7.Backlight brightness:
- 8.Backlight color:
- 9.Backlight electronic characteristic
- 10.Pattern:
- 11.Contrast:
- 12.Function:
- 13.Characteristic:
- 14.Vlcd:
- 15.Module operation current:
- 16.Reliability Test:
- 17.Test Result:
- 18.Others

<input type="checkbox"/>	OK	<input type="checkbox"/>	NG
<input type="checkbox"/>	OK	<input type="checkbox"/>	NG
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<input type="checkbox"/>	OK	<input type="checkbox"/>	NG

Customer Approval:

<input type="checkbox"/> Accept	<input type="checkbox"/> Reject
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Prepare Engineer			
Check Mechanical	Engineer		
Check Electronic	Engineer		
Verify			
Approval			

WIMRD005-02-B

DOCUMENT REVISION HISTORY

Sample Version	DOC. Version	DATE	DESCRIPTION	CHANGED BY
B00 00		19 th Apr 2005	First issue	Cashe
01		13 th JUN 2006	Change the BL Size	Han hui li

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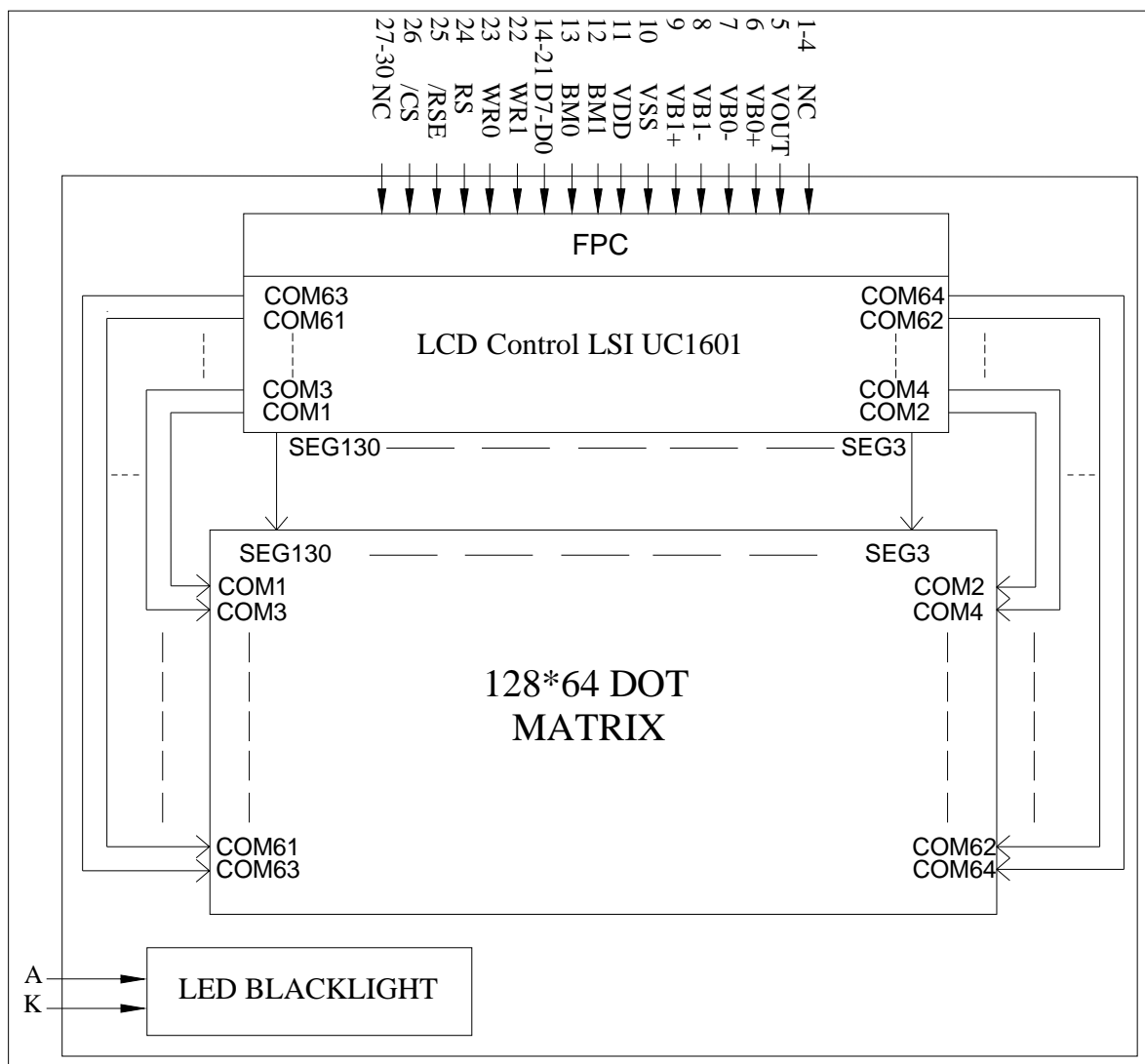
1.FUNCTIONS & FEATURES

1-1.Format	: 128*64 Dots Graphic
1-2. LCD mode	: FSTN/White-Black /Negative/Transmissive
1-3. Viewing direction	: 6 o'clock
1-4.Driving scheme	: 1/65 duty, 1/9 bias, VLCD 10.2V

