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	Specification						
Part	NACOT1200CAVVVVNA						
Number:	MCOT128064KV-YM						
Version:							
Date:							



DOC.

DATASHEET STATEMENT

- 1. The following icons are absolutely designed by Midas independently in 2007-SEP. They are not in common use in the LCD industry yet but just used for marking out Midasproducts' characteristics quickly and simply without any special meaning. Midas reserves the composing right and copyright.

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- 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.

SAMPLE APPROVAL document rather than consider this DATASHEET as the standard for judging whether or not the LCD meets your requirements. Once you instruct Midas to a mass-production without definite demand for providing sample before, Midas will disclaim all responsibility if the mass-production is proved not meeting with your requirements.

- 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.



VIcm = 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 Displays OLED Part Number System

MCO

10

В

Voltage Variant:

e.g. **3** = 3v

21605

1		2 3	4	5	6		7	8	9	10
1	=	MCO:	Midae Dier	olays OLED						
1	_	WCC.	Wildas Disp	nays OLLD						
2	=	Blank:	B: COB (C	hip on Boar	rd) T : TAB (Taped Auton	nated Bond	ding)		
3	=	No of dots:	(e.g. 24006	64 = 240 x 6	64 dots)	(e.g. 21605	= 2 x 16 5ı	mm C.H.)		
4	=	Series	A to Z							
5	=	Series Variant:	A to Z and	1 to 9 – see	e addendum					
6	=	Operating Temp Range:	A: -30+85 X: -40 +85		40+80° C	Y : -40 +70°	C Z : -3	80+70° C		
7	=	Character Set:		t Applicable iropean For	nt Set (English	n/Japanese –	Western I	European (K) – Cyrill	lic (R))
8	=	Colour:	Y: Yellow	W: White	B : Blue	R: Red G:	: Green	RGB: Full	Colour	
9	=	Interface:	P: Parallel	l : l²(S: SPI	M : N	⁄lulti		

F/Displays/Midas Brand/Midas NEW OLED Part Number System 18 June 2013 2011.doc $\,$

1.Revision History

DATE	VERSION	REVISED PAGE NO.	Note
2010/11/23	1		First issue
			-

2. General Specification

The Features is described as follow:

■ Module dimension: 82.7 $\times 40.2 \times 3.4$ (max.) mm³

■ View area: 63.41 × 32.69 mm²

■ Active area:61.41 × 30.69 mm²

■ Number of dots: 128 x 64 manufacture ■ Supply

■ Pixel size: 0.48x 0.48 mm²

■ Pixel pitch: 0.45 x 0.45 mm2

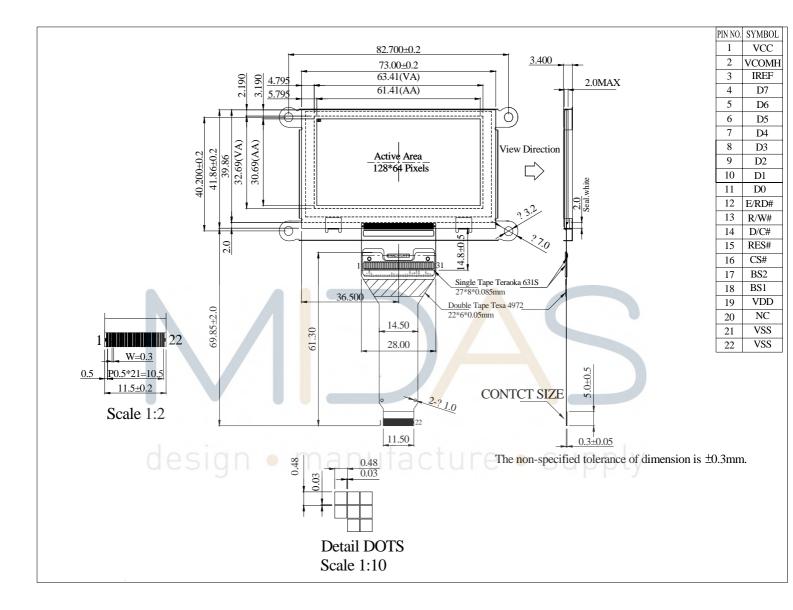
■ Duty: 1/64

■ Emitting Color: Yellow

4. Interface Pin Function

No.	Symbol	Functi	ion						
1	VCC	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	us.						
12	E/RD#	Data r	ead operation is	s initiated when	it's pull le	ow.			
13	R/W#	Data v	vrite operation is	s initiated when	it's pull l	OW.			
14	D/C#	Data/ Command control. Pull high for write/read display data. Pull low for write command or read status.							
15	RES#	Reset signal input. When it's low, initialization of SSD1305 is executed.							
16	CS#	Chip s	elect input.			0			
17 de	BS2	These	nunicating Proto pins are MCU		SUI ion input	. See			
		the followi	ng table:						
18	BS1		68XX-paralle	80XX-paralle	Serial				
		BS1	0	1	0				
		BS2 1 1 0							
19	VDD	Power	supply for logic	circuit.					
20	NC	No cor	nnection.						
21	VSS	Ground.							
22	VSS	Ground.							

5. Outline Dimension



6. Optics & Electrical Characteristics

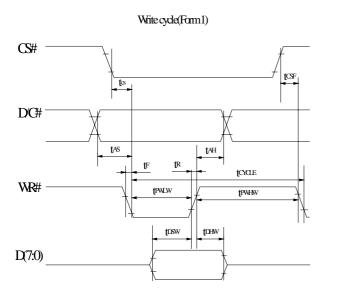
6.1INTERFACE TIMING CHART

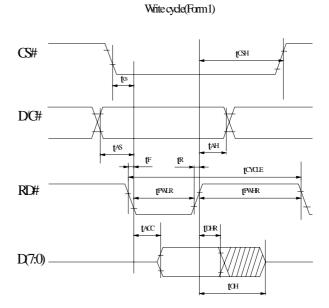
8080-Series MCU Parallel Interface Timing Characteristics

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

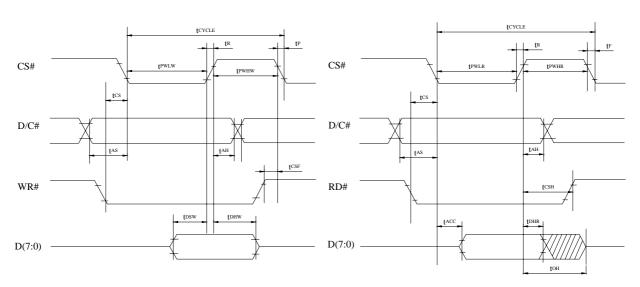
Symbol	Parameter	Min	Тур	Max	Unit
tcycle	Clock Cycle Time	300	-	-	ns
tAS	Address Setup Time	10	-	-	ns
tAH	Address Hold Time	0	-	-	ns
tDSW	Write Data Setup Time	40	-	-	ns
tDHW	Write Data Hold Time	7	-	-	ns
tDHR	Read Data Hold Time	20	-	-	ns
tOH	Output Disable Time	-	-	70	ns
tACC	Access Time	-	-	140	ns
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	-	7	15	ns
tF	Fall Time	-		15	ns
tCS	Chip select setup time	0	-	-	ns
tCSH	Chip select setup hold time to read	0	-	-	ns
	signal				
tCSF	Chip select setup hold time	20	-	-	ns

8080-seriesparallel interface characteristics (Form 1)









6.2 DC Characteristics

Characteristics	Symbol	Condition	Min	Тур	Max	Unit
		Condition				
Supply Voltage for Logic	VDD	_	2.4	2.7	3.5	V
Supply Voltage for Display	VCC		14.5	15	15.5	V
High Level Input	VIH	lout = 100µA,3.3MHz	0.8×VDD	-	VDD	V
Low Level Input	VIL	lout = 100µA,3.3MHz	ore •	SUI	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 VDD	טטו	Note 5	_	250	400	μA
Operating Current for VCC	ICC	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

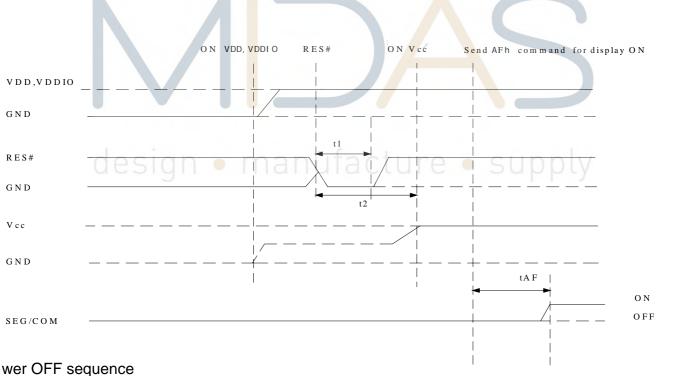
Power ON sequence

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).

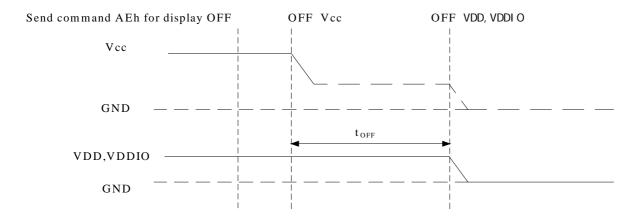


Po

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)

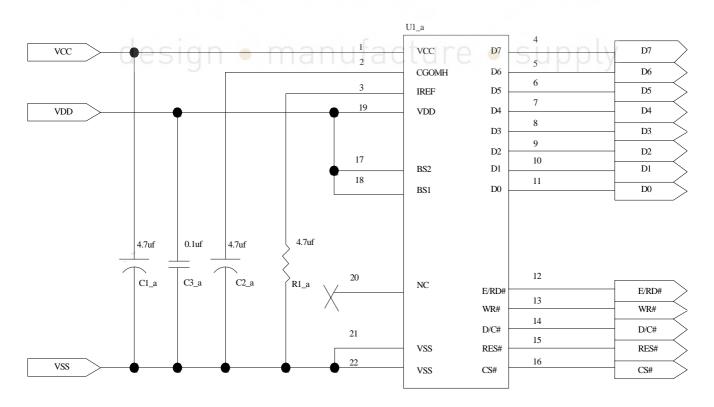


Note:

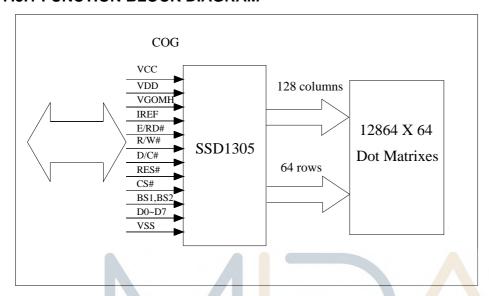
Since an ESD protection circuit is connected between VDD ,VDDIO and Vcc, Vcc becomes lower than VDD and VDD , VDDIO is ON and Vcc is OFF as shown in the dotted line of Vcc in above figures.

Vcc should be disabled when it is OFF.

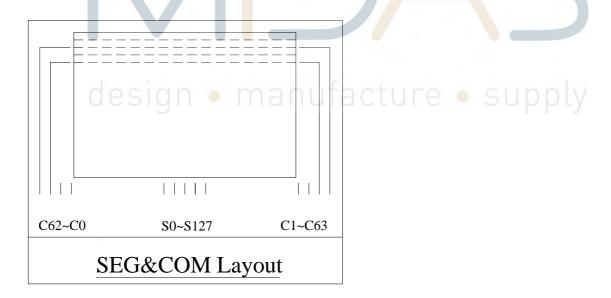
7.2 APPLICATION CIRCUIT



7.3 INTERFACE 7.3.1 FUNCTION BLOCK DIAGRAM



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.

															1
			9	30	0,	0,5	30	9	9	9,0	ဓ္ဓ	9,0	30	9	
			SEG0	SEG0	SEG0	SEG0	SEG0	SEG0	SEG0	SEG0	 SEG0	SEG0	SEG0	SEG0	
				<i>∞</i>	· 2	· S	S	<i>S</i> 2	· · ·	S	$ \circ $	S	S	\sim	
									_	_					
			0x83h	0x82h	0x81h	0x80h	0x7Fh	0x7Eh	0x7Dh	0x7Ch	0x03h	0x02h	0x01h	0x00h	
			×	0x8	0x8	0x8	0x7	0x7	0×7	0x7	×)×(0x()X	
			_												
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			0x00h	0x01h	0x02h	0x03h	0x04h	0x05h	0x06h	0x07h	0x80h	0x81h	0x82h	0x83h	
			0	0	0	0	0	0	0	0	0	0	0	0	
COM0 0x3Fh 0x00h		D0													
COM1 0x3Eh 0x01h		D1													
COM2 0x3Dh 0x02h		D2													
COM3 0x3Ch 0x03h	PAGE 0	D3													
COM4 0x3Bh 0x04h		D4								-/					
COM5 0x3Ah 0x05h COM6 0x39h 0x06h		D5													
COM6 0x39h 0x06h COM7 0x38h 0x07h		D6 D7							1		\vdash				
COM7 0x38h 0x07h 0x08h		D0			100	· .									
COM9 0x36h 0x09h	-	D1		1.					107						
COM10 0x35h 0x0Ah		D2							4						
COM11 0x34h 0x0Bh	PAGE 1	D3							400						
COM12 0x33h 0x0Ch	FAGE	D4													
COM13 0x32h 0x0Dh		D5													
COM14 0x31h 0x0Eh		D6		Dec											-
COM15 0x30h 0x0Fh	n _	D7	0	n	1.1	1+		0	F L	LE	0			1	1
COM16 0x2Fh 0x10h		D0							U	Ш					/ L)
COM17 0x2Eh 0x11h		D1											_		
COM18 0x2Dh 0x12h		D2													
COM19 0x2Ch 0x13h COM20 0x2Bh 0x14h	PAGE 2	D3													
COM20 0x2Bii 0x14ii COM21 0x2Ah 0x15h		D4 D5													
COM22 0x29h 0x16h		D6													
COM23 0x28h 0x17h		D7													
1		, ,													
i															
1															
		_													,
COM48 0x0Fh 0x30h		D0													
COM49 0x0Eh 0x31h		D1													
COM50 0x0Dh 0x32h	4	D2									$\vdash \vdash$				
COM51 0x0Ch 0x33h	PAGE 6	D3									\vdash				
COM52 0x0Bh 0x34h	+	D4									$\vdash\vdash$				
COM53 0x0Ah 0x35h COM54 0x09h 0x36h	+	D5 D6	\vdash								$\vdash\vdash$				
COM54 0x09h 0x36h COM55 0x08h 0x37h	+	D6									\vdash				
COM56 0x07h 0x38h		D0									\vdash				
COM57 0x06h 0x39h	†	D1									\vdash				
COM58 0x05h 0x3Ah	1	D2													
COM59 0x04h 0x3Bh	DACE 7	D3													
COM60 0x03h 0x3Ch	PAGE 7	D4													
COM61 0x02h 0x3Dh		D5													
COM62 0x01h 0x3Eh	1	D6													
COM63 0x00h 0x3Fh		D7													J

8. Reliability

8.1 Contents of Reliability Tests

Item	Conditions	Criteria
High Temperature Operation	80°C,240hrs	4
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°C 80°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	Cond <mark>ition</mark>	Notes
Operating Life Time		60,000	7	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".

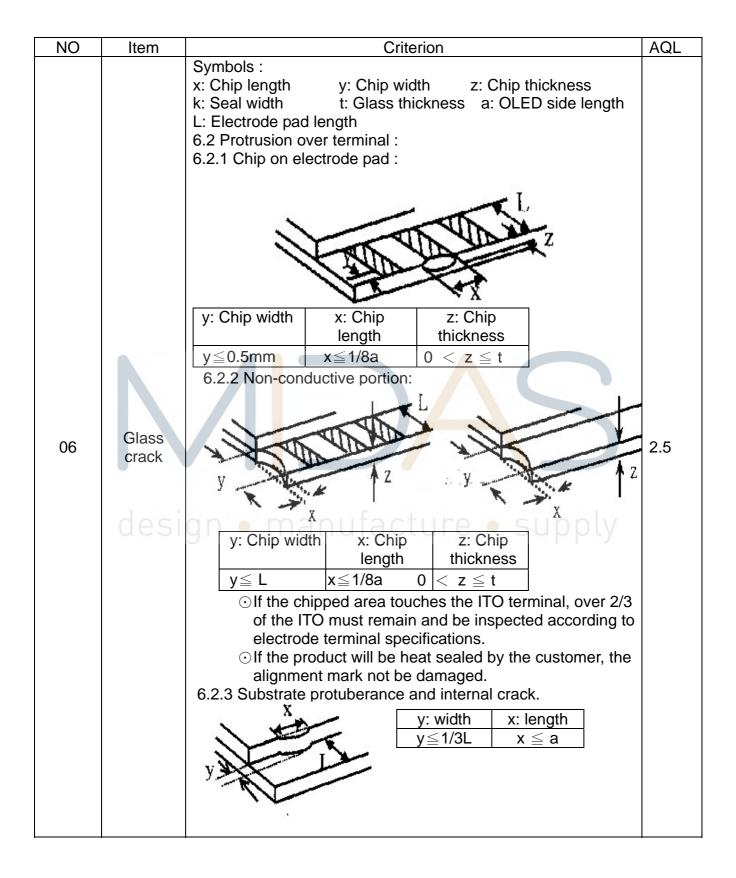
Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section 3. "Optics & Electrical Characteristics". If this module is used beyond these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



10. Inspection specification

NO	Item	Criterion	AQL
01	Electrical Testing	 1.1 Missing vertical, horizontal segment, segment contrast defeation. 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. 	ect. 0.65
02	Black or bright spots on OLED (display only)	 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 3nd 	2.5
03	Black spots, bright spots, contaminati	3.1 Round type : As following drawing Φ=(x+y)/2	2.5
	(non-display	3.2 Line type : (As following drawing) Length Width Acceptable TY W ≤ 0.02 Accept no dense L ≤ 3.0 0.02 < W ≤ 0.03 L ≤ 2.5 0.03 < W ≤ 0.05 As round ty	2.5
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction. $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	⊋ Q

NO	Item	Criterion	AQL						
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:	2.5						
	☐ 1/3k ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐								
		chip.							



NO	Item	Criterion		
07	Cracked glass	The OLED with extensive crack is not acceptable.		
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.		
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 2.5 0.65 0.65 0.65 0.65

design • manufacture • supply

Pattern Check (Display On) in Active Area

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