ORIENT DISPLAY (North America) Limited
145 Royal Crest Court Unit 42 Markham, ON, Canada L3R 9Z4
Tel: 905-477-1166 Fax: 905-477-1782 http://www.orientdisplay.com

SPECIFICATIONS
FOR LCD MODULE

CUSTOMER	
CUSTOMER PART NO.	
ACMMI PART NO.	AMG24064B
DESCRIPTION	
APPROVED BY	
DATE	

PREPARED BY	CHECKED BY	APPROVED BY

DOCUMENT REVISION HISTORY:

DATE	PAGE	DESCRIPTION
2000.8.	-	First release
2005.3.	-	Modify the full specification
2005.12.	4	Update the part number system

Contents

1. Module Classification Information

A	M	C	1	6	0	2	A	R	-	B	-	B	6	W	T	D	W	-	S	P
1		2	3				4	5		6		7	8	9	10	11	12		13	

1	Brand：Orient Display (N.A.) Ltd.	
2	Display Type：C→ Character Type, G→ Graphic Type, NONE→ Custom-made	
3	Display Font：Characters X Lines / Rows X Columns /Others	
4	Model serials no.	
5	RoHS compliant: R→YES NONE→ NO	
6	IC Package Type：	M→ SMT Type B→ COB Type T→ TAB Type G→ COG Type F→ COF Type S→ Special
7	LCD Mode：	P→TN Positive N→TN Negative Y→ STN Positive, Yellow Green B→ STN Negative, Blue G→ STN Positive, Gray W→ FSTN Positive T→ FSTN Negative F→ FFSTN Negative S→ Special
8	Viewing direction	6→ 6:00,12→12:00, S→Special
9	Temperature range	N → Normal Temperature W→ Wide Temperature S→ Special
10	LCD Polarizer Type	R→ Reflective T→ Transmissive F→ Transflective S→ Special
11	Backlight Type	N→ None D→ LED E→ EL F→ CCFL S→ Special
12	Backlight Color	Y→ Yellow-green B→ Blue A→ Amber W→ White G→ Green R→ Red S→ Special
13	Internal Code	

2. Precautions in use of LCD Modules

(1)Avoid applying excessive shocks to the module or making any alterations or modifications to it.
(2)Don't make extra holes on the printed circuit board, modify its shape or change the components of LCD module.
(3)Don't disassemble the LCM.
(4)Don't operate it above the absolute maximum rating.
(5)Don't drop, bend or twist LCM.
(6)Soldering: only to the I/O terminals.
(7)Storage: please storage in anti-static electricity container and clean environment.

3. General Specification

Item	Dimension	Unit
Number of Dots	240 x 64	—
Module dimension(None Backlight)	180.0 x 65.0 x 11.0（MAX）	mm
Module dimension(With Backlight)	180.0 x 65.0 x 16.0（MAX）	mm
View area	132.0 x 39.0	mm
Active area	127.16 x 33.88	mm
Dot size	0.49 x 0.49	mm
Dot pitch	0.53 x 0.53	mm
LCD type	STN LCD	
Duty	1/64	
View direction	6 o'clock or 12 o'clock	
Backlight Type	None, YELLOW-GREEN backlight	

4. Absolute Maximum Ratings

Item		Symbol	Min	Max	Unit
Input Voltage		V_I	-0.3	VDD+0.3	V
Supply Voltage For Logic		VDD-V_{SS}	-0.3	7.0	V
Supply Voltage For LCD		V_{DD}-V_0	0	16	V
Standard Temperature LCM	Operating Temp.	Top	0	50	℃
	Storage Temp.	Tstr	-10	60	℃
Wide Temperature LCM	Operating Temp.	Top	-20	70	℃
	Storage Temp.	Tstr	-30	80	℃

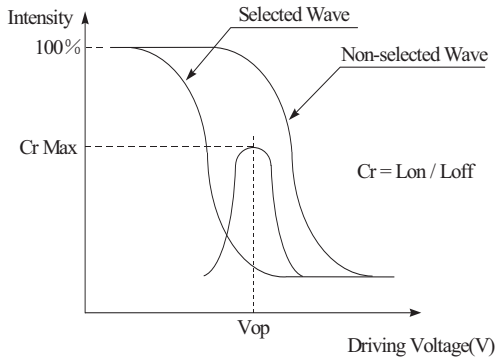
5. Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	4.5	5.0	5.5	V
Supply Voltage For LCD	V_{DD}-V_0	Ta=25℃	-	13.0	-	V
Input High Volt.	V_{IH}	—	0.7 V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	V_{SS}	—	0.3 V_{DD}	V
Supply Current	I_{DD}	V_{DD}=5V	2.0	-	-	mA
Supply Voltage of Yellow-green backlight	V_{LED}	Forward current =1000 mA Number of LED die 2x100= 200	3.8	4.2	4.3	V

6. Optical Characteristics

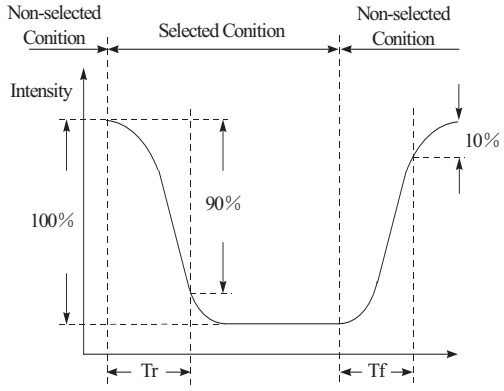
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	(V)θ	CR≧2	-20	—	35	deg
	(H)φ	CR≧2	-30	—	30	deg
Contrast Ratio	CR	—	—	3	—	—
Response Time	T rise	—	—	—	250	ms
	T fall	—	—	—	250	ms

Definition of Operation Voltage (Vop)



[positive type]

Definition of Response Time (Tr , Tf)



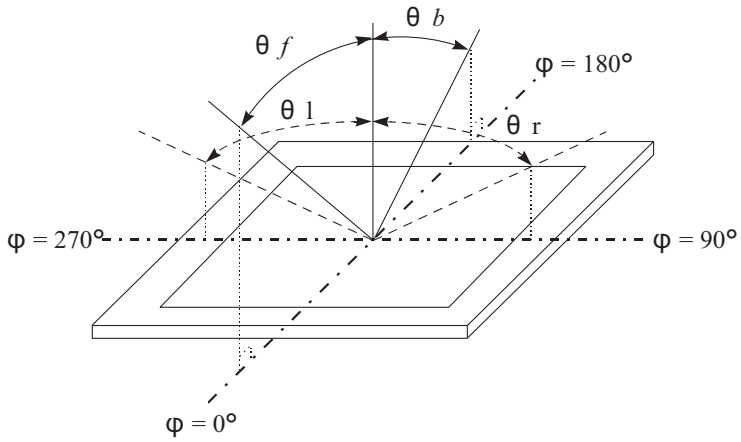
[positive type]

Conditions :

Operating Voltage : Vop　　Viewing Angle(θ，φ) : 0°， 0°

Frame Frequency : 64 HZ　　Driving Waveform : 1/N duty , 1/a bias

Definition of viewing angle(CR≧2)

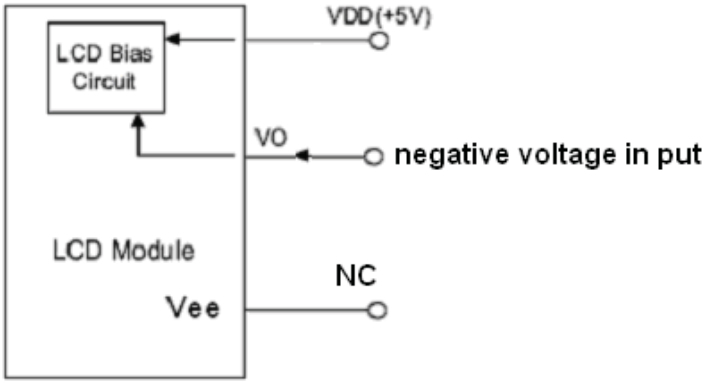


7. Interface Pin Function

Pin No.	Symbol	Level	Description
1	V_{SS}	0V	Ground
2	V_{DD}	5.0V	Supply Voltage for logic
3	V0		Supply voltage for LCD
4	RS	H/L	Command/Data select
5	RW	H/L	Data Read/Write
6	E	H/L	Chip Enable
7	DB0	H/L	Data bit 0
8	DB1	H/L	Data bit 1
9	DB2	H/L	Data bit 2
10	DB3	H/L	Data bit 3
11	DB4	H/L	Data bit 4
12	DB5	H/L	Data bit 5
13	DB6	H/L	Data bit 6
14	DB7	H/L	Data bit 7
15	/CS	H/L	Chip enable for T6963C
16	/RST	H/L	Reset signal
17	Vee		Negative Voltage Output/input
18	NC		NC
19	LED(+)		Anode of LED Backlight
20	LED(-)		Cathode of LED Backlight

