



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.	AM-1280800WJTZQW-TH2H-A
Approved by	
Date	

☐ Preliminary Specification

☒ Formal Specification

AMPIRE CO., LTD.

**4F., No.116, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei
City221, Taiwan (R.O.C.)**

新北市汐止區新台五路一段 116 號 4 樓(東方科學園區 A 棟)

TEL:886-2-26967269 , FAX:886-2-26967196 or 26967270

Approved by	Checked by	Organized by
<i>Patrick</i>	<i>Simon</i>	<i>Jessica</i>

This Specification is subject to change without notice.

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2021/11/17	--	New Release	Jessica

1. General Descriptions

1.1 Introduction

The LCM is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a backlight system, column driver and row driver circuit, and Projective Capacitive Touch (USB Interface). This TFT LCD has a 10.1-inch diagonally measured active display area with WXGA resolution (1280 horizontal by 800 vertical pixels array).

1.2 Features

- (1) 10.1" TFT LCD Panel
- (2) LED Backlight System
- (3) Supported WXGA 1280x800 pixels resolution
- (4) Touch panel
 - ✧ IC: ILI2511
 - ✧ Interface: Mini-USB
- (5) Cover glass
 - ✧ Thickness: 1.1mm
- (6) HDMI to LCD interface board (Rev.E)
 - ◆ Single Power input: 12V / 2A power input. (Connector: PJ1 or PJ2).
 - ✧ LCD LVDS output: 24 BIT LVDS (Connector: J2)
 - ✧ HDMI Digital input : (Connector: HDMI1)
 - ◆ HDMI 1.4a Compliant
 - ◆ Single-link (Type A HDMI) on-chip TMDS receiver up to 225MHz. Support long cable.
 - ◆ Do not support HDCP.

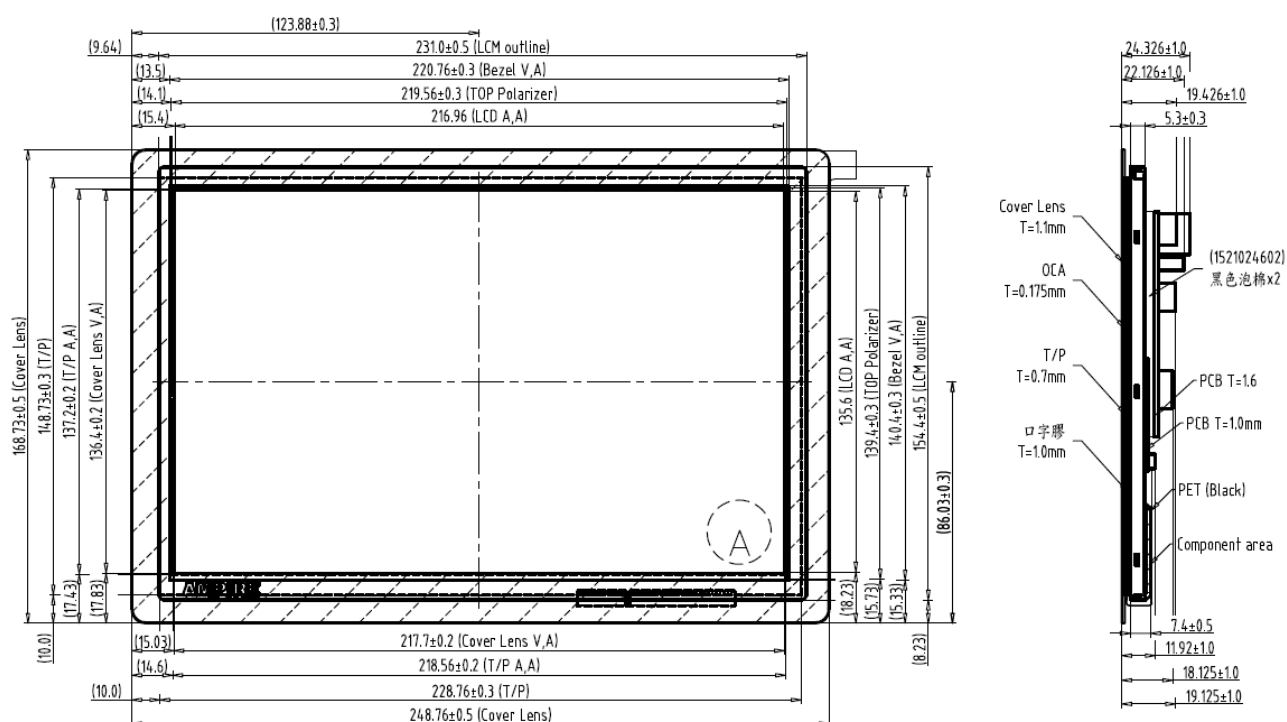
HDMI Support Input Video Format:

Resolution	V Sync	Resolution	V Sync
640x480	60	1280x800	60
640x480	72	1280x800	75
640x480	75	1280x960	60
800x600	56	1280x1024	60
800x600	60	1280x1024	75
800x600	72	1360x768	60
800x600	75	1366x768	60
848x480	60	1400x1050	60
1024x768	60	1400x1050	75
1024x768	70	1440x900	60
1024x768	75	1440x900	75
1152x864	75	1600x900	60
1280x720	60	1680x1050	60
1280x768	60	1680x1050	75
1280x768	75	1920x1080	60

- (7) LVDS Cable :
- (8) Pin to Pin. One side connects to LCD module. The other Side connects to J2_1280800N in the HDMI to LCD interface board.

1.3 Product Summary

Items	Specifications	Unit
Screen Diagonal	10.1	Inch
Pixel Format	1280(RGB) x800	-
Pixel Pitch	0.1695(H)×0.1695(V)	mm
Pixel Arrangement	R.G.B. Vertical Stripe	-
Display Mode	Normally Black	-
White Luminance	425(Typ.)	cd /m2
Contrast Ratio	800 : 1 (Typ.)	-
Response Time	25	msec
Input Voltage	3.3	V
Electrical Interface (Logic)	LVDS	-
Support Color	16.7M	-



2. Absolute Maximum Ratings

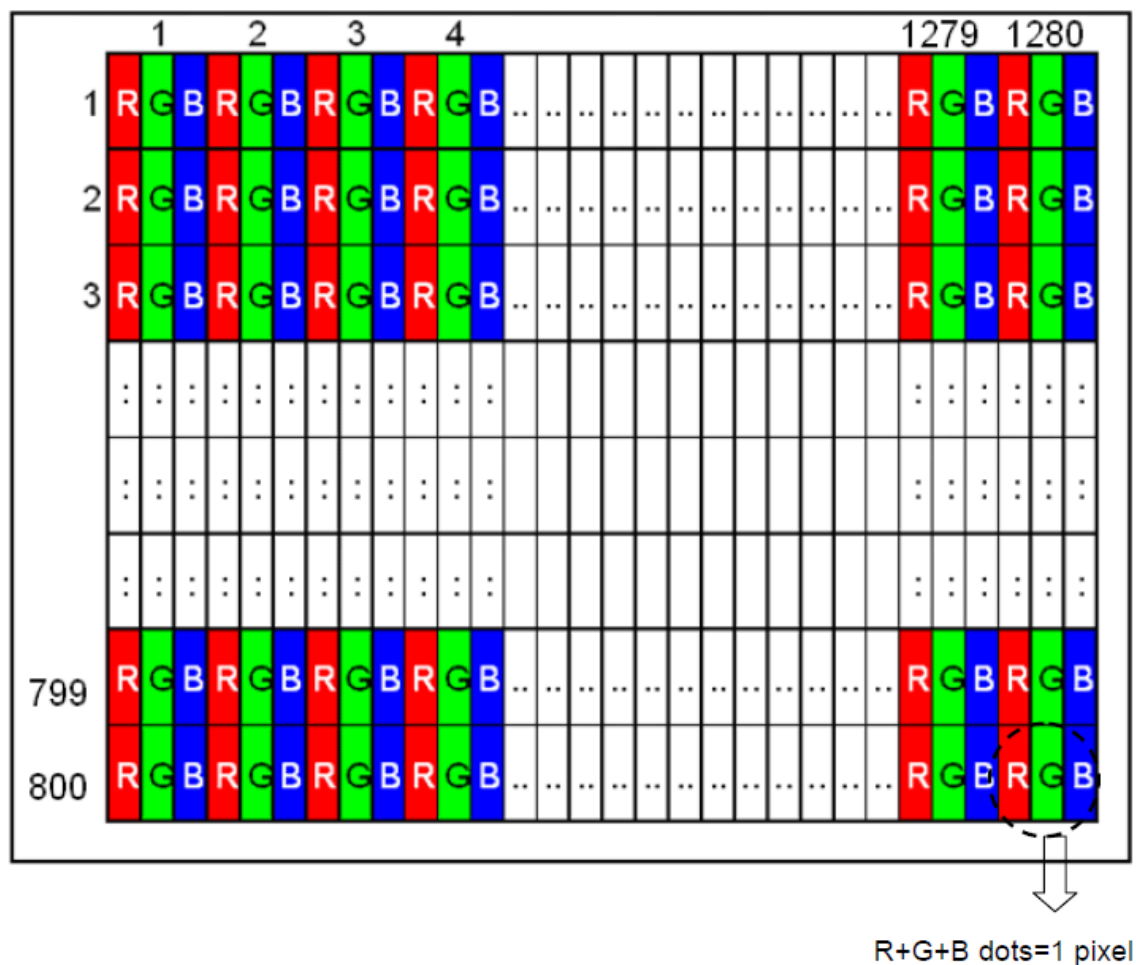
Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power Voltage	VDD	-0.3	4.0	V	VSS=0V, TA=25°C
Operation Temperature	TOP	-20	70	°C	
Storage Temperature	TST	-30	80	°C	

Note(1) The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

3. Pixel Format Image

Figure 2 shows the relationship of the input signals and LCD pixel format image.

Figure 2 Pixel Format



4. Optical Characteristics

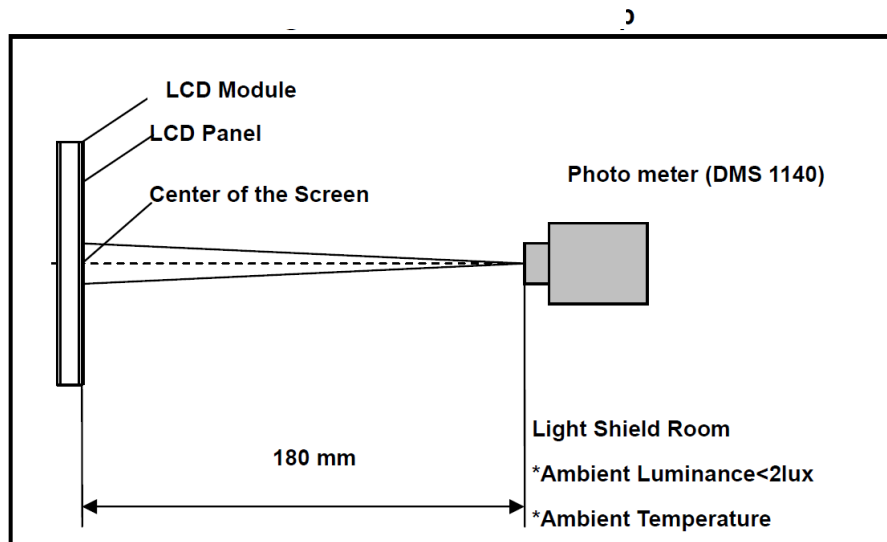
The optical characteristics are measured under stable conditions as following notes

Table 2 Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR>10)	Horizontal	θ L	(75)	(85)	-	degree	(1),(2),(3)
		θ R	(75)	(85)	-		
	Vertical	θ T	(75)	(85)	-		
		θ B	(75)	(85)	-		
Contrast Ratio	Center		(600)	(800)	-	-	(1),(2),(4)
Response Time	Rising		-	-	-	ms	(1),(2),(5)
	Falling		-	-	-	ms	
	Rising + Falling		-	25	-	ms	
Color Chromaticity (CIE1931)	NTSC		-	45	-	%	(1),(2)
	Red	x	Typ. -0.05	0.561	Typ. +0.05	-	(1),(2)
	Red	y		0.334		-	
	Green	x		0.341		-	
	Green	y		0.568		-	
	Blue	x		0.161		-	
	Blue	y		0.129		-	
	White	x		0.313		-	
	White	y		0.329		-	
White Luminance	Center		340	425	-	cd/m ²	(1),(2),(6)
Luminance Uniformity	9Points		70	75	-	%	(1),(2),(6)

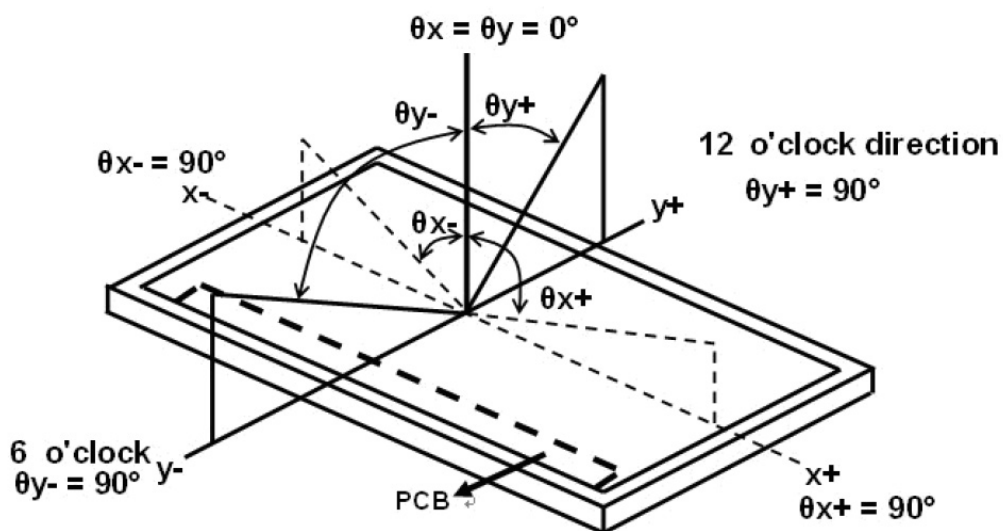
Note(1) Measurement Setup:

The LCD module should be stabilized at given temperature(25°C) for 15 minutes to Avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.



Note(2) The LED input parameter setting as: PWM: duty 100 %

Note(3) Definition of viewing angle:



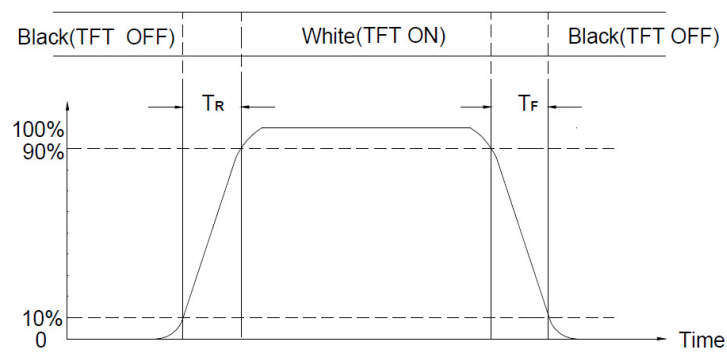
Note(4) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L63: Luminance of gray level 255, L0: Luminance of gray level 0

Note(5) Definition of Response Time (TR, TF)

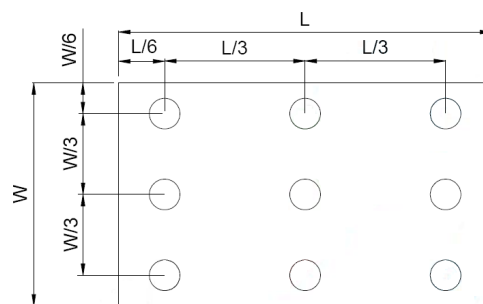


Note(6) Definition of brightness luminance

Active area is divided into 9 measuring areas (Refer to bellow figure).
Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{\min}}{B_{\max}}$$

L ----- Active area length W ----- Active area width



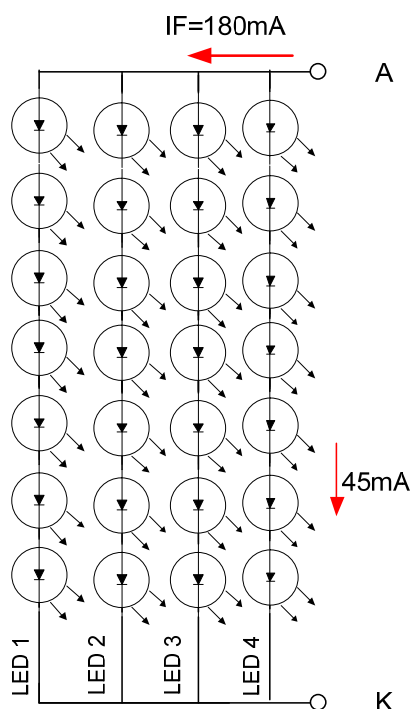
Bmax: The measured maximum luminance of all measurement position.

Bmin: The measured minimum luminance of all measurement position.

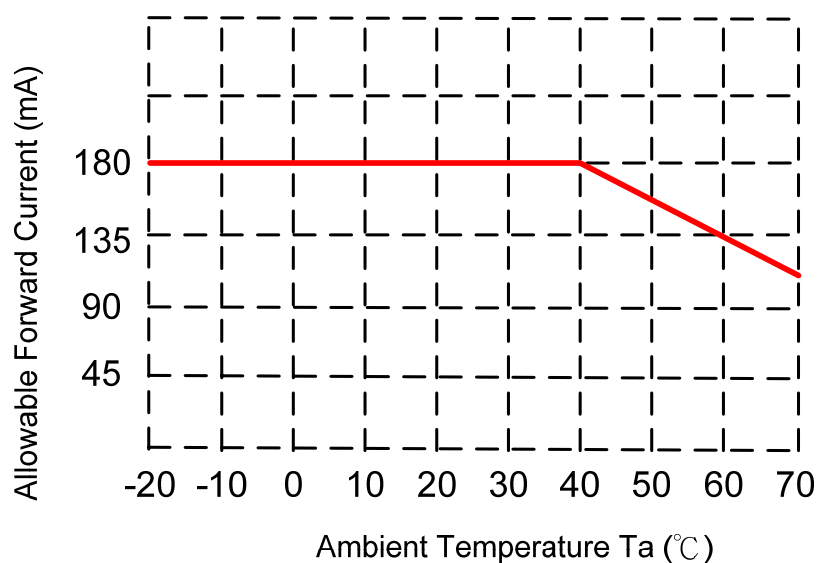
5. Backlight Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
LED Backlight Voltage	VBL	--	21	23.1	V	For reference
LED Backlight Current	IBL	-	180	--	mA	Ta=25°C
LED Life Time		--	50K	-	Hrs.	Note(1)

Note(1) Brightness to be decreased to 50% of the initial value. Ta=25°C



Note(2) When LCM is operated over 40°C ambient temperature, the IBL should be follow :



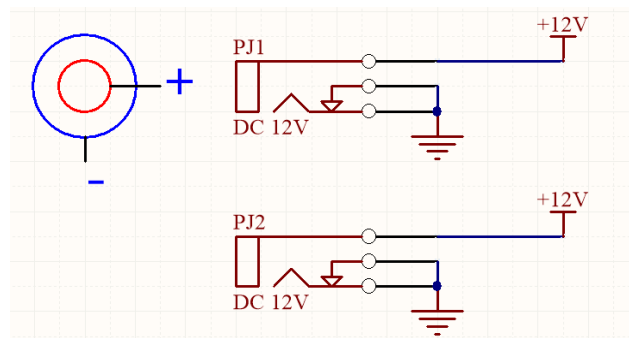
6. Interface

6.1 Interface (HDMI Interface Board)\

HDMI1:HDMI Type A P0.5 19Pin/HDFP1L-1N51 or Equivalent
DC Jack:DC-0005-20-20Z2S-Y or Equivalent.

- **PJ1 & PJ2 Power Supply Power Jack:**

Inner terminal is positive. Outer terminal is GND.



- **HDMI1: HDMI Type A Connector**

HDMI			
PIN	SIGNAL	PIN	SIGNAL
1	TMDS Data2+	11	TMDS Clock Shield (Ground)
2	TMDS Data2 Shield (Ground)	12	TMDS Clock-
3	TMDS Data2-	13	CEC (not used)
4	TMDS Data1+	14	Reserved (No Connection)
5	TMDS Data1 Shield (Ground)	15	SCL
6	TMDS Data1-	16	SDA
7	TMDS Data0+	17	DDC/CED (Ground)
8	TMDS Data0 Shield (Ground)	18	+5V input
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+		

7. Electrical Characteristics

7.1 TFT LCD Module Interface Connector

Item	Description
Manufacturer / Part Number	Starconn / 300E40-0010RA-G3
Mating Model Number	TBD or compatible

Pin #	Signal Name	Description	Remarks
1	NC	Not Connect	-
2	VDD	Power Supply, 3.3V (typical)	-
3	VDD	Power Supply, 3.3V (typical)	
4	VDD_EDID	Power Supply for EDID I2C Flash IC	
5	SCL_EDID	I2C Serial Clock for EDID I2C Flash IC	
6	SDA_EDID	I2C Serial Data for EDID I2C Flash IC	
7	NC	Not Connect	
8	LV0N	-LVDS differential data input	
9	LV0P	+LVDS differential data input	
10	GND	Ground	
11	LV1N	-LVDS differential data input	
12	LV1P	+LVDS differential data input	
13	GND	Ground	
14	LV2N	-LVDS differential data input	
15	LV2P	+LVDS differential data input	
16	GND	Ground	
17	LVCLKN	-LVDS differential data input	
18	LVCLKP	+LVDS differential data input	
19	GND	Ground	
20	LV3N	-LVDS differential data input	
21	LV3P	+LVDS differential data input	
22	GND	Ground	
23	NC	Not Connect	
24	NC	Not Connect	
25	NC	Not Connect	
26	NC	Not Connect	
27	NC	Not Connect	
28	NC	Not Connect	
29	NC	Not Connect	
30	NC	Not Connect	
31	NC	Not Connect	
32	NC	Not Connect	
33	NC	Not Connect	
34	NC	Not Connect	
35	BIST	BIST pin. (Keep NC or "High" if not use.)	
36	NC	Not Connect	
37	NC	Not Connect	
38	NC	Not Connect	
39	NC	Not Connect	
40	NC	Not Connect	

Note: All input signals shall be low or Hi-resistance state when VDD is off.

7.2 LVDS Receiver

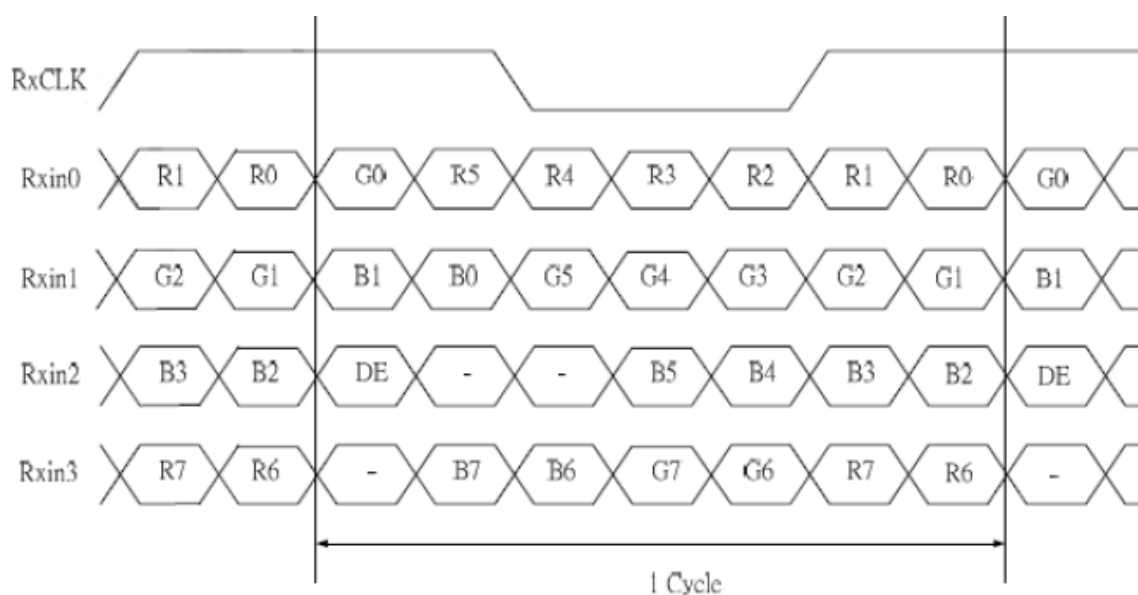
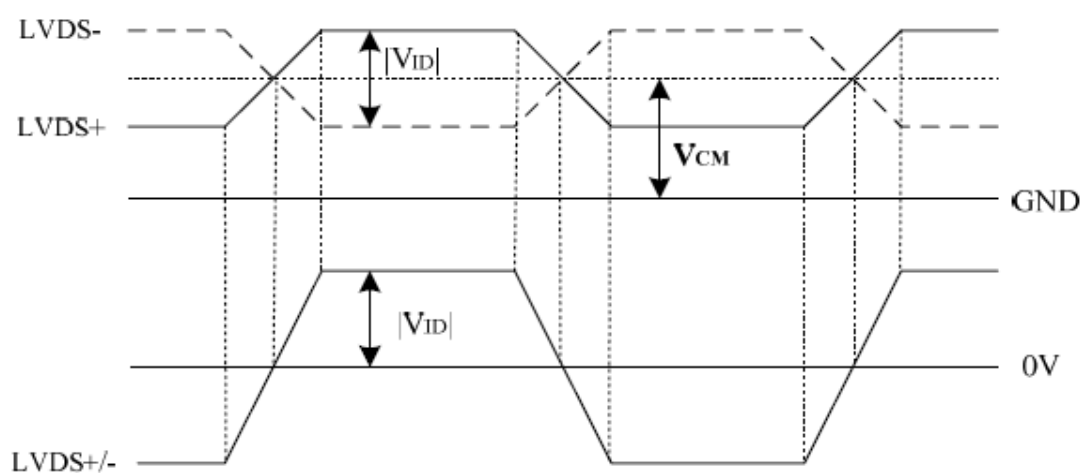
6.2.1 Signal Electrical Characteristics For LVDS Receiver

Table 7 LVDS Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High	V_{th}	-	-	+100	mV	$V_{CM}=+1.2V$
Differential Input Low	V_{tl}	-100	-	-	mV	$V_{CM}=+1.2V$
Magnitude Differential Input	$ V_{ID} $	200	-	400	mV	-
Common Mode Voltage	V_{CM}	$0.3+(V_{ID}/2)$	-	$V_{DD}-1.2-(V_{ID}/2)$	V	-
Common Mode Voltage	ΔV_{CM}	-	-	50	mV	$V_{CM}=+1.2V$

Note (1) Input signals shall be low or Hi-Z state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.



8. Interface Timings

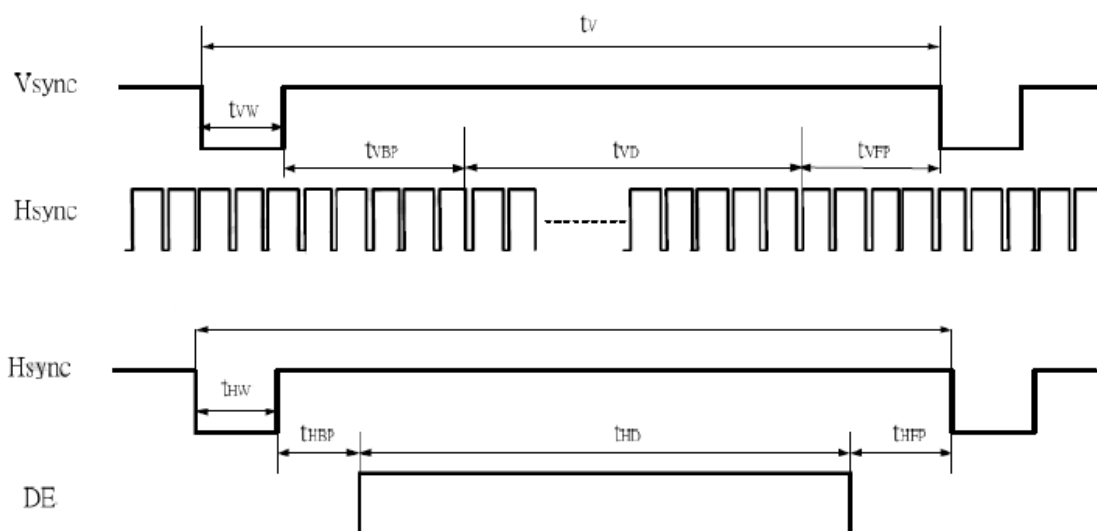
8.1 Timing Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
LVDS Clock Frequency	Fclk	(70.0)	(72.4)	(76.6)	MHz
H Total Time	HT	(1,410)	(1,440)	(1,470)	Clocks
H Active Time	HA	1,280			Clocks
V Total Time	VT	(828)	(838)	(868)	Lines
V Active Time	VA	800			Lines
Frame Rate	FV	-	(60)	-	Hz

Note1: $HT * VT * \text{Frame Frequency} \leq (76.6) \text{ MHz}$

Note2: All reliabilities are specified for timing specification based on refresh rate of 60Hz.

8.2 Timing Diagram of Interface Signal (DE mode)



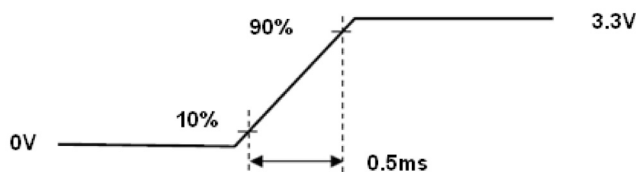
9. Power Consumption

Input power specifications are as follows.

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LCD Drive Voltage	VDD	3.0	3.3	3.6	V	(3)
VDD Current	White Pattern IDD	--	0.295	--	A	(2),(3)
VDD Power Consumption	White Pattern PDD	--	--	1.2	W	(2),(3)
Rush Current	Irush			1.5	A	(1),(3),(4)
Allowable Logic/LCD Drive Ripple Voltage	VDDrp			300	mV	(3)

Note(1) Measure Condition

Figure 9 VDD rising time

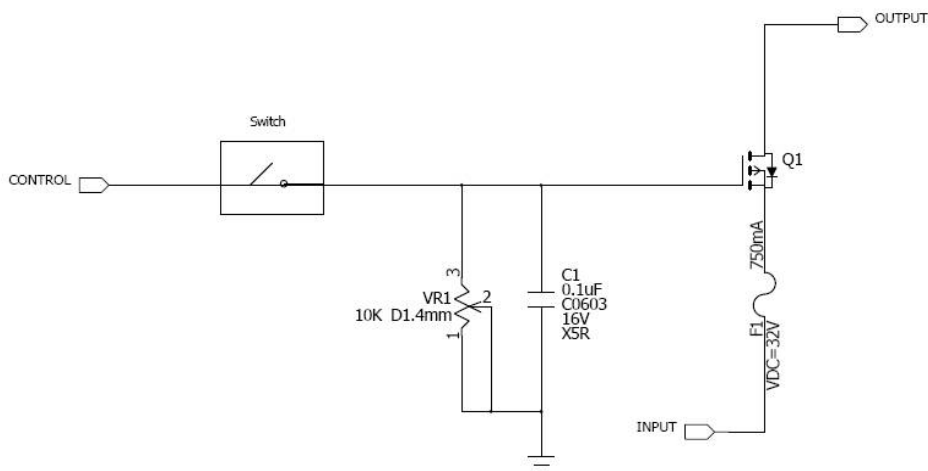


VDD rising time

Note(2) Frame Rate=60Hz, VDD=3.3V, DC Current.

Note(3) Operating temperature 25°C , humidity 55%RH.

Note(4) The reference measurement circuit of rush current.



10. Projected Capacitive-Type Touch Panel Specification

10.1 Basic Characteristic

Item	Specification
Type	Projective Capacitive Touch Panel
Activation	Two-fingers or Single-finger
X/Y Position Reporting	Absolute Position
Touch Force	No contact pressure required
Calibration	No need for calibration
Report Rate	Approx. 80 points/sec
Control IC	ILI2511

10.2 Electrical Absolute Max Rating

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power supply voltage	PVDD	-0.3	5.5	V	GND=0V

10.3 Electrical Characteristics

Specify the normal operating condition
(PGND=0V)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power supply voltage	PVDD	-	5	-	V	

10.4 Interface

Pin No.	Symbol	Function
1	PVDD	Power supply
2	D-	USB Data-
3	D+	USB Data+
4	PGND	Ground
5	PGND	Ground

11. Reliability Test Conditions

Test Item	Test Conditions	Note
High Temperature Operation	70±3°C ,Dry t=240 hrs	
Low Temperature Operation	-20±3°C, Dry t=240 hrs	
High Temperature Storage	80±3°C , Dry t=240 hrs	1,2
Low Temperature Storage	-30±3°C ,Dry t=240 hrs	1,2
Thermal Shock Test	-20°C ~ 25°C ~ 70°C 30 m in. 5 min. 30 min. (1 cycle) Total 100 cycle(Dry)	1,2
Storage Humidity Test	60 °C, Humidity 90%, 240 hrs	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).

Note(3) The module shouldn't be tested more than one condition, and all the test conditions are independent.

Note(4) All the reliability tests should be done without protective film on the module.

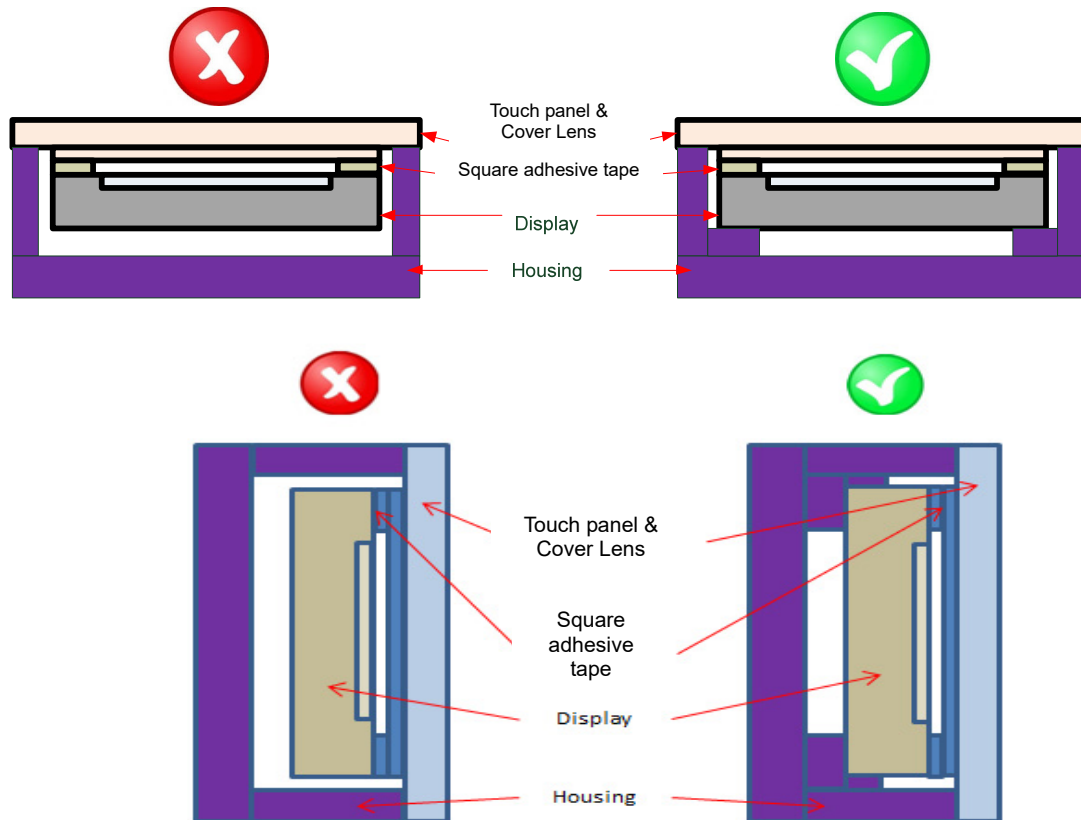
12. Use Precautions

12.1 Handling precautions

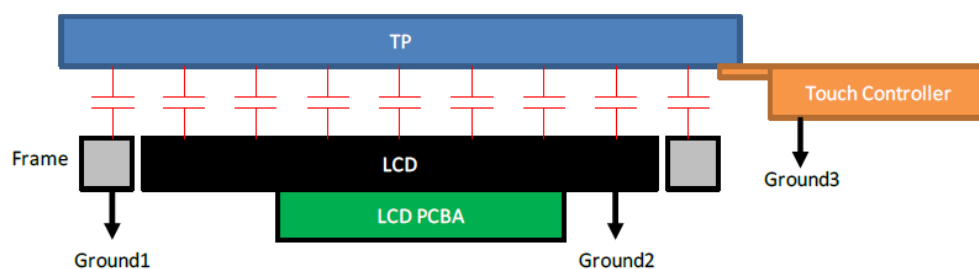
- (1) The polarizing plate may break easily so be careful when handling it. Do not touch, press or rub it with a hard-material tool like tweezers.
- (2) Do not touch the polarizing plate surface with bare hands so as not to make it dirty. If the surface or other related part of the polarizing plate is dirty, soak a soft cotton cloth or chamois leather in benzine and wipe off with it. Do not use chemical liquids such as acetone, toluene and isopropyl alcohol. Failure to do so may bring chemical reaction phenomena and deteriorations.
- (3) Remove any spit or water immediately. If it is left for hours, the suffered part may deform or decolorize.
- (4) If the LCD element breaks and any LC stuff leaks, do not suck or lick it. Also if LC stuff is stuck on your skin or clothing, wash thoroughly with soap and water immediately.

12.2 Installing precautions

- (1) The PCB has many ICs that may be damaged easily by static electricity. To prevent breaking by static electricity from the human body and clothing, earth the human body properly using the high resistance and discharge static electricity during the operation. In this case, however, the resistance value should be approx. $1M\Omega$ and the resistance should be placed near the human body rather than the ground surface. When the indoor space is dry, static electricity may occur easily so be careful. We recommend the indoor space should be kept with humidity of 60% or more. When a soldering iron or other similar tool is used for assembly, be sure to earth it.
- (2) When installing the module and ICs, do not bend or twist them. Failure to do so may crack LC element and cause circuit failure.
- (3) To protect LC element, especially polarizing plate, use a transparent protective plate (e.g., acrylic plate, glass etc) for the product case.
- (4) Do not use an adhesive like a both-side adhesive tape to make LCD surface (polarizing plate) and product case stick together. Failure to do so may cause the polarizing plate to peel off.
- (5) The square adhesive tape which is between the touch panel and display can't provide well supporting in the long term and high ambient temperature condition. Whether upright or horizontal position the support holder which is in the back side of the display is needed. Do not let the display floating.



- (6) TP needs to work in environment with stable stray capacitance. In order to minimize the variation in stray capacitance, all conductive mechanical parts must not be floating. Intermittent floating any conductive part around the touch sensor may cause significant stray capacitance change and abnormal touch function. It is recommended to keep all conductive parts having same electrical potential as the GND of the touch controller module.



GND1, GND2 and GND3 should be connected together to have the same ground

12.3 Storage precautions

- (1) Avoid a high temperature and humidity area. Keep the temperature between 0°C and 35°C and also the humidity under 60%.
- (2) Choose the dark spaces where the product is not exposed to direct sunlight or fluorescent light.
- (3) Store the products as they are put in the boxes provided from us or in the same conditions as we recommend.

12.4 Operating precautions

- (1) Do not boost the applied drive voltage abnormally. Failure to do so may break ICs. When applying power voltage, check the electrical features beforehand and be careful. Always turn off the power to the LC module controller before removing or inserting the LC module input connector. If the input connector is removed or inserted while the power is turned on, the LC module internal circuit may break.
- (2) The display response may be late if the operating temperature is under the normal standard, and the display may be out of order if it is above the normal standard. But this is not a failure; this will be restored if it is within the normal standard.
- (3) The LCD contrast varies depending on the visual angle, ambient temperature, power voltage etc. Obtain the optimum contrast by adjusting the LC drive voltage.
- (4) When carrying out the test, do not take the module out of the low-temperature space suddenly. Failure to do so will cause the module condensing, leading to malfunctions.
- (5) Make certain that each signal noise level is within the standard (L level: 0.2V_{dd} or less and H level: 0.8V_{dd} or more) even if the module has functioned properly. If it is beyond the standard, the module may often malfunction. In addition, always connect the module when making noise level measurements.
- (6) The CMOS ICs are incorporated in the module and the pull-up and pull-down function is not adopted for the input so avoid putting the input signal open while the power is ON.
- (7) The characteristic of the semiconductor element changes when it is exposed to light emissions, therefore ICs on the LCD may malfunction if they receive light emissions. To prevent these malfunctions, design and assemble ICs so that they are shielded from light emissions.
- (8) Crosstalk occurs because of characteristics of the LCD. In general, crosstalk occurs when the regularized display is maintained. Also, crosstalk is affected by the LC drive voltage. Design the contents of the display, considering crosstalk.

12.5 Other

- (1) Do not disassemble or take the LC module into pieces. The LC modules once disassembled or taken into pieces are not the guarantee articles.
- (2) Do not keep the LCD at the same display pattern continually. The residual image will happen and it will damage the LCD. Please use screen saver.
- (3) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

13. Mechanical Drawing

REV. REVISION RECORD
NEW RELEASE

A Block

HDM	
1	Datd2+
2	Datd2- Shield (Ground)
3	Datd2-
4	Datd1+
5	Datd1- Shield (Ground)
6	Datd1-
7	Datd0+
8	Datd0- Shield (Ground)
9	Datd0-
10	Clock+
11	Clock- Shield (Ground)
12	Clock-
13	CEC (not used)
14	Reserver (no connection)
15	Datd1 Shield (Ground)
16	SCL
17	SDA
18	+5V Input
19	Hot Plug Detect

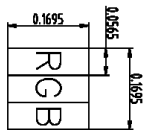
JP1	
1	PVDD
2	D-
3	D+
4	PGND
5	PGND

Note:

- Unless indicated, Tolerance "±0.5"
- HDM1:HDMI Type A P0.5 19Pin/HDFP1L-1N51 or Equivalent
- DC Jack:DC-0005-20-20Z2S-Y or Equivalent.
- T/P Controller board: Mini USB Type B/5PIN/CS04-SAM15B0-RO-LF or Equivalent

TOLERANCE GRADING		A	B	DIM.	M	DWN.	EMILY	DATE
1	HDMI BOARD (2800000042)	8	(USB)(J1281)-Mini USB的接頭					05-11-21
3	CCFL光源延長線(171000025)	9						DATE
4	Cable (1710140018)	10						DATE
5	黑色泡棉墊x2pcs(1521024602)	11						DATE
6	1280800UN-T CTP (1791280811)	12						DATE

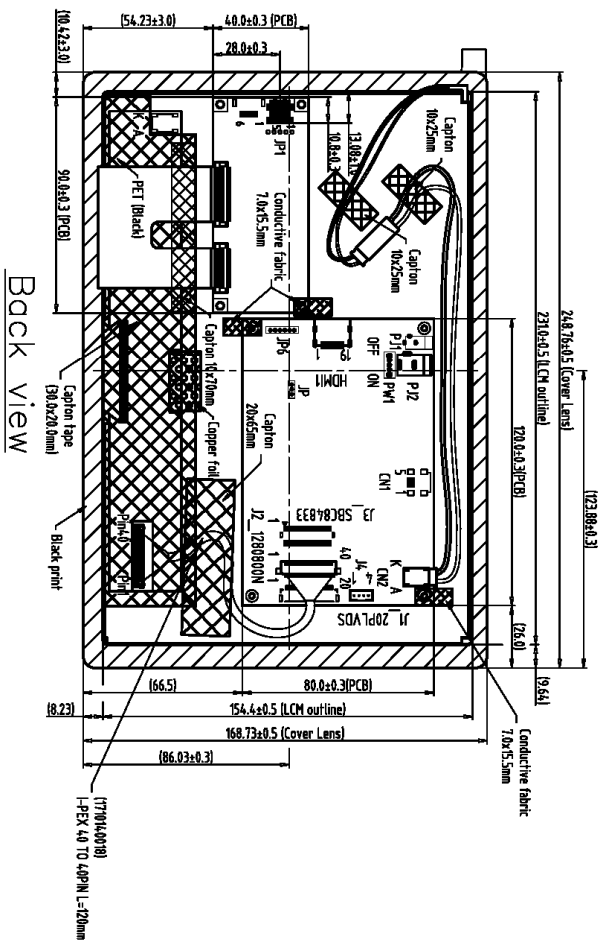
TITLE	晶采光電科技	DATE	
1280800WJ-TH2			
DWG. NO.			
*210570MA			
SHEET 1 OF 1			



A Block

1	Data2+
2	Data2 Shield (Ground)
3	Data2-
4	Data1+
5	Data1 Shield (Ground)
6	Data1-
7	Data0+
8	Data0 Shield (Ground)
9	Data0-
10	Clock+
11	Clock Shield (Ground)
12	Clock-
13	CEC (not used)
14	Reserver (no connection)
15	Data1 Shield (Ground)
16	SDA
17	SCL
18	+SV Input
19	Hot Plug Detect

1	PVDD
2	D-
3	D+
4	PGND



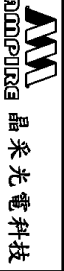
Back view

Note:

1. Unless indicated, Tolerance "±0.5"
2. HDMI: HDMI Type A PO.5 19Pin/HDFP1-1N51 or Equivalent
3. DC Jack: DC-0005-20-20ZS-Y or Equivalent.
4. T/P Controller board: Mini USB Type B/5PIN/CS04-SAM15B0-R0-LF or Equivalent

1	1280800WJ-TZQW-H1H	7	1024600UD-T T/P Controller Board	TOLERANCE GRADIENT	A	B	DIM.	MM	DWG.	EMILY	DATE	05-11-21
2	HDMI BOARD (2800000042)	8	(USB) (1112511) Mini USB的接頭									
3	CCFL 燈座基座 (171000025)	9										
4	Cable (1710140018)	10										
5	黑色泡棉*2pcs (152102402)	11										
6	1280800N-T CTP (1791280811)	12										

TITLE		1280800WJ-TH2	
DWG. NO.		*210571MA	
SHEET		1 OF 1	



14. Package

TBD