# VISHAY. Vishay Dale Electronics, Inc. Information Display Products OLED Product Data Sheet

## **OLED SPECIFICATION**

Model No:

OLED-256Y064A-LPP3N00000

**RELEASE DATE:** 

Module #: OLED-256Y064A-LPP3N00000

Global / SAP #: 0256Y064ALPP3N0000

APPROVED BY:	
( FOR CUSTOMER USE ONLY )	

APPROVED BY SALES BY CHECKED BY PREPARED BY

# MODEL #: OLED-256Y064A-LPP3N00000

REC	ORDS OF REV		DOC. FIRST ISSUE					
VERSION	DATE	REVISED PAGE NO.	SUMMARY					
0	2015/06/17		First release					
А	2015/07/02		Remove reference spec.					
В	2015/12/11		Modify Life Time					
С	2016/03/23		Modify Static electricity test					
D	2016/05/04		Modify Interface Pin Function.					
Е	2016/11/10		Added IC P/N.					
F	2016/11/22		Add FPC bending rule					

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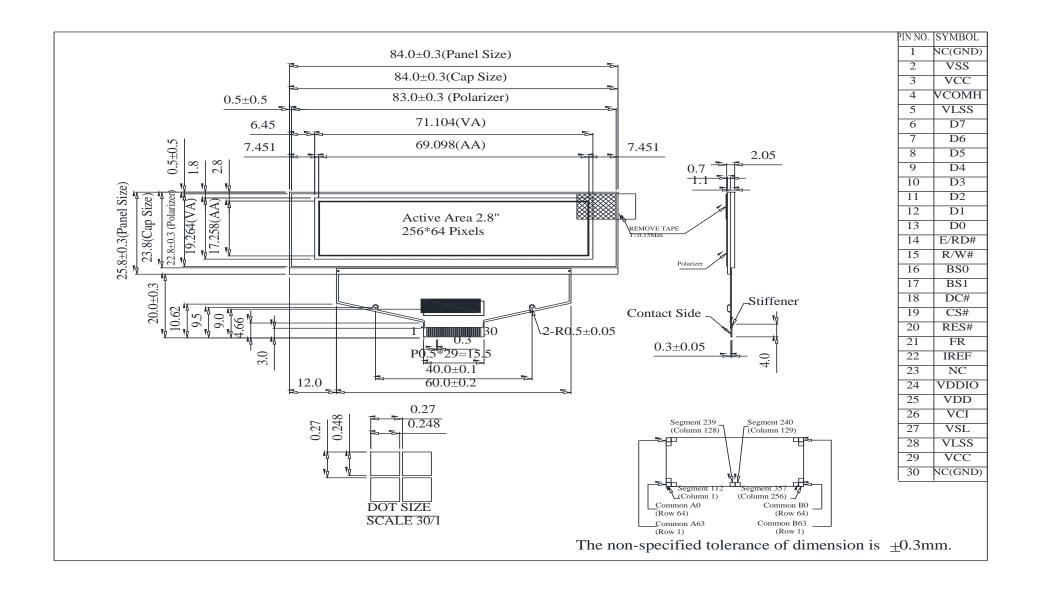
## **1.Module Classification Information**

1	Brand: Vishay Into	ertechnology, Inc.						
2	Horizontal Format: 128 Columns							
3	Display Type: N-	Display Type: N→Character Type, H→Graphic Type, Y→Tab Type,						
4	Vertical Format: 64	Vertical Format: 64 Lines						
5	Serials code							
6		A: Amber	R: RED					
	  - :::: 0.1	B: Blue	C : Full color					
	Emitting Color	G: Green	W : White					
		Y: Yellow Green	L: Yellow					
7	Polarizer	P: With Polarizer; N: Witho	ut Polarizer					
8	Display Mode	P: Passive Matrix; A: Activ	e Matrix					
9	Driver Voltage	3: 3.0 V; 5: 5.0V						
10	Touch Panel	N: Without touch panel; T: With touch panel						
		0 : Standard type						
		Sunlight Readable type						
11	Products type	2. Transparent OLED (TOLED)						
		3. Flexible OLED						
		4. OLED for Lighting						
		product grades:						
		0 : Standard(A-level)						
12	Droduct grades	2 : B-level						
12	Product grades	3 : C-level						
		4 : high class(AA-level)						
		5 : Customer offerings						
13	Serial No.	Application serial number(000~ZZZ)						

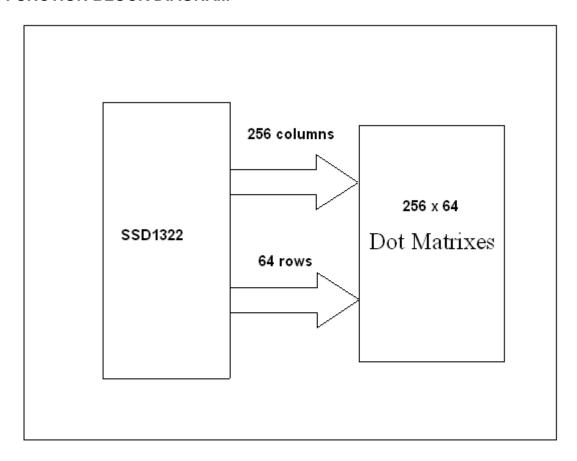
# **2.General Specification**

Item	Dimension	Unit
Dot Matrix	256 x 64 Dots	_
Module dimension	84.0 × 25.8 × 2.05	mm
Active Area	69.098 × 17.258	mm
Pixel Size	0.248 × 0.248	mm
Pixel Pitch	0.27 × 0.27	mm
Display Mode	Passive Matrix	
Display Color	Yellow	
Drive Duty	1/64 Duty	
IC	SSD1322UR1 (COF)	

## **3.Contour Drawing & Block Diagram**



#### **FUNCTION BLOCK DIAGRAM**



\*For more information, please refer to Application Note provided by Vishay

# 4. Interface Pin Function

Pin	Symbol	I/O	Function
Number			
Power Su	7		
26	VCI	P	Power Supply for Operation
			This is a voltage supply pin. It must be connected to external source &
		_	always be equal to or higher than VDD & VDDIO.
25	VDD	P	Power Supply for Core Logic Circuit
			This is a voltage supply pin. It can be supplied externally (within the range of
			2.4~2.6V) or regulated internally from VCI. A capacitor should be connected
		_	between this pin & VSS under all circumstances.
24	VDDIO	P	Power Supply for I/O Pin
			This pin is a power supply pin of I/O buffer. It should be connected to VDD
			or external source. All I/O signal should have VIH reference to VDDIO.
			When I/O signal pins (BS0~BS1, D0~D7, control signals) pull high, they
	T/CC	D	should be connected to VDDIO.
2	VSS	P	Ground of Logic Circuit
			This is a ground pin. It also acts as a reference for the logic pins. It must be
2.20	MOO	D	connected to external ground.
3,29	VCC	P	Power Supply for OLED Panel  These are the great positive valtege average gives of the chira. They great have
			These are the most positive voltage supply pin of the chip. They must be
<i>5</i> 30	VI CC	P	connected to external source.
5,28	VLSS	Г	Ground of Analog Circuit  These are the analog ground pine. They should be connected to VSS
			These are the analog ground pins. They should be connected to VSS externally.
Driver			externally.
22	IREF	Ι	Current Reference for Brightness Adjustment
22	IKEF	1	This pin is segment current reference pin. A resistor should be connected
			between this pin and VSS. Set the current lower than 10uA.
4	VCOMH	P	Voltage Output High Level for COM Signal
7		*	This pin is the input pin for the voltage output high level for COM signals. A
			tantalum capacitor should be connected between this pin and VSS.
27	VSL	P	Voltage Output Low Level for SEG Signal
	, , ,		This is segment voltage reference pin.
			When external VSL is not used, this pin should be left open.
			When external VSL is used, this pin should connect with resistor and diode
			to ground.
Testing P	Pads		
21	FR	О	This pin is No Connection pins. Nothing should be connected to this pin.
			This pin should be left open individually.
16	BS0	I	Communicating Protocol Select
17	BS1	1	These pins are MCU interface selection input. See the following table:
		<u> </u>	1 0

						I					
				BS0	BS1						
			3-wire SPI	1	0						
			4-wire SPI	0	0						
			8-bit 68XX Parallel	1	1						
			8-bit 80XX Parallel	0	1						
20	RES#	I	Power Reset for Controller and Driver								
			This pin is reset signal input. When the		initializatio	n of the chip is					
			xecuted.								
19	CS#	I	Chip Select								
			This pin is the chip select input. The ch	This pin is the chip select input. The chip is enabled for MCU							
			communication only when CS# is pulle	d low.							
18	D/C#	I	Data/Command Control								
			This pin is Data/Command control pin.	_	oin is pulled	l high, the					
			input at D7~D0 is treated as display dat								
			When the pin is pulled low, the input at								
			command register. For detail relationship	•	interface sig	gnals, please					
4.4	E (DD ) (	-	refer to the Timing Characteristics Diag	rams.							
14	E/RD#	I	Read/Write Enable or Read								
			This pin is MCU interface input. When								
			microprocessor, this pin will be used as								
			operation is initiated when this pin is pu								
			When connecting to an 80XX-micropro								
			(RD#) signal. Data read operation is ini CS# is pulled low.	mated when	i uns pin is	pulled low and					
			When serial mode is selected, this pin n	nuct he con	nected to V	22					
15	R/W#	I	Read/Write Select or Write	iust de con	nected to v	SS.					
13	ΙΝ/ ۷۷ π	1	This pin is MCU interface input. When	interfacing	to a 68XX.	-series					
			microprocessor, this pin will be used as								
			Pull this pin to "High" for read mode ar								
			When 80XX interface mode is selected.								
			input. Data write operation is initiated v								
			CS# is pulled low.	1	1						
			When serial mode is selected, this pin n	nust be con	nected to V	SS.					
6~13	D7~D0	I/O	Host Data Input/Output Bus								
			These pins are 8-bit bi-directional data	bus to be co	onnected to	the					
			microprocessor's data bus. When serial	mode is se	lected, D1 v	will be the					
			serial data input SDIN and D0 will be the		-						
			Unused pins must be connected to VSS	except for	D2 in serial	l mode.					
Reserve		1									
23	N.C.	-	Reserved Pin	_		<u> </u>					
			The N.C. pin between function pins are	reserved for	or compatib	le and flexible					
4.00	***		design.								
1,30	N.C.	-	Reserved Pin (Supporting Pin)	C		4 6 3					
	(GND)		The supporting pins can reduce the influence of the support pins can reduce the support pins can r			n the function					
			pins. These pins must be connected to external ground.								

## **5.Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Operation	VCI	-0.3	4	V	1, 2
Supply Voltage for Logic	VDD	-0.5	2.75	V	1, 2
Supply Voltage for I/O Pins	VDDIO	-0.5	VCI	V	1, 2
Supply Voltage for Display	VCC	-0.5	20	V	1, 2
Operating Temperature	TOP	-40	80	°C	-
Storage Temperature	TSTG	-40	80	°C	-

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 6 "Electrical Characteristics". If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate

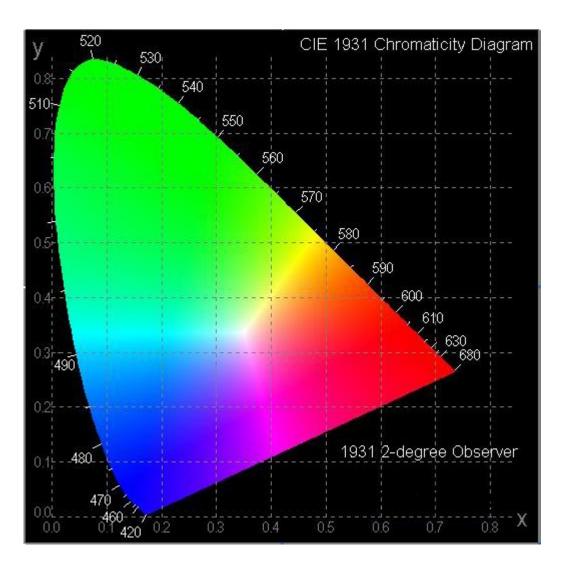
## **6.Electrical Characteristics**

Item	Symbol	Condition	Min	Тур	Max	Unit
Supply Voltage for Logic	VCI	Note	2.8	3.0	3.3	V
Supply Voltage for Display	VCC	_	14	14.5	15	V
High Level Input	VIH	_	0.8×V <sub>DDIO</sub>	_	$V_{DDIO}$	V
Low Level Input	VIL	_	0	_	0.2×V <sub>DDIO</sub>	V
High Level Output	VOH	_	0.9×V <sub>DDIO</sub>	_	$V_{DDIO}$	V
Low Level Output	VOL	_	0	_	0.1×V <sub>DDIO</sub>	V
50% Check Board operating Current		VCC =14.5V	23	25	32	mA

Note: Supply Voltage for Logic = VDD core power supply can be regulated from VCI.

## 7. Optical Characteristics

Item	Symbol	Condition	Min	Тур	Max	Unit
View Angle	(V)θ		160			deg
view Angle	(Η)φ		160			deg
Contrast Ratio	CR	Dark	2000:1		_	_
Response Time	T rise	_		10		μs
ixesponse rime	T fall	_		10		μs
Display with 50% check	Board Bri	ghtness	100	120		cd/m2
CIEx(Yellow)		(CIE1931)	0.45	0.47	0.49	
CIEy(Yellow)		(CIE1931)	0.48	0.50	0.52	



## 8.OLED Lifetime

ITEM	Conditions	Min	Тур	Remark
Operating Life Time	Ta=25°C / Initial 50% check board brightness Typical Value	50,000 Hrs	ı	Note

#### Notes:

- 1. Life time is defined the amount of time when the luminance has decayed to <50% of the initial value.
- 2. This analysis method uses life data obtained under accelerated conditions to extrapolate an estimated probability density function (*pdf*) for the product under normal use conditions.
- 3. Screen saving mode will extend OLED lifetime.

## 9.Reliability

**Content of Reliability Test** 

Environmenta	Il Test	T	I
Test Item	Content of Test	Test Condition	Applicable Standard
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80°C 240hrs	
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-40°C 240hrs	
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	80°C 240hrs	
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-40°C 240hrs	
High Temperature/ Humidity Storage	Endurance test applying the high temperature and high humidity storage for a long time.	60°С,90%RH 240hrs	
Temperature Cycle	Endurance test applying the low and high temperature cycle.  -40°C 25°C 80°C  30min 5min 30min 1 cycle	-40°C/80°C 100 cycles	
Mechanical Te	st		
Vibration test	Endurance test applying the vibration during transportation and using.	10~22Hz→1.5mmp-p 22~500Hz→1.5G Total 0.5hr	
Shock test	Constructional and mechanical endurance test applying the shock during transportation.	50G Half sin wave 11 ms 3 times of each direction	
Atmospheric pressure test	Endurance test applying the atmospheric pressure during transportation by air.	115mbar 40hrs	
Others			
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact) ±800v(air), RS=330Ω CS=150pF 10 times	),

<sup>\*\*\*</sup> Supply voltage for OLED system =Operating voltage at 25  $^{\circ}\!\mathbb{C}$ 

#### Test and measurement conditions

- 1. All measurements shall not be started until the specimens attain to temperature stability. After the completion of the described reliability test, the samples were left at room temperature for 2 hrs prior to conducting the failure test at 23±5°C; 55±15% RH.
- 2. All-pixels-on is used as operation test pattern.
- 3. The degradation of Polarizer are ignored for High Temperature storage, High Temperature/ Humidity Storage, Temperature Cycle

#### **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.

#### **APPENDIX:**

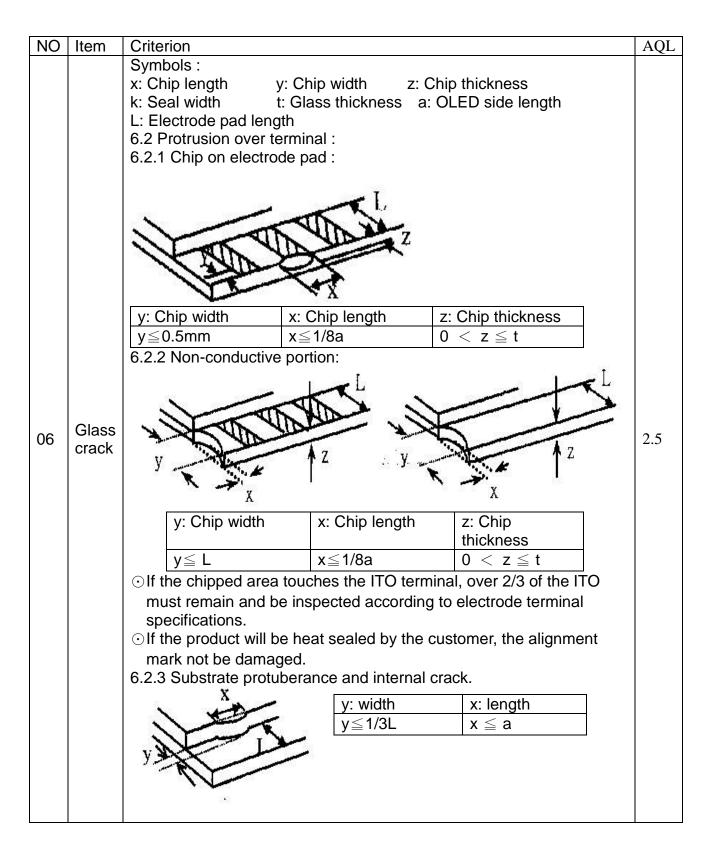
#### **RESIDUE IMAGE**

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.

# 10.Inspection specification

NO	Item	Criterion					AQL
01	Electrical Testing	<ul> <li>1.1 Missing vertical, horizontal segment, segment contrast defect.</li> <li>1.2 Missing character, dot or icon.</li> <li>1.3 Display malfunction.</li> <li>1.4 No function or no display.</li> <li>1.5 Current consumption exceeds product specifications.</li> <li>1.6 OLED viewing angle defect.</li> <li>1.7 Mixed product types.</li> <li>1.8 Contrast defect.</li> </ul>					0.65
02	Black or white spots on OLED (display only)	<ul> <li>2.1 White and black spots on display ≤0.25mm, no more than three white or black spots present.</li> <li>2.2 Densely spaced: No more than two spots or lines within 3mm.</li> </ul>					2.5
03	OLED black spots, white spots, contamina tion (non-display)	3.1 Round type: following drawing Φ=(x+y)/2			SIZE $\Phi \le 0.10$ $0.10 < \Phi \le 0.20$ $0.20 < \Phi \le 0.25$ $0.25 < \Phi$	Acceptable Q TY Accept no dense 2 1	2.5
		3.2 Line type : (A	Length Length $L \le 3.0$ $L \le 2.5$	Wi W: 0.0	•	Acceptable Q TY Accept no dense 2 As round type	2.5
04	Polarizer bubbles	If bubbles are vis judge using black specifications, no to find, must che- specify direction.	k spot ot easy ck in	Φ <sub>3</sub> 0.2 0.5 1.0	ze Φ $\le$ 0.20 $20 < Φ \le$ 0.50 $50 < Φ \le$ 1.00 00 < Φ tal Q TY	Acceptable Q TY Accept no dense 3 2 0 3	2.5

NO	Item	Criterion			AQL	
05	Scratches	Follow NO.3 OLED black spots, white spots, contamination				
			y: Chip width z: 0 t: Glass thickness a: pth:			
		6.1 General glass chip : 6.1.1 Chip on panel surface and crack between panels:				
		z: Chip thickness	y: Chip width	x: Chip length		
06	Chipped	Z≦1/2t	Not over viewing area	x≦1/8a	2.5	
	glass	1/2t < z ≤ 2t	Not exceed 1/3k	x≦1/8a		
		1/2t < z ≤ 2t	Not exceed 1/3k	x≦1/8a		
	⊙ If there are 2 or more chips, x is the total length of each chip.					



NO	Item	Criterion	AQL
07	Cracked glass	The OLED with extensive crack is not acceptable.	
08	Backlight elements	<ul> <li>8.1 Illumination source flickers when lit.</li> <li>8.2 Spots or scratched that appear when lit must be judged. Using OLED spot, lines and contamination standards.</li> <li>8.3 Backlight doesn't light or color wrong.</li> </ul>	
09	Bezel	<ul><li>9.1 Bezel may not have rust, be deformed or have fingerprints, stains or other contamination.</li><li>9.2 Bezel must comply with job specifications.</li></ul>	2.5 0.65
10	PCB、COB	<ul> <li>10.1 COB seal may not have pinholes larger than 0.2mm or contamination.</li> <li>10.2 COB seal surface may not have pinholes through to the IC.</li> <li>10.3 The height of the COB should not exceed the height indicated in the assembly diagram.</li> <li>10.4 There may not be more than 2mm of sealant outside the seal area on the PCB. And there should be no more than three places.</li> <li>10.5 No oxidation or contamination PCB terminals.</li> <li>10.6 Parts on PCB must be the same as on the production characteristic chart. There should be no wrong parts, missing parts or excess parts.</li> <li>10.7 The jumper on the PCB should conform to the product characteristic chart.</li> <li>10.8 If solder gets on bezel tab pads, OLED pad, zebra pad or screw hold pad, make sure it is smoothed down.</li> </ul>	2.5 2.5 0.65 2.5 0.65 0.65 2.5
11	Soldering	<ul> <li>11.1 No un-melted solder paste may be present on the PCB.</li> <li>11.2 No cold solder joints, missing solder connections, oxidation or icicle.</li> <li>11.3 No residue or solder balls on PCB.</li> <li>11.4 No short circuits in components on PCB.</li> </ul>	2.5 2.5 2.5 0.65

NO	Item	Criterion	AQL
12	General appearance	<ul> <li>12.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP.</li> <li>12.2 No cracks on interface pin (OLB) of TCP.</li> <li>12.3 No contamination, solder residue or solder balls on product.</li> <li>12.4 The IC on the TCP may not be damaged, circuits.</li> <li>12.5 The uppermost edge of the protective strip on the interface pin must be present or look as if it cause the interface pin to sever.</li> <li>12.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color.</li> <li>12.7 Sealant on top of the ITO circuit has not hardened.</li> <li>12.8 Pin type must match type in specification sheet.</li> <li>12.9 OLED pin loose or missing pins.</li> <li>12.10 Product packaging must the same as specified on packaging specification sheet.</li> <li>12.11 Product dimension and structure must conform to product specification sheet.</li> </ul>	2.5 0.65 2.5 2.5 2.5 2.5 2.5 0.65 0.65 0.65

Check Item	Classification	Criteria
No Display	Major	
Missing Line	Major	
Pixel Short	Major	
Darker Short	Major	
Wrong Display	Major	
Un-uniform B/A x 100% < 70% A/C x 100% < 70%	Major	A Normal B Dark Pixel C Light Pixel

### 11.Precautions in use of OLED Modules

#### **Modules**

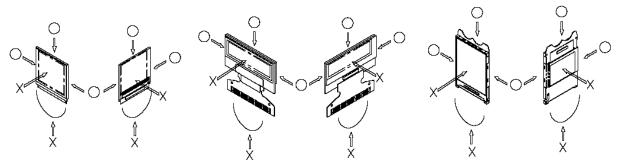
- (1) Avoid applying excessive shocks to module or making any alterations or modifications to it.
- (2)Don't make extra holes on the printed circuit board, modify its shape or change the components of OLED display module.
- (3)Don't disassemble the OLED display module.
- (4)Don't operate it above the absolute maximum rating.
- (5)Don't drop, bend or twist OLED display module.
- (6)Soldering: only to the I/O terminals.
- (7) Storage: please storage in anti-static electricity container and clean environment.
- (8)It's pretty common to use "Screen Saver" to extend the lifetime and Don't use fix information for long time in real application.
- (9)Don't use fixed information in OLED panel for long time, that will extend "screen burn" effect time..
- (10)Vishay has the right to change the passive components, including R2and R3 adjust resistors. (Resistors, capacitors and other passive components will have different appearance and color caused by the different supplier.)
- (11)Vishay have the right to change the PCB Rev. (In order to satisfy the supplying stability, management optimization and the best product performance...etc, under the premise of not affecting the electrical characteristics and external dimensions, Vishay have the right to modify the version.)

#### 11.1. Handling Precautions

- (1) Since the display panel is being made of glass, do not apply mechanical impacts such us dropping from a high position.
- (2) If the display panel is broken by some accident and the internal organic substance leaks out, be careful not to inhale nor lick the organic substance.
- (3) If pressure is applied to the display surface or its neighborhood of the OLED display module, the cell structure may be damaged and be careful not to apply pressure to these sections.
- (4) The polarizer covering the surface of the OLED display module is soft and easily scratched. Please be careful when handling the OLED display module.
- (5) When the surface of the polarizer of the OLED display module has soil, clean the surface. It takes advantage of by using following adhesion tape.
  - \* Scotch Mending Tape No. 810 or an equivalent
  - Never try to breathe upon the soiled surface nor wipe the surface using cloth containing solvent such as ethyl alcohol, since the surface of the polarizer will become cloudy.

Also, pay attention that the following liquid and solvent may spoil the polarizer:

- \* Water
- \* Ketone
- \* Aromatic Solvents
- (6) Hold OLED display module very carefully when placing OLED display module into the System housing. Do not apply excessive stress or pressure to OLED display module. And, do not over bend the film with electrode pattern layouts.
  - These stresses will influence the display performance. Also, secure sufficient rigidity for the outer cases.



- (7) Do not apply stress to the LSI chips and the surrounding molded sections.
- (8) Do not disassemble nor modify the OLED display module.
- (9) Do not apply input signals while the logic power is off.
- (10) Pay sufficient attention to the working environments when handing OLED display modules to prevent occurrence of element breakage accidents by static electricity.
- \* Be sure to make human body grounding when handling OLED display modules.
- \* Be sure to ground tools to use or assembly such as soldering irons.
- \* To suppress generation of static electricity, avoid carrying out assembly work under dry environments.
- \* Protective film is being applied to the surface of the display panel of the OLED display module. Be careful since static electricity may be generated when exfoliating the protective film.
- (11) Protection film is being applied to the surface of the display panel and removes the protection film before assembling it. At this time, if the OLED display module has been stored for a long period of time, residue adhesive material of the protection film may remain on the surface of the display panel after removed of the film. In such case, remove the residue material by the method introduced in the above Section 5.
- (12) If electric current is applied when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may be corroded and be careful to avoid the above.

#### 11.2. Storage Precautions

(1) When storing OLED display modules, put them in static electricity preventive bags avoiding exposure to direct sun light nor to lights of fluorescent lamps. and, also, avoiding high temperature and high humidity environment or low temperature (less than 0°C) environments.

(We recommend you to store these modules in the packaged state when they were shipped from Vishay.

At that time, be careful not to let water drops adhere to the packages or bags nor let dewing occur with them.

(2) If electric current is applied when water drops are adhering to the surface of the OLED display module, when the OLED display module is being dewed or when it is placed under high humidity environments, the electrodes may be corroded and be careful about the above.

#### 11.3. Designing Precautions

- (1) The absolute maximum ratings are the ratings which cannot be exceeded for OLED display module, and if these values are exceeded, panel damage may be happen.
- (2) To prevent occurrence of malfunctioning by noise, pay attention to satisfy the VIL and VIH specifications and, at the same time, to make the signal line cable as short as possible.
- (3) We recommend you to install excess current preventive unit (fuses, etc.) to the power circuit (VDD). (Recommend value: 0.5A)
- (4) Pay sufficient attention to avoid occurrence of mutual noise interference with the neighboring devices.
- (5) As for EMI, take necessary measures on the equipment side basically.
- (6) When fastening the OLED display module, fasten the external plastic housing section.

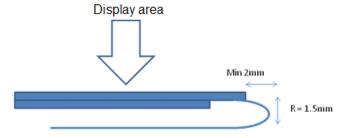
- (7) If power supply to the OLED display module is forcibly shut down by such errors as taking out the main battery while the OLED display panel is in operation, we cannot guarantee the quality of this OLED display module.
- \* Connection (contact) to any other potential than the above may lead to rupture of the IC.

#### 11.4. Precautions when disposing of the OLED display modules

1) Request the qualified companies to handle industrial wastes when disposing of the OLED display modules. Or, when burning them, be sure to observe the environmental and hygienic laws and regulations.

#### 11.5. Other Precautions

- (1) When an OLED display module is operated for a long of time with fixed pattern may remain as an after image or slight contrast deviation may occur.
- Nonetheless, if the operation is interrupted and left unused for a while, normal state can be restored. Also, there will be no problem in the reliability of the module.
- (2) To protect OLED display modules from performance drops by static electricity rapture, etc., do not touch the following sections whenever possible while handling the OLED display modules.
- \* Pins and electrodes
- \* Pattern layouts such as the TCP & FPC
- (3) With this OLED display module, the OLED driver is being exposed. Generally speaking, semiconductor elements change their characteristics when light is radiated according to the principle of the solar battery. Consequently, if this OLED driver is exposed to light, malfunctioning may occur.
- \* Design the product and installation method so that the OLED driver may be shielded from light in actual usage.
- \* Design the product and installation method so that the OLED driver may be shielded from light during the inspection processes.
- (4) Although this OLED display module stores the operation state data by the commands and the indication data, when excessive external noise, etc. enters into the module, the internal status may be changed. It therefore is necessary to take appropriate measures to suppress noise generation or to protect from influences of noise on the system design.
- (5) We recommend you to construct its software to make periodical refreshment of the operation statuses (re-setting of the commands and re-transference of the display data) to cope with catastrophic noise.
- (6)Resistors, capacitors and other passive components will have different appearance and color caused by the different supplier.
- (7)Our company will has the right to upgrade and modify the product function.
- (8) The limitation of FPC bending





Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

#### Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



**«JONHON»** (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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