EastRising technologies

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ERC12864FS-1

LCD Module User Manual

EastRising Technology Co., Ltd

REV	Descriptions	Release Date
1.0	Prelimiay release	August 04, 2008
2.0	Improve the mechanical drawing	October 27, 2009
3.0	Change the operating temp from -20C -70C to 0C-50C	February 18, 2011

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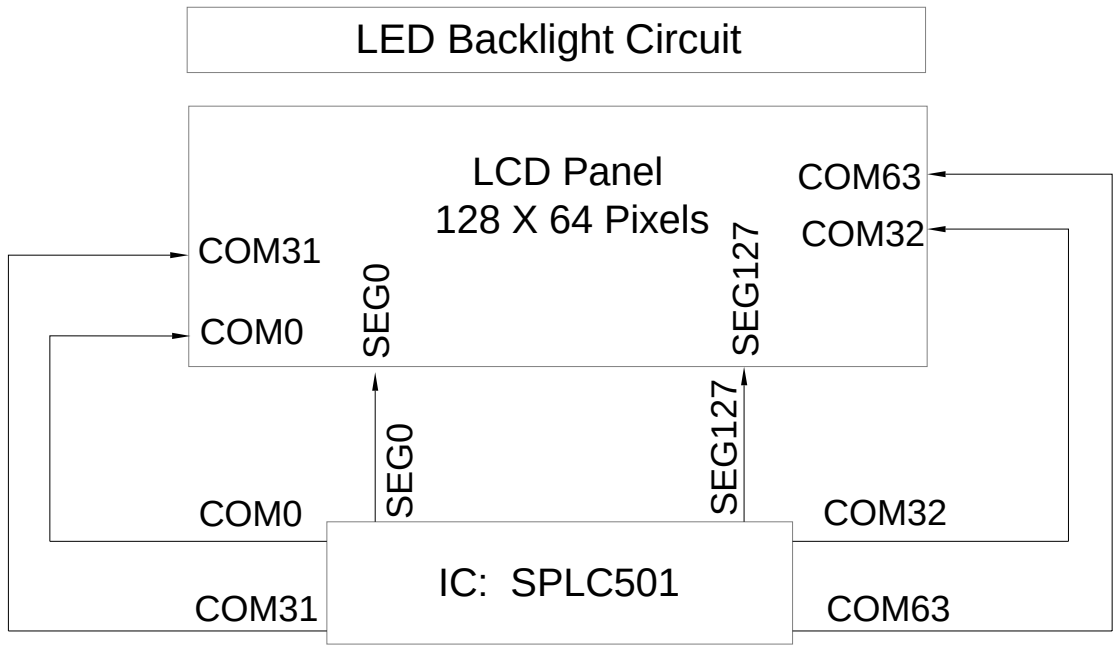
1.0 Basic Specification

1.1 Display and Mechanical Specification

ITEM	STANDARD VALUE	UNIT
Display Type	128 X 64	Dots
LCD Type	FSTN/ Transflective/Positive	--
LCD Duty	1/64	--
LCD Bias	1/9	Bias
Viewing Direction	12:00	Clock
Backlight Type	Edge LED Backlight with white color	--
Interface	6800/8080 series or Serial Interface	--
Driver IC	SPLC501C (Gold Bump Chip)	--
IC Package	COG	--
Module Dimension	39.0(W) × 29.0(H) × 6.1(T) (MAX)	mm
Visual Area	36.0(W) × 20.0(H)	mm
Dot size	0.220 ×0.235	mm
Dot Pitch	0.250 ×0.265	mm
Operating Temperature	0 ~ 50	℃
Storage Temperature	-10 ~ 60	℃

