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.	AF-11264CFA-H
APPROVED BY	
DATE	

AMPIRE CO., LTD.
TOWER A, 4F, No.114, Sec. 1, HSIN-TAI 5th RD., HIS-CHIH,
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APPROVED BY	CHECKED BY	ORGANIZED BY

RECORD OF REVISION

Revision Date	Contents
2002/12/16	New Release

1 FEATURES

(1) Display format :112× 64 dot-matrix

(2) Construction : LCD panel, and COF.

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

(4) Driver : IC S6B1713

(5) 3.0V power input.

(6) Extended temperature type.

2 MECHANICAL DATA

Parameter	Stand Value	Unit
Dot size	0.245(W) × 0.310(H)	mm
Dot pitch	0.260(W) × 0.325(H)	mm
Viewing area	33.6(W) × 22.3(H)	mm
Module size	39.0(W) × 66.6(H) ×5.7 (T)	mm

3 ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Logic Circuit Supply Voltage	VDD-VSS	-0.3	7.0	V
LCD Driving Voltage	VDD-VO	0	14	V
Input Voltage	V_I	-0.3	VDD+0.3	V
Operating Temp.	T_{OP}	-20	70	°C
Storage Temp.	T_{STG}	-30	80	°C

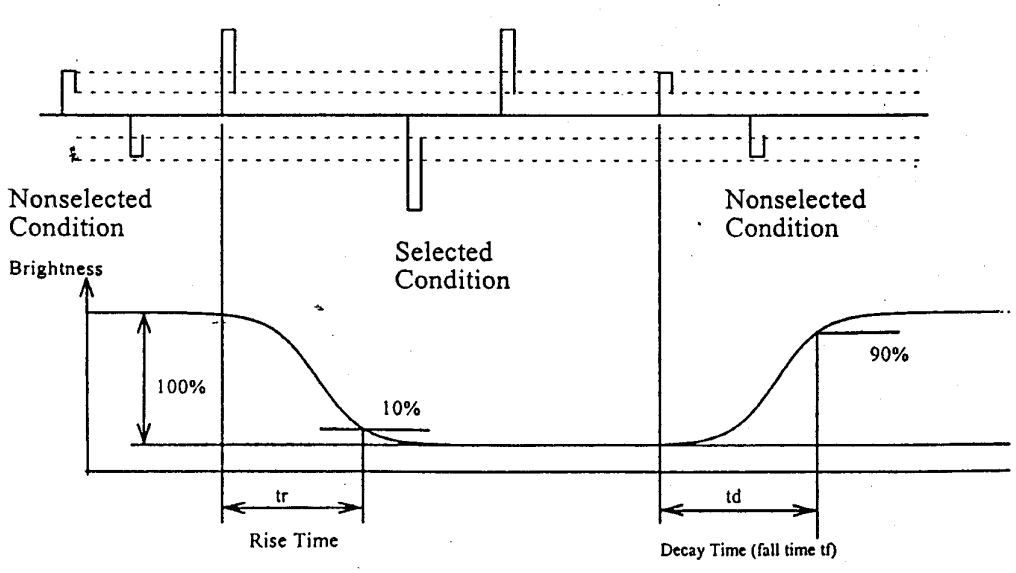
4 ELECTRO-OPTICAL CHARACTERISTICS

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
----- Electronic Characteristics -----							
Logic Circuit Supply Voltage	VDD-VSS	--	--	3.0	--	V	
LCD Driving Voltage	V0-VSS	-20°C	--	9.3	--	V	
		-10°C	--	9.0	--		
		25°C	--	8.8	--		
		50°C	--	8.65	--		
		70°C	--	8.3	--		
Input Voltage	VIH	--	0.8 VDD	--	VDD	V	
	VIL	--	0	--	0.2 VDD	V	
Logic Supply Current	IDD	VDD = 3V	--	--	1.2	mA	
----- Optical Characteristics -----							
Contrast	CR	25°C	--	5	--		Note 1
Rise Time	tr	25°C	--	200	--	ms	Note 2
Fall Time	tf	25°C	--	200	--	ms	
Viewing Angle Range	θ f	25°C & CR≥2	--	40	--	Deg.	Note 3
	θ b		--	20	--		
	θ l		--	30	--		
	θ r		--	30	--		
Frame Frequency	fF	25°C	--	64	--	Hz	

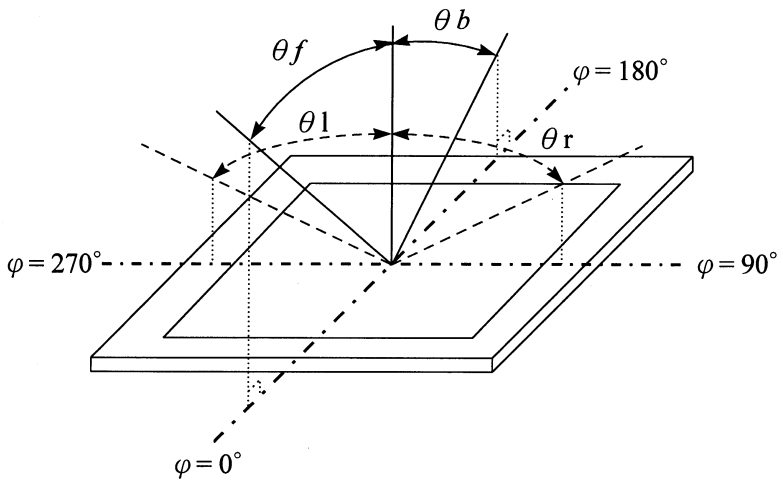
(NOTE 1) Contrast ratio :

CR = (Brightness in OFF state) / (Brightness in ON state)

(NOTE 2) Response time :



(NOTE 3) Viewing angle



5 BLOCK DIAGRAM &POWER INPUT

PIN NO	SYMBOL
1	LCD_CS
2	LCD_RESET
3	A0
4	WRITE
5	READ
6-13	DO-D7
14	VSS
15	VDD

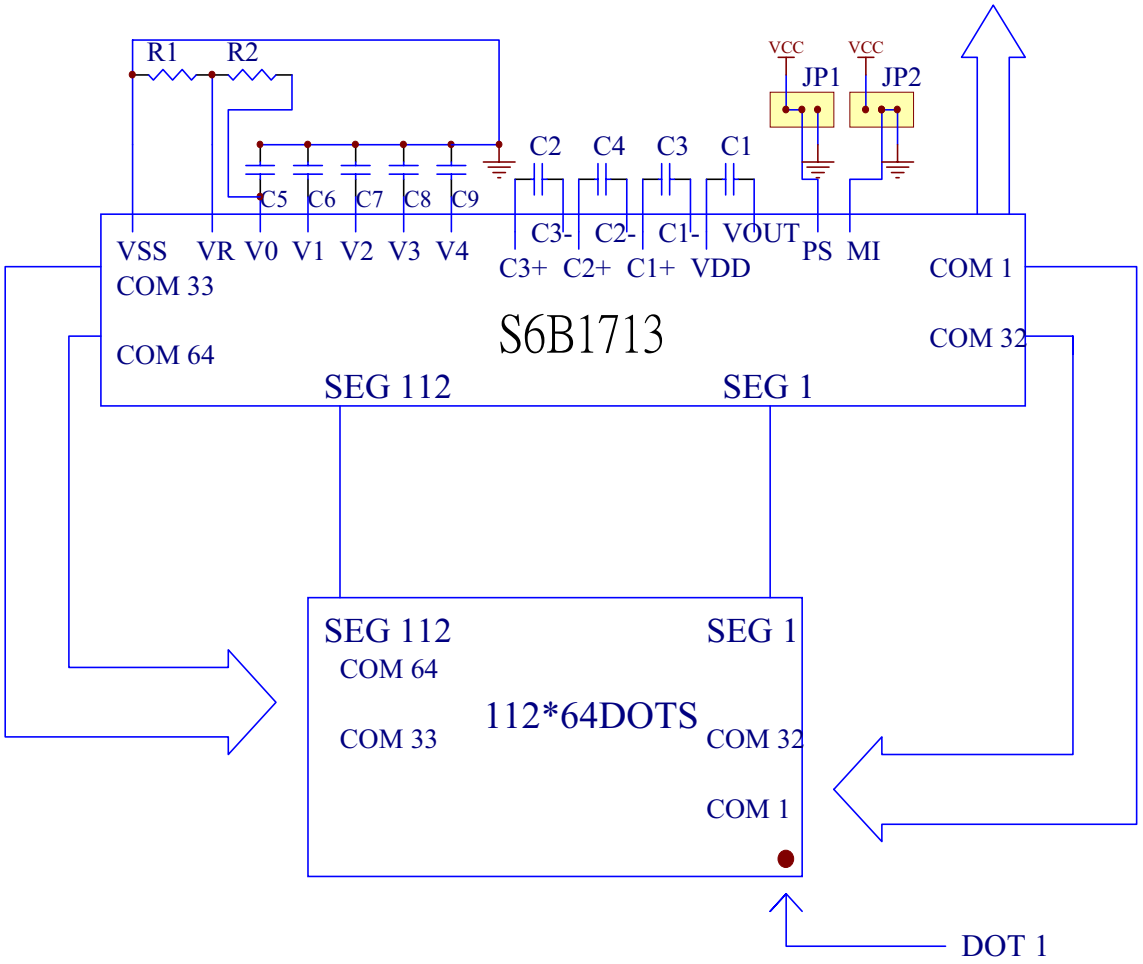
Power Supply : Using

Voltage Converter Circuit

Voltage Regulator Circuit

(External Resistor , INTRS = "L"**)**

&Voltage Follower Circuit



Date Shift Direction Setting : SHL=0 , ADC=0

JP1: Select Serial(L) / Parallel(H)

JP2: Select 8080(L) / 6800(H)

6 PIN CONNECTIONS

No.	Symbol	Function
1	LCD_CS	Chip select input
2	LCD_RESET	Hardware reset input
3	A0	Select address register/data register
4	WRITE	Write control signal input
5	READ	Read control signal input
6	DO	Data bus
7	D1	Data bus
8	D2	Data bus
9	D3	Data bus
10	D4	Data bus
11	D5	Data bus
12	D6	Data bus
13	D7	Data bus
14	VSS	Power Supply Ground (0V)
15	VDD	Power Supply (3V)

7 TIMING CHARACTERISTICS

7.1 Read/Write Characteristics(8080-series MPU)

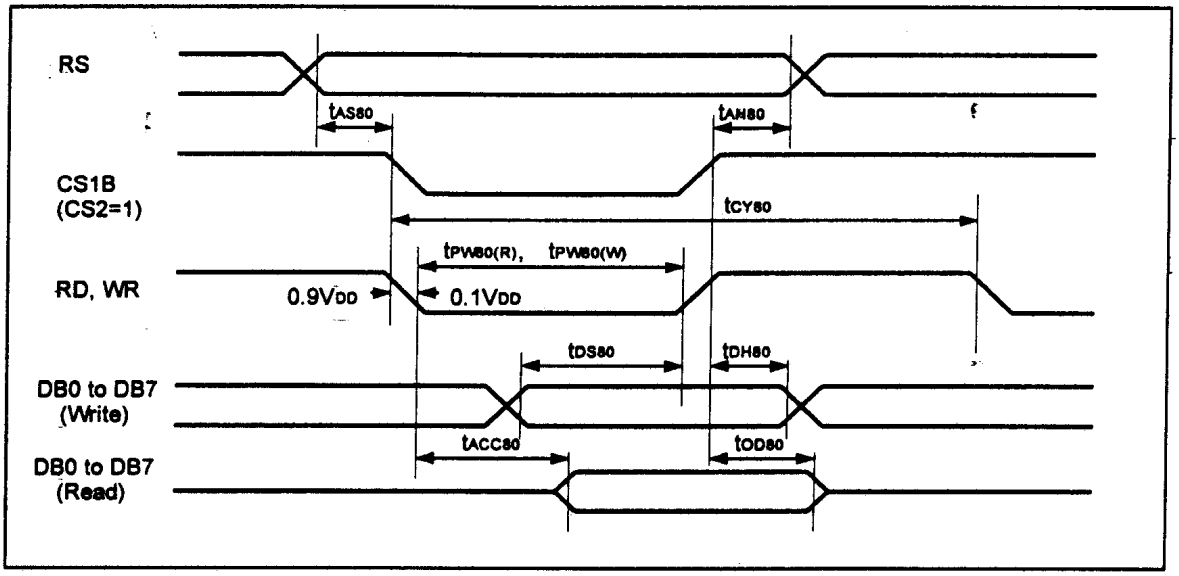


Figure 34. Read / Write Characteristics (8080-series MPU)

(VDD = 2.4 to 3.6V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time Address hold time	RS	tAS80 tAH80	13 17	-	-	ns	
System cycle time	RS	tCY80	400	-	-	ns	
Pulse width (WR)	RW_WR	tPW80 (W)	55	-	-	ns	
Pulse width (RD)	E_RD	tPW80 (R)	125	-	-	ns	
Data setup time Data hold time	DB7 to DB0	tDS80 tDH80	35 13	-	-	ns	
Read access time Output disable time		tACC80 tOD80	- 10	-	125 90	ns	CL = 100 pF

(VDD = 3.6 to 5.5V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time Address hold time	RS	tAS80 tAH80	10 10	-	-	ns	
System cycle time	RS	tCY80	150	-	-	ns	
Pulse width (WR)	RW_WR	tPW80 (W)	25	-	-	ns	
Pulse width (RD)	E_RD	tPW80 (R)	65	-	-	ns	
Data setup time Data hold time	DB7 to DB0	tDS80 tDH80	18 10	-	-	ns	
Read access time Output disable time		tACC80 tOD80	- 10	-	65 45	ns	CL = 100 pF

7.2 Read/Write Characteristics(6800-series MPU)

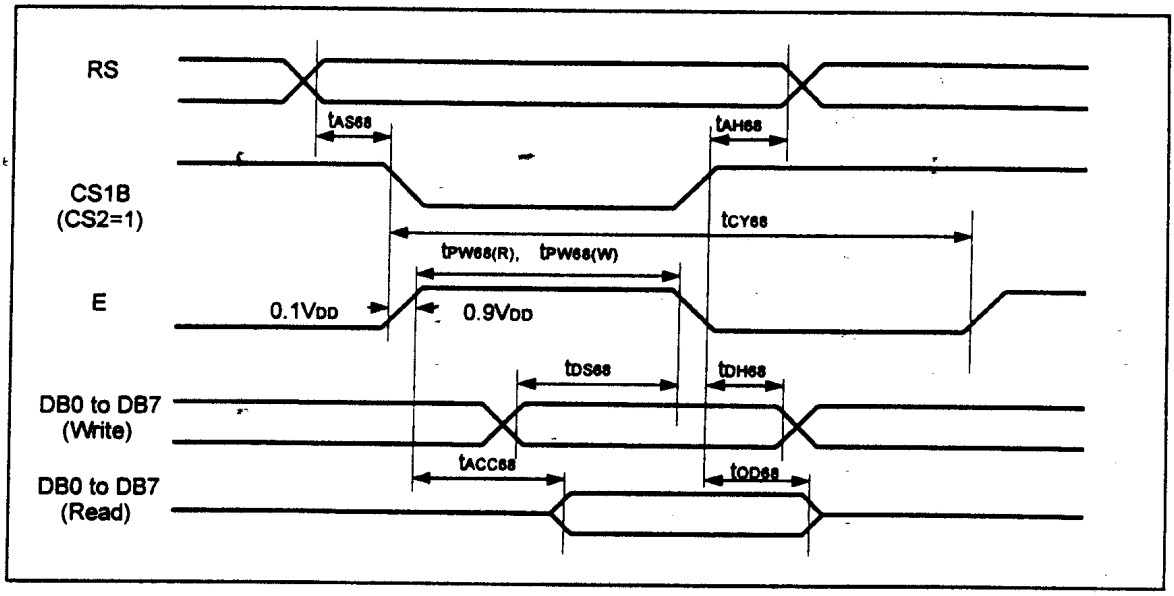


Figure 35. Read/Write Characteristics (6800-series Microprocessor)

(VDD = 2.4 to 3.6V, Ta = -40 to +85°C)

Item		Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time Address hold time		RS	TAS68 TAH68	13 17	-	-	ns	
System cycle time		RS	TCY68	400	-	-	ns	
Data setup time Data hold time		DB7 to DB0	TDS68 TDH68	35 13	-	-	ns	
Access time Output disable time			TACC68 TOD68	- 10	-	125 90	ns	CL = 100 pF
Enable pulse width	Read write	E_RD	TPW68 (R) TPW68 (W)	125 55	-	-	-	

(VDD = 3.6 to 5.5V, Ta = -40 to +85°C)

Item		Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time Address hold time		RS	tAS68 tAH68	10 10	-	-	ns	
System cycle time		RS	tCY68	150	-	-	ns	
Data setup time Data hold time		DB7 to DB0	tDS68 tDH68	18 10	-	-	ns	
Access time Output disable time			tACC68 tOD68	- 10	-	65 45	ns	CL = 100 pF
Enable pulse width	Read write	E_RD	tPW68 (R) tPW68 (W)	65 25	-	-	-	

8 QUALITY AND RELIABILITY

8.1 TEST CONDITIONS

Tests should be conducted under the following conditions :

Ambient temperature : 25 ± 5°C

Humidity : 60 ± 25% RH.

8.2 SAMPLING PLAN

Sampling method shall be in accordance with MIL-STD-105E, inspection level II, normal inspection, and single sampling plan tables for normal, tightened, and reduced inspection.

8.3 ACCEPTABLE QUALITY LEVEL

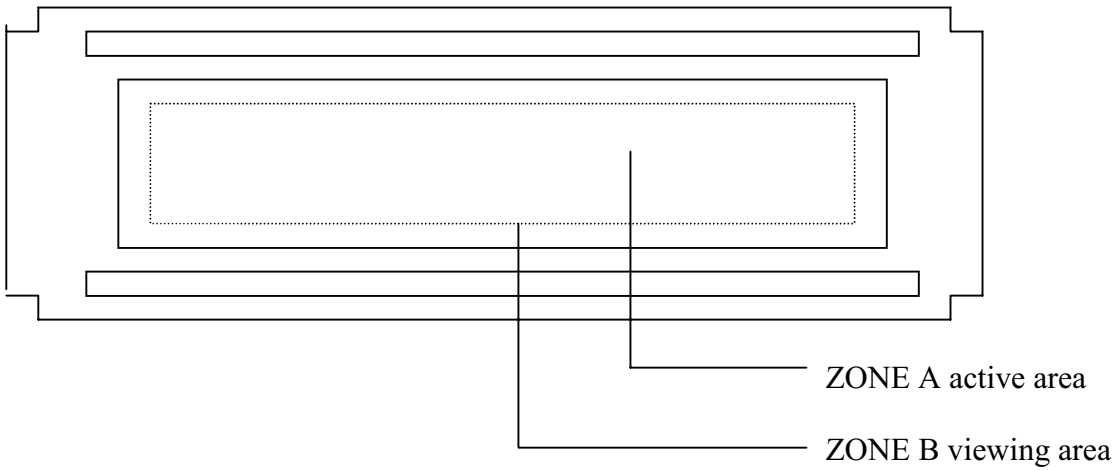
A major defect is defined as one that could cause failure to or materially reduce the usability of the unit for its intended purpose. A minor defect is one that does not materially reduce the usability of the unit for its intended purpose or is an infringement from established standards and has no significant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

8.4 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.

8.5 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



8.6 RELIABILITY

Test Item	Test Conditions	Note
High Temperature Operation	70 ± 3°C , t=96 hrs	
Low Temperature Operation	-20 ± 3°C , t=96 hrs	
High Temperature Storage	80± 3°C , t=96 hrs	1,2
Low Temperature Storage	-30± 3°C , t=96 hrs	1,2
Humidity Test	40°C , Humidity 90%, 96 hrs	1,2
Thermal Shock Test	-20°C (30 min.) ~ 25°C (5 min.) ~ 70°C (30 min.) (1 cycle) Total 5 cycle	1,2
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

Note 1 : Condensation of water is not permitted on the module.

Note 2 : The module should be inspected after 1 hour storage in normal conditions (15-35°C , 45-65%RH).

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.

9 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.

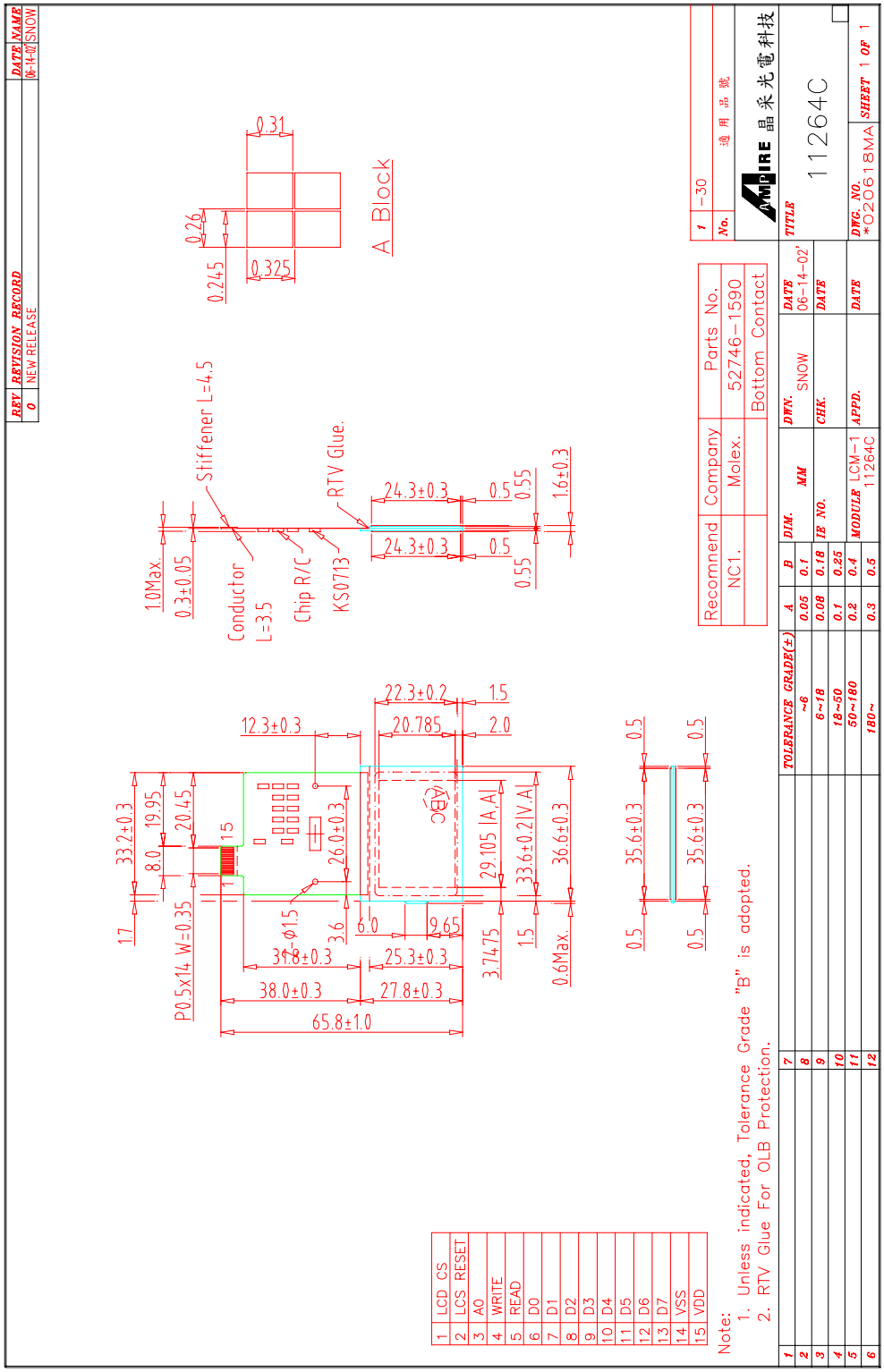
(7) In the event of LCD breakage and resultant leakage of fluid do not inhale, ingest or make contact with the skin. If contact is made rinse immediately.

(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.

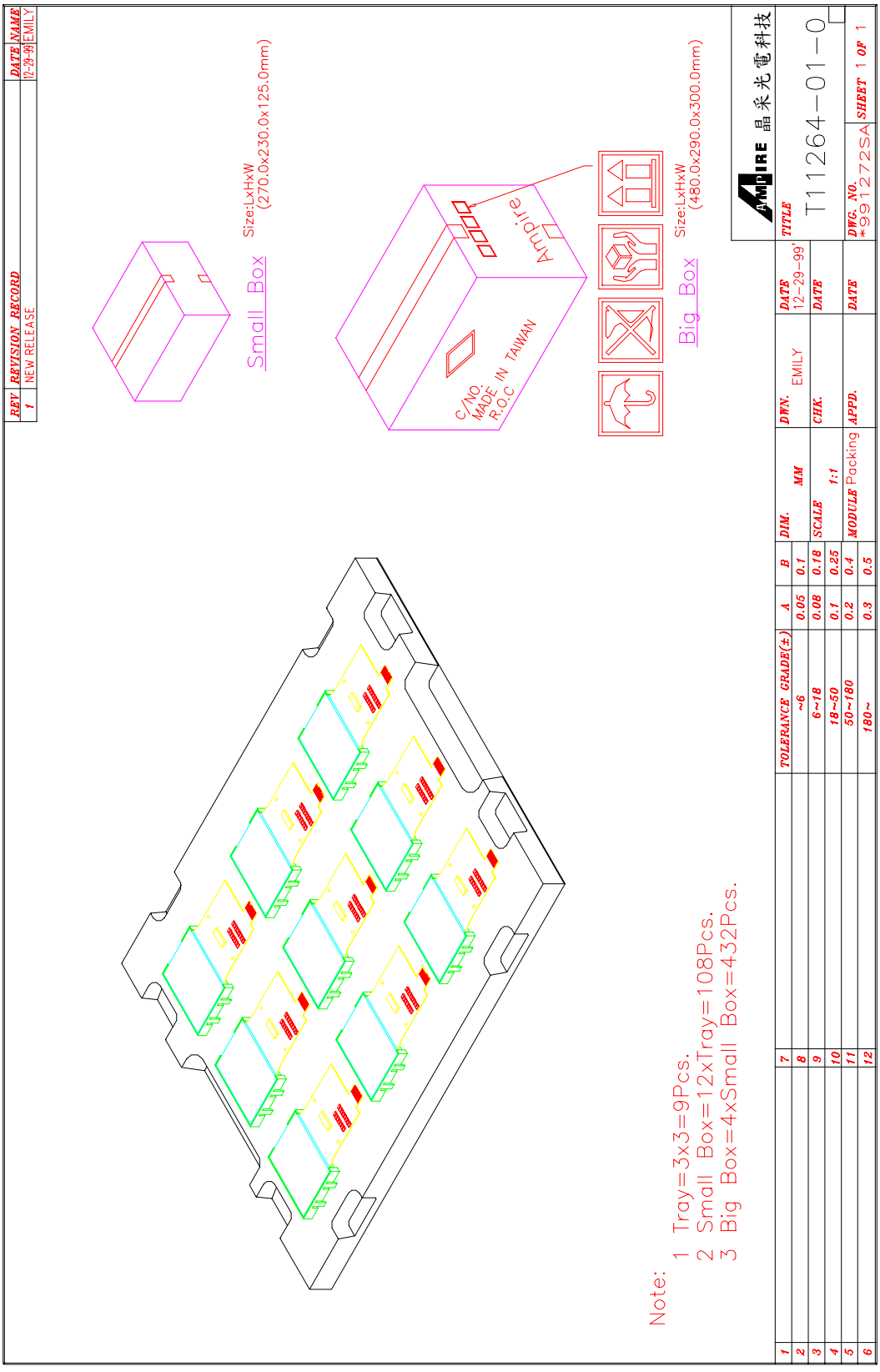
(9) Prior to initial power up input signals should not be applied.

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

10 OUTLINE DIMENSION



11 PACKING


Small Box
Size:LxHxW
(270.0x230.0x125.0mm)
Big Box
Size:LxHxW
(480.0x290.0x300.0mm)
Ampire
C/NO.
MADE IN TAIWAN
R.O.C
Note:
1 Tray=3x3=9Pcs.
2 Small Box=12xTray=108Pcs.
3 Big Box=4xSmall Box=432Pcs.
REV REVISION RECORD
1 NEW RELEASE
DATE NAME
12-29-99 EMILY
TOLERANCE GRADE(±)
~6 0.05 0.1
6~18 0.06 0.18
18~50 0.1 0.25
50~180 0.2 0.4
180~ 0.3 0.5
DIM. MM
SCALE 1:1
MODULE Packing
DWN. EMILY
CHK.
APPD.
DATE 12-29-99'
DATE
DATE
TITLE
T11264-01-0
DWG. NO.
*9912725A
SHEET 1 OF 1