EXAMINED BY : Tony Chen	MITSUTECH INTERNATIONAL CORPORATION	FILE NO . CAS-10185
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		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

20400(REFLECTIVE TYPES)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

MITSUTECH INT'L CORP.

MODEL NO.	VERSION
20400(REFLECTIVE TYPES)	1

RECORDS OF REVISION

DOC . FIRST ISSUE

AUG.26,1999

DATE	REVISED PAGE NO.	SUMMARY

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Reflective	—	R

LCD type + LCD color	Code Value
STN + Yellow-Green	Y
STN + Gray	G

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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 : KS0066
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - K S 0 0 6 6

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF CHARACTER	20 CH * 4 LINES
(2)	MODULE SIZE	98.0W * 60.0H * 10.0D (max.) mm
(3)	EFFECTIVE AREA	76.0W * 25.2H mm
(4)	CHARACTER FONT	5 * 7 DOTS + CURSOR
(5)	CHARACTER SIZE	2.95W * 4.75H mm
(6)	CHARACTER PITCH	3.55W * 5.35H mm
(7)	DOT SIZE	0.55W * 0.55H mm
(8)	DOT PITCH	0.60W * 0.60H mm
(9)	LCD TYPE *	
(10)	DRIVING METHOD	1 / 16 DUTY MULTIPLEX DRIVE
(11)	VIEWING DIRECTION	6 O'CLOCK

* 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	13.0	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℃	70℃	-30℃	80℃	NOTE (2),(3)
HUMIDITY	—	90 % RH	—	90 % RH	WITHOUT CONDENSATION
VIBRATION	—	4.9 m/s^2 (0.5G)	—	19.6 m/s^2 (2G)	
SHOCK	—	29.4 m/s^2 (3G)	—	490.0 m/s^2 (50G)	XYZ DIRECTIONS
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -30℃ : 48HR MAX.
80℃ : 168HR MAX.
NOTE (3) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE.

4 . ELECTRICAL CHARACTERISTICS

Ta = 25℃ VDD = 5.0 ± 0.25 V

PARAMETER	SYMBOL	CONDITION	MIN .	TYP .	MAX .	UNIT
H LEVEL INPUT VOLTAGE	VIH	———	2 . 2	—	—	V
L LEVEL INPUT VOLTAGE	VIL	———	—	—	0 . 6	V
H LEVEL OUTPUT VOLTAGE	VOH	－IOH = 0 . 2 Ma	2 . 4	—	—	V
L LEVEL OUTPUT VOLTAGE	VOL	IOL = 1 . 2 Ma	—	—	0 . 4	V
POWER SUPPLY CURRENT (LOGIC)	IDD	VDD = 5 . 0 V	—	2 . 0	5 . 0	Ma
RECOMMENDED LCD DRIVING VOLTAGE	VDD - VO ∅ =10°, θ = 0° DUTY= 1/16	Ta = - 20 ℃	—	4 . 4	—	V
		Ta = 25 ℃	—	4 . 4	—	V
		Ta = 70 ℃	—	4 . 4	—	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 ℃	—	270	—	KHZ

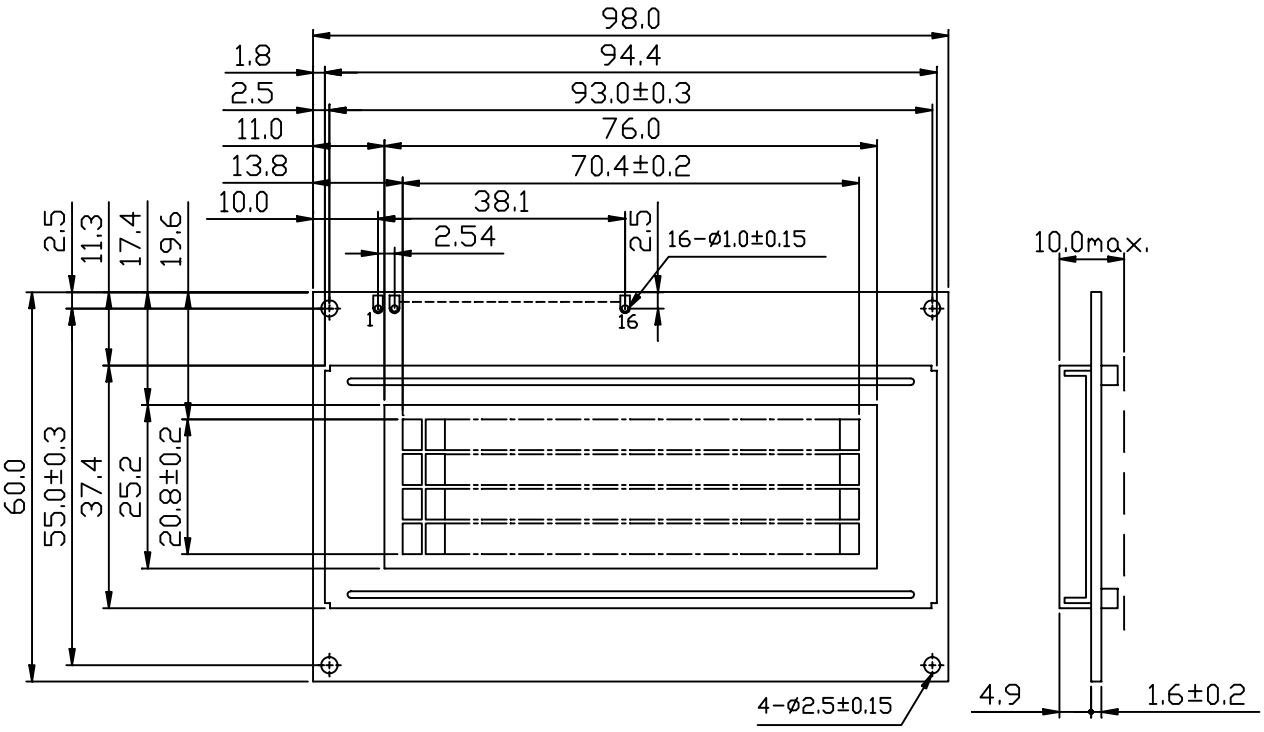
5 . OPTICAL CHARACTERISTICS .

Ta = 25 ℃ 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℃	—	5538	—	ms	1
			Ta = 25℃	—	228	—		
			Ta = 70℃	—	104	—		
	tf (fall)		Ta = -20℃	—	2316	—		
			Ta = 25℃	—	174	—		
			Ta = 70℃	—	85	—		

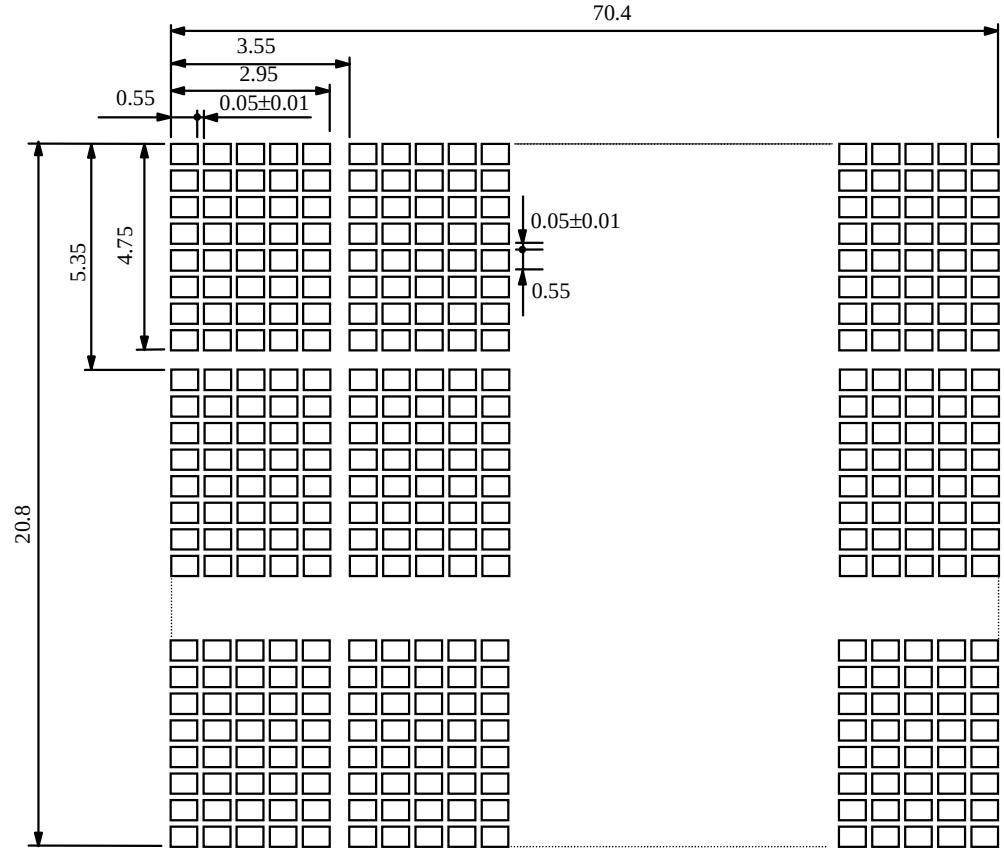
NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATION : EU-002A