1.2 Block Diagram

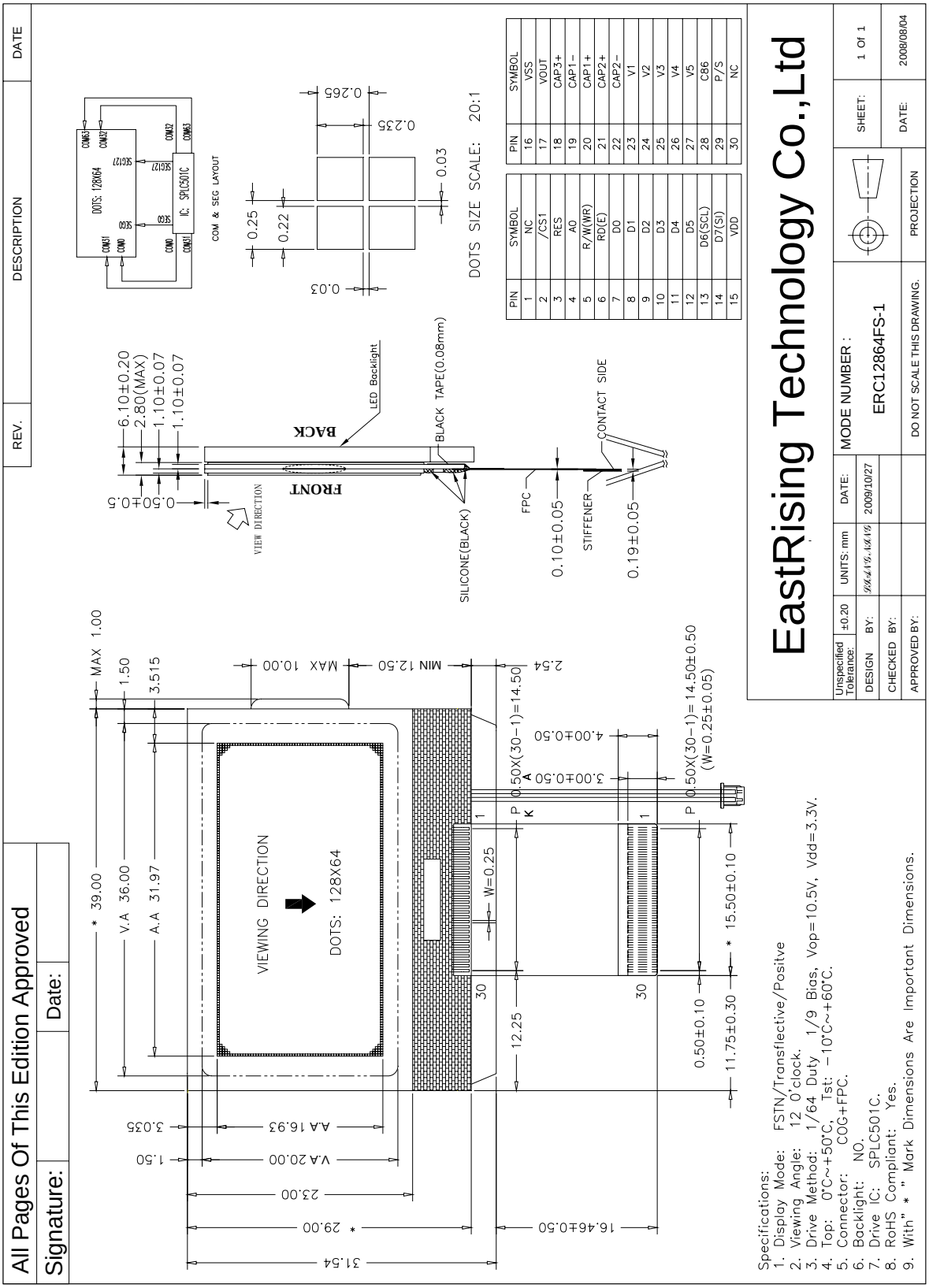


1.3 Terminal Functions

Pin No.	Pin Name	I/O	Descriptions
1	NC		NC pads, no connection for user
2	/CS1	I	Chip Select /CS1=L, enable access to the LCD module /CS1=H, disable access to the LCD module
3	RES	I	Reset Signal /RES=L, Initialization is executed /RES=H, Normal running
4	A0	I	A0 = “H” : Indicates that DB0-DB7 are display data A0 = “L” : Indicates that DB0-DB7 are control data
5	R/W(WR)	I	This is the read/write control signal input terminal. R/W = ‘H’: Read. R/W = ‘L’: Write.
6	RD(E)	I	When connected to an 8080 MPU, this is LOW active. This pin is connected to the RD signal of the 8080 MPU, and the SPLC501C data bus is in an output status when this signal is ‘L’. When connected to a 6800 Series MPU, this is HIGH active. This is the 68000 Series MPU enable clock input terminal.
7	D0	I/O	This is an 8-bit bi-directional data bus that connects to an 8-bit or 16-bit standard MPU data bus. When the serial interface is selected(PS=’L’),DB7 serves as the serial data input terminal(Sl) and BDB6 serves as the serial clock input terminal(SCL). At the same time, DB5-0 are set to high impedance. When the chip select is inactive DB0 to DB7 are set to high impendance.
8	D1		
9	D2		
10	D3		
11	D4		
12	D5		
13	D6(SCL)		
14	D7(Sl)		
15	VDD	P	Positive Power Supply
16	VSS	P	Negative Power Supply, Ground(0V)
17	VOUT	P	DC/DC voltage converter output
18	CAP3+	O	Capacitor 3+ pad for internal DC/DC voltage converter
19	CAP1-		Capacitor 1-pad for internal DC/DC voltage converter
20	CAP1+		Capacitor 1+ pad for internal DC/DC voltage converter
21	CAP2+		Capacitor 2 + pad for internal DC/DC voltage converter
22	CAP2-		Capacitor 2 -pad for internal DC/DC voltage converter
23	V1	P	A multi-level power supply for the liquid crystal drive. Voltage levels are determined based on VDD, and must maintain the relative magnitudes shown below. VDD (= V0) ≧V1≧V2≧V3≧V4≧V5 Master operation: When the power supply turns ON, the internal power supply circuits generate the V1 to V4 voltages shown below. The
24	V2		
25	V3		
26	V4		
27	V5		

			voltage settings are selected by the LCD bias command.
28	C86	I	This is the MPU interface switch terminal. C86 = ‘H’: 6800 Series MPU interface. C86 = ‘L’: 8080 MPU interface.
29	PS	I	This is the parallel data input/serial data input switch terminal. PS = ‘H’: Parallel data input. PS = ‘L’: Serial data input.
30	NC		NC pads, no connection for user

1.4 Mechanical Drawing



2. Absolute Maximum Ratings

Items	Symbol	Min	Max.	Unit	Condition
Supply Voltage (Logic)	V_{DD}-Vss	0	+7.0	V	V_{ss}=0V
Supply Voltage (LCD Driver)	V_{EE}	-12	+0.3	V	Relative to VDD
Input Voltage	V_{IN}	-0.3	VDD+0.3	V	V_{ss}=0V
Operating Temperature	T_{OP}	0	+50	℃	No Condensation
Storage Temperature	T_{ST}	-10	+60	℃	No Condensation

Cautions:

Any stresses exceeding the Absolute Maximum Ratings may cause substantial damage to the device Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability

3. Electrical Characteristics

3.1 DC Characteristics

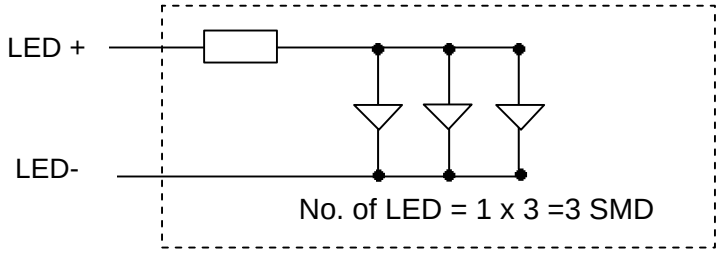
Items	Symbol	Min	Typ.	Max.	Unit	Condition
Supply Voltage (Logic)	V_{DD}-Vss	2.7	3.0	3.3	V	
Supply Voltage (LCD Driver)	V_0	--	--	--	V	
		--	10.5	--		25℃
		--	--	--		
Input Voltage	V_{IH}	0.8 V_{DD}	--	V_{DD}	V	--
	V_{IL}	Vss	--	0.2 V_{DD}		
Logic Supply Current	I_{DD}	--	--	0.4	mA	VDD-Vss=3.0V

3.2 LED Backlight Circuit Characteristics

Items	Symbol	MIN	TYP.	MAX.	Unit	Application pin
Forward Voltage	Vf_{LED+}	-	3.0	-	V	LED+
Forward Current	If_{LED+}	-	45	60	mA	LED+

Cautions:

Exceeding the recommended driving current could cause substantial damage to the backlight and shorten its lifetime.