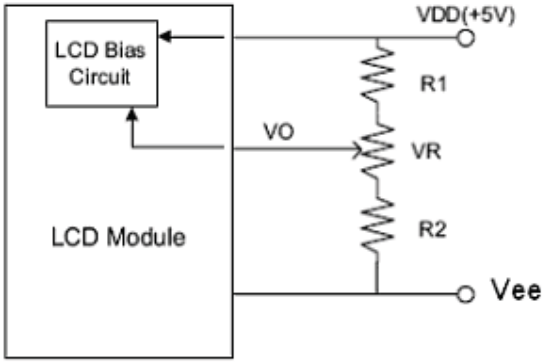
8. POWER SUPPLY

Without Negative Power on PCB



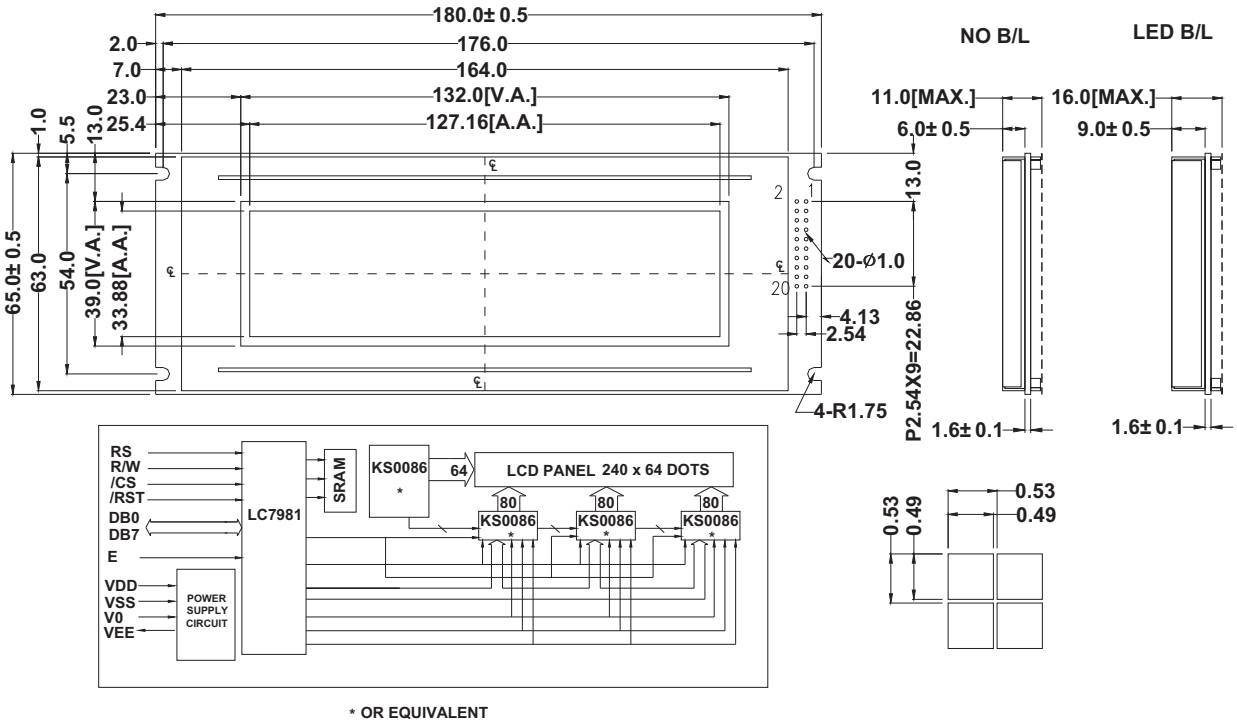
without DC-DC converter

With Negative Power on PCB



with DC-DC converter
VR:10K-20K

9. Contour Drawing &Block Diagram

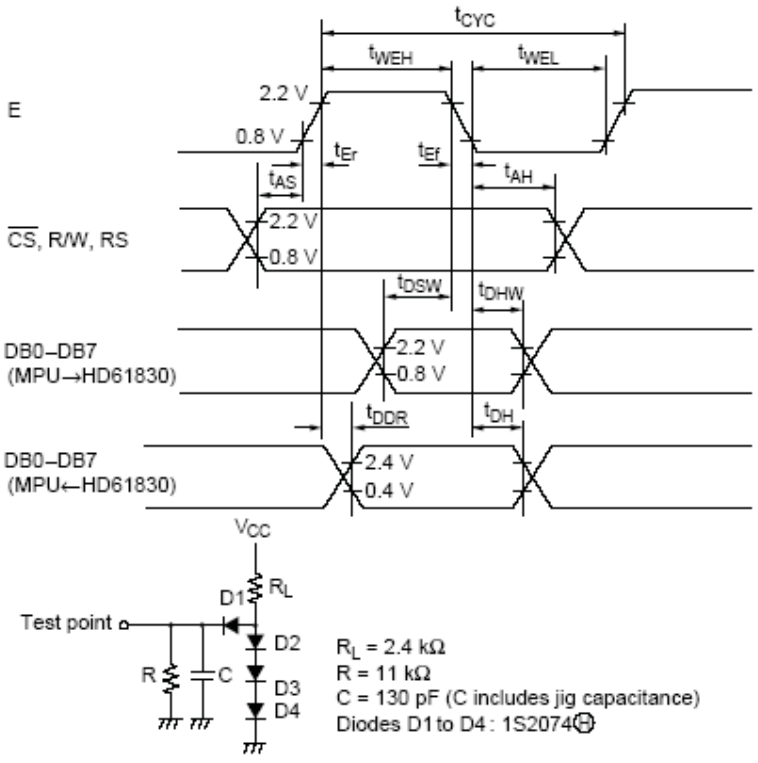


10.Timing Characteristics (equivalent to HD61830)

HD61830 MPU Interface (V_{CC} = 5 V ±10%, GND = 0 V, T_a = –20 to +75°C)

Item		Symbol	Min	Typ	Max	Unit
Enable cycle time		t_{CYC}	1.0	—	—	µs
Enable pulse width	High level	t_{WEH}	0.45	—	—	µs
	Low level	t_{WEL}	0.45	—	—	µs
Enable rise time		t_{Er}	—	—	25	ns
Enable fall time		t_{Ef}	—	—	25	ns
Setup time		t_{AS}	140	—	—	ns
Data setup time		t_{DSW}	225	—	—	ns
Data delay time		t_{DDR}	—	—	225	ns *
Data hold time		t_{DHW}	10	—	—	ns
Address hold time		t_{AH}	10	—	—	ns
Output data hold time		t_{DH}	20	—	—	ns

Note: * The following load circuit is connected for specification:



11.Quality Assurance

Screen Cosmetic Criteria

Item	Defect	Judgment Criterion	Partition
1	Spots	A)Clear Size: d mm — Acceptable Qty in active area d ≦0.1 — Disregard 0.1<d≦0.2 — 6 0.2<d≦0.3 — 2 0.3<d — 0 Note: Including pin holes and defective dots which must be within one pixel size. B)Unclear Size: d mm — Acceptable Qty in active area d ≦0.2 — Disregard 0.2<d≦0.5 — 6 0.5<d≦0.7 — 2 0.7<d — 0	Minor
2	Bubbles in Polarizer	Size: d mm — Acceptable Qty in active area d≦0.3 — Disregard 0.3<d≦1.0 — 3 1.0<d≦1.5 — 1 1.5<d — 0	Minor
3	Scratch	In accordance with spots cosmetic criteria. When the light reflects on the panel surface, the scratches are not to be remarkable.	Minor
