

MODEL : AMSA05BV07-0

Specification for Approval

Any modification of this specification is not allowed without
SAMSUNG DISPLAY's permission.

Proposed by			Customer's Approval
Designed	Checked	Approved	

OLED BUSINESS

SAMSUNG DISPLAY CO., LTD.

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

1/54

Revision History

Date	Rev. No.	Contents	Remark
3 Apr. '2014	Draft 0.0	- Initial issue (Tentative)	-
23 May. '2014	Draft 0.1	- [11. Quality Level] Moved to [Cosmetic Specification for Approval] - [9. Operating Sequence] updated. - [15. Packing] updated.	-
17 Jun. '2014	Draft 0.2	- [4. Mechanical Specification] Module Dimension change 240.36(H) → 241.16(H) - [13. Drawing] updated. (Cover glass changing) - Add clear images of drawing and schematics on the last pages.	-
8 Jul. '2014	Draft 0.3	- [15. Packing] updated.	-
21 Aug. '2014	X01	- [13. Drawing] updated. (Cover glass changing) - [14-2. Schematic (Touch FPC)] updated. - [15-3. Label] updated. - [16. Cosmetic Specification] updated. (Dell Spec + SDC Spec)	-
31 Oct. 2014	A00	- Final Version released. (A00)	-

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

2/54



SAMSUNG DISPLAY

2014.10.31 / YB Kim / Development Team

Contents

1. Scope	5
2. Warranty	5
3. Features	6
4. Mechanical Specification	6
5. Absolute Maximum Rating	7
6. Electrical characteristics	8
6-1. AMOLED	
6-2. TSP	
7. Electro-Optical Characteristics	9
8. Mechanical Characteristics	11
8-1. Flatness	
9. Input/Output Terminal Assignment	12
9-1. I/O Connection	
9-2. Block Diagram (Module)	
9-3. Block Diagram (AMOLED Driver IC - Tcon)	
10. AC Characteristics	15
10-1. MIPI Receiver	
10-2. MIPI Data to clock Timing	
10-3. MIPI Interface Timing Requirement	
11. Reliability	17
12. Handling Precautions	19
12-1. Mounting Method	
12-2. Caution of AMOLED Handling and Cleaning	
12-3. Caution Against Static Charge	
12-4. Packing	
12-5. Caution for Operation	
12-6. Storage	
12-7. Safety Precautions	
12-8. Precautions before Use	
13. Drawing	22

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

3/54

14. Schematic	23
14-1. Main PCB	
14-2. Touch FPC	
15. Packing	25
15-1. Packing	
15-2. Packing for small quantity	
15-3. Label	
15-4. Over Pack	
15-5. Caution	
16. Cosmetic Specification	29
[Operating Manual]	42
[Drawing]	52
[Schematic (Main PCB)]	53
[Schematic (Touch FPC)]	54

SAMSUNG DISPLAY

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

4/54



SAMSUNG DISPLAY

2014.10.31 / YB Kim / Development Team

1. Scope

This Specification defines general provisions as well as inspection standards for AMOLED module supplied by SAMSUNG Display Co., Ltd.,

If the event of unforeseen problems or unspecified items occurs, we naturally shall negotiate and agree to solution with customer.

2. Warranty

Basically, warranty term is 12 months of reliability characteristics of quality level after the outgoing date in SAMSUNG Display Co., Ltd., and SAMSUNG Display Co., Ltd., could compensate for defectives which happens within warranty term under condition that the products should be stored or be used as Specified under normal condition (22±3℃ Room Temperature and 65±20% Room Humidity Storage) within the contents of Specification.

Otherwise, it is impossible to compensate for defectives when they happens by customer's mistake such as careless handling or circuit change, etc.

And after 12 months of warranty term, all replacements for defectives will be charged.

This Specification stipulates the final and comprehensive requirements for the respective products hereof. Beyond this specification, it is responsibility of the customer to explicitly disclose any additional requirements, information or reservations regarding these requirements to Samsung Display prior to implementation, where any and all disclosures of the customer shall be with an authorized representative of Samsung Display in writing. Samsung Display shall not be responsible for safety, performance, functionality, compatibility of the system with which the SAMSUNG Display-supplied components are integrated unless such features have been expressly communicated and described in the Specification. SAMSUNG Display MAKES NO GUARANTY OR WARRANTY, EXPRESS OR IMPLIED , INCLUDING BUT NOT LIMITED TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TO ANY PARTY. Moreover, any party should do their own due diligence regarding these requirements prior to implementation.

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

5/54

3. Features

- 1) Display Color : 16M Colors
- 2) Display Format : 2560(H) x 1600(V) / S-Stripe Pixel type
- 3) Interface : MIPI Dual-DSI
- 4) Driver IC : Tcon - S6TNMR7 by Samsung System LSI
Source IC - D53D5EA8002SA by MagnaChip
- 5) TSP

Item	Specifications	Unit
Module Structure	Glass window(Cover Lens) + OCR(Resin) + OCTA	-
TSP Type	OCTA(On Cell Touch AMOLED)	-
TSP V/A	227.56(H) X 142.6(V)	mm
Window(Cover Lens) Material	Chemically Tempered Glass	-
	Anti-Finger Coating	-
	Surface Hardness	-
Interface	I2C	-
TSP IC Maker	Synaptics (P/N : S7501)	-
ITO Layer	2 Layers	-
Number of Sensing Channel	57 X 36	-

4. Mechanical Specification

Item	Specifications	Unit
Diagonal Inch	10.5	inch
Number of dots	2560(H) X 1600(V) / S-Stripe Pixel Structure	Dots
Pixel pitch	0.0885	mm
Display Active area	226.56(H) X 141.60(V)	mm
Glass Dimension	233.19(H) X 150.77(V)	mm
Module Dimension	241.16(H) X 170.603(V)	mm
Module Thickness (Window ~ Cu tape)	1.904	mm
Weight	(154)	g

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

6/54

5. Absolute Maximum Ratings

Item		Symbol	Condition	Unit
Supply voltage	System	VDD_3.3V	-0.3 to 4.6	V
	Logic	VDD_1.8V	-0.3 to 2.25	
	TSP_Supply	TSP_3.3V	-0.3 to 4	
	TSP_I/O	TSP_1.8V	-0.3 to 2	

Note. The absolute maximum rating is the limit value. When the display module is exposed to the operating environment beyond this range, the IC does not assure normal operations and may be damaged permanently, not be able to be recovered. The operating temperature is the range of device operating temperature. They do not guarantee display performance.



SAMSUNG DISPLAY

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

7/54



SAMSUNG DISPLAY

2014.10.31 / YB Kim / Development Team

6. Electrical Characteristics

6.1 AMOLED

□ Conditions : Temp.=25℃

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
System	Analog /Logic	VDD_3.3V	-	3.1	3.3	3.5	V	-
	Logic	VDD_1.8V	-	1.7	1.8	2.0		
Main	Analog	ELVDD	-	-	5.0	-	V	(1)
		ELVSS	-	Individual driving (Variable)				
Input Voltage	"H" level	VIH	-	0.7*VDD_1.8V	-	VDD_1.8V	V	-
	"L" level	VIL	-	Vss	-	0.3*VDD_1.8V	V	-
Output Voltage	"H" level	VOH	IOUT = -2/4/8/12mA	0.8*VDD_1.8V	-	VDD_1.8V	V	-
	"L" level	VOL	IOUT = -2/4/8/12mA	Vss	-	0.2*VDD_1.8V		
Supply Current		IBAT	DCDC Power (300cd/m ² , Full White.) VBAT=3.8V	-	-	1632	mA	(1) (2)
		IVDD_3.3V	Full White (Normal Operation)	-	-	307	mA	(1) (2)
		IVDD_1.8V	Full White (Normal Operation)	-	-	63	mA	(1) (2)
Frequency	Frame Frequency	Fframe	-	-	(60)	-	Hz	(3)

Note(1) : VDD_3.3V=3.3(V), VDD_1.8V=1.8(V), Full White pattern.

Temperature = 22±3℃ Room Temperature

Note(2) : Measured using SDC Standard Operating Circuit including DC-DC IC (TPS65633)

Current Consumption could be different under customer's DC-DC circuit design.

Note(3) : Frame Frequency is followed by SET Software Setting

6.2 TSP

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Logic	TSP_1.8V	1.71	1.8	1.98	V	-
	Analog	TSP_3.0V	2.7	3.3	3.6	V	-

Note : It is followed touch driver IC (S7501 by Synaptics)

Item	FW Version	Config ID
FW/Config version	1639618	050EB29A

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

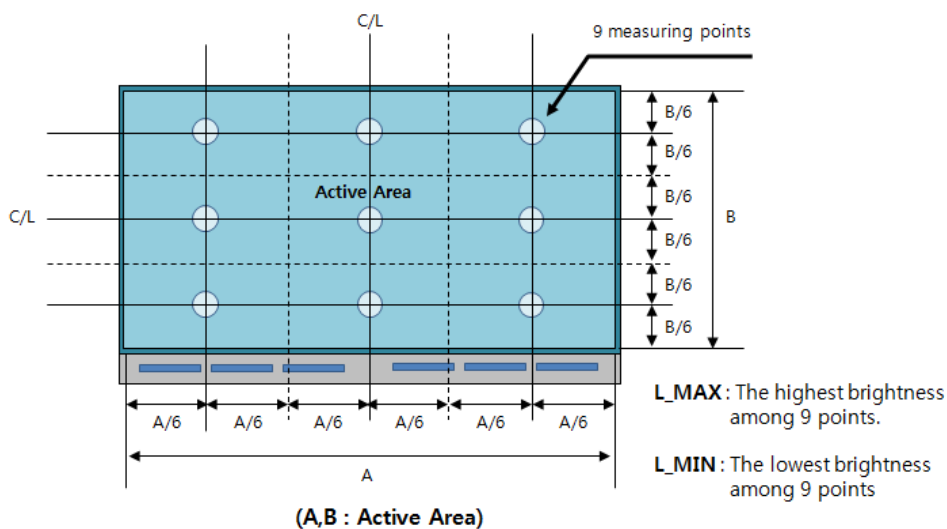
8/54

7. Electro-Optical characteristics

Item	Symbol	Temp	Condition	Min.	Typ.	Max.	Unit	Note
Brightness (with Window + TSP)		25℃	Normal (White Mode)	240	300	360	cd/m ²	(3)
Brightness Uniformity		25℃	Normal (White Mode)	70	-	-	%	(1)
Contrast ratio		25℃	Φ=0°,θ=0° White/Black	-	10000	-	-	(2),(3)
Color of CIE coordinate	White	x	25℃ Φ=0° θ=0° 300nit	0.292	0.312	0.332	-	(3),(4)
		y		0.309	0.329	0.349	-	
	Red	x		0.635	0.665	0.695	-	
		y		0.304	0.334	0.364	-	
	Green	x		0.200	0.250	0.300	-	
		y		0.656	0.706	0.756	-	
	Blue	x		0.097	0.137	0.177	-	
		y		0.015	0.055	0.095	-	
Color Gamut		25℃	Adobe RGB	-	97	-	%	
View angle		25℃	Upper/Down/Right/Left Contrast Ratio ≥ 100	Over 80°				(4)
WAD (off angle viewing)	Δu'v'	25℃	Φ=30°	-	-	0.028	-	(4),(5)

NOTE (1) Uniformity measuring point

$$\text{Uniformity} = L_{\min} / L_{\max} * 100 [\%]$$



SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

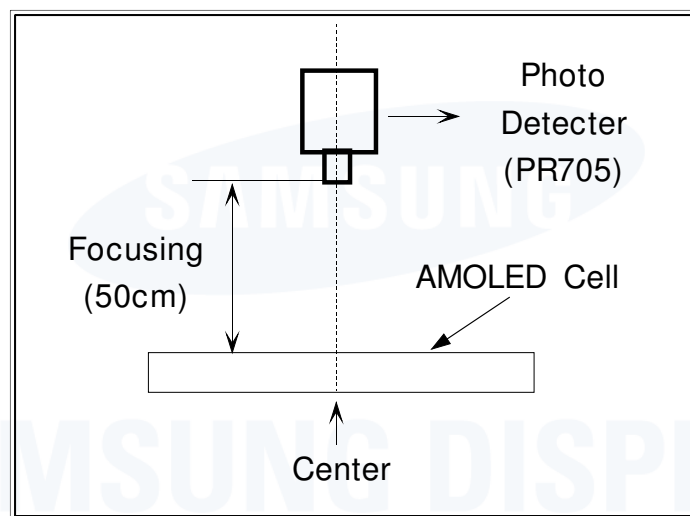
Revision : A00

9/54

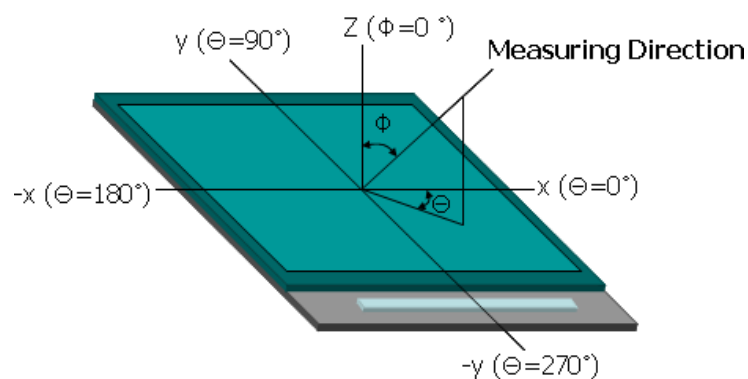
Note (2) Definition of contrast ratio (K)

$$\text{Contrast Ratio(K)} = \frac{\text{Brightness of selected dot (White patterned area) at } 300\text{cd/m}^2}{\text{Brightness of non-selected dot (Black patterned area) at } 300\text{cd/m}^2}$$

Note (3) Optical measuring system, temperature regulated chamber
external Light : dark state



Note (4) Definition of Φ , θ



Note (5) If needed, it is determined using limit sample.

SAMSUNG Display CO., LTD. (All Rights Reserved).

AMSA05BV07 (Eagle Peak)

Revision : A00

10/54