FORDATA
FOR DATA DISPLAY

classic mono LCDs

SPECIFICATION

CUSTOM DESIGN
LCD MODULE

UV | F | HC | RoHS | O₃ | 60°C -30°C | P | | 3.0V

ITEM NUMBER:	FDCD0134A
ESTABLISHED DATE:	2010.04
INITIAL ISSUED DATE:	2010.04
DATASHEET VERSION:	2008 VERSION

ISSUED BY: 魏燕东 **CHECKED BY:** 李金凤 **APPROVED BY:** 李智晨

FORDATA ELECTRONIC CO.,LTD PROFESSIONAL LCD SUPPLIER FROM CHINA	STANDARD DOC.	DATASHEET STATEMENT

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   4.1: providing quick reference when you are judging whether or not the product meets your requirements.
   4.2: listing out definitely the tolerance.

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5. The sequence of the icons is random and doesn't indicate the importance grade.

6. Icons explanation

FORDATA FOR DATA DISPLAY FORDATA's 2006 version logo. FORDATA is an integrated manufacturer of flat panel display (FPD). FORDATA supplies TN, HTN, STN, FSTN monochrome LCD panel; COB, COG, TAB LCD module; and all kinds of LED backlight.

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FAST RESPONSE TIME
This icon on the cover indicates the product is with high response speed; Otherwise not.

PROTECTION CIRCUIT
This icon on the cover indicates the product is with protection circuit; Otherwise not.

HIGH CONTRAST
This icon on the cover indicates the product is with high contrast; Otherwise not.

LONG LIFE VERSION
This icon on the cover indicates the product is long life version (over 9K hours guaranteed); Otherwise not.
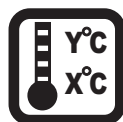
WIDE VIEWING SCOPE
This icon on the cover indicates the product is with wide viewing scope; Otherwise not.

Anti UV VERSION
This icon on the cover indicates the product is against UV line. Otherwise not.

RoHS COMPLIANCE
This icon on the cover indicates the product meets ROHS requirements; Otherwise not.

OPERATION TEMPERATURE RANGE
This icon on the cover indicates the operating temperature range (X-Y).

3TIMEs 100% QC EXAMINATION
This icon on the cover indicates the product has passed FORDATA's thrice 100% QC. Otherwise not.

TWICE SELECTION OF LED MATERIALS
This icon on the cover indicates the LED had passed FORDATA's twice strict selection which promises the product's identical color and brightness; Otherwise not.

VIcm = 3.0V
This icon on the cover indicates the product can work at 3.0V exactly; otherwise not.

N SERIES TECHNOLOGY (2008 developed)
FORDATA adopts new structure, new craft, new technology and new materials inside both LCD module and LCD panel to improve the "RainBow"

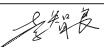| NO.	DATE	DESCRIPTION	ITEM	PAGE	APPROVED
1	2010.04	INITIAL ISSUED	ALL	ALL	FDZ82

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PROFESSIONAL LCD SUPPLIER FROM CHINA	DOC.	CUSTOM DESIGN		

1	2	3	4	5
FD	C	D	0001	A

No.	REMARKS	CODE	DESCRIPTION
1	Company Name Abbreviated	FD	FORDATA
2	IC packing	C	Chip On Board
		G	Chip On Glass
		T	TAB
		N	NO IC
3	CUSTOM DESIGN	D	PURE COB / COG / TAB
		B	COB / COG / TAB / with PCB
4	SERIAL NUMBER	0001 ~ 9999	
5	VERSION CODE	A ~ Z	

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1. GENERAL SPECIFICATIONS

ITEM	NOMINAL DIMENSIONS / AVAILABLE OPTIONS
DISPLAY FORMAT	20 Characters by 2 Lines
LCD PANEL OPTIONS	STN (Yellow-green color)
POLARIZER OPTIONS	Positive, Transflective
BACKLIGHT OPTIONS	Edge type LED backlight (White color)
VIEWING ANGLE OPTIONS	6:00 (Bottom)
TEMPERATURE RANGE OPTIONS	Temperature range (-30$°$C ~ 60$°$C)
CONTROLLER IC	SITRONIX(ST7070)
DISPLAY DUTY	1/16
DRIVING BIAS	1/5
REMARKS	Vlcm : 3. 0V Vlcd : 4. 5V Vled : 3. 0V

