Bolymin, Inc.

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LCD MODULE SPECIFICATION

MODEL NO.

BP240128B2 series

FOR MESSRS:

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ON DATE OF:

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APPROVED BY:

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RECORD OF REVISION

Revision Date	Section	Contents
2005/08/01	-	New Release
2005/11/26	A	Add power on/off sequence

C O N T E N T S

1. Numbering System

B	**P**	**240128**	**B2**	**-**	**-**	**-**		**-**	**-**
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

0	Brand		Bolymin	
1	Module Type		C= character type G= graphic type P= TAB/TCP type	O= COG type F= COF type
2	Format		2002=20 characters, 4 lines 12232= 122 x 32 dots	
3	Version No.		A type	
4	LCD Color		G=STN/gray Y=STN/yellow-green C=color STN	B=STN/blue F=FSTN T=TN
5	LCD Type		R=positive/reflective P=positive/transflective	M=positive/transmissive N=negative/transmissive
6	Backlight type/color		L=LED array/ yellow-green H=LED edge/white R=LED array/red G=LED edge/yellow-green	D=LED edge/blue E=EL/white B=EL/blue C=CCFL/white
7	CGRAM Font (applied only on character type)		J=English/Japanese Font E=English/European Font	C=English/Cyrillic Font H=English/Hebrew Font
8	View Angle/ Operating Temperature		B=Bottom/Normal Temperature H=Bottom/Wide Temperature U=Bottom/Ultra wide Temperature	T=Top/Normal Temperature W=Top/Wide Temperature C=9H/Normal Temperature
9	Special Code		3=3 volt logic power supply n=negative voltage for LCD c=cable/connector xxx=to be assigned on data sheet	t=temperature compensation for LCD p=touch panel

2. General Specification

(1) Mechanical Dimension

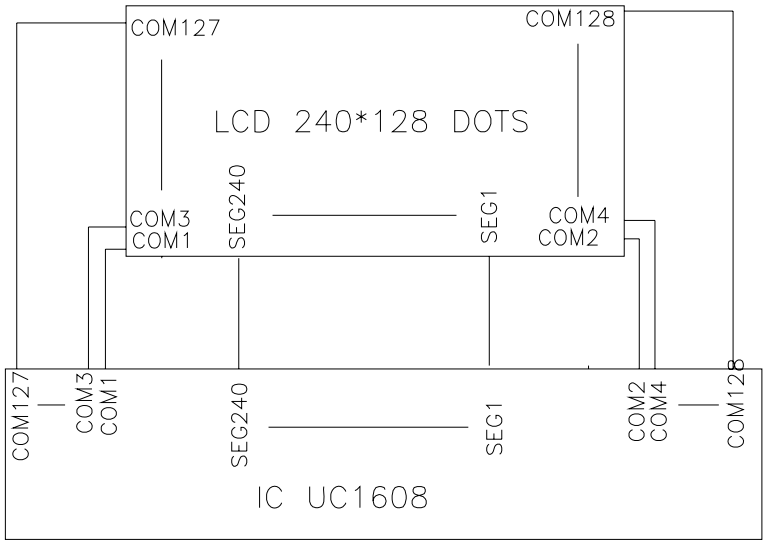
Item	Standard Value	Unit
Number of dots	240×128	dots
Module dimension (L*W*H)	154.7*79.68*7.8(max)	mm
View area	114.98*63.58	mm
Active area	107.98*57.58	mm
Dot size	0.43(W)×0.43(H)	mm
Dot pitch	0.45(W)×0.45 (H)	mm

(2) Controller IC: UC1608 Controller

(3) Temperature Range

	Wide
Operating	-20 ~ +70℃
Storage	-30 ~ +80℃

(4) Display format



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3. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	℃
Storage Temperature	TST	-30	—	+80	℃
Input Voltage	VI	0	—	V_{DD}	V
Supply Voltage For Logic	VDD-VSS	2.4	—	4.0	V
Supply Voltage For LCD			—	17	V

4. Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	2.7	3.0	3.3	V
Supply Voltage For LCD	V	Ta=-20℃	—	16.5	—	V
		Ta=25℃	—	15	—	V
		Ta=+70℃	—	13.5	—	V
Input High Vol	V_{IH}	—	$0.8V_{DD}$	—	V_{DD}	V
Input Low Vol	V_{IL}	—	0	—	$0.2V_{DD}$	V
Output High Vol	V_{OH}	—	V_{DD} -0.4	—	—	V
Output Low Vol.	V_{OL}	—	—	—	0.4	V
Supply Current	I_{DD}	V_{DD}=3V	—	2.5	4	mA

