晶采光電科技股份有限公司
AMPIRE CO., LTD.

SPECIFICATIONS FOR
LCD MODULE

CUSTOMER	
CUSTOMER PART NO.	
AMPIRE PART NO.	**AT-24868AFI-V**
APPROVED BY	
DATE	

☑ **Approved For Specifications & Sample**

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RECORD OF REVISION

Revision Date	Contents	Editor
2004/10/18	New Release	Rosaline

1 FEATURES

(1) Display format : 248 × 68 dot-matrix

(2) Construction : LCD panel and TAB IC.

(3) Display type : FSTN Positive, Transflective type, 6 o'clock view.

(4) Controller : LH155GF

2 MECHANICAL DATA

Parameter	Stand Value	Unit
Dot size	0.21(W) × 0.28(H)	mm
Dot pitch	0.23(W) × 0.30(H)	mm
Active area	57.02(W) × 20.38(H)	
Viewing area	60.0(W) × 23.4(H)	mm
Module size	71.4(W) × 56.4(H) × 2.8 max (T)	mm

3 ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Logic Circuit Supply Voltage	VDD-VSS	-0.3	6.0	V
LCD Driving Voltage	V0	-0.3	15.0	V
Input Voltage	VI	-0.3	VDD+0.3	V
Operating Temp.	TOP	0	50	°C
Storage Temp.	TSTG	-20	70	°C

4 ELECTRICAL CHARACTERISTICS / OPERATING METHODS
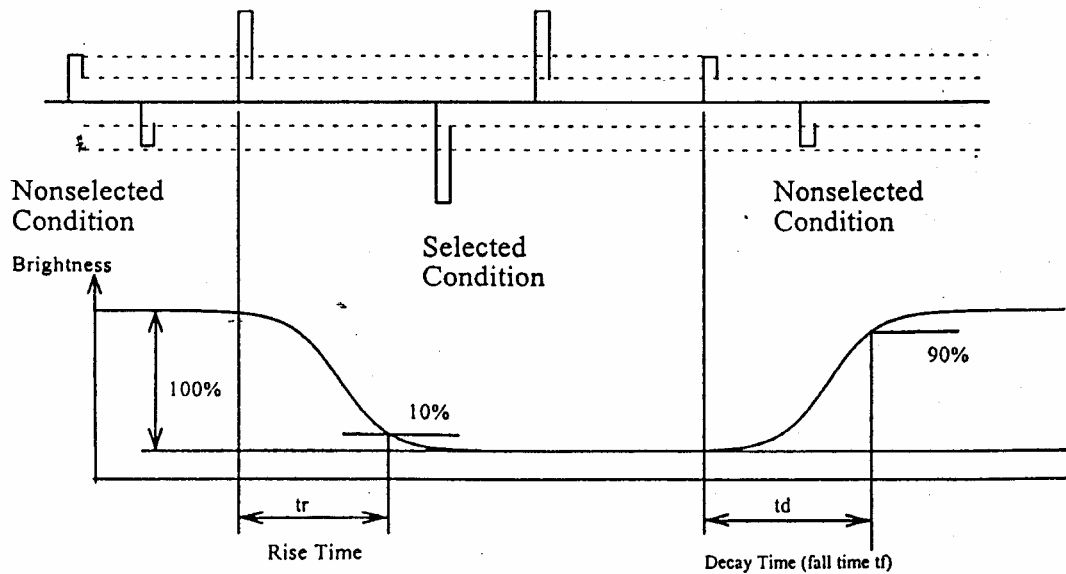
Note : Please refer to SHARP's LH155G data sheet

5 ELECTRO-OPTICAL CHARACTERISTICS

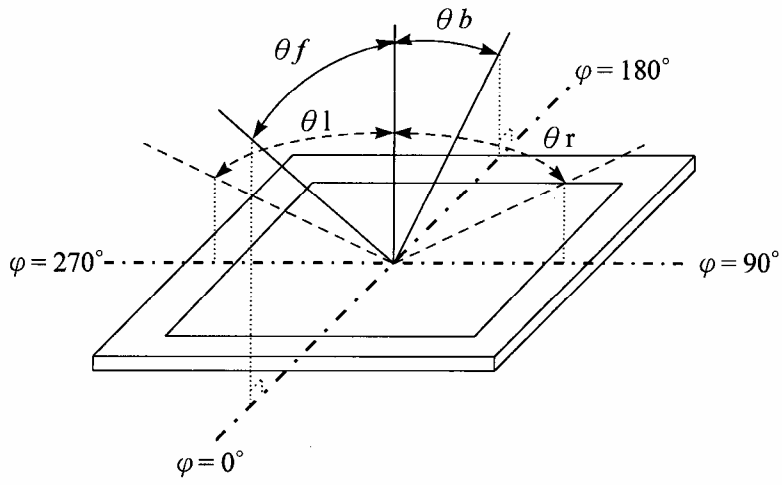| Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
LCD Driving Voltage	V0-VSS	-20 °C	13.9	14.68	15.5	V	1/9 Bias
		25 °C	12.3	13.05	13.8		
		70 °C	11.5	12.18	12.8		
Contrast	CR	FSTN type	2	5			Note 1
Rise Time	tr	25°C	--	170	--	ms	Note 2
Fall Time	tf	25°C	--	300	--	ms	
Viewing Angle Range	θ f	25°C & CR≥2	35	--	--	Deg.	Note 3
	θ b		40	--	--		
	θ l		40	--	--		
	θ r		30	--	--		
Frame Frequency	fF	25°C	--	70	--	Hz	

(NOTE 1) Contrast ratio :
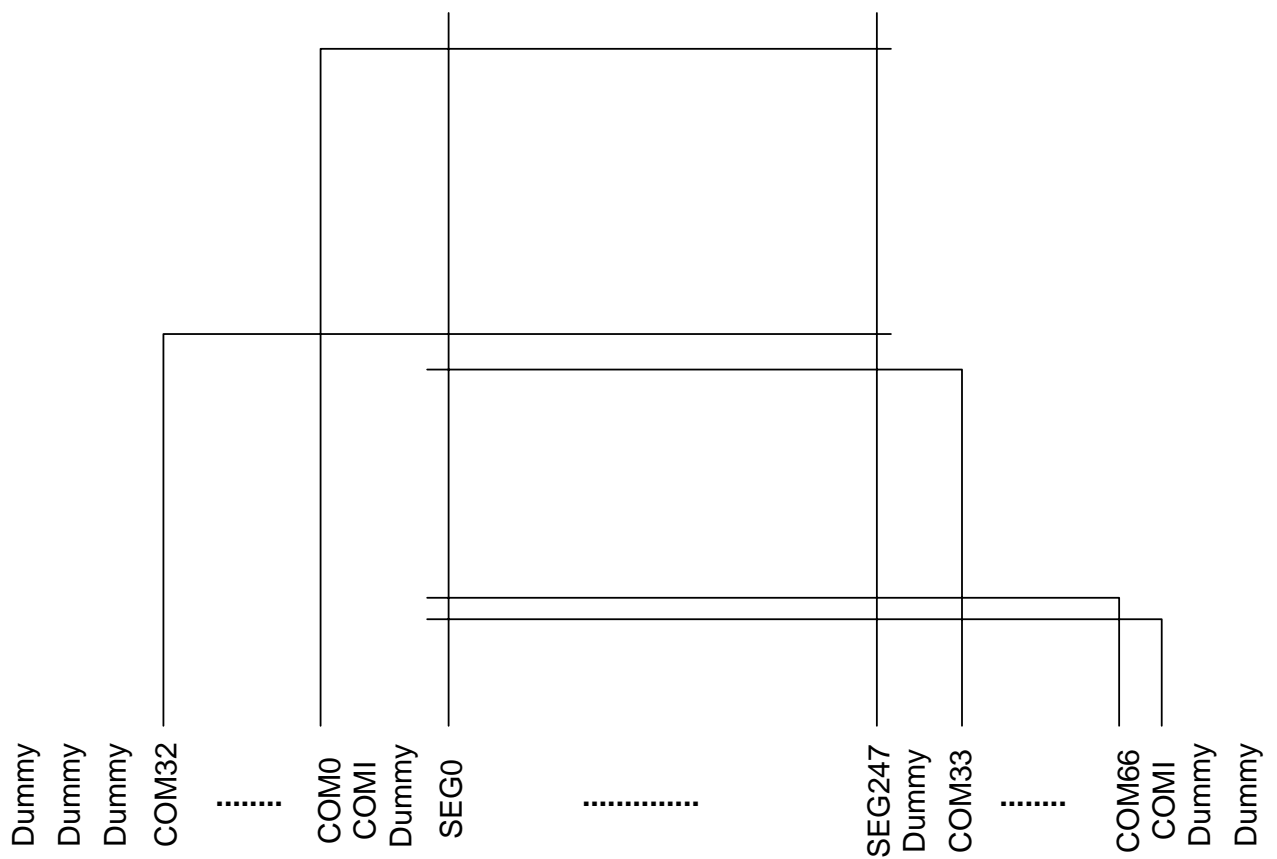
CR = (Brightness in ON state) / (Brightness in OFF state)

(NOTE 2) Response time :

(NOTE 3) Viewing angle

6 DISPLAY DATA RAM ADDRESS MAP

Dummy Dummy Dummy COM32 .... COM0 COMI Dummy SEG0 .... SEG247 Dummy COM33 .... COM66 COMI Dummy Dummy

7 QUALITY AND RELIABILITY

7.1 TEST CONDITIONS

Tests should be conducted under the following conditions :
Ambient temperature : $25 \pm 5°C$
Humidity   : $60 \pm 25\%$ RH.

7.2 SAMPLING PLAN

Sampling method shall be in accordance with MIL-STD-105E , level II, normal single sampling plan .

7.3 ACCEPTABLE QUALITY LEVEL

A major defect is defined as one that could cause failure to or materially reduce the usability of the unit for its intended purpose. A minor defect is one that does not materially reduce the usability of the unit for its intended purpose or is an infringement from established standards and has no significant bearing on its effective use or operation.

7.4 APPEARANCE

An appearance test should be conducted by human sight at approximately 30 cm distance from the LCD module under flourescent light. The inspection area of LCD panel shall be within the range of following limits.

7.5 INSPECTION QUALITY CRITERIA

Item	Description of defects				Class of Defects	Acceptable level (%)
Function	Short circuit or Pattern cut				Major	0.65
Dimension	Deviation from drawings				Major	1.5
Black spots	Ave . dia . D	area A		area B	Minor	2.5
	D≤0.2	Disregard				
	0.2<D≤0.3	3		4		
	0.3<D≤0.4	2		3		
	0.4<D	0		1		
Black lines	Width W, Length L		A	B	Minor	2.5
	W≤0.03		disregard			
	0.03<W≤0.05		3	4		
	0.05<W≤0.07 , L≤3.0		1	1		
	See line criteria					
Bubbles in polarizer	Average diameter D 0.2 < D < 0.5 mm for N = 4 , D > 0.5 for N = 1				Minor	2.5
Color uniformity	Rainbow color or newton ring.				Minor	2.5
Glass Scratches	Obvious visible damage.				Minor	2.5
Contrast ratio	See note 1				Minor	2.5
Response time	See note 2				Minor	2.5
Viewing angle	See note 3				Minor	2.5

ZONE A active area

ZONE B viewing area
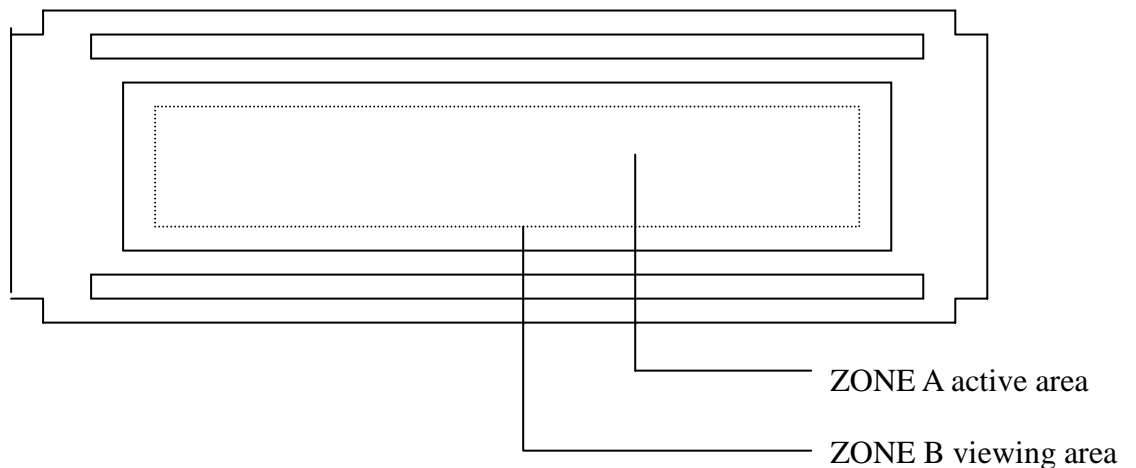
7.6 RELIABILITY

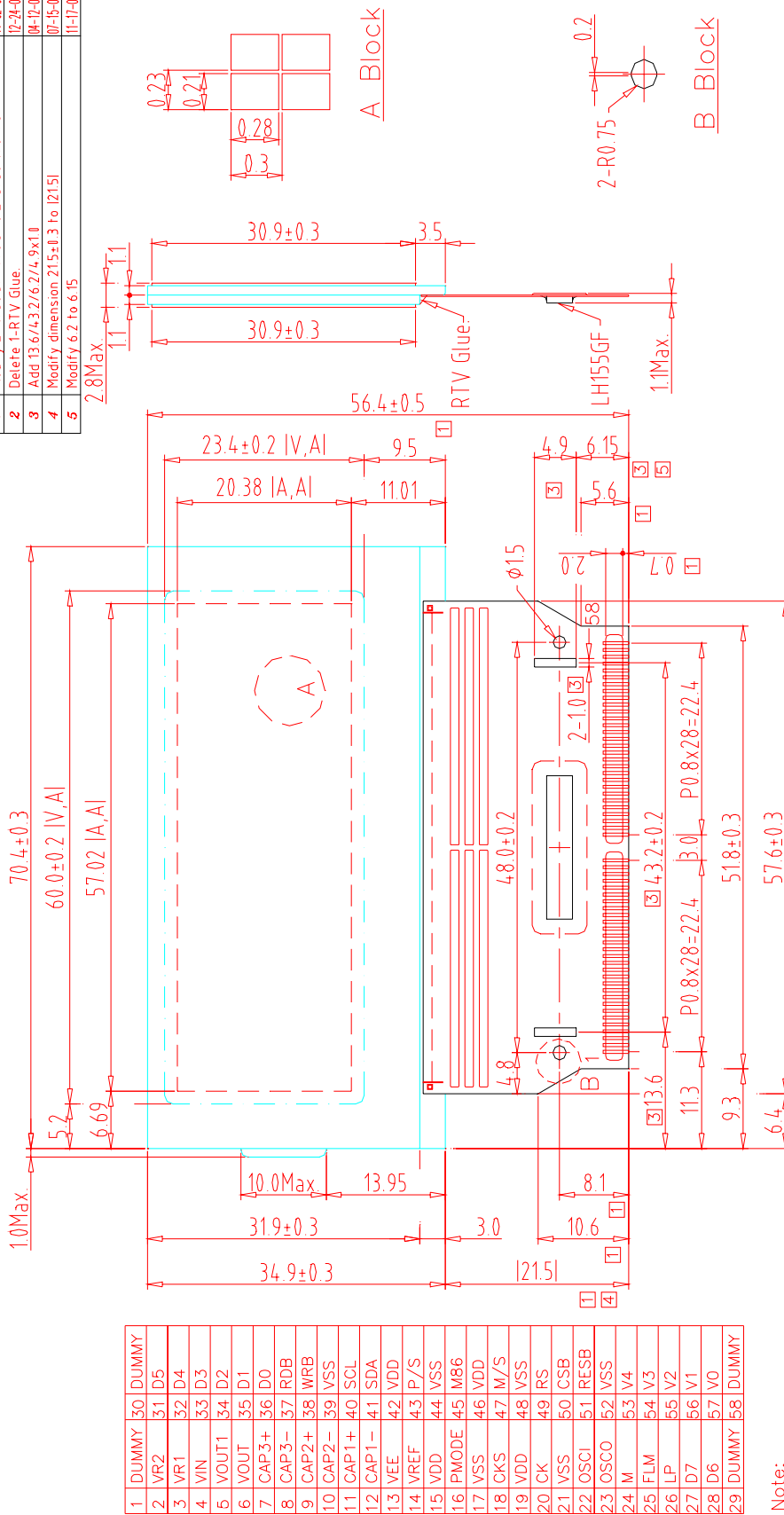| Test Item	Test Conditions	Applicable Standard
Environmental Test		
High Temperature Storage	-70± 3°C , t=200 hrs	--
Low Temperature Storage	-20± 3°C , t=200 hrs	--
High Temperature Operation	50± 3°C , t=200 hrs	--
Low Temperature Operation	0± 3°C , t=200 hrs	--
High Temperature/ Humidity operation	40°C , Humidity 90%, 96 hrs	MIL-202E-103B JIS-C5023
Temperature cycle	-20°C (30 min.) ~ 25°C (5 min.) ~ 70°C (30 min.) (1 cycle) Total 10 cycle	--
Vibration Test (Packing)	Sweep frequency : 10 ~ 55 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis	2

Definitions of life end point :

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.
- Appearance and display quality should not have degraded noticeably.
- Contrast ratio should be greater than 50% of the initial value.

8   HANDLING PRECAUTIONS

(1) An LCD module is a fragile item and should not be subjected to strong mechanical shocks.

(2) Avoid applying pressure to the module surface. This will distort the glass and cause a change in color.

(3) Under no circumstances should the position of the bezel tabs or their shape be modified.

(4) Do not modify the display PCB in either shape or positioning of components.

(5) Do not modify or move location of the zebra or heat seal connectors.

(6) The device should only be soldered to during interfacing. Modification to other areas of the board should not be carried out.

(7) In the event of LCD breakage and resultant leakage of fluid do not inhale, ingest or make contact with the skin. If contact is made rinse immediately.

(8) When cleaning the module use a soft damp cloth with a mild solvent, such as Isopropyl or Ethyl alcohol. The use of water, ketone or aromatic is not permitted.

(9) Prior to initial power up input signals should not be applied.

(10) Protect the module against static electricity and observe appropriate anti-static precautions.

9 OUTLINE DIMENSION

A Block

B Block

2-R0.75

0.2

0.23
0.21
0.28
0.3

30.9±0.3   3.5
30.9±0.3
2.8Max
1.1
1.1

56.4±0.5

RTV Glue

LH155GF

1.1Max.

23.4±0.2 |V,A| 9.5
20.38 |A,A| 11.01

4.9   6.15
5.6

φ1.5
2.0
0.7
58
2-1.0
4.8

70.4±0.3
60.0±0.2 |V,A|
57.02 |A,A|
5.2
6.69
1.0Max.

48.0±0.2

43.2±0.2
P0.8x28=22.4
51.8±0.3
57.6±0.3

P0.8x28=22.4
P0.8x28=22.4
3.0
11.3
9.3
6.4
13.6
A
B

10.0Max.   13.95
31.9±0.3   3.0
34.9±0.3

8.1
10.6
|21.5|

Note:
1. Unless indicated, Tolerance Grade "B" is adopted.
2. RTV Glue For OLB Protection.

1	DUMMY	30	DUMMY
2	VR2	31	D5
3	VR1	32	D4
4	VIN	33	D3
5	VOUT1	34	D2
6	VOUT	35	D1
7	CAP3+	36	D0
8	CAP3-	37	RDB
9	CAP2+	38	WRB
10	CAP2-	39	VSS
11	CAP1+	40	SCL
12	CAP1-	41	SDA
13	VEE	42	VDD
14	VREF	43	P/S
15	VDD	44	VSS
16	PMODE	45	M86
17	VSS	46	VDD
18	CKS	47	M/S
19	VDD	48	VSS
20	CK	49	RS
21	VSS	50	CSB
22	OSCI	51	RESB
23	OSCO	52	VSS
24	M	53	V4
25	FLM	54	V3
26	LP	55	V2
27	D7	56	V1
28	D6	57	V0
29	DUMMY	58	DUMMY