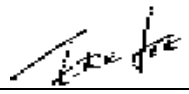
EXAMINED BY : 	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-10240
		ISSUE : MAR.20,2001
APPROVED BY: David Chang		TOTAL PAGE : 7
		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO . :

ES16201(TRANSFLECTIVE TYPES)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

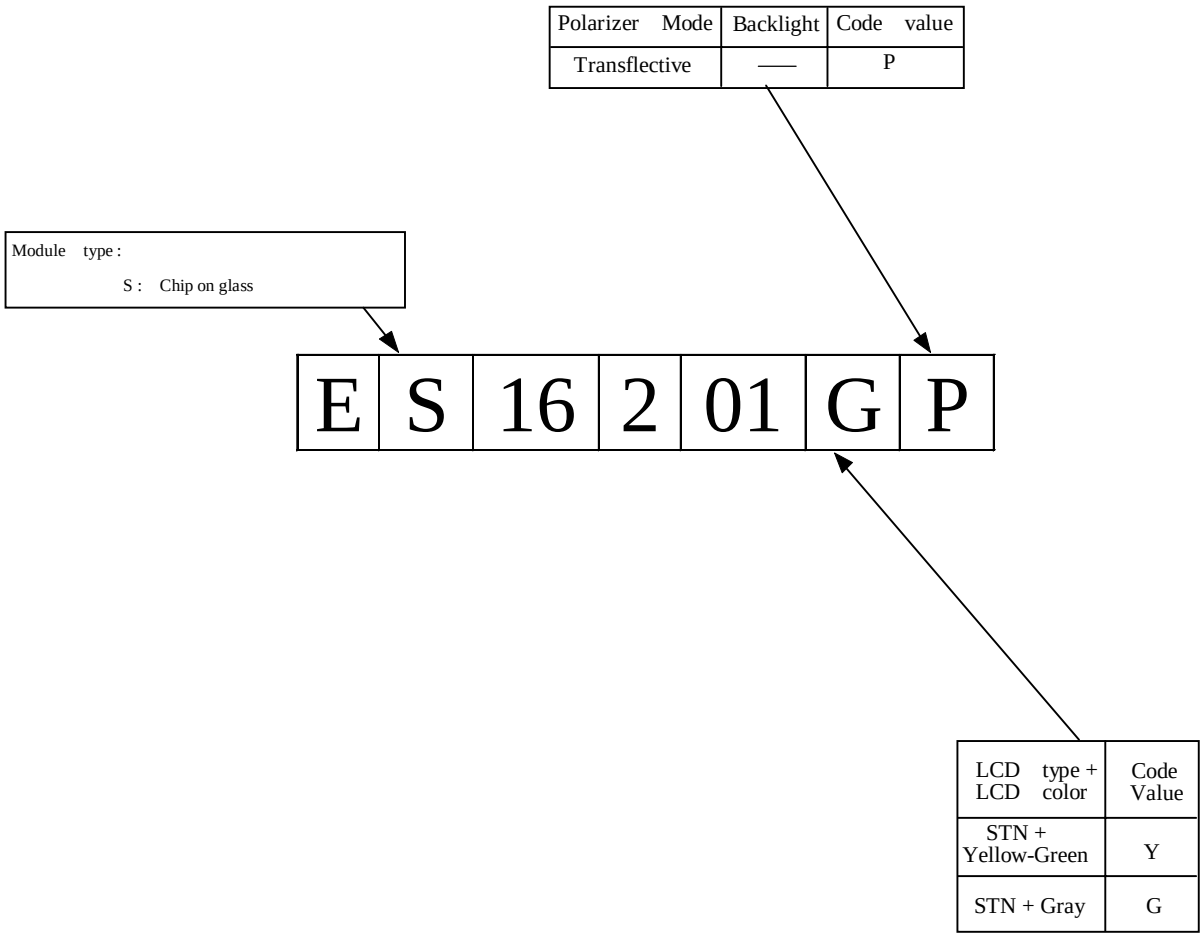
BY :

_____

EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL NO. ES16201(TRANSFLECTIVE TYPES)	VERSION 1
RECORDS OF REVISION	DOC. FIRST ISSUE MAR.20,2001	