6 . OUTLINE DIMENSION



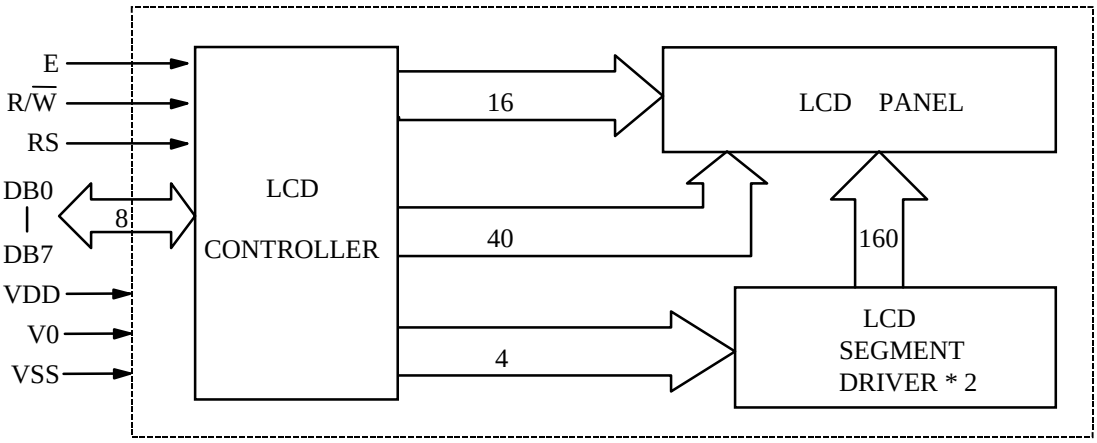
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

7 . DETAIL DRAWING OF DOT MATRIX



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

8 . BLOCK DIAGRAM

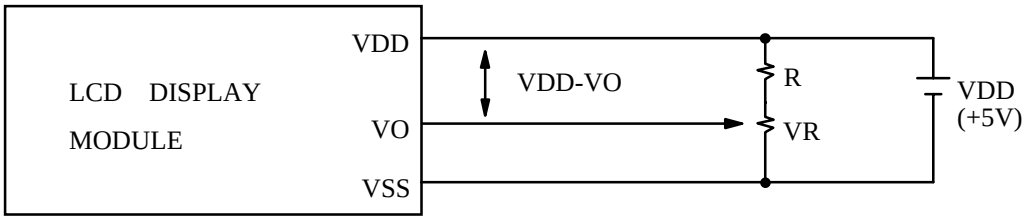


9 . INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0V (GND)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
3	V0	LCD CONTRAST FOR LOGIC CIRCUIT	
4	RS	INSTRUCTION/DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
5	R/$\overline{W}$	READ/WRITE SELECTION	R/$\overline{W}$ = 0 : REGISTER WRITE R/$\overline{W}$ = 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		
15	NC	NOT USE	
16	NC		

10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE



VDD - VO : LCD DRIVING VOLTAGE
VR : 10KΩ～20KΩ
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	17	18	19	20
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90	91	92	93
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3
LINE 3	94	95	96	97	98	99	8A	9B	9C	9D	9E	9F	A0	A1	A2	A3	A4	A5	A6	A7
LINE 4	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7