POWERTIP *CORPORATION*

SPECIFICATIONS

CUSTOMER

SAMPLE CODE

(This Code will be changed while mass production)

MASS PRODUCTION CODE   **PG9732LRS-BE3-H (VER.0)**

Customer Approved

Date:

Sales Sign	QC Confirmed	Checked By	Designer
		Tom 2003/08/03 *Nancy's* 2003/08/03	郭曉琴 2003/08/03

Approval For Specifications Only.

* This specification is subject to change without notice.

Please contact Powertip or it's representative before designing your product based on this specification.

Approval For Specifications and Sample.

Powertip Corporation

NO.PT-A-005-3

RECORDS OF REVISION

Date	Rev.	Description	Note	Page
2003/08/01	0	Revised Contents		

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   Note   For detailed information please refer to IC data sheet   SED1530

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	97 * 32 dots
LCD Type	STN,Gray, Transflective, Positive, Extended Temp.
Driver Condition	1/32 Duty , 1/5 Bias
Viewing Direction	6 O' clock
Backlight	YG LED B/L
Weight	7 g
Interface	
Other	

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	42.0 (L) * 28.9 (w) * 5.2 (H)(Max)	mm
Viewing Area	36.0 (L) * 21.0 (w)	mm
Active Area	31.0 (L) * 13.72 (w)	mm
Dot Size	0.28 (L) * 0.39m (w)	mm
Dot Pitch	0.32 (L) * 0.43 (w)	mm

Note   For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item		Symbol	Min.	Max.	Unit
Supply voltage range		V_{DD}	-0.3	7.0	V
	Triple boosting		-0.3	6.0	
	Quadruple boosting		-0.3	4.5	
Supply voltage range (1) (V_{DD} Level)		V5, V_{OUT}	-18.0	0.3	V
Supply voltage range (2) (V_{DD} Level)		V1,V2,V3,V4	V5	0.3	V
Input voltage range		V_{IN}	-0.3	VDD+0.3	V
Output voltage range		V_O	-0.3	VDD+0.3	V
Operating temperature		T_{OPR}	-20	70	
Storage temperature		T_{STR}	-30	80	
Humidity		HD	-	95	%RH

1.4 DC Electrical Characteristics

$V_{DD} = 5.0\ V \pm 10\%$ $V_{SS} = 0V$ $Ta = 25°C$

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}		2.4	5.0	6.0	V
"H" Input Voltage	V_{IH}		0.8 V_{DD}	-	V_{DD}	V
"L" Input Voltage	V_{IL}		Vss	-	0.2 V_{DD}	V
"H" Output Voltage	V_{OH}	I_{OH}=-0.5mA	0.8 V_{DD}	-	V_{DD}	V
"L" Output Voltage	V_{OL}	I_{OL}=0.5mA	Vss	-	0.2 V_{DD}	V
Supply Current	I_{DD}	V_{DD} = 5.0 V	-	4.5	-	mA
LCD Driver Voltage	V_{OP}	$V_{DD} - V_O$ (0°C)	-	-	-	V
		$V_{DD} - V_O$ (25°C)	-	5.6	-	
		$V_{DD} - V_O$ (50°C)	-	-	-	

1.5 Optical Characteristics

1/33Duty   1/5Bias   VOP = 5.4V   Ta = 25°C

Item	Symbol	Conditions	Min.	Typ.	Max.	Reference
View Angle	θ	C≥2.0,∅= 0°	30°	-	-	Notes 1 & 2
Contrast Ratio	C	θ=5°, ∅= 0°	-	3	-	Note 3
Response Time(rise)	Tr	θ= 5°, ∅= 0°	-	150ms	300ms	Note 4
Response Time(fall)	Tf	θ= 5°, ∅= 0°	-	300ms	500ms	Note 4

Note 1: Definition of angles θ and ∅

Light (when reflected) z (θ=0°)

Sensor

θ

Y' (∅=180°)

LCD panel

X'

X(∅=90°)

∅

Z'
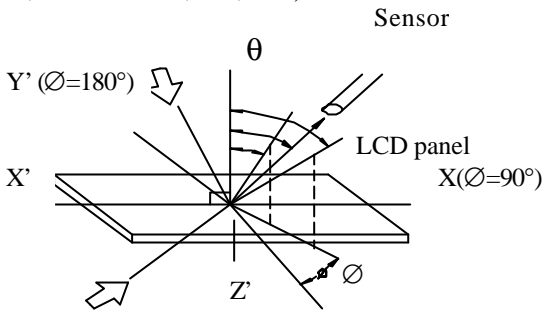
Light (when transmitted)   Y(∅=0°)

(θ=90°)

Note 2: Definition of viewing angles θ1 and θ2

Cmax.