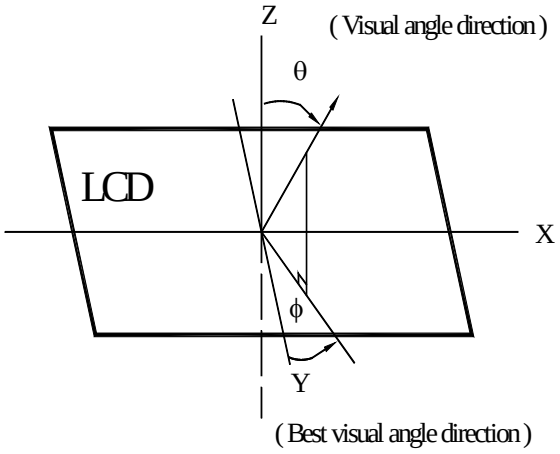
5. Optical Characteristics

FSTN

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
View Angle	(V) θ	CR≧3	10		108	deg
	(H) φ	CR≧3	-45		45	deg
Contrast Ratio	CR	—		5		—
Response Time 25℃	T rise	—		100	150	ms
	T fall	—		150	200	ms

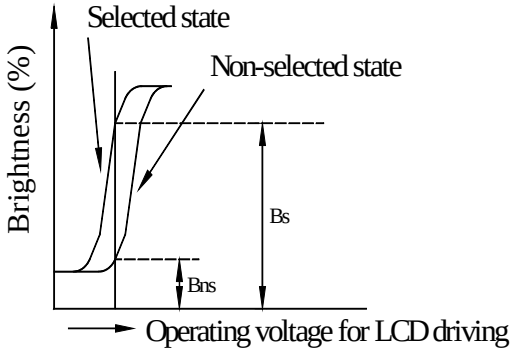
5.1 Definitions

■View Angles

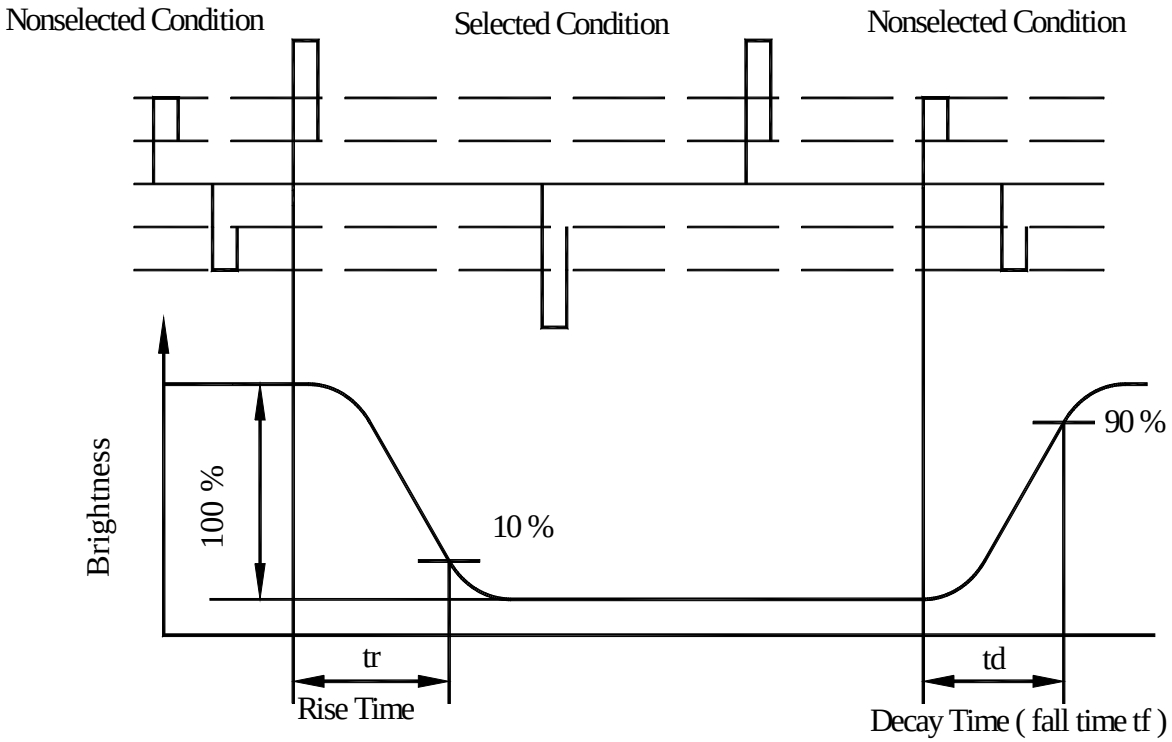


■Contrast Ratio

$$CR = \frac{\text{Brightness at selected state (BS)}}{\text{Brightness at non-selected state (Bns)}}$$



