

**BOLYMIN**

**SPECIFICATIONS FOR  
LCD MODULE**

**MODEL NO.**  
**BL128128C2 series**  
**VER01**

OR MESSRS:

---

ON DATE OF:

---

APPROVED BY:

---



## CONTENTS

1. Numbering System
2. General Specification
3. Absolute Maximum Ratings
4. Electrical Characteristics
5. Optical Characteristics
6. Interface Pin Function
7. Timing Characteristics
8. POWER ON / OFF SEQUENCE & APPLICATION CIRCUIT
9. Appendix

## 1. Numbering System

<b><u>B</u></b>	<b><u>L</u></b>	<b><u>128128</u></b>	<b><u>C2</u></b>	<b>:</b>	<b>:</b>	<b>:</b>	<b>:</b>	<b>:</b>	<b><u>xxx</u></b>
<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>

<b>0</b>	Brand	Bolymin	
<b>1</b>	Module Type	C= character type G= graphic type P= TAB/TCP type	O= COG type F= COF type L=PLED/OLED
<b>2</b>	Format	2002=20 characters, 2 lines 12232= 122 x 32 dots	
<b>3</b>	Version No.	A type	
<b>4</b>	LCD Color	G=STN/gray Y=STN/yellow-green PLED/yellow-green C=color STN,OLED/RGB	B=STN/blue,OLED/blue F=FSTN T=TN D=OLED/blue+yellow A=OLED/blue+yellow+green
<b>5</b>	LCD Type	R=positive/reflective P=positive/transflective	M=positive/transmissive N=negative/transmissive
<b>6</b>	Backlight type/color	L=LED array/ yellow-green H=LED edge/white R=LED array/red G=LED edge/yellow-green F=RGB array I=RGB edge Q=LED edge/red N=No backlight	D=LED edge/blue E=EL/white B=EL/blue C=CCFL/white Y=LED Bottom/yellow O=LED array/orange K=LED edge/green A=LED edge/amber
<b>7</b>	CGRAM Font (applied only on character type)	J=English/Japanese Font E=English/European Font G=Chinese(simple) F=Chinese(traditional)	C=English/Cyrillic Font H=English/Hebrew Font A=English/Arabic Font
<b>8</b>	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 E=Top/ultra wide temperature
<b>9</b>	Special Code	3=3 volt logic power supply n=negative voltage for LCD c=cable/connector xxx=to be assigned on datasheet	t=temperature compensation for LCD p=touch panel \$=RoHS

## 2. General Specification

### (1) Mechanical Dimension

Item	Standard Value	Unit
Number of dots	128x128xRGB	dots
Module dimension (L*W*H)	33.5*71.5*1.625(MAX)	mm
Active area	26.279*26.284	mm
Dot size	0.0435(W)x0.1855(H)	mm
Dot pitch	0.0685(W)x0.2055 (H)	mm

### (2) Controller IC: SSD1355 Controller

### (3) Temperature Range

Operating	-40 ~ +70
Storage	-40 ~ +85

## 3. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-40	-	+70	
Storage Temperature	TST	-40	-	+85	
Input Voltage	VI	-	-	VDD	V
Operating lifetime			13000(*)		Hrs

\*:80cd/m<sup>2</sup> light on

\*\* :Ta=25 ,50%RH

## 4. Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage For Logic	V <sub>DD</sub> -V <sub>SS</sub>	-	2.4	3.3	3.5	V
Supply Voltage For Analog	V <sub>CC</sub> -V <sub>SS</sub>	-	16	16.5	17	V
Input High Vol	V <sub>IH</sub>	-	0.8V <sub>DD</sub>	-	V <sub>DD</sub>	V
Input Low Vol	V <sub>IL</sub>	-	0	-	0.2V <sub>DD</sub>	V
Output High Vol	V <sub>OH</sub>	-	2.4	-	-	V
Output Low Vol.	V <sub>OL</sub>	-	0.9V <sub>DD</sub>	-	0.1V <sub>DD</sub>	V
Supply Current For Logic (with built-in positive voltage)	I <sub>DD</sub>	-	-	193	-	mA

## 5. Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
View Angle	(V)	CR 20	85		85	deg
	(H)	CR 20	85		85	deg
Contrast Ratio	CR	-		100		-
Response Time 25	T rise	-		40		ms
	T fall	-		40		ms

## 6. Interface Pin Function

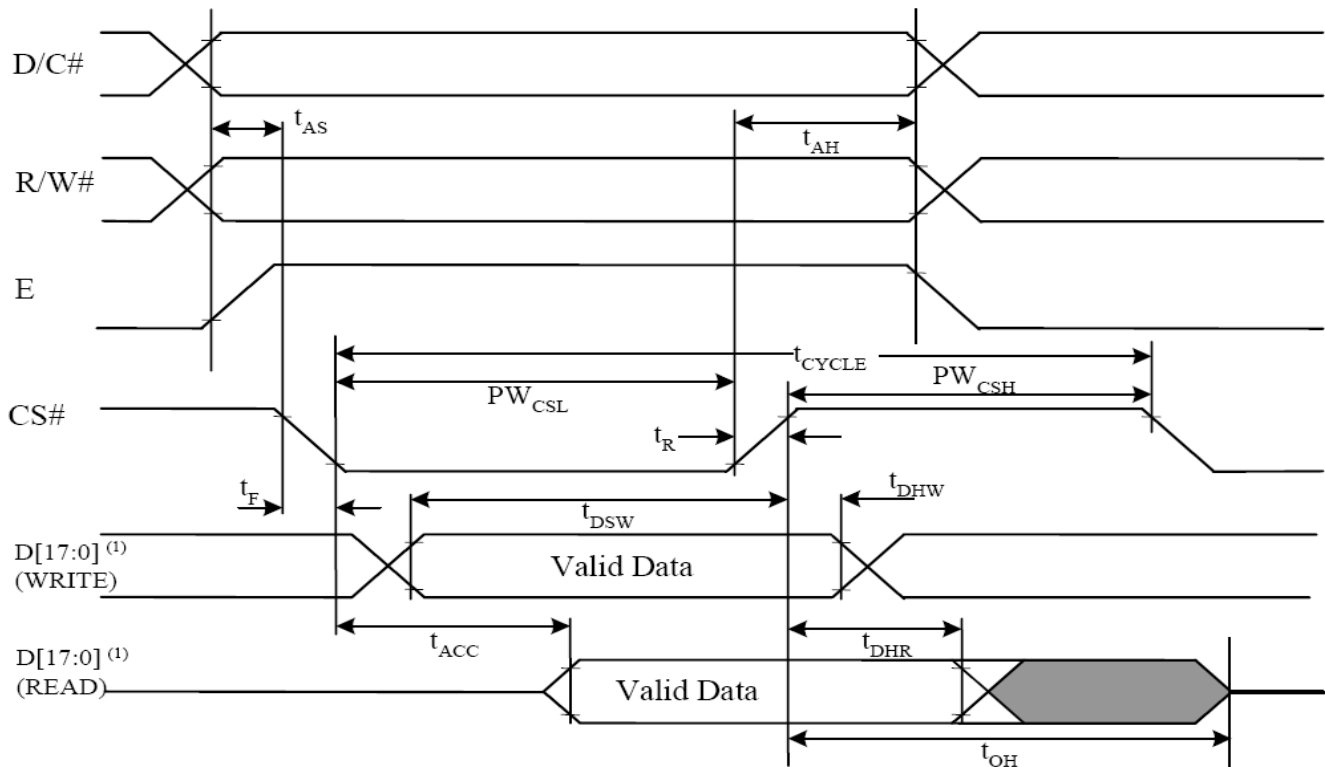
Pin No.	Symbol	Level	Description
1	V <sub>ss</sub>	0V	Ground
2	V <sub>dd</sub>	3.3V	Supply voltage for logic
3	CS	H/L	Chip select pin
4	/RES	H/L	Hardware Reset pin
5	D/C	H/L	H: Data; L: Command.
6	RW	H/L	8080: data write enable pin 6800: Read/Write select pin
7	E	H/L	8080: data read enable pin 6800: Read/Write enable pin
8	DB0	H/L	Data bus line
9	DB1	H/L	Data bus line
10	DB2	H/L	Data bus line
11	DB3	H/L	Data bus line
12	DB4	H/L	Data bus line
13	DB5	H/L	Data bus line
14	DB6	H/L	Data bus line
15	DB7	H/L	Data bus line
16	DISPOFF/ VCC	- H/L	DISPOFF: Active L VCC: Analog power control (DC 17V)

**Default:8080 series interface**

## 7. Timing Characteristics

### 7-1.6800 MPU Interfac

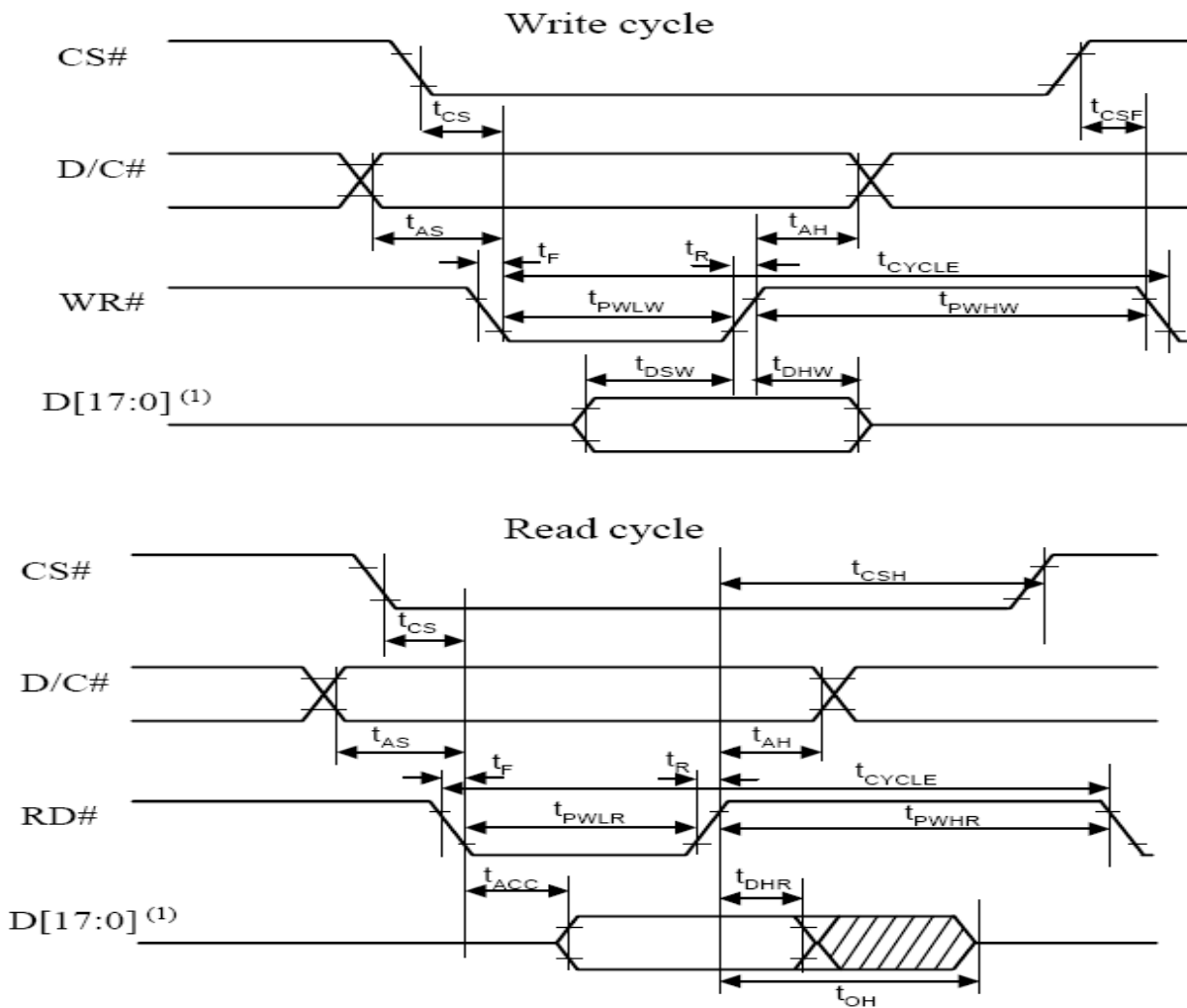
Symbol	Parameter	Min	Typ	Max	Unit
$t_{\text{CYCLE}}$	Clock Cycle Time	300	-	-	ns
$t_{\text{AS}}$	Address Setup Time	10	-	-	ns
$t_{\text{AH}}$	Address Hold Time	0	-	-	ns
$t_{\text{DSW}}$	Write Data Setup Time	40	-	-	ns
$t_{\text{DHW}}$	Write Data Hold Time	7	-	-	ns
$t_{\text{DHR}}$	Read Data Hold Time	20	-	-	ns
$t_{\text{OH}}$	Output Disable Time	-	-	70	ns
$t_{\text{ACC}}$	Access Time	-	-	140	ns
$PW_{\text{CSL}}$	Chip Select Low Pulse Width (read) Chip Select Low Pulse Width (write)	120 60	-	-	ns
$PW_{\text{CSH}}$	Chip Select High Pulse Width (read) Chip Select High Pulse Width (write)	60 60	-	-	ns
$t_{\text{R}}$	Rise Time	-	-	15	ns
$t_{\text{F}}$	Fall Time	-	-	15	ns





## 7-2.8080 MPU Interface

Symbol	Parameter	Min	Typ	Max	Unit
$t_{CYCLE}$	Clock Cycle Time	300	-	-	ns
$t_{AS}$	Address Setup Time	10	-	-	ns
$t_{AH}$	Address Hold Time	0	-	-	ns
$t_{DSW}$	Write Data Setup Time	40	-	-	ns
$t_{DHW}$	Write Data Hold Time	7	-	-	ns
$t_{DHR}$	Read Data Hold Time	20	-	-	ns
$t_{OH}$	Output Disable Time	-	-	70	ns
$t_{ACC}$	Access Time	-	-	140	ns
$t_{PWLW}$	Read Low Time	150	-	-	ns
$t_{PWLW}$	Write Low Time	60	-	-	ns
$t_{PWHR}$	Read High Time	60	-	-	ns
$t_{PWHW}$	Write High Time	60	-	-	ns
$t_R$	Rise Time	-	-	15	ns
$t_F$	Fall Time	-	-	15	ns
$t_{CS}$	Chip select setup time	0	-	-	ns
$t_{CSH}$	Chip select hold time to read signal	0	-	-	ns
$t_{CSF}$	Chip select hold time	20	-	-	ns

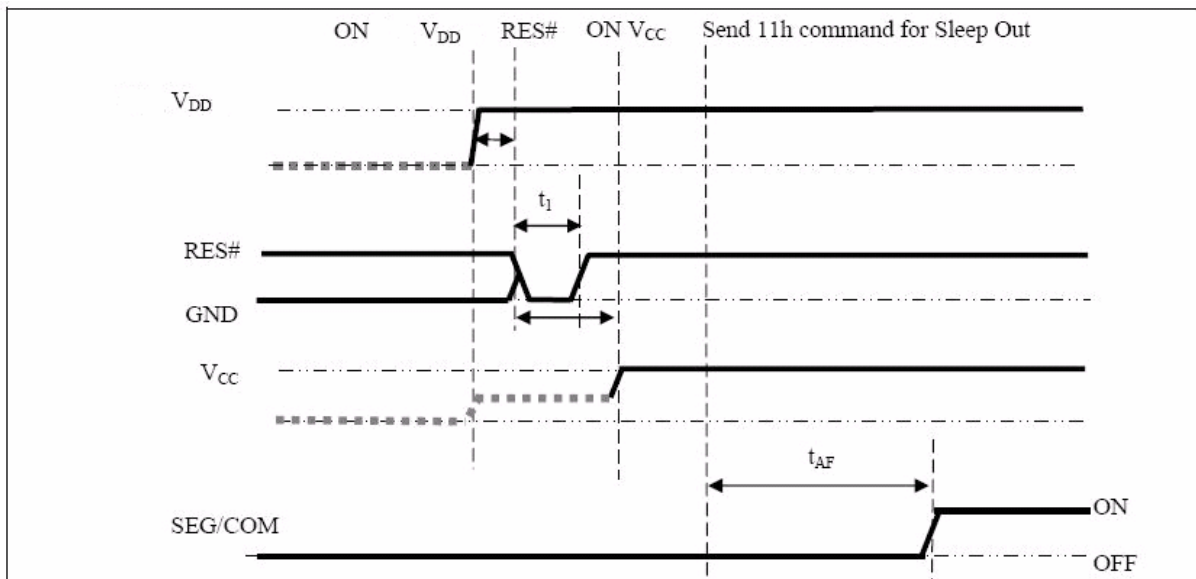


## 8. POWER ON / OFF SEQUENCE & APPLICATION CIRCUIT

### 8.1 POWER ON / OFF SEQUENCE

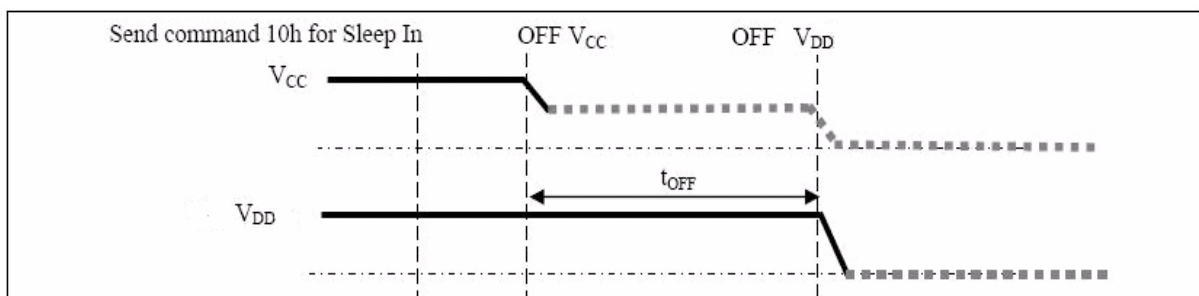
#### 8.1.1 Power ON Sequence

1. Power ON  $V_{DD}$ ,
2. After  $V_{CI}$ ,  $V_{DDIO}$  become stable, set wait time at least 1ms ( $t_0$ ) for internal  $V_{DD}$  become stable. Then set RES# pin LOW (logic low) for at least 2us ( $t_1$ ) and then HIGH (logic high).
3. After set RES# pin LOW (logic low), wait for at least 2us ( $t_2$ ). Then Power ON  $V_{CC}$ .(1)
4. After  $V_{CC}$  become stable, send command 11h for Sleep Out. SEG/COM will be ON after 200ms ( $t_{AF}$ ).



#### 8.1.2 Power OFF Sequence

1. Send command 10h for sleep In.
2. Power OFF  $V_{CC}$ . (1), (2)
3. Wait for  $t_{OFF}$ . Power OFF  $V_{DD}$  (where Minimum  $t_{OFF}=0$ ms, Typical  $t_{OFF}=100$ ms )



#### Note:

- (1) Since an ESD protection circuit is connected between  $V_{DD}$  and  $V_{CC}$ ,  $V_{CC}$  becomes lower than  $V_{CI}$ ,  $V_{DDIO}$  is ON and  $V_{CC}$  is OFF as shown in the dotted line of  $V_{CC}$  in above figures.
- (2)  $V_{CC}$  should be disabled when it is OFF.

## 8.2 COMMAND TABLE

Refer to IC Spec.: SSD1355

## 8.3 GAMMA LOOK UP TABLE (BEh)

This command is used to define three programmable gamma look-up tables for color A, B and C respectively in terms of Gray Scale (GS).

### Gamma Table

Following the command BEh, the Gamma Setting for Parameter1, Parameter2, Parameter3... Parameter96, should be set one by one in sequence for color A, B and C		
Color A (Red)	Color B (Green)	Color C (Blue)
1	1	1
1	1	2
2	2	3
4	4	4
6	6	6
8	8	8
10	10	10
12	12	12
14	14	14
17	17	17
20	20	20
23	23	24
27	27	28
33	33	33
35	35	36
37	37	39
41	41	43
47	47	49
51	51	51
57	57	54
65	65	57
70	70	65
75	75	70
81	81	75
86	86	81
91	91	86
97	97	91
101	101	97
113	113	101
119	119	113
123	123	119
127	127	127

# 9. Appendix ( Drawing )