2.0

θ1   θ2

viewing angle θ (∅ fixed)
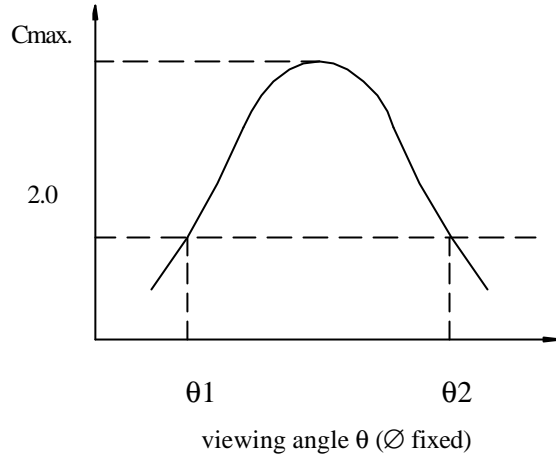
Note :   Optimum viewing angle with the

naked eye and viewing angle θ at

Cmax. Above are not always the same

Note 3: Definition of contrast C

$$C = \frac{\text{Brightness (reflection) of unselected dot (B2)}}{\text{Brightness (reflection) of selected dot (B1)}}$$

Brighness (reflection) of

selected dot

(%)

Brighness
(reflection) of

unselected dot

B2

B1

Brightness

(reflection)

0

operating voltage (v)
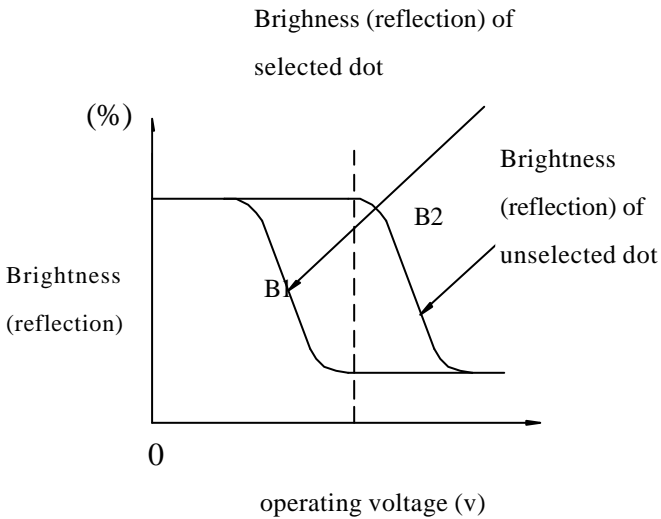
Note 4: Definition of response time

V_{LCD}

0

$-V_{LCD}$

Non-selected state   Selected state   Non-selected state

Contrast

90%

10%

Time

t_r t_f
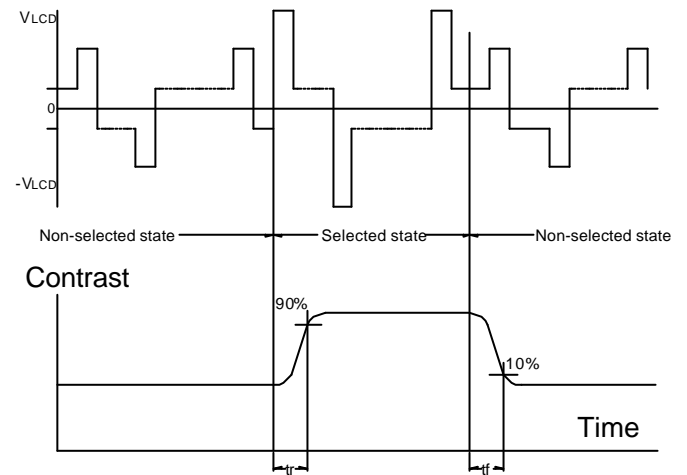
Note: Measured with a transmissive LCD

panel which is displayed 1 cm^2

V_{LCD} : Operating voltage f_{FRM} : Frame frequency

t_r : Response time (rise) t_f: Response time (fall)

1.6 Backlight Characteristics

LCD Module with LED Backlight

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25	-	200	mA
Reverse Voltage	VR	Ta =25	-	4	V
Power Dissipation	PO	Ta =25	-	0.46	W
Operating Temperature	T_{OP}	-	-20	70	
Storage Temperature	T_{ST}	-	-40	80	
Solder Temp. for 3 Second	-	-	-	260	

Electrical / Optical Characteristics

Ta =25

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 80 mA	-	2.1	2.5	V
Reverse Current	IR	VR= 8 V	-	-	0.2	mA
Average Brightness (with LCD)	IV	IF= 80 mA	-	-	-	cd/m^2
Wavelength	p	IF= 80 mA	571	-	576	nm
Luminous Intensity (without LCD)	Iv	IF=80 mA	7.2	9	-	cd/m^2
Color	Yellow-green					

2. MODULE STRUCTURE

2.1 Counter Drawing
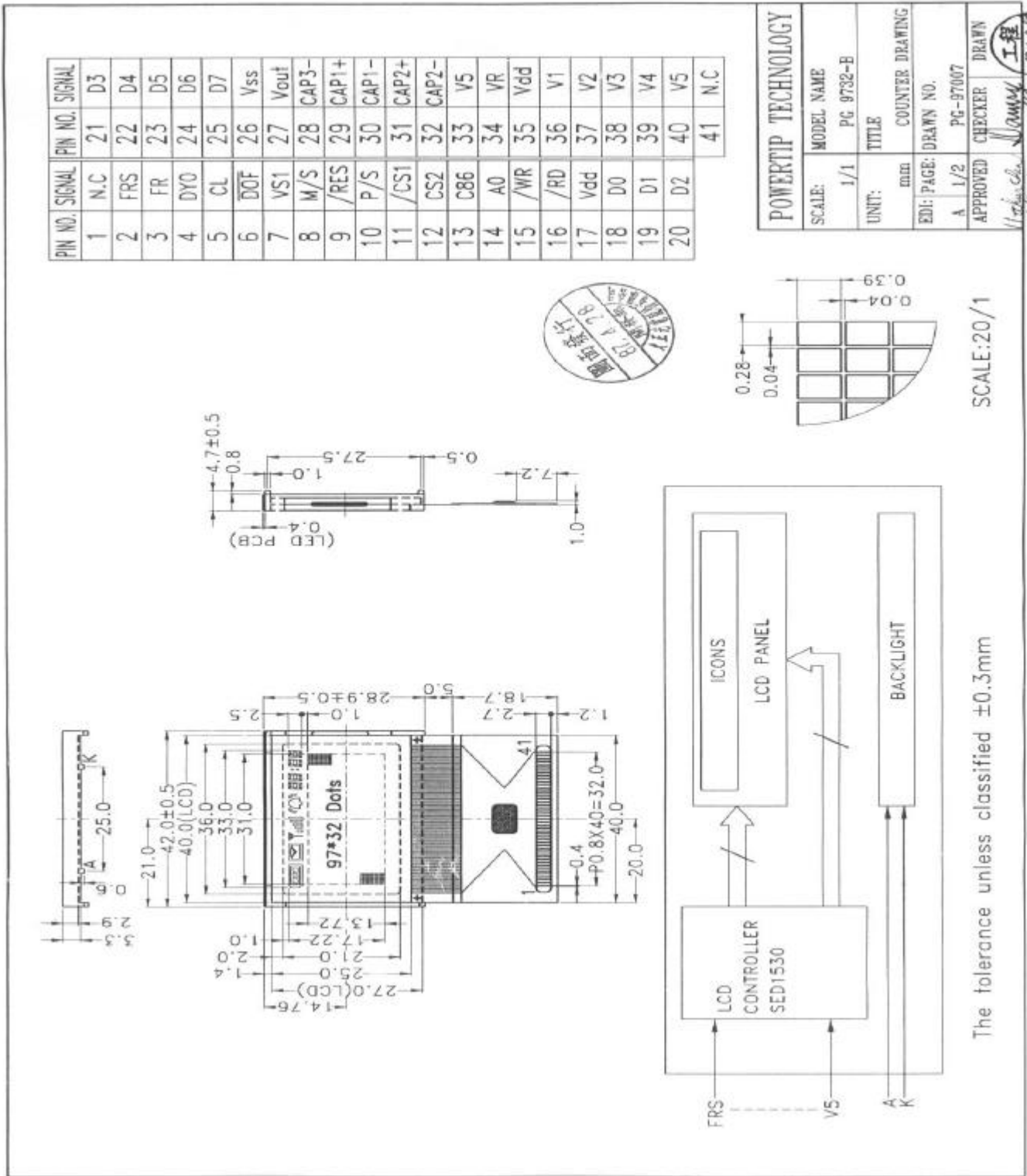
2.2 Interface Pin Description

Pin No.	Symbol	Function
1	NC	No connection.
2	FRS	Static drive output.
3	FR	LCD AC signal input/output. M/S=high: Output; M/S=low: Input.
4	DYO	Common drive signal output.
5	CL	Display clock input/output. M/S=high: Output; M/S=low: Input.
6	$\overline{DOF}$	LCD blanking control input/output. M/S=high: Output; M/S=low: Input.
7	VS1	Internal power supply voltage monitor output.
8	M/S	Master/slave mode select input. M/S=high: Master operation; M/S=low: Slave mode operation.
9	$\overline{RES}$	Reset. When $\overline{RES}$ is caused to go low, initialization is executed.
10	P/S	Parallel data input/serial data input select pin.
11~12	$\overline{CS1}$, CS2	Chip select pin. Data input/output is enabled when $\overline{CS1}$ is low and $\overline{CS2}$ is high.
13	C86	Microprocessor interface select terminal. C86=high: 6800 series microprocessor interface C86=low: 8080 series microprocessor interface
14	A0	Control/display data flag input. When low, the data on D0~D7 is control data.

		When high, the data on D0~D7 is display data.
15	$\overline{WR}$ (R/W)	· Write enable input. When interfacing to an 8080‑series microprocessor, $\overline{WR}$ is active low. · When interfacing to an 6800‑series microprocessor, it will be read mode when R/W is high and it will be write mode when R/W is low.

16	$\overline{RD}$ (E)	· When interfacing to an 8080‑series microprocessor:
		
		  Active low: Data bus output is enabled.
		
		· When interfacing to an 6800‑series microprocessor:
		
		  Active high. This is used as an enable clock input pin of the 6800 series microprocessor.

17	VDD	Power supply (+)

18~25	D0~D7
	(SI)
	(SCL)
		8-bit bi-directional data bus to be connected to the standard 8-bit or 16-bit microprocessor data bus.
		
		When the serial interface selects:
		
		  D7: Serial data input (SI)
		
		  D6: Serial clock input (SCL)

26	VSS	Power supply (-)
27	VOUT	DC/DC voltage converter output.
28	CAP3-	DC/DC voltage converter capacitor 3 negative connection.
29	CAP1+	DC/DC voltage converter capacitor 1 positive connection.
30	CAP1-	DC/DC voltage converter capacitor 1 negative connection.
31	CAP2+	DC/DC voltage converter capacitor 2 positive connection.
32	CAP2-	DC/DC voltage converter capacitor 2 negative connection.
33	V5	LCD driver supply voltage.

34	VR	Voltage adjustment pin. Applies voltage between VDD and V5 using a resistive divider.
35	VDD	Power supply (+).
36~40	V1~V5	LCD driver supply voltages.
41	NC	No connection.

Contrast Adjust
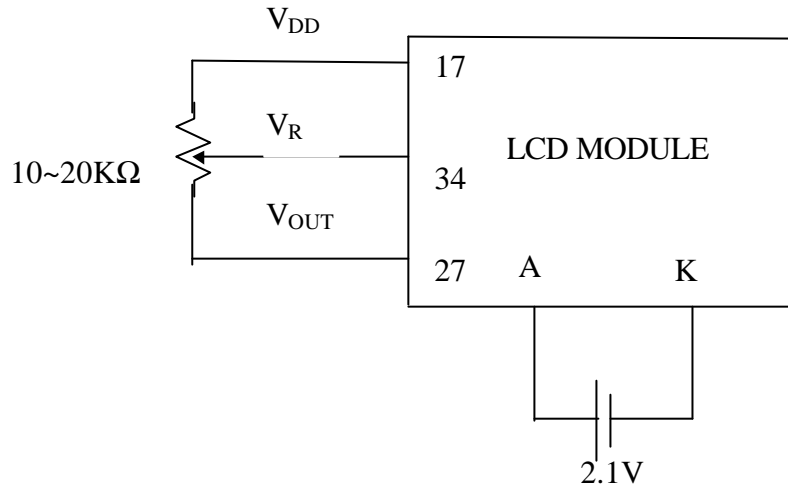
2.3 Timing Characteristics

•.Read/Write characteristics I (8080-series microprocessor)
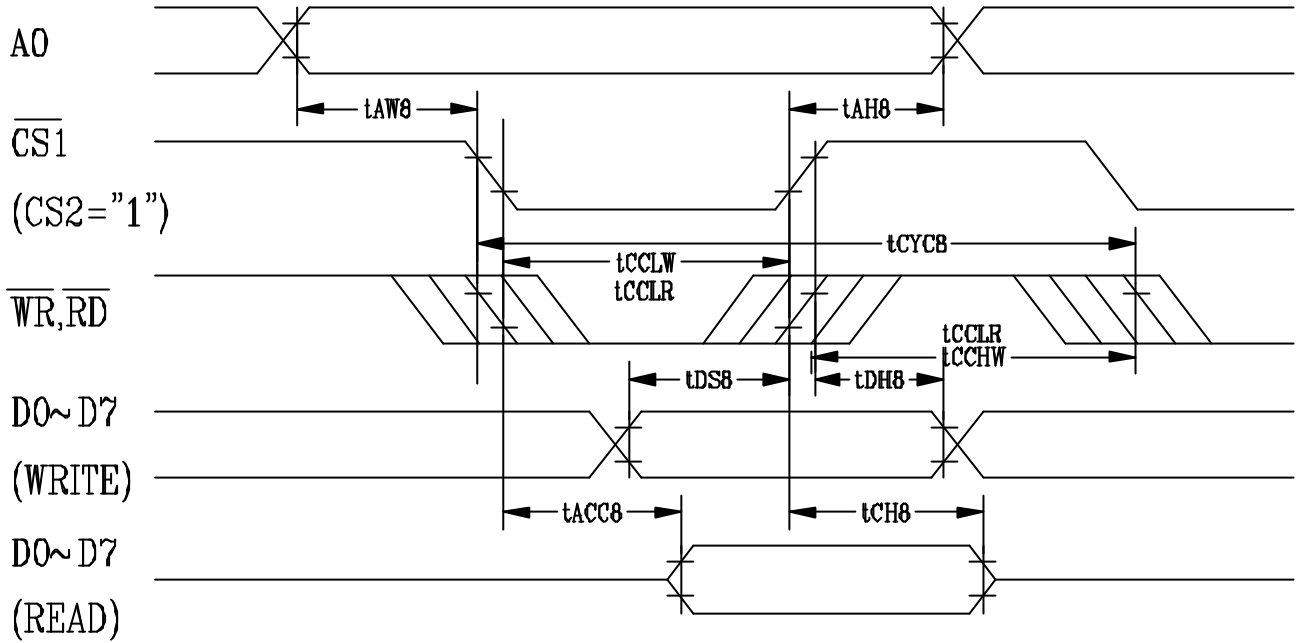
A0

$\overline{CS1}$
(CS2="1")

$\overline{WR},\overline{RD}$

tAW8   tAH8   tCCLW / tCCLR   tCYC8   tCCLR / tCCHW   tDS8   tDH8

D0~D7
(WRITE)

tACC8   tCH8

D0~D7
(READ)

• Read/Write characteristics II (6800-series microprocessor)

A0
R/$\overline{W}$

$\overline{CS1}$
(CS2="1")

E

tAW6   tAH6   tEWHW / tEWHR   tCYC6   tWLW / tEWLR   tDS6   tDH6

D0~D7
(WRITE)

tACC6   tOH6

D0~D7
(READ)
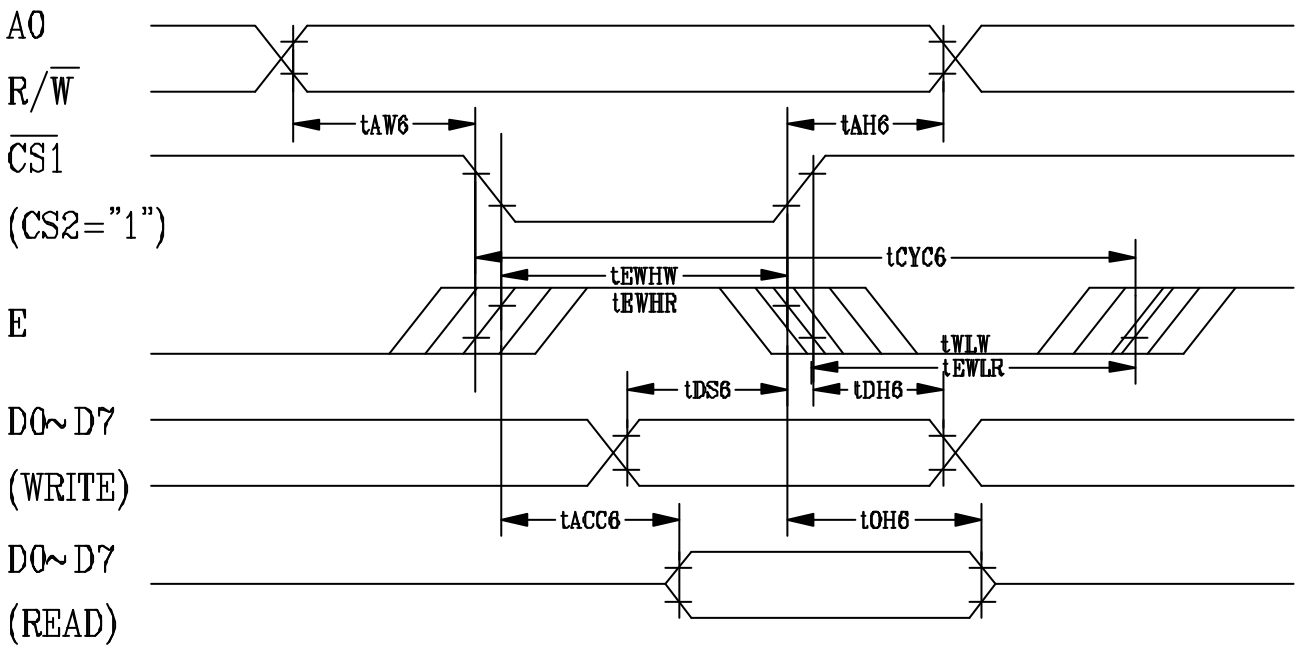
• .Read/Write characteristics I (8080‑series microprocessor)

VDD=5.0V±10%, Ta=25°C

Item	Symbol	Conditions	Min.	Max.	Unit	Signal
Address hold time	t_{AH8}	-	10	-	ns	A0
Address setup time	t_{AW8}	-	10	-	ns	
System cycle time	t_{CYC8}	-	166	-	ns	
Control L pulse width	t_{CCLW}	-	30	-	ns	$\overline{WR}$
Control L pulse width	t_{CCLR}	-	70	-	ns	$\overline{RD}$
Control H pulse width	t_{CCHW}	-	100	-	ns	$\overline{WR}$
Control H pulse width	t_{CCHR}	-	70	-	ns	$\overline{RD}$
Data setup time	t_{DS8}	-	20	-	ns	D0 to D7
Data hold time	t_{DH8}	-	10	-	ns	
RD access time	t_{ACC8}	CL=100 PF	-	70	ns	
Output disable time	t_{CH8}		10	50	ns	

VDD=2.7V to 4.5V, Ta=25°C

Item	Symbol	Conditions	Min.	Max.	Unit	Signal
Address hold time	t_{AH8}	-	19	-	ns	A0
Address setup time	t_{AW8}	-	15	-	ns	
System cycle time	t_{CYC8}	-	450	-	ns	
Control L pulse width	t_{CCLW}	-	60	-	ns	$\overline{WR}$
Control L pulse width	t_{CCLR}	-	140	-	ns	$\overline{RD}$
Control H pulse width	t_{CCHW}	-	200	-	ns	$\overline{WR}$
Control H pulse width	t_{CCHR}	-	140	-	ns	$\overline{RD}$
Data setup time	t_{DS8}	-	40	-	ns	D0 to D7
Data hold time	t_{DH8}	-	15	-	ns	
RD access time	t_{ACC8}	CL=100 PF	-	140	ns	
Output disable time	t_{CH8}		10	100	ns	

• Read/Write characteristics II (6800-series microprocessor)

$V_{DD}=5.0V\pm10\%,Ta=25°C$

Item		Symbol	Conditions	Min.	Max.	Unit	Signal
System cycle time		t_{CYC6}	-	166	-	ns	
Address setup time		t_{AW6}	-	10	-	ns	A0
Address hold time		t_{AH6}	-	10	-	ns	W/R
Data hold time		t_{DS6}	-	20	-	ns	
Data hold time		t_{DH6}	-	10	-	ns	
Output disable time		t_{OH6}	CL=100 PF	10	50	ns	D0 to D7
Access time		t_{ACC6}		-	70	ns	
Enable L pulse width	Read	t_{EWHR}	-	70	-	ns	E
	Write	t_{EWHW}	-	30	-	ns	
Enable H pulse width	Read	t_{EWLR}	-	70	-	ns	E
	Write	t_{EWlw}	-	100	-	ns	

$V_{DD}=2.7V$ to $4.5V$, $Ta=25°C$

Item		Symbol	Conditions	Min.	Max.	Unit	Signal
System cycle time		t_{CYC6}	-	450	-	ns	
Address setup time		t_{AW6}	-	15	-	ns	A0
Address hold time		t_{AH6}	-	19	-	ns	W/R
Data hold time		t_{DS6}	-	40	-	ns	
Data hold time		t_{DH6}	-	15	-	ns	
Output disable time		t_{OH6}	CL=100 PF	10	100	ns	D0 to D7
Access time		t_{ACC6}		-	140	ns	
Enable L pulse width	Read	t_{EWHR}	-	140	-	ns	E
	Write	t_{EWHW}	-	60	-	ns	
Enable H pulse width	Read	t_{EWLR}	-	140	-	ns	E
	Write	t_{EWlw}	-	200	-	ns	

2.4 Display Command (Reference SED 1530 technical Manual)

Command	Code											Function
	A0	R̄D̄	W̄R̄	D7	D6	D5	D4	D3	D2	D1	D0	
(1) Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0 1	Turns on LCD panel when goes high, and turns off when goes low.
(2) Initial Display Line	0	1	0	0	1	Start display address						Specifies RAM display line for COM0.
(3) Set Page Address	0	1	0	1	0	1	1	Page address				Sets the display RAM page in Page Address register.
(4) Set Column Address 4 higher bits	0	1	0	0	0	0	1	Higher column address				Sets 4 higher bits of column address of display RAM in register
(4) Set Column Address 4 lower bits	0	1	0	0	0	0	0	Lower column address				Sets 4 lower bits of column address of display RAM in register
(5) Read Status	0	0	1	Status				0	0	0	0	Reads the status information.
(6) Write Display Data	1	1	0	Write data								Writes data in display RAM.
(7) Read Display Data	1	0	1	Read data								Reads data from display RAM.
(8) ADC Select	0	1	0	1	0	1	0	0	0	0	0 1	Sets normal relationship between RAM column address and segment driver when low, but reverses the relationship when high.
(9) Normal/Reverse Display	0	1	0	1	0	1	0	0	1	1	0 1	Normal indication when low, but full indication when high.
(10) Entire Display ON/OFF	0	1	0	1	0	1	0	0	1	0	0 1	Selects normal display (0) or Entire display ON (1).
(11) Set LCD Bias	0	1	0	1	0	1	0	0	0	1	0 1	Sets LCD drive voltage bias ratio.
(12) Read-Modify-Write	0	1	0	1	1	1	0	0	0	0	0	Increments Column Address counter during each write when high and during each read when low.
(13) End	0	1	0	1	1	1	0	1	1	1	0	Releases the Read-Modify-Write.
(14) Reset	0	1	0	1	1	1	0	0	0	1	0	Resets internal functions.
(15) Set Output Status Register	0	1	0	1	1	0	0	0 1	*	*	*	Selects COM output scan direction. * Invalid data
(16) Set Power Control	0	1	0	0	0	1	0	1	Operation status			Selects the power circuit operation mode.
(17) Set Electronic Control Register	0	1	0	1	0	0	Electronic control value					Sets V5 output voltage to Electronic Control register.

(18) Set Standby	0	1	0	1	0	1	0	1	1	0	0	Selects standby status.
											1	0: OFF 1:ON
(19) Power Save	-	-	-	-	-	-	-	-	-	-	-	Compound command of display OFF and entire display ON
(20) Test Command	0	1	0	1	1	1	1	*	*	*	*	IC Test command. Do not use!

Note: Do not use any other command, or the system malfunction may result.

2.5 Display Programming

• **Programming**

The display is programmed via an 8 Bit parallel interface (Data, Clock, and Latch). Data is clocked into the driver on the rising edge of the /CS line. Conversely, the MPU will latch data from the display driver on the rising edge of the /CS line. Table 2 shows the segment definitions (see figure 1 for the icon definitions). The pixel coordinates are defined by the following:

Upper leftmost pixel	Seg 0, Com 0
Lower leftmost pixel	Seg 0, Seg99/Com32
Upper rightmost pixel	Seg 95, Com 0
Lower rightmost pixel	Seg 95, Seg99/Com32

Table 1. Pixel Coordinates

ICON	LCD Out	ICON	LCD Out	ICON	LCD Out
15a	S69	17a	S84	1	S3
15b	S68	17b	S83	2	S18
15g	S71	17g	S86	3	S16
15c	S74	17c	S89	4	S14
15d	S73	17d	S88	5	S25
15e	S72	17e	S87	6	S39
15f	S70	17f	S85	7	S43
16a	S81	18a	S96	8	S45
16b	S80	18b	S95	9	S47
16g	S76	18g	S91	10	S49
16c	S79	18c	S94	11	S51
16d	S78	18d	S93	12	S56
16e	S77	18e	S92	13	S62
16f	S75	18f	S90	14	S66
		19	S82		

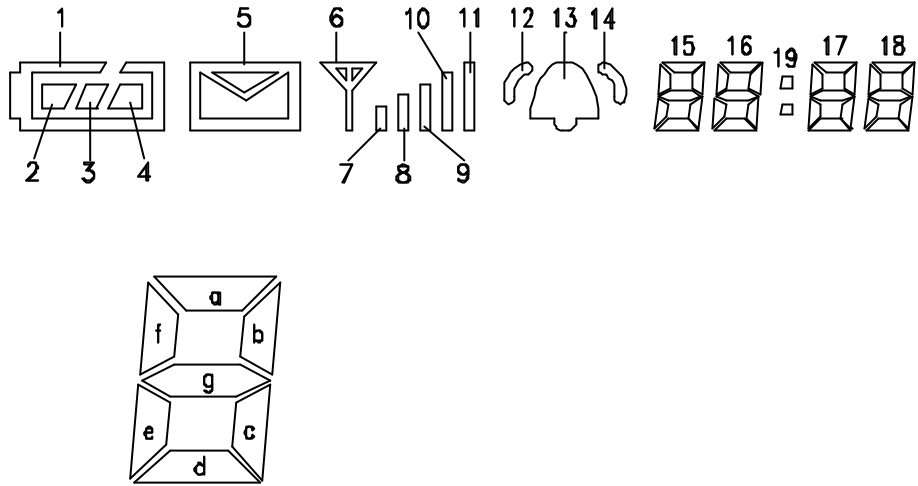Table 2: Segment Definition

•**I-con** NUMBER
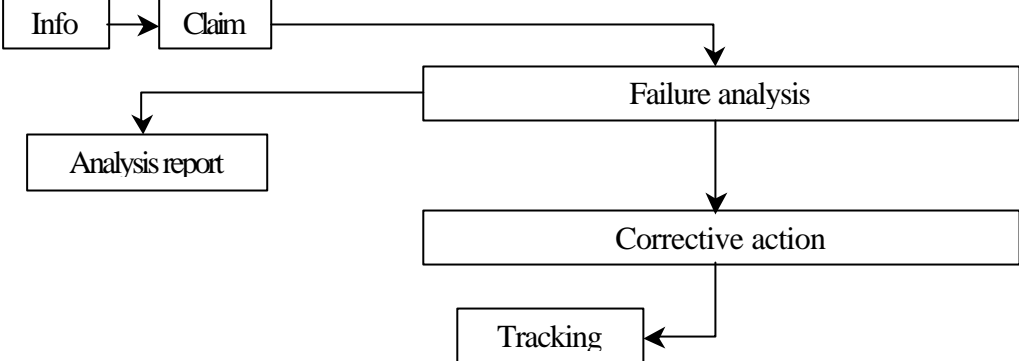
figure 1 icon definitions

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Marketing & Design								
Sample Approval								
Pilot Run & Mass Product								
Ship Out								

Marketing & Design:
Info → Survey

Request → Inquiry → Project evaluation

Project Validation ← (NG → back to Inquiry)

OK → Quote

Quote → Contract

Sample Approval:
Contract → Design check

Design check → Sample test

Sample test → Verification

NG → (back to Design check)

OK → Sample approval

NG → (back to Contract)

Pilot Run & Mass Product:
OK → Pilot run & Reliability test

Pilot run & Reliability test → Verification

NG → (back to Pilot run & Reliability test)

OK → Specification preparation

Specification preparation → Mass production

Mass production → Inspection

OK → Shipment   NG → (back to Mass production)

Ship Out:
Shipment → Ship out

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	Info → Claim → Failure analysis → Analysis report / Corrective action / Tracking							
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

3.2 Inspection Specification

Inspection Standard   MIL-STD-105E Table Normal Inspection Single Sampling Level

Equipment   Gauge   MIL-STD   Powertip Tester   Sample
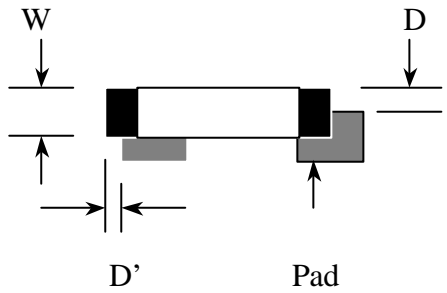
IQC Defect Level   Major Defect AQL 0.4; Minor Defect AQL 1.5

FQC Defect Level   100% Inspection

OUT Going Defect Level   Sampling

Specification

NO	Item	Specification	Judge	Level
1	Part Number	The part number is inconsistent with work order of production	N.G.	Major
2	Quantity	The quantity is inconsistent with work order of production	N.G.	Major
3	Electronic characteristics of LCM $A=(L + W)\div 2$	The display lacks of some patterns.	N.G.	Major
		Missing line.	N.G.	Major
		The size of missing dot, A is 1/2 Dot size	N.G.	Major
		There is no function.	N.G.	Major
		Output data is error	N.G.	Major
4	Appearance of LCD $A=(L + W)\div 2$ Dirty particle (Including scratch bubble)	Material is different with work order of production	N.G.	Major
		LCD is assembled in inverse direction	N.G.	Major
		Bezel is assembled in inverse direction	N.G.	Major
		Shadow is within LCD viewing area + 0.5 mm	N.G.	Major
		The diameter of dirty particle, A is 0.4 mm	N.G.	Minor
		Dirty particle length is 3.0mm, and 0.01mm width 0.05mm	N.G.	Minor
		Display is without protective film	N.G.	Minor
		Conductive rubber is over bezel 1mm	N.G.	Minor
		Polarizer exceeds over viewing area of LCD	N.G.	Minor
		Area of bubble in polarizer, A 1.0mm, the number of bubble is 1 piece.	N.G.	Minor
		0.4mm Area of bubble in polarizer, A 1.0mm, the number of bubble is 4 pieces.	N.G.	Minor
5	Appearance of PCB $A=(L + W)\div 2$	Burned area or wrong part number is on PCB	N.G.	Major
		The symbol, character, and mark of PCB are unidentifiable.	N.G	Minor
		The stripped solder mask , A is 1.0mm	N.G.	Minor
		0.3mm stripped solder mask or visible circuit, A 1.0mm, and the number is 4 pieces	N.G.	Minor
		There is particle between the circuits in solder mask	N.G	Minor
		The circuit is peeled off or cracked	N.G	Minor
		There is any circuits risen or exposed.	N.G	Minor
		0.2mm Area of solder ball, A is 0.4mm The number of solder ball is 3 pieces	N.G	Minor
		The magnitude of solder ball, A is 0.4mm.	N.G	Minor

NO	Item	Specification	Judge	Level
6	Appearance of molding A=(L + W)÷ 2	The shape of modeling is deformed by touching.	N.G.	Major
		Insufficient epoxy: Circuit or pad of IC is visible	N.G.	Minor
		Excessive epoxy: Diameter of modeling is 20mm or height is 2.5mm	N.G.	Minor
		The diameter of pinhole in modeling, A is 0.2mm.	N.G.	Minor
7	Appearance of frame A=(L + W)÷ 2	The folding angle of frame must be 45 +10	N.G.	Minor
		The area of stripped electroplate in top-view of frame, A is 1.0mm.	N.G.	Minor
		Rust or crack is (Top view only)	N.G.	Minor
		The scratched width of frame is 0.06mm. (Top view only)	N.G.	Minor
8	Electrical characteristic of backlight A=(L + W)÷ 2	The color of backlight is nonconforming	N.G.	Major
		Backlight can't work normally.	N.G.	Major
		The LED lamp can't work normally	N.G.	Major
		The unsoldering area of pin for backlight, A is 1/2 solder joint area.	N.G.	Minor
		The height of solder pin for backlight is 2.0mm	N.G.	Minor
10	Assembly parts A=(L + W)÷ 2	The mark or polarity of component is unidentifiable.	N.G.	Minor
		The height between bottom of component and surface of the PCB is floating 0.7mm	N.G.	Minor
		D 1/4W	N.G.	Minor
		End solder joint width, D' is 50% width of component termination or width of pad	N.G.	Minor
		Side overhang, D is 25% width of component termination.	N.G.	Minor
		Component is cracked, deformed, and burned, etc.	N.G.	Minor
		The polarity of component is placed in inverse direction.	N.G.	Minor
		Maximum fillet height of solder extends onto the component body or minimum fillet height is 0.5mm.	N.G.	Minor

4. RELIABILITY TEST

4.1 Reliability Test Condition

NO	Item	Test Condition	
1	High Temperature Storage	Storage at 80 ± 2 96~100 hrs Surrounding temperature, then storage at normal condition 4hrs	
2	Low Temperature Storage	Storage at -30 ± 2 96~100 hrs Surrounding temperature, then storage at normal condition 4hrs	
3	High Temperature /Humidity Storage	1.Storage 96~100 hrs 60± 2 , 90~95%RH surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer). or 2.Storage 96~100 hrs 40± 2 , 90~95%RH surrounding temperature, then storage at normal condition 4 hrs.	
4	Temperature Cycling	-20 25 70 25 (30mins) (5mins) (30mins) (5mins) 10 Cycle	
5	Vibration	10~55Hz (1 minute) 1.5mm X,Y and Z direction (each 2hrs)	
6	ESD Test	Air Discharge: Apply 6 KV with 5 times discharge for each polarity +/- Testing location: Around the face of LCD	Contact Discharge: Apply 250V with 5 times discharge for each polarity +/- Testing location: 1.Apply to bezel. 2.Apply to Vdd, Vss.
7	Drop Test	Packing Weight (Kg)	Drop Height (cm)
		0 ~ 45.4	122
		45.4 ~ 90.8	76
		90.8 ~ 454	61
		Over 454	46

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

5.1.1   If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

5.1.2   If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

5.2 HANDLING

5.2.1   Avoid any strong mechanical shock which can break the glass.

5.2.2   Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.

5.2.3   Do not remove the panel or frame from the module.

5.2.4   The polarizing plate of the display is very fragile. So , please handle it very carefully ,do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

5.2.5   Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.

5.2.6   Do not touch the display area with bare hands , this will stain the display area.

5.2.7   Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.2.8   To control temperature and time of soldering is 280± 10   and 3-5 sec.

5.2.9   To avoid liquid (include organic solvent) stained on LCM .

5.3 STORAGE

5.3.1   Store the panel or module in a dark place where the temperature is 25   ± 5 and the humidity is below 65% RH.

5.3.2   Do not place the module near organics solvents or corrosive gases.

5.3.3   Do not crush , shake , or jolt the module.

5.4 TERMS OF WARRANTY

5.4.1   Applicable warrant period

The period is within thirteen months since the date of shipping out under normal using and storage conditions.

5.4.2   Unaccepted responsibility

This product has been manufactured to your company' s specification as a part for use in your company' s general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronicequipment , we cannot take responsibility if the product is used in nuclear power control equipment , aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.