■Response time



6. Interface Pin Function

Pin No.	Symbol	Level	Description
1	/RESTb	H/L	"L"= Reset the LCD controller
2	CSb	H/L	Chip select
3	RS	(Variable)	H: Data , L: Instruction
4	/WR	H/L	Command or Data write signal
5	/RD	H/L	Command or Data read signal
6	DB0	H/L	Data bus line
7	DB1	H/L	Data bus line
8	DB2	H/L	Data bus line
9	DB3	H/L	Data bus line
10	DB4	H/L	Data bus line
11	DB5	H/L	Data bus line
12	DB6	H/L	Data bus line
13	DB7	H/L	Data bus line
14	VDD	3V	Logic power
15	VSS	0	GND
16	VLCD		NC (Note1)
17	NC		
18	VOUT		NC (Note1)
19	LED+	3V	Power for LED Backlight V+
20	LED-	0V	Power for LED Backlight V-

Note1:Controller IC UC1608 with built in "Booster and temperature compensation circuit ", so LCD operating voltage is controlled by software command.

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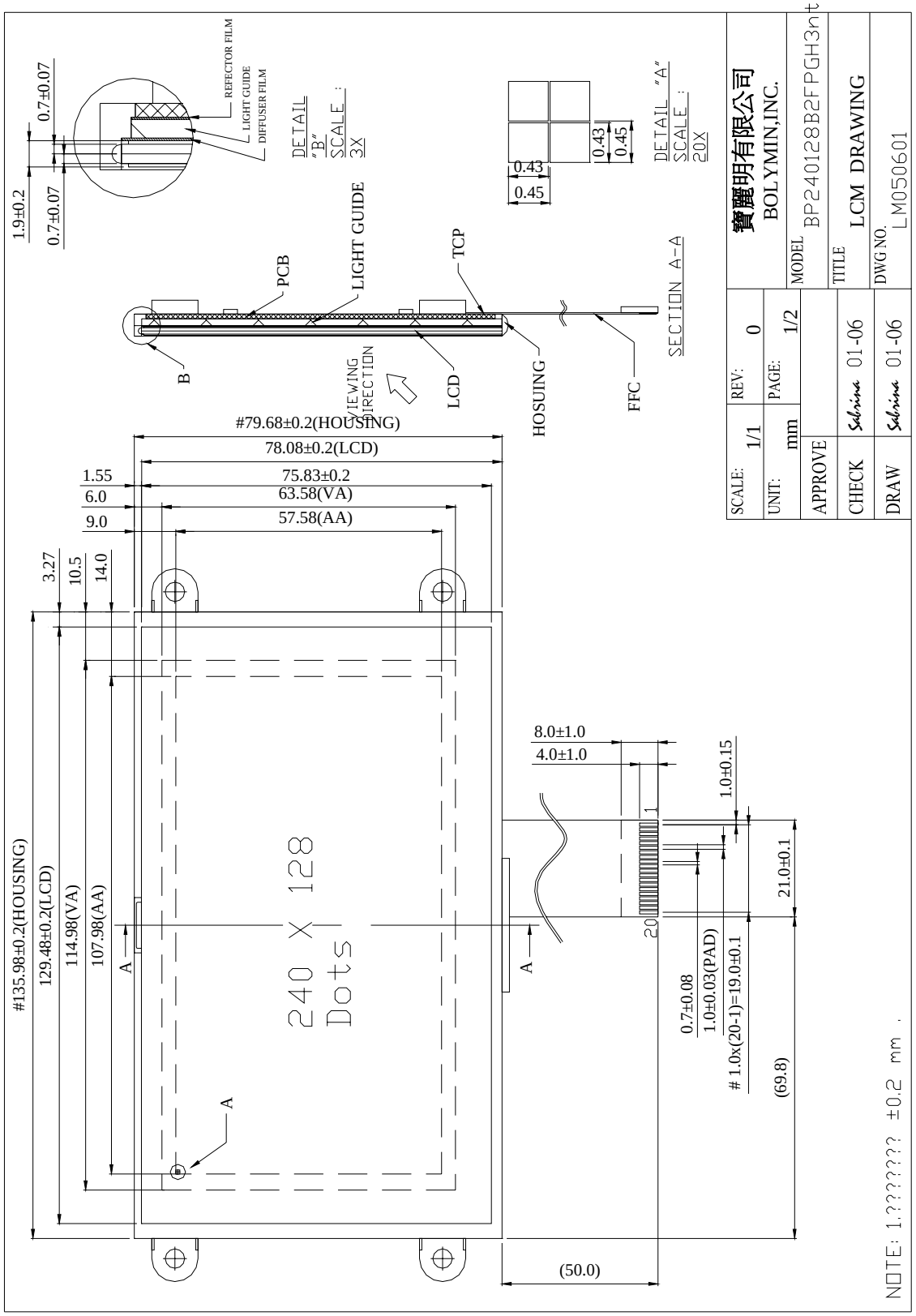
7. Backlight Information

(a)LED edge / yellow-green

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Supply Current	ILED	—	100	200	mA	V=3.0V
Supply Voltage	V	—	3.0	3.3	V	
Reverse Voltage	VR	—	—	8	V	
Luminous Intensity	IV	20	—	—	cd/m^2	ILED=100mA
Wave Length	λp		574		nm	ILED=100mA
Life Time		—	100000	—	Hr.	V≦3.3V
Color	Yellow Green					

LED BACKLIGHT drive from PIN19,PIN20 3.0V/100ma

8.Outline drawing



9. Controller UC1608
Reference “UC1608” SPEC.

10. POWER ON/OFF SEQUENCE

Power-Up Sequence

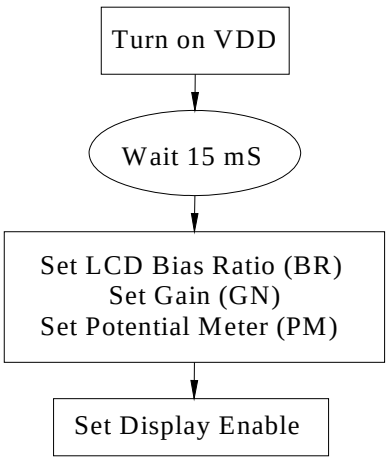
UC 1608 power-up sequence is simplified by built-in “Power Ready” flags and the automatic invocation of System-Reset command after Power-ON-Reset.

System programmers are only required to wait 15mS before the CPU starting to issue commands to UC1608. No additional time sequences are required between enabling the charge pump, turning on the display drivers, writing to RAM or any other commands.

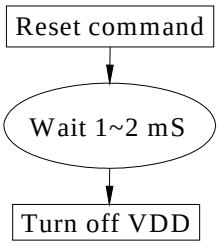
Power-Down Sequence

To prevent the charge stored in capacitors C from damaging the LCD when VDD is switched off, use Reset mode to enable the built-in draining circuit and discharge these capacitors.

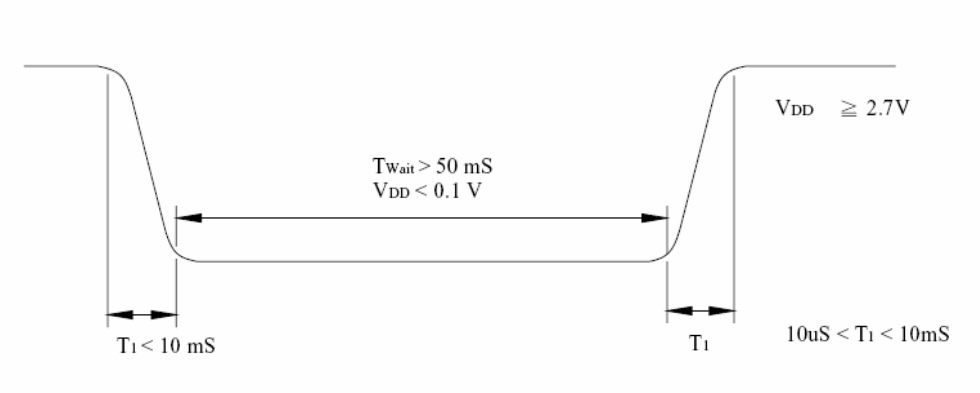
When internal VLCD is not used. UC1608 will NOT drain VLCD during RESET. System designers need to make sure external VLCD source is properly drained off before turning off VDD.



Reference Power-Up Sequence



Reference Power-Down Sequence


VDD ≧ 2.7V
Twait > 50 mS
VDD < 0.1 V
T1 < 10 mS
T1
10uS < T1 < 10mS