

EXAMINED BY :  <i>[Signature]</i>	EMERGING DISPLAY  TECHNOLOGIES CORPORATION	FILE NO . CAS-50149
APPROVED BY:  David Chang		ISSUE : MAR.15,2001
		TOTAL PAGE : 17
		VERSION : 8

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

EG50070FLY

FOR MESSRS :

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CUSTOMER'S APPROVAL

DATE :  
\_\_\_\_\_

BY :  
\_\_\_\_\_

EMERGING DISPLAY  
TECHNOLOGIES CORPORATION

MODEL NO. <b>EG50070FLY</b>	VERSION <b>8</b>
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RECORDS OF REVISION		DOC . FIRST ISSUE	OCT.19,1999
DATE	REVISED PAGE NO.	SUMMARY	
OCT.21,1999	5	5.2 SWITCHING CHARACTERISTICS CL1 SET UP TIME : 25ns → 51ns CL1 T0 CL2 TIME : 25ns → 51ns FLM SET UP TIME : 200ns(MAX) → 30ns(MIN) FLM HOLD TIME : 200ns(MAX) → 50ns(MIN) ADDITIONS (1) DISPOFF REMOVAL TIME (2) DISPOFF LOW PULSE WIDTH	
	11	ADD PAGE 11 (1) POWER SUPPLY FOR LED BACKLIGHT (2) POWER SEQUENCING DIAGRAM FOR VDD, <u>DISPLAYOFF</u> , AND V0	
OCT.22,1999	7	OUTLINE DIMENSION WAS CHANGED. ADD PAGE 7-1 (BACK SIDE DIMENSION.)	
OCT.25,1999	7-1	FLEX-CABLE POSITION WAS CHANGED.	
JAN.05,2000	7,7-1	7. OUTLINE DIMENSION WAS CHANGED.	
JAN.10,2000	9~12	SCREW HOLE WAS CHANGED	
MAY,10,2000	7	7. OUTLINE DIMENSION ① FLEX-CABLE'S OUTLINE WAS CHANGED . ② FLEX-CABLE'S STIFFENER WAS CHANGED . ( 9.5mm → 13.5mm )	
	8	7.2 COMPONENT SIDE ① FLEX-CABLE'S OUTLINE DIMENSION WAS ADDED . ② HELGHT OF THESE LED PINS WAS CHANGED . ( 0.7mm → 0.35mm max )	
MAR.15,2001	2	3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATING ① OPERATING 0°C(MIN)~50°C(MAX) → -20°C(MIN)~70°C(MAX) ② STORAGE -20°C(MIN)~70°C(MAX) → -30°C(MIN)~80°C(MAX) ③ NOTE(2) : Ta AT-20°C:48HR MAX 70°C:168HR MAX → -30°C,80°C	
	3	4. ELECTRICAL CHARACTERISTICS CONDITION Ta=0°C → -20°C, TYP (20.0) → (18.9) Ta=50°C → 70°C, TYP (16.0) → (17.1)	

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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

EU - 002A

1.2 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

(1) NUMBER OF DOTS	-----	105W * 140H DOTS
(2) MODULE SIZE	-----	48.0W * 65.0H * 11.5D (max.) mm
(3) EFFECTIVE AREA	-----	34.5W * 45H mm
(4) ACTIVE AREA	-----	31.48W * 41.98H mm
(5) DOT SIZE	-----	0.28W * 0.28H mm
(8) DOT PITCH	-----	0.30W * 0.30H mm
(9) LCD TYPE	-----	FSTN, POSITIVE, BLACK/WHITE, TRANSFLECTIVE
(10) DRIVING METHOD	-----	1 / 140 DUTY MULTIPLEX DRIVE
(11) VIEWING DIRECTION	-----	6 O'CLOCK
(12) BACK LIGHT	-----	LED; COLOR : YELLOW GREEN

### 3. ABSOLUTE MAXIMUM RATINGS

#### 3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS . ( AT Ta = 25 °C )

PARAMETER	SYMBOL	MIN .	MAX .	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD — VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVE	V0 — VSS	0	+45.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR LED	VLED-VLSS	—	4.0	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 <sup>2</sup> (0.25 G)	—	11.76 m/S <sup>2</sup> (1.2 G)	10 ~ 100HZ XYZ DIRECTIONS 1 Hr.EACH
SHOCK	—	29.4 m/S <sup>2</sup> (3 G)	—	490 m/S <sup>2</sup> (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

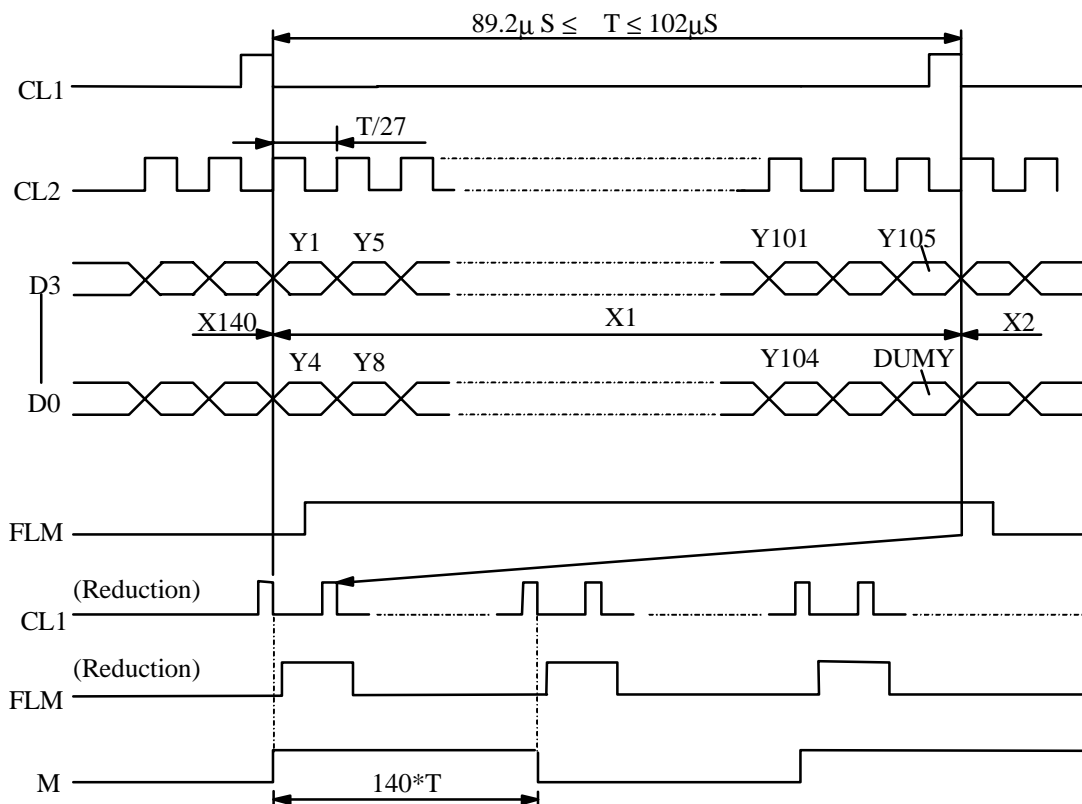
PARAMETER	SYMBOL	CONDITION	MIN .	TYP .	MAX .	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	—	2.5	—	5.0	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	V0-VSS	—	+15.0	—	+42.0	V
INPUT VOLTAGE	VIH	H LEVEL	0.8VDD	—	—	V
NOTE ( 1 )	VIL	L LEVEL	—	—	0.2VDD	V
POWER SUPPLY CURRENT FOR LOGIC NOTE ( 2 )	IDD	VDD-VSS =3.0V V0-VSS=18.0V	—	(1.0)	—	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE ( 2 )	I0	VDD-VSS =3.0V V0-VSS=18.0V	—	(3.0)	—	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE ( 3 )	V0-VSS ∅=10°,θ =0° DUTY=1/140	Ta = -20 °C	—	(18.9)	—	V
		Ta = 25 °C	—	(18.0)	—	V
		Ta = 70 °C	—	(17.1)	—	V
CLOCK OSCILLATION FREQUENCY	fFLM	—	70	75	80	HZ
LED POWER SUPPLY	VLED-VLSS	IF = 80 mA	—	3.0	—	V

NOTE ( 1 ) : APPLIED TO TERMINALS FLM , CL1, CL2, M, D0, D1, D2, D3.

NOTE ( 2 ) : THIS DISPLAY PATTERN IS ALL ON OR OFF.

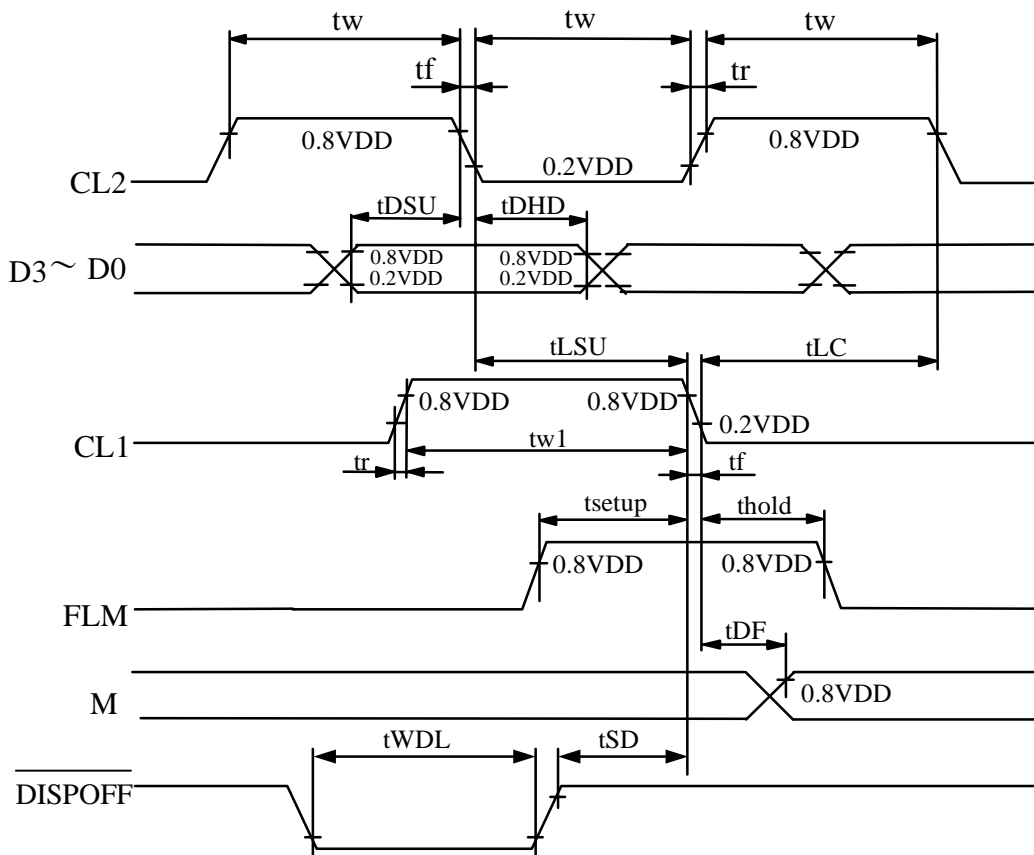
NOTE ( 3 ) : RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ± 1 . 0 V BY EACH MODULE.

5. TIMING CHARACTERISTICS  
5.1 INTERFACE TIMING



5.2 SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
CL1 PULSE WIDTH	tw1	23	—	—	ns
CL2 PULSE	tw	23	—	—	ns
RISE,FALL TIME	tr,tf	—	—	50	ns
DATA SETUP TIME	tDSU	10	—	—	ns
DATA HOLD TIME	tDHD	20	—	—	ns
CL1 SETUP TIME	tLSU	51	—	—	ns
CL1 TO CL2 TIME	tLC	51	—	—	ns
FLM SETUP TIME	tsetup	30	—	—	ns
FLM HOLD TIME	thold	50	—	—	ns
DISPOFF REMOVAL TIME	tSD	100	—	—	ns
DISPOFF LOW PULSE WIDTH	tWDL	1.2	—	—	μs





6. OPTICAL CHARACTERISTICS

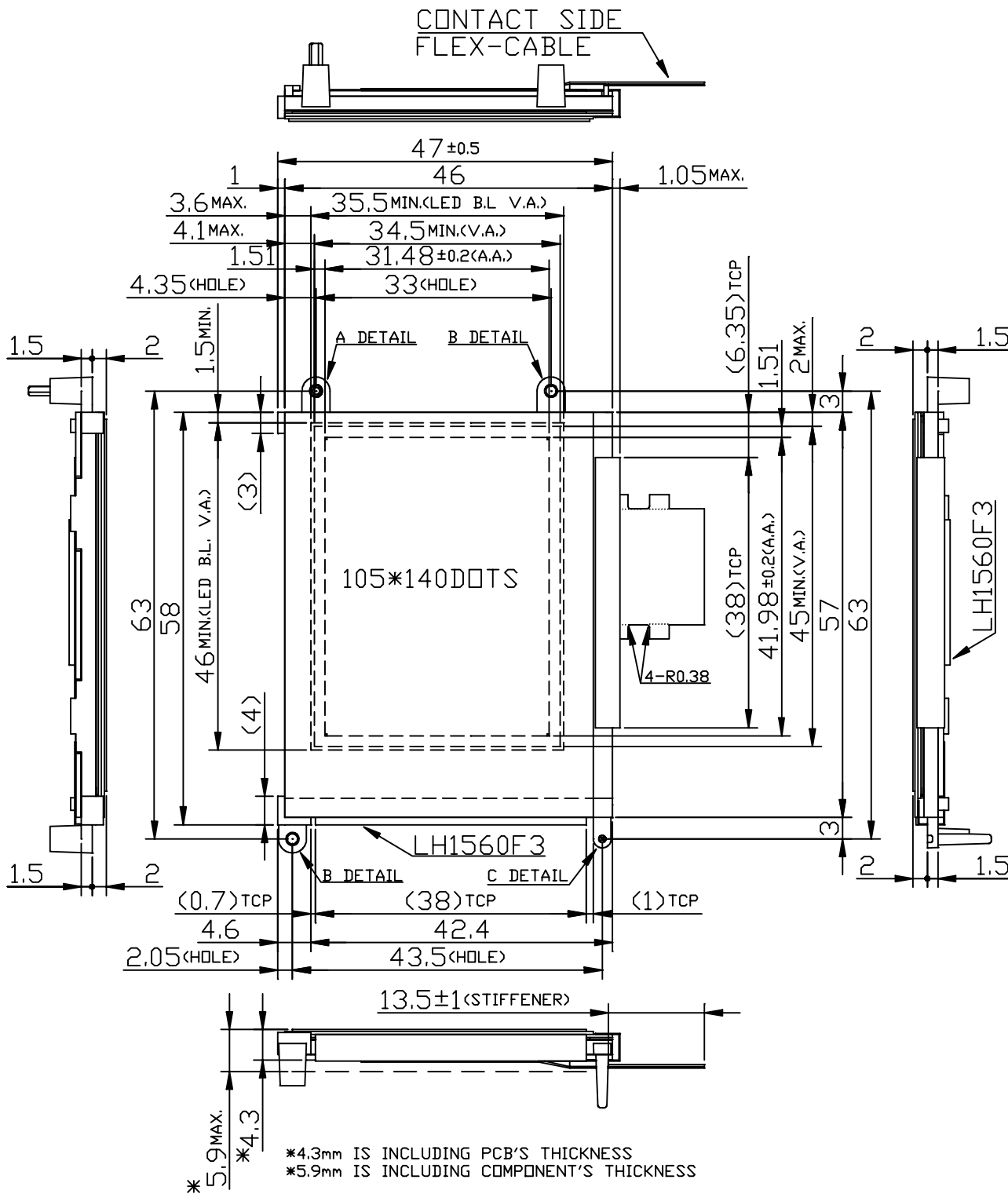
Ta = 25 °C

I T E M	SYMBOL	CONDITION	MIN .	TYP .	MAX.	UNIT	NOTE
VIEWING AREA	$\varnothing 2 - \varnothing 1$	$K \geq 2.0$	50	—	—	deg.	1
CONTRAST	K	$\varnothing = 10^\circ$	5	—	—	—	1
RESPONSE TIME	t r ( rise )	$\varnothing = 10^\circ$ $\theta = 0^\circ$	—	(330)	—	msec	1
	t f ( fall )	$\varnothing = 10^\circ$ $\theta = 0^\circ$	—	(330)	—	msec	1
THE BRIGHTNESS OF BACK-LIGHT	L	IF = 80 mA	3	—	—	cd/m <sup>2</sup>	1
PEAK EMISSION WAVELENGTH	$\lambda P$	IF = 80 mA	—	572	—	nm	1

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

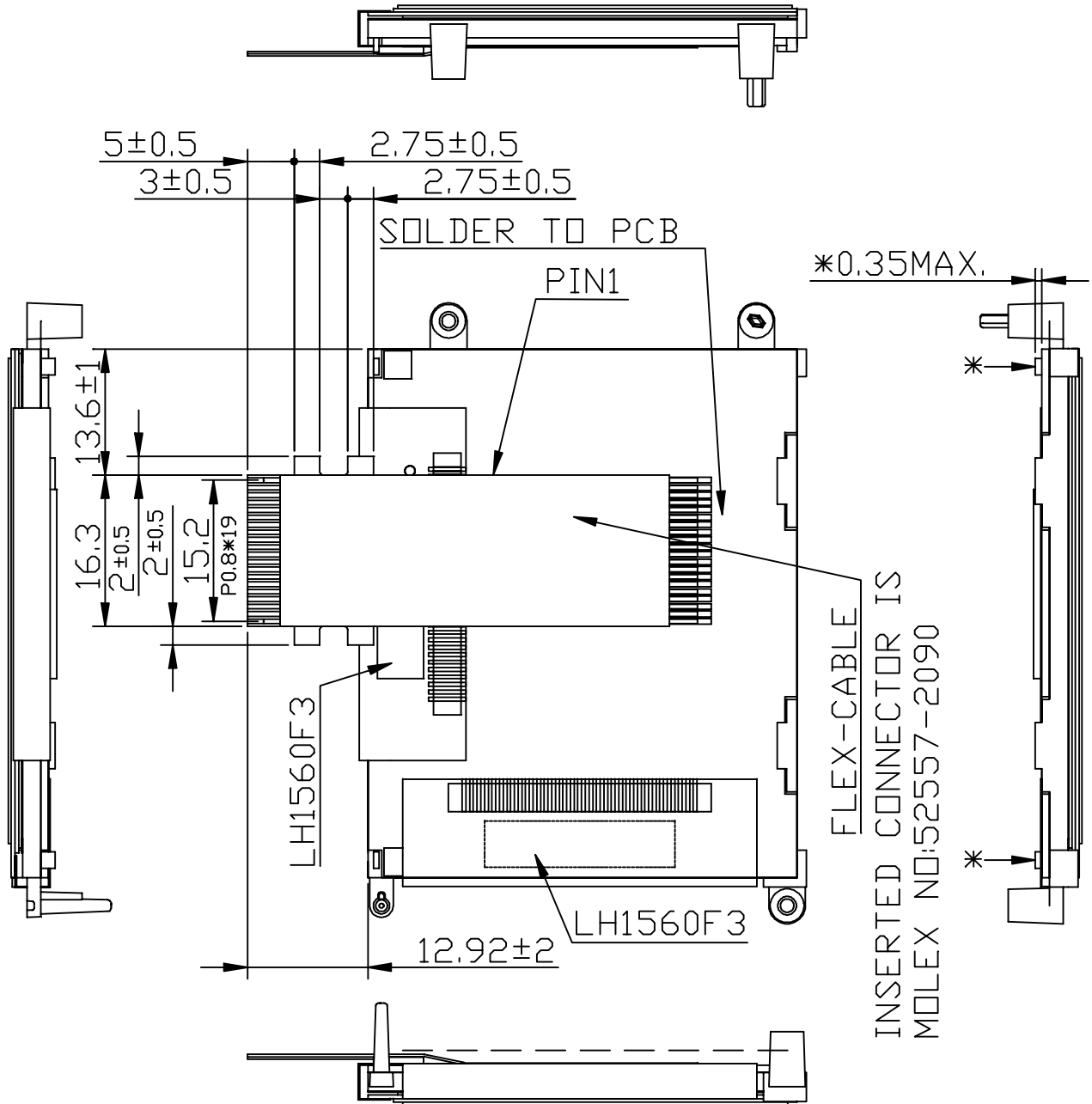
7. OUTLINE DIMENSION

7.1 LCD SIDE



UNIT : mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS ± 0.3

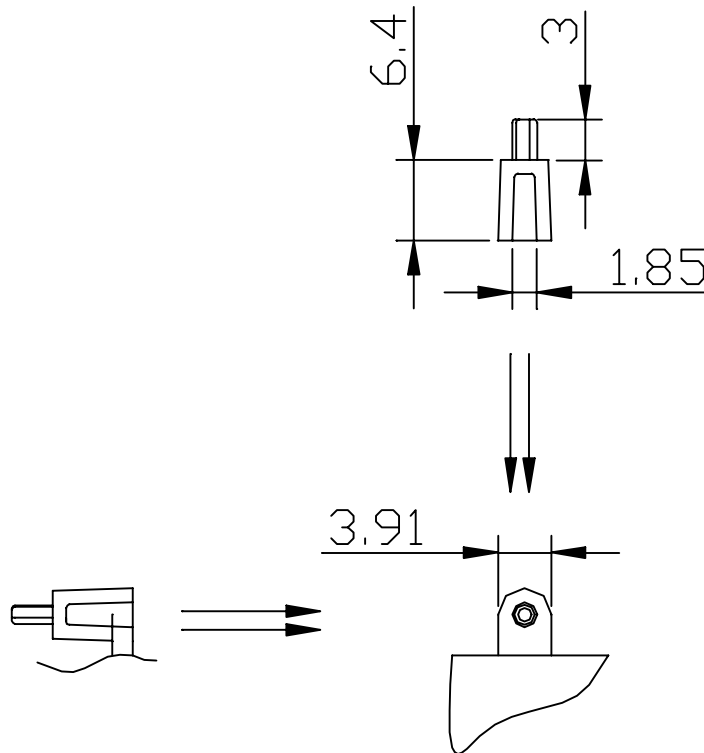
7.2 COMPONENT SIDE



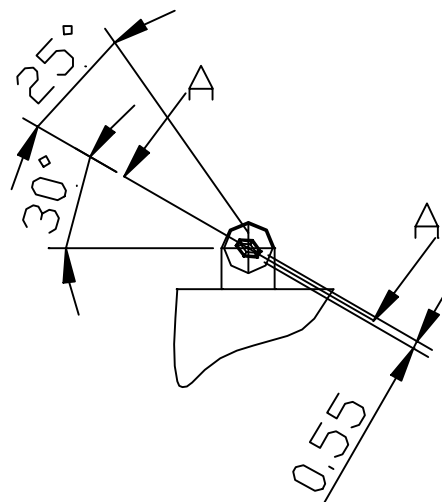
\*:HEIGHT OF THESE LED PINS ARE 0.35mmMAX.(FROM PCB SURFACE)

A DETAIL:

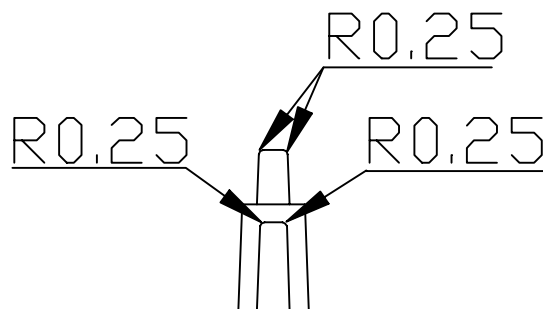
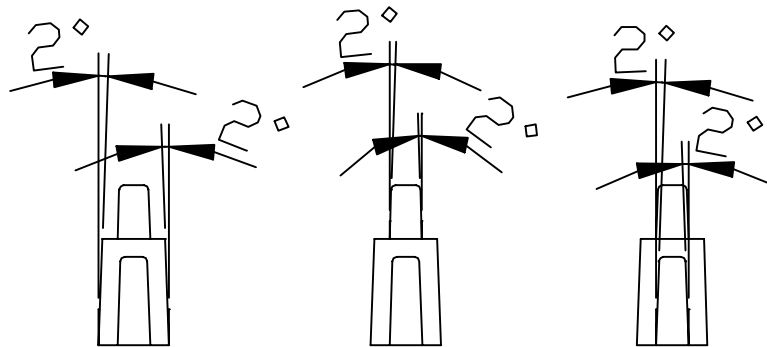
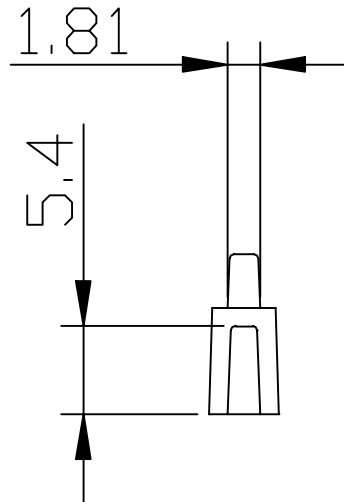
A.1.LCD SIDE



A.2.COMPONENT SIDE

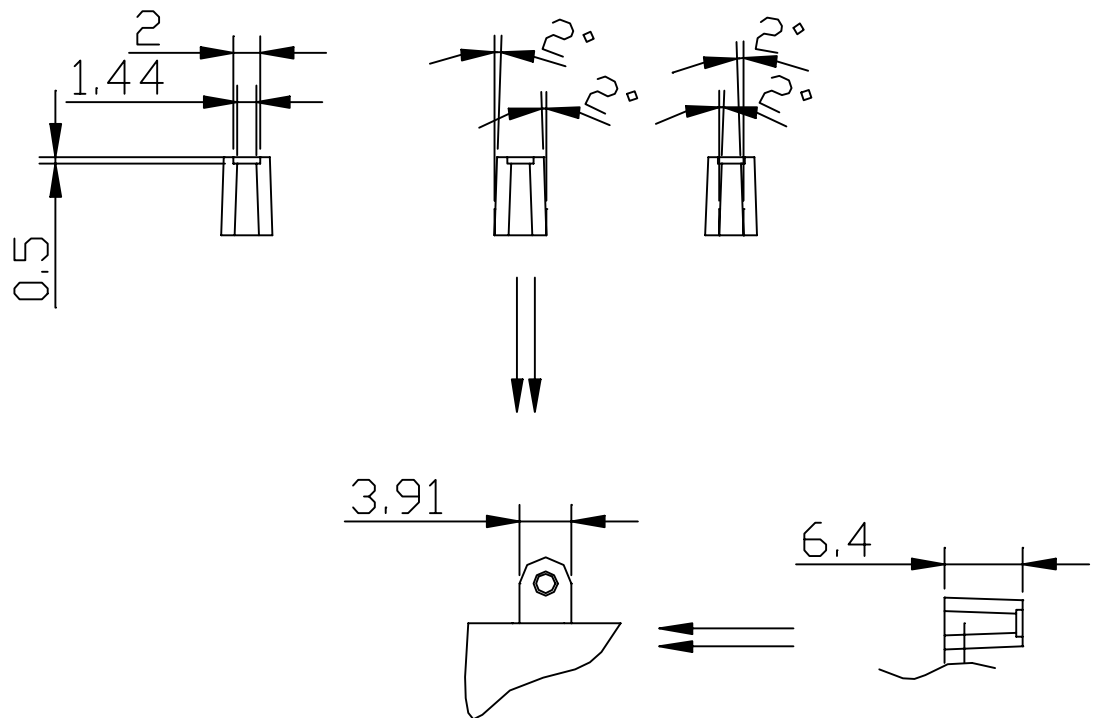


A.2.1.SECTION A-A

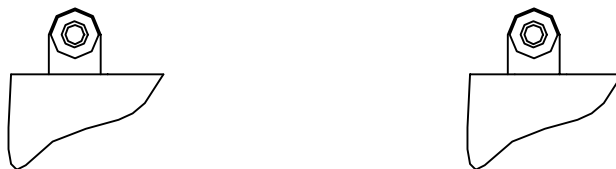


B DETAIL:

B.1.LCD SIDE

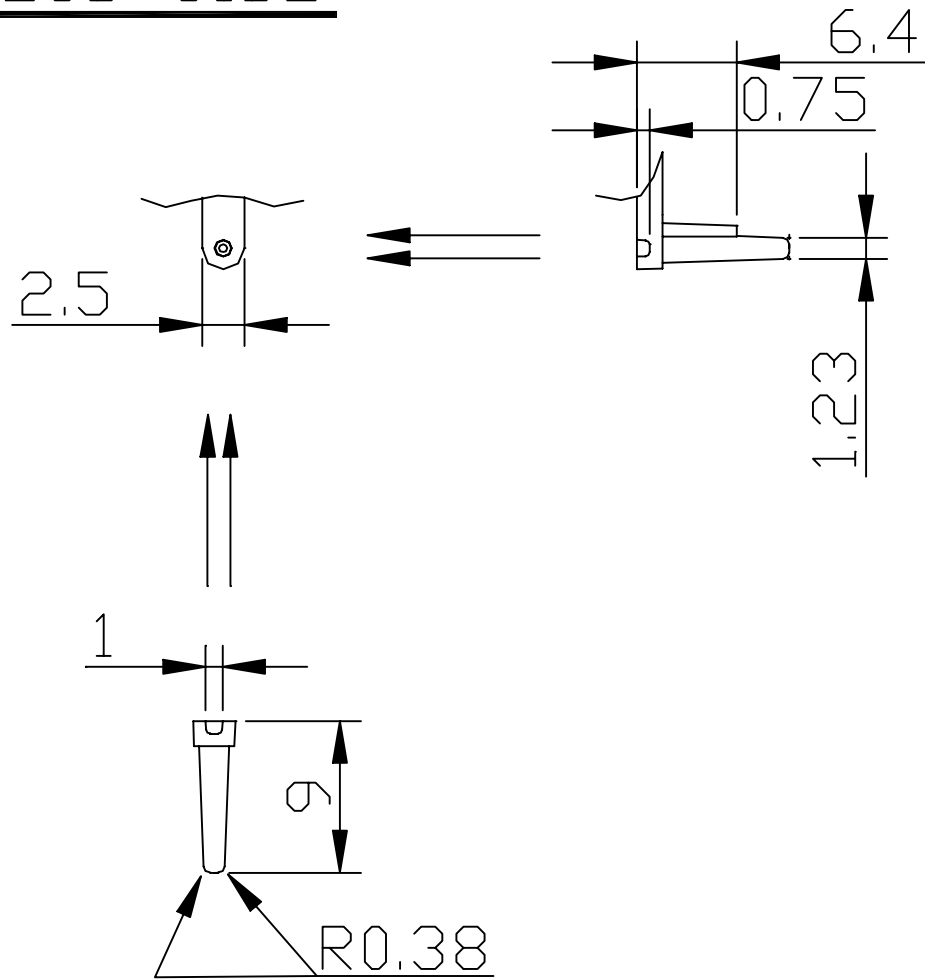


B.2.COMPONENT SIDE

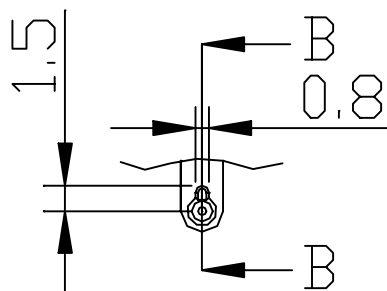


C DETAIL:

C.1.LCD SIDE

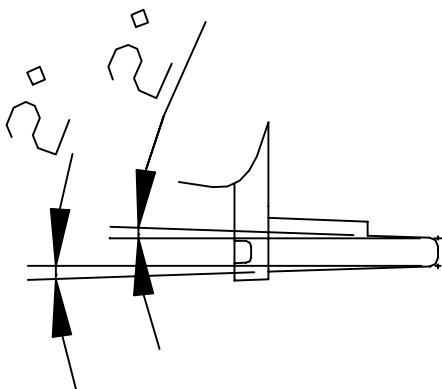
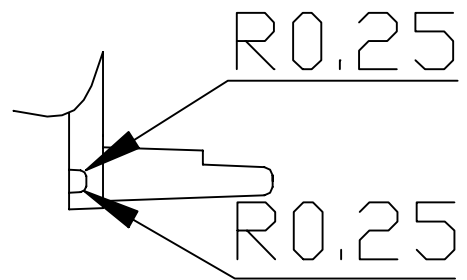
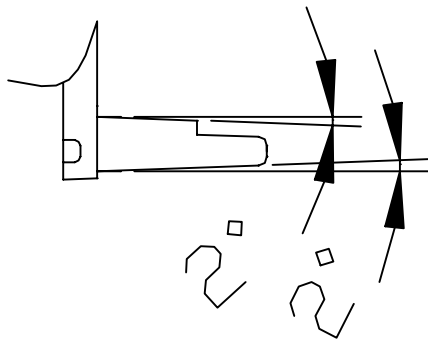
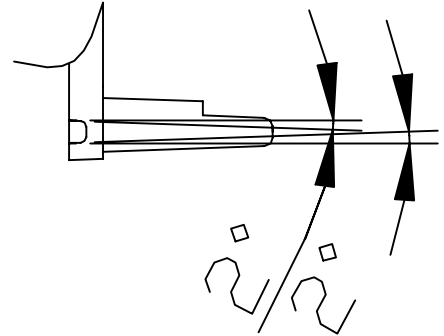
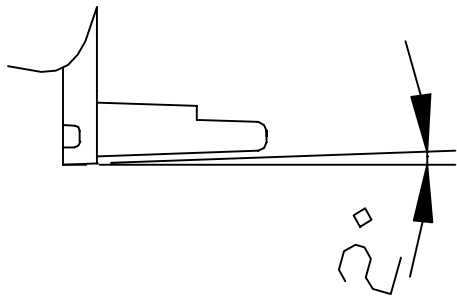


C.2.COMPONENT SIDE



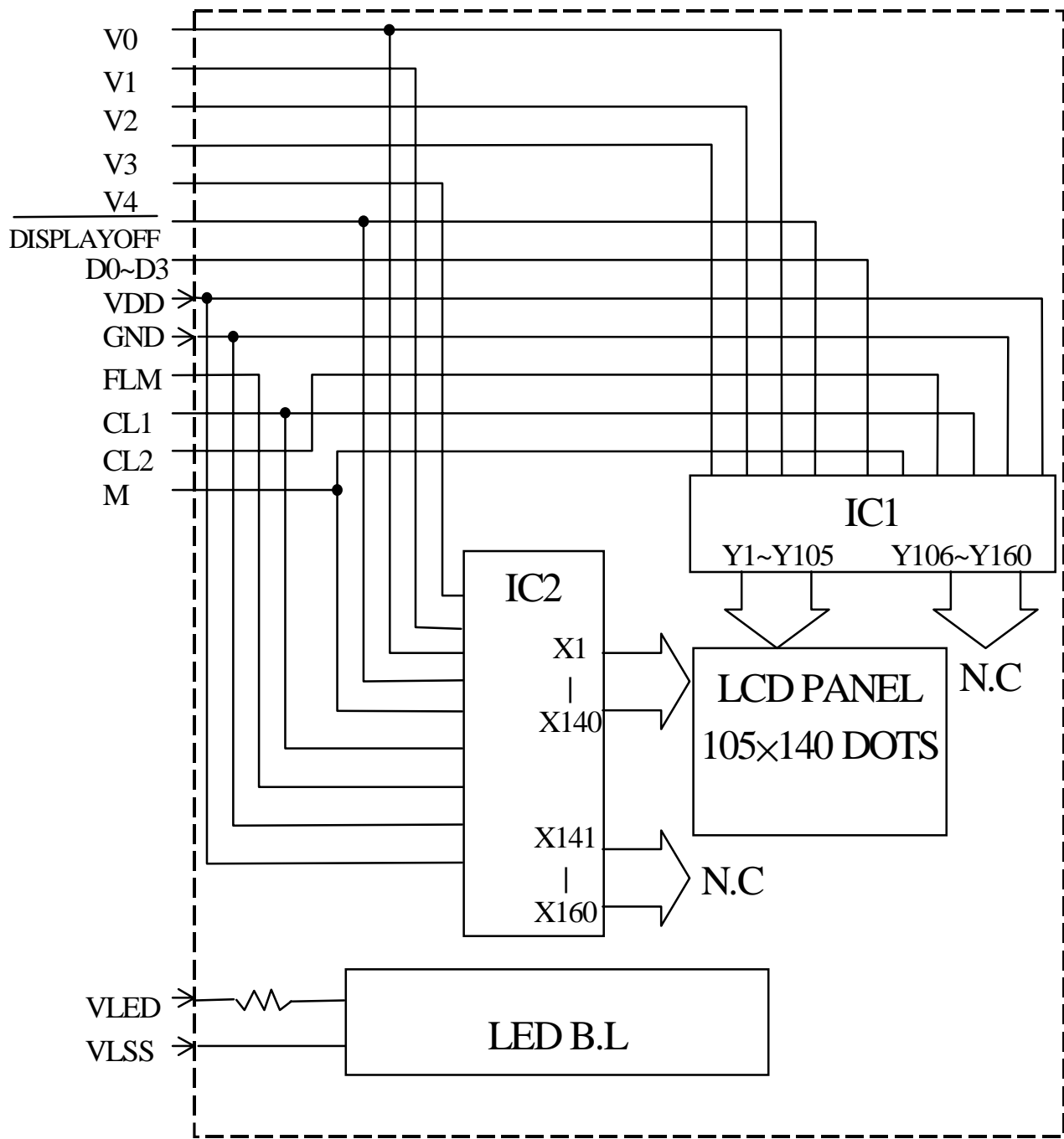
MODEL NO.	VERSION	PAGE
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## C.2.1.SECTION B-B

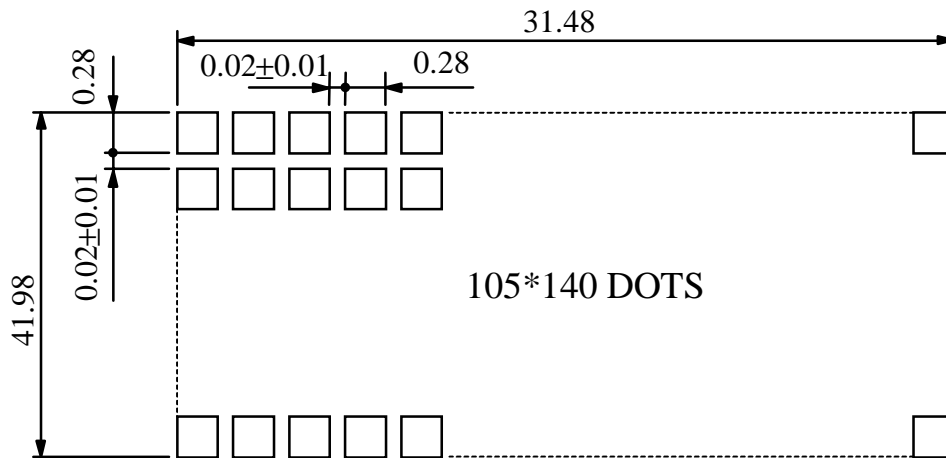




8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



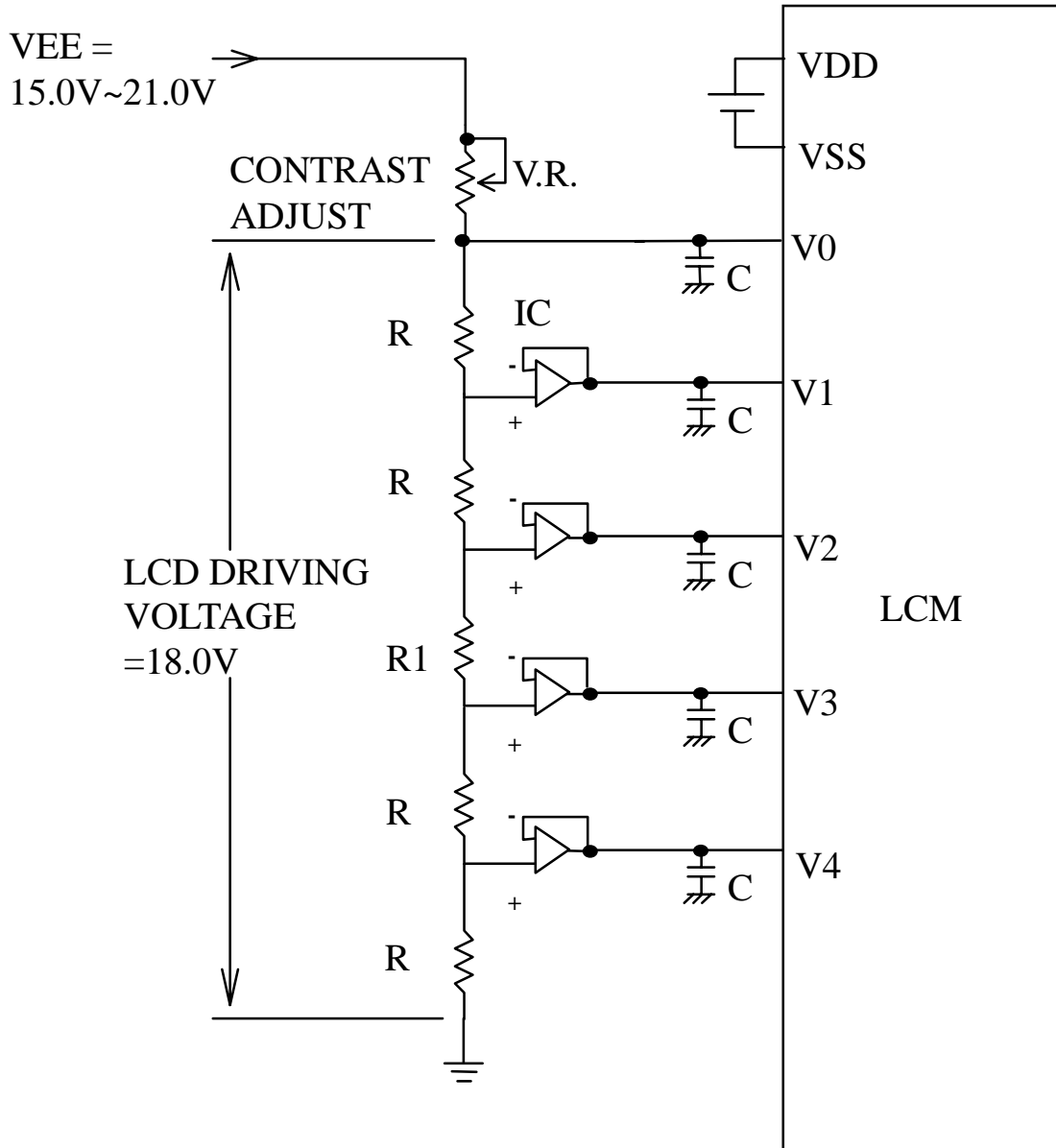
UNIT : mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS  $\pm 0.1$

10. INTERFACE SIGNALS

PIN NO.	SYMBOL	FUNCTION
1	VSS	GROUND.
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT.
3	FLM	THE FLM SIGNAL INDICATING THE BEGINNING OF EACH DISPLAY CYCLE.
4	CL1	DISPLAY DATA LATCH.
5	CL2	DISPLAY DATA SHIFT.
6	M	CONTROL SIGNAL FOR AC DRIVING.
7	D0	DISPLAY DATA
8	D1	DISPLAY DATA
9	D2	DISPLAY DATA
10	D3	DISPLAY DATA
11	$\overline{\text{DISPAYOFF}}$	CONTROLL LCD ON/OFF, "L":DISPLAY OFF,"H":DISPLAY ON.
12	VSS	GROUND
13	V0	POWER SUPPLY FOR LCD.(COM.SEG.SELECTED LEVEL)
14	V1	POWER SUPPLY FOR LCD.(COM.NON-SELECTED LEVEL)
15	V2	POWER SUPPLY FOR LCD.(SEG.NON-SELECTED LEVEL)
16	V3	POWER SUPPLY FOR LCD.(SEG.NON-SELECTED LEVEL)
17	V4	POWER SUPPLY FOR LCD.(COM.NON-SELECTED LEVEL)
18	VSS	GROUND
19	VLSD	POWER SUPPLY FOR LED BACKLIGHT (+3.0V)
20	VLSS	POWER SUPPLY FOR LED BACKLIGHT (+0V)

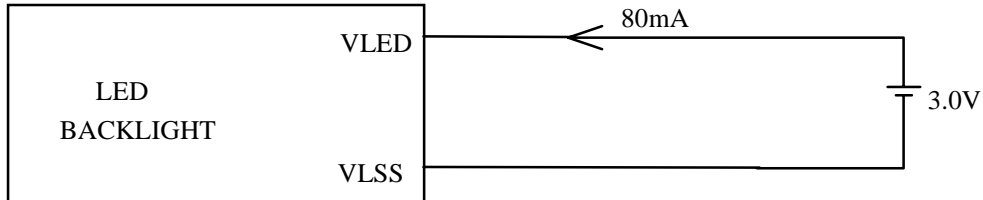
11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



R1 = 9R  
VR : 10KOHM  
C : 3.3uf/50V

11.2 POWER SUPPLY FOR LED BACKLIGHT



11.3 POWER SEQUENCING DIAGRAM FOR VDD,  $\overline{\text{DISPOFF}}$ , V0