2.MECHANICAL SPECIFICATIONS

2-1. Module size	: 56.6(W)*44.2(H)*7.15MAX (T)
2-2. Viewing area	: 50.6(W)* 31(H)
2-3. Dot pitch	: 0.364(W)*0.433(H)
2-4. Dot size	: 0.334(W) * 0.403(H)

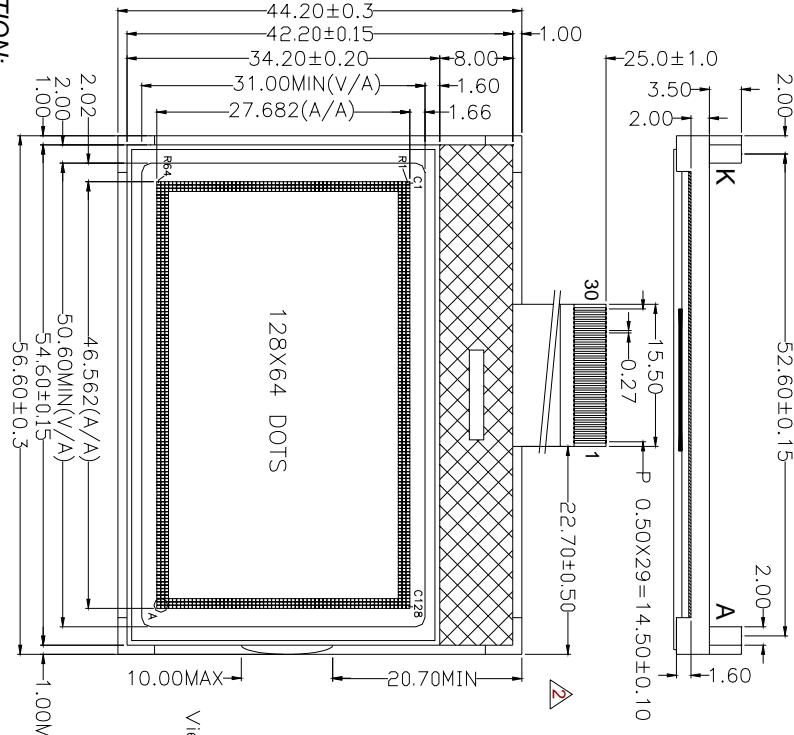
3.BLOCK DIAGRAM



4.DIMENSIONAL OUTLINE

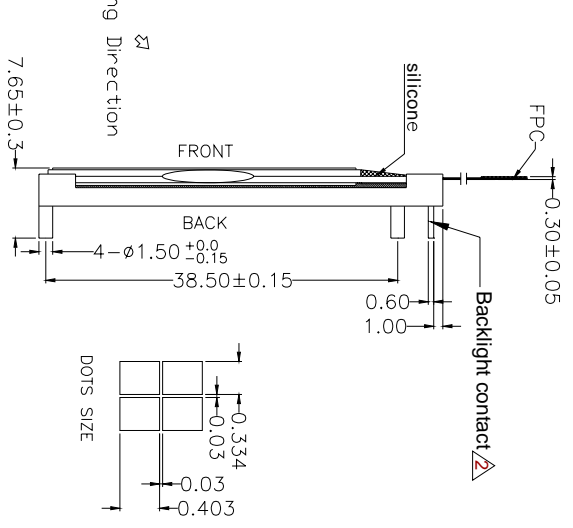
Count drawing & Spec:revision record during discussion with customer

Rec.	Revision content description	Date
#1	FIRST ISSUE	2005-03-24
#2	1) Remove D S T indication 2) Remove dim 4.0 3) Revise tol 22.7/+0.20 to +/-0.50	2006-06-13



SPECIFICATION:

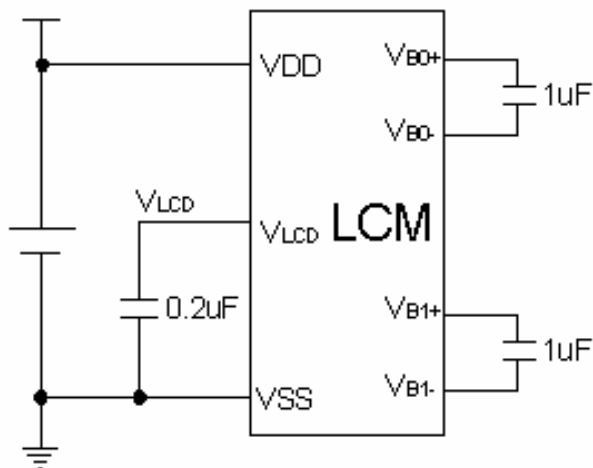
- 1. Display mode: FSTN/B-V/Negative/Transmissive
- 2. Drive condition: 1/65 Duty, 1/9Bias, VLcd: 10.2V
- 3. Viewing angle: 6 O'Clock
- 4. Operating temp: 0°C ~ 50°C
Storage temp: -20°C ~ 70°C
- 5. BL color: White
- 6. Unspecified tolerance: ±0.20mm
- 7. The driver IC is UC1601
- 8. Rehs request



PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PIN NAME	NC	NC	NC	NC	VLCD	VBO+	VBO-	VBI-	VBI+	VSS	VDD	BM1	BM0	D7	D6
PIN NAME	D5	D4	D3	D2	D1	D0	WR1	WR0	CS	/RST	/CS0	NC	NC	NC	NC

UNIT	SIZE	SCALE	DESIGNED	CHECKED	VERIFIED	APPROVED	MATERIAL	WEIGHT
mm	A4	1:1	HAN J J 2006-04-13	CAI SH 2006-04-13	GRACE 2006-04-13	JONES 2006-04-13	BG-12864A-FDWA-J-G -B	
							NUMBER	TOTAL
							FILE NAME	Count Dwg.

