

# BO055FHM-TO1

## Product Specification

### Rev. P0

Customer Name

:

Product Name

: 5.5" FHD1080 LOLED

Model Name

: BO055FHM-TO1

Description

: 5.5" FHD (1080x1920) 16M Color

Proposed by			Customer's Approval
Designed	Checked	Approved	

**ORODS YUANSHENG Optoelectronics Technology CO. LTD**

PRODUCT GROUP

REV.

ISSUE DATA

AMOLED - PRODUCT

P0

2016.7.13

## Revision History

Rev.	ECN No.	Description of Change	Date	Prepared
P0	-	-.Initial issue	July. 13. 2016	Xuan Minghua

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# 1. General Description

## 1-1. Introduction

BOE 5.5" FHD1080 is a color active matrix AMOLED module using Low Temperature Poly-silicon Thin Film Transistors as active switching devices. This module has a 5.5inch diagonally measured active area with FHD resolutions (1080horizontal by 1920vertical pixel arrays). Each pixel is divided into RED and GREEN dots, or BLUE and GREEN dots, and two pixels share RED or BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors.

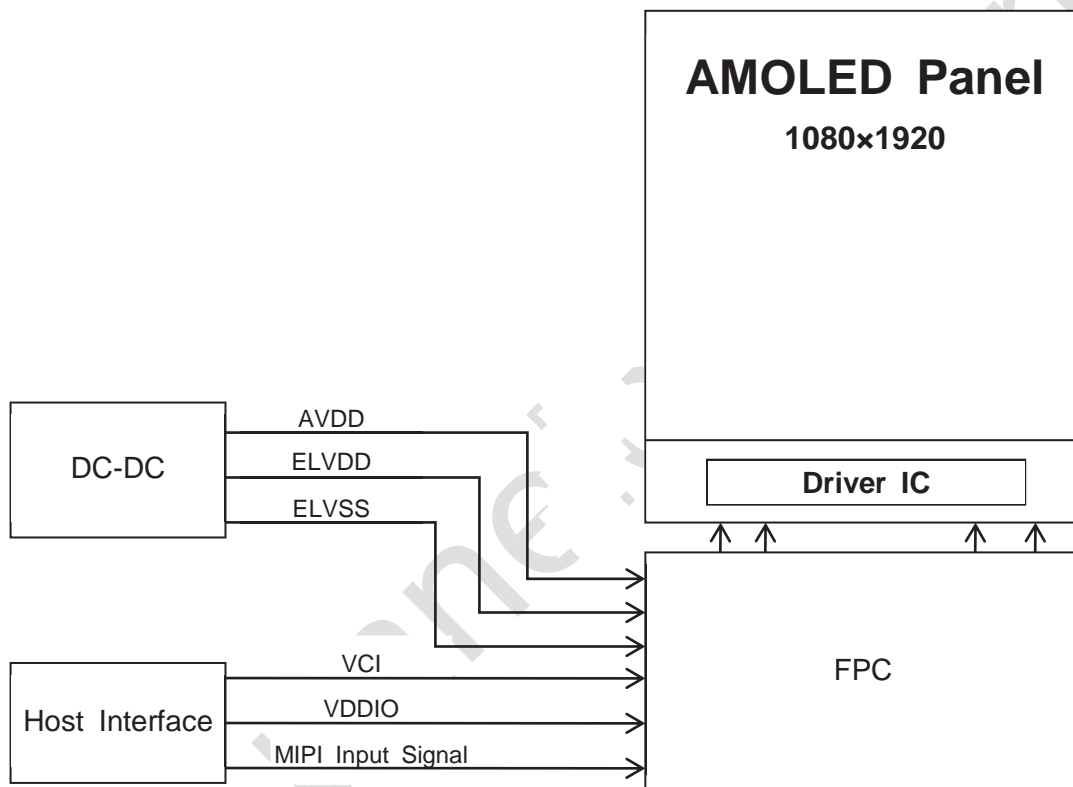


Figure 1

## 1-2. Features

- 1) Display Colors : 16.7M
- 2) Display Format : 5.5" FHD OLED Star : 1080x1920
- 3) Interface : MIPI 4-lane
- 4) Driver IC : WD5EA5F01
- 5) Touch IC : GT1151
- 6) Polarizer : Hard Coating Polarizer

