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Specification

MCOG025AW128064MYI



DOC.

DATASHEET STATEMENT

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- 2. The ISO9001 logo used in this document is authorized by SGS (www.sgs.com). Midas had already successfully passed the strict and professional ISO9001:2000 Quality Management System Certification and got the certificate (No.: CN07/00404)
- 3. The technologies/techniques/crafts which denoted by the following icons are not exclusively owned by Midas, but also shared by Midas LCD strategic cooperators, however all these technologies/techniques/crafts have been finally confirmed by Midas professional engineers and QC department.
- **4.** As the difference in test standard and test conditions, also Midas insufficient familiarity with the actual LCD using environment, all the referred information in this DATASHEET (including the icons) only have two functions:
 - 4.1: providing quick reference when you are judging whether or not the product meets your requirements.
 - 4.2: listing out definitely the tolerance.

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- **5.** The sequence of the icons is random and doesn't indicate the importance grade.
- 6. Icons explanation

Midas 2006 version logo. Midas is an integrated manufacturer of flat panel display (FPD). Midas supplies TN, HTN, STN, FSTN monochrome LCD panel; COB, COG, TAB LCD module; and all kinds of LED backlight.



FAST RESPONSE TIME

This icon on the cover indicates the product is with high response speed; Otherwise not.



PROTECTION CIRCUIT

This icon on the cover indicates the product is with protection circuit; Otherwise not.



HIGH CONTRAST

This icon on the cover indicates the product is with high contrast; Otherwise not.



LONG LIFE VERSION

This icon on the cover indicates the product is long life version (over 9K hours guaranteed); Otherwise not.



WIDE VIEWING SCOPE

This icon on the cover indicates the product is with wide viewing scope; Otherwise not.



Anti UV VERSION

This icon on the cover indicates the product is against UV line. Otherwise not.



RoHS COMPLIANCE

This icon on the cover indicates the product meets ROHS requirements; Otherwise not.



OPERATION TEMPERATURE RANGE

This icon on the cover indicates the operating temperature range (X-Y).



3TIMEs 100% QC EXAMINATION

This icon on the cover indicates the product has passed Midas thrice 100% QC.
Otherwise not.



TWICE SELECTION OF LED MATERIALS

This icon on the cover indicates the LED had passed Midas twice strict selection which promises the product's identical color and brightness; Otherwise not.



Vlcm = 3.0V

This icon on the cover indicates the product can work at 3.0V exactly; otherwise not.



N SERIES TECHNOLOGY (2008 developed)

New structure, new craft, new technology and new materials inside both LCD module and LCD panel to improve the "RainBow"

Midas Passive OLED Part Number System

MC OC 057/21605 A W * M Y * 1 2 3 4 5 6 7 8 9

MC: **Midas Components** 1 = 2 **OC:** OLED Character **OG:** OLED Graphic 3 Size / No of Characters and Character Height = 4 = **Series** Operating Temp Range: B: -40+70Deg C W: -40+80 Deg C 5 = Blank: Not applicable 6 =**No of Pixels** (320240) or 7 Mode: M: Transmissive S: Sunlight Readable =(transmissive) **Colour:** G: Green 8 Y: Yellow R: Red B: Blue W: White RGB: Red, Green, Blue $I: I^2C$ 9 **Driver Chip/Controller:** Blank: General

E: Multi-European Character Set

1.Revision History

VERSION	REVISED PAGE NO.	Note
1		First issue

2. General Specification

The Features is described as follow:

■ Module dimension: 82.7 ×40.2 × 3.4 (max.) mm³

■ View area: 63.41 × 32.69 mm²

■ Active area:61.41 × 30.69 mm²

■ Number of dots: 128 x 64

Pixel size: 0.48x 0.48 mm²
 Pixel pitch: 0.45 x 0.45 mm²

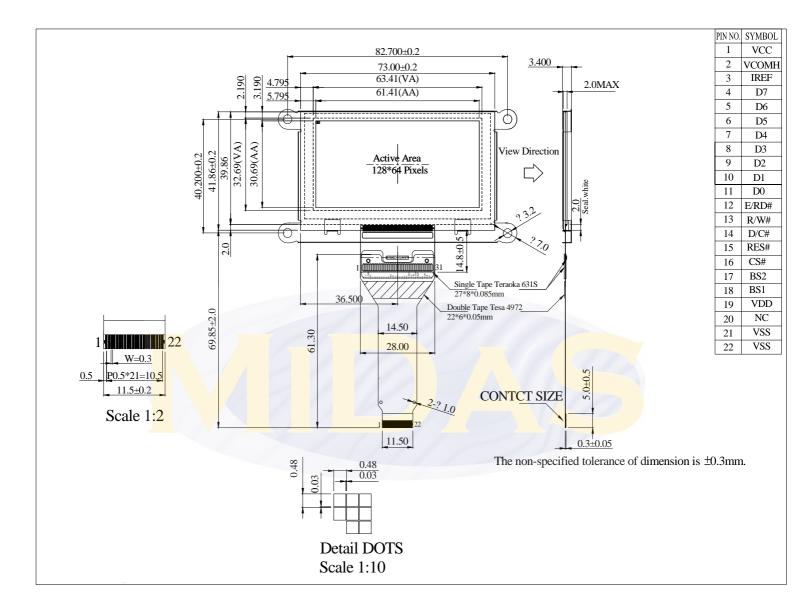
■ Duty: 1/64

■ Emitting Color: Yellow

4. Interface Pin Function

No.	Symbol	Funct	ion						
1	VCC	Power	Power supply for analog circuit.						
2	VCOMH	Com Voltage Output. A capacitor should be connected between this pin and VSS.							
3	IREF	Reference current input pin. A resistor should be connected between this pin and VSS.							
4~11	D7~D0	Data b	ous.						
12	E/RD#	Data r	ead operation is	s initiated when	it's pull low.				
13	R/W#	Data v	vrite operation is	s initiated when	it's pull low.				
14	D/C#	Data/ Command control. Pull high for write/read display data. Pull low for write command or read status.							
15	RES#		sig <mark>nal</mark> input. it's <mark>low</mark> , initializa ted.	ation of SSD130	05 is				
16	CS#	Chip s	elect input.						
17	BS2	These	nunicating Proto pins are MCU		ion input. See				
18	BS1	followi BS1 BS2	ng table: 68XX-paralle I 0	80XX-paralle I 1	Serial 0 0				
19	VDD		supply for logic	circuit.					
20	NC		nnection.						
21	VSS	Ground.							
22	VSS	Groun							

5. Outline Dimension



6. Optics & Electrical Characteristics

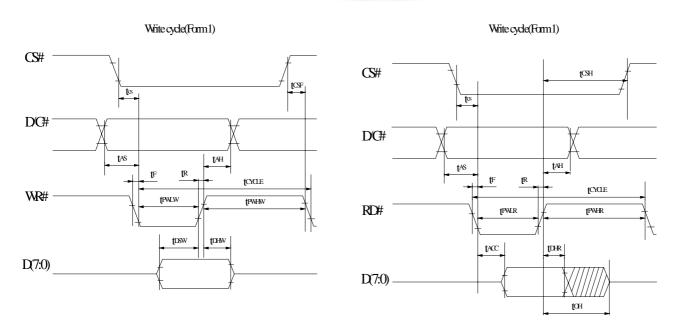
6.1INTERFACE TIMING CHART

8080-Series MCU Parallel Interface Timing Characteristics

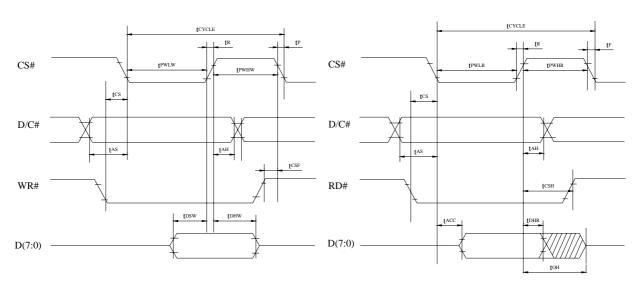
(VDD-VSS=2.4V to 3.5V, VDDIO=VDD,TA=25°C)

	,				
Symbol	Parameter	Min	Тур	Max	Unit
tcycle	Clock Cycle Time	300	_	-	ns
tAS	Address Setup Time	10	-	-	ns
tAH	Address Hold Time	0	-	-	ns
tDSW	Write Data Setup Time	40	-	-	ns
tDHW	Write Data Hold Time	7	-	-	ns
tDHR	Read Data Hold Time	20	-	-	ns
tOH	Output Disable Time	-	-	70	ns
tACC	Access Time	-	-	140	ns
tPWLR	Read Low Time	120	-	-	ns
tPWLW	Write Low Time	60	-	-	ns
tPWHR	Read High Time	60	-	-	ns
tPWHW	Write High Time	60	-	/-	ns
tR	Rise Time	-	//-//	15	ns
tF	Fall Time	-	-	15	ns
tCS	Chi <mark>p selec</mark> t setup time	0	/- A	-	ns
tCSH	Chip select setup hold time to read	0	/ -/	<u>-</u>	ns
	signal		/		
tCSF	Chip select setup hold time	20	—) <u>-</u>	ns