5. POWER SUPPLY



VLCD-VSS=Operating voltage for LCD

6. PIN DESCRIPTION

Pin no.	Symbol	Function
1	NC	NO Connection
2	NC	NO Connection
3	NC	NO Connection
4	NC	NO Connection
5	VLCD	Power supply for LCD drive circuit
6	VB0+	LCD bias Voltages.
7	VB0-	LCD bias Voltages.
8	VB1-	LCD bias Voltages.
9	VB1+	LCD bias Voltages.
10	VSS	Ground (0V)
11	VDD	Power supply for Logic circuit and LCD
12	BM1	Host Interface set function
13	BM0	Host Interface set function
14	D7	Display data signal
15	D6	
16	D5	
17	D4	
18	D3/ SDA	
19	D2	
20	D1	
21	D0/ SCK	
22	WR1	Read/write enable signal
23	WR0	Read/write select signal
24	CD	Signal to select registers
25	R ST	Reset signal
26	/CS	Chip select signal
27	NC	NO Connection
28	NC	NO Connection
29	NC	NO Connection
30	NC	NO Connection

7. MAXIMUM ABSOLUTE LIMIT (T=25°C)

Item Sym	bol	Standard value	Unit
Power supply voltage for logic	$V_{DD} - 0$.3~+4.0	V
Input voltage	V_I	$V_{SS} - 0.4 \sim V_{DD} + 0.3$	V
Operating temperature	T_{opr}	0~+50	°C
Storage temperature	T_{stg}	-20~+70	°C

Note: Voltage greater than above may damage the module
All voltages are specified relative to $V_{SS}=0V$

8. ELECTRICAL CHARACTERISTICS

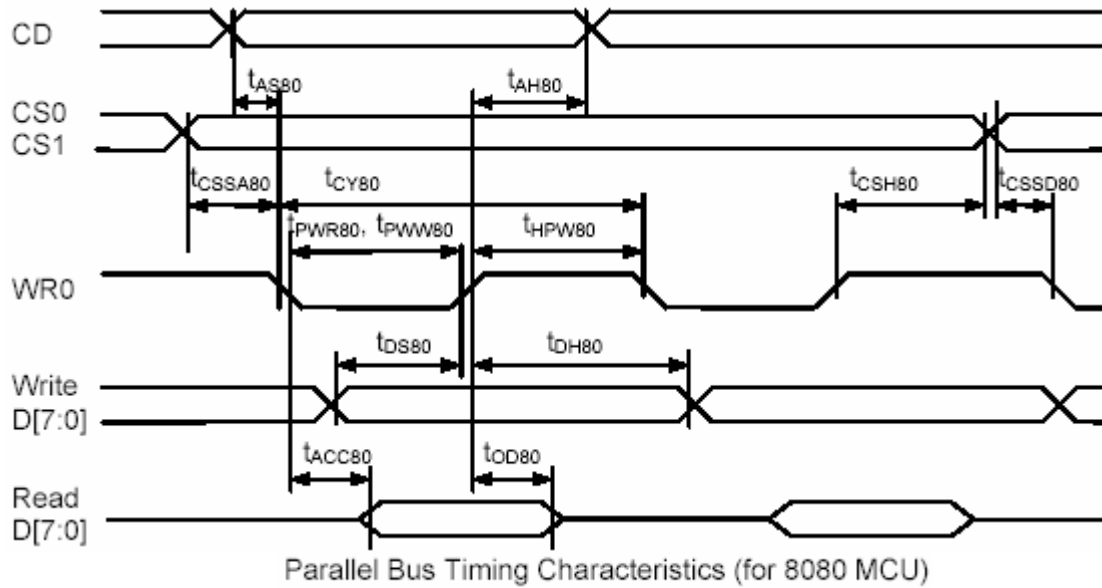
8-1-1. Backlight Specifications Absolute maximum rating (Ta=25°C)

Item	Symbol	Min Ty	p	Max Uni	t	Condition
Forward voltage	V_f	2.9	3.1	3.3	V	$I_f=30mA$
Reverse Current	I_r	-	-	50	μA	$V_r=3V$
Power Dissipation	P_d	-	165	-	mw	$I_f=30mA$
Chromaticity Coordinates	X 0.	26	0.28	0.295	Nm	$I_f=30mA$
	Y	0.265 0.	28	0.30	Nm	$I_f=30mA$
Luminance	L_v	100 -		-	Cd/m^2	$I_f=30mA$
Luminance with the LCD	L_v	15 -		-	Cd/m^2	$I_f=30mA$
Color		White				

8-1-2 DC Characteristics ($V_{DD}=+3V$, $V_{SS}=0V$, $T_a=25^\circ C$)