4	Allowable Density	Above defects should be separated more than 30mm each other.	Minor
5	Coloration	Not to be noticeable coloration in the viewing area of the LCD panels. Back-light type should be judged with back-light on state only.	Minor

12.Reliability

Content of Reliability Test

Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Applicable Standard**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	60℃ 96hrs	———
Low Temperature storage	Endurance test applying the high storage temperature for a long time.	-10℃ 96hrs	———
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	50℃ 96hrs	———
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	0℃ 96hrs	———
High Temperature/ Humidity Storage	Endurance test applying the high temperature and high humidity storage for a long time.	60℃,90%RH 96hrs	———
High Temperature/ Humidity Operation	Endurance test applying the electric stress (Voltage & Current) and temperature / humidity stress to the element for a long time.	50℃,90%RH 96hrs	———
Temperature Cycle	Endurance test applying the low and high temperature cycle. -10℃ 25℃ 60℃ 30min 5min 30min 1 cycle	-10℃/60℃ 10 cycles	———
Mechanical Test			
Vibration test	Endurance test applying the vibration during transportation and using.	10~22Hz→1.5mmp-p 22~500Hz→1.5G Total 0.5hrs	———
Shock test	Constructional and mechanical endurance test applying the shock during transportation.	50G Half sign wave 11 msedc 3 times of each direction	———

***Supply voltage for logic system=5V. Supply voltage for LCD system =Operating voltage at 25℃