## 1-3. Application

- Smart Mobile Phone

## 2. Mechanical Specification

Table 1

Item	Specifications	Unit	Remark
Glass outline	70.71(W) × 128.44(H) × 0.50(T)	mm	
Number of dots	720(W)RGB × 1920(H)	Dots	FHD (HRA)
Active area	68.31(W) × 121.44(H)	mm	
Diagonal Inch	5.486	inch	
Pixel pitch	63.25(W) × 63.25(H)	um	
Pixel Arrangement	OLED Star Delta		
Weight	TBD	g	
Total Thickness(Pol+Cell)	0.679	mm	

## 3. Absolute Maximum Ratings

Table 2

Item	Symbol	Min.	Max.	Unit	Note
I/O Voltage	VDDIO	-0.3	3.6	V	
Operation Voltage	VCI	-0.3	6.5	V	
EL Driving Voltage	ELVDD	4.4	5	V	
	ELVSS	-6.4	-1.4	V	
Supply voltage (TSP)	TSP_VDD	-0.3	7.2	V	
	IOVDD	-0.3	4.0	V	
Operating temperature	Topr	-20	70	°C	-
Storage temperature	Tstg	-40	85	°C	-

## 4. Electrical Characteristics

Test Condition: Temp=25±2°C

Table 3

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark		
ELVDD	ELVDD	-	4.4	4.6	5.0	V	100mVStep		
ELVSS	ELVSS	-	-6.4	-5.0	-1.4	V	100mV Step		
AVDD	AVDD	-	5.0	7.6	7.7	V			
VCI	VCI	-	2.8	3.0	3.6	V			
VDDIO	VDDIO	-	1.65	1.8	3.3	V			
Current Consumption (Display)	Display on mode	IC	VCI	-	1.0	-	mA		
			VDDIO	-	30	-	mA		
			AVDD	-	11	-	mA		
	Sleep in mode	Panel	EL	-	100	-	mA	Full White Half Brightness	
			IC	VCI	-	1.0	-	mA	
				VDDIO	-	13.5	-	mA	
Frame Frequency	F <sub>frm</sub>	-	59	60	61	Hz			
Vin	Vin(DC DC Input)	White Mode	-	640	680	mA	Vin=4V		
		L255	-	700	740	mA	Vin=3.7		

Notes :

1. The value is just the reference value. The customer may optimize the setting value.
2. The current of Vin is just the reference value,because it depends on the efficiency of Power IC.

## 5. Electro-optical Characteristics

Table 4

Item	Symb ol	Temp	Condition	Min.	Typ.	Max.	Unit	Note
Brightness		25°C	Normal (W L255)	320	350	380	cd/m <sup>2</sup>	Center brightness
Uniformity		25°C		75	85	-	%	(1)
Contrast ratio	K	25°C	$\Phi=0^\circ, \theta=0^\circ$	10,000	17,000	-	-	(2)
Color of CIE coordinate	White	x	$\Phi=0^\circ, \theta=0^\circ$ CIE1931	0.290	0.300	0.310	-	Color of CIE coordinate
		y		0.300	0.310	0.320	-	
	Red	x		0.635	0.665	0.695	-	
		y		0.314	0.334	0.354	-	
	Green	x		0.166	0.226	0.286	-	
		y		0.659	0.719	0.779	-	
	Blue	x		0.119	0.139	0.159	-	
		y		0.035	0.055	0.075	-	
Color Gamut		25°C	NTSC , CIE1931	85	101	-	%	(3)
Viewing Angle		25°C	Up/Down/Right/Left CR ratio $\geq 10$	75	80	-	°	(4)
Cross Talk		25°C	Background: gray128	-	-	2.5	%	(5)
Gamma		25°C	-	1.9	2.2	2.5	-	
Life time		25°C	Light on for 240 hrs	Luminance decrease $\leq 6\%$			%	(6)

Notes :

(1) Uniformity Measuring Point

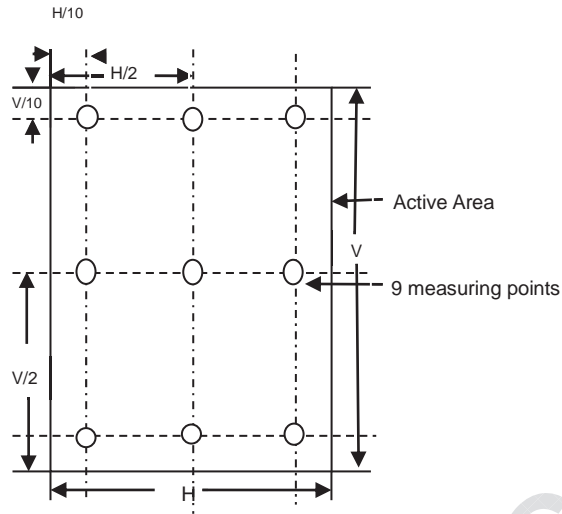


Figure 1. Uniformity Measuring Point

$$\text{Uniformity} = L_{\min} / L_{\max} \times 100\%$$

(2) Definition of contrast ratio(K)

$$CR = \frac{\text{Luminance When Display panel is at "White" state}}{\text{Luminance When Display panel is at "Black" state}}$$

(3) Definition of Color of CIE Coordinate and NTSC Ratio

$$S = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}} \times 100\%$$

(4) Viewing Angle measuring system

Refer to the graph below marked by  $\theta$  and  $\Phi$

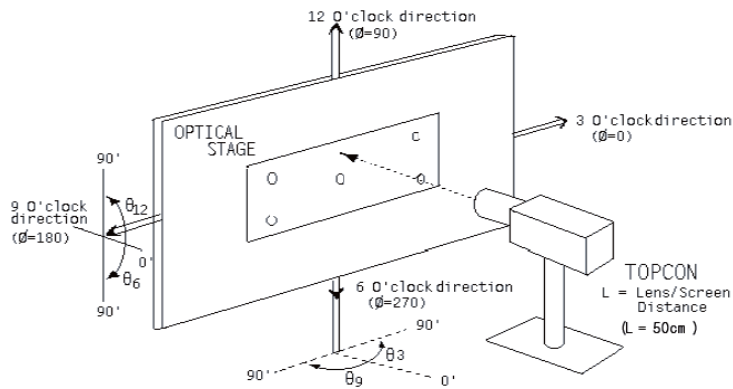


Figure 2. Viewing Angle measuring system

(5) Crosstalk measurement shall be done at the center of the different pattern and the result shall be calculated as follow formula.

- a. measure luminance at the center.
- b. calculate cross talk as below equation:



$$\text{Crosstalk}(V) = \max \left( \left| \frac{L_{V1} - L_{V2}}{L_{V2}} \right| \times 100, \left| \frac{L_{V3} - L_{V4}}{L_{V4}} \right| \times 100 \right)$$

$$\text{Crosstalk}(H) = \max \left( \left| \frac{L_{H1} - L_{H2}}{L_{H2}} \right| \times 100, \left| \frac{L_{H3} - L_{H4}}{L_{H4}} \right| \times 100 \right)$$

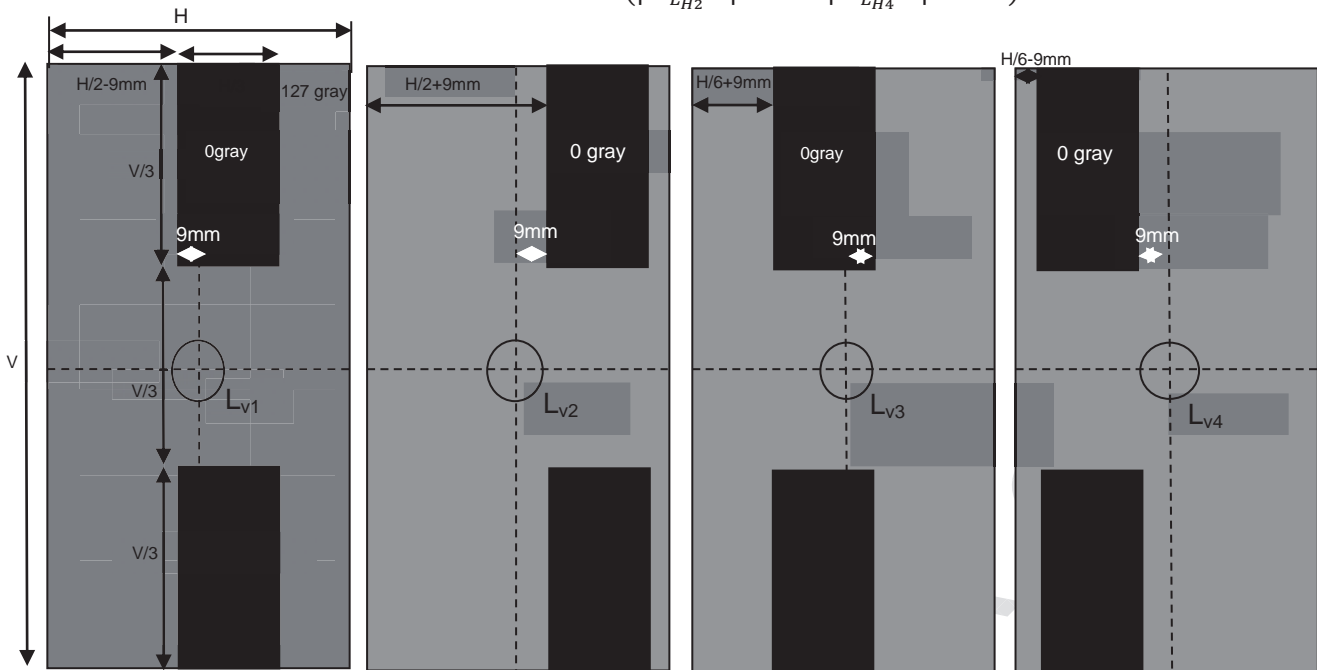


Figure 3. Vertical crosstalk measuring pattern

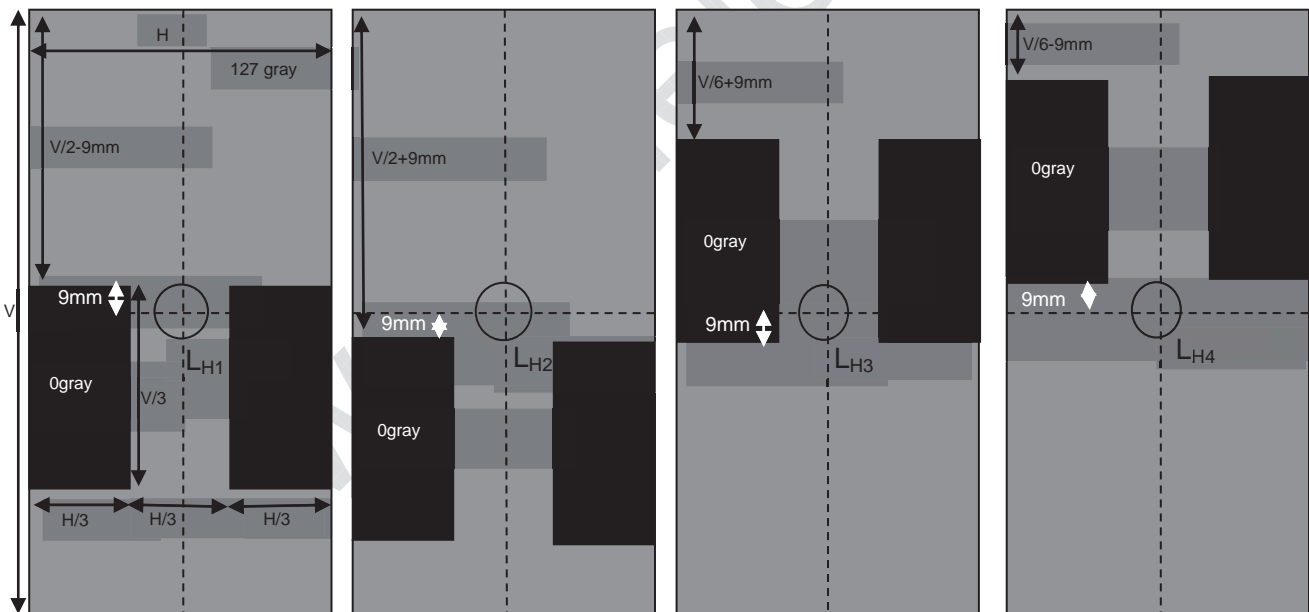


Figure 4. Horizontal crosstalk measuring pattern

(6) OLED life time

Test samples 8pcs;

At room temperature(25℃), light the module with typical value brightness, display a white pattern.

Keep working 240 hours, luminance decrease ≤ 6%.

The test data must pass the specification.

## 6. FPC Pin Assignment

Main FPC assignment- AMOLED Panel Input/output Signal Interface.

Recommended connector: Kyocera 145806040002829+.

Table 5

No.	Name	No.	Name
1	TSP_ATTEN	2	ID1
3	TSP_SDA	4	GND
5	TSP_SCL	6	D2P
7	TSP_RESET	8	D2N
9	TSP_1.8V	10	GND
11	TSP_3.3V	12	D1P
13	PCD	14	D1N
15	VPP	16	GND
17	EL_ON2	18	CKP
19	VDDP_EN	20	CKN
21	TE	22	GND
23	ERR_FG	24	D0P
25	RESET	26	D0N
27	VDD_1.8V	28	GND
29	VLIN1	30	D3P
31	VCL_3.3V	32	D3N
33	ID0	34	GND
35	ELVDD	36	ELVSS
37	ELVDD	38	ELVSS
39	ELVDD	40	ELVSS

<Pin layout of B-to-B contact pads>