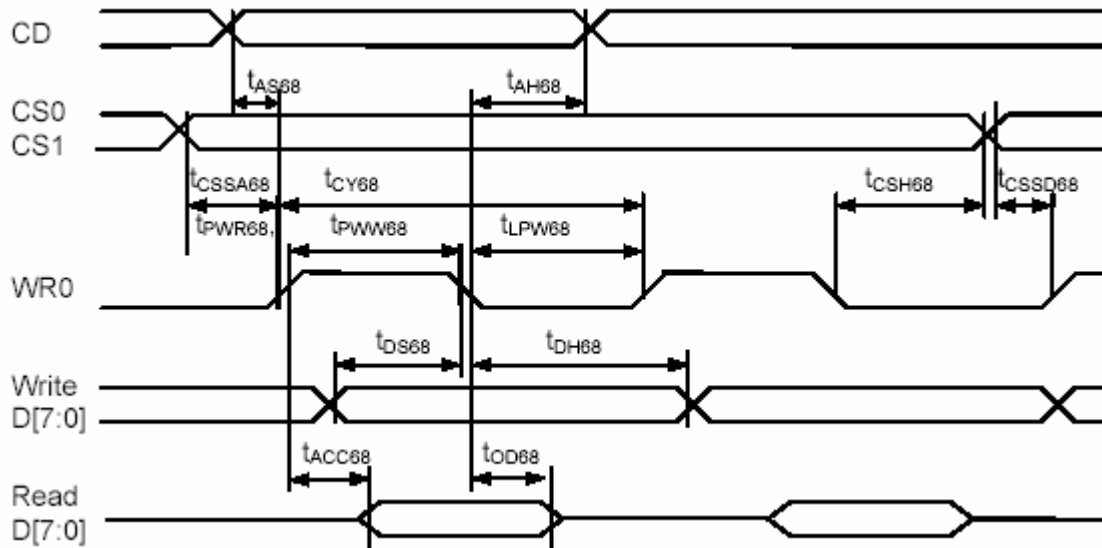
Item	Symbol	Min	Type	Max	Unit	Test condition
Operating voltage	V_{DD}	2.8	3	3.2	V	-
Supply current	I_{DD}	-	-	1	mA	During display
Input voltage	V_{IL}	V_{SS}	-	0.2VDD	V	-
	V_{IH}	0.8VDD	-	V_{DD}	V	
Output voltage	V_{OL}	V_{SS}	-	0.2VDD	V	-
	V_{OH}	0.8VDD	-	VDD	V	-
Input leakage current	I_{LKG}	-	-	1.5	μA	-
LCD driving voltage	V_{LCD}	10	10.2	10.4	V	VLCD-VSS

8-2 AC Characteristics



(VDD=3.0V, Ta=0 to 50°C)

Symbol	Signal	Description	Condition	Min.	Max.	Units
t _{AS80}	CD	Address setup time		0	–	nS
t _{AH80}		Address hold time		40		
t _{CY80}		System cycle time		135	–	nS
t _{PWR80}	WR1	Pulse width (read)		65	–	nS
t _{PWW80}	WR0	Pulse width (write)		65	–	nS
t _{HPW80}	WR0, WR1	High pulse width		65	–	nS
t _{DS80}	D0~D7	Data setup time		30	–	nS
t _{DH80}		Data hold time		20		
t _{ACC80}		Read access time	C _L = 100pF	–	50	nS
t _{OD80}		Output disable time		10	50	
t _{CSSA80}	CS1/CS0	Chip select setup time		10		nS
t _{CSSD80}				10		
t _{CSH80}				20		



Parallel Bus Timing Characteristics (for 6800 MCU)

(VDD=3.0V, Ta=0 to 50°C)

Symbol	Signal	Description	Condition	Min.	Max.	Units
t_{AS68}	CD	Address setup time		0	–	nS
t_{AH68}		Address hold time		40	–	nS
t_{CY68}		System cycle time		135	–	nS
t_{PWR68}	WR1	Pulse width (read)		65	–	nS
t_{PWW68}		Pulse width (write)		65	–	nS
t_{LPW68}		Low pulse width		65	–	nS
t_{DSS68}	D0~D7	Data setup time		30	–	nS
t_{DHS68}		Data hold time		15	–	nS
t_{ACC68}		Read access time	$C_L = 100pF$	–	50	nS
t_{OD68}		Output disable time		10	50	nS
T_{CSSA68}	CS1/CS0	Chip select setup time		10		nS
T_{CSSD68}				10		nS
T_{CSH68}				20		nS

9. CONTROL AND DISPLAY COMMAND

The following is a list of host commands supported by UC1601

C/D: 0: Control, 1: Data
 W/R: 0: Write Cycle, 1: Read Cycle
 # Useful Data bits
 - Don't Care