DATE	REVISED PAGE NO.	SUMMARY

NUMBERING SYSTEM



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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 / DRIVER : NT7603
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - N T 7 6 0 3

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF CHARACTER	16 CH * 2 LINE
(2)	MODULE SIZE	69.0W * 30.0H * 3.0D (max.) mm
(3)	EFFECTIVE AREA	63.0W * 18.0H mm
(4)	CHARACTER FONT	5 * 7 DOTS + CURSOR
(5)	CHARACTER SIZE	2.96W * 5.56H mm
(6)	CHARACTER PITCH	3.55(W)*5.94 (H)
(7)	DOT SIZE	0.56W * 0.66H mm
(8)	DOT PITCH	0.60W * 0.70H mm
(9)	LCD TYPE *	
(10)	DRIVING METHOD	1 / 16 DUTY MULTIPLEX DRIVE

* PLEASE REFER TO NUMBERING SYSTEM

3. ABSOLUTE MAXIMUM RATINGS

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

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVE	VDD – VO	0	5.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)

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.

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20 °C	70 °C	-30 °C	80 °C	NOTE (2), (3)
HUMIDITY	—	90 % RH	—	90 % RH	WITHOUT CONDENSATION
VIBRATION	—	4.9 m/s^2 (0.5 G)	—	19.6 m/s^2 (2 G)	
SHOCK	—	29.4 m/s^2 (3 G)	—	490.0 m/s^2 (50 G)	XYZ DIRECTIONS
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 ± 0 . 5V

PARAMETER	SYMBOL	CONDITION	MIN .	TYP .	MAX .	UNIT	NOTE
H LEVEL INPUT VOLTAGE	VIH	—	2 . 2	—	VDD	V	2
L LEVEL INPUT VOLTAGE	VIL	—	- 0.3	—	0 . 8	V	—
H LEVEL OUTPUT VOLTAGE	VOH	–IOH = 0 . 2 mA	2 . 4	—	—	V	2
L LEVEL OUTPUT VOLTAGE	VOL	IOL = 1 . 2 mA	—	—	0 . 4	V	—
POWER SUPPLY CURRENT (LOGIC)	IDD	VDD = 5 . 0 V	—	1 . 0	1 . 5	mA	—
RECOMMENDED LCD DRIVING VOLTAGE	VDD – VO ∅ = 10° θ = 0° DUTY = 1/16	Ta = - 20 °C	—	4 . 5	—	V	—
		Ta = 25 °C	—	4 . 5	—		
		Ta = 70 °C	—	4 . 5	—		
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 °C	3 8 0	5 4 0	7 0 0	KHZ	—

5 . OPTICAL CHARACTERISTICS .

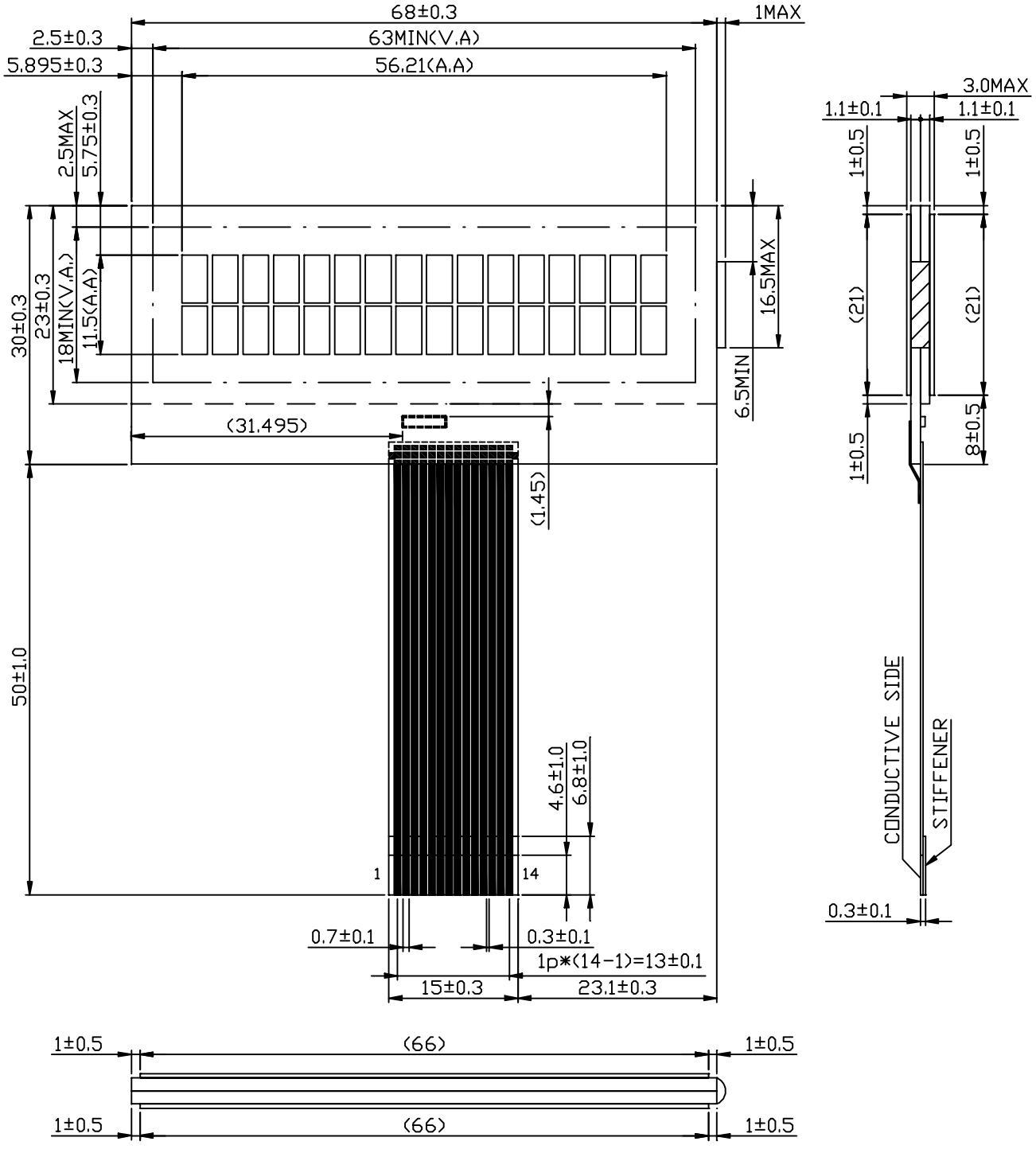
Ta = 25°C VDD = 5 . 0 V

I T E M	SYMBOL	CONDITION		MIN .	TYP .	MAX .	UNIT	NOTE
VIEWING AREA	∅ 2 - ∅ 1	K≧ 1.4		3 0	—	—	deg.	1
CONTRAST RATIO	K	∅ = 10° θ = 0°		—	5	—	—	1
RESPONSE TIME	tr (rise)	∅ =10° θ = 0°	Ta = -20°C	—	5538	—	ms	1
			Ta = 25°C	—	228	—		
			Ta = 70°C	—	104	—		
	tf (fall)		Ta = -20°C	—	2316	—		
			Ta = 25°C	—	174	—		
			Ta = 70°C	—	85	—		

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

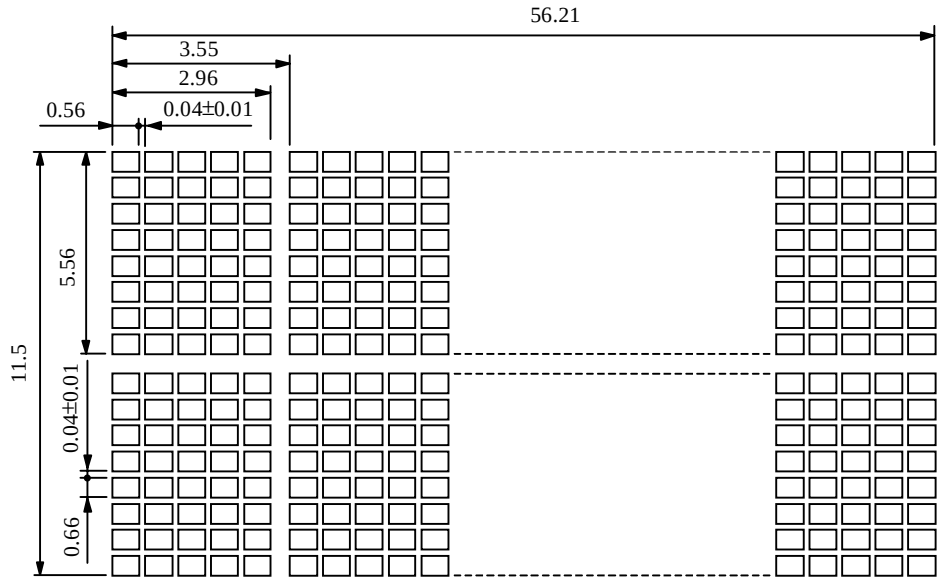
NOTE (2) : APPLICABLE : DB0 ~ DB7 , RS , R/W ,E

