

FCC SAR Evaluation Report

Report No. : SA131114C07A
Applicant : Samsung Electronics Co., Ltd.
Address : 19 Chapin Rd. Building D Pine Brook NJ 07058
Product : Digital camera
Brand : SAMSUNG
FCC ID : A3LWB1100F
Model No. : SAMSUNG WB1100F, SAMSUNG WB1101F, SAMSUNG WB1102F
(Refer to item 2 for more details)
Standards : FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1992 / IEEE 1528:2003
IEEE 1528a-2005 / KDB 865664 D01 v01r02
KDB 248227 D01 v01r02 / KDB 447498 D01 v05r01

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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Approved By : Roy Wu
Roy Wu / Manager



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Appendix A. Photographs of EUT and Setup



Release Control Record

Issue No.	Reason for Change	Date Issued
R01	Initial release	Jan. 08, 2014

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR _{1g} (W/kg)
DTS	2.4G WLAN	N/A
DXX	NFC	N/A

Note:

1. The SAR limit (**Head & Body: SAR_{1g} 1.6 W/kg**) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

2. Description of Equipment Under Test

EUT Type	Digital camera
Brand Name	SAMSUNG
FCC ID	A3LWB1100F
Model Name	SAMSUNG WB1100F, SAMSUNG WB1101F, SAMSUNG WB1102F (Refer to Note for more details)
Tx Frequency Bands (Unit: MHz)	WLAN : 2412 ~ 2462 NFC : 13.56
Uplink Modulations	802.11b : DSSS 802.11g/n : OFDM NFC : ASK
Maximum Tune-up Conducted Power (Unit: dBm)	12.5
Antenna Type	PCB Antenna
EUT Stage	Identical Prototype

Note:

1. All models are listed as below. Model SAMSUNG WB1100F is the representative for final test.

Brand	Model	Difference
SAMSUNG	SAMSUNG WB1100F	All models are electrically identical, different model names are for marketing purpose.
	SAMSUNG WB1101F	
	SAMSUNG WB1102F	

2. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory:

Battery	Brand Name	SAMSUNG
	Model Name	SLB-10A
	Power Rating	3.7Vdc (3.7B), 1030mAh, 3.81Wh
	Type	Li-ion

3. SAR Measurement Evaluation

3.1 Maximum Output Power

3.2.1 Maximum Conducted Power

The maximum conducted power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	2.4G WLAN
802.11b	12.5
802.11g	11.0
802.11n HT20	10.0

3.2.2 Measured Conducted Power Result

The measuring conducted power (Unit: dBm) is shown as below.

Mode	802.11b		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	12.05	11.92	12.00
Mode	802.11g		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	10.77	10.71	10.68
Mode	802.11n (HT20)		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	9.97	9.88	9.82

3.2 SAR Testing Results

3.3.1 SAR Test Exclusions

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

1. For the test separation distance ≤ 50 mm

$$\frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \sqrt{f_{(\text{GHz})}} \leq 3.0$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2. For the test separation distance > 50 mm, and the frequency at 100 MHz to 1500 MHz

$$\left[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times \left(\frac{f_{(\text{MHz})}}{150} \right) \right]_{(\text{mW})}$$

3. For the test separation distance > 50 mm, and the frequency at > 1500 MHz to 6 GHz

$$[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times 10]_{(\text{mW})}$$

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Front Face			Rear Face			Left Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
WLAN 2.4G	12.5	18	42.3	0.7	No	49	0.6	No	98.5	581 mW	No
			Right Side			Top Side			Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
			16.3	1.7	No	33	0.9	No	20	1.4	No

Note:

1. When separation distance ≤ 50 mm and the calculated result shown in above table is ≤ 3.0 , the SAR testing exclusion is applied.
2. When separation distance > 50 mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

Summary:

Since the SAR testing for all device orientations apply SAR test exclusion per KDB 447498, SAR testing for this device is not required.

Test Engineer : Willy Chang

4. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The road map of all our labs can be found in our web site also.

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