EXAMINED BY : Kevin Kuo	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-10095 ISSUE : APR.04.2002
APPROVED BY: Roger Yang		TOTAL PAGE : 8 VERSION : 2

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO . :

32F40(REFLECTIVE TYPES)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

ACDS 175-177 route de Genas - 69100 VILLEURBANNE - France
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EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL NO. 32F40(REFLECTIVE TYPES)	VERSION 2
RECORDS OF REVISION	DOC. FIRST ISSUE APR.10.1998	

DATE	REVISED PAGE NO.	SUMMARY
APR.04,2002	3	4. ELECTRICAL CHARACTERISTICS ① ADDING ELECTRICAL CHARACTERISTICS FOR VDD=3.3V ② REVISE LCD DRIVING VOLTAGE

PARAMETER	SYMBOL				CONDITION	MIN.	TYP.	MAX.	UNIT
RECOMMENDED LCD DRIVING VOLTAGE NOTE (3)	VDD-V0 ∅ = 10 ° θ = 0 ° DUTY = 1/240	N.T.	STN		Ta = 0 °C	—	25.1	—	V
					Ta = 25 °C	—	23.1	—	V
					Ta = 50 °C	—	20.5	—	V
			FSTN	POSITIVE	Ta = 0 °C	—	25.1	—	V
					Ta = 25 °C	—	23.3	—	V
					Ta = 50 °C	—	20.5	—	V
				NEGATIVE	Ta = 0 °C	—	25.1	—	V
					Ta = 25 °C	—	22.3	—	V
					Ta = 50 °C	—	20.5	—	V
		W.T			Ta =- 10 °C	—	24.9	—	V
					Ta = 25 °C	—	22.4	—	V
					Ta = 60 °C	—	20.0	—	V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
RECOMMENDED LCD DRIVING VOLTAGE NOTE (3)	VDD-V0 ∅ = 10 ° θ = 0 ° DUTY =1/240	Ta = -20 °C	22.7	23.7	24.7	V
		Ta = 25 °C	21.5	22.5	23.5	V
		Ta = 70 °C	19.7	20.7	21.7	V

		5. OPTICAL CHARACTERISTICS REVISE RESPONE TIME

I T E M	SYMBOL		CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
RESPONSE TIME	t r (rise)	N.T.	∅ = 1 0° θ = 0°	—	110	—	msec	1
		W.T.		—	300	—	msec	1
	t f (fall)	N.T.	∅ = 1 0° θ = 0°	—	220	—	msec	1
		W.T.		—	190	—	msec	1

I T E M	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	NOTE
RESPONSE TIME	t r (rise)	∅ = 1 0° θ = 0°	Ta = -20 °C	—	3816	—	msec	1
			Ta = 25 °C	—	310	—	msec	1
			Ta = 70 °C	—	96	—	msec	1
	t f (fall)	∅ = 1 0° θ = 0°	Ta = -20 °C	—	2411	—	msec	1
			Ta = 25 °C	—	158	—	msec	1
			Ta = 70 °C	—	89	—	msec	1

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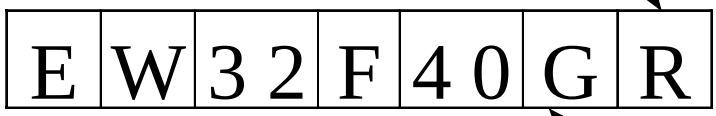
NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Reflective	—	R



LCD type + LCD color	Code Value
STN + Gray	G
FSTN + White	F

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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 1 A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER : SED1335
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - S E D 1 3 3 5

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF DOTS	320W * 240H DOTS
(2)	MODULE SIZE	160.0W * 109.0H * 11.0D mm
(3)	EFFECTIVE AREA	120.0W * 90.0H mm
(4)	ACTIVE AREA	115.17W * 86.37H mm
(5)	DOT SIZE	0.33W * 0.33H mm
(6)	DOT PITCH	0.36W * 0.36H mm
(7)	LCD TYPE *	
(8)	DRIVING METHOD	1 / 240 DUTY MULTIPLEX DRIVE
(9)	VIEWING DIRECTION	6 O'CLOCK

* PLEASE REFER TO NUMBERING SYSTEM .

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD – VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVING	VDD – VEE	0	30.0	V	
INPUT VOLTAGE	VIN	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		COMMENT
	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/s² (0.25 G)	—	11.76 m/s² (1.2 G)	10~100 HZ XYZ DIRECTIONS 1 Hr. EACH
SHOCK	—	29.4 m/s² (3 G)	—	490.0 m/s² (50 G)	1 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		—	4.5	5.0	5.5	V
			—	3.0	3.3	3.5	
INPUT VOLTAGE FOR NOTE (1)	VDD=5.0 V	VIH	H LEVEL	0.5*VDD	—	—	V
		VIL	L LEVEL	—	—	0.2*VDD	
	VDD=3.3 V	VIH	H LEVEL	0.8*VDD	—	VDD	V
		VIL	L LEVEL	VSS	—	0.2*VDD	
OUTPUT VOLTAGE FOR NOTE (1)	VDD=5.0 V	VOH	H LEVEL	2.4	—	—	V
		VOL	L LEVEL	—	—	VSS+0.4	
	VDD=3.3 V	VOH	H LEVEL	2.4	—	—	V
		VOL	L LEVEL	—	—	VSS+0.4	
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	VDD=5.0 V	IDD	VDD – VO = 22.5 V	—	25.0	—	mA
	VDD=3.3 V			—	19.0	—	
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	VDD=5.0 V	IEE		—	6.0	—	mA
	VDD=3.3 V			—	6.0	—	
RECOMMENDED LCD DRIVING VOLTA	VDD – V0 ∅= 10° θ = 0° DUTY =1/240		Ta = -20 °C	22.7	23.7	24.7	V
			Ta = 25 °C	21.5	22.5	23.5	V
			Ta = 70 °C	19.7	20.7	21.7	V
CLOCK OSCILLATION FREQUENCY	f OSC		—	—	8	—	MHz

NOTE (1): APPLIED TO TERMINALS D0 TO D7, A0, $\overline{CS}$, R/$\overline{W}$ ($\overline{WR}$), E ($\overline{RD}$)
NOTE (2): THE DISPLAY PATTERN IS ALL "ON" / "OFF".

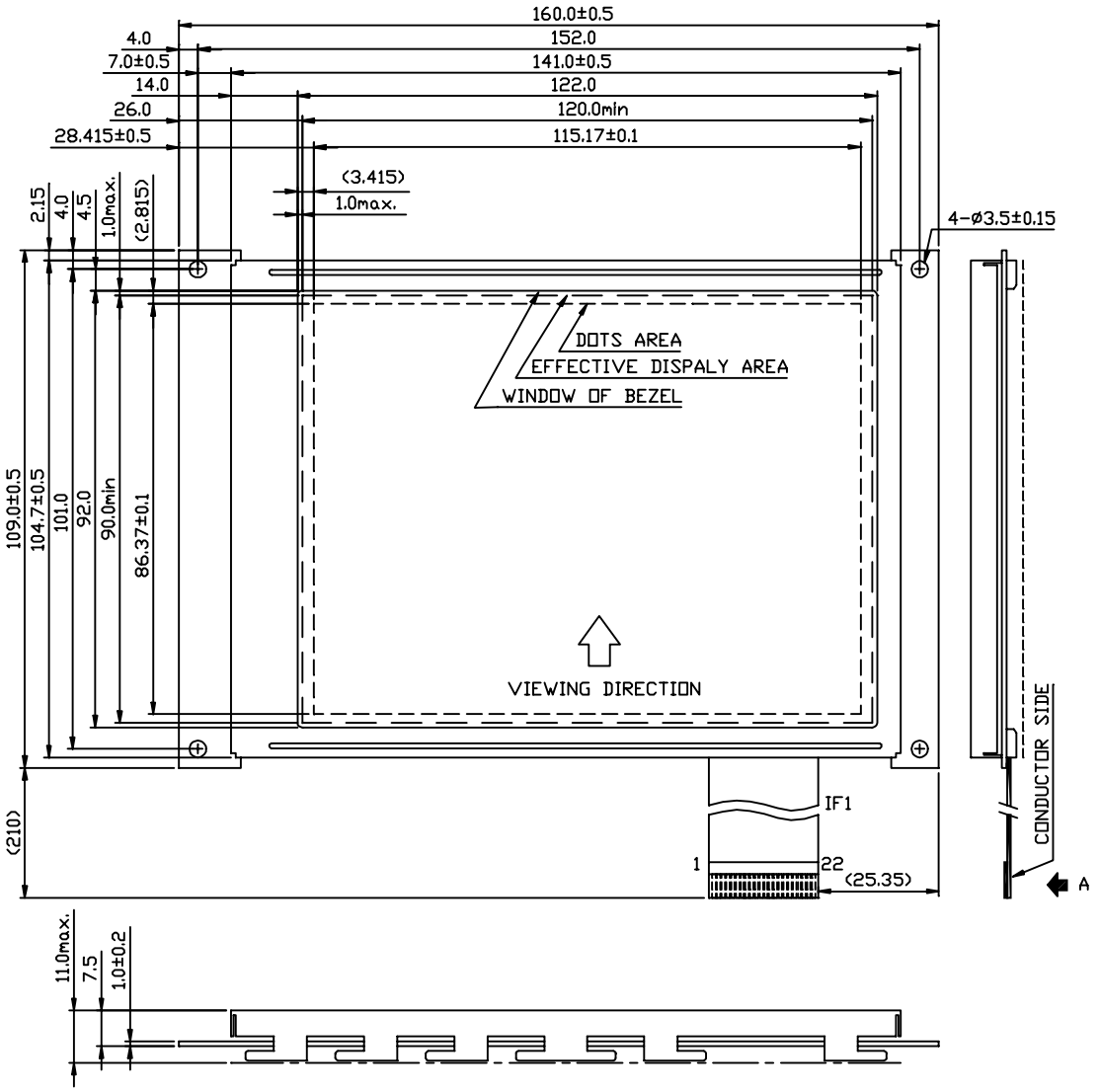
5. OPTICAL CHARACTERISTICS

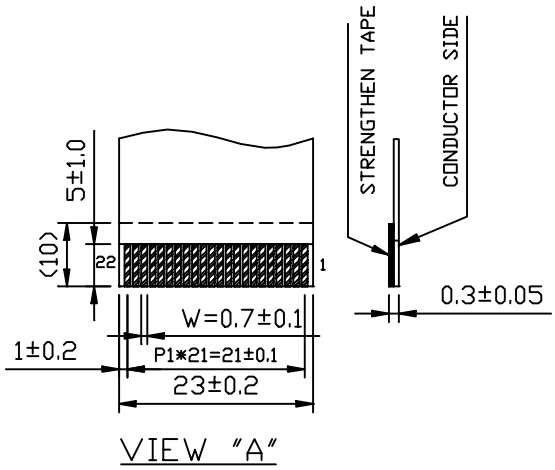
Ta = 25 ℃ VDD-V0 = 22.5V

ITEM		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	STN	∅2 – ∅1	K ≥ 2.0		—	40	—	deg.	1
	FSTN				—	50	—	deg.	1
CONTRAST RATIO	STN	K	∅ = 10° θ = 0°		—	10	—	—	1
	FSTN				—	20	—	—	1
RESPONSE TIME		t r (rise)	∅ = 10° θ = 0°	Ta = -20 °C	—	3816	—	msec	1
				Ta = 25 °C	—	310	—	msec	1
				Ta = 70 °C	—	96	—	msec	1
		t f (fall)	∅ = 10° θ = 0°	Ta = -20 °C	—	2411	—	msec	1
				Ta = 25 °C	—	158	—	msec	1
				Ta = 70 °C	—	89	—	msec	1

NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU - 001A)

6. OUTLINE DIMENSION

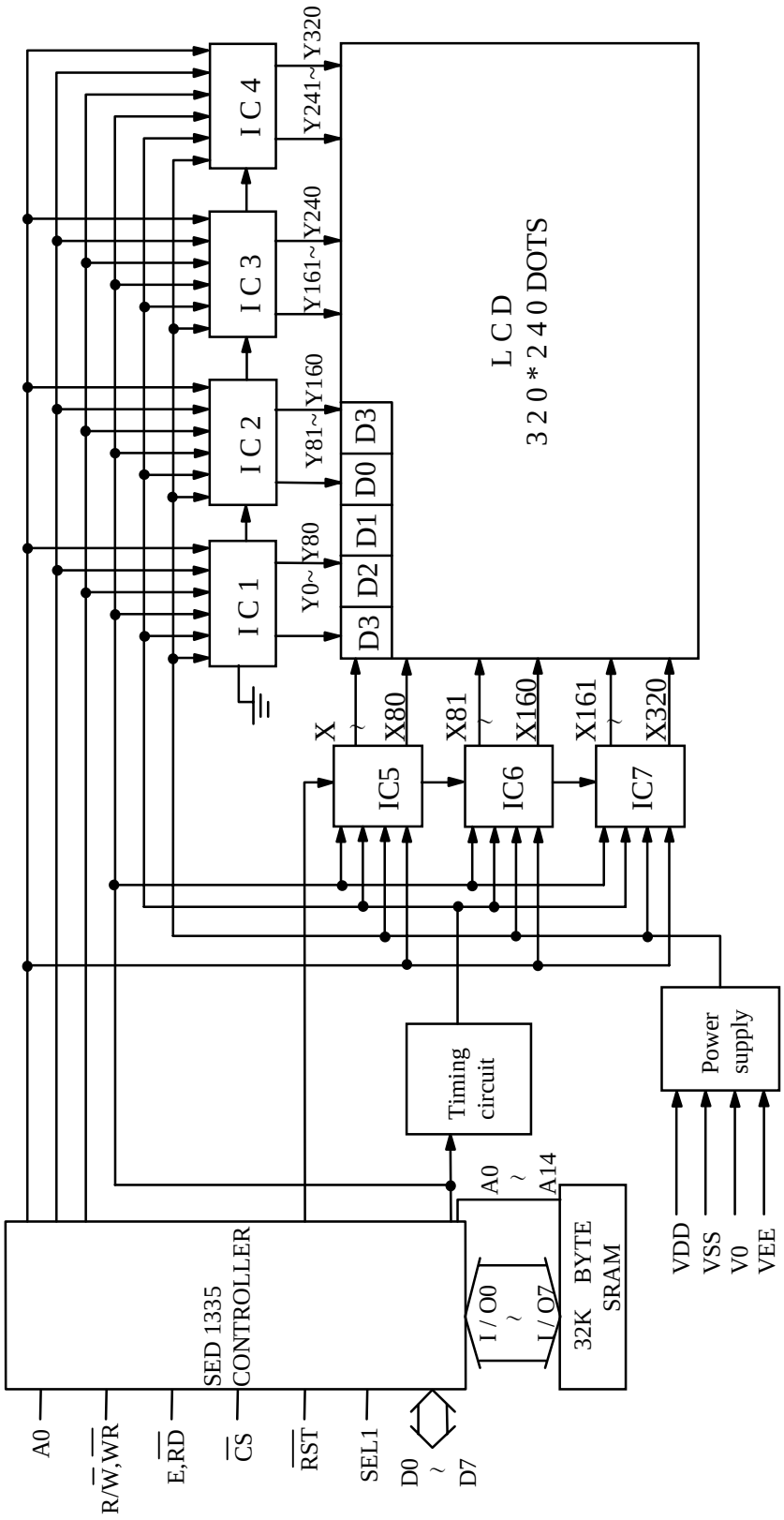




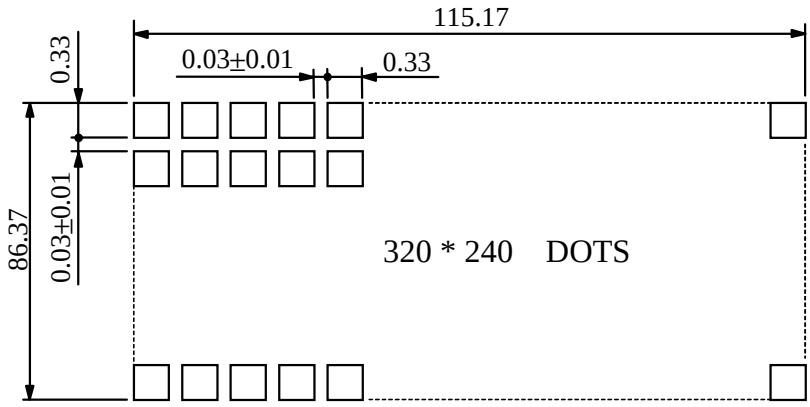
VIEW "A"

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

7. BLOCK DIAGRAM



8 . DETAIL DRAWING OF DOT MATRIX



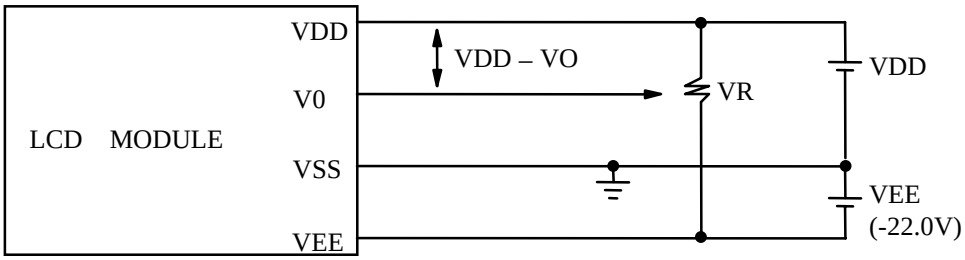
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.1

9 . INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION
1	VSS	—	GROUND
2	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT
3	VO	—	OPERATING VOLTAGE FOR LCD DRIVING
4	A0	—	8080 FAMILY INTERFACE AO / $\overline{RD}$ / $\overline{WR}$ / FUNCTION 0 / 0 / 1 / STATUS FLAG READ 1 / 0 / 1 / DISPLAY DATA AND CURSOR ADDRESS READ 0 / 1 / 0 / DISPLAY DATA AND PARAMETER WRITE 1 / 1 / 0 / COMMAND WRITE 6800 FAMILY INTERFACE AO / R/$\overline{W}$ / E / FUNCTION 0 / 1 / 1 / STATUS FLAG READ 1 / 1 / 1 / DISPLAY DATA AND CURSOR ADDRESS READ 0 / 0 / 1 / DISPLAY DATA AND PARAMETER WRITE 1 / 0 / 1 / COMMAND WRITE
5	$\overline{WR}$,R/$\overline{W}$	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW WRITE STROBE . 6800 FAMILY INTERFACE ACTS AS THE READ/ WRITE CONTROL SIGNAL .
6	$\overline{RD}$,E	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW READ STROBE . 6800 FAMILY INTERFACE ACTS AS THE ACTIVE-HIGH ENABLE CLOCK .
7~14	D0~D7	H/L	DISPLAY DATA
15	$\overline{CS}$	H/L	CHIP SELECT
16	$\overline{RST}$	H/L	RESET
17	VEE	—	POWER SUPPLY FOR LCD DRIVING
18	SEL1	H/L	8080 OR 6800 FAMILY INTERFACE SELECT , H:6800 , L:8080
19~22	NC	—	NOT USE

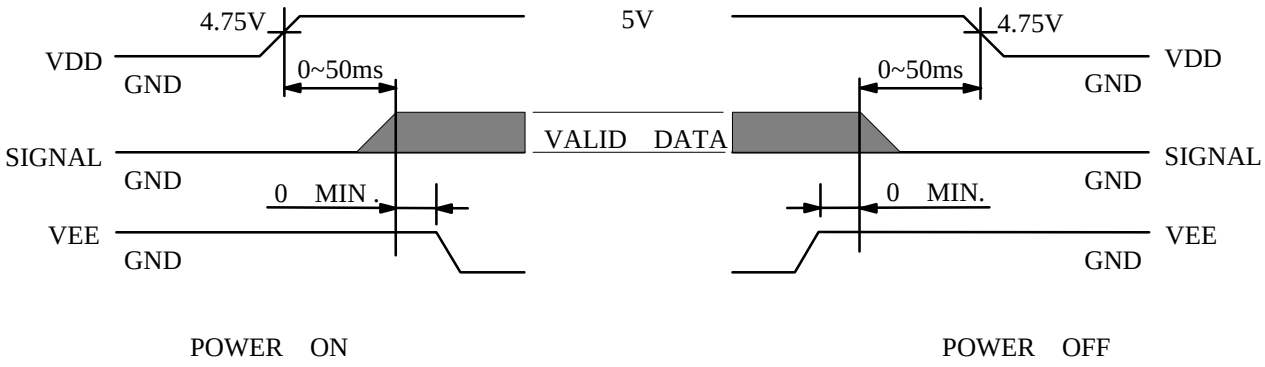
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM

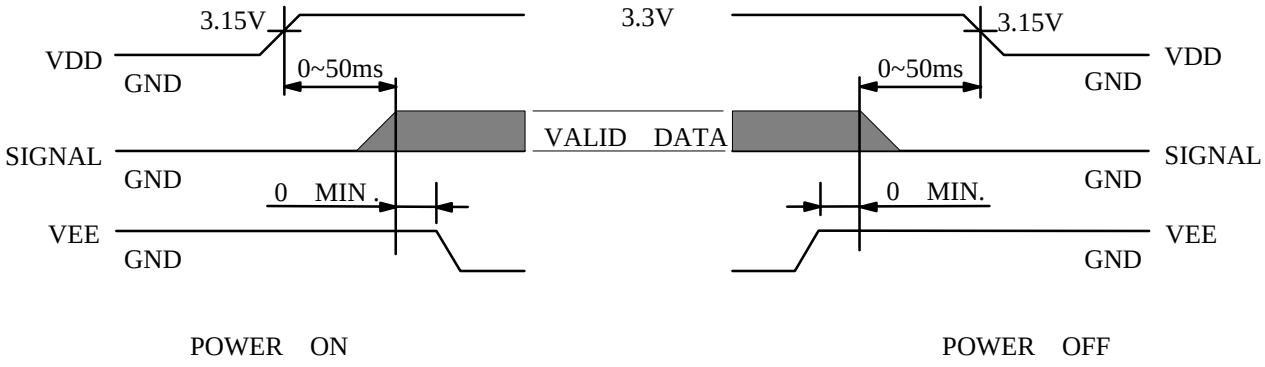


VDD – VO: LCD DRIVING VOLTAGE
VR: 20KΩ

10.2 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL



POWER ON POWER OFF



POWER ON POWER OFF