6. OUTLINE DIMENSION



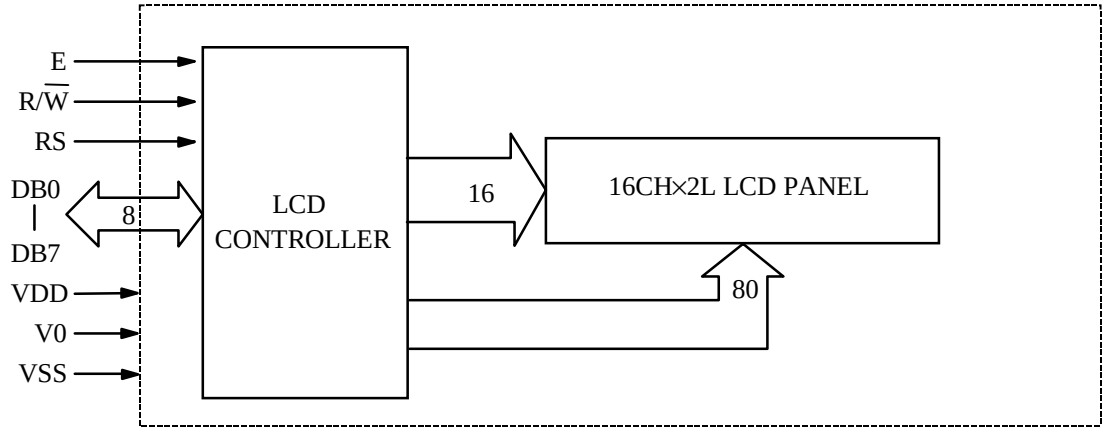
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.5

7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

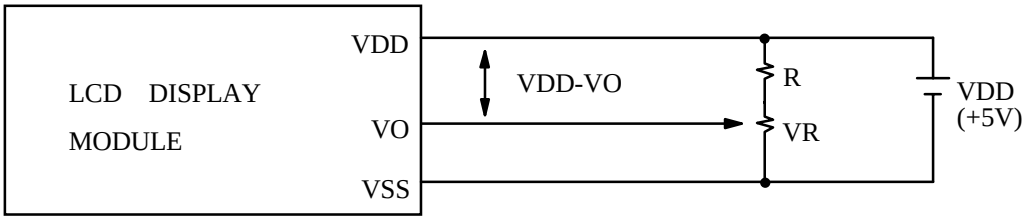


9 . INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0V (GND)
2	VO	LCD CONTRAST ADJUSTMENT	
3	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
4	RS	INSTRUCTION/DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
5	$\overline{R/W}$	READ/WRITE SELECTION	$\overline{R/W}$ = 0 : REGISTER WRITE $\overline{R/W}$ = 1 : REGISTER READ
6	E	ENABLE INPUT	
7	DB0	DATA INPUT/OUTPUT LINES	4 BIT/8BIT SELECTABLE 4 BIT : DB4 - DB7 8 BIT : DB0 - DB7
8	DB1		
9	DB2		
10	DB3		
11	DB4		
12	DB5		
13	DB6		
14	DB7		

10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE



VDD - VO : LCD DRIVING VOLTAGE
VR : 10K Ω ~ 20K Ω
RECOMMENDED RESISTOR R : VDD - VO ≧ 1.5 V

11. DISPLAY DATA RAM ADDRESS

CHARACTER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF