FEATURES

AVAILABLE OPTIONS	CHARACTERISTICS	CODE	No.
DISPLAY FORMAT	20 Characters by 4 Lines	FC2004C03	1~6
POLARIZER OPTIONS	Negative Transmissive	N	7
BACKLIGHT TYPE OPTIONS	Edge Type LED Backlight (Standard version)	S	8
BACKLIGHT COLOR OPTIONS	White color	W	9
LCD PANEL OPTIONS	Blue STN	B	10
VIEWING ANGLE OPTIONS	6:00 (Bottom)	B	11
TEMPERATURE RANGE OPTIONS	-20°C ~ 70°C, Single Supply Voltage	W	12
SUGGESTED DRIVING VOLTAGE	Vlcm = 3.0V Vled = 3.0V	9	13
SUGGESTED LED DRIVING MODE	PIN15: LED+, PIN16:LED-	1	14
CONTROLLER ▲1	SPLC780D + SPLC063A	L	15
FONT MAP CODE	E Version	E	16
DRIVING DUTY	1/16	—	—
DRIVING BIAS	1/5	—	—

▲1 Please ask for datasheet of the mentioned controller from FORDATA or FORDATA's authorized distributors. You can find the related information including AC & DC characteristics, Write & Read Timing diagram, Instruction table and descriptions, DDRAM & CGRAM, Rest Function and so on from the datasheet of controller.

▲1 You can ask for the example of software program (C language) from FORDATA or FORDATA's authorized distributors.

MECHANICAL SPECIFICATIONS

OVERALL SIZE	77.0W x 47.0H	mm	THICKNESS	max 14.5	mm
VIEWING AREA	60.0W x 22.0H	mm	HOLE-HOLE	70.0W x 40.0H	mm
CHARACTER SIZE	2.30W x 4.03H	mm	CHARACTER PITCH	0.48W x 0.48H	mm
DOT SIZE	0.42W x 0.46H	mm	DOT PITCH	0.05W x 0.05H	mm

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
POWER SUPPLY (LOGIC)	Vdd	25°C	-0.3	—	7.0	V
POWER SUPPLY (LCD)	V0	25°C	Vdd -13.5	—	Vdd +0.3	V
INPUT VOLTAGE	Vin	25°C	-0.3	—	Vdd +0.3	V
OPERATING TEMPERATURE	Vopr	—	-20	—	70	°C
STORAGE TEMPERATURE	Vstg	—	-30	—	80	°C

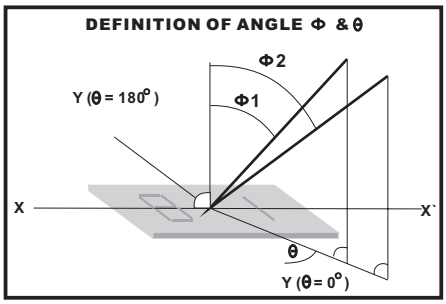
ELECTRONIC CHARACTERISTICS*

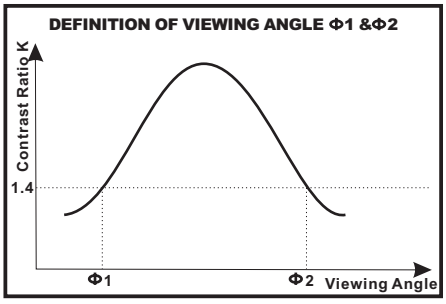
ICONS	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
3.0V	INPUT VOLTAGE	Vdd	—	—	3.0	—	V
	SUPPLY CURRENT	Idd	Vdd=3V	—	1.5	—	mA
	DRIVING VOLTAGE FOR LCD PANEL	Vlcd = (Vdd - V0)	-20°C	—	—	—	V
			0°C	—	—	—	
			25°C	—	—	—	
			50°C	—	—	—	
			70°C	—	—	—	

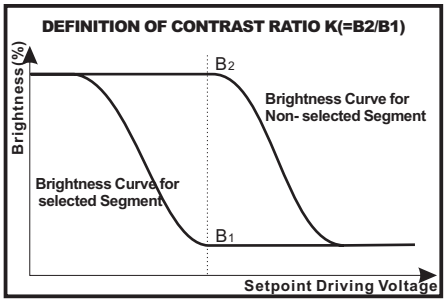
All data are recorded from TEST REPORT #FSYP027800122

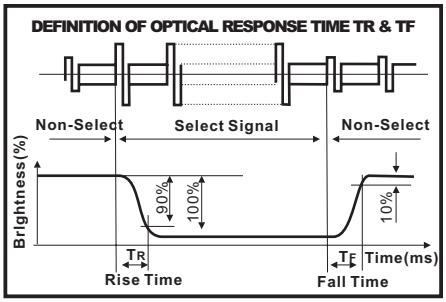
LCD CHARACTERISTICS

FOR STN/FSTN TYPE LCD Panel (TA=25°C, Vlcd=5.0V ± 0.5V)							
ICONS	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
	VIEWING ANGLE	Φ2 − Φ1	K=4	40	—	—	deg
		θ		60			
HC	CONTRAST RATIO	K	—	—	10	—	—
	RESPONSE TIME(RISE)	TR	—	—	150	250	ms
F	RESPONSE TIME(FALL)	TF	—	—	150	250	ms









LED CHARACTERISTICS

ICONS	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
	LED FORWARD VOLTAGE	Vf	25°C If = 15mA	—	3.0	—	V
	LED FORWARD CURRENT ▲2	If	25°C	—	15	—	mA
	LED REVERSE CURRENT	Ir	25°C Vr= 5.0V	—	—	10	μA
	LED COLOR RANGE	X coordinate	25°C If = 15mA	0.26	—	0.30	—
		Y coordinate		0.27	—	0.31	—
	LED BRIGHTNESS (WITHOUT LCD)	Lv	25°C If = 15mA	—	295	—	cd/m²
	LED BRIGHTNESS UNIFORMITY	Lvmin/Lvmax	25°C If = 15mA	70	—	—	Ratio
	LED LIFE TIME ▲3	—	25°C If = 15mA	9K	—	—	Hours

▲2 请注意, 驱动背光考虑的是恒流而不是恒压. 所以, 这个数值非常重要!
YOUR ATTENTION: It is constant current (not constant voltage) that should be applied when driving LED backlight. Therefore, this data is very important!

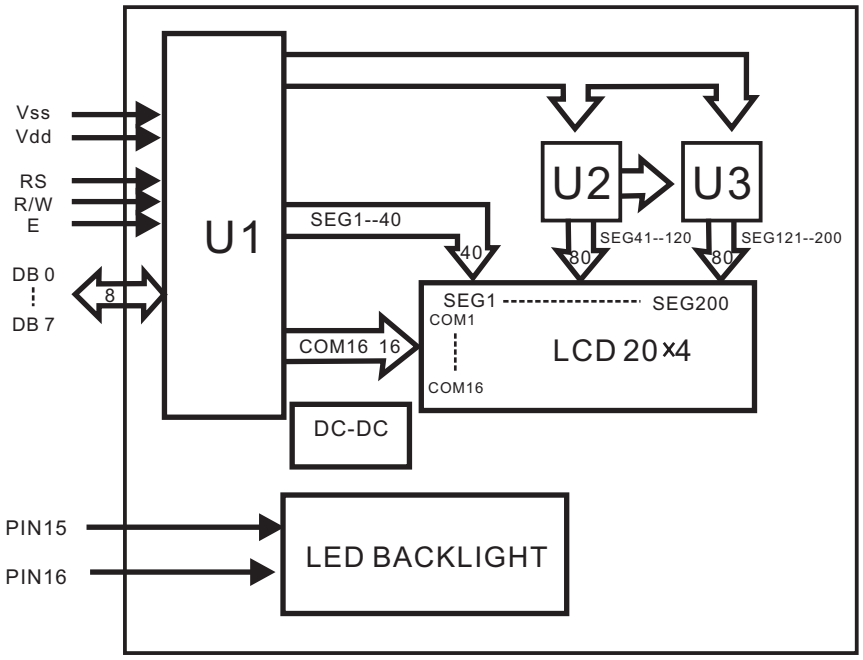
* 当工作温度高于25°C时, Ifm,Ifp和Pd必须降低; 电流降低率是 -0.36*1mA/°C（直流驱动）, 或-0.86*1mA/ °C（脉冲驱动）, 功率降低率是-75*1mW/ °C.
产品工作电流不能大于对应的工作条件温度Ifm或Ifpr的 60%.
For operation above 25°C, The Ifm Ifp & Pd must be derated, the Curent derating is -0.36*1mA/°C for DC drive and -0.86*1mA/ °C for Pulse drive, the power dissipation is -75*1 mW/ °C The product working current must not be more than 60% of the Ifm ir Ifp according to the working temperature.

▲3 如果您需要让背光连续不间断工作超过8小时, 那么不建议您采用这款背光. 福德电子可以提供您长寿背光的解决方案.
If you want to drive the LED Backlight uninterruptedly over 8hours, this version is not suggested.
Please consult long life design solution from FORDATA or FORDATA's authourized distributors.

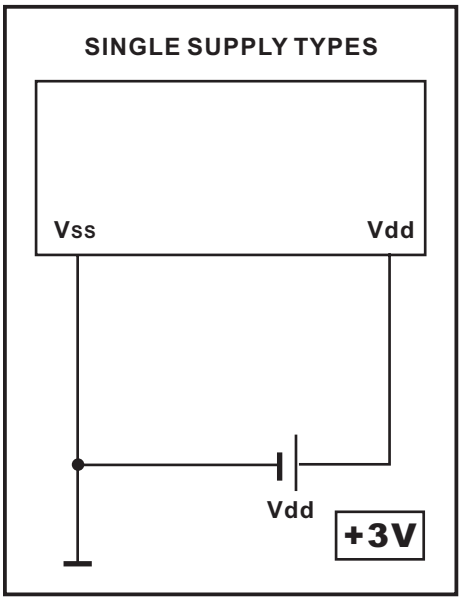
PIN ASSIGNMENT

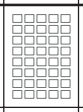
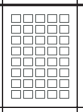
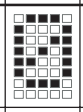
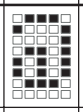
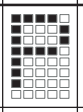
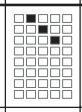
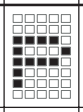
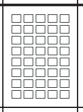
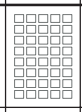
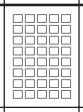
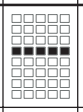
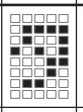
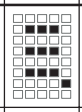
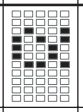
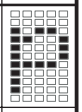
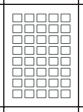
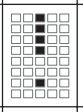
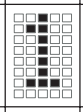
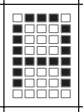
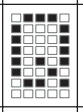
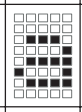
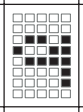
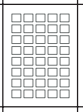
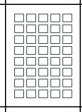
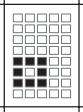
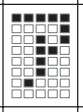
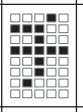
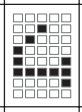
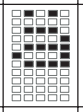
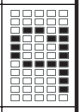
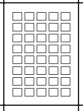
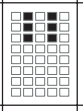
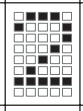
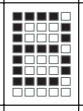
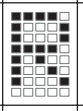
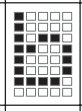
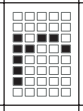
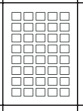
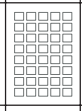
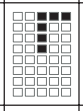
PIN	SYMBOL	DESCRIPTION	REMARKS
1	Vss	GND	
2	Vdd	Power supply for LCM	3.0V
3	NC	No connection	
4	RS	Register Select Signal	
5	R/W	Data Read / Write	
6	E	Enable Signal	
7	DB0	Data bus line	
8	DB1	Data bus line	
9	DB2	Data bus line	
10	DB3	Data bus line	
11	DB4	Data bus line	
12	DB5	Data bus line	
13	DB6	Data bus line	
14	DB7	Data bus line	
15	LED+	Power supply for BKL	3.0V
16	LED-	Power supply for BKL	

BLOCK DIAGRAM



POWER SUPPLY DIAGRAM



Upper 4bit / Lower 4bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)															
LLLH	(2)															
LLHL	(3)															
LLHH	(4)															
LHLL	(5)															
LHLH	(6)															
LHHL	(7)															
LHHH	(8)															
HLLL	(1)															
HLLH	(2)															
HLHL	(3)															
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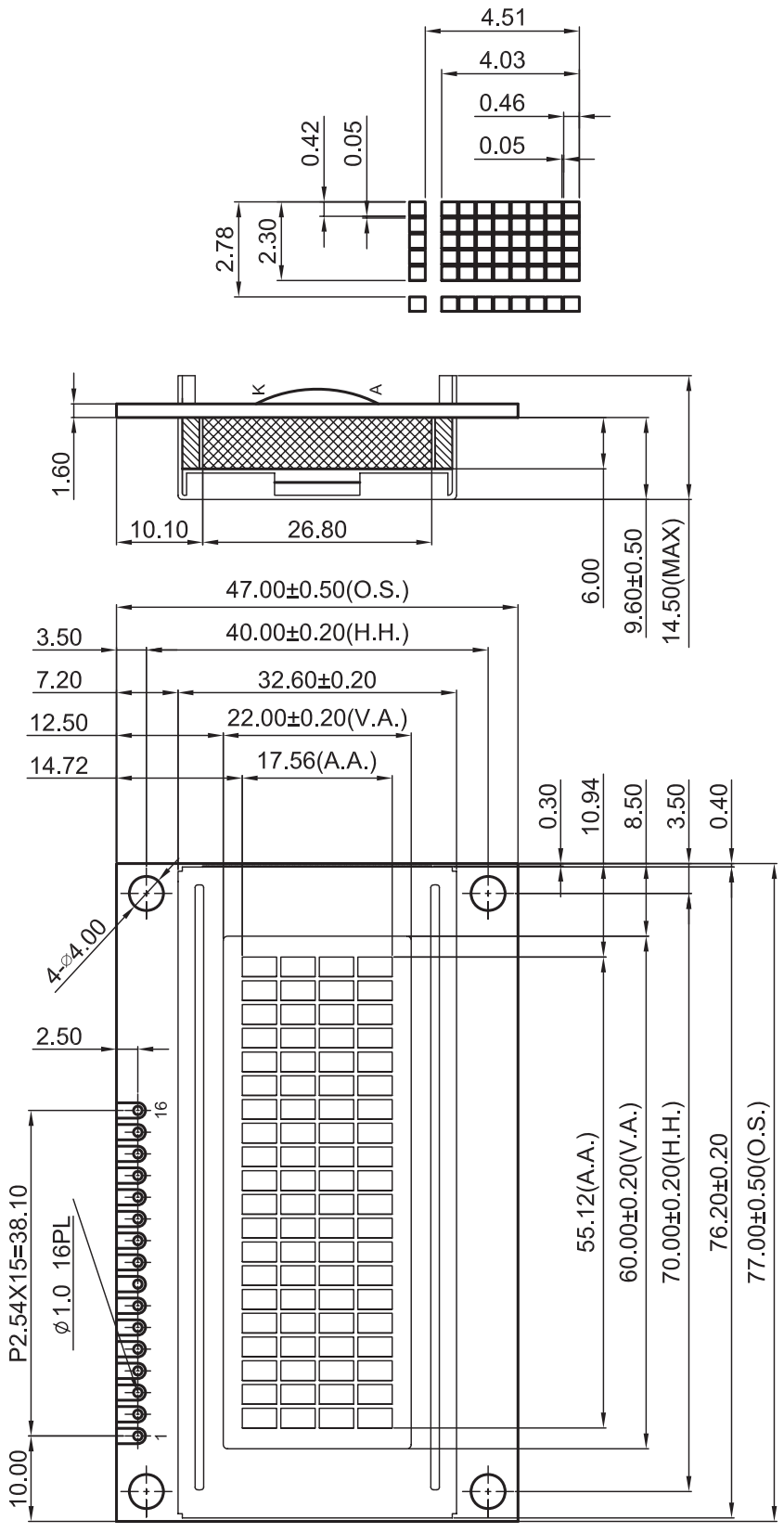
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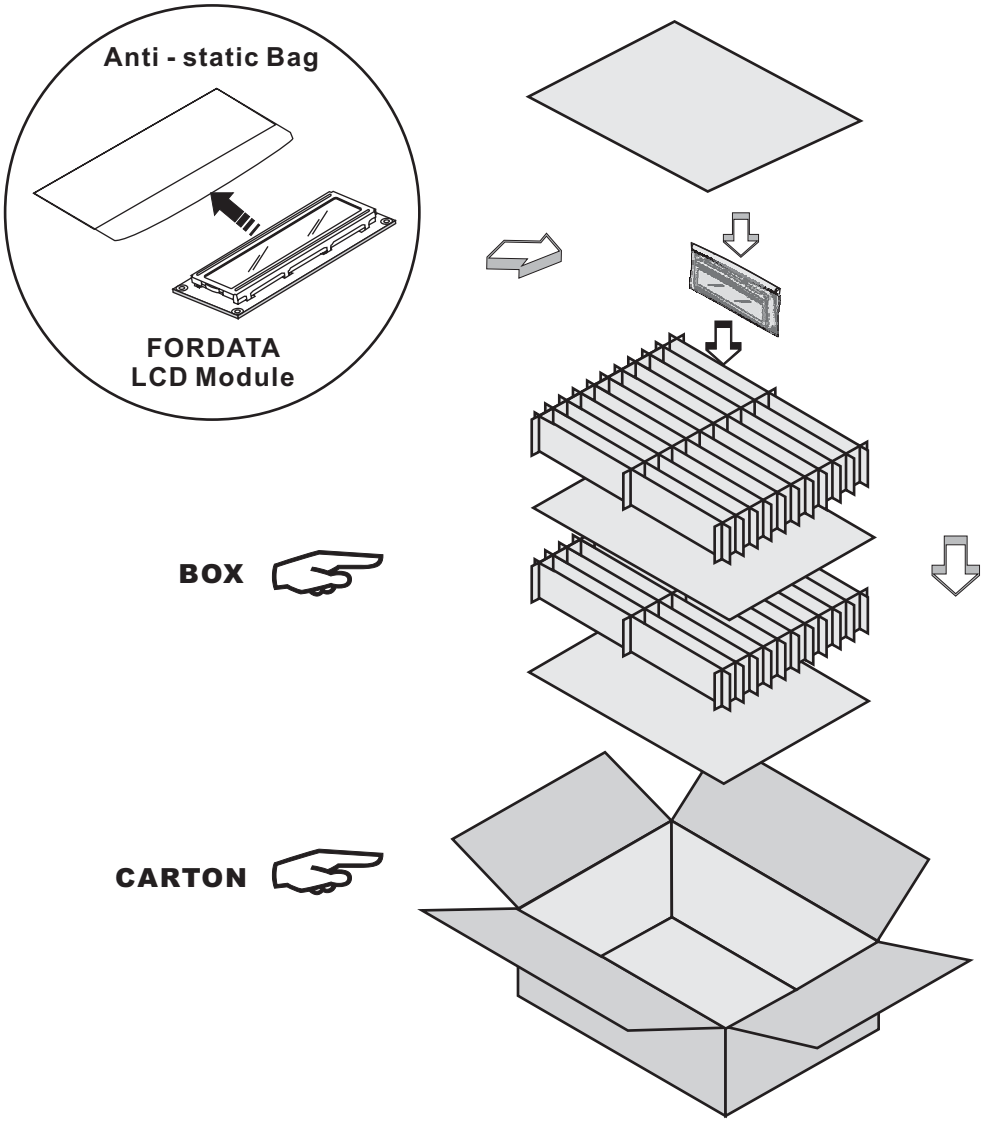
0.05
0.42
0.05
2.78
2.30
K
A
1.60
10.10
26.80
6.00
9.60±0.50
14.50(MAX)
47.00±0.50(O.S.)
40.00±0.20(H.H.)
32.60±0.20
22.00±0.20(V.A.)
17.56(A.A.)
3.50
7.20
12.50
14.72
0.30
10.94
8.50
3.50
0.40
4-ø4.00
2.50
16
1
P2.54X15=38.10
ø1.0 16PL
10.00
55.12(A.A.)
60.00±0.20(V.A.)
70.00±0.20(H.H.)
76.20±0.20
77.00±0.50(O.S.)

FULL-SIZED PACKAGE
45 PCS/BOX
10 BOXES/CARTON
450 PCS/CARTON
13.00 KGS/CTN(G.W.)
0.054 M^3/CARTON

HALF-SIZED PACKAGE
45 PCS/BOX
5 BOXES/CARTON
225 PCS/CARTON
6.00 KGS/CTN(G.W.)
0.027 M^3/CARTON

PACKING DECLARATION

1. This packaging information is for reference only. The actual information is subject to the actual packaging. Especially for packaging of LCL, tolerances may exist.
2. FORDATA will not be responsible for quality problems caused by unnormal transportation conditions (including but not limited to climate factors or human factors, such as improper handling).