The oled product specifications

Customer:AKIZUKI

Model Name: AL12832AWWB-H-U02

Supplier Approval			Customer approval
R&D Designed	R&D Approved	QC Approved	
Li yu sheng	Peng Jun		

Revision Record

REV NO.	REV DATE	CONTENTS	Note
A	2019-09-10	NEW ISSUE	

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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 AMSON.
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.

AMSON 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"). AMSON 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 or used as the conditions specified in the specifications. Nevertheless, AMSON 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.

◆Display Type: OLED 0.91” .
◆5.0V POWER SUPPLY.
◆Drive Duty:1/32 Duty.
◆Interface:I2C.
◆Display Color : Monochrome(White).
◆OLED assembly is simple.
◆High Contrast/ High Brightness/ Wide View Angle.
◆Single Power /Built in DC to DC Converter for OEL Panel.
◆Small molecular organic light emitting diode.

4. MECHANICAL DATA.

NO	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	128×32	dots
2	Pixel Size	0.159×0.159	mm
3	Pixel Pitch	0.175×0.175	mm

4	Panel Size	30.0×11.5×1.45	mm
5	Window Size	24.384×7.584	mm
6	Active Area	22.384×5.584	mm
7	View Angle	⩾160	degree
8	Diagonal A/A size	0.91"	inch
9	Module Size (W x H x T)	42.0 x 16.0 x 5.0	mm
10	Module Weight	3.45±10%	gram

5. MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit	Notes
Power supply voltage	VDD1	4.5	5.5	V	
Supply Voltage for Logic	VDD	2.7	4	V	1,2
Supply Voltage for Display	Vcc	0	11	V	1,2
Supply Voltage for DC/DC	VDDB	-0.3	5	V	1,2
Operating Temperature	TOP	-40	70	℃	
Storage Temperature	TSTG	-40	80	℃	3
Life time(120cd/m²)		5,000	-	hour	4

Note 1: All the above voltages are on the basis of “Vss = 0V”.
Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section 3. “Optics & Electrical Characteristics”. If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.
Note3: The defined temperature ranges do not include the polarizer. The maximum withstood Temperature of the polarizer should be 80℃.
Note4: End of lifetime is specified as 50% of initial brightness reached. The reference average Operation lifetime at room temperature is estimated by the accelerated at high temperature Conditions.

6. ELECTRICAL CHARACTERISTICS

6.1 D.C ELECTRICAL CHARACTERISTICS.

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Power supply voltage	VDD1		4.5	5.0	5.5	V
Supply Voltage for Logic	VDD		2.7	2.8	3.3	V
Supply Voltage for Display	Vcc	Notes5	7.0	7.5	8.0	V
High Level Input	VIH		0.8×VDD	-	VDD	V
Low Level Input	VIL		0	-	0.2x VDD	V
High Level Output	VOH	Iout=100uA,3.3MHz	0.9x VDD	-	VDD	V
Low Level Output	VOL	Iout=100uA,3.3MHz	0	-	0.1x VDD	V
Operating Current for V_{DD}	I_{DD}		-	180	300	uA
Operating Current for Vcc	I_{CC}	Note 6	-	2.8	3.5	mA
		Note 7	-	4.4	5.5	mA
		Note 8	-	8.2	10.3	mA
Sleep mode current for vdd	IDD,sleep		-	1	5	uA
Sleep mode current for vcc	Icc,sleep			2	10	uA

Note 5: Brightness (Lbr) and Supply Voltage for Display (Vcc) are subject to the change of the panel characteristics and the customer's request.
Note 6: V_{DD} = 2.8V, Vcc = 7.5V, 30% Display Area Turn on.
Note 7: V_{DD} = 2.8V, Vcc = 7.5V, 50% Display Area Turn on.
Note 8: V_{DD} = 2.8V, Vcc = 7.5V, 100% Display Area Turn on.

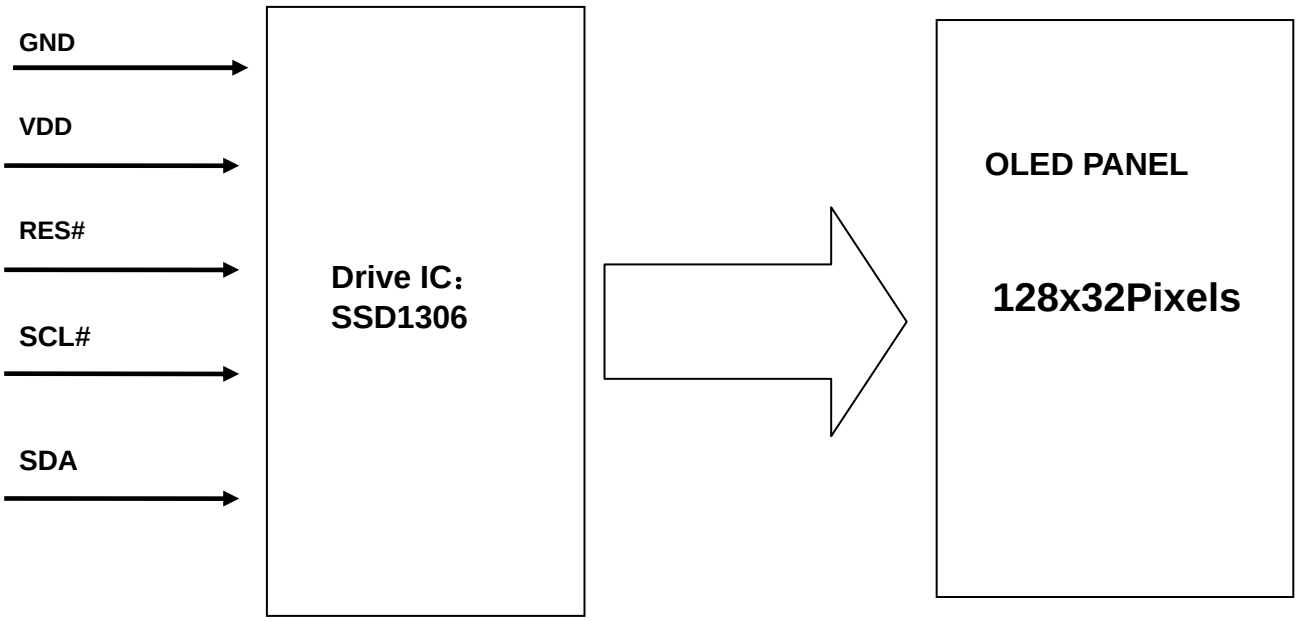
6.2 ELECTRO-OPTICAL CHARACTERISTICS

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Brightness	L_{br}	Note 5	160	200	-	cd/m^2
C.I.E. (White)	(x)	C.I.E1931	0.25	0.27	0.33	
	(y)		0.27	0.31	0.35	
Dark Room Contrast	CR			>10,000:1		
View Angle			≥160	-	-	degree

（* Optical measurement taken at VDD = 2.8V, VCC= 7.5V.）

7. INTERFACE(I2C)。

7.1 FUNCTION BLOCK DIAGRAM



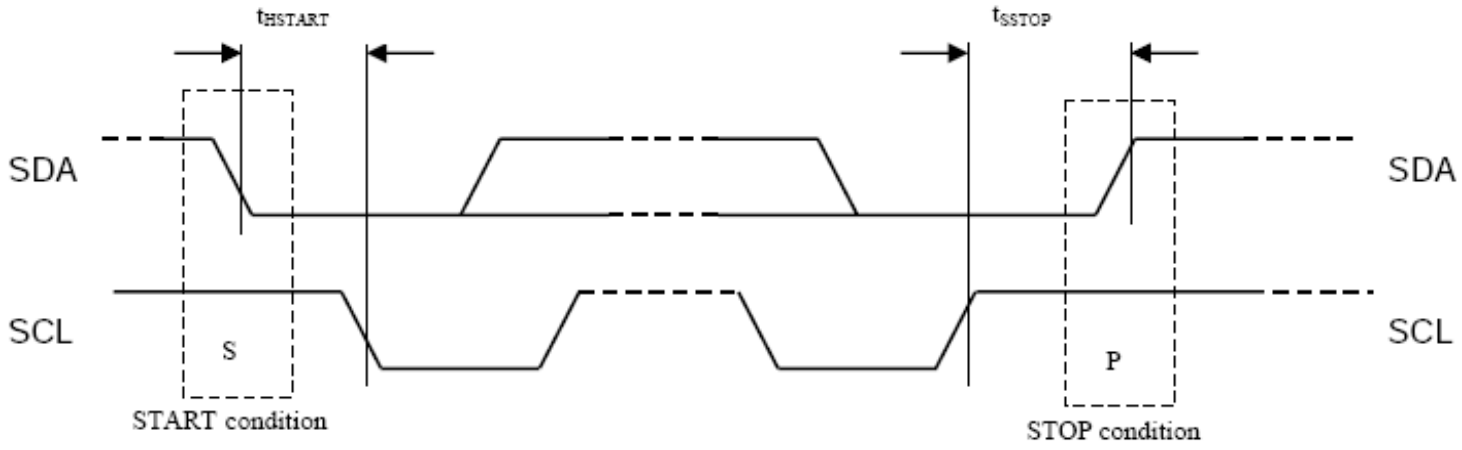
7.2 PIN ASSIGNMENTS.

PIN NO.	Symbol	Function
1	GND	Ground for System This is a ground pin ,It must be connected to external ground.
2	VDD	Power Supply for Logic This is voltage supply pin ,It must be connected to external source
3	RES#	Power Reset for Controller and Drive This pin is reset signal input ,When the pin is low,initialization of the chip is executed.
4	SCL	I2C bus clock signal. The transmission if information in the I2C bus is following a clock signal. Each transmission of data bit is taken place during a single clock periond of this pin.
5	SDA	I2C bus data signal. This pin acts as a communication channel between the transmitter and the receiver.

7.3 AC Charcteristics.

Symbol	Description	Min	Max	Unit
t_{cycle}	Clock Cycle Time	2.5	-	μs
t_{HSTART}	Start Condition Hold Time	0.6	-	μs
t_{HD}	Data Hold Time (for "SDA_{OUT}" Pin)	0	-	ns
	Data Hold Time (for "SDA_{IN}" Pin)	300		
t_{SD}	Data Setup Time	100	-	ns
t_{SSTART}	Start Condition Setup Time (Only relevant for a repeated Start condition)	0.6	-	μs
t_{SSTOP}	Stop Condition Setup Time	0.6	-	μs
t_R	Rise Time for Data and Clock Pin		300	ns
t_F	Fall Time for Data and Clock Pin		300	ns
t_{IDLE}	Idle Time before a New Transmission can Start	1.3	-	μs

(*VDD=2.8V ,Ta=25℃)



8. *Reliability*.

8.1 RELIABILITY TEST CONDITIONS。

NO.	TEST ITEMS	TEST CONDITION	Quantity
①	High Temperature Storage	80°C±2°C×240Hours	3
②	Low Temperature Storage	-40°C±2°C×240Hours	3
③	High Temperature Operating	70°C±2°C×240Hours	**3**
④	Low Temperature Operating	-40°C±2°C×240Hours	**3**
⑤	Thermal Shock	-40°C ~80C, 24 cycles 60 mins dwell The operational functions work. * The samples used for the above tests do not include polarizer.	**3**
⑥	Damp Proof Test (Storage)	60°C±5°C×90%RH×120Hours	**3**
⑦	Vibration Test	Frequency:10Hz~55Hz~10Hz Amplitude:1.5M X,Y,Z direction for total 3hours (Packing Condition)	1 Carton
⑧	Drooping Test	Drop to the ground from 1M height one time every side of carton. (Packing Condition)	1 Carton
⑨	ESD Test	Voltage:±8KV,R:330Ω,C:150PF,Air Mode,10times	**3**

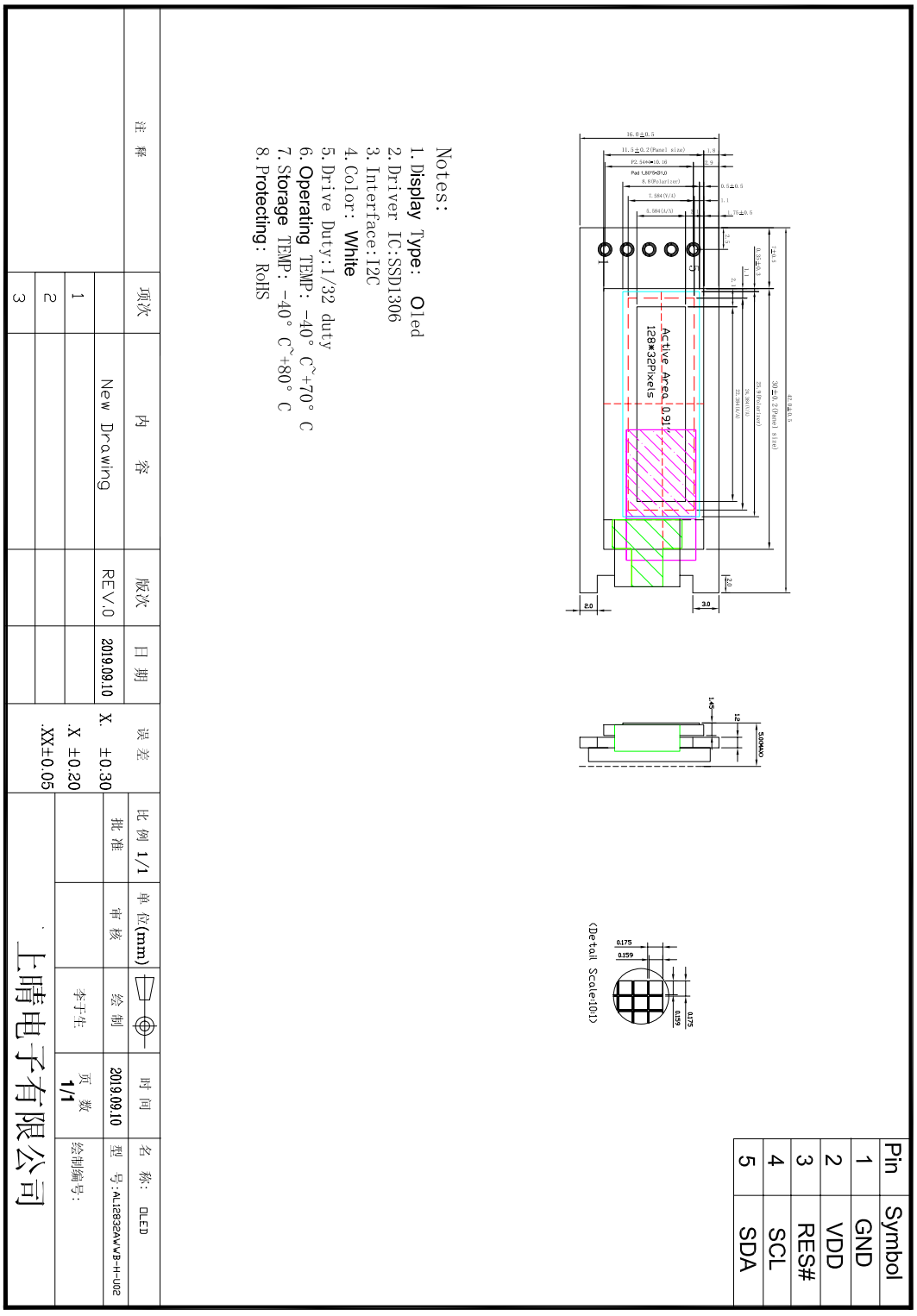
Test and measurement conditions

1. All measurements shall not be started until the specimens attain to temperature stability.
2. All-pixels-on is used as operation test pattern.

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.

9. EXTERNAL DIMENSION.



10. PACKING SPECIFICATION.

TBD(**To Be Determined**)

11 APPENDIXES.

APPENDIX 1: DEFINITIONS

A. DEFINITION OF CHROMATICITY COORDINATE

The chromaticity coordinate is defined as the coordinate value on the CIE 1931.

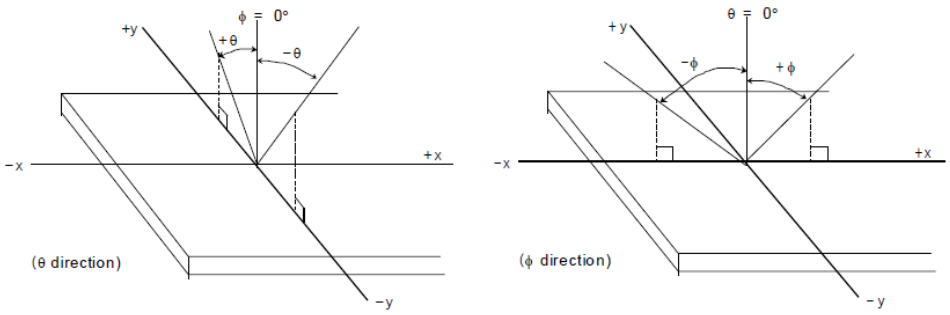
B. DEFINITION OF CONTRAST RATIO

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 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.



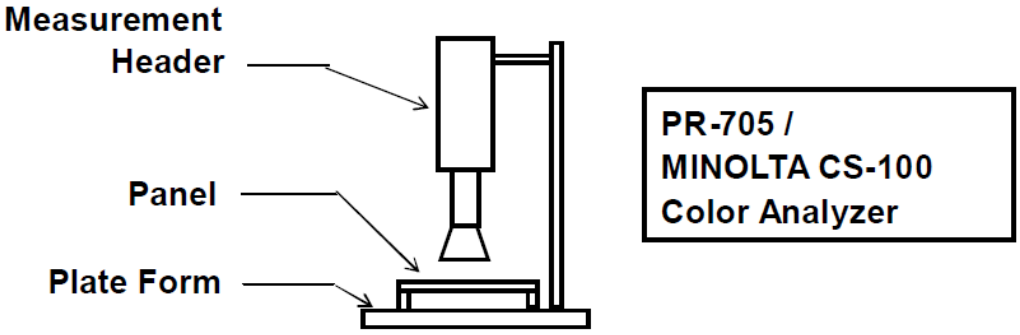
Vertical angles　　Horizontal angles

Figure 3 Viewing angle

APPENDIX 2: MEASUREMENT APPARATUS

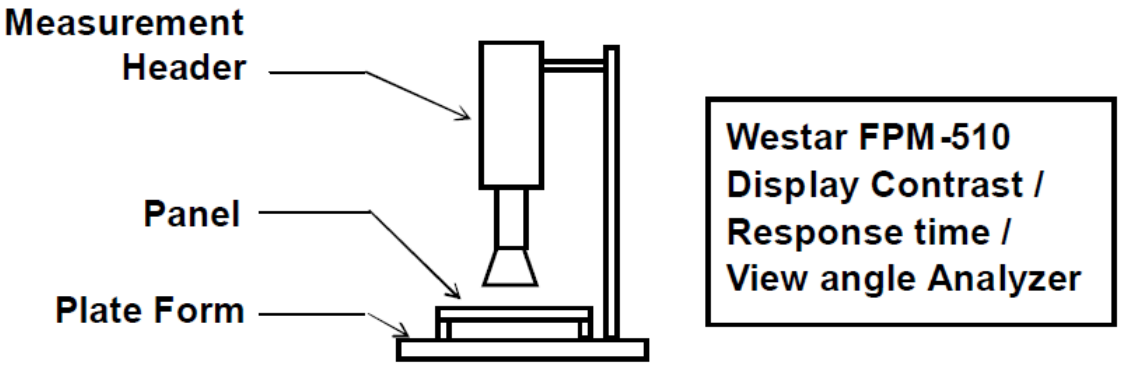
A. LUMINANCE/COLOR COORDINATE

PHOTO RESEARCH PR-705, MINOLTA CS-100

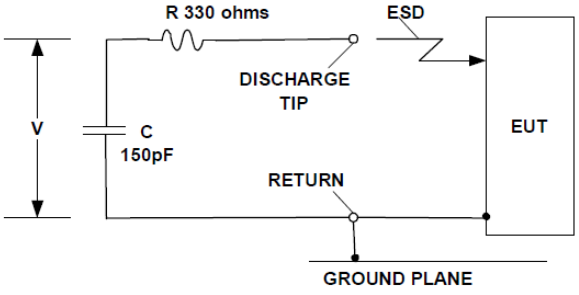


B. CONTRAST / RESPONSE TIME / VIEWING ANGLE.

WESTAR CORPORATION FPM-510



B. ESD ON AIR DISCHARGE MODE.



APPENDIX 3: PRECAUTIONS.

A. RESIDUE IMAGE.

Because the pixels are lighted in different time, the luminance of active pixels may reduce or differ from inactive pixels. Therefore, the residue image will occur. To avoid the residue image, every pixel needs to be lighted up uniformly.