

MPE TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID/IC Certification: A3LWDF210M / 649E-WDF210M

Equipment Under Test : WDF210M WiFi module
Model Name : WDF210M
Serial No. : N/A
Applicant : Samsung Electronics Co., Ltd.
Manufacturer : Samsung Electronics Co., Ltd.
Date of Test(s) : 2013.10.28 ~ 2013.11.07
Date of Issue : 2014.01.06

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Patrick Kang

Date:

2014.01.06

Approved By:



Feel Jeong

Date:

2014.01.06

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040 (Lab)
- 413-15, Goma-e-Dong, Giheung-Gu, Yongin-Si, Gyeonggi-Do, South Korea. (Chamber)

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Telephone : +82 31 428 5700

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1.2. Details of Applicant

Applicant : SAMSUNG ELECTRONICS CO., LTD.

Address : 129, Samsung-Ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea

Contact Person : Lee Jaywoo

Phone No. : +82 31 436 7632

1.3. Description of EUT

Kind of Product	WDF210M WiFi module
Model Name	WDF210M
Serial Number	N/A
Power Supply	DC 5 V
Frequency Range	2 412 MHz ~ 2 462 MHz (11b/g/n_HT20), 2 422 MHz ~ 2 452 MHz (11n_HT40)
Modulation Technique	DSSS, OFDM
Number of Channels	11 channels (11b/g/n_HT20), 7 channels(11n_HT40)
Antenna Type	Internal type (MISO)
Antenna Gain	2 412 MHz ~ 2 462 MHz: 3.5 dB i

1.4. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL007111	Initial
1	F690501/RF-RTL007111-1	Added result of max power includes power tolerance
2	F690501/RF-RTL007111-2	Revised result of max power includes power tolerance

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2. RF Exposure Evaluation

2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time
(A) Limits for Occupational /Control Exposures				
300 – 1 500	--	--	F/300	6
1 500 – 100 000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1 500	--	--	F/1500	6
<u>1 500 – 100 000</u>	--	--	<u>1</u>	<u>30</u>

2.1.1. Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

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2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

OFDM : 802.11g (The max. power includes the power tolerance)

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
Low	2 412	14.3	3.5	0.011 988	1

Note :

1. The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm².

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