Specification for Approval

PRODUCT NUMBER: RTD9916803000
PRODUCT DESCRIPTION: RGS18160128FH003

CUSTOMER
APPROVED BY
DATE:

RITDISPLAY CORP. APPROVED

REVISION RECORD

REV.	REVISION DESCRIPTION	REV. DATE	REMARK
X01	■ Initial release	2006. 09. 12	
X02	■ Modify white CIE specification & contrast setting ■ Add single tape & modify seal dimension ■ Modify FPC	2006. 10. 26	Page 6, 8 & 17
A01	■ Transfer from X version ■ Modify specification of dark room contrast ■ Add the information of module weight ■ Modify the D.C electrical characteristics ■ Add the packing specification	2007. 02. 06	Page 4, 5, 7, 8 & 18
A02	■ Modify power on/off sequence ■ Rename IC (SSD1353U4→ SSD1353U7) ■ Modify single tape	2008. 05. 21	Page 14 & 17
A03	■ Modify definition of panel thickness ■ Modify panel electrical specifications – contrast setting, current, power consumption, luminance & CIE	2009. 07. 09	Page 5, 6 & 8
A04	■ Add handler ■ Add appendixes of ROHS test report	2011. 10. 04	Page 17 & 24~31
A05	■ Add appendix of precautions for using the OLED module	2014. 03. 31	Page 23~32
A06	■ Modify specification format ■ Modify connector type ■ Increase the amount of desiccant of packing ■ Add outgoing inspection provision	2018. 07. 13	Page 4, 6, 7, 8 & 17~24
A07	■ Modify electro-optical characteristics ■ Modify lifetime specification ■ Update format (ITEM. 8.1、8.3、9.2) ■ Modify measurement apparatus	2022.02.10	Page 7~10,15&27

CONTENTS

1. SCOPE

The purpose of this specification is to define the general provisions and quality requirements that apply to the supply of display cells manufactured by RiTdisplay.　This document, together with the Module Assembly Drawing, is the highest-level specification for this product. It describes the product, identifies supporting documents and contains specifications.

2. WARRANTY

RiTdisplay warrants that the products delivered pursuant to this specification (or order) will conform to the agreed specifications for twelve (12) months from the shipping date ("Warranty Period"). RiTdisplay is obligated to repair or replace the products which are found to be defective or inconsistent with the specifications during the Warranty Period without charge, on condition that the products are stored in the original packages at 25°C±5°C, 55%±10%RH or used as the conditions specified in the specifications.

Nevertheless, RiTdisplay is not obligated to repair or replace the products without charge if the defects or inconsistency are caused by the force majeure or the reckless behaviors of the customer.

After the Warranty Period, all repairs or replacements of the products are subject to charge.

3. FEATURES

- Small molecular organic light emitting diode.
- Color : 262K color and 65K colors
- Panel resolution : 160x128
- Driver IC : SSD1353
- Excellent Quick response time : 10μs
- Extremely thin thickness for best mechanism design. : 2.05 mm
- High contrast : 2000:1
- Wide viewing angle : 160°
- Strong environmental resistance.
- 8/9/16/18-bits 6800/8080-series Parallel Interface, Serial Peripheral Interface.
- Wide range of operating temperature : -40 to 70°C
- Anti-glare polarizer.

4. MECHANICAL DATA

NO	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	160 x 3 x 128	dot
2	Dot Size	0.048 (W) x 0.199 (H)	mm^2
3	Dot Pitch	0.073 (W) x 0.219 (H)	mm^2
4	Aperture Rate	60	%
5	Active Area	35.015 (W) x 28.012 (H)	mm^2
6	Panel Size	42.7 (W) x 33.4 (H)	mm^2
7*	Panel Thickness	1.85 ± 0.1	mm
8	Module Size	42.7 (W) x 79.5 (H) x 2.05 (T)	mm^3
9	Diagonal A/A size	1.8	inch
10	Module Weight	6.1 ± 10%	gram

* Panel thickness includes substrate glass, cover glass and UV glue thickness.

5. MAXIMUM RATINGS

ITEM	MIN	MAX	UNIT	Condition	Remark
Supply Voltage (V_{CI})	-0.5	3.5	V	Ta = 25°C	IC maximum rating
Supply Voltage (Vcc)	10	21	V	Ta = 25°C	IC maximum rating
Operating Temp.	-40	70	°C	-	-
Storage Temp	-40	85	°C	-	Note (2)

Note:

(1) Maximum ratings are those values beyond which damages to the OLED module may occur. The OLED functional operation should be restricted to the limits in the section 6. Electrical Characteristics tables.

(2) The defined temperature ranges do not include the polarizer. The maximum withstood temperature of the polarizer should be 80°C.

6. ELECTRICAL CHARACTERISTICS

6.1 D.C ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETERS	TEST CONDITION	MIN	TYP	MAX	UNIT
V_{CC}	Driver power supply (for OLED panel)	Ta = 25°C	16.5	17	17.5	V
V_{CI}	Low voltage power supply (for driver IC)	Ta = 25°C	2.4	2.8	3.5	V
V_{DDIO}	Logic I/O operating voltage	Ta = 25°C	1.6	1.8	V_{CI}	V
V_{OH}	High logic output level	Iout=100uA	$0.9*V_{DDIO}$		V_{DDIO}	V
V_{OL}	Low logic output level	Iout=100uA	0		$0.1*V_{DDIO}$	V
V_{IH}	High logic input level	Iout=100uA	$0.8*V_{DDIO}$		V_{DDIO}	V
V_{IL}	Low logic input level	Iout=100uA	0		$0.2*V_{DDIO}$	V

6.2 ELECTRO-OPTICAL CHARACTERISTICS

PANEL ELECTRICAL SPECIFICATIONS

PARAMETER	MIN	TYP.	MAX	UNITS	COMMENTS
Normal mode current (ICC)	-	39	41	mA	All pixels on (1)
Standby mode current (ICC)	-	3	5	mA	Standby mode 10% pixels on (2)
Normal mode power consumption	-	663	697	mW	All pixels on (1)
Standby mode power consumption	-	51	85	mW	Standby mode 10% pixels on (2)
Pixel Luminance	60	100	-	cd/m^2	Display Average(1)
Standby Luminance	-	40	-	cd/m^2	
CIEx (Red)	0.62	0.66	0.70		CIE1931
CIEy (Red)	0.29	0.33	0.37		CIE1931
CIEx (Green)	0.26	0.30	0.34		CIE1931
CIEy (Green)	0.59	0.63	0.67		CIE1931
CIEx (Blue)	0.10	0.14	0.18		CIE1931
CIEy (Blue)	0.14	0.18	0.22		CIE1931
CIEx (White)	0.27	0.31	0.35		CIE1931
CIEy (White)	0.29	0.33	0.37		CIE1931
Dark Room Contrast	2000:1				
Viewing Angle	160			degree	
Response Time		10		μs	

(1) Normal mode condition :
- Driving Voltage : 17V
- Master contrast setting : 0x0f
- Red contrast setting : 0x75
- Green contrast setting : 0x60
- Blue contrast setting : 0x6a
- Frame rate : 85Hz
- Duty setting : 1/128

(2) Standby mode condition :
- Driving Voltage : 17V
- Master contrast setting : 0x05
- Red contrast setting : 0x80
- Green contrast setting : 0x6b
- Blue contrast setting : 0x7f
- Frame rate : 85Hz
- Duty setting : 1/128

(3) Sleep mode condition :
When send 0xae command OLED display off and memory data will be maintained.

(4) Wake up condition :
When send 0xaf command OLED will be turned on.

7. LIFETIME SPECIFICATION

ITEM	MIN	UNIT	Condition	Remark
Life Time	12,000	Hrs	100 cd/m^2, 50% alternating checkerboard	Note (1)
Life Time	15,000	Hrs	80 cd/m^2, 50% alternating checkerboard	Note (2)
Life Time	20,000	Hrs	60 cd/m^2, 50% alternating checkerboard	Note (3)

Note:

(A) Under Vcc = 17V, Ta = 25°C, 50% RH.

(B) Life time is defined the amount of time when the luminance has decayed to less than 50% of the initial measured luminance.

(1) Setting of 100 cd/m^2 :

- Master contrast setting : 0x0f
- Red contrast setting : 0x75
- Green contrast setting : 0x60
- Blue contrast setting : 0x6a
- Frame rate : 85Hz
- Duty setting : 1/128

(2) Setting of 80 cd/m^2 :

- Master contrast setting : 0x0b
- Red contrast setting : 0x86
- Green contrast setting : 0x69
- Blue contrast setting : 0x7c
- Frame rate : 85Hz
- Duty setting : 1/128
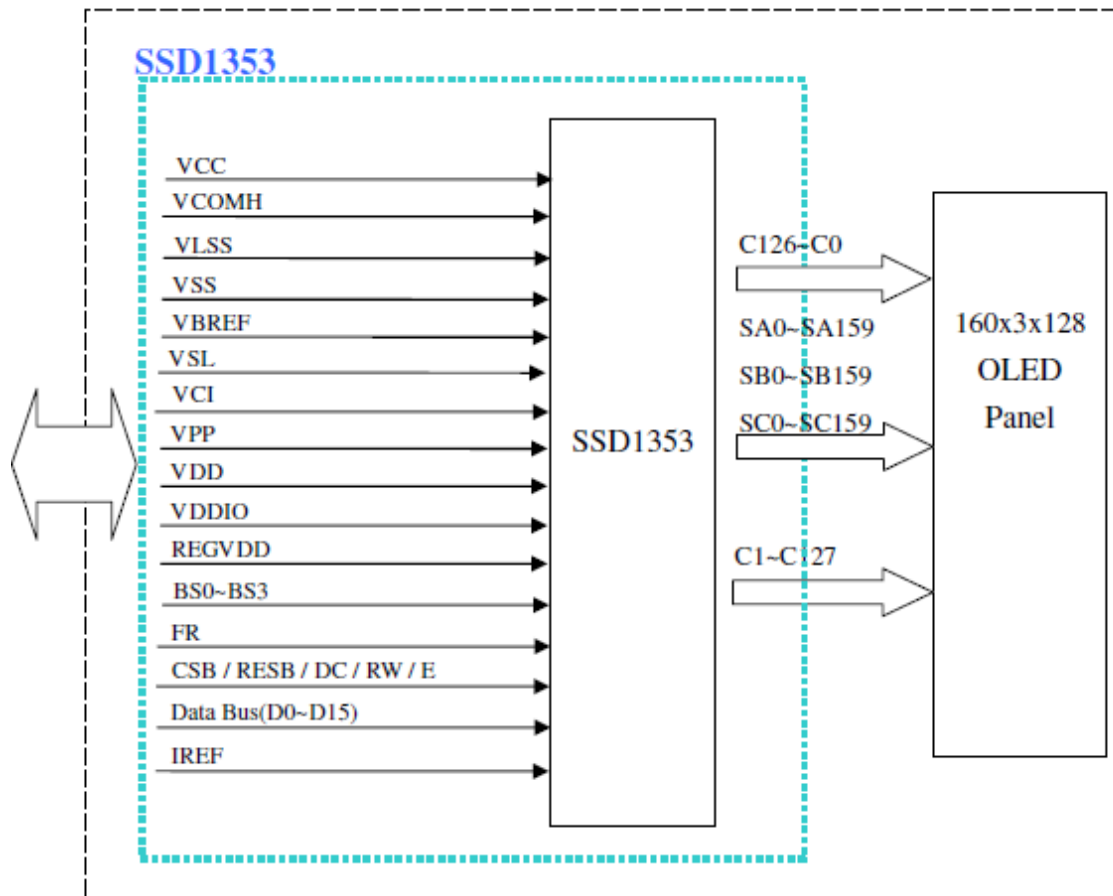
(3) Setting of 60 cd/m^2 :

- Master contrast setting : 0x08
- Red contrast setting : 0x81
- Green contrast setting : 0x6a
- Blue contrast setting : 0x7c
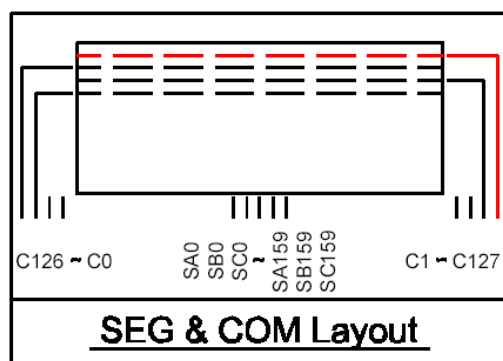- Frame rate : 85Hz
- Duty setting : 1/128

8. INTERFACE

8.1 FUNCTION BLOCK DIAGRAM

RiTdisplay 160X3X128 OLED

8.2 PANEL LAYOUT DIAGRAM

SEG & COM Layout

REV.: A07   2022/02/10

8.3 PIN ASSIGNMENTS

PIN NAME	PIN NO.	DESCRIPTION	Setting at each interface		
			16-8080 parallel	SPI	IIC
1	VCC	Power supply for panel driving voltage.			
2	VCOMH	A capacitor should be connected between this pin and VSS.			
3	VLSS	Analog system ground pin.			
4	VSS	Ground pin.			
5	VBREF	Connect to ground with a capacitor.			
6	VSL	This is segment voltage reference pin.			
7	VCI	Low voltage power supply.			
8	VPP	Connect to VDD.			
9	VDD	Power supply input for logic.			
10	VDDIO	Power supply for interface logic level. It should be match with the MCU interface voltage level. VDDIO must always be equal or lower than VCI.			
11	REGVDD	Internal VDD regulator selection pin. When this pin is pulled high, internal VDD regulator is enabled. When this pin is pulled low, external VDD regulator is used.			
12	BS0		High	Low	NA
13	BS1	Interface selection pins.	High	Low	NA
14	BS2		High	Low	NA
15	BS3		Low	Low	NA
16	FR	It should be kept NC.			
17	CSB	This pad is the chip select input. Low active.	CS#	CS#	NA
18	RESB	This is a reset signal input. Low active.	RES#	RES#	NA
19	DC	D/C="H": Data. D/C="L": Command.	D/C#	D/C#	NA
20	RW	When connected to 8080-series MPU. WR pin. When RW ="L": Write signal input. When connected to 6800-series MPU. When RW ="H": Read. When RW ="L": Write.	WR#	Low	NA

REV.: A07   2022/02/10

21	E	When connected to 8080-series MPU. RD pin. When E ="L": Read signal input. When connected to 6800-series MPU. Enable clock input of the 6800 series MPU.	RD#	Low	NA
22	D0	18 bit / 16bit / 9bit / 8 bit Data bus I/O.	D0	SCLK	NA
23	D1		D1	SDIN	NA
24	D2		D2	NC	NA
25	D3		D3	NA	NA
26	D4		D4	NA	NA
27	D5		D5	NA	NA
28	D6		D6	NA	NA
29	D7		D7	NA	NA
30	D8		D8	NA	NA
31	D9		D9	NA	NA
32	D10		D10	NA	NA
33	D11		D11	NA	NA
34	D12		D12	NA	NA
35	D13		D13	NA	NA
36	D14		D14	NA	NA
37	D15		D15	NA	NA
38	D16		Low	NA	NA
39	D17		Low	NA	NA
40	IREF	A resistor should be connected between this pin and VSS.			
41	VSS	Ground pin.			
42	VLSS	Analog system ground pin.			
43	VCOMH	A capacitor should be connected between this pin and VSS.			
44	VCC	Power supply for panel driving voltage.			
45	NC	No connection.			

Note

(1) Low is connected to VSS

(2) High is connected to VDDIO

8.4 GRAPHIC DISPLAY DATA RAM ADDRESS MAP

The GDDRAM is a bit mapped static RAM holding the bit pattern to be displayed. The size of the RAM is 160x132x18bits.

For mechanical flexibility, re-mapping on both Segment and Common outputs can be selected by software.

For vertical scrolling of the display, an internal register storing display start line can be set to control the portion of the RAM data to be mapped to the display.

Each pixel has 18-bit data. Each sub-pixels for color A, B and C have 6 bits. The arrangement of data pixel in graphic display data RAM is shown below.

Common Address (Normal)	Common Address (Remapped)	A5 A4 A3 A2 A1 A0	B5 B4 B3 B2 B1 B0	C5 C4 C3 C2 C1 C0	A5 A4 A3 A2 A1 A0	B5 B4 B3 B2 B1 B0	C5 C4 C3 C2 C1 C0	A5 A4 A3 A2 A1 A0	......	......	C5 C4 C3 C2 C1 C0	A5 A4 A3 A2 A1 A0	B5 B4 B3 B2 B1 B0	C5 C4 C3 C2 C1 C0	Common output
0	131	6	6	6	6	6	6	6	......	......	6	6	6	6	COM0
1	130	6	6	6					......	......					COM1
2	129								......	......					COM2
3	128								......	......					COM3
4	127								......	......					COM4
5	126								......	......					COM5
6	125		no of bits in this cell						......	......					COM6
7	124								......	......					COM7
:	:	:	:	:	:	:	:	:	......	......	:	:	:	:	
:	:	:	:	:	:	:	:	:	......	......	:	:	:	:	
:	:	:	:	:	:	:	:	:	......	......	:	:	:	:	
127	4								......	......					
128	3								......	......					COM128
129	2								......	......					COM129
130	1								......	......					COM130
131	0								......	......					COM131

| SEG output	SA0	SB0	SC0	SA1	SB1	SC1	SA2	......	......	SC158	SA159	SB159	SA159

REV.: A07   2022/02/10

8.5 INTERFACE TIMING CHART

8080-Series MCU Parallel Interface Timing Characteristics

(V_{DD} - V_{SS} = 2.4 to 2.6V, V_{DDIO}=1.6V, V_{CI} = 3.3V, T_A = 25°C)

Symbol	Parameter	Min	Typ	Max	Unit
t_{cycle}	Clock Cycle Time	300	-	-	ns
t_{AS}	Address Setup Time	10	-	-	ns
t_{AH}	Address Hold Time	0	-	-	ns
t_{DSW}	Write Data Setup Time	40	-	-	ns
t_{DHW}	Write Data Hold Time	7	-	-	ns
t_{DHR}	Read Data Hold Time	20	-	-	ns
t_{OH}	Output Disable Time	-	-	70	ns
t_{ACC}	Access Time	-	-	140	ns
t_{PWLR}	Read Low Time	150	-	-	ns
t_{PWLW}	Write Low Time	60	-	-	ns
t_{PWHR}	Read High Time	60	-	-	ns
t_{PWHW}	Write High Time	60	-	-	ns
t_R	Rise Time	-	-	15	ns
t_F	Fall Time	-	-	15	ns
t_{CS}	Chip select setup time	0	-	-	ns
t_{CSH}	Chip select hold time to read signal	0	-	-	ns
t_{CSF}	Chip select hold time	20	-	-	ns

8080-series MCU parallel interface characteristics (Form 1)

Write cycle (Form 1)   Read cycle (Form 1)

8080-series MCU parallel interface characteristics (Form 2)
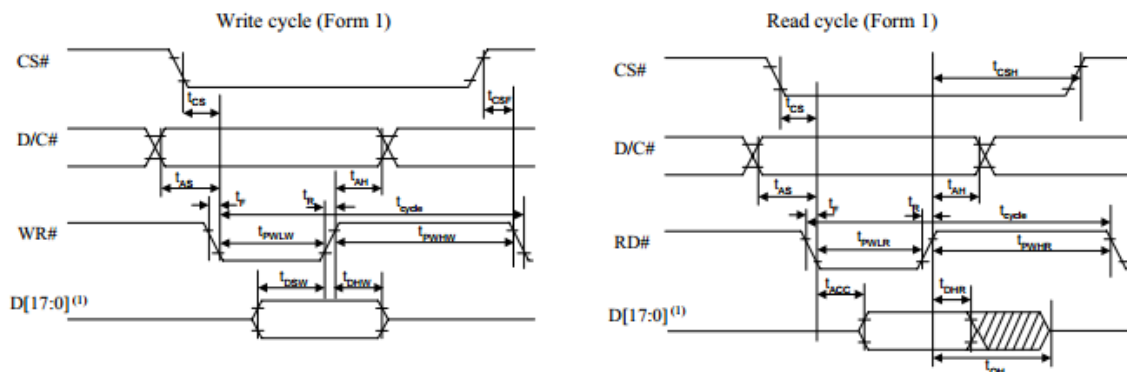
Write cycle (Form 2)   Read cycle (Form 2)
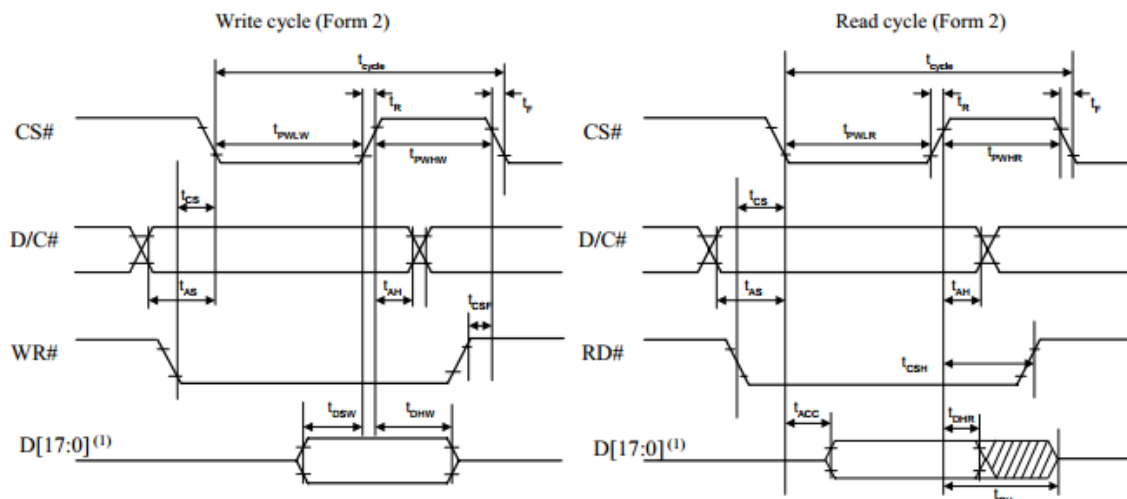
Note
[1] when 8 bit used: D[7:0] instead; when 9 bit used: D[8:0] instead; when 16 bit used: [15:0] instead; when 18 bit used: D[17:0] instead.

REV.: A07   2022/02/10

9. POWER ON / OFF SEQUENCE & APPLICATION CIRCUIT

9.1 POWER ON / OFF SEQUENCE

Power ON sequence:

1. Power ON V_{CI}, V_{DDIO}.

2. After V_{CI}, V_{DDIO} become stable, set RES# pin LOW (logic low) for at least 100us (t_1) and then HIGH(logic high).

3. After set RES# pin LOW (logic low), wait for at least 100us (t_2). Then Power ON $V_{CC.(1)}$

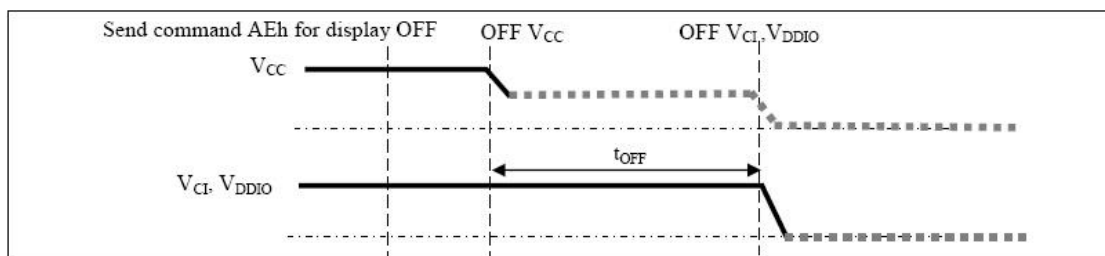4. After V_{CC} become stable, send command AFh for display ON. SEG/COM will be ON after 200ms(t_{AF}).

The Power ON sequence.
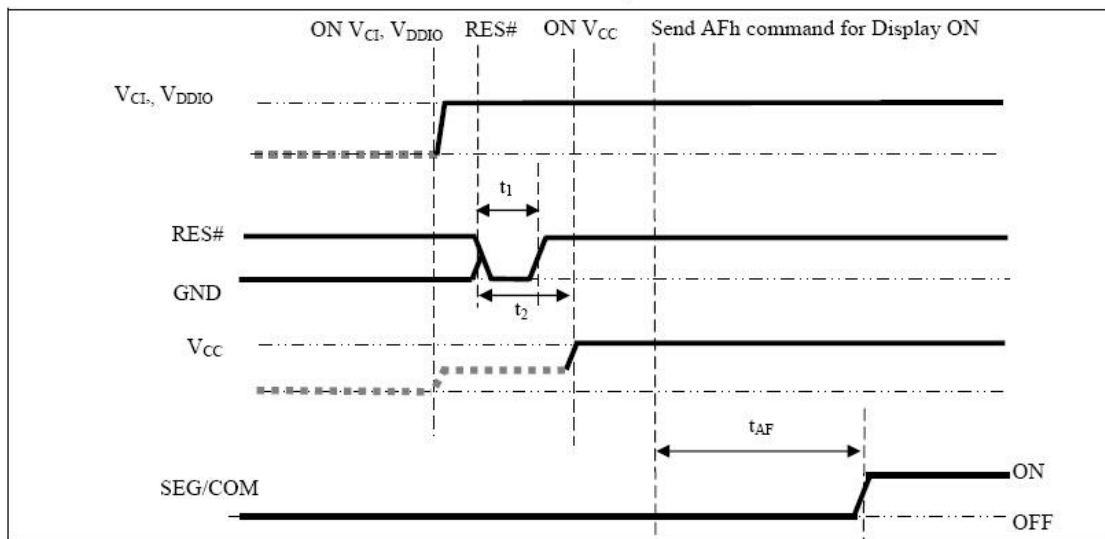
Power OFF sequence:

1. Send command AEh for display OFF.

2. Power OFF $V_{CC.(1), (2)}$

3. Wait for t_{OFF}. Power OFF V_{CI}, V_{DDIO}.
   (Where Minimum t_{OFF}=80ms, Typical t_{OFF}=100ms)

The Power OFF sequence

Note:

(1) Since an ESD protection circuit is connected between V_{CI}, V_{DDIO} and V_{CC}, V_{CC} becomes lower than V_{CI} whenever V_{CI},V_{DDIO} is ON and V_{CC} is OFF as shown in the dotted line of V_{CC} in above figures.

(2) V_{CC} should be disabled when it is OFF.

9.2 APPLICATION CIRCUIT
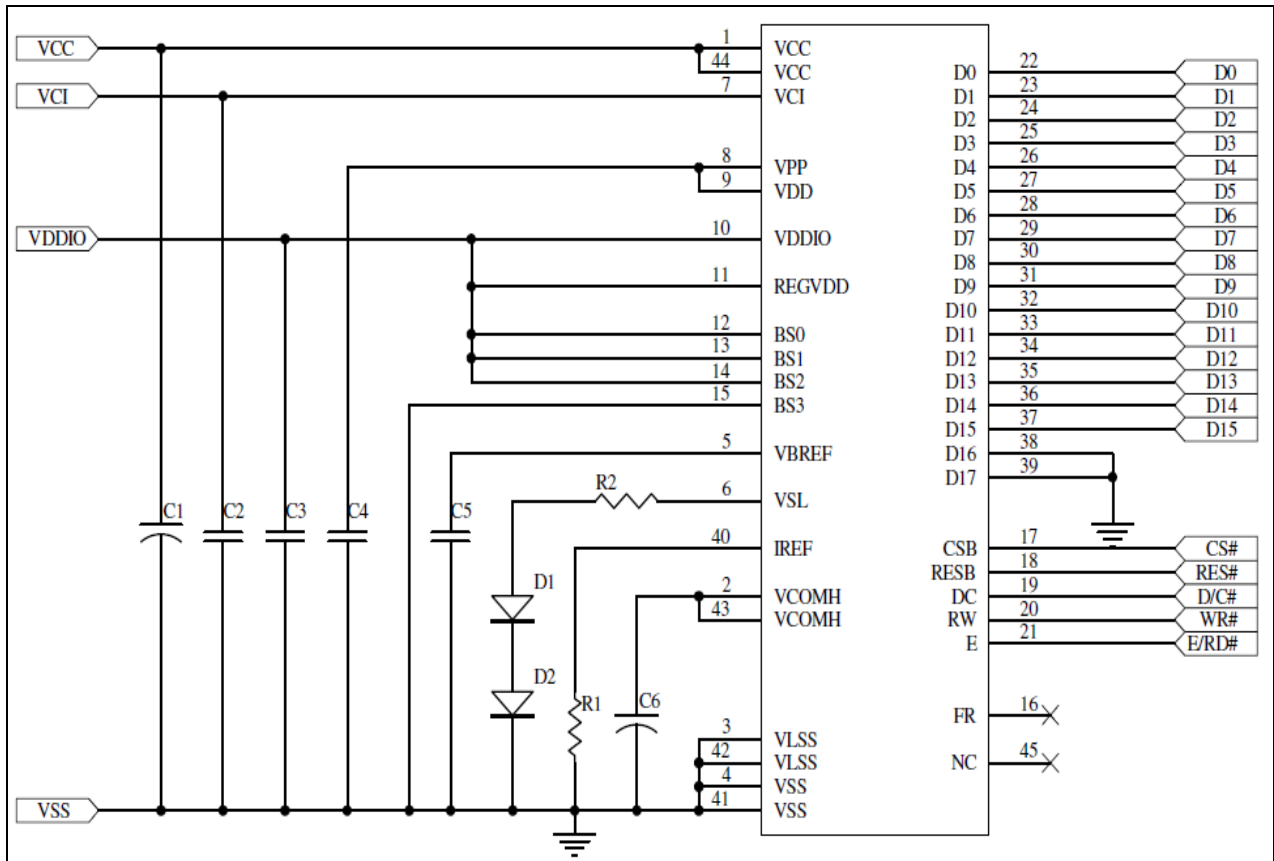
Recommended components：

C1, C6 : 4.7uF/25V (Tantalum type) or VISHAY (572D475X0025A2T)

C2, C3, C4 : 1uF/16V(0603)

C5 : 0.1uF/16V(0603)

R1: 1.2M ohm (0603) 1%

R2: 49.9ohm 1/4W

D1,D2: RB480K (ROHM)

This circuit is for 16-bit 8080 interface.

9.3 COMMAND TABLE

Refer to IC Spec : SSD1353

REV.: A07   2022/02/10

10. RELIABILITY TEST CONDITIONS

No.	Items	Specification	Quantity
1	High temp. (Non-operation)	85°C, 240hrs	5
2	High temp. (Operation)	70°C, 120hrs	5
3	Low temp. (Operation)	-40°C, 120hrs	5
4	High temp. / High humidity (Operation)	65°C, 90%RH, 96hrs	5
5	Thermal shock (Non-operation)	-40°C ~85°C (-40°C /30min; transit /3min; 85°C /30min; transit /3min) 1cycle: 66min, 20 cycles	5
6	Vibration	Frequency : 5~50HZ, 0.5G Scan rate : 1 oct/min Time : 2 hrs/axis Test axis : X, Y, Z	1 Carton
7	Drop	Height: 120cm Sequence : 1 angle、3 edges and 6 faces Cycles: 1	1 Carton
8	ESD (Non-operation)	Air discharge model, ±8kV, 10 times	5

Test and measurement conditions

1. All measurements shall not be started until the specimens attain to temperature stability.
2. All-pixels-on is used as operation test pattern.
3. The degradation of Polarizer are ignored for item 1, 4 & 5.

Evaluation criteria

1. The function test is OK.
2. No observable defects.
3. Luminance: > 50% of initial value.
4. Current consumption: within ± 50% of initial value.

REV.: A07   2022/02/10

11. EXTERNAL DIMENSION
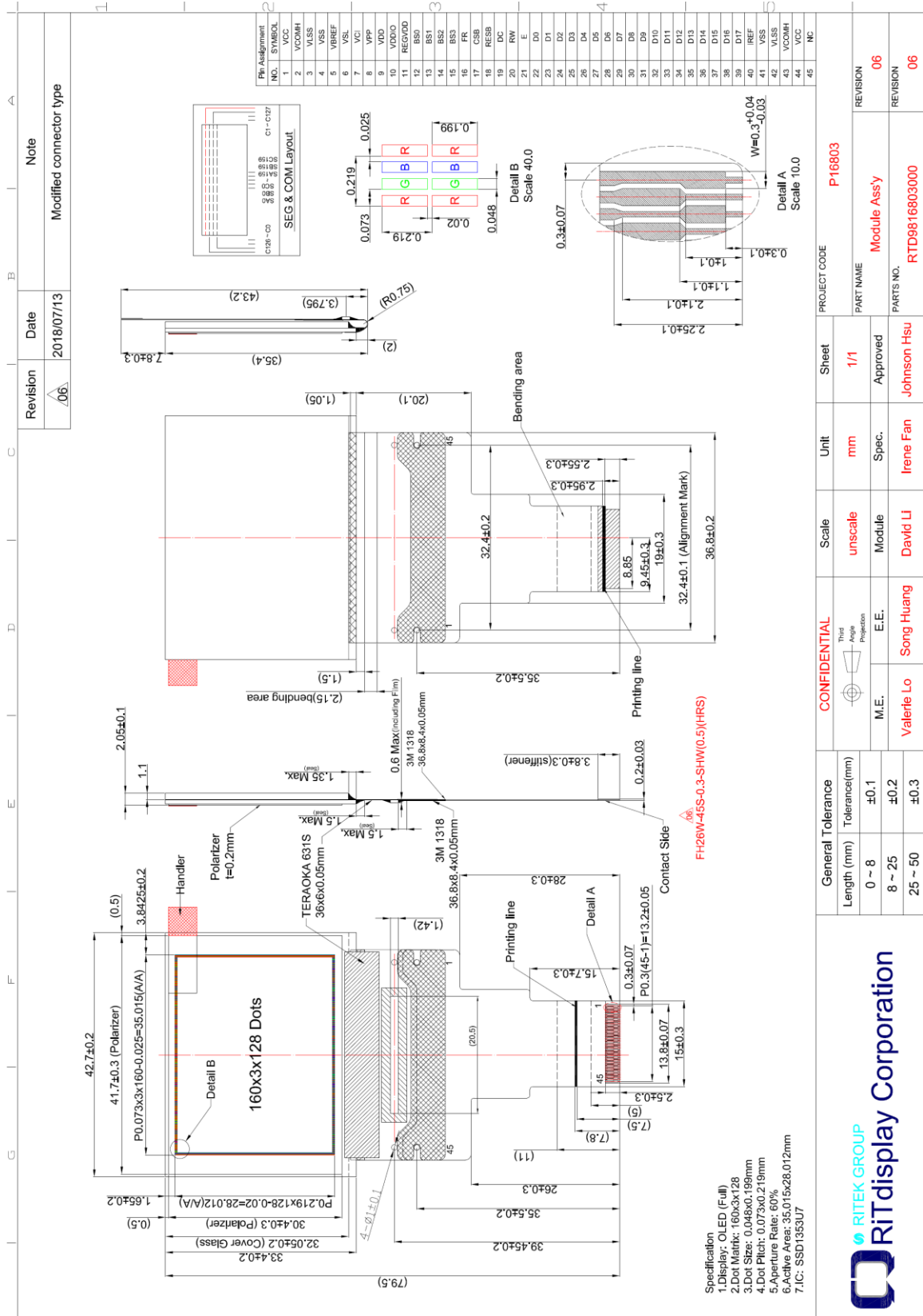
12. PACKING SPECIFICATION

Revision	Date	Note
01	2007/02/09	Packing Tray Instruction
02	2018/07/13	Modify the amount of desiccant

⑤ 7003003001011 真空包裝袋,285x90x480mm ANTIS

⑥ RTD3003000016 Antistatic Bubble Bag 440x(350+100)mm

⑦ 7003001000001 PIZZA BOX 345x285x88mm,B泓,ROHS
RiTdisplay Corporation
x2 pcs

⑨ RTD3006000000 HI-FI LABEL 8cm*8cm

④ 7003010000011 7003010001001 5G 乾燥劑 x12

① RTD9816803000 MODULE ASS'Y FOR P16803 Face Down 旋轉放置

x 1 pcs(empty)

③ RTD3002000110 RTD3002000243 EPE COVER FOAM 284.9*231.3*2, FOR P16803

x 9 pcs

旋轉堆疊

② RTD3008000084 RTD3008000513 TRAY 330x270x11.7mm,T=0.7mm,PET,P16803

x 10 pcs

⑩ RTD3208000125 封箱膠帶 ,W=48mm , L=910cm

⑧ 7003000000001 單色CARTON 385x305x203mm, AB泓,ROHS

⑨ RTD3006000000 HI-FI LABEL 8cm*8cm

⑩ RTD3208000125 封箱膠帶 ,W=48mm , L=910cm

x1 pcs

RiT display Corporation

ITEM	PART No.	DESC	QTY
	RTD9916803000		
1	RTD9816803000	MODULE ASS'Y FOR P16803	288
2	RTD3008000084	TRAY 330x270x11.7mm,T=0.7mm,PET,P16803	20
2	RTD3008000513	TRAY 330x270x11.7mm,T=0.7mm,PET,P16803-H	20
3	RTD3002000110	EPE COVER FOAM 284.9*231.3*2,FOR P16803	36
3	RTD3002000243	EPE COVER FOAM 284.9*231.3*2, P16803-H	36
4	7003010000011	5G 矽膠乾燥劑 透明 SA~40(5-5)(4 Pack)	24
4	7003010001001	5G BENTONITE DESICCANT 藍灰矽土乾燥劑	24
5	7003003001011	真空包裝袋,285x90x480mm ANTIS	2
6	RTD3003000016	ANTI STATIC BUBBLE BAG 440*(350+100)mm	2
7	7003001000001	PIZZA BOX 345x285x88mm,B泓,ROHS	2
8	7003000000001	單色CARTON 385x305x203mm,AB泓,ROHS	1
9	RTD3006000000	HI-FI LABEL 8cm*8cm	3
10	RTD3208000125	封箱膠帶,48mm*910cm,OPP	

RITEK GROUP
RiTdisplay Corporation

General Tolerance		CONFIDENTIAL		Scale	Unit		
Length (mm)	Tolerance(mm)		Third Angle Projection	1:9	mm		
0 ~ 8	±0.1	M.E.	E.E.	Module	Spec.		REVISION 02
8 ~ 25	±0.2	Ou Yang	X	Valerie Lo	Irene Fan		REVISION 02
25 ~ 50	±0.3						

PROJECT CODE P16803
PART NAME Packing Tray Instruction
PARTS NO. RTD9916803000
Sheet 1/1
Approved Johnson Hsu

REV.: A07   2022/02/10

13. OUTGOING INSPECTION PROVISION

1. 抽樣方法 / SAMPLING METHOD

(1) MIL-STD-1916 / 驗證水準 level III / 正常檢驗 / 單次樣品檢驗
MIL-STD-1916 / inspection level III / normal inspection / single sample inspection

(2) 主要缺陷 Level III；次要缺陷 Level II
Major Level III ; Minor Level II

批量	驗證水準（VL）						
	VII	VI	V	IV	III	II	I
2～170	A	A	A	A	A	A	A
171～288	A	A	A	A	A	A	B
289～544	A	A	A	A	A	B	C
545～960	A	A	A	A	B	C	D
961～1632	A	A	A	B	C	D	E
1633～3072	A	A	B	C	D	E	E
3073～5440	A	B	C	D	E	E	E
5441～9216	B	C	D	E	E	E	E
9217～17408	C	D	E	E	E	E	E
17409～30720	D	E	E	E	E	E	E
≧30721	E	E	E	E	E	E	E

MIL-STD-1916 樣本代字對照表

2. 檢驗條件 / INSPECTION CONDITION

檢查和測量在下列條件下進行的，除非另有規定。
The inspection and meaurement are performed under the following conditions, unless otherwise specified.

溫度 / Temperature: 25±5°C

濕度 / Humidity: 50±10%R.H.

壓力 / Pressure: 860~1060hPa (mbar)
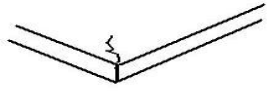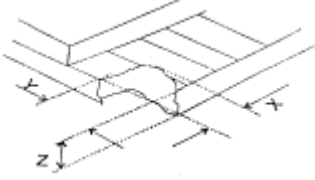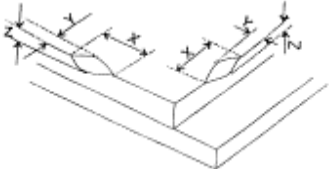
檢驗員拿的面板和眼睛之間的距離 / Distance between the panel and eyes of the inspector≧30cm

3. 品質檢驗規格 / SPECIFICATION FOR QUALITY CHECK

3.1 缺陷分類 / DEFECT CLASSIFICATION

嚴重度 Severity	檢驗項目 Inspection Item	缺陷 Defect	備註 Remark
主要缺陷 Major Defect	1. 面板 Panel	(1) 無顯示 Non-displaying	
		(2) 線缺陷 Line defects	
		(3) 故障 Malfunction	
		(4) 玻璃破損 Glass cracked	
	2. 軟板 Film	(1) 軟板尺寸超規 Film dimension out of specification	不能組裝 Can not be assembled
	3. 尺寸 Dimension	(1) 外形尺寸超規 Outline dimension out of specification	
次要缺陷 Minor Defect	1. 面板 Panel	(1) 玻璃刮傷 Glass scratch	
		(2) 玻璃切割異常 Glass cutting NG	
		(3) 玻璃崩邊、崩角 Glass chip	
	2. 偏光板 Polarizer	(1) 偏光板刮傷 Polarizer scratch	外觀缺陷 Appearance defect
		(2) 表面汙漬 Stains on surface	
		(3) 偏光板氣泡 Polarizer bubbles	
	3. 顯示 Displaying	(1) 暗點、亮點、髒污 Dim spot、Bright spot、dust	
	4. 軟板 Film	(1) 損傷 Damage	
		(2) 異物 Foreign material	

3.2 出貨規格 / OUTGOING SPECIFICATION

項目 Item	描述 Description	標準 Criterion			允收 水準 AQL
I. 面板 Panel	1. 玻璃刮傷 Glass scratch				次要 Minor
		寬 / Width (mm) W	長 / Length (mm) L	容許個數 number of pieces permitted	
		W≦0.03	忽略 Ignore	忽略 Ignore	
		0.03< W≦0.05	L≦3	3	
		0.05< W	------	無 None	
		顯示區外 beyond A.A.	------	忽略 Ignore	
	2. 玻璃破損 Glass crack	(1) 裂紋 / Crack 擴展裂紋是不能接受的。 Propagation crack is not acceptable. 			主要 Major
	3. 玻璃崩邊、崩角 Glass chip	(1) 崩角 / Chip on corner 			次要 Minor
		(2) 崩邊 / Chip on edge 			次要 Minor

項目 Item	描述 Description	標準 Criterion				允收 水準 AQL
I. 面板 Panel	3. 玻璃崩邊、崩角 Glass chip	<table><tr><td>崩角 C ip on corner</td><td>Size (mm)</td><td>崩邊 Chip on edge</td><td>Size (mm)</td></tr><tr><td>X</td><td>≦1.5</td><td>X</td><td>≦3.0</td></tr><tr><td>Y</td><td>≦2.0</td><td>Y</td><td>≦1.0</td></tr><tr><td>Z</td><td>≦t</td><td>Z</td><td>≦t</td></tr></table> 備註 / Note: 1. t = 玻璃厚度 　 t = glass thickness 2. 崩邊或崩角延伸到 ITO 導線是不能接受的。 　 Chip on the corner extending into the ITO 　 contact is not acceptable.				次要 Minor
	4. 尺寸 Dimension	請參閱圖紙的規範。 Refer to the drawing of the spec				主要 Major
II. 偏光板 Polarizer	1.刮傷 Scratch	點狀按照"項目 II-3 偏光板氣泡"的標準。 Spot type in accordance with the criteria of "Item II-3. Polarizer bubble". 線狀按照"項目 I-1 玻璃刮傷"的標準。 Line type in accordance with the criteria of "Item I-1. Glass scratch".				次要 Minor
	2. 表面汙漬 Stains on surface	表面汙漬無法用軟布或類似的清潔物輕輕擦拭 去除。 Stains cannot be removed even when wiped lightly with a soft cloth or similar cleaning.				次要 Minor
	3. 偏光板氣泡 Polarizer bubble	(mm) <table><tr><td>尺寸 Size</td><td>容許個數 number of pieces permitted</td></tr><tr><td>Φ≦0.2</td><td>忽略 Ignore</td></tr><tr><td>0.2＜Φ≦0.5</td><td>2</td></tr><tr><td>0.5＜Φ</td><td>0</td></tr><tr><td>顯示區外 beyond A.A.</td><td>忽略 Ig ore</td></tr></table>				次要 Minor

REV.: A07   2022/02/10

項目 Item	描述 Description	標準 Criterion	允收 水準 AQL
III. 顯示 Displaying	1. 耗電 Power consumption	該模組的工作電流消耗不應超出產品規格書的規範。 The module operating current consumption should not go beyond the standard indicated in Product Specification	主要 Major
	2. 像素尺寸 Pixel size	顯示像素的尺寸的公差應規格的±25％之內。 The tolerance of display pixel dimension should be within ±25% of specification.	次要 Minor
	3. 顏色 Color	依據產品規格。 Refer to the product specification.	主要 Major
	4. 亮度 Luminance	依據產品規格。 Refer to the product specification.	主要 Major
	5. 暗點、亮點、髒污 Dimming spot、Lighting spot、Dust	1. 表格如下 D=長邊直徑 D=long diameter 像素暗點是不允許。 Pixel off is not allowed.	次要 Minor

平均直徑 Average diameter D:(mm)	容許個數 number of pieces permitted
D ≦0.1	忽略 Ignore
0.1 ＜ D ≦0.15	1
0.15＜ D ≦0.2	1
0.2 ＜ D	0
顯示區外 beyond A.A.	忽略 Ignore

項目 Item	描述 Description	標準 Criterion				允收 水準 AQL
III. 顯示 Displaying	5. 暗點、亮點、 髒污 Dimming spot、Lighting spot、Dust	2.				次要 Minor

Criterion table (item III.5):

寬 width(mm) W	長 length(mm) L	容許個數 number of pieces permitted
W≦0.03	忽略 Ignore	忽略 Ignore
0.03< W≦0.05	L≦3	3
0.05< W	------	無 None
顯示區外 beyond A.A.	------	忽略 Ignore

項目 Item	描述 Description	標準 Criterion	允收水準 AQL
IV. 軟板 Film	1. 尺寸 Dimension	軟板尺寸超規。 Film dimension out of Spec.	主要 Major
	2. 損傷 Damage	破損；深刮傷；深摺痕；深壓痕或其他損害是不能接受的。 Crack; deep scratch; deep fold; deep pressure mark or other damage is not acceptable.	次要 Minor
	3. 異物 Foreign material	導電異物附著在導線，軟板和玻璃之間的異物是不能接受的。 Conductive foreign material sticking to the leads, foreign material between film and glass are not acceptable.	次要 Minor

14. APPENDIXES

APPENDIX 1: DEFINITIONS

A. DEFINITION OF CHROMATICITY COORDINATE

The chromaticity coordinate is defined as the coordinate value on the CIE 1931 color chart for R, G, B, W.

B. DEFINITION OF CONTRAST RATIO

The contrast ratio is defined as the following formula:

$$\text{Contrast Ratio} = \frac{\text{Luminance of all pixels on measurement}}{\text{Luminance of all pixels off measurement}}$$

C. DEFINITION OF RESPONSE TIME

The definition of turn-on response time Tr is the time interval between a pixel reaching 10% of steady state luminance and 90% of steady state luminance. The definition of turn-off response time Tf is the time interval between a pixel reaching 90% of steady state luminance and 10% of steady state luminance. It is shown in Figure 2.
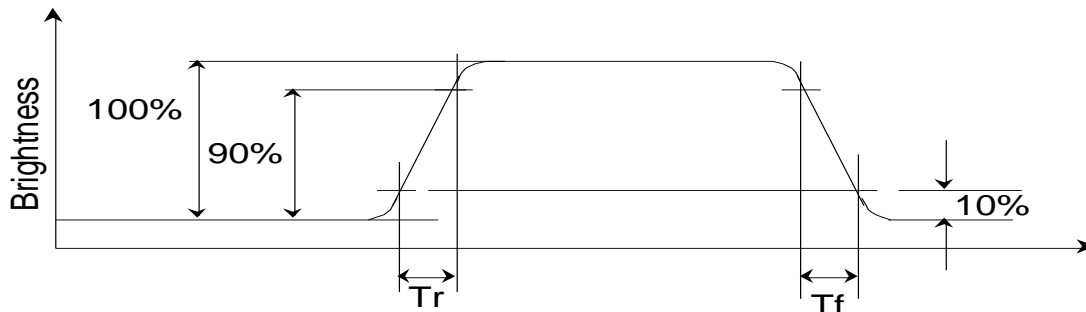

Figure 2 Response time

D. DEFINITION OF VIEWING ANGLE

The viewing angle is defined as Figure 3. Horizontal and vertical (H & V) angles are determined for viewing directions where luminance varies by 50% of the perpendicular value.
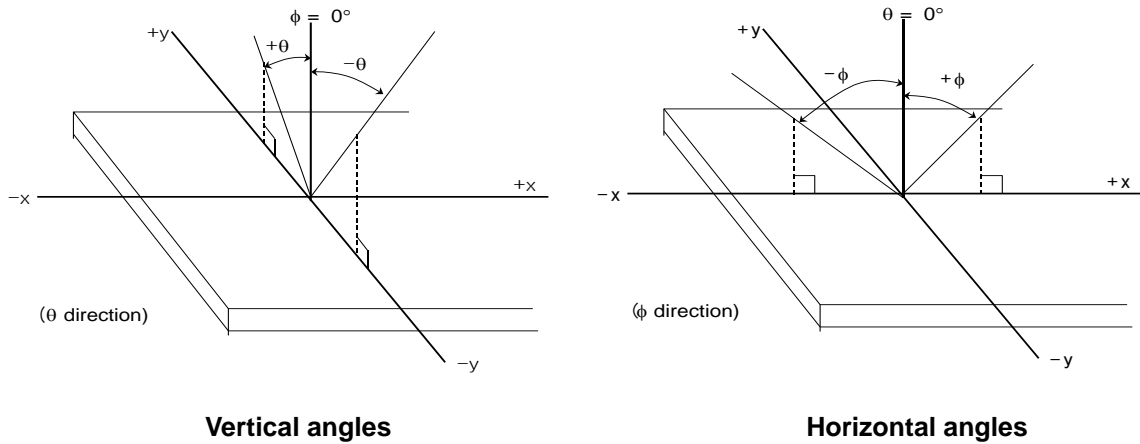
Vertical angles   **Horizontal angles**

Figure 3 Viewing angle

APPENDIX 2: MEASUREMENT APPARATUS
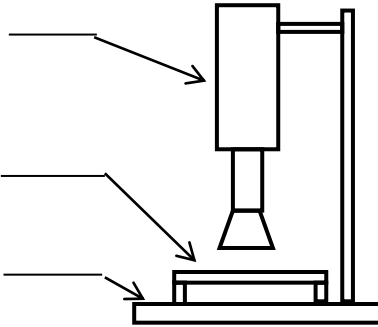

A. LUMINANCE/COLOR COORDINATE

PHOTO RESEARCH PR-670, Konica Minolta CA-410

Measurement
Header

Panel

Plate Form

PR-670 /

Konica Minolta CA-410
Color Analyzer

B. CONTRAST / RESPONSE TIME / VIEWING ANGLE

WESTAR CORPORATION FPM-510

Measurement
Header

Panel

Plate Form
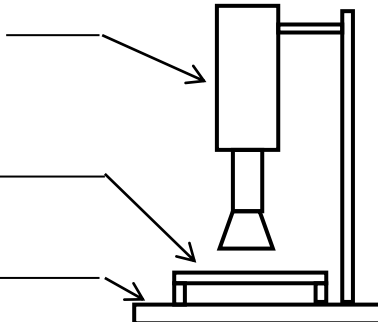
Westar FPM-510
Display Contrast /
Response time /
View angle Analyzer

REV.: A07   2022/02/10

C. ESD ON AIR DISCHARGE MODE

R 330 ohms   **ESD**

**DISCHARGE
TIP**

V   **C
150pF**   **EUT**

RETURN

GROUND PLANE
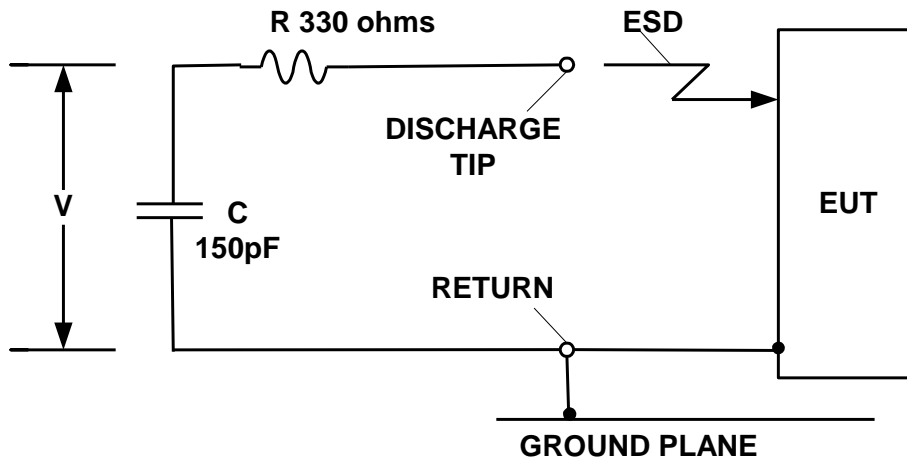
**APPENDIX 3: PRECAUTIONS FOR USING THE OLED MODULE**

Precautions for Handling

1. When handling the module, wear powder-free anti static rubber finger cots/ anti-static clothing, anti-static gloves ,antistatic wrist strap and anti-static shoes
   The environment should dispose the static elimination blower, anti-static pad, anti-static chair, and anti-static floor. The humidity maintains usually more than 40%

2. The OLED module is an electronic component and is subject to damage caused by Electro Static Discharge (ESD). And hence normal ESD precautions must be taken when handling it. Also, appropriate ESD protective environment must be administered and maintained in the production line. When handling and assembling the panel, wear an antistatic wrist strap with the alligator clip attached to the ground to prevent ESD damage on the panel. Antistatic wrist strap should touch human body directly instead of gloves. (See below photos).

REV.: A07   2022/02/10
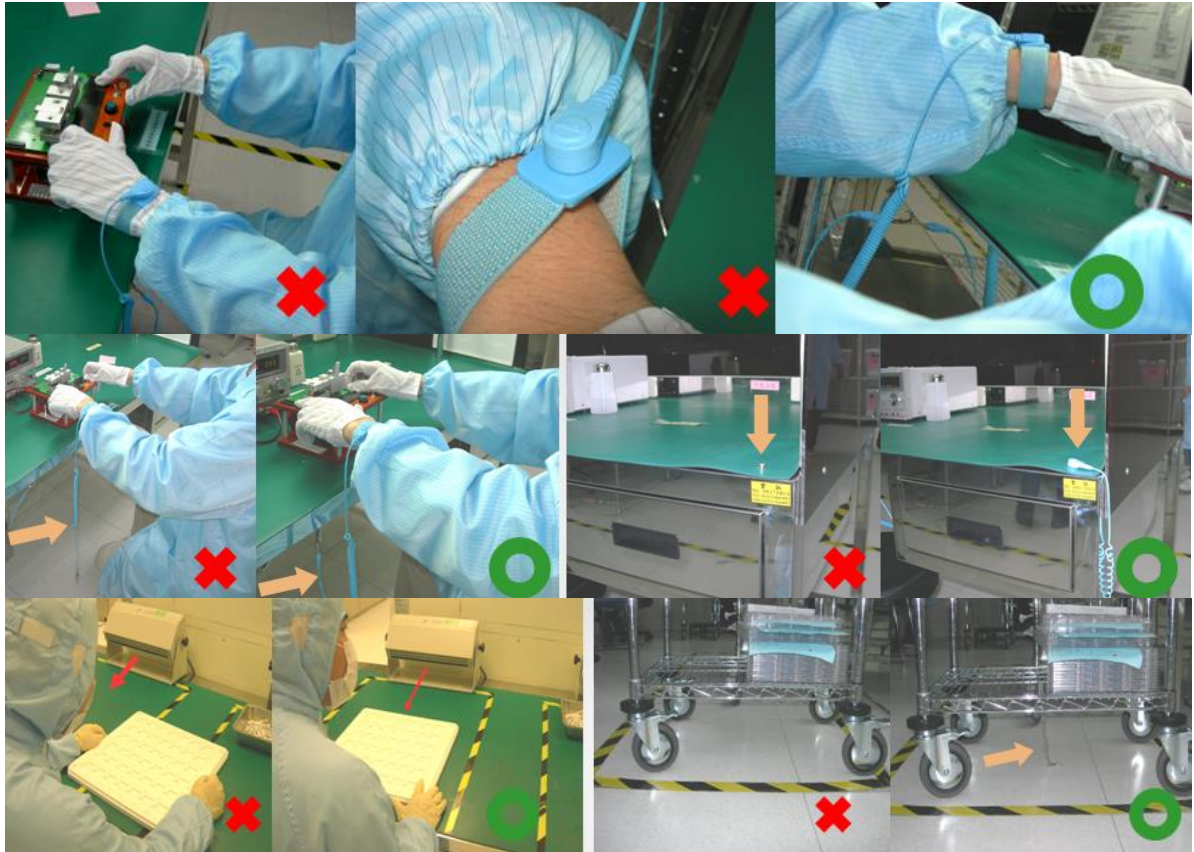
3. The OLED module is consisted of glass and film, and it should avoid pressure, strong impact, or being dropped from a high position.

REV.: A07   2022/02/10
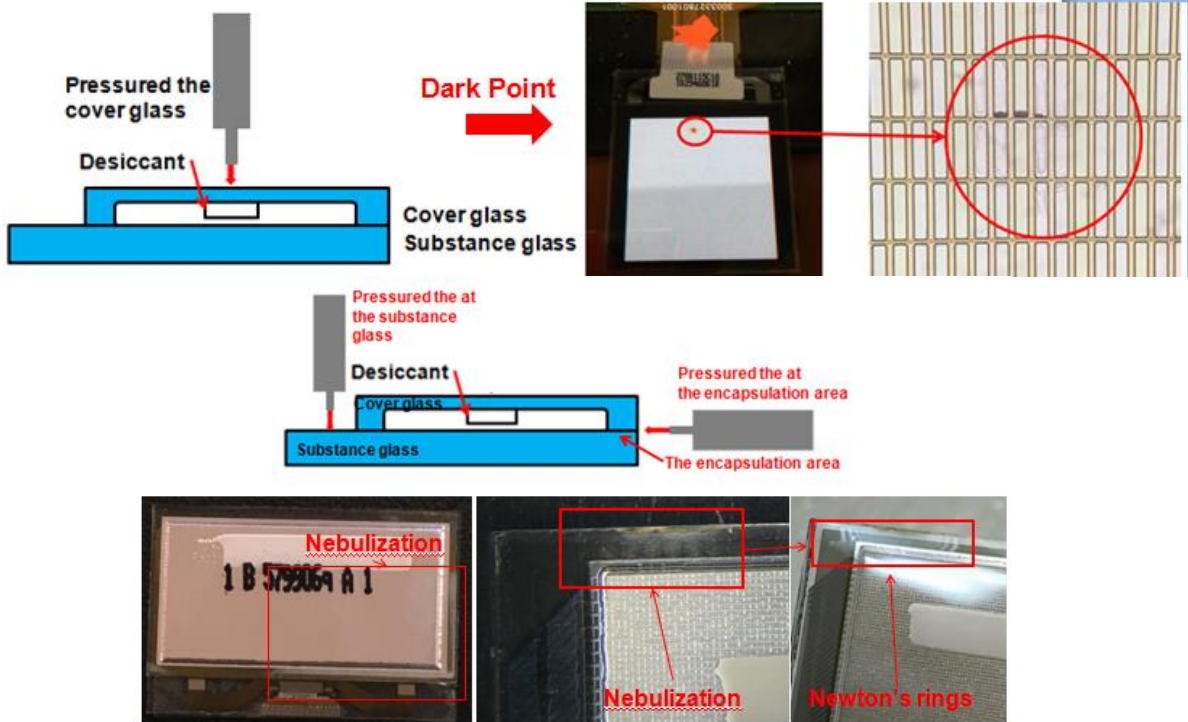
4. Take out the panel one by one from the holding trays for assembly, and never put the panel on top of another one to avoid the scratch.
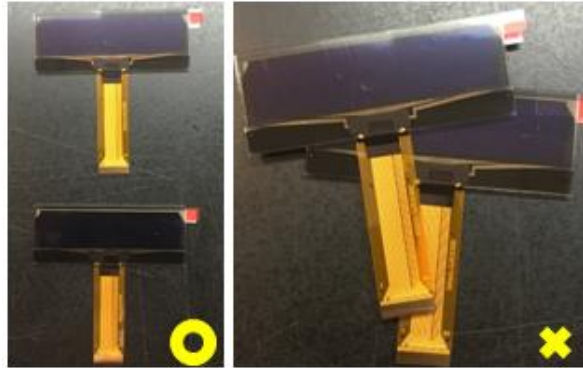
5. Avoid jerk and excessive bend on TAB/FPC/COF, and be careful not to let foreign matter or bezel damage the film.

6. When handling and assembling the module (panel + IC), grab the panel, not the TAB/FPC/COF.
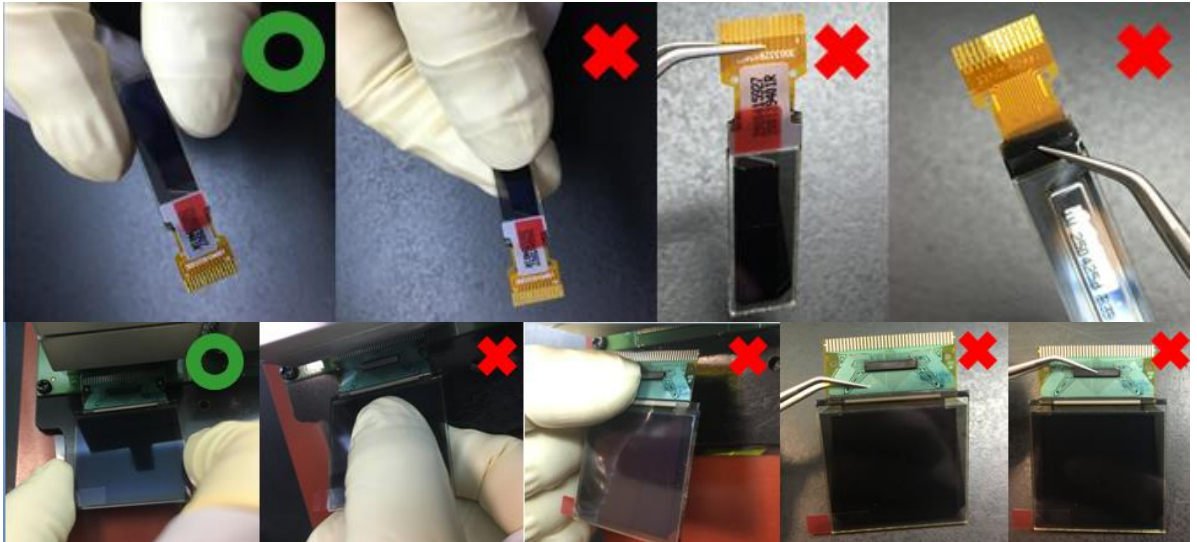
7. Use the tweezers to open the clicks on the connector of PCB before the insertion of FPC/COF, and click them back in. Once the FPC/COF sits properly in the connector, use the tweezers to avoid the damages.

8. Please do not bend the film near the substrate glass. It could cause film peeling and TAB/FPC/COF damage. For TAB, It should bend the slit area as actual OLED it is. For FPC or COF, it is suggested to follow below pictures for instruction (distance between substrate glass and bending area >1.5mm; R>0.5mm).

9. Avoid bending the film at IC bonding area. It could damage the IC ILB bonding. It should avoid bending the IC seal area. Please keep the bending distance >1.5mm.

REV.: A07   2022/02/10
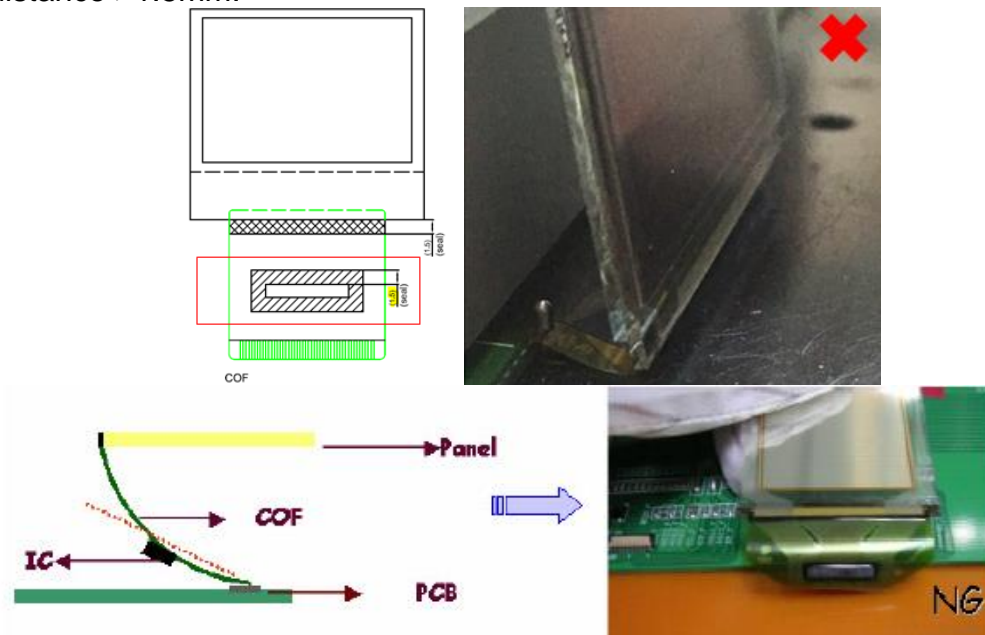
Use finger to insert COF /FPC into the connector when assembling the panel. Please refer to the photo.
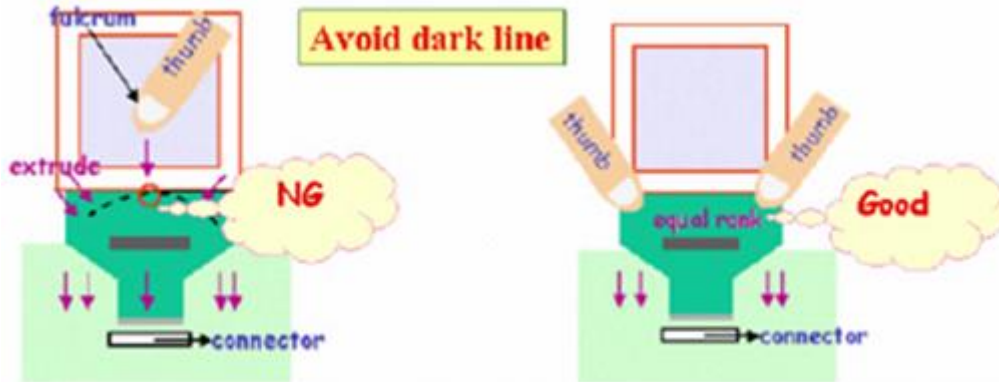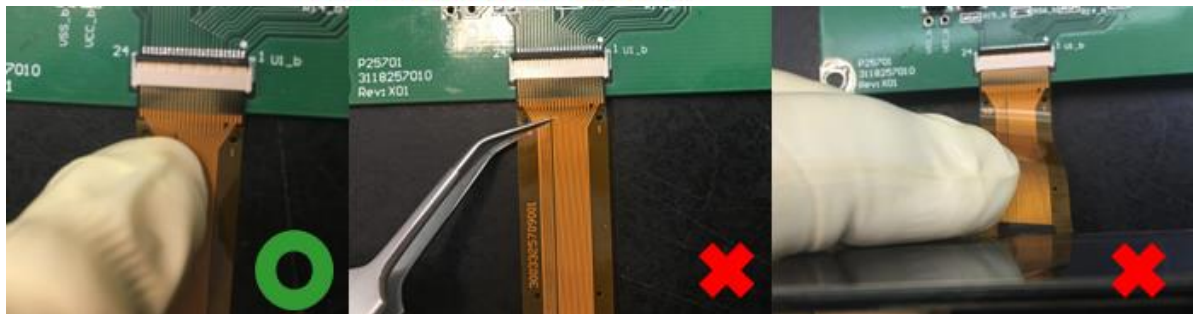
10. Do not wipe the pin of film and polarizer with the dry or hard materials that will damage the surface. When cleaning the display surface, use the soft cloth with solvent, IPA or alcohol, to clean.

11. Protection film is applied to the surface of OLED panel to avoid the scratch. Please remove the protective film before assembling it. If the OLED panel has been stored for a long time, the residue adhesive material of the protective film may remain on the display surface after remove the protective film. Please use the soft cloth with solvent, IPA or alcohol, to clean.

12. When hand or hot-bar soldering TAB/FPC onto PCB, make sure the temperature and timing profiles to meet the requirements of soldering specification (the specification depends on the application or optimized by customer) to prevent the damage of IC pins by inappropriate soldering, and also avoid the high temperature to damage the Organic light-emitting materials.

REV.: A07   2022/02/10
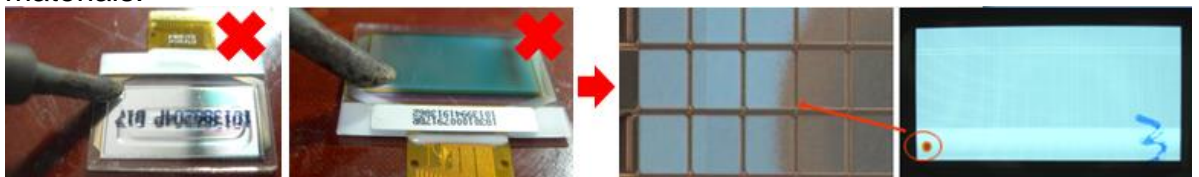
13. Solder residues arise from soldering process have to be cleaned up thoroughly before the module assembly.

14. Use the voltage and current settings listed in the specification to do the function test after the module assembly.

15. Suggestion for soldering process:
    i. TAB Lead- free soldering hot bar process
        1. Use pulse heated bonding tool equipment
        2. Material: Sn/Ag/Cu lead-free solder paste with typical 25um thickness on PCB pad. The TAB pin size and shape may be different, please base on the production line to adjust the thickness of PCB pad and temperature.S
        3. Bonding Force:--4kg per centimeter square as the starting point.
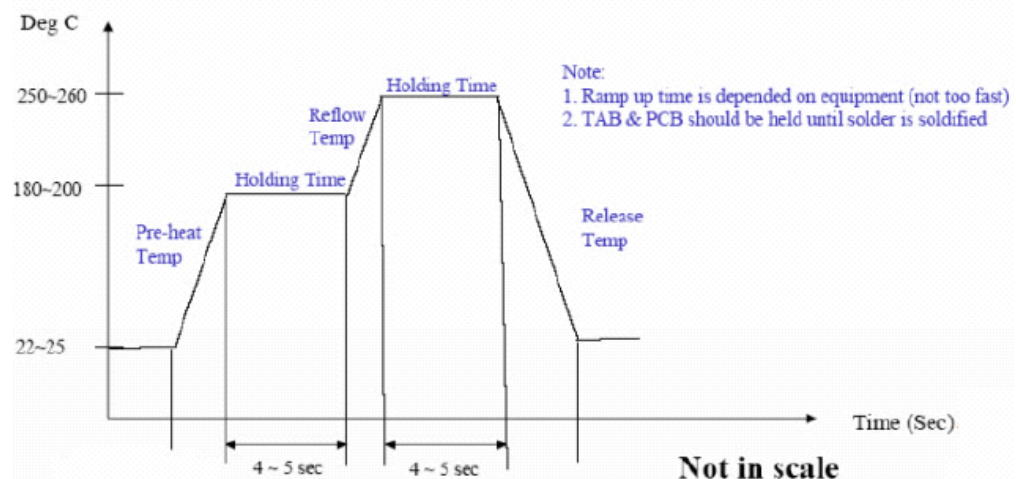   4. Suggested bonding tool temperature & time profile is as below for reference. Since there are differences in TAB soldering pins, soldering technicians' skills, mechanism…etc., the soldering conditions must be adequately tuned.

    ii. TAB Lead- free soldering wire process
        In case of manual soldering (Lead- free solder wire)
        1. Solder wire contact iron directly: 280±5°C at 3-5secs
        2. Solder wire contact TAB lead directly (near iron but not contact): 380±5 °C, 3-5secs
        3. Since there are differences in TAB soldering pins, soldering technicians' skills, mechanism…etc., the soldering conditions must be adequately tuned.
    iii. High temperature will result in rapid heat conduction to IC and might cause damage to IC, so please keep the temperature below 380°C. Also, avoid damaging the polyimide and solder resist which might take place at high temperatures. Refold cycles base on the de-soldering status, if the plating of pin was damaged, it can not be used again.

Precautions for Electrical

1. Design using the settings in the specification

It is very important to design and operate the panel using the settings listed in the specification. It includes voltage, current, frame rate and duty cycle... etc. Operation the OLED outside the range of the specification should be entirely avoided to ensure proper operation of the OLED.

2. Maximum Ratings

To ensure the proper operation of the panel, never design the panel with parameters running over the maximum ratings listed in the specification. Also the logic voltages such as VIL and VIH have to be within the specified range in the specification to prevent any improper operation of the panel.

3. Power on/off procedure

To avoid any inadvertent effects resulting from inappropriate power on/off operations, please follow the directions of power on/off procedure on page 6. Any operation that does not comply with the procedure could cause permanent damage of the IC and should be avoided. When the logic power is not on, do not activate any input signal. Abrupt shutdown of power to the module, while the OLED panel is on, would cause OLED panel malfunction.

Display turn on sequence

```
DC-DC power off          DC-DC power on
(VCC turn off)           (VCC turn on)
     │                        │
     ▼                        ▼
VDD power on             Wait 100ms for
                         VCC stable
     │                        │
     ▼                        ▼
Hardware RESET           Display on
RESET time depends
on driver IC datasheet        │
     │                        ▼
     ▼                   Display start and
Display off              end address setting
     │                        │
     ▼                        ▼
Driver IC initial        Send display data
```

Display turn off sequence

```
Send display off
command
     │
     ▼
DC-DC power off
(VCC turn off)
     │
     ▼
Wait 100ms for
VCC reach 0V
     │
     ▼
VDD power turn off
```

4. Power savings

To save power consumption of the OLED, please use partial display or sleep mode when the panel is not fully activated. Also, if possible, make the black background to save power.

The OLED is a self-luminous device and a particular pixel cluster or image can be lit on via software control. So power savings can be achieved by partial display or dimming down the luminance. Depending on the application, the user can choose among Ultra Bright Mode, Normal Operation Mode, and Sleeping Mode. The power consumption is almost in directly proportion to the brightness of the panel, and also in directly proportion to the number of pixels lit on the panel. The customer can save the power by the use of black background and sleeping mode. One benefit from using these design schemes is the extension of the OLED lifetime.
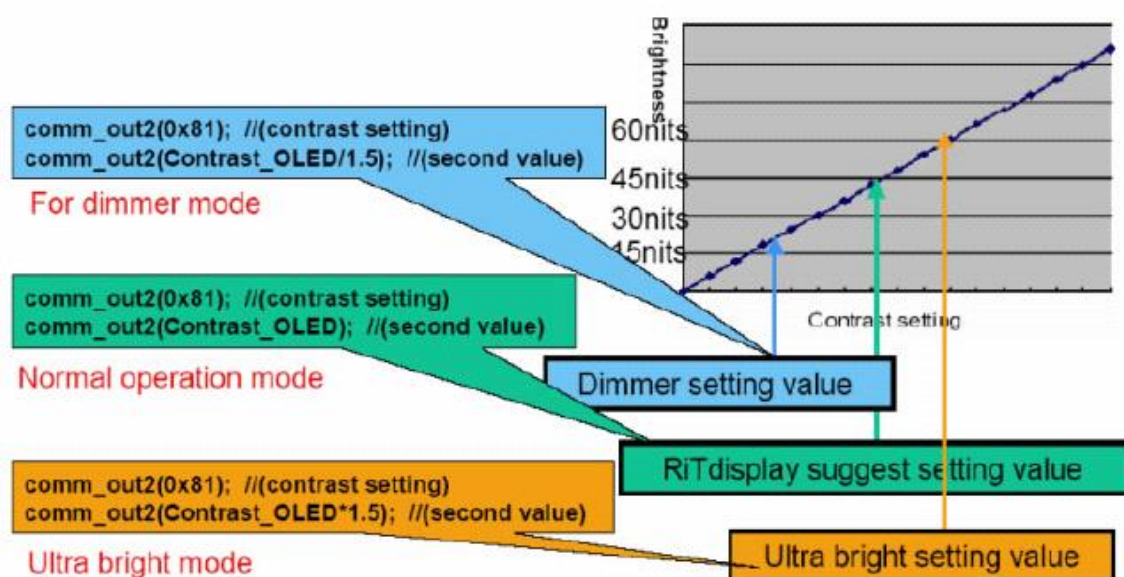
5. Adjusting the luminance of the panel

Although there are a couple of ways to adjust the luminance of the panel, it is strongly recommended that the customer change the contrast setting to adjust the luminance of the panel. Adjusting voltages to achieve desired luminance is not allowed. Be aware that the adjustment of luminance would accompany the change of lifetime of the panel and its power consumption as well.

6. Residual Image (Image Sticking)

The OLED is a self-emissive device. As with other self-emissive device or displays consisting of self-emissive pixels, when a static image frozen for a long period of time is changed to another one with all-pixels-on background, residual image or image sticking is noticed by the human eye. Image sticking is due to the luminance difference or contrast between the pixels that were previously turned on and the pixels that are newly turned on. Image sticking depends on the luminance decay curve of the display. The slower the decay, the less prominent the image sticking is. It is strongly recommended that the user employ the following four strategies to minimize image sticking.

REV.: A07   2022/02/10

1. <u>Employ image scrolling or animation</u> to even out the lit-on time of each and every pixel on the display, also could use sleeping mode for reduced the residual image and extend the power capacity.

2. <u>Minimize the use of all-pixels-on or full white background</u> in their application because when the panel is turned on full white, the image sticking from previously shown patterns is the most revealing. Black background is the best for power savings, greatest visibility, eye appealing, and dazzling displays.

3. Avoid displaying the characters or menu with high brightness level in a fix position for a long time or repeatedly. If necessary, using the auto fadeout technology.

4. If a static logo is used in the reliability test, change the pattern into its inverse (i.e., turn off the while pixels and turn on the previously unlit pixels) and freeze the inverse pattern as long as the original logo is used, so every pixel on the panel can be lit on for about the same time to minimize image sticking, caused by the differential turn-on time between the original and its reverse patterns.

Black Background

Scrolling example

Frame1

Frame2

Frame3

Example: setup and start

```
comm_out2(0x26); // scrolling setup
comm_out2(0x08); // scrolling numbers/step
comm_out2(0x00); // start page
comm_out2(0x00); // scrolling step/frame
comm_out2(0x08); // end page
comm_out2(0x2F); // start
```

Frame4

Frame5

Example: stop

```
comm_out2(0x2E); //stop
```

Precautions for Mechanical

1. Cushion or Buffer tape on the cover glass

It is strongly recommended to have a cushion or buffer tape to apply on the panel backside and front side when assembling OLED panel into module to protect it from damage due to excessive extraneous forces.
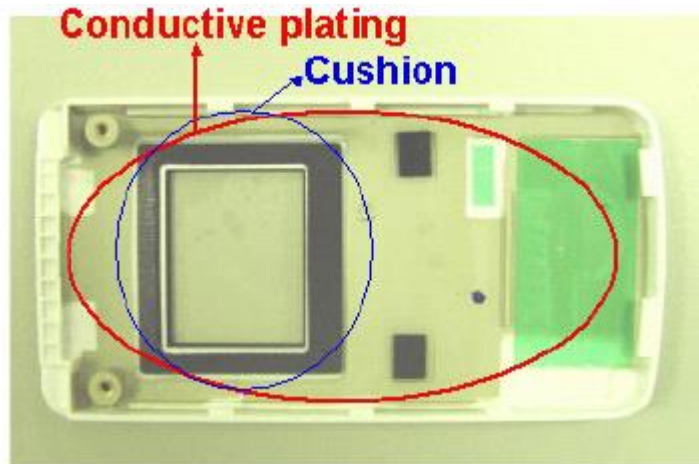
It is recommended that a plating conductive layer be used in the housing for EMI/EMC protection. And, the enough space should be reserved for the IC placement if the IC thickness is thicker than the TAB film when customer design the PCB.

2. Avoid excessive bending of film when handling or designing the panel into the product

The bending of TAB/COF/FPC has to follow the precautions indicated in the specification, extra bending or excessive extraneous forces should be avoided to minimize the chances of film damage. If bending the film is necessary, please bend the designated bending area only. Please refer to items 8 and 9 of Precautions for Handling for more information.

Precautions for Storage and Reliability Test

1. Storage

Store the packed cartons or packages at 25°C±5°C, 55%±10%RH. Do not store the OLED module under direct sunlight or UV light. For best panel performance, unpack the cartons and start the production of the panels within six months after the reception of them.

2. Reliability Test

RiTdisplay only guarantees the reliability of the OLEDs under the test conditions and durations listed in the specification.

REV.: A07   2022/02/10

APPENDIX 4: ROHS TEST REPORT

AOV®

TEST REPORT

NO.: A002R12052305-46R01

Date: May. 28, 2012

Page 1 of 8

Customer: Kunshan Hutek Corporation Co.,Ltd

客户/申请商: 昆山沪铢光电科技有限公司

Address: 88, Second Avenue, Kunshan Export Processing Zone, Jiangsu Province, China

地　　址：江苏省昆山市综合保税区第二大道 88 号

Report on the submitted sample said to be

委托检验的样品及申请者对样品的说明如下

Sample name: OLED

样品名称: OLED

Supplier: Hutek

供 应 商: 泡铢

Manufacturer: Hutek

制造商: 泡铢

Sample received date: May. 23, 2012

样品接收日期: 2012-05-23

Testing Requested/ 测 试 要 求:

1）As specified by client, to determine the Lead, Cadmium, Mercury, Hexavalent Chromium, PBB & PBDE content in the submitted sample in accordance with Directive 2002/95/EC (RoHS).

依照欧盟 RoHS 指令 2002/95/EC，测定委托样品中铅、镉、汞、六价铬、多溴联苯（PBBs）和多溴联苯醚（PBDEs）的含量。

2）As specified by client, to determine the Fluorine, Chlorine, Bromine and Iodine content in the submitted sample.

依据客户要求，测定委托样品中氟、氯、溴、碘的含量。

3) As specified by client, to determine PFOS content in the submitted samples in accordance with Directive (EU) No 757/2010.

依照(EU) No 757/2010 指令，测定委托样品中的全氟辛烷磺酸（PFOS）的含量。

Results/ 结果:

Please refer to the next pages.

见下页。

******FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)******

******更多详细信息请查阅下页******

Signed for and on behalf of

Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader: _Maggie_

Li Tingting, Maggie

Chemical Test Director

Reviewed by: _Weikin_

Wang Wexin, Weikin

Technical Director

Approved by: _Mickey_

Yuan Qi, Mickey

Lab Manager

AOV®

TEST REPORT

NO.: A002R12052305-46R01

Date: May. 28, 2012

Testing method/ 测 试 方 法:

Testing Item/测试项目	Pretreatment method / 前处理方法	Measuring instrument / 测试仪器	MQL
Lead (Pb)/铅 (Pb)	IEC 62321: 2008, section 8/ IEC 62321: 2008, 第 8 部分	ICP-OES	2 mg/kg
Cadmium (Cd)/镉 (Cd)	IEC 62321: 2008, section 8/ IEC 62321: 2008, 第 8 部分	ICP-OES	2 mg/kg
Mercury (Hg)/汞 (Hg)	IEC 62321: 2008, section 7/ IEC 62321: 2008, 第 7 部分	ICP-OES	2 mg/kg
Chromium (Cr VI)/六价铬 (Cr^{6+})	IEC 62321:2008, Annex C / IEC 62321: 2008, 附件 C	UV-VIS	2 mg/kg
PBBs/ PBDEs /多溴联苯（PBBs）及多溴联苯醚（PBDEs）	IEC 62321: 2008, Annex A / IEC 62321: 2008, 附件 A	GC-MS	5 mg/kg
Fluorine/ Chlorine/ Bromine/ Iodine /氟(F)/ 氯(Cl)/ 溴(Br)/ 碘(I)	BS EN 14582：2007	IC	50 mg/kg
PFOS	US EPA 3540C:1996	LC-MS	10 mg/kg

Test Flow/检测流程:

1. To Determine Lead, Cadmium Content:

Tested by: _Condy_

```
Weigh the sample into        Add the digestion solution, close      The sample is digested in the
a vessel.               →    the microwave vessel              →    microwave oven following a specific
                                                                    decomposition program.
                                                                          ↓
Report    ←    Tested by ICP-OES    ←    Take out the vessel, filter; transfer the
                                         digestion solution into the beaker and
                                         filled to the mark with DI water.
```

测定铅、镉含量
测试人员： _Condy_

```
将称量好的样品放入消解罐    →    加入相关消解液，密封微波消    →    样品在微波炉中按照预先制定
                              解罐                              的程序进行消解
                                                                      ↓
制作报告    ←    用 ICP-OES 测定    ←    取出消解罐，过滤，转移消解液到容量
                                        瓶中，DI 水定容
```

REV.: A07   2022/02/10

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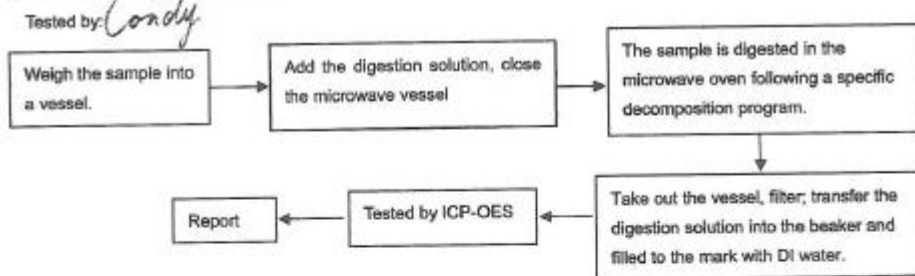
TEST REPORT

2. To Determine Mercury Content:

Tested by: Condy

| Weigh the sample into a vessel. | → | Add the digestion solution, close the microwave vessel. | → | The sample is digested in the microwave oven following a specific decomposition program. |

| Report | ← | Tested by ICP-OES | ← | Cooling the vessel, filter; washed and filled to the mark with DI water. |

测定汞含量
测试人员 Condy

| 将称量好的样品放入消解罐中 | → | 加入相关消解液，密封微波消解罐 | → | 样品在微波炉中按照预先制定的程序进行消解 |

| 制作报告 | ← | 用ICP-OES测定 | ← | 取出消解罐，过滤，转移消解液到容量瓶中，DI水定容 |
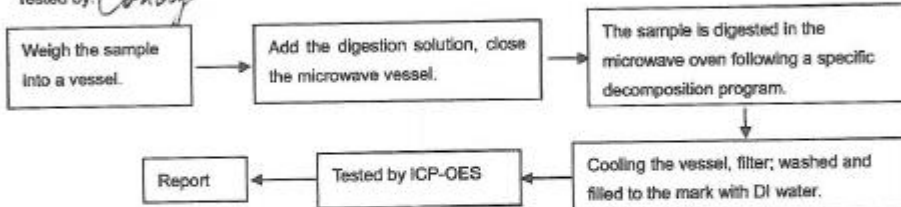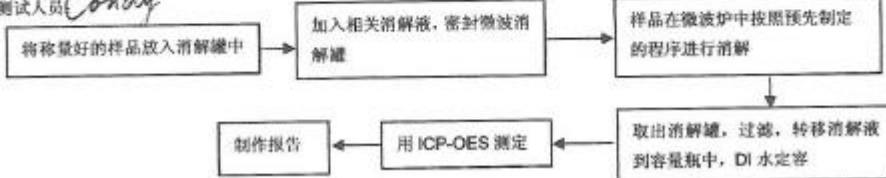
3. To Determine Hexavalent Chromium Content (for Polymer):

Tested by: Danal

| Weigh the sample; add the digestion solution. | → | Stir 3 hours while heating the samples continuously to 90-95 ℃, Gradually cool each solution to room temperature | → | Filter; adjust the pH of the solution and filled to the mark with DI water. |

| Report | ← | Transfer a portion of the solution to absorption cell, measure the absorbance with UV-VIS. | ← | Add the diphenylcarbazide solution and adjust the pH to acidic. |

测定六价铬含量(聚合物中)
测试人员: Danal

| 将称量好的样品放入锥形瓶中，加入消解剂 | → | 在90-95℃中持续加热搅拌3个小时，冷却至室温 | → | 过滤，调整溶液PH值，转移溶液到容量瓶中，DI水定容 |

| 制作报告 | ← | 将溶液转移到吸收池中，UV－VIS测定 | ← | 添加显色剂，调整溶液PH值至酸性 |

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4. To Determine PBBs/PBDEs Content:

Tested by: _Carina_

| Add 100 mg +/- 10 mg of the sample into the extraction thimbles. | → | Add appropriate surrogate and matrix spiking standards. | → | Add extraction to flask; extract for appropriate hours. |

| Report | ← | Test by GC-MS | ← | Collect extract, filled to the mark with solvent. |
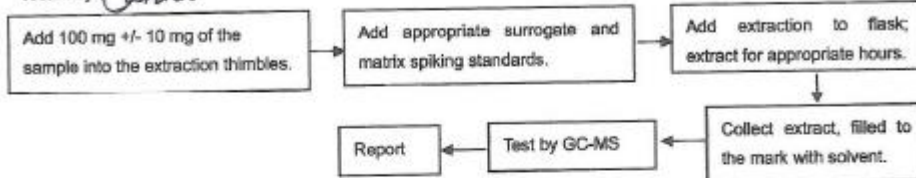
测定 PBBs&PBDEs 的含量

测试人员: _Carina_

| 称量 100 mg +/- 10 mg 样品于提取套管中 | → | 加入适当的内标物 | → | 加入萃取溶剂，在指定时间内完成萃取 |

| 制作报告 | ← | 用 GC-MS 分析 | ← | 收集，浓缩萃取液，定容 |

5. To Determine Fluorine, Chlorine, Bromine and Iodine Content:

Tested by: _Jason_

| Measure about 50mg sample | → | Burn the sample completely in the full oxygen of oxygen bomb working bin, and absorbed by 10mL absorption liquid | → | Stand about 1 hour, marked to 25mL |

| Report | ← | Filtrated with micro – channel percolation film Test by IC |

测定氟，氯，溴，碘含量

测试人员: _Jason_

| 称量 50mg 左右样品 | → | 在充满氧气的氧弹工作仓中完全燃烧，并用 10mL 的吸收液吸收 | → | 静置1小时左右，定容到 25mL |

| 制作报告 | ← | 微孔滤膜过滤，用 IC 测定 |

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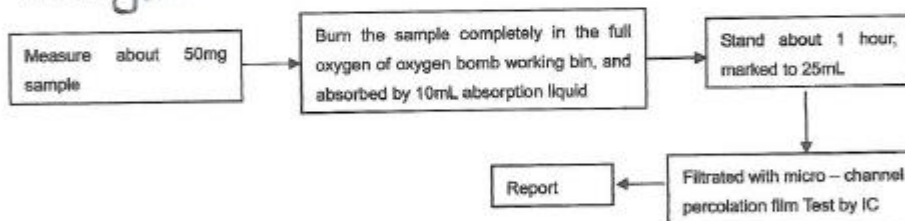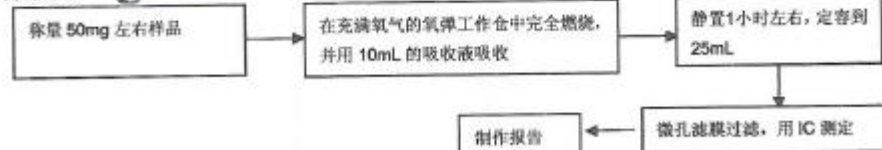
TEST REPORT

NO.: A002R12052305-46R01

Date: May. 28, 2012

Page 5 of 8

6. To Determine PFOS Content:

Tested by: Carina

| Weight hogged sample | → | Take into thimbles of soxhlet extraction | → | Soxhlet extraction 16h |

Report ← Test by LC-MS ← Cleanse, Collect extract

测定 PFOS 的含量:

测试人员: Carina

| 称取剪碎的样品 | → | 置于索氏萃取用的滤筒中 | → | 索氏萃取 16 小时 | → | 净化并浓缩萃取液 |

报告 ← 用 LC-MS 分析
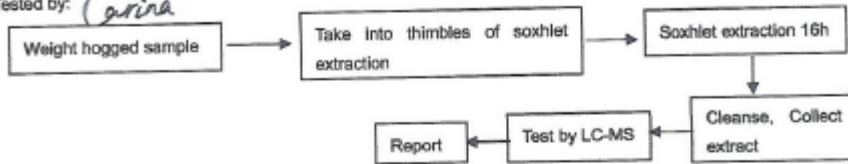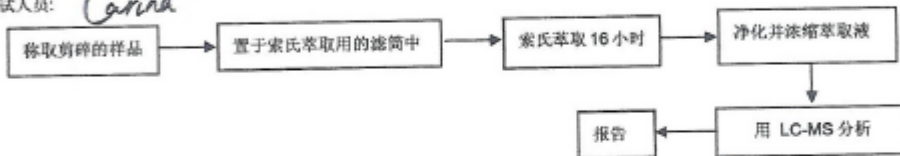
Test Results/ 测 试 结 果:

1)

Item/项目	Unit/单位	RoHS Limit/ RoHS 限值	Results/ 结果
Lead (Pb)/铅 (Pb)	mg/kg	1000	N.D.
Cadmium (Cd)/镉 (Cd)	mg/kg	100	N.D.
Mercury (Hg)/汞(Hg)	mg/kg	1000	N.D.
Chromium (CrVI)/六价铬(CrVI)	mg/kg	1000	N.D.

深圳市安姆特检测技术有限公司昆山分公司
中国江苏省昆山市周市镇民营路东侧6号厂房
联系电话: 86-512-5510 8808 公司网址: www.aovt.com
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REV.: A07   2022/02/10

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TEST REPORT

NO.: A002R12052305-46R01   Date: May. 28, 2012   Page 6 of 8

Flame Retardants/阻燃剂	Unit/单位	RoHS Limit/ RoHS 限值	Results/ 结果
PBBs/多溴联苯	mg/kg	1000	N.D.
MonoBB/一溴联苯	mg/kg	/	N.D.
DiBB/二溴联苯	mg/kg	/	N.D.
TriBB/三溴联苯	mg/kg	/	N.D.
TetraBB/四溴联苯	mg/kg	/	N.D.
PentaBB/五溴联苯	mg/kg	/	N.D.
HexaBB/六溴联苯	mg/kg	/	N.D.
HeptaBB/七溴联苯	mg/kg	/	N.D.
OctaBB/八溴联苯	mg/kg	/	N.D.
NonaBB/九溴联苯	mg/kg	/	N.D.
DecaBB/十溴联苯	mg/kg	/	N.D.
PBDEs/多溴联苯醚	mg/kg	1000	N.D.
MonoBDE/一溴联苯醚	mg/kg	/	N.D.
DiBDE/二溴联苯醚	mg/kg	/	N.D.
TriBDE/三溴联苯醚	mg/kg	/	N.D.
TetraBDE/四溴联苯醚	mg/kg	/	N.D.
PentaBDE/五溴联苯醚	mg/kg	/	N.D.
HexaBDE/六溴联苯醚	mg/kg	/	N.D.
HeptaBDE/七溴联苯醚	mg/kg	/	N.D.
OctaBDE/八溴联苯醚	mg/kg	/	N.D.
NonaBDE/九溴联苯醚	mg/kg	/	N.D.
DecaBDE/十溴联苯醚	mg/kg	/	N.D.

2)

Item/项目	Unitc	Limit/限值	Resultsc
Fluorine (F)/氟 (F)	mg/kg	/	N.D.
Chlorine (Cl)/氯 (Cl)	mg/kg	900	N.D.
Bromine (Br)/溴 (Br)	mg/kg	900	N.D.
Iodine (I)/碘 (I)	mg/kg	/	N.D.
Total (Br+ Cl)/总计（氯+溴）	mg/kg	1500	N.D.

3)

Item/项目	Unit/项目	Limit/限值	Result/限值
Perfluorooctane Sulfonates (PFOS) 全氟辛烷磺酸（PFOS） PFOS – Acid PFOS – 酸类 PFOS – Metal Salt PFOS – 金属盐类	mg/kg	See note 见备注	N.D.

深圳市安博特检测技术有限公司昆山分公司
中国江苏省昆山市..........
.... www.antt.com

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REV.: A07   2022/02/10

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TEST REPORT

NO.: A002R12052305-46R01   Date: May. 28, 2012   Page 7 of 8

Note/备 注:

-The new RoHS directive 2011/65/EU, on Jul. 21, 2011 come into force, on Jan. 03, 2013 the formal implementation, Directive 2002/95/EC shall be repealed simultaneously.

- 欧盟新 RoHS 指令 2011/65/EU，于 2011 年 7 月 21 日生效，2013 年 1 月 3 日正式实施，指令 2002/95/EC 同时废止。

- Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.

- 对于检测铅、镉、汞的样品已完全溶解。

- Reference information: Directive (EU) No 757/2010

- 相关信息：(EU) No 757/2010 指令

- (i) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.001% by mass.

- (i) 不可于市场销售全氟辛烷磺酸化合物，其在成品中的浓度不得相等或超过总体的 0.001%；

- (ii) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1% by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1μg/m^2 of the coated material.

- (ii) 不得销售全氟辛烷磺酸化合物浓度相等于或超过总体 0.1% 的半制成品或半制成品的部件；在纺织品或其他涂层物料，全氟辛烷磺酸化合物含量必须少于每平方米 1 微克。

- mg/kg=ppm

- N.D.=not detected(<MQL)

- N.D. =未检出（<MQL）

- MQL=Method Quantitation Limit

- MQL=方法定量检测下限

- Photo is included

- 附相片

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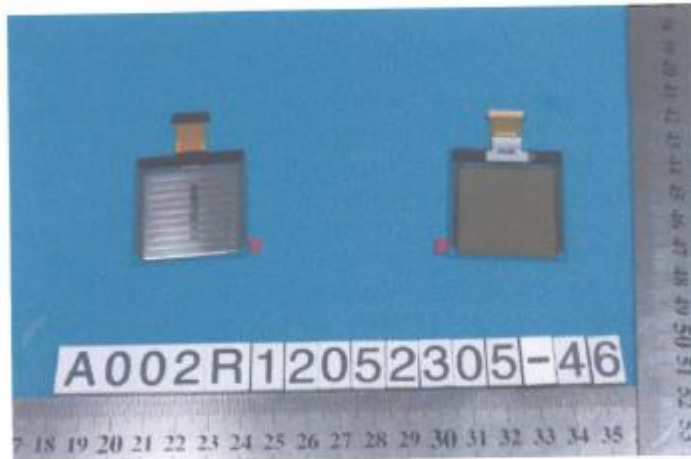查询热线
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TEST REPORT

NO.: A002R12052305-46R01

Date: May. 28, 2012

Page 8 of 8

Photograph of Sample
样 品 相 片

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End of Report
报告结束

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