SAMPLE SPECIFICATIONS

MODULE NO. : T12832C020 **REVISION :** V1.0

DRAWING BY : JIN **DATE :** 2010-09-09

APPROVED BY : _____ **DATE :** _____

FOR CUSTOMER'S APPROVAL

CHECK BY: _____ **DATE :** _____

APPROVED BY: _____ **DATE :** _____

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COMMENT:

History of Versions and Modifications

Version	Modifications	Date
V1.0	Generation first version	2010-09-03

SAMPLE SPECIFICATIONS

- LCD MODULE PHYSICAL DATA
- BLOCK DIAGRAM
- ABSOLUTE MAXIMUM RATINGS
- ELECTRICAL CHARACTERISTICS
- INSTRUCTION LIST
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- INTERFACE PIN CONNECTIONS
- SUGGESTIONS FOR USING LCD MODULES
- 外围电路参考图
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■ LCD MODULE PHYSICAL DATA

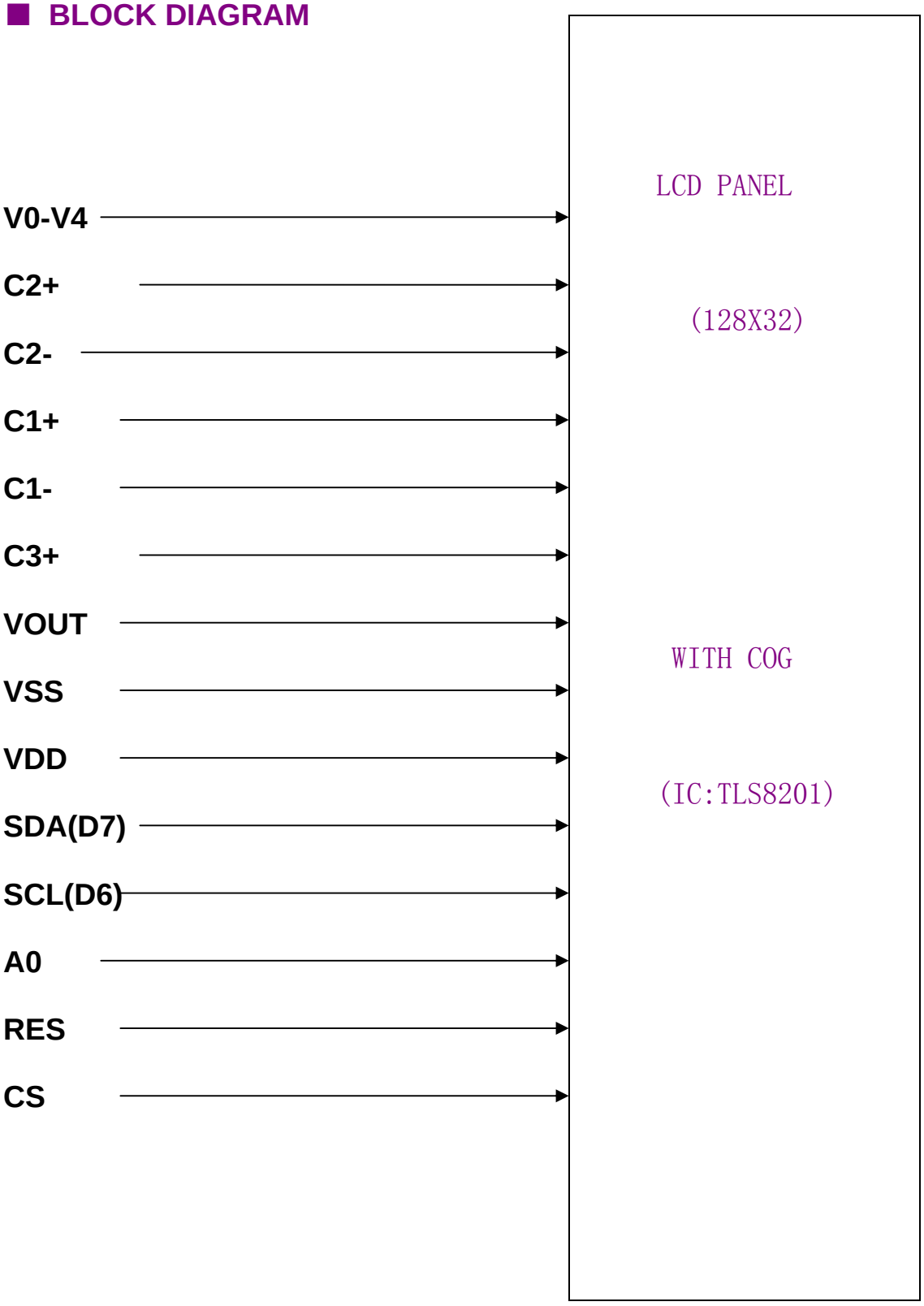
◆ General Description

Display Type	FSTN	
Viewing Direction	6 o'clock	
Connection Type	COG	
Operation temperature	-10℃ ~ +60℃	
Storage temperature	-20℃ ~ +70℃	
Driving IC	TLS8201	
Driving Method	Duty	1/33
	Bias	1/6
	VDD	3.0V
Polarizer Mode	Transflective/positive	

◆ Mechanical Description

Item	Standard Value	Unit
Number of dots	128X32 dots	--
Module dimension	36.6(W) X17.6(H) X8.8(T)	mm
Viewing area	32.0(W) X 10.0(H)	mm
Active area	29.666(W) X8.45(H)	mm
Dot size	0.202(W) X 0.235 (H)	mm
Dot pitch	0.232(W) X 0.265(H)	mm
Approx. weight	TBD	g
Backlight	TBD	

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Max	Unit
Operating temperature	Top	-10	60	℃
Storage temperature	Tst	-20	70	℃
Input voltage VIN	VSS	-0.3	5.3	V
Supply voltage for logic	VDD	-0.3	5	V
Supply voltage for LCD	VLCD	-16	0.3	V

NOTE:

1. If the module is used above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.

2. **VDD>GND must be maintained.**

■ ELECTRICAL CHARACTERISTICS(Vss=0V, VDD=2.4~3.6V Ta=25℃)

◆ DC Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Input high voltage	VIH	-	0.8VDD	-	VDD	V
Input low voltage	VIL	-	Vss	-	0.2VDD	V
Supply voltage for logic	VDD-VSS	Ta=25℃	2.4	-	3.6	V
Operating voltage for LCD VLCD	Ta=25℃		-13	-	-6	V
Current consumption for LCD normal operation(Without Backlight)	IDD	VDD =3.0V	-	-	1.0	mA

◆ AC Characteristics

IC DATA SHEET

◆ INSTRUCTION LIST

IC DATA SHEET

■ ELECTRO-OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Typ	Max	Unit
View angle(V)	θ	Cr⩾2	-35	-	+35	deg
View angle(H)	Φ	Cr⩾2	-35	-	+35	deg
Contrast ratio	Cr	Ta=25℃	-	5	-	-
Response time	Tr	Ta=25℃	-	200	400	ms
	Td	Ta=25℃	-	200	800	ms

■ INTERFACE PIN CONNECTIONS

NO.	SYMBOL	FUNCTION
1	V0	Power supply for LCD driver
2	V1	
3	V2	
4	V3	
5	V4	
6	C2+	DC-DC voltage converter. Connect external capacitor.
7	C2-	
8	C1+	
9	C1-	
10	C3+	
11	VOUT	DC-DC voltage converter. Connect a capacitor to VSS.
12	VSS	GND
13	VDD	Power Supply

NO.	SYMBOL	FUNCTION
14	SDA(D7)	Serival data input.
15	SCL(D6)	Serival clock input.
16	A0	Data control PIN
17	RES	Initialized control PIN.
18	CS	Chip select PIN.
19	LED-A	LED Anode
20	LED-K	LED Cathode

■ SUGGESTIONS FOR USING LCD MODULES

◆ Handling of LCM

(1) The LCD screen is made of glass. Don't give excessive external shock, or drop from a high place.

(2) If the LCD screen is damaged and the liquid crystal leaks out, do not lick and swallow. When the liquid is attach to your hand, skin, cloth etc, wash it off by using soap and water thoroughly and immediately.

(3) Don't apply excessive force on the surface of the LCM.

(4) If the surface is contaminated ,clean it with soft cloth. If the LCM is severely contaminated , use Isopropyl alcohol/Ethyl alcohol to clean. Other solvents may damage the polarizer . The following solvents is especially prohibited: water , ketone Aromatic solvents etc.

(5) Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.

(6) Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.

(7) Don’t disassemble the LCM.

(8) To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- Be sure to ground the body when handling the LCD modules.
- Tools required for assembling, such as soldering irons, must be properly grounded.
- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

(9) Do not alter, modify or change the the shape of the tab on the metal frame.

(10) Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

(11) Do not damage or modify the pattern writing on the printed circuit board.

(12) Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector

(13) Except for soldering the interface, do not make any alterations or modifications with a soldering iron.

(14) Do not drop, bend or twist LCM.

◆ **Storage**

(1) Store in an ambient temperature of 5 to 45 ° C, and in a relative humidity of 40% to 60%.

Don't expose to sunlight or fluorescent light.

(2) Storage in a clean environment, free from dust, active gas, and solvent.

(3) Store in antistatic container.

◆ **Soldering**

(1) Use the high quality solder. (60-63% tin mixed with lead)

(2) Iron: no higher than 260° C and less than 3-4 sec during soldering.

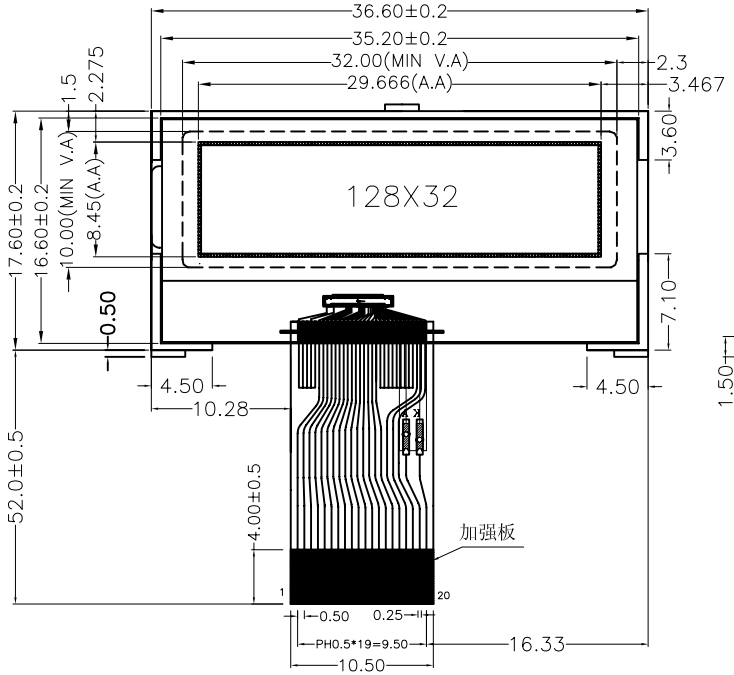
(3) Soldering: only to the I/O terminals.

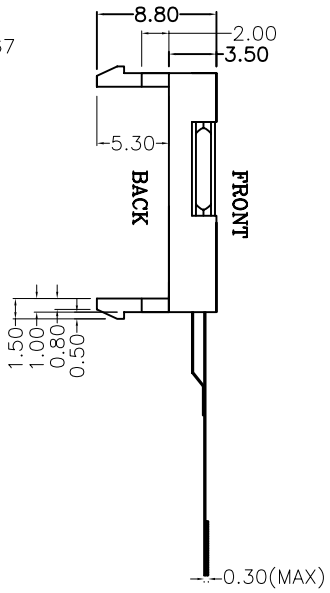
(4) Rewiring: no more than 3 times.

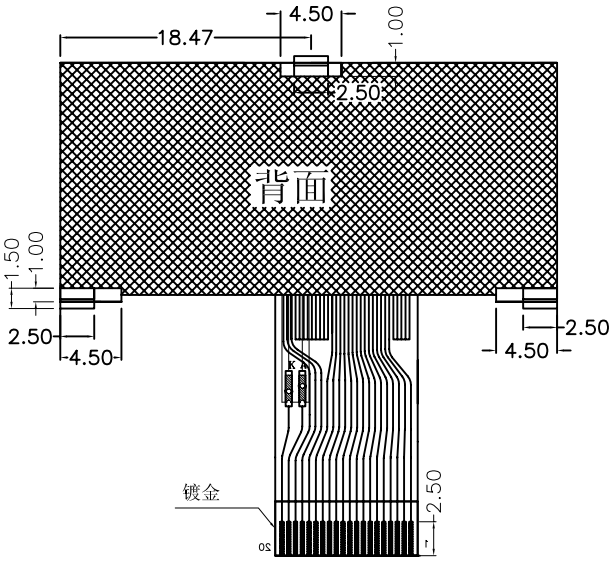
■ 外围电路参考图


PIN
SUMBOL
1 V0
2 V1
3 V2
4 V3
5 V4
6 C2+
7 C2-
8 C1+
9 C1-
10 C3+
11 VOUT
12 VSS
13 VDD
14 D7(SDA)
15 D6(SCL)
16 A0
17 RES
18 CS
19 LED-A
20 LED-K
VSS
9颗电容均为无极性，
容值1uF、耐压25V
VSS
电源 3V~3.3V
数据
时钟
选择写入的是指令或数据
复位
片选(低电平有效)
串一个电阻位
背光电源正极（2.8V~3.0V）
背光电源负极（0V）

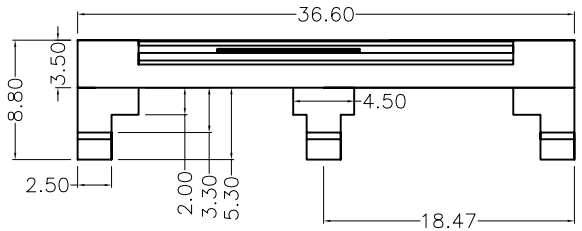
REV.	DESCRIPTION	DATE

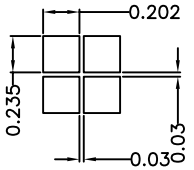


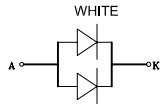




DESC	PIN
1	V0
2	V1
3	V2
4	V3
5	V4
6	C2+
7	C2-
8	C1+
9	C1-
10	C3+
11	VOUT
12	VSS
13	VDD
14	D7
15	D6
16	A0
17	RES
18	CS
19	LED-A
20	LED-K







NOTE :

1) DISPLAY TYPE : FSTN POSITIVE TRANSFLECTIVE
2) VIEWING DIRECTION : 6 O'CLOCK
3) DRIVE METHOD : 1/33 DUTY 1/6 BIAS
4) OPERATING VOLTAGE : VDD = 3.0V
4) LCD Drive VOLTAGE : 5V
5) OPERATING TEMP : −10°C − +60°C
6) STORAGE TEMP : −20°C − +70°C
7) CONNECTOR : COG/TLS8201

LCM NO.:

DESIGNED BY:

VED BY: