DISPLAY Elektronik GmbH

DATA SHEET

LCD MODULE

DEM 240128D FGH-PW (A-TOUCH)

Product specification ***Version :1***

07/Sep/2007

GENERAL SPECIFICATION

MODULE NO. :

DEM 240128D FGH-PW (A-TOUCH)

CUSTOMER P/N

VERSION NO.	CHANGE DESCRIPTION	DATE
0	ORIGINAL VERSION	04.09.2007
1	REVISE PIN ASSIGNMENT	07.09.2007

PREPARED BY: ZWY DATE: 07.09.2007

APPROVED BY: MH DATE: 07.09.2007

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1. FUNCTIONS & FEATURES

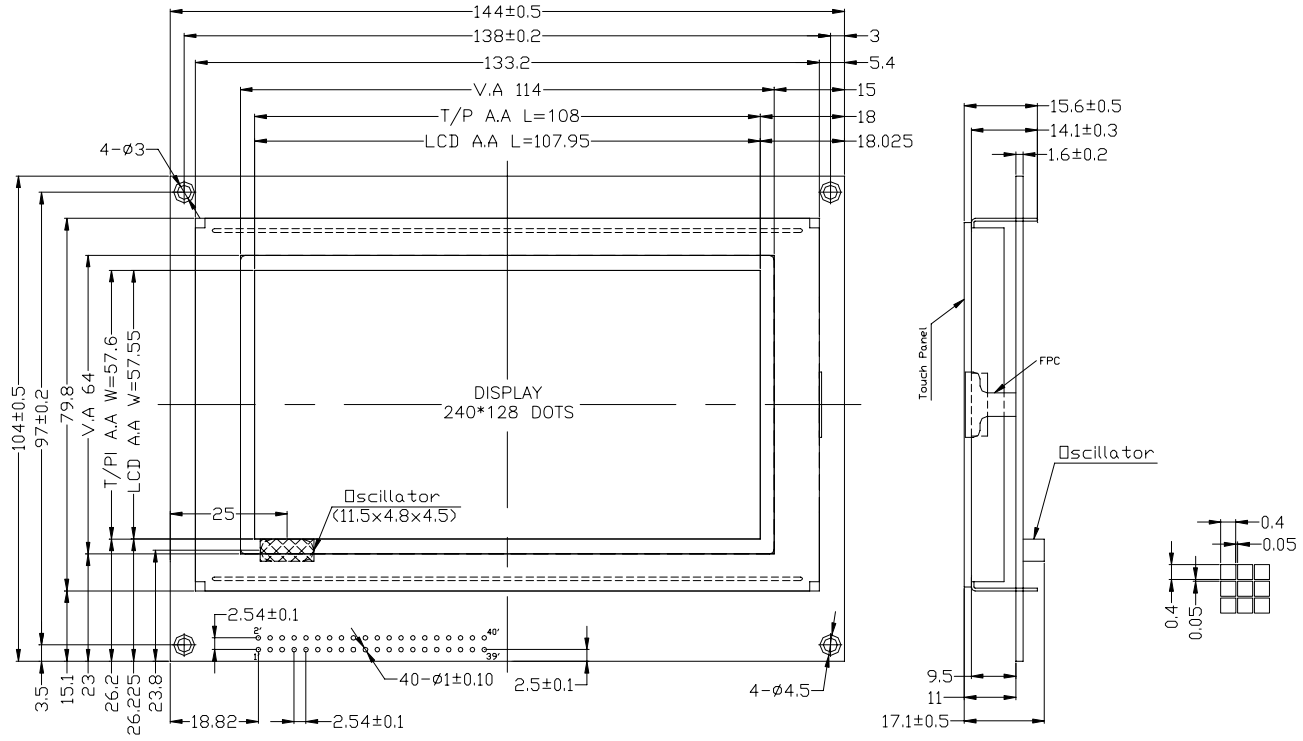
NAME	TYPE
DEM 240128D FGH-PW (A-TOUCH)	FSTN Transflective Positive Mode

- Glass Thickness : 1.1mm
- Viewing Direction : 6 O'clock
- Driving Scheme : 1/128Duty, 1/12 Bias
- Power Supply for logic : 5.0 Volt (typ.)
- Backlight Color : White, LED, Lightguide
- Display Content : 240 x 128 Dots
- V_{LCD} （V_{LCD}=VDD-V5） : 20.0 Volt (typ. @ 20°C)
- Driver IC : S6B0086 (Samsung)
- Controller IC : T6963C (Toshiba)
- Operating Temperature : -20°C to +70°C
- Storage Temperature : -25°C to +75°C
- With touch panel : Analog-4-Wire-Resisistive, Anti-Glare Type

2. MODULE ARTWORK

- Module Size : 144.00 x 104.00 x 15.6 mm (max.)
- Viewing Area : 114.00 x 64.00 mm
- Active Area : 107.95 x 57.55 mm
- Dot Pitch : 0.45 x 0.45 mm
- Dot Size : 0.40 x 0.40 mm
- Dot Gap : 0.05 mm

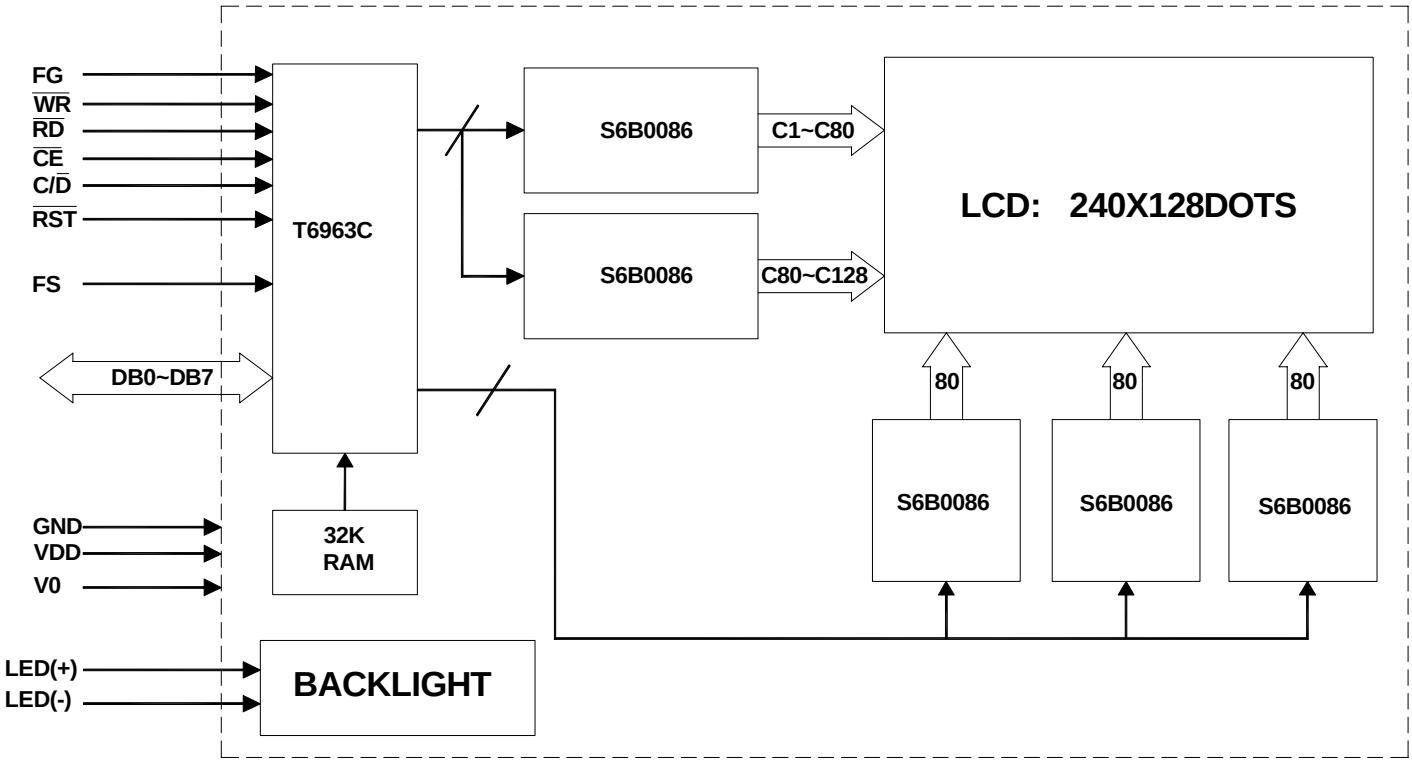
3. EXTERNAL DIMENSIONS



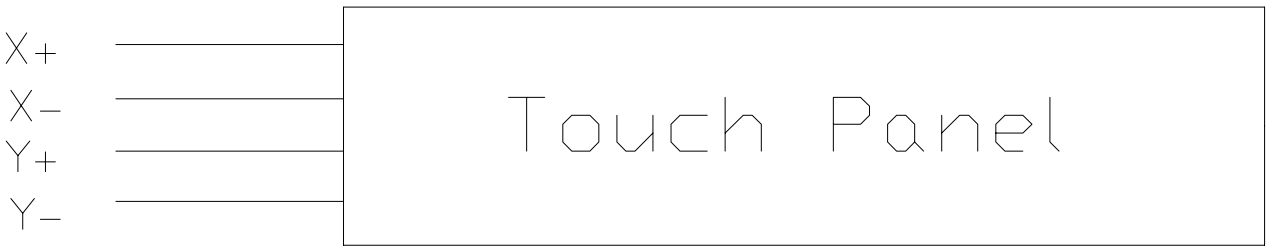
Remarks:
1,Unmarked tolerance is ±0.3
2,All materials comply with RoHs.

4. BLOCK DIAGRAM

4.1 Block Diagram of LCD Module



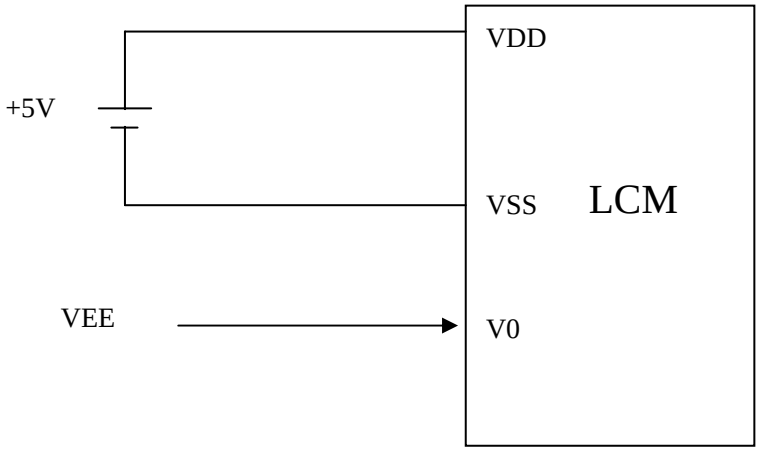
4.2 Analog Touch Screen Auto-Scanning Block Diagram



5. PIN ASSIGNMENT

NO.	SYMBOL	FUNCTION
1	FG	Frame ground
2	Y-	Y- Position Input
3	VSS	Ground(0V)
4	X+	X+ Position Input
5	VDD	Power supply for logic(+5V)
6	Y+	Y+ Position Input
7	V0	Power supply for LCD drive(-15.5V)
8	X-	X- Position Input
9	/WR	Write Command or data to module when “L”
10,12,14,16, 18,20,22,24, 26,28,30,32, 34,36,38,40	NC	
11	/RD	Read Command or data from module when “L”
13	/CE	Enable LCD controller when “L”
15	C//D	Command/data select. “H” for command read/write. “L” for data read/write
17	/RST	LCD Controller reset. Controller initialize and DB00-DB07 are set to be high impedance when/RST is “L”
19,21,23,25, 27,29,31,33,	DB0~DB7	LCD data input/output. DB0(pin10) is LSB and DB7(pin17) is MSB.
35	FS	Font select. “H” for 6x8 font & “L” for 8x8 font
37	LED+(A)	Please refer to item 8 PCB drawing and description
39	LED-(K)	

6. POWER SUPPLY

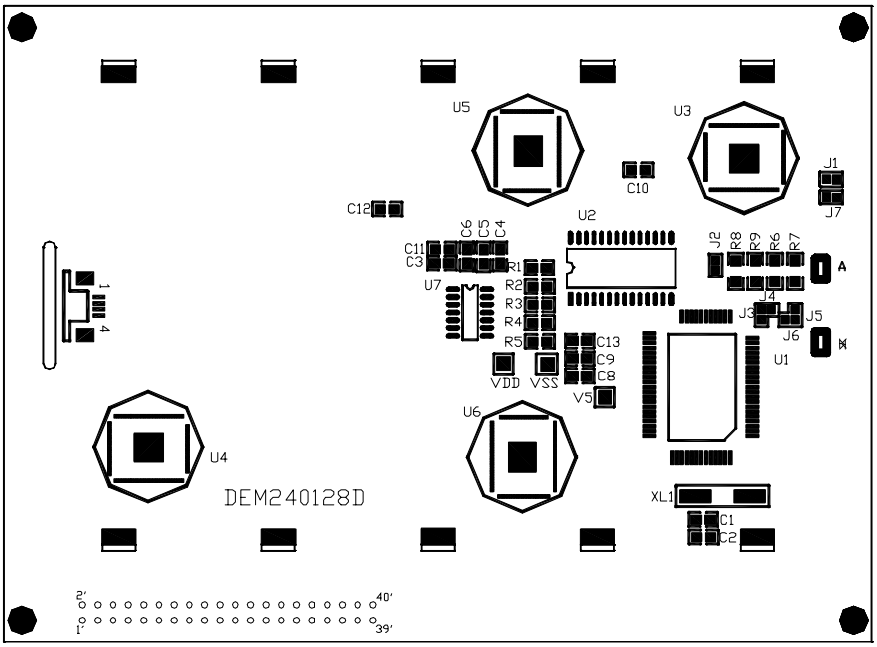


7. ABSOLUTE MAXIMUM RATINGS(Vss=0V, Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage (Logic)	V_{DD}	-0.3 to 7.0	V
Input voltage	V_{IN}	-0.3 to VDD +0.3	V
Operating Temperature	Topr	-20 to +70	°C
Storage Temperature	Tstg	-25 to +75	°C

8. PCB DRAWING AND DESCRIPTION

8.1. PCB DRAWING



8.2 DESCRIPTION:

8-2-1.The polarity of the pin 37 and the pin 39:

symbol / state	J3,J5	J6, J4	LED Polarity	
			37 Pin	39 Pin
Each solder-bridge	Each closed	Each open	Anode	Cathode
Each solder-bridge	Each open	Each closed	Cathode	Anode

Note: In application module, J3=J5=0 Ohm, J4=J6=open.

8-2-2. The J1 is metal-bezel GND to module GND and J7 is mounting holes GND to module GND.

Note: In application module, J1= J7=0 Ohm,

8-2-3. The LED resistor on board are used when J2 is open

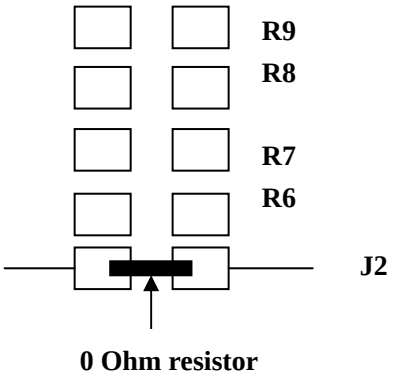
Note: In application module, J2=open

8-2-4. The R6 and the R7, R8, R9 are the LED resistor.

Note: In application module, R8=R9=82 Ohm; R6= R7=open

8.3 Example application

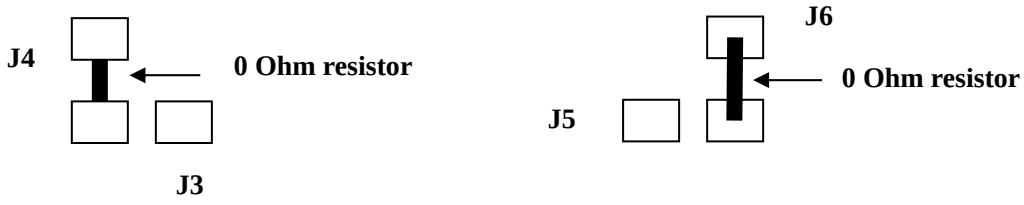
8-3-1. The LED resistors on board can be disabled when J2 is closed. Then customer needs to use external resistors



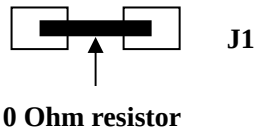
8-3-2. The 37 pin is the anode and the 39 pin is the cathode as following.



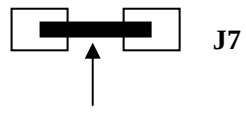
8-3-3.The 37 pin is the cathode and the 39 pin is the anode as following.



8-3-4.The metal-bezel is on ground as following



8-3-5.The holes is on ground as following



9. BACKLIGHT ELECTRICAL/OPTICAL SPECIFICATIONS

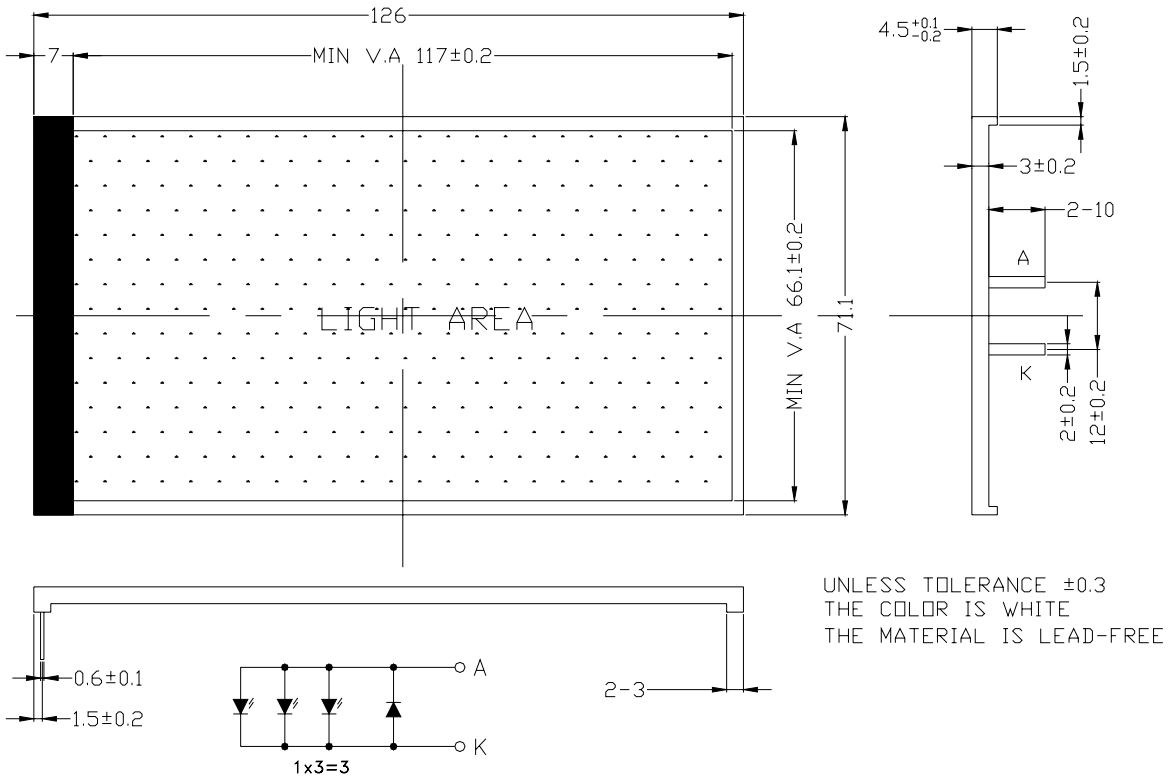
9.1 Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Conditions	Rating	Unit
Absolute Maximum Forward Current	Ifm		75	mA
Peak Forward Current	Ifp	1 Msec Plus 10% Duty Cycle	120	mA
Reverse Voltage	Vr		1	V
Power Dissipation	Pd		225	mW

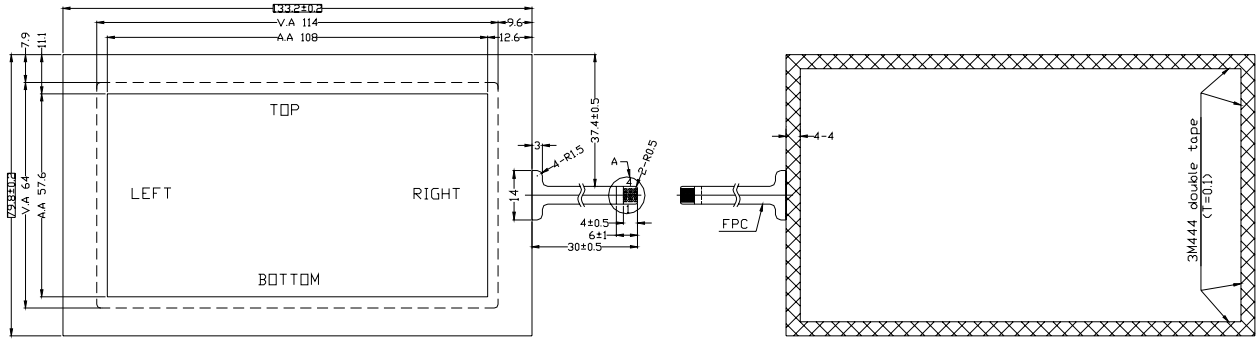
9.2 Backlight Electro/Optical Characteristics

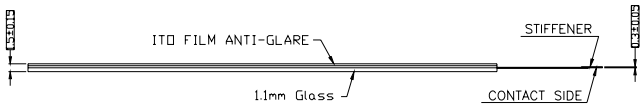
Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	Vf	2.9	3.2	3.4	V	If=45mA
Reverse Current	Ir		30		uA	Vr=0.8V
Peak Wave Length	λ p				nm	
Spectral Line Half Width	Δ λ				nm	
Luminance	Lv	60	90		cd/m^2	If=45mA
Backlight Color	White					

9.3 Backlight Drawing



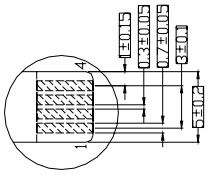
10.TOUCH PANEL DRAWING





TOUCH PANEL	
No	SYMBOL
1	BOTTOM
2	RIGHT
3	TOP
4	LEFT

Characteristics:
1,Operating voltage:DC5V
2,Operating pressure:30~70g
3,Linearity:±1.5% or less
4,Operating temperature:-10°C~+50°C
5,Storage temperature:-20°C~+70°C
6,Humidity:<90%RH
7,Transmittance:75% or more
8,Connector:FPC
9,Film Type:Anti_Glare
10,Lifetime:1000000 times
11,Response time:<10ms



Detail A

Remarks:
1,Unmarked tolerance is ±0.3,
2,The material comply with RoHS.

11. ELECTRICAL Characteristics

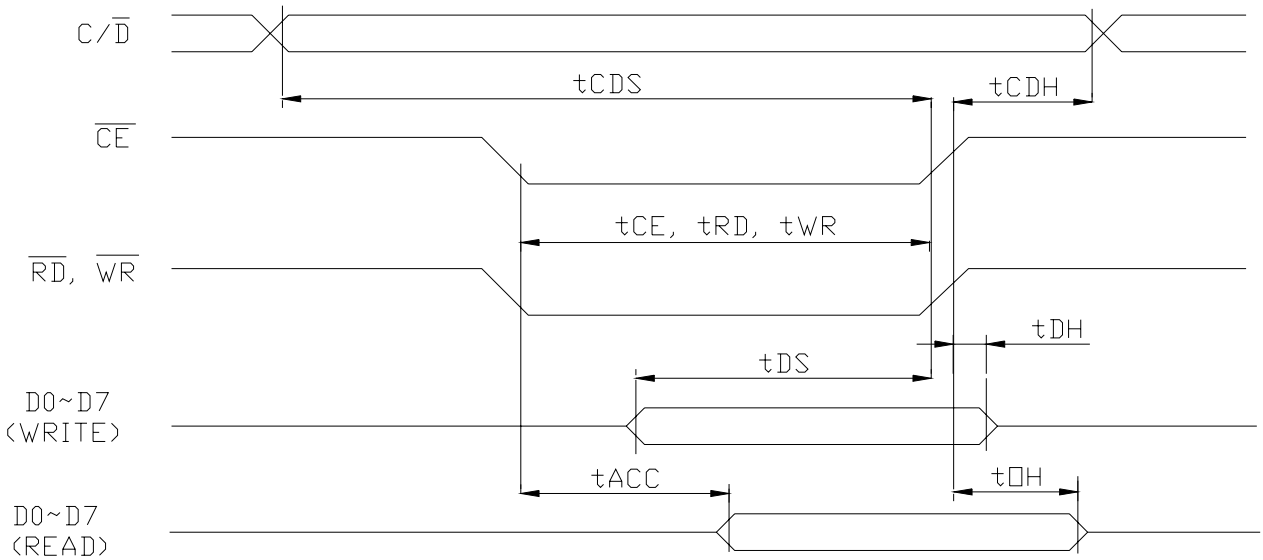
11.1 DC Characteristics

Ta=25°C, VSS=0V

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Supply Voltage (Logic)	V_{DD}-V_{SS}	-	4.5	5.0	5.5	V
Current Consumption(Operating)	$I_{DD(1)}$	V_{DD}=5.0V f_{OSC} = 3.0 MHz	-	3.3	6.0	mA
Current Consumption(Halt)	$I_{DD(2)}$	V_{DD}=5.0V			3	uA
Power Supply for LCD	Vlcd	VLCD=VDD-V5		20		V

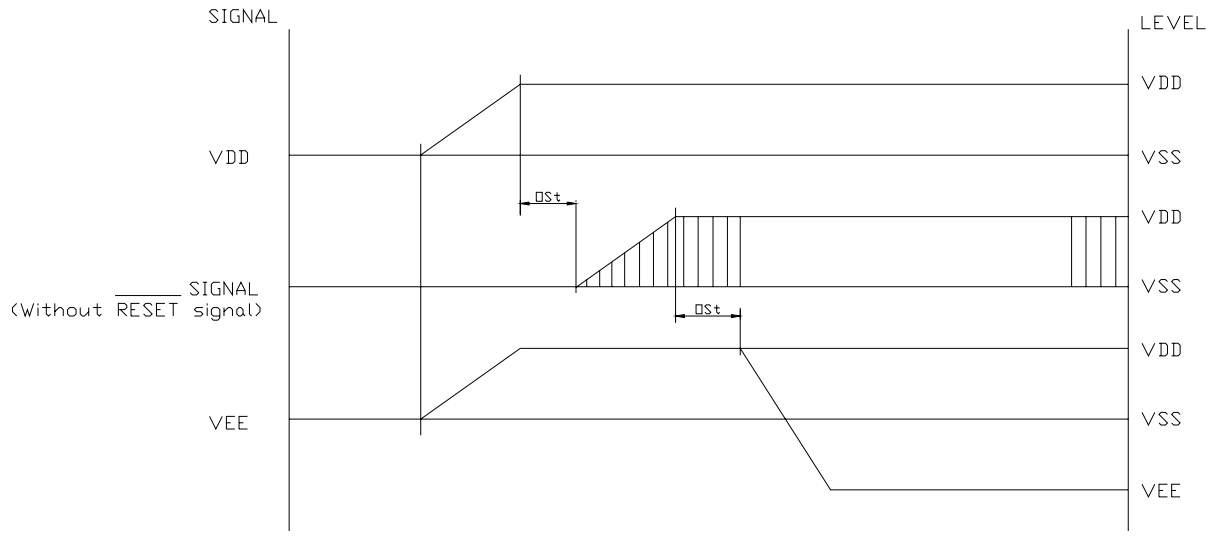
11.2 AC Characteristics

Parameter	Symbol	Min.	Max.	Units
C/D Setup Time	t_{CDS}	100	-	ns
C/D Hold Time	t_{CDH}	10	-	ns
CE, RD, WR Pulse Width	t_{CE}, t_{RD}, t_{WR}	80	-	ns
Data Setup Time	t_{DS}	80	-	ns
Data Hold Time	t_{DH}	40	-	ns
Access Time	t_{ACC}	-	150	ns
Output Hold Time	t_{OH}	10	50	ns

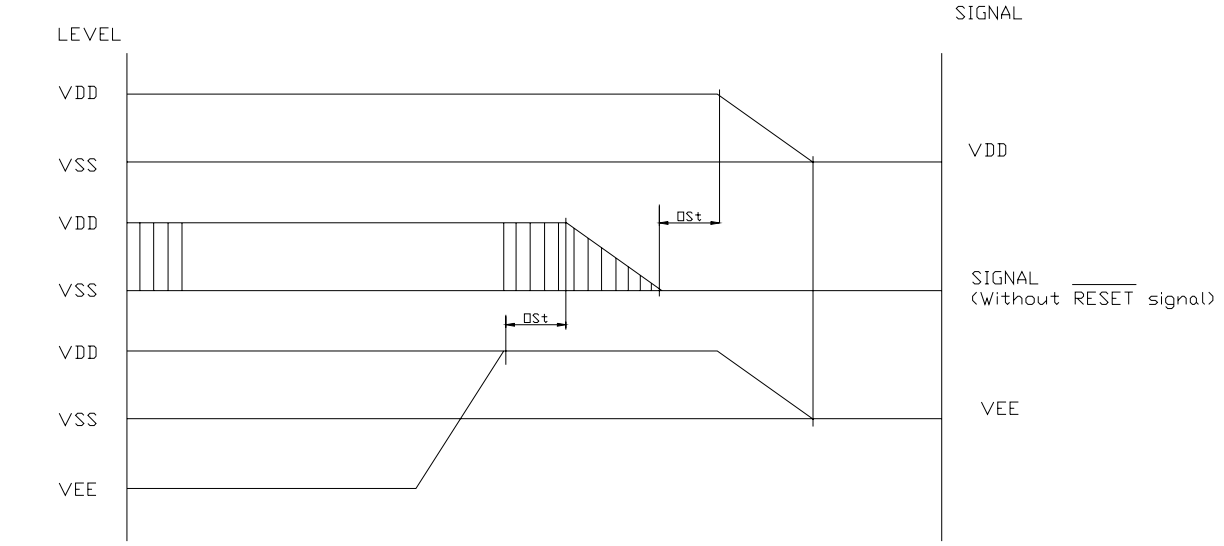


11.3 Power Supply ON/OFF Sequence

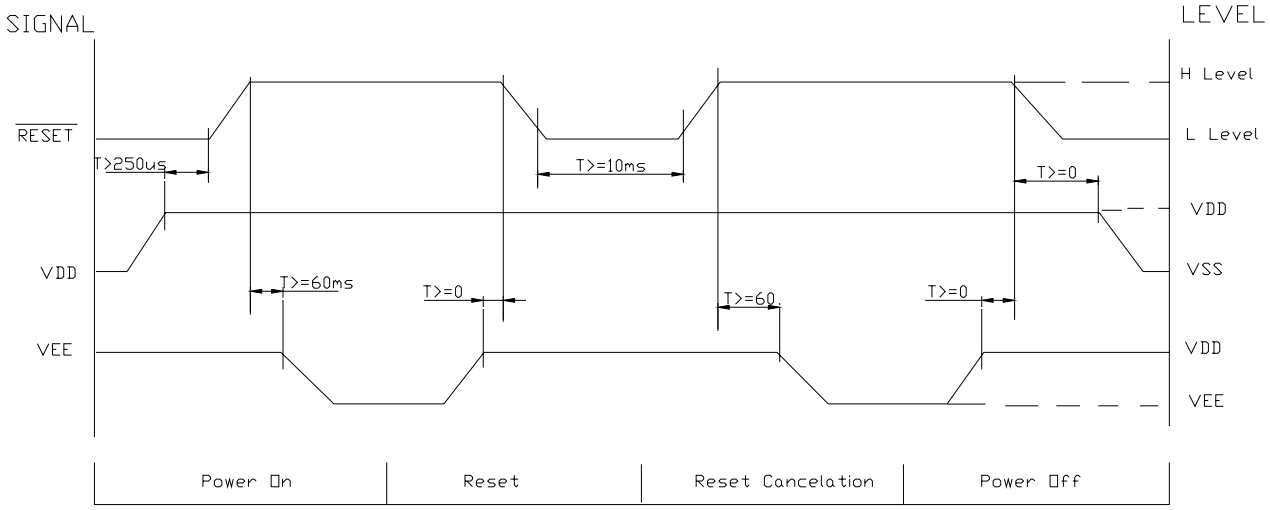
- ON Sequence



- OFF Sequence



- Reset Sequence



Please maintain the above sequence when turning on and off the power supply of the module.
If VEE is supplied to the module while internal alternate signal for LCD driving (M) is unstable or RESET is active, DC component will be supplied to the LCD panel. This may cause damage to the LCD module.

12. LCD MODULES HANDLING PRECAUTIONS

- Please remove the protection foil of polarizer before using.

- The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- If the display panel is damaged and the liquid crystal substance inside it leaks out, do not get any in your mouth. If the substance come into contact with your skin or clothes promptly wash it off using soap and water.
- Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarize carefully.
- To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  -Be sure to ground the body when handling the LCD module.
  -Tools required for assembly, such as soldering irons, must be properly grounded.
  -To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
  -The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- Storage precautions
  When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature / normal humidity conditions (avoid high temperature / high humidity and low temperatures below 0°C). Whenever possible, the LCD modules should be stored in the same conditions in which they were shipped from our company.

13. OTHERS

- Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomena does not adversely affect performance reliability.
- To minimize the performance degradation of the LCD modules resulting from caused by static electricity, etc. exercise care to avoid holding the following sections when handling the modules:
  - Exposed area of the printed circuit board
  - Terminal electrode sections