	Command	C/D	W/R	D7	D6	D5	D4	D3	D2	D1	D0	Action
1	Write Data Byte	1	0	#	#	#	#	#	#	#	#	Write 1 byte
2	Read Data Byte	1	1	#	#	#	#	#	#	#	#	Read 1 byte
3	Get Status	0	1	-	MX	MY	RS	WA	DE	-	-	N/A
4	Set Column Address LSB	0	0	0	0	0	0	#	#	#	#	Set CA [3:0]
	Set Column Address MSB	0	0	0	0	0	1	#	#	#	#	Set CA [7:4]
5	Set Multiplexing Rate	0	0	0	0	1	0	0	0	#	#	Set MR [1:0]
6	Set Temp. Compensation	0	0	0	0	1	0	0	1	#	#	Set TC[1:0]
7	Set Panel Loading	0	0	0	0	1	0	1	0	0	#	Set PC[0]
8	Set Pump Control	0	0	0	0	1	0	1	1	#	#	Set PC[2:1]
9	Set Adv. Program Control (double byte command)	0	0	0	0	1	1	0	0	0	R	Set APC[R][7:0], R = 0, or 1
		0	0	#	#	#	#	#	#	#	#	
10	Set Scroll Line	0	0	0	1	#	#	#	#	#	#	Set SL[5:0]
11	Set Page Address	0	0	1	0	1	1	#	#	#	#	Set PA[3:0]
12	Set V _{BIAS} Potentiometer (double-byte command)	0	0	1	0	0	0	0	0	0	1	Set PM[7:0]
		0	0	#	#	#	#	#	#	#	#	
13	Set RAM Address Control	0	0	1	0	0	0	1	#	#	#	Set AC[2:0]
14	Set Frame Rate	0	0	1	0	1	0	0	0	0	#	Set LC[3]
15	Set All-Pixel-ON	0	0	1	0	1	0	0	1	0	#	Set DC[1]
16	Set Inverse Display	0	0	1	0	1	0	0	1	1	#	Set DC[0]
17	Set Display Enable	0	0	1	0	1	0	1	1	1	#	Set DC[2]
18	Set LCD Mapping Control	0	0	1	1	0	0	0	#	#	0	Set LC[2:1]
19	System Reset	0	0	1	1	1	0	0	0	1	0	System Reset
20	NOP	0	0	1	1	1	0	0	0	1	1	No operation
21	Set Test Control (double byte command)	0	0	1	1	1	0	0	1	TT		For testing only. Do not use.
		0	0	#	#	#	#	#	#	#	#	
22	Set LCD Bias Ratio	0	0	1	1	1	0	1	0	#	#	Set BR[1:0]
23	Reset Cursor Update Mode	0	0	1	1	1	0	1	1	1	0	AC[3]=0, CA=CR
24	Set Cursor Update Mode	0	0	1	1	1	0	1	1	1	1	AC[3]=1, CR=CA

* Other than commands listed above, all other bit patterns result in NOP (No Operation).

10.Package

REV	DESCRIPTION	DATE (Remark)
00	First Issue	2005-07-07 (41)

name	unit	qty per	spec	material	remark
1 carton	pcs	1	400*300*285	paper	*A,type
2 Sub-carton	pcs	1	375*270*260	paper	*A,type
3 ADHESIVE TAPE	M	2		PE	≡≡ SHAPE
4 PSPPK TRAY	pcs	19	360*255*17	PS	ESD 10 ⁶ ---10 ¹¹
5 PEARL PAD	pcs	18	306.5*233.7*2	EPE	ESD 10 ⁸ ---10 ¹¹
6 module	pcs	360	56.6*89.2*7.65		be careful in put
7 DRYER	pcs	8		1g	
8 paper board	pcs	2	360*255*6	paper	*A,type

Specification:

One sub-carton contains 19 layers packings, 20 modules live in each packing. Each bottom and top side a stiff board is added to stiffen the packings and on the top a empty ps is put, then using adhesive tape for enlacing. One sub-carton are placed in the outside carton.

One carton can contain 18X20=360 modules.

YEEDO	UNIT	SIZE	SCALE	PART No.	DESIGNED	CHECKED	VERIFIED	APPROVED	MATERIAL NUMBER	WEIGHT TOTAL
	mm	A4	FIT	BG-12864A-PK-J-G	TANG D Y 2005-07-07	ZHANG Y H 2005-07-07	LUI Y Q 2005-07-07	J.S CHENG 2005-07-07	-A	FILE NAME

