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CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

24B50(WHITE LED TYPES)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO .
24B50(WHITE LED TYPES)

VERSION
1

RECORDS OF REVISION

DOC . FIRST ISSUE

MAR.28,2002

DATE	REVISED PAGE NO.	SUMMARY

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	LED	L
Transmissive	LED	M

E W 24 B 50 G L W

LCD type + LCD color	Code Value
STN + Yellow-Green	Y
STN + Gray	G
STN + Blue	B
FSTN + White	F
FSTN + Black	N

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1. GENERAL SPECIFICATIONS

1.1 QUALITY SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
EU - 002 A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER : T6963C
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
EU - T6963 C

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL
SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF DOTS ----- 240W * 64H DOTS
- (2) MODULE SIZE ----- 180.0W * 65.0H * 14.8D (max .) mm
- (3) EFFECTIVE AREA ----- 134.5W * 41.0H mm
- (4) ACTIVE AREA ----- 127.16W * 33.88H mm
- (5) DOT SIZE ----- 0.49W * 0.49H mm
- (6) DOT PITCH ----- 0.53W * 0.53H mm
- (7) LCD TYPE *
- (8) DRIVING METHOD ----- 1 / 64 DUTY MULTIPLEX DRIVE
- (9) BACK LIGHT ----- LED, COLOR : WHITE

* PLEASE REFER TO NUMBERING SYSTEM

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS . (AT Ta = 25 °C)

PARAMETER	SYMBOL	MIN .	MAX .	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVE	VDD – VEE	0	22.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR LED B/L	VLED–VLSS	—	5	V	

NOTE (1) : TEST METHOD AND CONDITIONS :
AFTER CHARGING UP 200 PF CAPACITOR BY STATED VOLTAGE ,
THE CAPACITOR IS CONNECTED WITH INTERFACE PINS OF THE
MODULE .

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS .

I T E M	OPERATING		STORAGE		REMARK
	MIN .	MAX .	MIN .	MAX .	
AMBIENT TEMPERATURE	- 20 °C	70 °C	- 30 °C	80 °C	NOTE (2), (3)
HUMIDITY	—	85 % RH	—	85 % RH	WITHOUT CONDENSATION
VIBRATION	—	4.9 m/s ² (0.5 G)	—	19.6 m/s ² (2 G)	10~300 HZ XYZ DIRECTIONS 1 Hr EACH
SHOCK	—	29.4 m/s ² (3 G)	—	490.0 m/s ² (50 G)	10 m SEC XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -30°C: 48HR MAX .
80°C: 168HR MAX .

NOTE (3) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT
TEMPERATURE THIS PHENOMENON IS REVERSIBLE .

4. ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD - VSS	—	4.75	5.0	5.25	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VEE - VSS	—	- 2.0	—	- 10.0	V
INPUT VOLTAGE	VIH	H LEVEL	VDD - 2.2	—	VDD	V
NOTE (1)	VIL	L LEVEL	0	—	0.8	V
OUTPUT VOLTAGE	VOH	H LEVEL	VDD - 0.3	—	VDD	V
NOTE (1)	VOL	L LEVEL	0	—	0.3	V
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD - VSS = 5.0 V VEE - VSS = -3.7 V	—	9.0	—	mA
RECOMMENDED LCD DRIVING VOLTAGE	VDD - VEE ∅= 10° θ= 0° DUTY =1/64	Ta = - 20 °C	—	(8.7)	—	V
		Ta = 25 °C	—	(8.7)	—	V
		Ta = 70 °C	—	(8.7)	—	V
CLOCK OSCILLATION FREQUENCY	f OSC	—	—	3.58	—	MHZ
POWER SUPPLY FOR LED B/L	VLED-VLSS	IF =160 mA	—	5	—	V

NOTE (1): APPLIED TO TERMINALS \overline{WR} , \overline{RD} , \overline{CE} , $\overline{C/D}$, \overline{RST} , FS, D0~D7)

NOTE (2): THE DISPLAY PATTERN IS ALL "OFF"/"ON"