4. IC Contents Attachment:

Reference Documents From SUNPLUS SPLC501C Driver with

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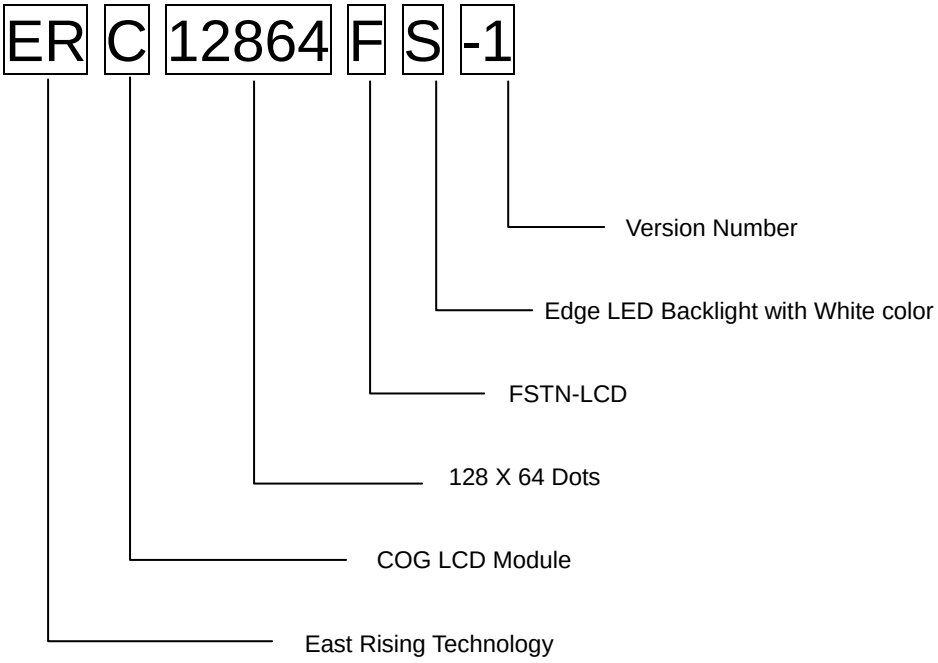
5. LCM Numbering System



6. Design and Handling Precaution

1.0 The LCD panel is made by glass. Any mechanical shock (e.g. dropping form high place) will damage the LCD module.
2.0 Do not add excessive force on the surface of the display, which may cause the Display color change abnormally.
3.0 The polarizer on the LCD is easily get scratched. If possible, do not remove the LCD protective film until the last step of installation.
4.0 Never attempt to disassemble or rework the LCD module.
5.0 Only Clean the LCD with Isopropyl Alcohol or Ethyl Alcohol. Other solvents (e.g. water) may damage the LCD.
6.0 When mounting the LCD module, make sure that it is free form twisting, warping and distortion.
7.0 Ensure to provide enough space (with cushion) between case and LCD panel to prevent external force adding on it, or it may cause damage to the LCD or degrade the display result.
8.0 Only hold the LCD module by its side. Never hold LCD module by adds force on the heat seal or TAB.
9.0 Never add force to component of the LCD module. It may cause invisible damage or degrade of the reliability.
10.0 LCD module could be easily damaged by static electricity. Be careful to maintain an optimum anti-static work environment to protect the LCD module.
11.0 When peeling off the protective film from LCD, static charge may cause abnormal display pattern. It is normal and will resume to normal in a short while.
12.0 Take care and prevent get hurt by the LCD panel sharp edge.
13.0 Never operate the LCD module exceed the absolute maximum ratings.
14.0 Keep the signal line as short as possible to prevent noisy signal applying to LCD module.
15.0 Never apply signal to the LCD module without power supply.
16.0 IC chip (e.g. TAB or COG) is sensitive to the light. Strong lighting environment could possibly cause malfunction. Light sealing structure casing is recommend.
17.0 LCD module reliability may be reduced by temperature shock.
18.0 When storing the LCD module, avoid exposure to the direct sunlight, high humidity, high temperature or low temperature. They may damage or degrade the LCD module