EXAMINED BY : Vincent Wu	EMERGING DISPLAY	FILE NO . CAS-51551
		ISSUE : MAR.13, 2007
APPROVED BY: David Chang	TECHNOLOGIES CORPORATION	TOTAL PAGE : 11
		VERSION : 3

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

EW50850FLWP

(RoHS)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

RECORDS OF REVISION

DOC . FIRST ISSUE

MAR.01, 2007

DATE	REVISED PAGE NO.	SUMMARY
MAR.07, 2007	1	2. MECHANICAL SPECIFICATIONS (7) LCD TYPE : FSTN , POSITIVE , WHITE , TRANSFLECTIVE, PG POLARIZER→ (7) LCD TYPE : FSTN , POSITIVE , WHITE , TRANSFLECTIVE, PG POLARIZER , FRONT POLARIZER : ANTIGLARE
MAR.13, 2007	3	4. ELECTRICAL CHARACTERISTICS
	11	11.1 POWER SUPPLY FOR LCM VDD (+3.3V) → VDD (+3.0V)

Ta = 25°C VDD-VSS=3.3V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD–VSS	—	3.24	3.3	3.36	V
POWER SUPPLY CURRENT FOR LCD DRIVE	IDD	VDD –VSS = 3.3V	—	(2.0)	(5.0)	mA

↓ Ta = 25°C VDD-VSS=3.0V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD–VSS	—	2.5	3.0	3.3	V
POWER SUPPLY CURRENT FOR LCD DRIVE	IDD	VDD –VSS = 3.0V	—	(2.0)	(5.0)	mA

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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 2 B

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

ULTRACHIP – UC1611

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS.

1.4 MATERIAL SAFETY DESCRIPTION
ASSEMBLIES SHALL COMPLY WITH EUROPEAN ROHS REQUIREMENTS, INCLUDING PROHIBITED MATERIALS/COMPONENTS CONTAINING LEAD,MERCURY, CADMIUM, HEXAVALENT CHROMIUM, POLYBROMINATED BIPHENYLS (PBB) AND POLYBROMINATED DIPHENYL ETHERS (PBDE)

2 . MECHANICAL SPECIFICATIONS

(1)	NUMBER OF DOTS	240W * 160H DOTS
(2)	MODULE SIZE	75.6W * 55.1H * 7D (max.) mm
(3)	EFFECTIVE AREA	62W * 45.7H mm
(4)	ACTIVE AREA	55.19W * 41.59H mm
(5)	DOT SIZE	0.22W * 0.25H mm
(6)	DOT PITCH	0.23W * 0.26H mm
(7)	LCD TYPE	FSTN , POSITIVE , WHITE , TRANSFLECTIVE , PG POLARIZER FRONT POLARIZER : ANTIGLARE
(8)	DRIVING METHOD	1 / 160 DUTY MULTIPLEX DRIVE
(9)	VIEWING DIRECTION	6 O'CLOCK
(10)	BACK LIGHT	LED , COLOR : WHITE

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	-0.3	4.0	V	
POWER SUPPLY FOR LCD DRIVING	VLCD	-0.3	18.0	V	
ANY INPUT / OUTPUT	VIN / VOUT	-0.3	VDD+0.3	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
LED BACKLIGHT POWER DISSIPATION	PD	—	0.45	W	
LED BACKLIGHT FORWARD CURRENT	IF	—	90	mA	
LED BACKLIGHT REVERSE VOLTAGE	VR	—	7.05	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 (1), (2)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	—	2.45 m/s^2 (0. 25 G)	—	11.76 m/s^2 (1.2 G)	10~100Hz XYZ DIRECTIONS 1 HR.EACH
SHOCK	—	29.4 m/s^2 (3 G)	—	490 m/s^2 (50 G)	10 mSECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (1) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE .

NOTE (2) : Ta AT -30°C : WILL BE < 48HRS.
80°C : WILL BE < 168HRS.

NOTE (3) : Ta ≤ 60°C : 85%RH MAX.(96HRS. MAX.)
Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 85%RH AT 60°C.(96HRS. MAX.)

4. ELECTRICAL CHARACTERISTICS

Ta = 25°C VDD-VSS=3.0V

PARAMETER	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD–VSS	—		2.5	3.0	3.3	V
H LEVEL INPUT VOLTAGE (NOTE1)	VIH	—		0.85VDD	—	VDD	V
L LEVEL INPUT VOLTAGE (NOTE1)	VIL	—		VSS	—	0.15VDD	V
H LEVEL OUTPUT VOLTAGE (NOTE2)	VOH	—		0.8VDD	—	VDD	V
L LEVEL OUTPUT VOLTAGE (NOTE2)	VOL	—		VSS	—	0.2VDD	V
INPUT LEAKAGE CURRENT	IIL	—		—	—	1.5	μA
OPERATION VOLTAGE FOR CONTRAST	VOP	θy-=10°, θx=0° DUTY=1/160	Ta =-20°C	14.7	15.7	16.7	V
			Ta = 25°C	14.2	15.2	16.2	
			Ta = 70°C	13.7	14.7	15.7	
POWER SUPPLY CURRENT FOR LCD DRIVE	IDD	VDD –VSS = 3.0V		—	(2.0)	(5.0)	mA
POWER SUPPLY FOR LED BACKLIGHT	VLED-VLSS	IF = 45~75mA		—	5.0	—	V

NOTE (1) : PINS : D0 ~ D7, $\overline{RST}$, CS1, CD, WR0 , WR1, BM0.

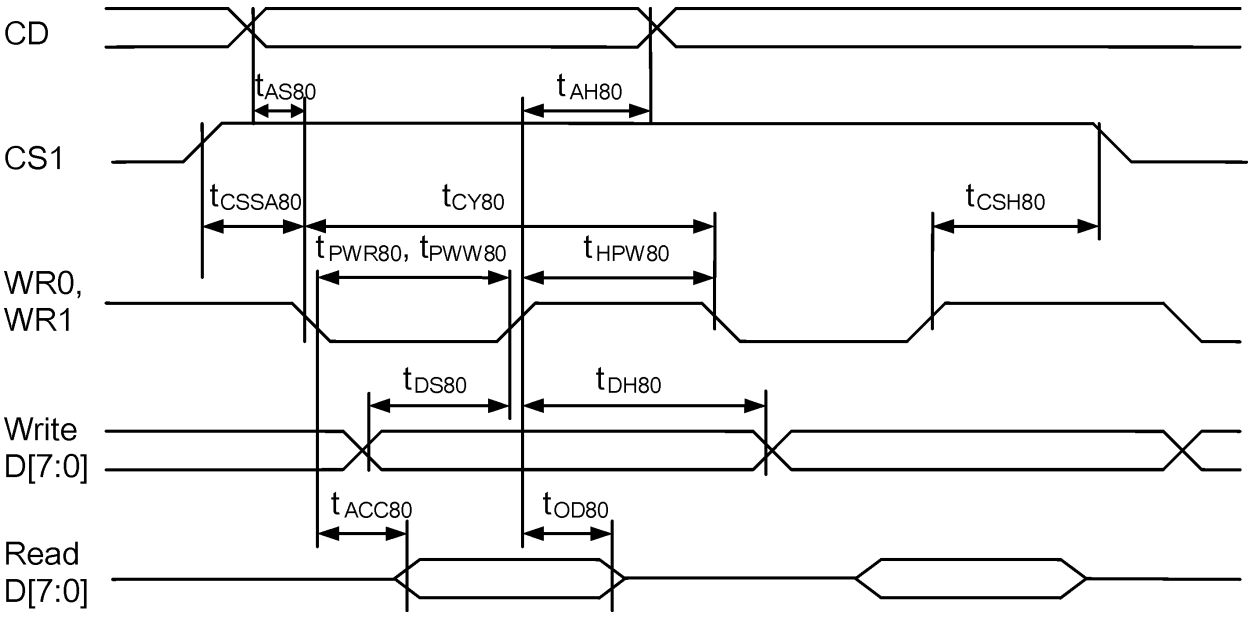
NOTE (2) : PINS D0 ~ D7.

5. TIMING CHARACTERISTICS

5.1 INTERFACE TIMING

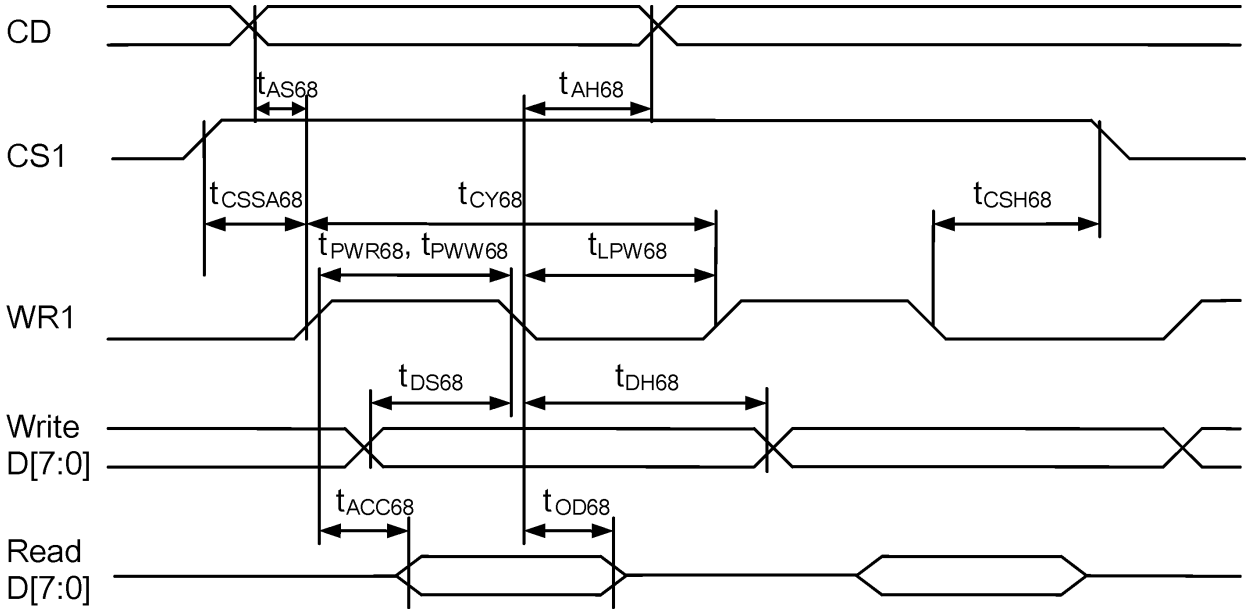
5.1.1 8080 SERIES MPU

SYMBOL	SIGNAL	DESCRIPTION	CONDITION	MIN.	MAX.	UNITS
t_{AS80}	CD	ADDRESS SETUP TIME		13	—	ns
t_{AH80}		ADDRESS HOLD TIME		22		
t_{CY80}		SYSTEM CYCLE TIME (READ) SYSTEM CYCLE TIME(WRITE)		140 80	—	ns
t_{PWR80}	WR1	PULSE WIDTH (READ)		65	—	ns
t_{PWW80}	WR0	PULSE WIDTH (WRITE)		35	—	ns
t_{HPW80}	WR0 , WR1	HIGH PULSE WIDTH (READ) HIGH PULSE WIDTH (WRITE)		65 35	—	ns
t_{DS80}	D0~D7	DATA SETUP TIME		30	—	ns
t_{DH80}		DATA HOLD TIME		15		
t_{ACC80}		READ ACCESS TIME	C_L = 100 pF	—	60	ns
t_{OD80}		OUTPUT DISABLE TIME		12	20	
t_{SSA80}	CS1	CHIP SELECT SETUP TIME		10		ns
t_{CSH80}				20		



5.1.2 6800 SERIES MPU

SYMBOL	SIGNAL	DESCRIPTION	CONDITION	MIN.	MAX.	UNITS
t_{AS68} t_{AH68}	CD	ADDRESS SETUP TIME ADDRESS HOLD TIME		0 20	—	ns
t_{CY68}		SYSTEM CYCLE TIME (READ) SYSTEM CYCLE TIME (WRITE)		140 80	—	ns
t_{PWR68}	WR1	PULSE WIDTH (READ)		65	—	ns
t_{PWW68}		PULSE WIDTH (WRITE)		35	—	ns
t_{LPW68}		LOW PULSE WIDTH (READ) LOW PULSE WIDTH (WRITE)		65 35	—	ns
t_{DS68} t_{DH68}	D0~D7	DATA SETUP TIME DATA HOLD TIME		30 15	—	ns
t_{ACC68} t_{OD68}		READ ACCESS TIME OUTPUT DISABLE TIME	C_L = 100 pF	— 12	60 20	ns
t_{CSSA68} t_{CSH68}	CS1	CHIP SELECT SETUP TIME		15 20		ns



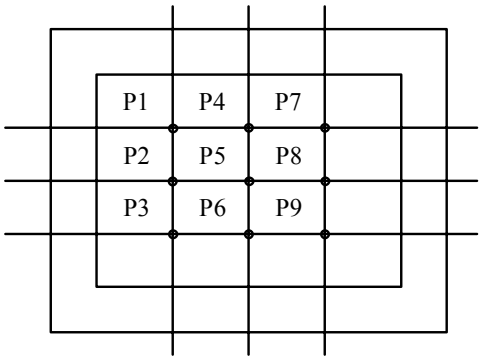
6 . OPTICAL CHARACTERISTICS

Ta = 25 °C

I T E M	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	θy+	K≥2.0	θx = 0°	28	33	—	deg.	1
	θy-			40	45	—		
	θx+		θy = 0°	42	47	—		
	θx-			48	53	—		
CONTRAST RATIO	K	θy-= 10 ° θx = 0 °		4.5	7.5	—	—	1
RESPONSE TIME	tr (rise)	θy- = 10° θx = 0°	Ta = -20 °C	—	4680	6084	ms	1
			Ta = 25 °C	—	240	312		
			Ta = 70 °C	—	95	124		
	tf (fall)		Ta = -20 °C	—	3720	4836		
			Ta = 25 °C	—	180	234		
			Ta = 70 °C	—	70	91		
THE BRIGHTNESS OF MODULE	B	VLED–VLSS =5.0V ALL"OFF"		9.6	12	—		2,3
THE UNIFORMITY OF MODULE	—			—	—	30	%	2,3

NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU – 002B)

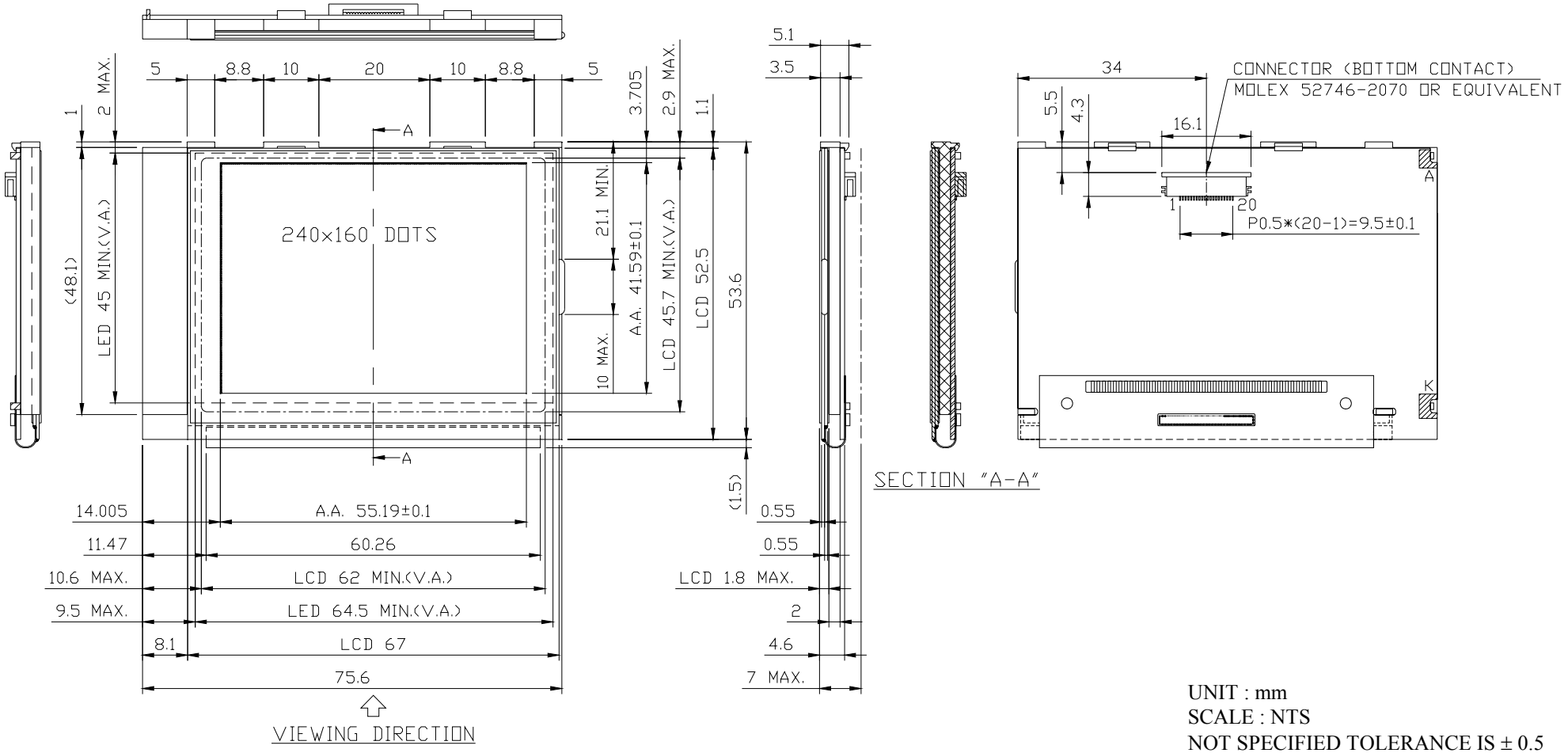
NOTE (2) : MEASUREMENT OF THE FOLLOWING 9 PLACES ON THE DISPLAY.
DEFINITION OF THE BRIGHTNESS TOLERANCE.



NOTE (3) : BRIGHTNESS UNIFORMITY IS DEFINED AS FOLLOWING.

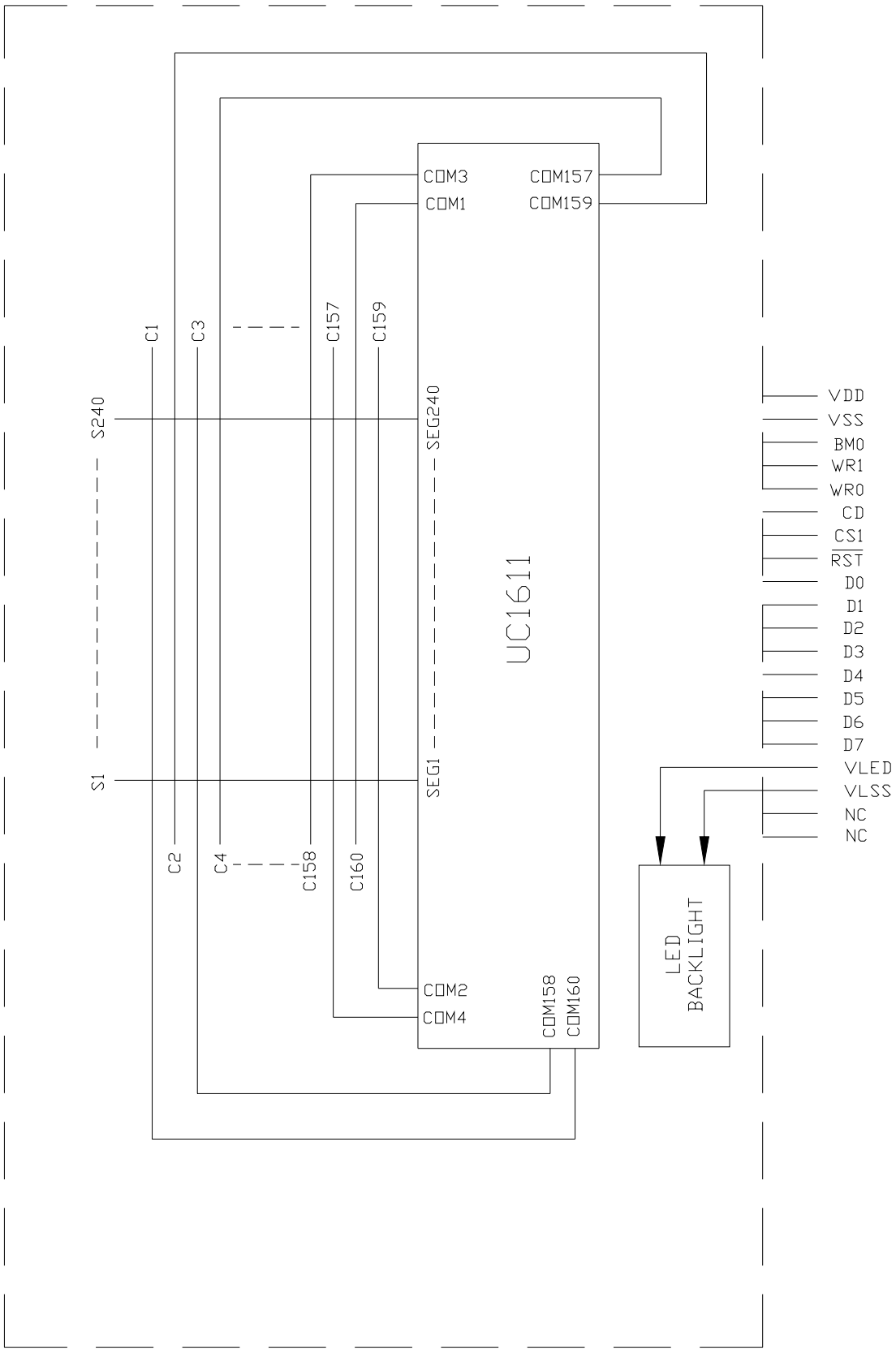
$$\Sigma_X = \frac{\text{MAXIMUM BRIGHTNESS - MINIMUM BRIGHTNESS}}{\text{AVERAGE BRIGHTNESS}} \times 100\%$$

7. OUTLINE DIMENSIONS

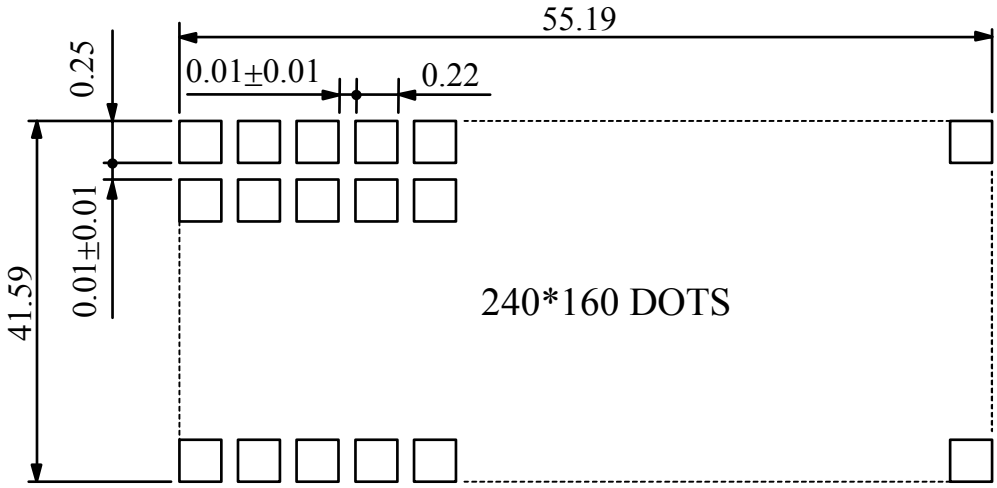


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



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

10. INTERFACE SIGNALS

PIN NO.	SYMBOL	FUNCTION
1	VDD	POWER SUPPLY FOR LOGIC
2	VSS	GROUND
3	BM0	" L " : 8080 SERIES MPU " H " : 6800 SERIES MPU
4	WR1	SERIES MPU TYPE / WR0 / WR1 8080 SERIES MPU / $\overline{WR}$ / $\overline{RD}$ 6800 SERIES MPU / R/$\overline{W}$ / E
5	WR0	
6	CD	REGISTER SELECT INPUT
7	CS1	CHIP ENABLE INPUT , "H " : ENABLE "L" : DISABLE
8	$\overline{RST}$	HARDWARE RESET INPUT
9	D0	DISPLAY DATA
10	D1	
11	D2	
12	D3	
13	D4	
14	D5	
15	D6	
16	D7	
17	VLED	LED BACKLIGHT DRIVER VOLTAGE (+)
18	VLSS	LED BACKLIGHT DRIVER VOLTAGE (–)
19	NC	NO CONNECTION
20	NC	

11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM

VR = 500KΩ

11.2 POWER SUPPLY FOR LED BACKLIGHT