



**PHOENIX DISPLAY  
INTERNATIONAL, INC.**

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**PHOENIX DISPLAY INTERNATIONAL, INC**

**SPECIFICATION FOR LCD MODULE**

<b>CUSTOMER</b>	
<b>PART NUMBER</b>	PDIAT43QHD3008
<b>DESCRIPTION</b>	4.3" Color AMOLED Module
<b>VERSION</b>	
<b>ISSUE DATE</b>	

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Doc. version :	0.7
Total pages :	
Date :	2013/12/13

# Product Specification

## 4.3" COLOR AMOLED MODULE

**MODEL NAME:** AT043QHD3008

Trial-run sample P/N: 92.04H59.000

MP product P/N: 92.04H59.000

< >Preliminary Specification  
< >Final Specification



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Item	Description	Single LCM	Remark
1	<b>A. General Specification</b> Physical Specifications	4.3	
2	Driving Method	DC	
3	Display Mode	OLED	
4	Display Resolution (dot)	540xRGBx960	
5	Active Area (mm)	53.46(H)×95.04(V)	
6	Dot Pitch (mm)	0.033(H)×0.099(V)	
7	Display Color	16.7M	
8	Driver IC	-	Recommend RM69032
9	Interface	-	RGB/MIPI
10	Brightness(nits)	-	Recommend 250
11	Outline Dimension (mm)	57.26x103.87x0.77	

Block Diagram

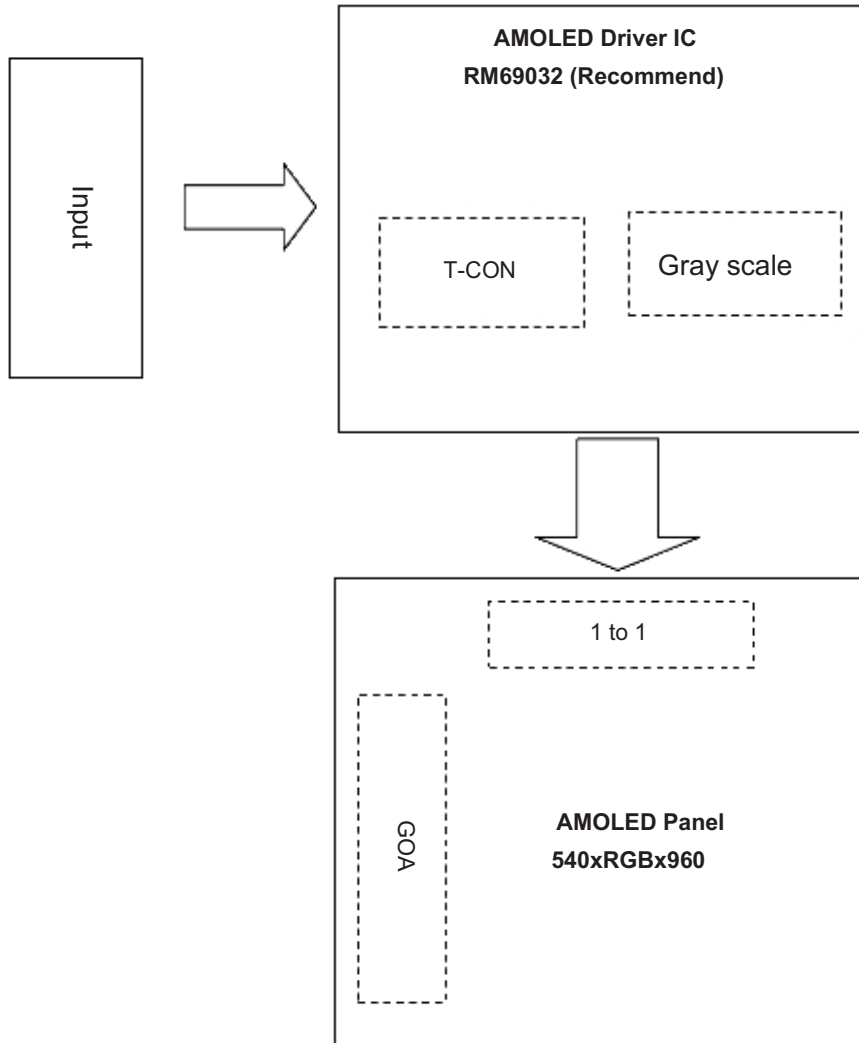


Fig. 1 Block diagram

## B. Electrical Specifications

### 1. Fan out pin assignment — AMOLED Panel Input/Output Signal Interface

1	Dummy	33	VDD_DET	65	DGND	97	D1
2	OVSS	34	DIOPWR	66	VDDIO	98	D0
3	OVSS	35	VGSP	67	SCL	99	DE
4	OVSS	36	VGSP	68	SDA	100	PCLK
5	OVSS	37	VGMP	69	MUX13	101	HS
6	OVSS	38	VGMP	70	PMOS[0]	102	VS
7	OVSS	39	DGND	71	PMOS[1]	103	ERR
8	Dummy	40	DVDD	72	CGM[2]	104	VDDIO
9	OVDD	41	AGND	73	CGM[1]	105	DGND
10	OVDD	42	LANSEL0	74	CGM[0]	106	VDD
11	OVDD	43	LANSEL1	75	D23	107	AVDD
12	OVDD	44	DSWAP0	76	D22	108	AVEE
13	OVDD	45	DSWAP1	77	D21	109	DGND
14	OVDD	46	PSWAP	78	D20	110	DVDD
15	Dummy	47	DSTB_SEL	79	D19	111	MVDDA
16	D3_P1	48	I2C_SA0	80	D18	112	VDD
17	D3_P1	49	IM3	81	D17	113	MVDDL
18	D3_P2	50	IM2	82	D16	114	AGND
19	D3_P2	51	IM1	83	D15	115	HSSI_D22_P
20	VSS3D	52	IM0	84	D14	116	HSSI_D22_N
21	VSS3D	53	SWIRE	85	D13	117	AGND
22	BVP3D	54	OLED_EN	86	D12	118	HSSI_D1_P
23	MTP_PWR	55	EXB1T	87	D11	119	HSSI_D1_N
24	VGL	56	TE_L	88	D10	120	AGND
25	VGLR	57	VSEL	89	D9	121	HSSI_CLK_P
26	VGHR	58	SDO	90	D8	122	HSSI_CLK_N
27	VCL	59	SDI	91	D7	123	AGND
28	VREF	60	DCX	92	D6	124	HSSI_D0_P
29	AGND	61	WRX	93	D5	125	HSSI_D0_N
30	VDD	62	RDX	94	D4	126	AGND
31	VDDR	63	CSX	95	D3	127	HSSI_D21_P
32	VSSR	64	RESX	96	D2	128	HSSI_D21_N

129	AGND	161	C14P	193	C41P	225	Dummy
130	VDDR	162	C14P	194	C41P	226	OVSS
131	TE_R	163	C14P	195	C41N	227	OVSS
132	AGND	164	C14N	196	C41N	228	OVSS
133	VREFCP	165	C14N	197	C51N	229	OVSS
134	VGHR	166	C14N	198	C51N	230	OVSS
135	EXTP	167	C32P	199	C51P	231	OVSS
136	CSP	168	C32P	200	C51P		
137	EXTN	169	C32P	201	VGH		
138	CSN	170	C32N	202	VGH		
139	AGND	171	C32N	203	VGHR		
140	C11P	172	C32N	204	VGHR		
141	C11P	173	VCL	205	VGLR		
142	C11N	174	VCL	206	VGLR		
143	C11N	175	C31P	207	VGL		
144	C12P	176	C31P	208	VGL		
145	C12P	177	C31N	209	AGND		
146	C12N	178	C31N	210	AGND		
147	C12N	179	C21P	211	DVDD		
148	C13N	180	C21P	212	DVDD		
149	C13N	181	C21N	213	VREFP		
150	C13P	182	C21N	214	VREFP		
151	C13P	183	C22P	215	Dummy		
152	AVDD	184	C22P	216	VREFN		
153	AVDD	185	C22N	217	VREFN		
154	AVDD	186	C22N	218	Dummy		
155	VDD	187	AVEE	219	OVDD		
156	VDD	188	AVEE	220	OVDD		
157	VDD	189	VDDDB	221	OVDD		
158	AGND	190	VDDDB	222	OVDD		
159	AGND	191	AGND	223	OVDD		
160	AGND	192	AGND	224	OVDD		



## 2. Absolute maximum ratings (VSS=0V) (Note 1)

Item	Symbol	Min.	Max.	Unit	Remark
Operating temperature (Ambient)	Topr	-40	+85		
Storage temperature (Ambient)	Tstg	-55	+105		

Note 1: If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also, if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

## C. Electrical Characteristics

## 1. Typical Operating Conditions

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Input power supply	V <sub>DDIO</sub>	1.65	1.80	3.30	V	
Analog power supply	V <sub>DD</sub>	2.80	3.00	3.20	V	
OVDD power supply	OVDD	4.55	4.60	4.65	V	Note1
OVSS power supply	OVSS	-4.33	-4.40	-4.47	V	Note1
Input Signal Voltage	H Level	V <sub>IH</sub>	0.8*V <sub>DDIO</sub>	-	V <sub>DDIO</sub>	V
	L Level	V <sub>IL</sub>	0	-	0.2*V <sub>DDIO</sub>	V
Output Signal Voltage	H Level	V <sub>OH</sub>	0.7*V <sub>DDIO</sub>	-	V <sub>DDIO</sub>	V
	L Level	V <sub>OL</sub>	0	-	0.3*V <sub>DDIO</sub>	V

Note 1 Suggestion use STOD13AS (STMicroelectronics)

## 2. Current Consumption

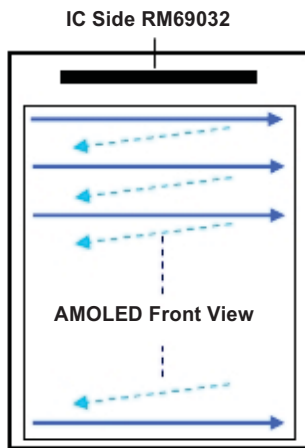
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Panel Power	P <sub>NL</sub>	OVDD:4.6V	-	405.0	1350.0	mW	Note1	
	I <sub>NL</sub>	OVSS:-4.4V	-	64.2	150.0	mA	Note1	
IC	Normal	P <sub>VDD</sub>	V <sub>DD</sub> : 3.0V V <sub>DDIO</sub> :1.8V	81.8	102.3	122.7	mW	Note2
		I <sub>VDD</sub>		26.6	33.3	39.9	mA	Note2
		P <sub>VDDIO</sub>		18.5	23.2	27.8	uW	Note2
		I <sub>VDDIO</sub>		9.8	12.3	14.7	uA	Note2

Note 1: Typ value is EL power in 30% max brightness condition.

Note 2: Testing in white pattern.

### E. Recommended Initial code and Power On/Off sequence for RM69032.

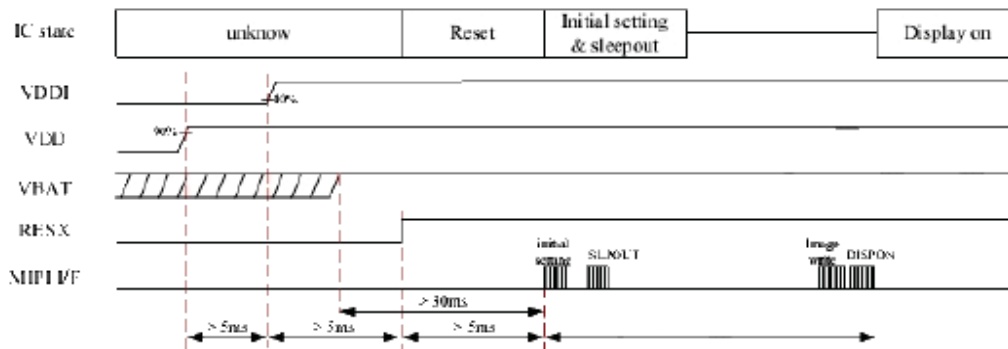
(1) Panel Scan direction



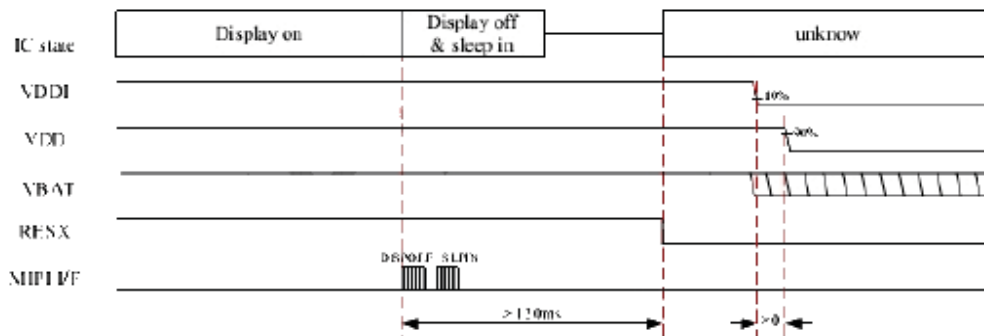
(2) I/O Power on/off Sequence.

a. MIPI Power on/off sequence

**Power On sequence**



**Power Off sequence**



Note . VBAT is the power of power IC (for OVDD/OVSS)

## (3) Initial setting

Recommended Power on Initial Sequence								
Step	Instruction/Parameters	Delay time	R/W	MIPI Data Type	Address		Data hex.	Description
					MIPI	Others		
1	Turn on V <sub>DD</sub>							VDD=3.0V
2	Turn on V <sub>DDI</sub>							VDDI=1.8V
3	Delay	no limit						
4	REST pin low	20us						
6	REST pin high							
7	Delay	5 ms						
8			W	0x39	F0	F000	55	
9			W			F001	AA	
10			W			F002	52	
11			W			F003	08	
12			W			F004	00	
13			W	0x39	BD	BD00	01	
14			W			BD01	5A	
15			W			BD02	14	
16			W			BD03	14	
17			W			BD04	00	
18			W	0x39	C8	C800	80	
19			W			C801	12	
20			W			C802	00	
21			W			C803	00	
22			W			C804	01	
23			W			C805	00	
24			W			C806	0E	
25			W	0x39	C9	C900	80	
26			W			C901	12	
27			W			C902	00	
28			W			C903	00	
29			W			C904	01	
30			W			C905	00	
31			W			C906	0E	
32			W	0x39	CA	CA00	83	
33			W			CA01	D6	
34			W			CA02	00	
35			W			CA03	00	

36			W			CA04	01	
37			W			CA05	00	
38			W			CA06	0E	
39			W	0x39	CB	CB00	83	
40			W			CB01	D5	
41			W			CB02	00	
42			W			CB03	00	
43			W			CB04	01	
44			W			CB05	00	
45			W			CB06	0E	
46				0x39	D1	D100	80	
47			W			D101	10	
48						D102	20	
49				0X39	D2	D200	80	
50			W			D201	09	
51						D202	24	
52			W	0x15	D0	D000	22	
53			W	0x39	F0	F000	55	
54			W			F001	AA	
55			W			F002	52	
56			W			F003	08	
57			W			F004	02	
58			W	0x39	FE	FE00	08	
59			W			FE01	50	
60			W	0x39	ED	ED00	48	
61			W			ED01	00	
62			W			ED02	E0	
63			W			ED03	13	
64			W			ED04	08	
65			W			ED05	00	
66			W			ED06	0C	
67			W	0x39	C3	C300	F2	
68			W			C301	95	
69			W			C302	04	
70			W	0x39	E9	E900	00	
71			W			E901	36	
72			W			E902	0B	
73			W	0x15	CA	CA00	04	
74			W	0x15	E1	E100	00	
75			W	0x39	F0	F000	55	

76			W			F001	AA	
77			W			F002	52	
78			W			F003	08	
79			W			F004	01	
80			W	0x39	B0	B000	00	
81		W	B001			00		
82		W	B002			00		
83			W	0x39	B4	B400	07	
84		W	B401			07		
85		W	B402			07		
86			W	0x39	B5	B500	07	
87		W	B501			07		
88		W	B502			07		
89			W	0x39	B6	B600	44	
90		W	B601			44		
91		W	B602			44		
92			W	0x39	B9	B900	04	
93		W	B901			04		
94		W	B902			04		
95			W	0x39	BA	BA00	34	
96		W	BA01			34		
97		W	BA02			34		
98			W	0x39	BE	BE00	22	
99		W	BE01			30		
100		W	BE02			70		
101			W	0x15	35	3500	00	
102			W	0x15	36	3600	02	
103			W	0x15	C0	C000	20	
104			W	0x39	C2	C200	17	
105			W			C201	17	
106			W			C202	17	
107			W			C203	17	
108			W			C204	17	
109			W			C205	15	
110	Turn on peripheral packet			0x32				Video Turn On
111	Sleep out		W	0x05	11	1100	00	
112	Delay	300 ms						
113	Display on		W	0x05	29	2900	00	

Recommended Power off Mode Sequence							
Instruction/Parameters	Delay time	R/W	MIPI Data Type	Address		Data hex.	Description
				MIPI	Others		
DIPOFF		W	0x05	28		00	
SLPIN		W	0x05		2800	00	
				10			
					1000		
delay	120ms						

Power off

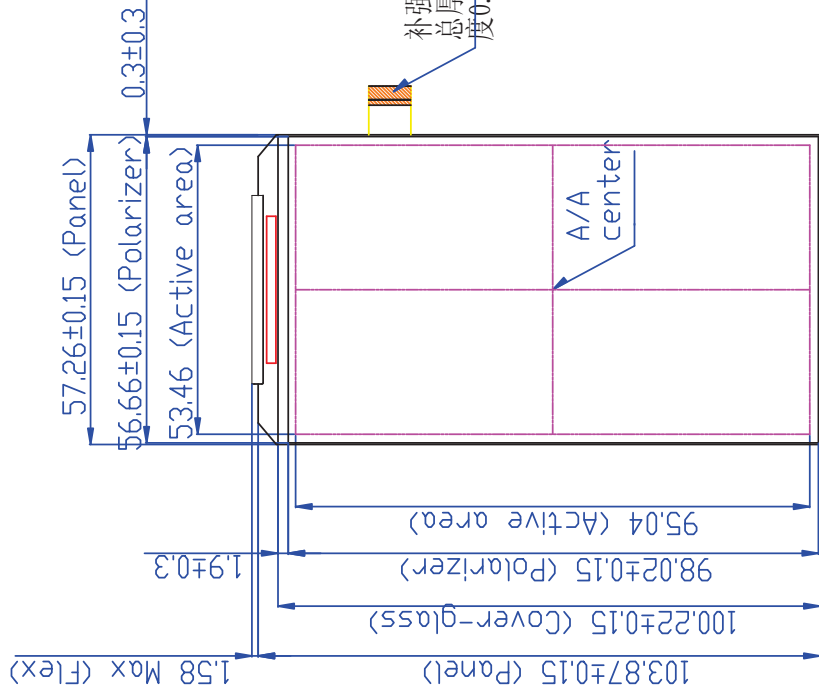
Category	No.	Test items	Conditions	Remark
Reliability (Environment)	1	High Temp. Operation	Ta= 60 168hrs	Ta: Ambient temperature.
	2	High Temp. Storage	Ta= 70 168hrs	Non-operation
	3	Low Temp. Operation	Ta= -20 168hrs	
	4	Low Temp. Storage	Ta= -30 168hrs	Non-operation
	5	High Temp./Humi. Operation	Ta= 40 . 95% RH 168hrs	
	6	Thermal Shock	-30 ~70 , Dwell for 30 min. 50 cycles.	Non-operation
Reliability (OLED)	7	OLED Lifetime (LT95)	Luminance should be larger than 95% of initial luminance after 100 hrs operating at 25°C	
	8	OLED Lifetime (LT50)	Luminance should be larger than 50% of initial luminance after 2000 hrs operating at 25°C	
Carton Test	9	Carton Random vibration	Wave Form: Random Direction: X Y Z axis Duration: 30 minutes/ axis Test PSD Condition: 1.5Grms, 10~200Hz, total time: 90 mins (30 mins/axis for X, Y, Z)	
	10	Carton Drop Test	Height: 61cm 1 corner, 3 edges, 6 surfaces.	

## G. Main FPC Pisssn assignment

NO	Pin_name	I/O	Description
1	GND	Power	Ground
2	VCI	Power	Driver IC analog supply
3	IOVCC	Power	Driver IC digital I/O supply
4	RESET	I	Driver IC RESET PIN
5	GND	Power	Ground
6	GND	Power	Ground
7	SWIRE	I	
8	EN	I	
9	GND	Power	
10	GND	Power	
11	VBAT	Power	
12	VBAT	Power	
13	VBAT	Power	
14	GND	Power	Ground
15	GND	Power	Ground
16	D0N	I/O	MIPI DSI data1-
17	D0P	I/O	MIPI DSI data1+
18	GND	Power	Ground
19	CLKN	I	MIPI DSI clk-
20	CLKP	I	MIPI DSI ckl+
21	GND	Power	Ground
22	D1N	I	MIPI DSI data-
23	D1P	I	MIPI DSI data1+
24	GND	Power	Ground

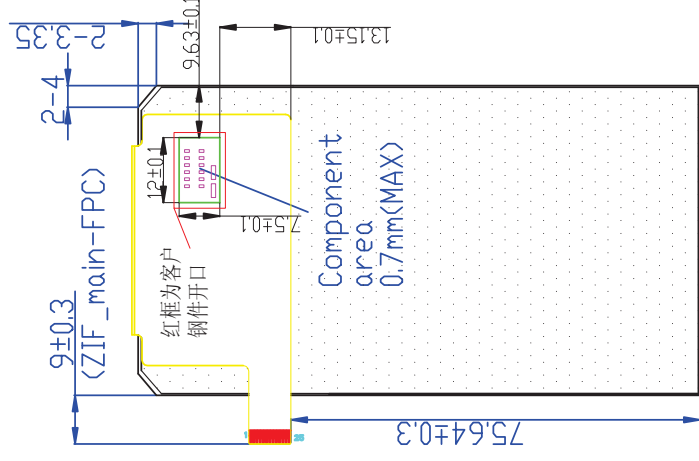
Notes:

1. 4.29" OLED module
2. General tolerance:  $\pm 0.2\text{mm}$
3. Resolution: 540RGB X 960
4. Connector of panel: ZIF type FH26-25S-0.3SHW



接口定义:

Pad No.	Pad Name
1	ELVDD (4.6V)
2	ELVDD (4.6V)
3	ELVSS (-4.4V)
4	ELVSS (-4.4V)
5	VDD1018
6	AVDD28
7	MTP (主板 LNC处理)
8	RSTB
9	TE
10	NC
11	NC
12	GND
13	GND
14	TDON
15	TDOP
16	GND
17	TCN
18	TCP
19	GND
20	TDIN
21	TDIP
22	GND
23	SWIRE
24	NC
25	GND



REV	ECN NO.	DESCRIPTION	SIGN	DATE
-	-	New release	-	-

UNIT	SCALE	WEIGHT	ANGLE	GENERAL TOLERANCE	3rd ANGLE	ORIGINAL MODEL
MM	1:1	-	-	-	-	-

TITLE		CRITICAL DIMENSION		MATERIAL		FINISH		APPROVED		CHECKED		DESIGNED	
DIM.	LEVEL	GENERAL	TOLERANCE	±	SELECT	LEVEL	APPROVED	LEVEL	APPROVED	LEVEL	APPROVED	LEVEL	APPROVED
0 ~ 4	1	0.05	0.1	0.1	0.1	0.1	APPROVED	0.1	0.1	0.1	0.1	0.1	0.1
4 ~ 74	2	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8
74 ~ 250	3	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8
250 ~ 600	4	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8
600 ~ 4000	5	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8

UNIT	SCALE	WEIGHT	ANGLE	GENERAL TOLERANCE	3rd ANGLE	ORIGINAL MODEL
MM	1:1	-	-	-	-	-

TITLE		CRITICAL DIMENSION		MATERIAL		FINISH		APPROVED		CHECKED		DESIGNED	
DIM.	LEVEL	GENERAL	TOLERANCE	±	SELECT	LEVEL	APPROVED	LEVEL	APPROVED	LEVEL	APPROVED	LEVEL	APPROVED
0 ~ 4	1	0.05	0.1	0.1	0.1	0.1	APPROVED	0.1	0.1	0.1	0.1	0.1	0.1
4 ~ 74	2	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8
74 ~ 250	3	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8
250 ~ 600	4	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8
600 ~ 4000	5	0.05	0.1	0.1	0.1	0.2	APPROVED	0.1	0.1	0.2	0.3	0.5	0.8

OLED MODULE ASSY

DRAWING NO. (PART NO.)  
AT043QHJ3008

REV	SIZE	SHEET
X0	A3	1/1