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		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

ERA026200 (LED TYPES)

(RoHS)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL NO.	VERSION	PAGE
	ERA026200(LED TYPES)(RoHS)	1	0-1

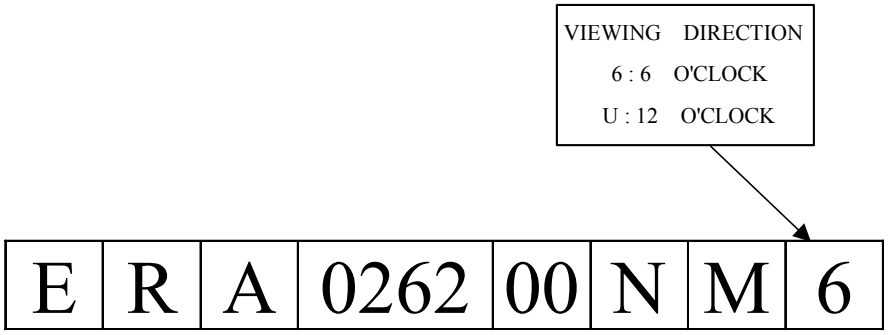
RECORDS OF REVISION

DOC . FIRST ISSUE

DEC.14, 2006

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 4 B

1.2 APPLICATION NOTES FOR CONTROLLER/DRIVER
PLEASE REFER TO :

N O V A T E K N T 7 5 7 3

1.3 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) DISPLAY SIZE	----------	2.62” (inch)
(2) NUMBER OF DOTS	----------	132W * (RGB) * 65H DOTS
(3) MODULE SIZE	----------	68.5W * 44.2H * 5.8D mm (WITHOUT FPC)
(4) ACTIVE AREA	----------	58.994W * 30.735H mm
(5) VIEWING AREA	----------	62W * 33.8H mm
(6) DOT SIZE	----------	0.139W * 0.463H mm
(7) DOT PITCH	----------	0.149W * 0.473H mm
(8) LCD TYPE	----------	CSTN , TRANSMISSIVE , ANTI-GLARE TYPE
(9) COLOR	----------	65k (16 BIT)
(10) DRIVING METHOD	----------	1 / 96 DUTY MULTIPLEX DRIVE 1 / 5 BIAS
(11) VIEWING DIRECTION*		
(12) BACK LIGHT	----------	LED , COLOR : WHITE

* 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	-0.3	+3.6	V	
	VCC-VEE	-0.3	+19.8	V	
INPUT VOLTAGE	Vin	-0.3	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
LED POWER DISSIPATION	PD	—	(0.48)	W	
LED FORWARD CURRENT	IF	—	(120)	mA	
LED REVERSE VOLTAGE	VR	—	(6)	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

NOTE (2) : ESD TEST DO REFER TO IEC61000-4-2 LEVEL4 , ±8kv CONTACT DISCHARGE
±15kv AIR DISCHARGE

3 . 2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS .

I T E M	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	- 3 0 °C	+ 8 0 °C	- 4 0 °C	+ 8 5 °C	NOTE(1) , (2) , (3)
HUMIDITY	NOTE (4)		NOTE (4)		WITHOUT CONDENSATION
VIBRATION	—	4.9 m/s^2 (0.25 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 (1) : Ta AT -40°C : 48HR MAX.
+85°C : 168HR MAX.
NOTE (2) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE .
NOTE (3) : LED BACKLIGHT: OPERATING TEMPERATURE RANGE : -30°C ~+80°C (48HR MAX.)
STORAGE TEMPERATURE RANGE : -40°C ~+85°C (48HR MAX.)
NOTE (4) : Ta ≤ 60°C : 90%RH MAX. (96HRS MAX.)
Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 60°C.(96HRS MAX.)

4. ELECTRICAL CHARACTERISTICS

Ta=25°C

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
POWER SUPPLY FOR LOGIC		VDD-VSS	—	2.7	3.0	3.3	V	
INPUT VOLTAGE	"H" LEVEL	VIH	—	0.8*VDD	—	VDD	V	1
	"L" LEVEL	VIL		VSS	—	0.2*VDD		
OUTPUT VOLTAGE	"H" LEVEL	VOH	IOH=-0.5mA/ VDD=1.65~3.6V IOH=-0.1mA/ VDD=1.2~1.65V	0.8*VDD	—	VDD	V	2
	"L" LEVEL	VOL	IOL=0.5mA/ VDD=1.65~3.6V IOL=0.1mA/ VDD=1.2~1.65V	VSS	—	0.2*VDD		
I/O LEAKAGE CURRENT		ILI	Vin=VDD OR VSS	-1.0	—	1.0	uA	
CURRENT CONSUMPTION		IDD	VDD-VSS=3.0V VRP–VSS=(10.0V)	—	1.1	2	mA	3
LCD DRIVING VOLTAGE		VLCD (VRP–VSS)	Ta=-30°C	—	—	—	V	
			Ta=25°C	(9.5)	(10.0)	(10.5)		
			Ta=+80°C	—	—	—		
LED FORWARD VOLTAGE		VF	IF=80mA	—	4.0	4.5	V	
LED REVERSE CURRENT		IR	VR=6V	—	—	0.2	mA	

NOTE (1) : APPLIED TO TERMINALS , D/I , RD , WR , CS1B , CS2 , RSTB , D0~D15.
NOTE (2) : APPLIED TO TERMINALS , D0~D15.
NOTE (3) : OPTIMUM CONTRAST VOLTAGE IS ADDED.(ALL DOTS ON STATE)
DUTY=1/96 , BIAS=1/5

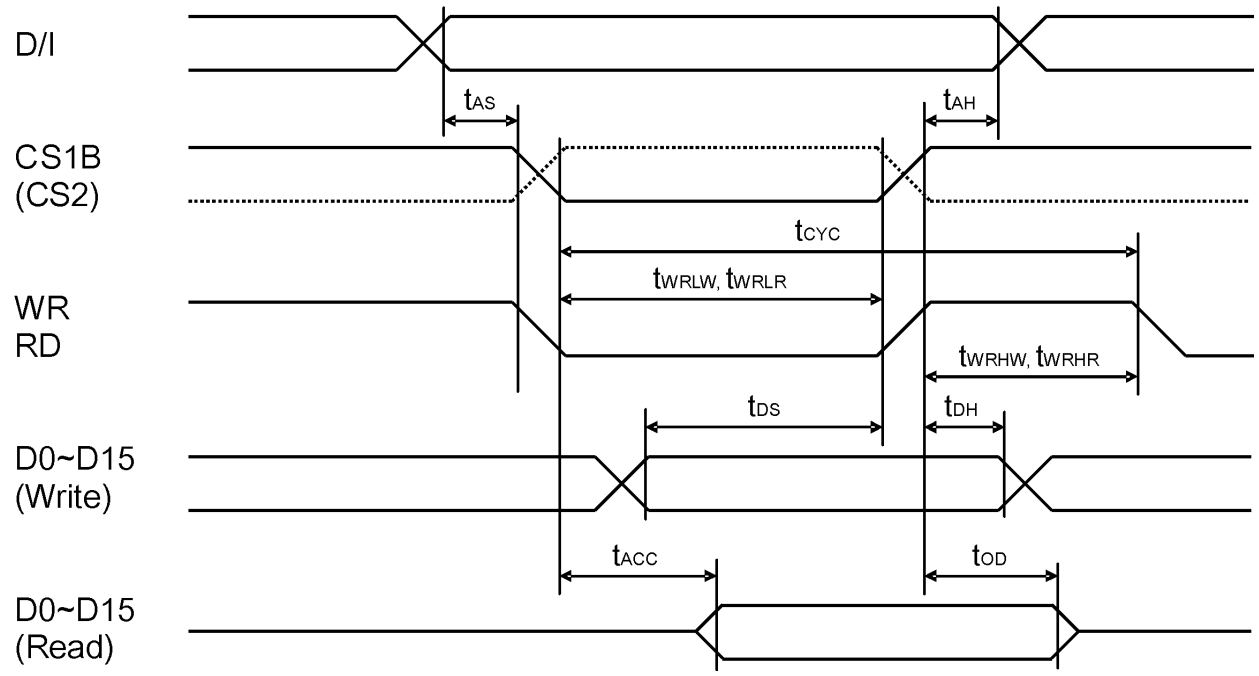
5. TIMING CHARACTERISTICS

5.1 8080-SERIES MPU

(VDD = 2.7 ~ 3.3V)

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT	CONDITION
t_{AH}	ADDRESS HOLD TIME	0	—	—	ns	D/I
t_{AS}	ADDRESS SETUP TIME	0	—	—	ns	
t_{CYC}	SYSTEM CYCLE TIME	100	—	—	ns	
$t_{cyc(READ)}$	SYSTEM CYCLE TIME(READ)	200	—	—	ns	
t_{WRLW}	LOW PULSE WIDTH FOR WRITE	20	—	—	ns	WR
t_{WRLR}	LOW PULSE WIDTH FOR READ	60	—	—	ns	RD
t_{WRHW}	HIGH PULSE WIDTH FOR WRITE	20	—	—	ns	WR
t_{WRHR}	HIGH PULSE WIDTH FOR READ	20	—	—	ns	RD
t_{DS}	DATA SETUP TIME	15	—	—	ns	D0~D15
t_{DH}	DATA HOLD TIME	5	—	—	ns	
t_{ACC}	ACCESS TIME	—	—	80	ns	D0~D15,C_L=100pF
t_{OD}	OUTPUT DISABLE TIME	20	—		ns	

*1. The input signal rise time and fall time (t_r, t_f) is specified at 10ns or less.
($t_r + t_f$) < (t_{CYC} - t_{CSLW} - t_{CSHW}) for write, ($t_r + t_f$) < (t_{CYC} - t_{CSLR} - t_{CSHR}) for read.
*2. All timing is specified using 20% and 80% of VDD as the reference.
*3. t_{WRLW} and t_{WRLR} are specified as the overlap interval when CS1B is low (CS2 is high) and WR or RD is low.



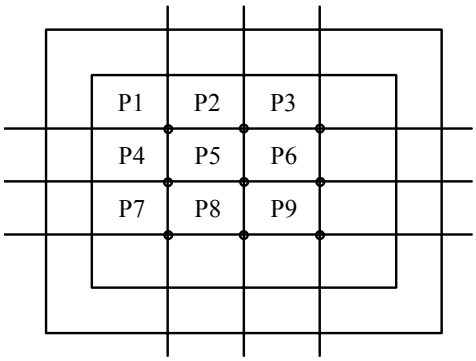
6. OPTICAL CHARACTERISTICS

Ta = 2 5 °C

I T E M		SYMBOL	TEMP	CONDITION		MIN.	TYP.	MAX.	UNIT	REMARK
RESPONSE TIME	RISE TIME	t r	-30°C	θx=0° θy=0°		—	(16000)	(20800)	msec	NOTE 1
			25°C			—	(320)	(415)		
			80°C			—	(70)	(90)		
	FALL TIME	t f	-30°C			—	(11000)	(14300)		
			25°C			—	(110)	(145)		
			80°C			—	(70)	(90)		
VIEWING ANGLE		θy+	25°C	K≥2	θx=0°	(55)	(60)	—	deg.	
		θy-				(29)	(34)	—		
		θx+			θy=0°	(43)	(48)	—		
		θx-				(44)	(49)	—		
CONTRAST RATIO		K	25°C	θx=0° θy=0°		(20)	(30)	—		
COLOR OF CIE COORDINATE	WHITE	x	25°C	θx=0° θy=0°		(0.25)	(0.30)	(0.35)		
		y				(0.26)	(0.31)	(0.36)		
	RED	x				(0.40)	(0.45)	(0.50)		
		y				(0.26)	(0.31)	(0.36)		
	GREEN	x				(0.25)	(0.30)	(0.35)		
		y				(0.34)	(0.39)	(0.44)		
	BLUE	x				(0.15)	(0.20)	(0.25)		
		y				(0.15)	(0.20)	(0.25)		
BRIGHTNESS OF MODULE		L	25°C	IF=80mA		(175)	—	—	cd/m^2	NOTE (2)
BRIGHTNESS UNIFORMITY		B	25°C			(75)	—	—	%	NOTE (2)

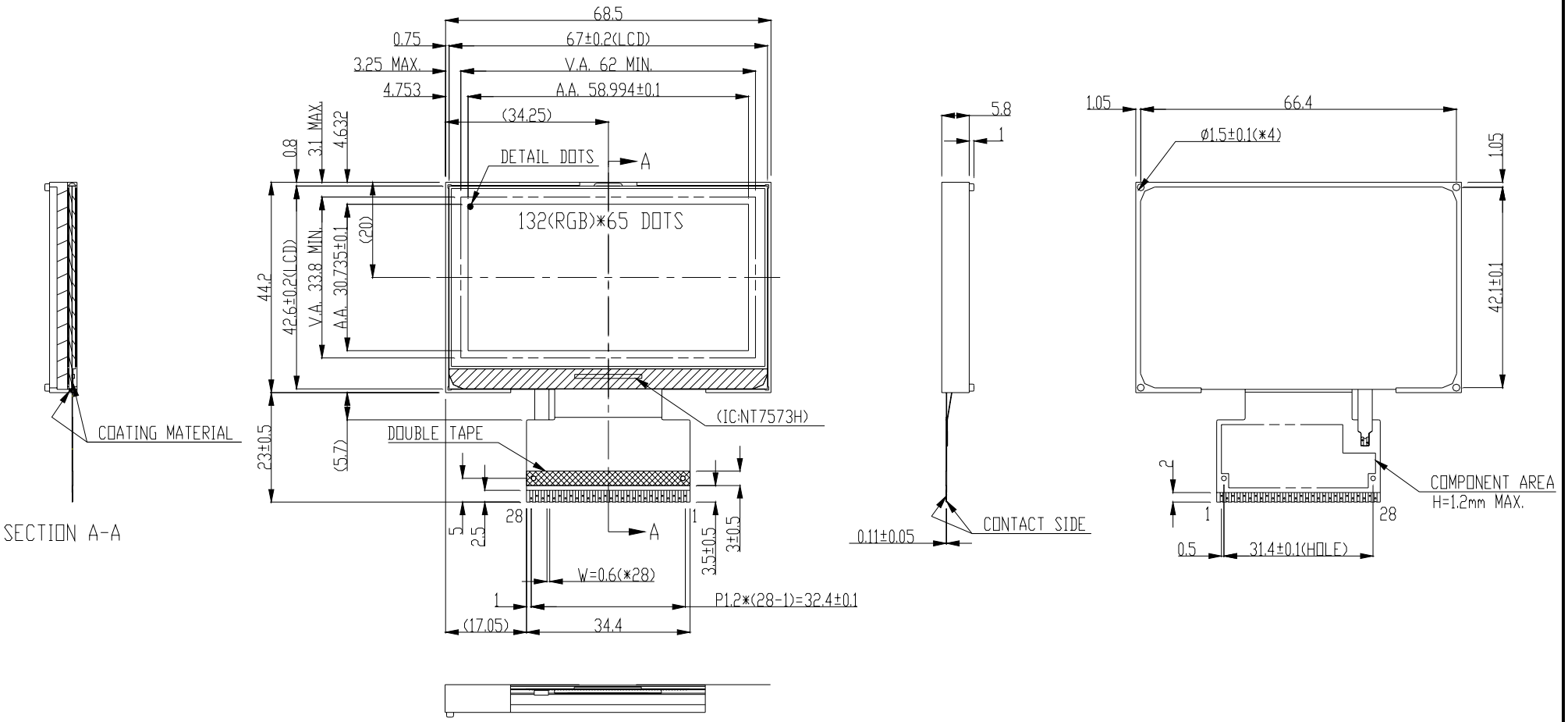
NOTE (1): PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU – 004B)

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



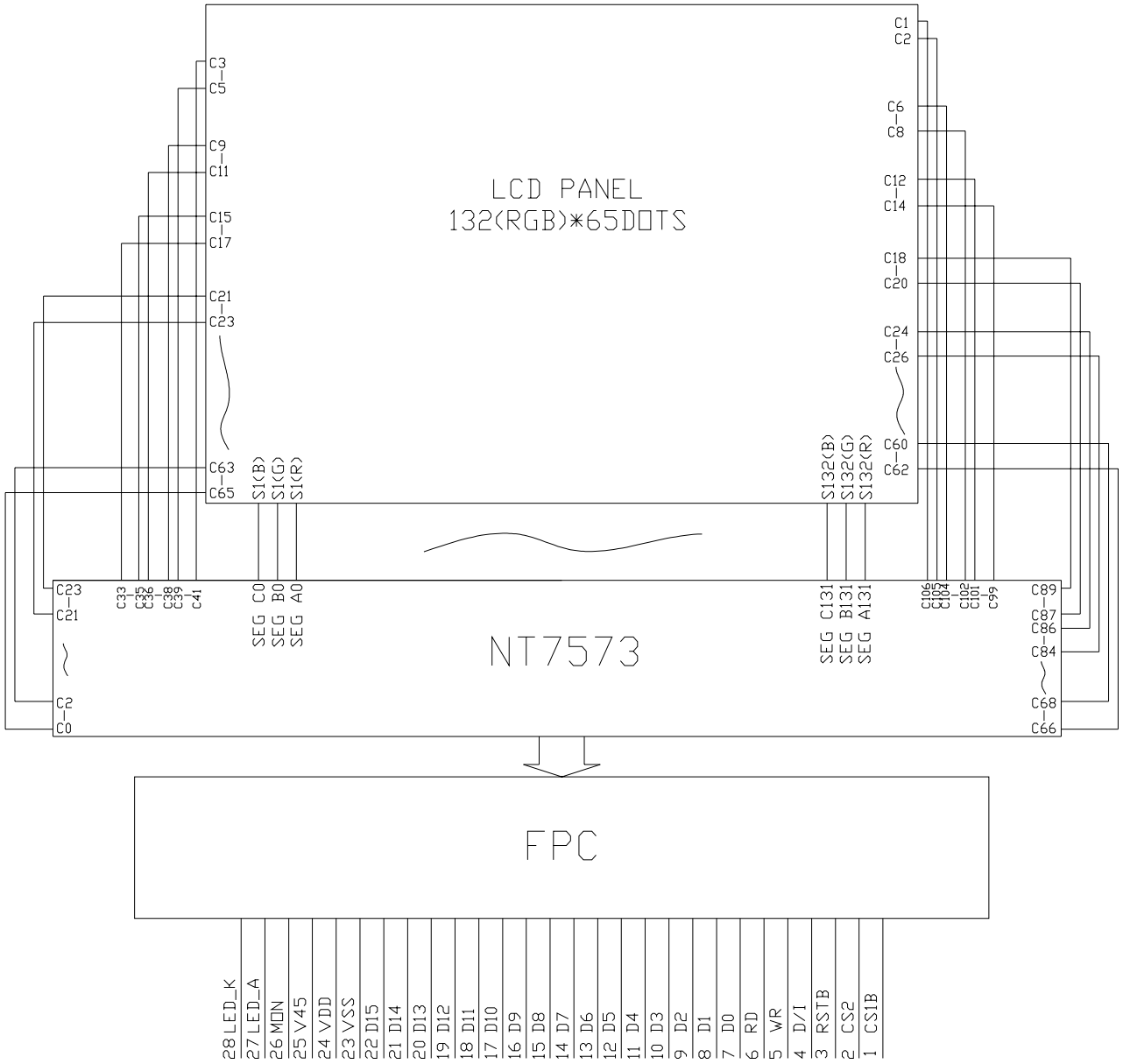
$$\Sigma_X = \left[1 - \frac{\text{(MAXIMUN BRIGHTNESS - MINIMUN BRIGHTNESS)}}{\text{AVERAGE BRIGHTNESS}} \right] \times 100\%$$

7 . OUTLINE DIMENSIONS

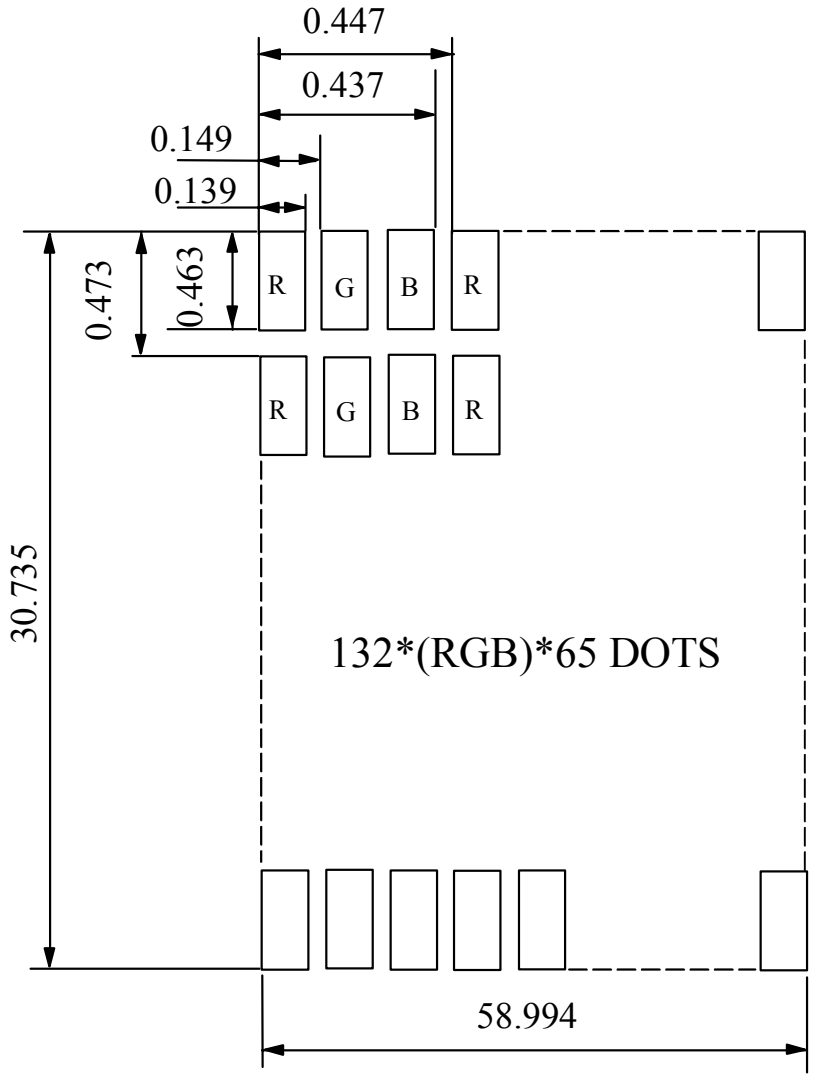


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.2

8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



UNIT : mm
SCALE : NTS
NON-SPECIFIDE TO LERANCE IS ±0.1
DOT NON-SPECIFIDE TO LERANCE IS ±0.01

10 INTERFACE SIGNALS

PIN NO	SYMBOL	I/O	FUNCTION
1	CS1B	I	CHIP SELECT INPUT PIN
2	CS2	I	WHEN CS1B IS “L” AND CS2 IS “H” THE DATA/ COMMAND I/O IS ENABLED
3	RSTB	I	WHEN RSTB IS SET TO “L” , THE SETTINGS ARE INITIALIZED
4	D/I	I	D/I = “H”：INDICATES THAT D0 TO D15 ARE DISPLAY DATA D/I = “L”：INDICATES THAT D0 TO D15 ARE CONTROL DATA
5	WR	I	WHEN 8080 MPU IS SELECTED , THIS IS THE WRITE ENABLE CLOCK INPUT PIN. THE DATA ON D0 TO D15 ARE LATCHED AT THE RISING EDGE OF THE WR SIGNAL.
6	RD	I	WHEN 8080 MPU IS SELECTED , THIS IS THE READ ENABLE CLOCK INPUT PIN. THE DATA ON D0 TO D15 ARE IN OUTPUT STATUS WHEN RD IS ”L”.
7	D0	I/O	DATA BUS PIN
8	D1	I/O	
9	D2	I/O	
10	D3	I/O	
11	D4	I/O	
12	D5	I/O	
13	D6	I/O	
14	D7	I/O	
15	D8	I/O	
16	D9	I/O	
17	D10	I/O	
18	D11	I/O	
19	D12	I/O	
20	D13	I/O	
21	D14	I/O	
22	D15	I/O	
23	VSS	I	GROUND
24	VDD	I	MAIN POWER SUPPLY
25	V45(MTP)	—	NO CONNECT
26	MON	—	NO CONNECT
27	LED_A	I	BACKLIGHT ANODE INPUT
28	LED_K	I	BACKLIGHT CATHOD INPUT

11 POWER SUPPLY

11.1 POWER SUPPLY FOR LCM

11.2 POWER SUPPLY FOR LCD BACKLIGHT