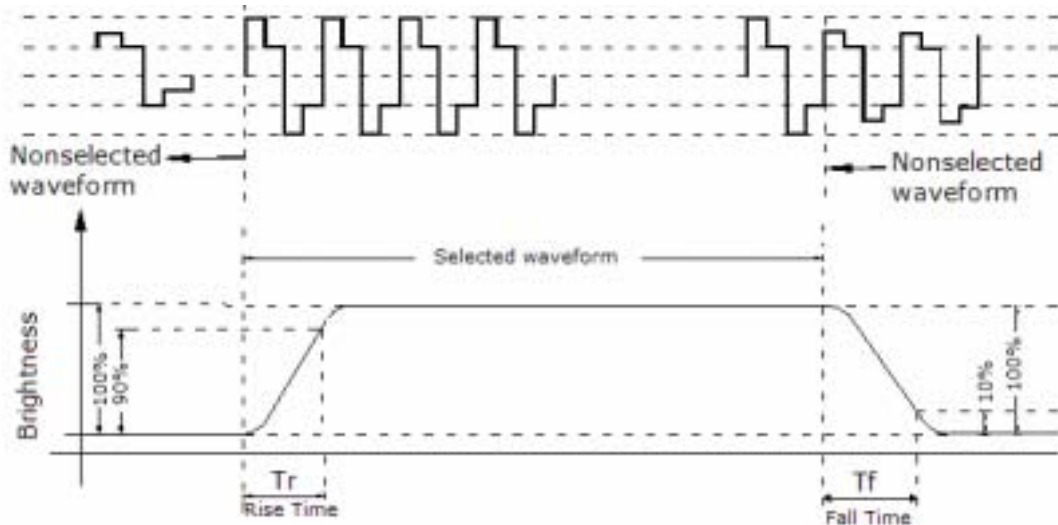
PAPKAGE

11. Quality Specifications

11-1. Electro-Optic Characteristics

NO	TEM Symbol		Temp	Rating			Unit	
				Min	Typ	Max		
1	Response	Rise time	Tr	25	N/A	176.9	300	Ms
	time Fall	time	Tf	25	N/A	109.3	300	
2	Operating Frequency		Ff	25		64		Hz
3	Contrast	Rate	Cr	25	2	9.805	10.64	-
4	Viewing Direction		60° CLOCK					
5	Viewing Angle	12H =90°	1	25		33		Deg
		6H =270°	2			50		
		3H =0°	3			50		
		9H =180°	4			51		
6	Current Consumption		Is	25		11.6	19.3	μA
7	Capacitance		C	25	4.1			nF

Response Time

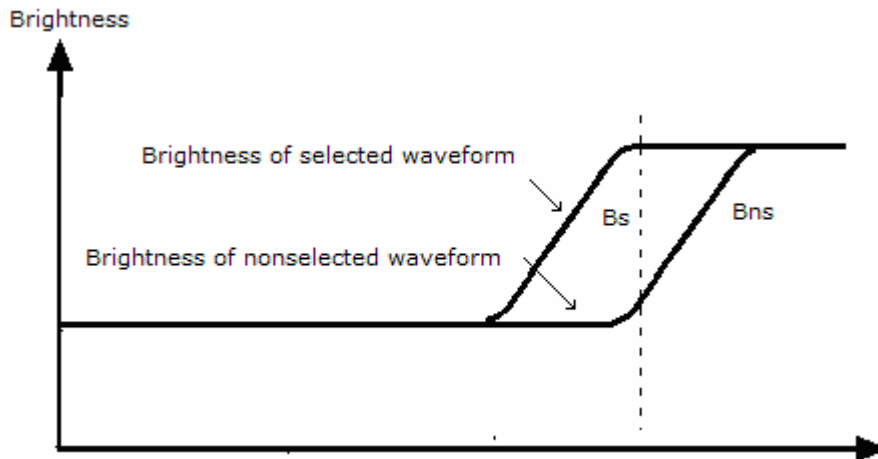


Measur

ing Condition:

1. Driving waveform: 1/N Duty, 1/a Bias selected waveform.
2. Driving Frequency: Typical value in Individual specification.
3. Operating Voltage : LCD driving voltage getting maximum contrast rate.
4. Measuring Angle : See Individual Specification.
5. Measuring Temperature : See Individual Specification .

Contrast Ratio Definition

**Negative Type**

$$\text{Contrast Ratio(Cr)} = \frac{\text{Brightness of non-selected waveform(Bns)}}{\text{Brightness of selected waveform(Bs)}}$$

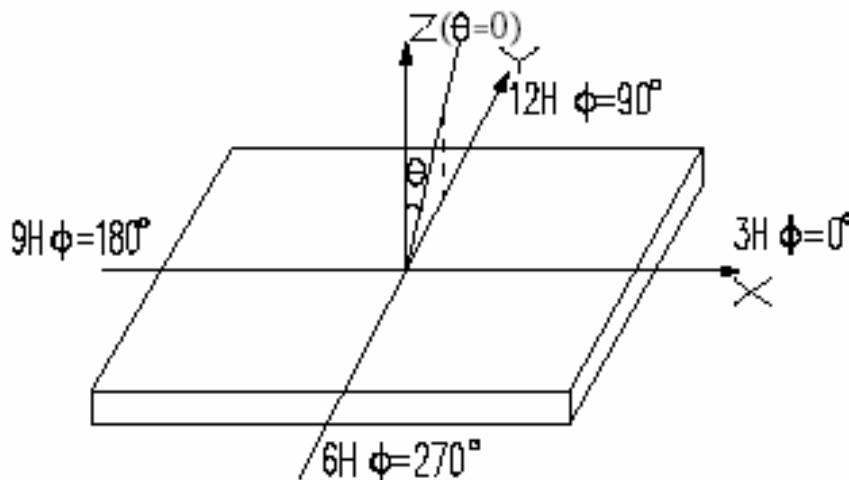
Viewing Angle

θ : Angle between Viewer Direction and Normal.

(-90° 90°)

ϕ : Angle between Projection of Viewer Direction to X-Y plane and Y axis.

(0° ϕ 360°)

**Measuring Condition**

1. Driving Voltage: Same as VLCD.
2. Driving Frequency: Same as Frame Frequency

11-2. Specification of quality assurance

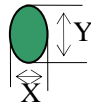
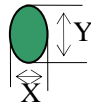
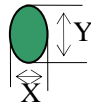
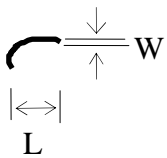
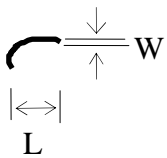
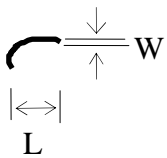
AQL inspection standard

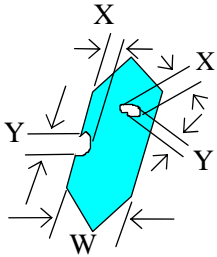
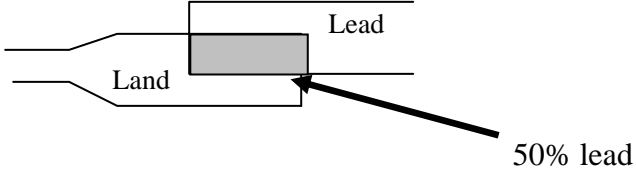
Sampling method: MIL-STD-105E, Level II, single sampling

Defect classification

Classify	Item		Note	AQL
Major	Display state	Short or open circuit	1	0.65
		Contrast defect (dim, ghost)		
		LC leakage		
		Flickering		
		No display		
		Wrong viewing direction	2	
	Wrong Back-light	7		
	Non-display	Flat cable or pin reverse	9	
Wrong or missing component		10		
Minor	Display state	Background color deviation	2	1.5
		Black spot and dust	3	
		Line defect	4	
		Scratch		
		Rainbow	5	
		Pin hole	6	
	Polarizer	Bubble and foreign material	3	
		Scratch	4	
	PCB	Scratch	4	
	Soldering	Poor connection	8	
	Wire	Poor connection	9	

Note on defect classification

No. Item	Criterion																					
1	<table border="1"> <tr> <td>Short or open circuit</td> <td rowspan="6">Not allow</td> </tr> <tr> <td>LC leakage</td> </tr> <tr> <td>Flickering</td> </tr> <tr> <td>No display</td> </tr> <tr> <td>Wrong viewing direction</td> </tr> <tr> <td>Wrong Back-light</td> </tr> </table>	Short or open circuit	Not allow	LC leakage	Flickering	No display	Wrong viewing direction	Wrong Back-light														
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Flickering																						
No display																						
Wrong viewing direction																						
Wrong Back-light																						
2	<table border="1"> <tr> <td>Contrast defect</td> <td rowspan="2">Refer to approval sample</td> </tr> <tr> <td>Background color deviation</td> </tr> </table>	Contrast defect	Refer to approval sample	Background color deviation																		
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3	<table border="1"> <tr> <td rowspan="6"> Point defect, Black spot, dust (incl. Polarizer) $\phi = (X+Y)/2$ </td> <td rowspan="6">  </td> <td> <table border="1"> <thead> <tr> <th>Point Size</th> <th>Acceptable Qty.</th> </tr> </thead> <tbody> <tr> <td>$\phi \leq 0.10$</td> <td>Disregard</td> </tr> <tr> <td>$0.10 < \phi \leq 0.20$</td> <td>3</td> </tr> <tr> <td>$0.20 < \phi \leq 0.25$</td> <td>2</td> </tr> <tr> <td>$0.25 < \phi \leq 0.30$</td> <td>1</td> </tr> <tr> <td>$\phi > 0.30$</td> <td>0</td> </tr> </tbody> </table> </td> </tr> <tr> <td colspan="2" style="text-align: center;">Unit : mm</td> </tr> </table>	Point defect, Black spot, dust (incl. Polarizer) $\phi = (X+Y)/2$		<table border="1"> <thead> <tr> <th>Point Size</th> <th>Acceptable Qty.</th> </tr> </thead> <tbody> <tr> <td>$\phi \leq 0.10$</td> <td>Disregard</td> </tr> <tr> <td>$0.10 < \phi \leq 0.20$</td> <td>3</td> </tr> <tr> <td>$0.20 < \phi \leq 0.25$</td> <td>2</td> </tr> <tr> <td>$0.25 < \phi \leq 0.30$</td> <td>1</td> </tr> <tr> <td>$\phi > 0.30$</td> <td>0</td> </tr> </tbody> </table>	Point Size	Acceptable Qty.	$\phi \leq 0.10$	Disregard	$0.10 < \phi \leq 0.20$	3	$0.20 < \phi \leq 0.25$	2	$0.25 < \phi \leq 0.30$	1	$\phi > 0.30$	0	Unit : mm					
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				$\phi \leq 0.10$	Disregard																	
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				$0.20 < \phi \leq 0.25$	2																	
		$0.25 < \phi \leq 0.30$	1																			
$\phi > 0.30$	0																					
Unit : mm																						
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Unit: mm																						
5 Rainbow	Not more than two color changes across the viewing area.																					

No.	Item	Criterion								
6	Segment pattern $W = \text{Segment width}$ $\phi = (X+Y)/2$	(1) Pin hole $\phi < 0.10\text{mm}$ is acceptable.  <table border="1" data-bbox="935 488 1396 667"> <thead> <tr> <th>Point Size</th> <th>Acceptable Qty</th> </tr> </thead> <tbody> <tr> <td>$\phi < 1/4W$</td> <td>Disregard</td> </tr> <tr> <td>$1/4W < \phi < 1/2W$</td> <td>1</td> </tr> <tr> <td>$\phi > 1/2W$</td> <td>0</td> </tr> </tbody> </table> <p style="text-align: right;">Unit: mm</p>	Point Size	Acceptable Qty	$\phi < 1/4W$	Disregard	$1/4W < \phi < 1/2W$	1	$\phi > 1/2W$	0
Point Size	Acceptable Qty									
$\phi < 1/4W$	Disregard									
$1/4W < \phi < 1/2W$	1									
$\phi > 1/2W$	0									
7	Back-light	(1) The color of backlight should correspond its specification. (2) Not allow flickering								
8	Soldering	(1) Not allow heavy dirty and solder ball on PCB. (The size of dirty refer to point and dust defect) (2) Over 50% of lead should be soldered on Land. 								
9	Wire	(1) Copper wire should not be rusted (2) Not allow crack on copper wire connection. (3) Not allow reversing the position of the flat cable. (4) Not allow exposed copper wire inside the flat cable.								
10	PCB	(1) Not allow screw rust or damage. (2) Not allow missing or wrong putting of component.								

11-3. Reliability of LCM

Reliability test condition:

Item Condition		Time (hrs)	Assessment
High temp. Storage	70°C	240	No abnormalities in functions and appearance
High temp. Operating	50°C	240	
Low temp. Storage	-20°C	240	
Low temp. Operating	0°C	240	
Humidity	40°C/ 90%RH	240	
Temp. Cycle	-20°C ← 25°C → 70°C (1 hour ← 5 min → 1 hour)	10cycles	

Recovery time should be 24 hours minimum. Moreover, functions, performance and appearance shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature (20±8°C), normal humidity (below 65% RH), and in the area not exposed to direct sun light.

11-4. Precaution for using LCM

LCM is assembled and adjusted with a high degree of precision. Do not attempt to make any alteration or modification. The followings should be noted.

General Precautions:

1. LCD panel is made of glass. Avoid excessive mechanical shock or applying strong pressure onto the surface of display area.
2. The polarizer used on the display surface is easily scratched and damaged. Extreme care should be taken when handling. To clean dust or dirt off the display surface, wipe gently with cotton, or other soft material soaked with isopropyl alcohol, ethyl alcohol or trichloroethylene, do not use water, ketone or aromatics and never scrub hard.
3. Do not tamper in any way with the tabs on the metal frame.
4. Do not make any modification on the PCB without consulting YB.
5. 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.
6. Avoid pressing on the metal bezel, otherwise the elastomer connector could be deformed and lose contact, resulting in missing pixels and also cause rainbow on the display.
7. Be careful not to touch or swallow liquid crystal that might leak from a damaged cell. Any liquid crystal adheres to skin or clothes, wash it off immediately with soap and water.

Static Electricity Precautions:

1. CMOS-LSI is used for the module circuit; therefore operators should be grounded whenever he/she comes into contact with the module.
2. Do not 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.
3. Do not touch the connection terminals of the display with bare hand; it will cause disconnection or defective insulation of terminals.
4. The modules should be kept in anti-static bags or other containers resistant to static for storage.
5. Only properly grounded soldering irons should be used.
6. If an electric screwdriver is used, it should be grounded and shielded to prevent sparks.
7. The normal static prevention measures should be observed for work clothes and working benches.
8. Since dry air is inductive to static, a relative humidity of 50-60% is recommended.

Soldering Precautions:

1. Soldering should be performed only on the I/O terminals.
2. Use soldering irons with proper grounding and no leakage.
3. Soldering temperature: $300^{\circ}\text{C} \pm 10^{\circ}\text{C}$
4. Soldering time: 3 to 4 second.
5. Use eutectic solder with resin flux filling.
6. If flux is used, the LCD surface should be protected to avoid spattering flux.
7. Flux residue should be removed.

Operation Precautions:

1. The viewing angle can be adjusted by varying the LCD driving voltage V_o .
2. Since applied DC voltage causes electro-chemical reactions, which deteriorate the display, the applied pulse waveform should be a symmetric waveform such that no DC component remains. Be sure to use the specified operating voltage.
3. Driving voltage should be kept within specified range; excess voltage will shorten display life.
4. Response time increases with decrease in temperature.
5. Display color may be affected at temperatures above its operational range.

Operation Precautions:

1. Keep the temperature within the specified range usage and storage. Excessive temperature and humidity could cause polarization degradation, polarizer peel-off or generate bubbles.
2. For long-term storage over 40°C is required, the relative humidity should be kept below 60%. Avoid direct sunlight.

Limited Warranty

YB LCDs and modules are not consumer products, but may be incorporated by YB's customers into consumer products or components thereof, YB does not warrant that its LCDs and components are fit for any such particular purpose.

1. The liability of YB is limited to repair or replacement on the terms set forth below. YB will not be responsible for any subsequent or consequential events or injury or damage to any personnel or user including third party personnel and/or user. Unless otherwise agreed in writing between YB and the customer, YB will only replace or repair any of its

LCD which is found defective electrically or visually when inspected in accordance with YB GENERAL LCD INSPECTION STANDARD. (Copies available on request)

2. No warranty can be granted if any of the precautions state in handling liquid crystal display above has been disregarded. Broken glass, scratches on polarizer mechanical damages as well as defects that are caused accelerated environment tests are excluded from warranty.
3. In returning the LCD/LCM, they must be properly packaged; there should be detailed description of the failures or defect.

12. DESCRIBE TO THE PART NO:

