



SPECIFICATIONS FOR LCD MODULE

MODEL NO.
BP12864C-163 series
VER.01

FOR MESSRS:

ON DATE OF:

APPROVED BY:

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1. Numbering System

<u>B</u>	<u>P</u>	<u>12864</u>	<u>C</u>	:	:	:	:	:	<u>xxx</u>
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 L=PLED/OLED
2	Format	2002=20 characters, 2 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 F=RGB Q=LED edge/red A=LED edge/amber 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
7	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
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 E=Top/ultra wide temperature
9	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

2. General Specification

(1) Mechanical Dimension

Item	Standard Value	Unit
Number of dots	128×64	dots
Module dimension (L*W*H)	57.0*42.5*2.5(Max)-EL B/L 58.2*44.7*4.7-LED B/L	mm
View area	52.0(W)×33.5(H)	mm
Active area	47.34(W)×26.86(H)	mm
Dot size	0.35(W)×0.4(H)	mm
Dot pitch	0.37(W)×0.42(H)	mm

(2) Controller IC: S6B1713 Controller

(3) Temperature Range

	Normal	Wide
Operating	0 ~ +50°C	-20 ~ +70°C
Storage	-10 ~ +60°C	-30 ~ +80°C

3. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	°C
Storage Temperature	TST	-30	—	+80	°C
Input Voltage	VI	0	—	V _{CC}	V
Supply Voltage For Logic	VDD-VSS	2.4	—	3.6	V
Supply Voltage For LCD	VO-VSS	4.0	—	15	V

4. Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage For Logic	$V_{DD}-V_{SS}$	—	2.7	3.3	3.6	V
Supply Voltage For LCD	$V_{DD}-V_O$	Ta=-20°C	—	9.5	—	V
		Ta=25°C	—	8.5	—	V
		Ta=+70°C	—	7.5	—	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}	$V_{DD}=3V$	—	—	500	uA

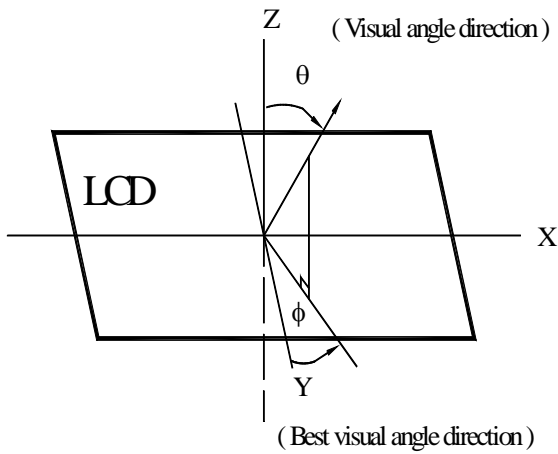
5. Optical Characteristics

a. FSTN

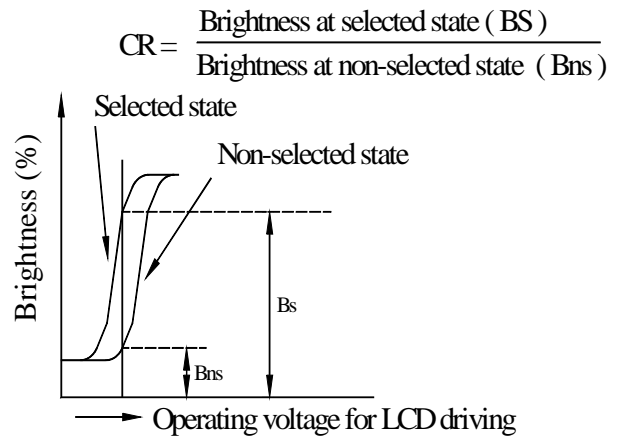
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
View Angle	(V) θ	$CR \geq 5$	10		60	deg
	(H) ϕ	$CR \geq 5$	-45		45	deg
Contrast Ratio	CR	—		5		—
Response Time 25°C	T rise	—		100	150	ms
	T fall	—		150	200	ms

5.1 Definitions

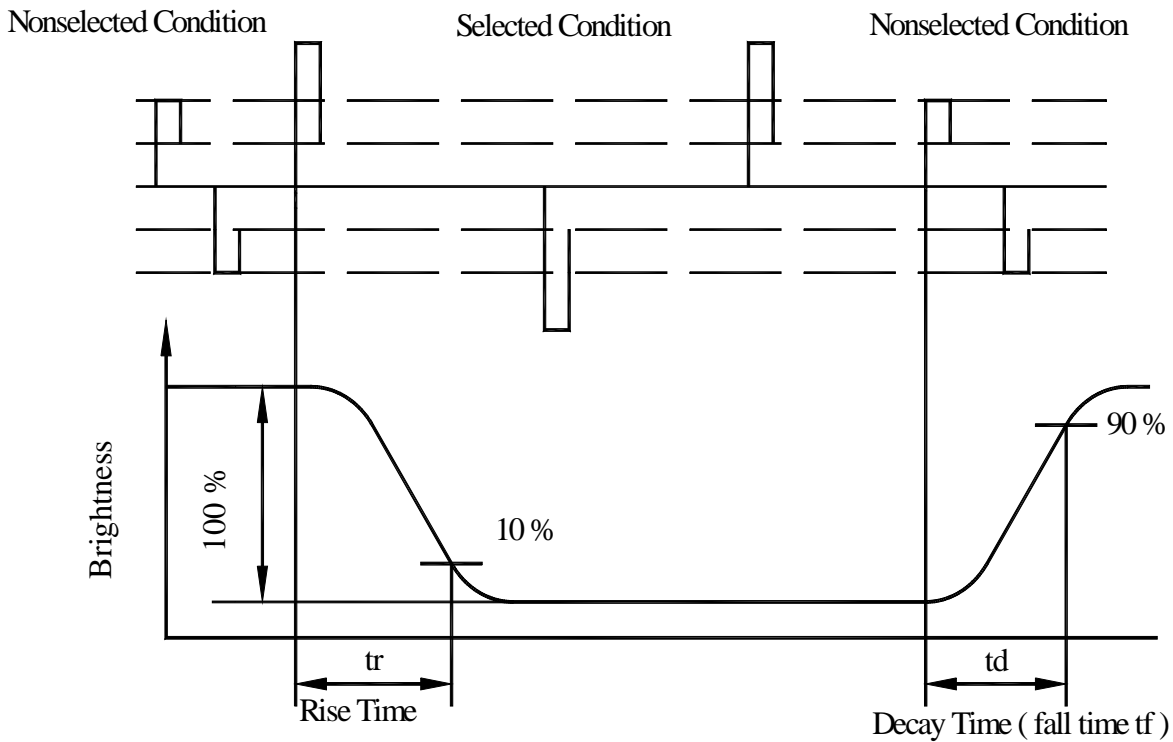
■ View Angles



■ Contrast Ratio



■ Response time



6. Interface Pin Function

Pin No.	Symbol	I/O	Description																
1	VDD	—	Power supply pin for logic.																
2	VSS	—	Ground pin, connected to 0V																
3 4	CS1B CS	I	Chip select input pins Data/instruction I/O enable only when CS1B is “L” and CS2 is “H”. When chip select is non-active, DB0~DB7 may be high impedance.																
5	RES	I	Reset input pin When RES is “L”, initialization is executed.																
6	RS	I	Register select pin RS=“H”: DB0~DB7 are display data RS=“L”: DB0~DB7 are control data																
7	RW_WR	I	When connected to 80-family MPU: Write enable clock input pin. The data ON DB0~DB7 are latched at the rising edge of the /WR signal. When connected to 68-family MPU: RW = “H”: read RW = “L”: write																
8	E_RD	I	When connected to 80-family MPU: Read enable clock input pin. When /RD is “L”, DB0~DB7 are in an output status When connected to 68-family MPU: RW = “H”: When E is “H”, DB0~DB7 are in an output status RW = “L”: The data on DB0~DB7 are latched at the falling edge of the E signal																
9~16	DB0~DB7	I/O	8-bit bi-directional data bus that is connected to the standard 8-bit microprocessor data bus. When the serial interface selected(PS=“L”) DB0~DB5: high impedance DB6: serial input clock (SCLK) DB7: serial input data (SID) When chip select is not active, DB0~DB7 may be high impedance.																
17	MI	I	Microprocessor interface selects pin. MI=“H”: 6800-series MPU interface MI=“L”: 8080-series MPU interface																
18	P/S	I	Parallel/Serial data input select pin. <table border="0" style="margin-left: 20px;"> <tr> <td>Interface</td> <td>Data</td> <td>Read/Write</td> <td>Serial clock</td> </tr> <tr> <td>PS=“H”:</td> <td>Parallel</td> <td>DB0~DB7</td> <td>E_RD,RW_WR</td> </tr> <tr> <td>PS=“L”:</td> <td>Serial</td> <td>SID(DB7)</td> <td>Write only</td> </tr> <tr> <td></td> <td></td> <td></td> <td>SCLK(DB6)</td> </tr> </table> In serial mode, it is impossible to read data from the on-chip RAM. And DB0 to DB5 are high impedance and E_RD and RW_WR must be fixed to either “H” or “L”.	Interface	Data	Read/Write	Serial clock	PS=“H”:	Parallel	DB0~DB7	E_RD,RW_WR	PS=“L”:	Serial	SID(DB7)	Write only				SCLK(DB6)
Interface	Data	Read/Write	Serial clock																
PS=“H”:	Parallel	DB0~DB7	E_RD,RW_WR																
PS=“L”:	Serial	SID(DB7)	Write only																
			SCLK(DB6)																

7. Backlight Information

7.1 Specification

(1) EL / White

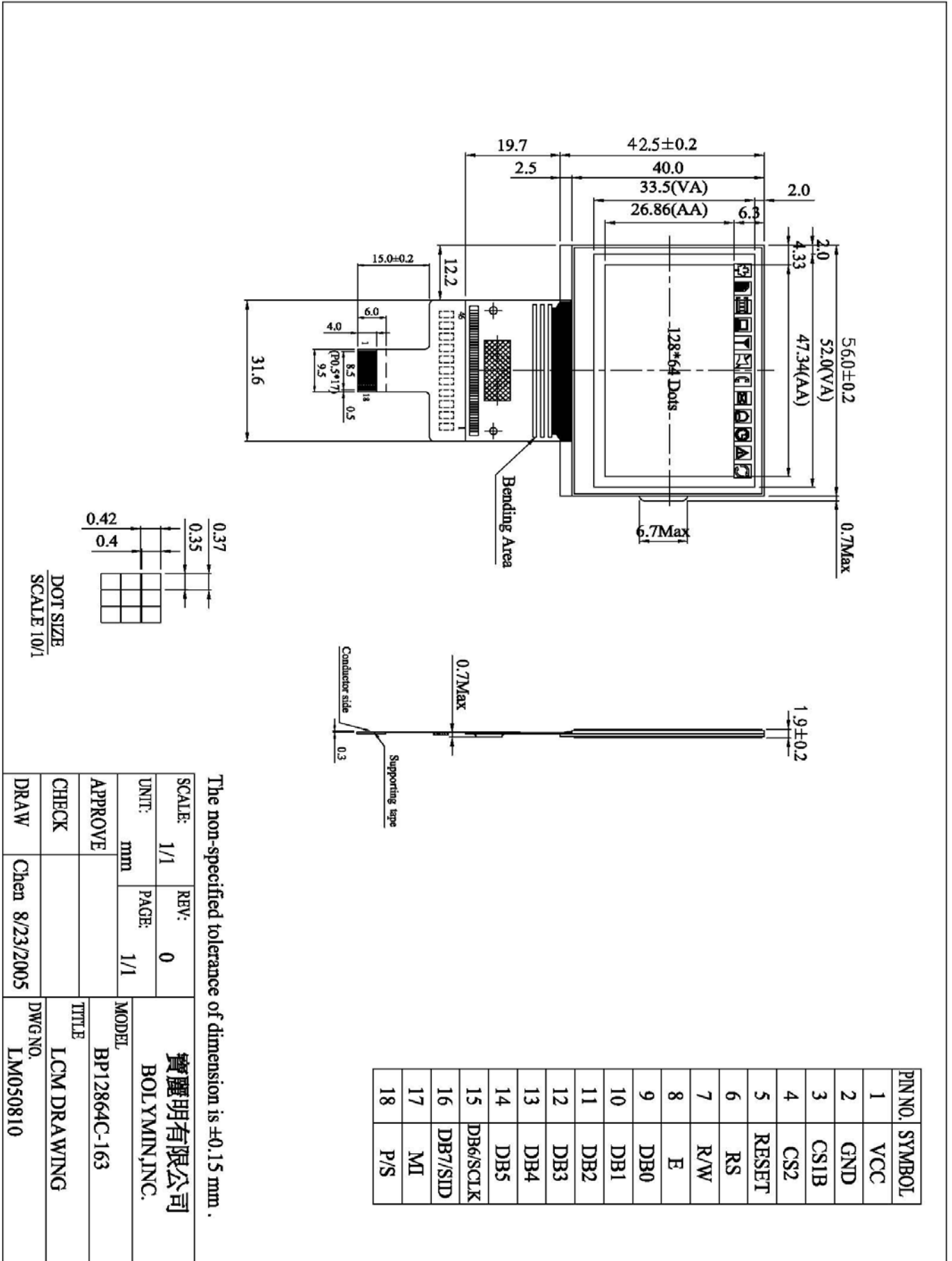
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Drive Voltage	Vmax	78	—	85	Vrms	25°C
Drive Wave	Fmax	400	—	1000	Hz	25°C
Brightness		65	—	—	cd/m ²	78~85Vrms/400~1000Hz
Power Consumption		—	43.55	—	mW	78~85Vrms/400~1000Hz
Chromatism	X	—	0.330	—	—	78~85Vrms/400~1000Hz
	Y	—	0.365	—	—	78~85Vrms/400~1000Hz
Life time		5000			hour	78~85Vrms/400~1000Hz
Color		White			—	—

(1) LED / White

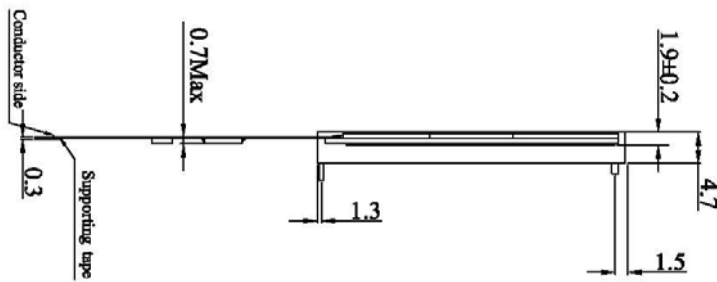
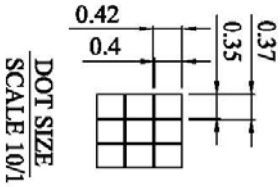
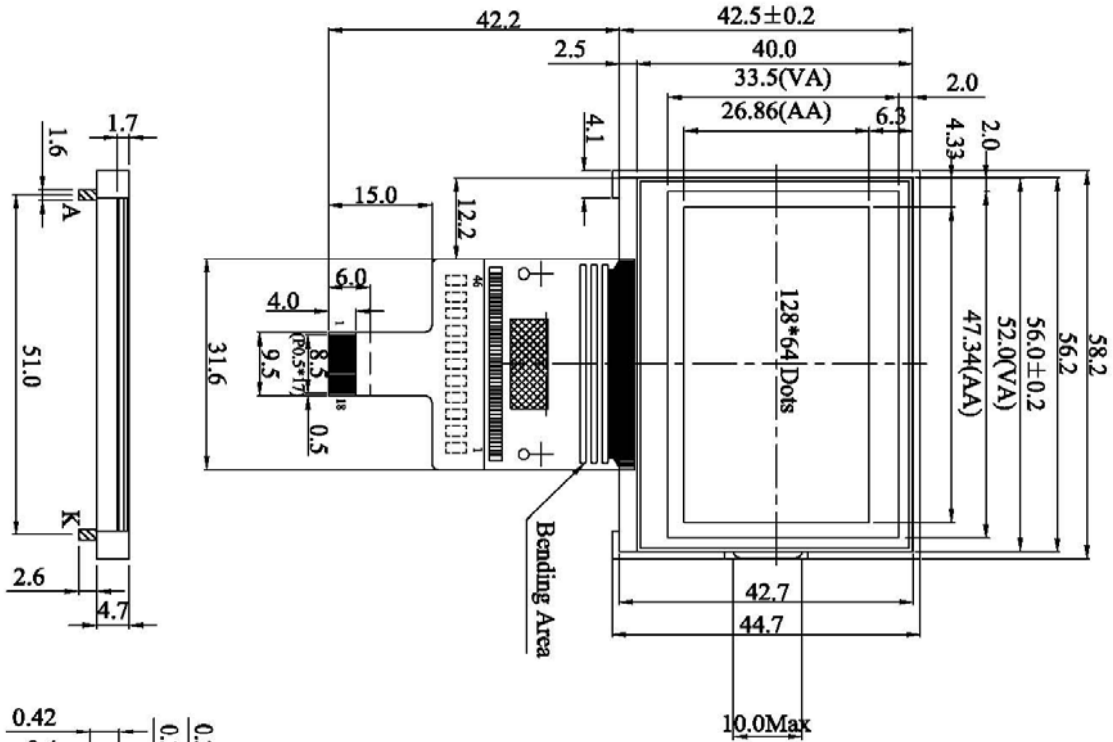
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Supply Current	ILED	—	45		mA	V=3.4V
Supply Voltage	V	—	3.4	3.6	V	
Reverse Voltage	VR	—	—	5	V	
Luminous Intensity	IV	80		—	cd/m ²	ILED=45mA
Wave Length	X	0.240		0.300		ILED=45mA
	Y	0.240		0.320		
Life Time		—	50000	—	Hr.	Iled=15mA Each chip
Color		White				

8.Drawing

8-1 No backlight



8-2 edge LED backlight



PIN NO.	SYMBOL
1	VCC
2	GND
3	CS1B
4	CS2
5	RESET
6	RS
7	R/W
8	E
9	DB0
10	DB1
11	DB2
12	DB3
13	DB4
14	DB5
15	DB6/SCLK
16	DB7/SDD
17	MI
18	P/S

BOLYMIN INC,		SCALE:	1/1	REV:	0
MODEL	BP12864C-163	UNIT:	mm	PAGE:	1/1
TITLE		APPROVE		CHECK	
DWGNO.	TEM04032501	DRAW			