8080-seriesparallel interface characteristics (Form 1)







6.2 DC Characteristics

Characteristics	Symbol	Condition	Min	Тур	Max	Unit
Supply Voltage for Logic	VDD		2.4	2.7	3.5	V
Supply Voltage for Display	VCC	9 ///	14.5	15	15.5	V
High Level Input	VIH	lout = 100μΑ,3.3MHz	0.8×VDD	-	VDD	V
Low Level Input	VIL	lout = 100µA,3.3MHz	0		0.2×VDD	V
High Level Output	VOH	lout =100µA,3.3MHZ	0.9×VDD		VDD	V
Low Level Input	VOL	lout =100µA,3.3MHZ	0	_	0.1×VDD	V
Operating Current for VDD	IDD	Note 4	_	250	400	μΑ
operating current for VBB		Note 5	_	250	400	μΑ
0	100	Note 4	_	31	39	mA
Operating Current for VCC	ICC	Note 5	_	53	66	mA
Sleep Mode Current for VDD	IDD, SLEEP		_		10	μΑ
Sleep Mode Current for VCC	ICC, SLEEP				10	μΑ

Note 3: Brightness (Lbr) and Supply Voltage for Display (VCC) are subject to the change of the panel characteristics and the customer's request.

Note 4: VDD = 2.7V, VCC = 15V, 50% Display Area Turn on.

Note 5: VDD = 2.7V, VCC = 15V, 100% Display Area Turn on.

^{*} Software configuration follows Section 4.4 Initialization.

7. Block Diagram

7.1.POWER ON/OFF SEQUENCE & APPLICATION CIRCUIT

3.1.1 POWER ON/OFF SEQUENCE

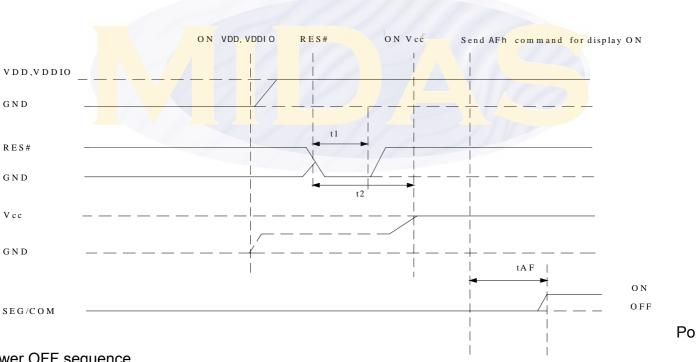
Power ON sequence

Power ON VDD, VDDIO

After VDD ,VDDIO become stable , set RES# pin LOW (logic low) for at least 3us(t1) and then HIGH (logic high).

After set RES# pin LOW (logic low), wait for at least 3us(t2). Then Power ON Vcc. (1)

After Vcc. become stable , send command AFh for display ON. DEG/COM will be ON after 100ms(tAF).

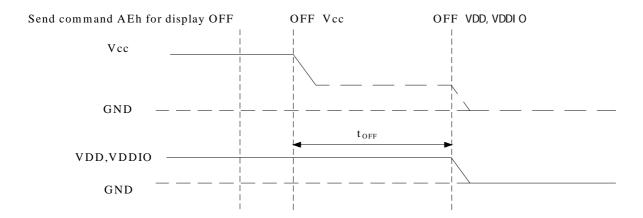


wer OFF sequence

Send command AEh for display OFF.