5. OPTICAL CHARACTERISTICS

Ta = 25 °C

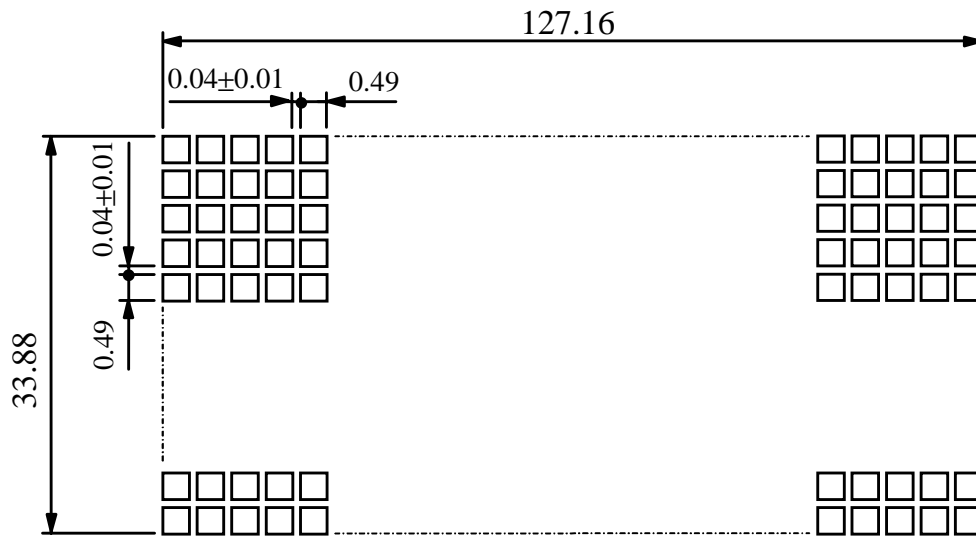
VDD = 5.0 V

I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	STN	∅ 2 - ∅ 1	K ≥ 1.4	40	—	—	deg.	1
	FSTN			50	—	—	deg.	1
CONTRAST RATIO	STN	K	∅ = 10 ° θ = 0 °	—	(5)	—	—	1
	FSTN			(5)	—	—	—	1
RESPONSE TIME	tr (rise)	∅ = 10 ° θ = 0 °	Ta = -20°C	—	3982	—	ms	1
			Ta = 25°C	—	228	—		
			Ta = 70°C	—	83	—		
	tf (fall)		Ta = -20°C	—	3752	—		
			Ta = 25°C	—	176	—		
			Ta = 70°C	—	94	—		
THE BRIGHTNESS OF BACK-LIGHT	L	IF = 160 mA	(10)	—	—	cd/m ²	1, 2	
			(15)	—	—		1, 3	

NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS.
E U - 0 0 2 A

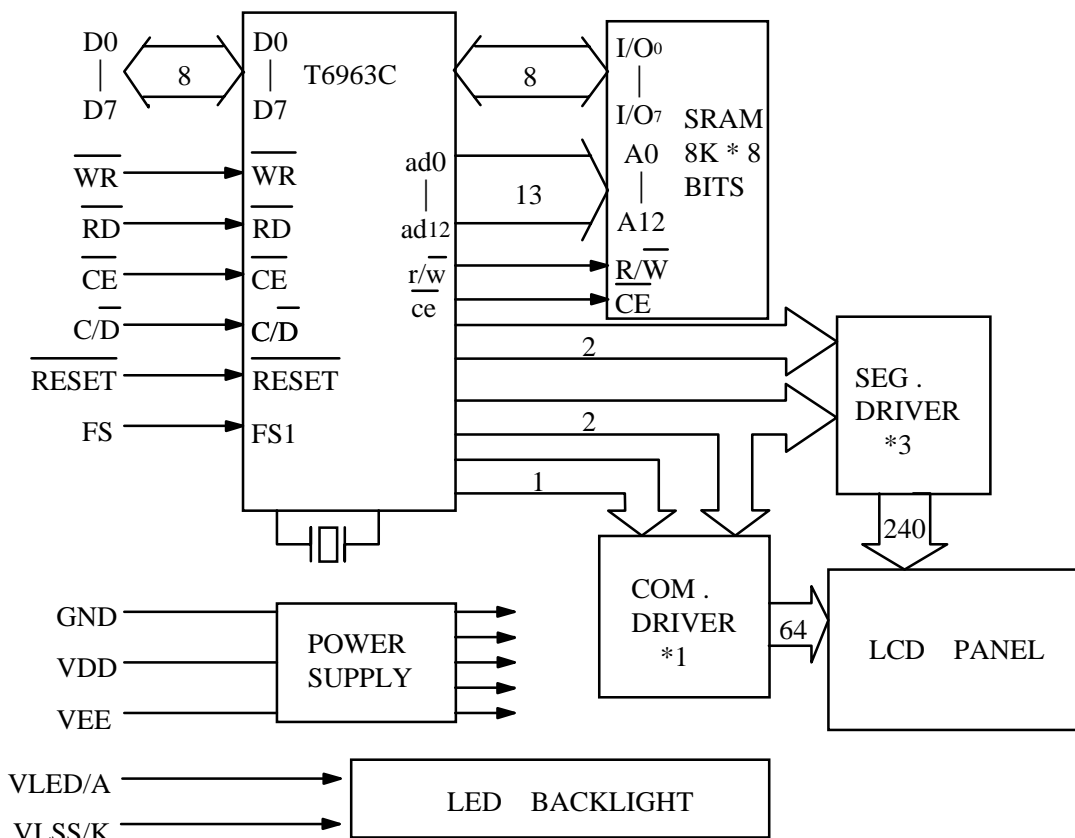
NOTE (2) : POLARIZER MODE : TRANSFLECTIVE
NOTE (3) : POLARIZER MODE : TRANSMISSIVE

7. DETAIL DRAWING OF DOT MATRIX



UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.1

8. BLOCK DIAGRAM

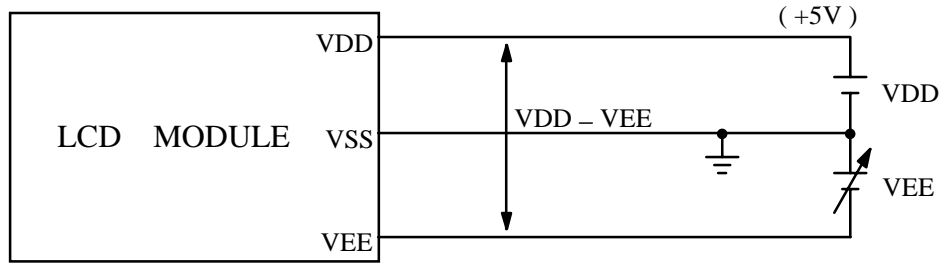


9. INTERFACE SIGNALS

PIN NO .	SIGNAL	FUNCTION
1	FGND	FRAME GROUND (0V)
2	GND	GROUND
3	VDD	POWER SUPPLY FOR LOGIC (+5V)
4	VEE	POWER SUPPLY FOR LCD DRIVER
5	$\overline{\text{WR}}$	DATA WRITE
6	$\overline{\text{RD}}$	DATA READ
7	$\overline{\text{CE}}$	CHIP ENABLE
8	$\overline{\text{CE}}$	$\overline{\text{WR}}$ = "L", $\overline{\text{C/D}}$ = "H" : COMMAND WRITE $\overline{\text{C/D}}$ = "L" : DATA WRITE $\overline{\text{RD}}$ = "L", $\overline{\text{C/D}}$ = "H" : STATUS READ $\overline{\text{C/D}}$ = "L" : DATA READ
9	NC	—————
10	$\overline{\text{RESET}}$	CONTROLLER RESET
11~18	D0~D7	DATA INPUT/OUTPUT
19	FS	FONT SELECT : CONNECT TO VDD : 6*8 PIXEL/FONT CONNECT TO GND : 8*8 PIXEL/FONT
20	NC	—————
21	VLED	POWER SUPPLY FOR LED BACKLIGHT (ANODE)
22	VLSS	POWER SUPPLY FOR LED BACKLIGHT (CATHODE)
A	VLED	POWER SUPPLY FOR LED BACKLIGHT (ANODE)
K	VLSS	POWER SUPPLY FOR LED BACKLIGHT (CATHODE)

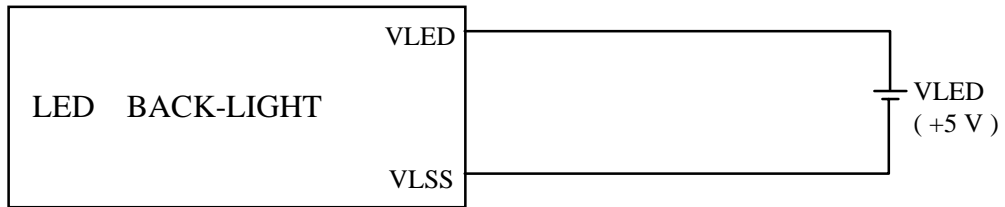
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE



VDD - VEE : LCD DRIVING VOLTAGE

10.2 POWER SUPPLY FOR LED BACK-LIGHT



10.3 POWER AND INTERFACE TIMING SEQUENCE