2. MECHANICAL SPECIFICATIONS

OVERALL SIZE	LED backlight version : 84.0 x 44.0 x max 13.5				mm
VIEWING AREA	69.6W x 14.4H	mm	HOLE-HOLE	79.0W x 36.0H	mm
CHARACTER SIZE	2.9W x 5.0H	mm	CHARACTER PITCH	0.4Wx0.4H	mm
DOT SIZE	0.54W x 0.59H	mm	DOT PITCH	0.05W x 0.04H	mm

3. ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITION	MIN	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	———	-30	60	$°$C
STORAGE TEMPERATURE	Vstg	———	-30	80	$°$C

4. ELECTRONICAL CHARACTERISTIC*

ITEM	SYMBOL	CONDITION	STANDARD			UNIT
			MIN	TYP	MAX	
Input voltage	Vdd	+3V	2.8	3.0	3.2	V
Supply current	Idd	Vdd=3V	———	2	———	mA
Recommended LCD driving voltage for normal temp. Version module	Vdd - V0	-30$°$C	4.65	———	5.30	V
		0$°$C	4.20	———	4.65	
		25$°$C	4.10	———	4.60	
		60$°$C	4.00	———	4.50	
LED forward voltage	Vf	25$°$C	2.8	———	3.2	V
LED forward current	If	25$°$C	———	22	———	mA
LED reverse Current	Ir	25$°$C	———	———	100	μA
LED Peak wave length	λp	25$°$C If = 22mA	———	———	———	nm
LED illuminance (Without LCD)	Lv	25$°$C If = 22mA	250	310	———	cd/m^2
LED life time	———	25$°$C If = 22mA	9K**	———	———	Hours

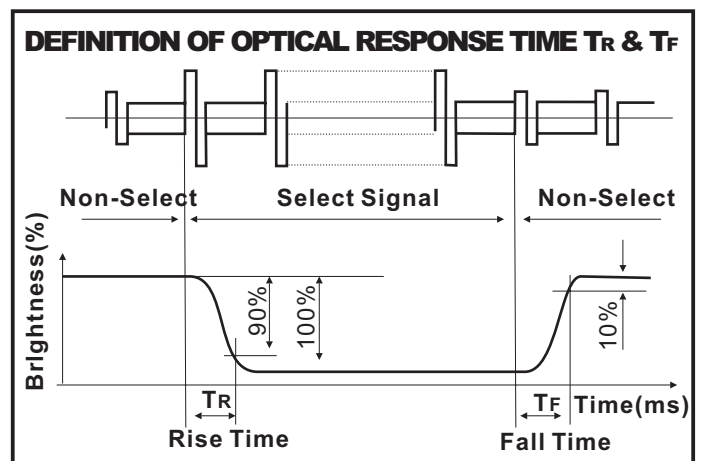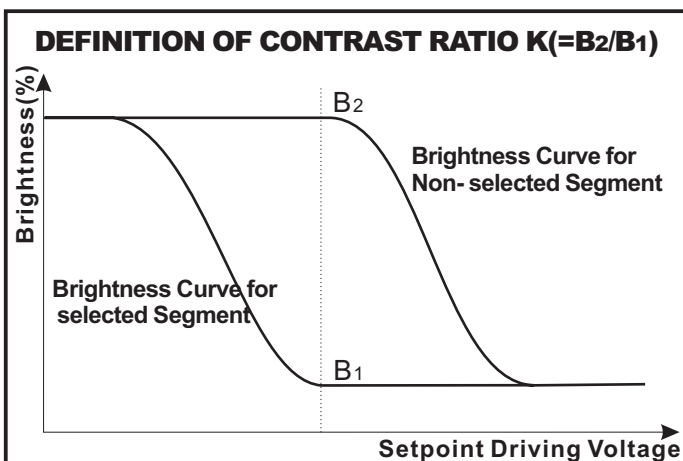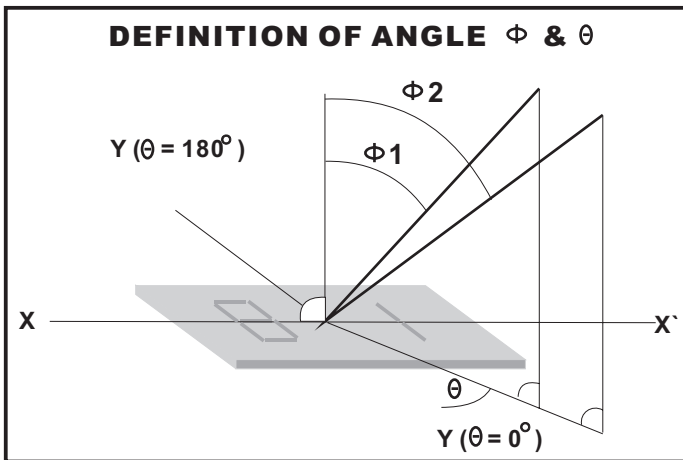* The above data are for reference only.

** The warranty period of FORDATA LCD module is 1YEAR counted from the date shown on the label of products.

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5. OPTICAL CHARACTERISTIC

FOR TN TYPE LCD MODULE (T$_A$=25 ^{O}C, Vdd=3.0V ± 0.25V)

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
VIEWING ANGLE	$\Phi2-\Phi1$	K=4	30	———	———	deg
	θ		25			
CONTRAST RATIO	K	———	———	2	———	———
RESPONSE TIME(RISE)	T$_R$	———	———	120	150	ms
RESPONSE TIME(FALL)	T$_F$	———	———	120	150	ms

FOR STN TYPE LCD MODULE (T$_A$=25 ^{O}C, Vdd=3.0V ± 0.25V)

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
VIEWING ANGLE	$\Phi2-\Phi1$	K=4	40	———	———	deg
	θ		60			
CONTRAST RATIO	K	———	———	6	———	———
RESPONSE TIME(RISE)	T$_R$	———	———	150	250	ms
RESPONSE TIME(FALL)	T$_F$	———	———	150	250	ms

DEFINITION OF ANGLE Φ & θ

$\Phi2$
$\Phi1$
Y (θ = 180°)
X
X`
θ
Y (θ = 0°)

DEFINITION OF VIEWING ANGLE $\Phi1$ & $\Phi2$

Contrast Ratio K
1.4
$\Phi1$
$\Phi2$ Viewing Angle

DEFINITION OF CONTRAST RATIO K(=B$_2$/B$_1$)

Brightness(%)
B$_2$
Brightness Curve for Non- selected Segment
Brightness Curve for selected Segment
B$_1$
Setpoint Driving Voltage

DEFINITION OF OPTICAL RESPONSE TIME T$_R$ & T$_F$

Brightness(%)
Non-Select
Select Signal
Non-Select
90%
100%
10%
T$_R$
Rise Time
T$_F$
Fall Time
Time(ms)

6. EXTERNAL DIMENSIONS

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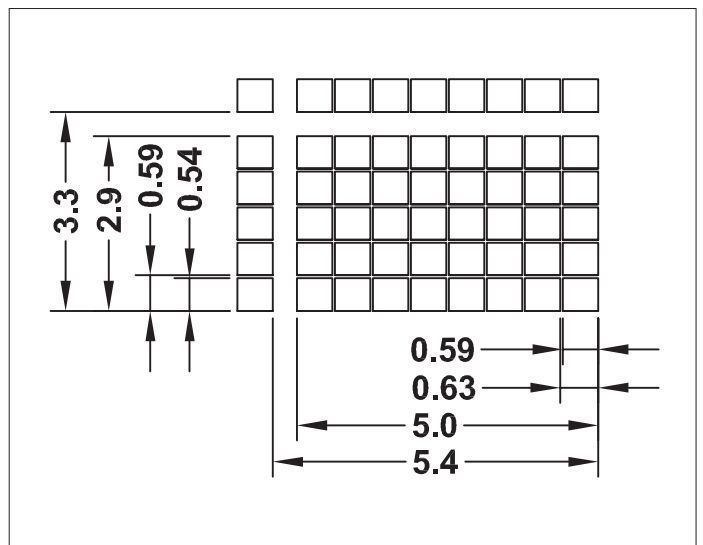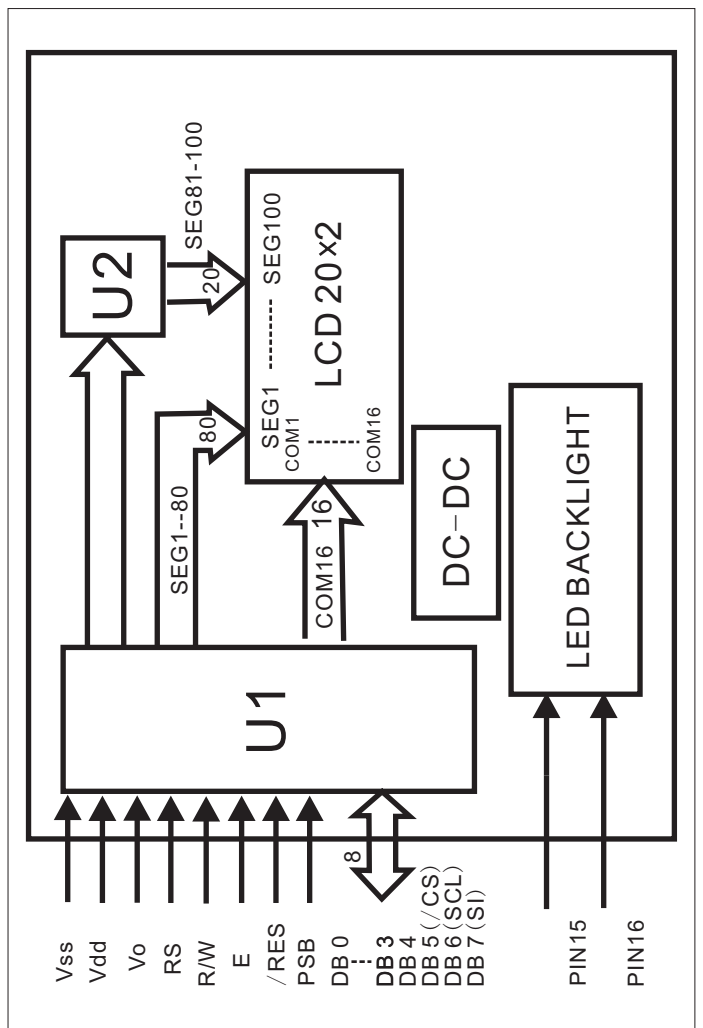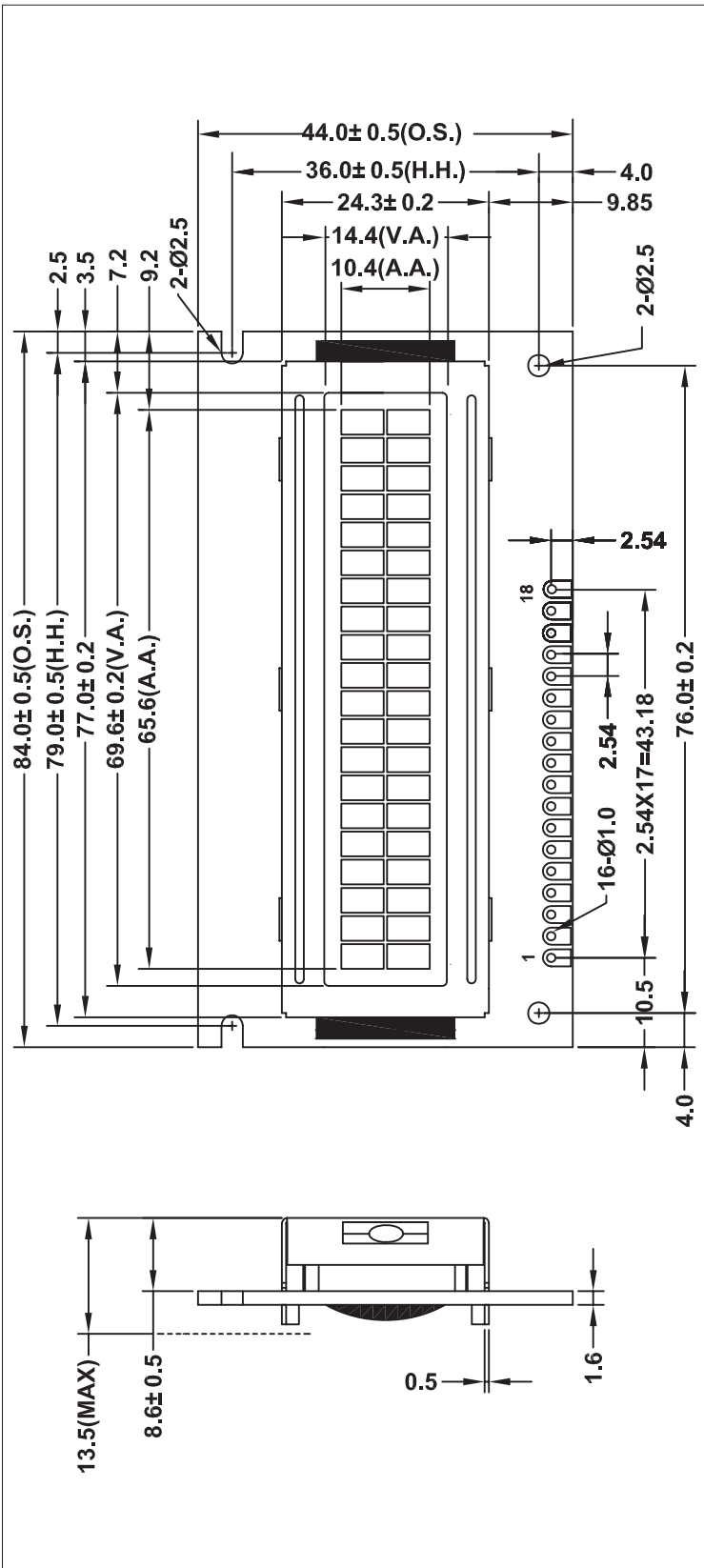
7. PIN ASSIGNMENT

PIN	SYMBOL	FUNCTION
1	Vss	GND
2	Vdd	Power supply for LCM (+3.0V)
3	V0	NC
4	RS	Register Select Signal
5	R/W	Data Read / Write
6	E	Enable Signal
7-10	DB0–DB3	Four low order bi−directional tristate data bus pins. For data These pins are not used during 4−bit operation and serial interface. must pull height, not floating.
11-14	DB4–DB7	Four high order bi−directional tristate data bus pins. Serial: DB5: chip select pin for serialmode(/CS) DB6: serial clock input for serial mode(SCL) DB7: data input pin for serial mode(SI) When serial interface select, Db4 pull height, not floating 4−bits mode: These pins are used during 4−bit operation.
15	LED+	Power supply for BKL (+3.0V)
16	LED-	Power supply for BKL (0V)
17	/RES	Hardware reset pin, Low active
18	PSB	Paralled/serial selection. PSB: "1"(parelled), "0"(serial)

8. POWERSUPPLY

SINGLE SUPPLY TYPES

Vss   Vdd

Vdd

+3.0V
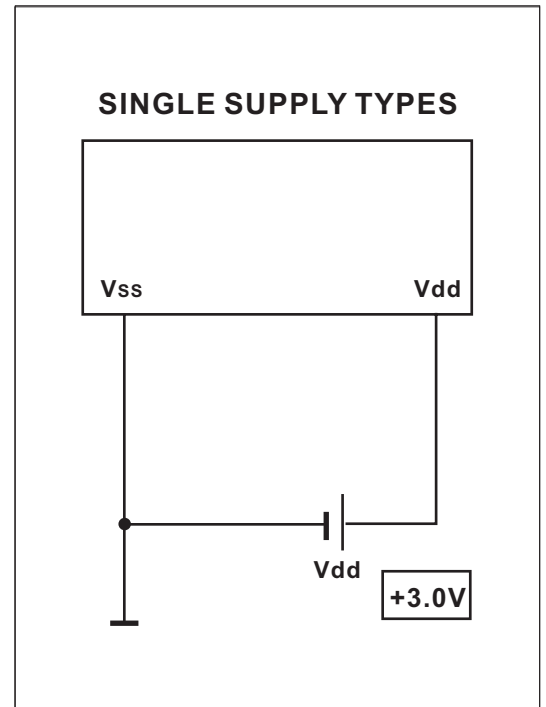
9. INSTRUCTION

Detailed Information please refer to the other one file, the datasheet for St7070.

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10. PACKING DETAIL

WITH LED BKL	WITHOUT LED BKL	NOTE
45 PCS/BOX	45 PCS/BOX	1. The weight is estimated for reference only.
10 BOXES/CARTON	10 BOXES/CARTON	2. Packing detail may be changed without notice.
450 PCS/CARTON	450 PCS/CARTON	
18.00 KGS/CTN(G.W.)	16.00 KGS/CTN(G.W.)	
0.07 M^3/CARTON	0.07 M^3/CARTON	

Anti - static Bag

FORDATA LCD Module

BOX

CARTON