Power OFF Vcc.(1),(2)

Wait for tOFF. Power OFF VDD ,VDDIO. (where Minimum tOFF=80ms, Typical tOFF=100ms)

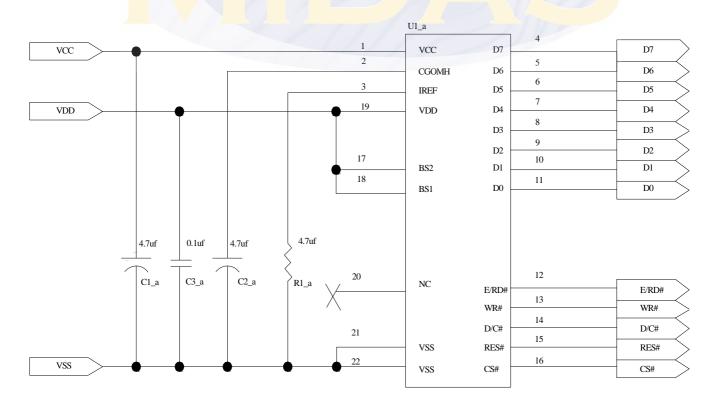


Note:

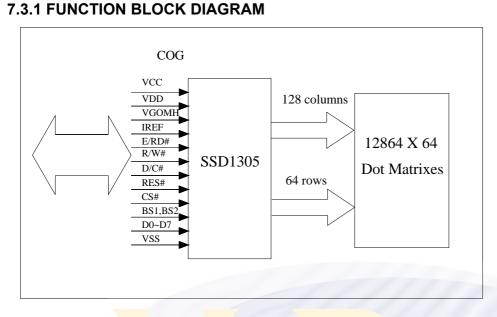
Since an ESD protection circuit is connected between VDD ,VDDIO and Vcc, Vcc becomes lower than VDD and VDD , VDDIO is ON and Vcc is OFF as shown in the dotted line of Vcc in above figures.

Vcc should be disabled when it is OFF.

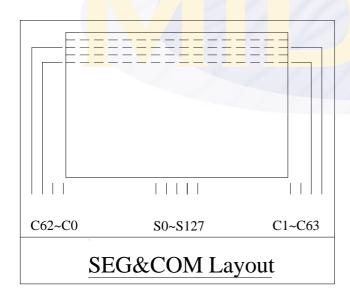
7.2 APPLICATION CIRCUIT



7.3 INTERFACE



7.4 PANEL LAYOUT DIAGRAM



7.5 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 132x64=8448bits

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

			SEG0	SEG0	SEG0	SEG0	SEG0	SEG0	SEG0	SEG0	 SEG0	SEG0	SEG0	SEG0
			SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
			0x83h	0x82h	0x81h	0x80h	0x7Fh	0x7Eh	0x7Dh	0x7Ch	0x03h	0x02h	0x01h	0x00h
			0×	0x	0x	0x	0x)	0x	0x)	0x)	0x	0x	0x	0x
			0x00h	0x01h	0x02h	0x03h	0x04h	0x05h	0x06h	0x07h	0x80h	0x81h	0x82h	0x83h
GOMO 0 251 0-00h			_	_	_	_	_		_	_	_	_	_	_
COM0 0x3Fh 0x00h COM1 0x3Eh 0x01h		D0												
COM1 0x3Eh 0x01h COM2 0x3Dh 0x02h		D1												
COM2 0x3Dh 0x02h 0x03h		D2 D3	_											
COM4 0x3Bh 0x04h	PAGE 0	D3												-
COM5 0x3Ah 0x05h		D5												
COM6 0x39h 0x06h		D6												
COM7 0x38h 0x07h		D7												
COM8 0x37h 0x08h		D0				1								
COM9 0x36h 0x09h		D1							1					
COM10 0x35h 0x0Ah		D2								/		1		
COM11 0x34h 0x0Bh	PAGE 1	D3												
COM12 0x33h 0x0Ch	111021	D4		100										
$\begin{array}{c cccc} COM13 & 0x32h & 0x0Dh \end{array}$		D5	4											
COM14 0x31h 0x0Eh		D6												
COM15 0x30h 0x0Fh		D7						7						
COM16 0x2Fh 0x10h		D0												
COM17 0x2Eh 0x11h		D1												
COM18 0x2Dh 0x12h		D2												
COM19 0x2Ch 0x13h	PAGE 2	D3												
COM20 0x2Bh 0x14h		D4												
COM21 0x2Ah 0x15h		D5												
COM22 0x29h 0x16h		D6	\rightarrow			_		_			_			
COM23 0x28h 0x17h		D7												
COM48 0x0Fh 0x30h		D0	_								<u> </u>			
COM49 0x0Eh 0x31h		D1	_											
COM50 0x0Dh 0x32h		D2	\dashv	_							<u> </u>			
COM51 0x0Ch 0x33h	PAGE 6	D3	-											
COM52 0x0Bh 0x34h		D4	-											
COM53 0x0Ah 0x35h		D5	\dashv	-							<u> </u>			-
COM54 0x09h 0x36h COM55 0x08h 0x37h		D6	\dashv	\rightarrow							<u> </u>			
		D7 D0	\dashv	\rightarrow										-
		D0	\dashv											
COM57 0x06h 0x39h COM58 0x05h 0x3Ah		D1 D2	\dashv	-										
COM58 0x05h 0x3Ah COM59 0x04h 0x3Bh		D3	\dashv											
COM59 0x04h 0x3Bh COM60 0x03h 0x3Ch	PAGE 7	D3	\dashv	\dashv										
COM60 0x03h 0x3Ch 0x3Dh		D5	\dashv	\rightarrow										
COM61 0x02h 0x3Eh		D6	_	-										
COM62 0x01h 0x3Eh COM63 0x00h 0x3Fh		D7	\dashv	\dashv										
COMIOS ONOUII ONSI II		ועו												

8. Reliability

8.1 Contents of Reliability Tests

Item	Conditions	Criteria
High Temperature Operation	80°C,240hrs	8.
Low Temperature Operation	-40°C ,240hrs	The energtion
High Temperature Storage	80°C,240hrs	The operation I
Low Temperature Storage	-40°C ,240hrs	functions work
High Temperature/Humidity	60°C,90%RH,120hrs → -40°C80°C	, idilotions won
Operation/ Thermal Shock	24cycles 1 hr dwell	

^{*} The samples used for the above tests do not include polarizer.

8.2 Lifetime

Parameter	Min	Тур	Max	Unit	Condition	Notes
Operating Life Time		60,000	-/	Hrs	80 cd/m2, 50% Checkerboard	6

Note 6: The average operating lifetime at room temperature is estimated by the accelerated operation at high temperature conditions.

8.3 Failure Check Standard

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.

^{*} No moisture condensation is observed during tests.

9. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Logic	VDD	-0.3	3.5	V	1,2
Supply Voltage for Display	VCC	8	16	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".

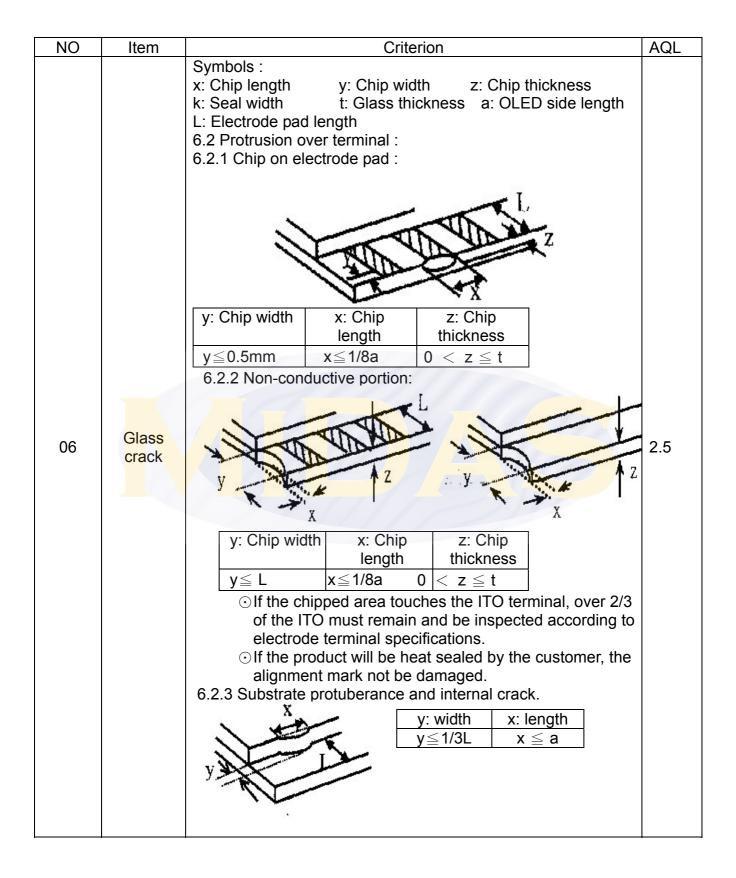
Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section 3. "Optics & Electrical Characteristics". If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.



10. Inspection specification

10. 111	pection	Specification	<i>/</i>						
NO	Item			Criterion		AQL			
01	Electrical Testing	1.2 Missing characte 1.3 Display malfuncti 1.4 No function or no 1.5 Current consump 1.6 Viewing angle de	 1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 Viewing angle defect. 1.7 Mixed product types. 1.8 Contrast defect. 						
02	Black or bright spots on OLED (display only)	three Bright or bla	 2.1 Bright and black spots on display ≤0.25mm, no more than three Bright or black spots present. 2.2 Densely spaced: No more than two spots or lines within 3mm 						
03	Black spots, bright spots, contaminati on	3.1 Round type : As Φ=(x + y) / 2	Tollowing	arawing		2.5			
	(non <mark>-di</mark> splay	3.2 Line type: (As for	Length L≤3.0 L≤2.5	wing) Width W≤0.02 0.02 < W≤0.03 0.03 < W≤0.05 0.05 < W	Acceptable Q TY Accept no dense 2 As round type	2.5			
04	Polarizer bubbles	If bubbles are visible using black spot specifications, not e find, must check in s direction.	asy to	Size Φ $ Φ \le 0.20 $ $ 0.20 < Φ \le 0.50 $ $ 0.50 < Φ \le 1.00 $ $ 1.00 < Φ $ Total Q TY	Acceptable Q TY Accept no dense 3 2 0	2.5			

NO	Item	Criterion						
05	Scratche s	Follow NO.3 black spots, bright spots, contamination						
06	Chipped glass	Symbols Define: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: OLED side length L: Electrode pad length: 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels: z: Chip thickness z: OLED side length x: Chip length thickness z: OLED side length x: Chip length thickness z: OLED side length x: Chip length z: Chip width z: Chip length thickness z: I/8a zi/8a zi/2t zi/2t zi/2t Not over zi/8a zi/8a zi/8a zi/2t zi/2t Not over zi/8a zi/8a zi/3k zi/8a zi/8a zi/3k zi/8a zi/3k zi/8a zi/8a zi/3k zi/8a zi/8a zi/3k zi/8a zi/8a zi/8a zi/3k zi/8a zi/	2.5					
		chip.						



NO	Item	Criterion	AQL
07	Cracked glass	The OLED with extensive crack is not acceptable.	2.5
08	Bezel	8.1 Bezel may not have rust, be deformed or have fingerprints, stains or other contamination.8.2 Bezel must comply with job specifications.	2.5 0.65
9	PCB COB	 9.1 COB seal may not have pinholes larger than 0.2mm or contamination. 9.2 COB seal surface may not have pinholes through to the IC. 9.3 The height of the COB should not exceed the height indicated in the assembly diagram. 9.4 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. 9.5 No oxidation or contamination PCB terminals. 9.6 Parts on PCB must be the same as on the production characteristic chart. There should be no wrong parts, missing parts or excess parts. 9.7 The jumper on the PCB should conform to the product characteristic chart. 9.8 If solder gets on bezel tab pads, zebra pad or screw hold pad, make sure it is smoothed down. 9.9 The Scraping testing standard for Copper Coating of PCB 	2.5 2.5 0.65 2.5 2.5 0.65 2.5 2.5 2.5
10	Soldering	 10.1 No un-melted solder paste may be present on the PCB. 10.2 No cold solder joints, missing solder connections, oxidation or icicle. 10.3 No residue or solder balls on PCB. 10.4 No short circuits in components on PCB. 	2.5 2.5 2.5 0.65

NO	Item	Criterion	AQL
11	General appearance	 11.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP. 11.2 No cracks on interface pin (OLB) of TCP. 11.3 No contamination, solder residue or solder balls on product. 11.4 The IC on the TCP may not be damaged, circuits. 11.5 The uppermost edge of the protective strip on the interface pin must be present or look as if it causes the interface pin to sever. 11.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color. 11.7 Sealant on top of the ITO circuit has not hardened. 11.8 Pin type must match type in specification sheet. 11.9 OLED pin loose or missing pins. 11.10 Product packaging must the same as specified on packaging specification sheet. 11.11 Product dimension and structure must conform to product specification sheet. 	2.5 0.65 2.5 2.5 2.5 2.5 0.65 0.65 0.65

Pattern Check (Display On) in Active Area

Check Item	Classification	Criteria
No Display	Major	
Missing Line	Major	
Pixel Short	Major	
Darker Pixel	Major	
Wrong Display	Major	
Un-uniform	Major	