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		VERSION : 3

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

24D30(LED TYPES)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	LED	L
Transmissive	LED	M

E W 2 4 D 3 0 G L Y

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 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 2 A

1.2 APPLICATION NOTES FOR CONTROLLER : T6963C

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - T 6 9 6 3 C

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- | | | |
|--------------------|-------|---------------------------------|
| (1) NUMBER OF DOTS | ----- | 240W * 128H DOTS |
| (2) MODULE SIZE | ----- | 144.0W * 104.0H * 17.0D(max) mm |
| (3) EFFECTIVE AREA | ----- | 114.0W * 64.0H mm |
| (4) ACTIVE AREA | ----- | 107.97W * 57.57H mm |
| (5) DOT SIZE | ----- | 0.42W * 0.42H mm |
| (6) DOT PITCH | ----- | 0.45W * 0.45H mm |
| (7) LCD TYPE * | | |
| (8) DRIVING METHOD | ----- | 1 / 128 DUTY MULTIPLEX DRIVE |
| (9) BACKLIGHT | ----- | LED , COLOR:YELLOW-GREEN |

* PLEASE REFER TO NUMBERING SYSTEM .

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS .

PARAMETER	SYMBOL	MIN .	MAX .	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	0	6.5	V	
POWER SUPPLY FOR LCD DRIVING	VDD – VEE	0	22.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
LED POWER DISSIPATION	PD	—	10.3	W	
LED FORWARD CURRENT	IF	—	2250	mA	
LED REVERSE VOLTAGE	VR	—	8	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	—	2.45 m/s ² (0.25 G)	—	11.76 m/s ² (1.2 G)	10~100 HZ XYZ DIRECTIONS 1 Hr . EACH
SHOCK	—	29.4 m/s ² (3 G)	—	490.0 m/s ² (50 G)	10 mSECONDS 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

Ta = 25 °C

VDD = 5.0 V

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	—	- 15.5	- 16.0	- 16.5	V
INPUT VOLTAGE NOTE (1)	VIH	H LEVEL	2.2	—	—	V
	VIL	L LEVEL	—	—	0.8	V
OUTPUT VOLTAGE NOTE (1)	VOH	H LEVEL	2.4	—	VCC	V
	VOL	L LEVEL	0	—	0.4	V
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD – VSS = 5.0 V VDD – VO = 18.2V	—	6.0	10.0	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD – VSS = 5.0 V VDD – VO = 18.2V	—	5.0	—	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (3)	VDD – V0 ∅ = 10° θ = 0°	Ta = - 20 °C	—	18.2	—	V
		Ta = 25 °C	—	18.2	—	
		Ta = 70 °C	—	15.0	—	
CLOCK OSCILLATION FREQUENCY	f osc	—	—	6	—	MHZ
LED FORWARD VOLTAGE	VF	IF = 900 mA	—	4.2	4.6	V
LED FORWARD CURRENT	IF	—	—	900	—	mA
LED REVERSE CURRENT	IR	VR = 8V	—	—	0.2	mA

NOTE (1): APPLIED TO TERMINALS FS, CE, \overline{WR} , \overline{RD} , C/D, DB0-DB7, \overline{RES} , MD2.

NOTE (2): THE DISPLAY PATTERN IS ALL “OFF”/“ON”.

NOTE (3): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ± 1.0V BY EACH MODULE.

5. OPTICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 V

VDD-V0 = 18.2 V

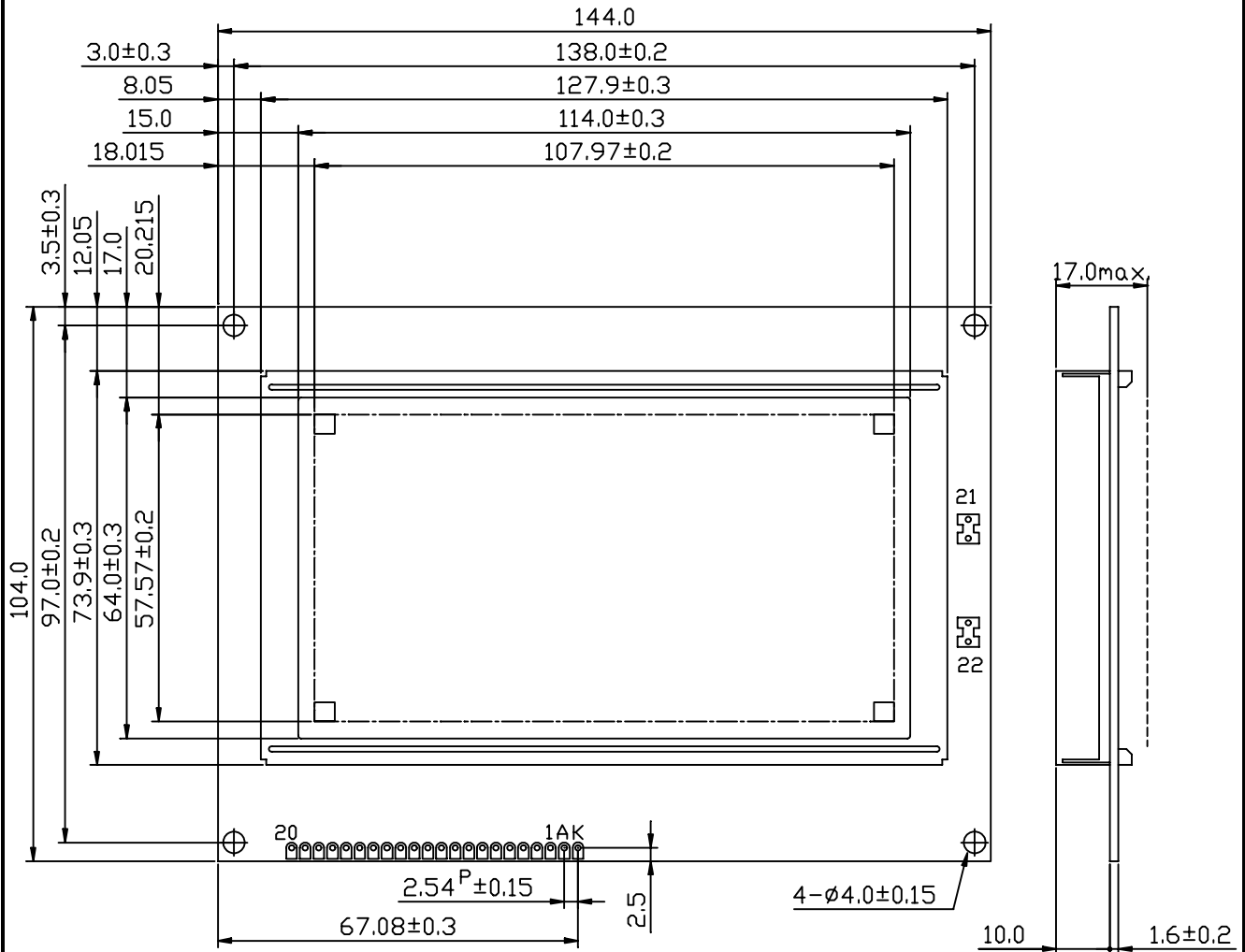
I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	STN	Ø2 - Ø1	K ≥ 1.4	40	—	—	deg.	1
	FSTN			50	—	—	deg.	1
CONTRAST RATIO	STN	K	Ø = 10 ° θ = 0 °	—	5	—	—	1
	FSTN			5	—	—	—	1
RESPONSE TIME	tr (rise)	Ø = 10 ° θ = 0 °	Ta = -20 °C	—	2886	—	ms	1
			Ta = 25 °C	—	259	—		
			Ta = 70 °C	—	156	—		
	tf (fall)		Ta = -20 °C	—	2193	—		
			Ta = 25 °C	—	177	—		
			Ta = 70 °C	—	84	—		
THE BRIGHTNESS OF BACK-LIGHT	L	IF = 900 mA	—	30	—	cd/m ²	2	
			—	65	—		3	
PEAK EMISSION WAVELENGTH	λP	IF = 900 mA	—	572	—	nm	1	

NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS.
EU-002A

NOTE (2) : POLARIZER MODE : TRANFLECTIVE

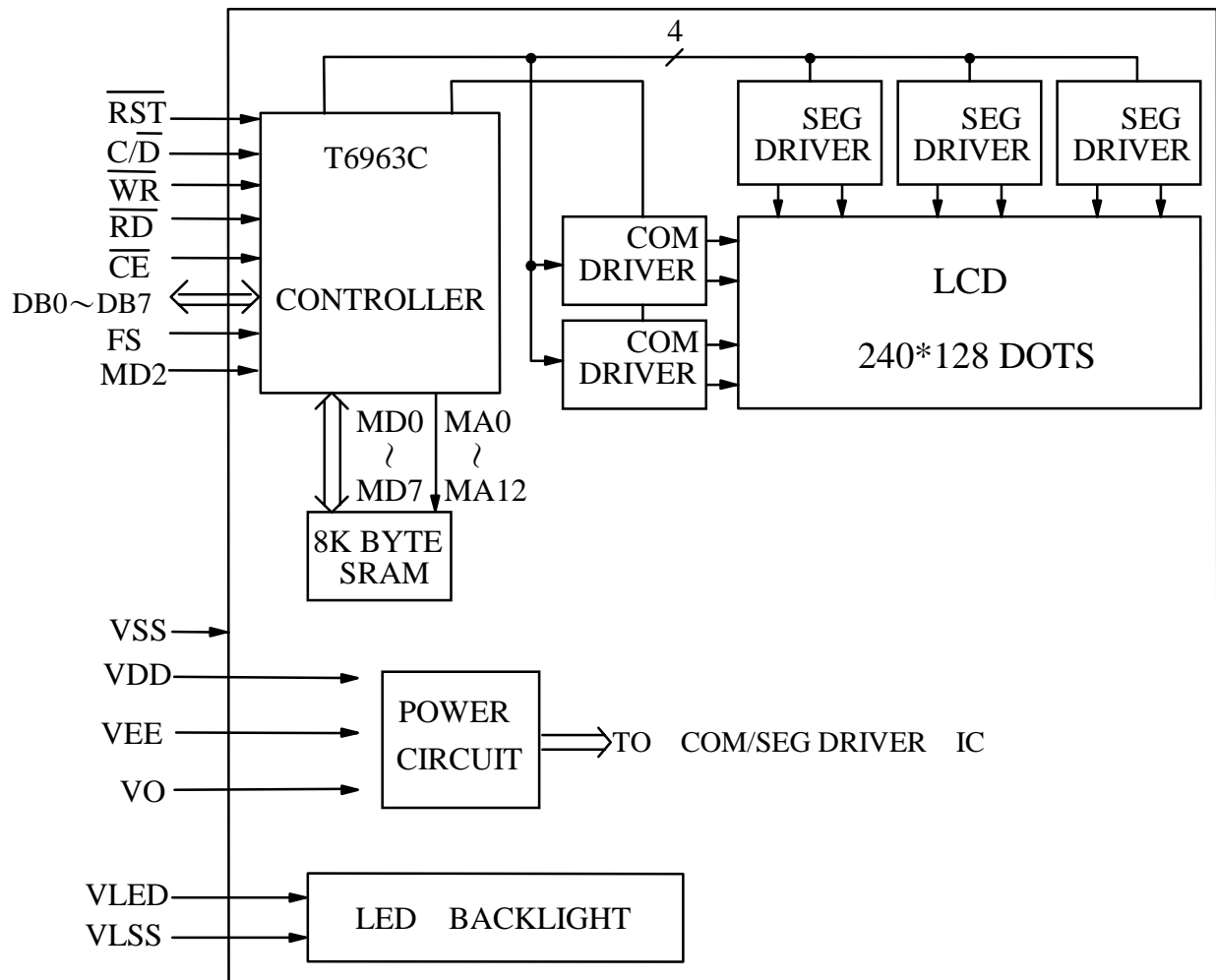
NOTE (3) : POLARIZER MODE : TRANSMISSIVE

6. OUTLINE DIMENSION

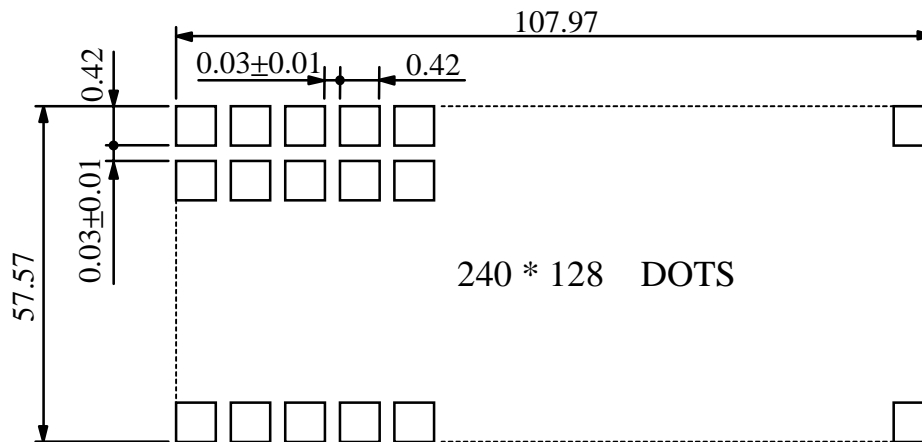


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



240 * 128 DOTS

UNIT : mm

SCALE : NTS

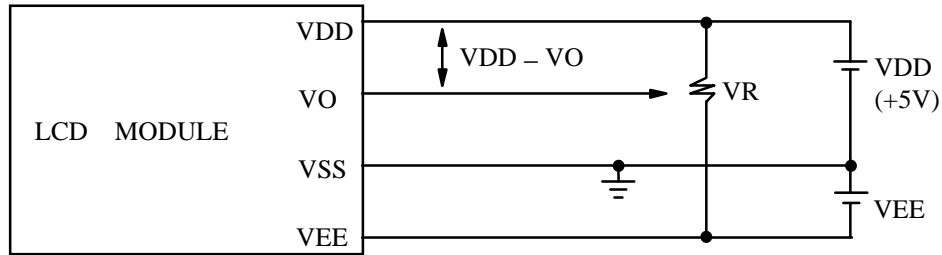
NOT SPECIFIED TOLERANCE IS ± 0.1

9. INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION
1	VSS	—	GROUND
2	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT
3	V0	—	OPERATING VOLTAGE FOR LCD DRIVE
4	C/D	H/L	\overline{WR} = "L", $\overline{C/D}$ = "H" : COMMAND WRITE $\overline{C/D}$ = "L" : DATA WRITE \overline{RD} = "L", $\overline{C/D}$ = "H" : STATUS READ $\overline{C/D}$ = "L" : DATA READ
5	\overline{RD}	L	DATA READ
6	\overline{WR}	L	DATA WRITE
7 14	DB0 DB7	H/L	DATA BUS LINE
15	\overline{CE}	L	CHIP SELECTION
16	\overline{RST}	L	RESET
17	VEE	—	POWER SUPPLY FOR LCD DRIVE
18	MD2	H/L	COLUMNS SELECT : "H" : 32 COLUMNS "L" : 40 COLUMNS
19	FS	H/L	SELECT : "H" : 6*8 PIXEL/FONT "L" : 8*8 PIXEL/FONT
20	N.C	—	—
A	VLED	—	POWER SUPPLY FOR LED BACKLIGHT(ANODE)
K	VLSS	—	POWER SUPPLY FOR LED BACKLIGHT(CATHODE)
21	VLED	—	POWER SUPPLY FOR LED BACKLIGHT(ANODE)
22	VLSS	—	POWER SUPPLY FOR LED BACKLIGHT(CATHODE)

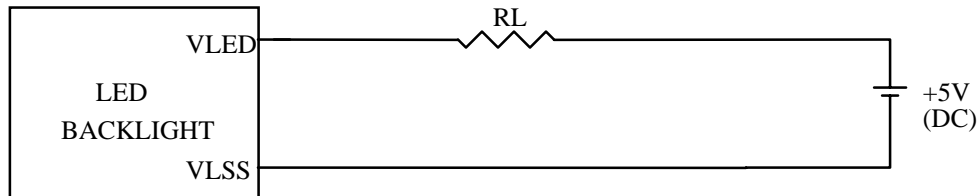
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM



VDD - VO : LCD DRIVING VOLTAGE
VR : 20KΩ

10.2 POWER SUPPLY FOR LED BACK - LIGHT



RECOMMENDED RESISTOR $RL = 1\sim 3.3\Omega, 1W$, (CONTROLLED BY USER)
* THE BRIGHTNESS WOULD BE ALTERED SUBJECT TO DIFFERENT VALUES OF RL

10.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

