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FCC MPE REPORT

FCC Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
May 24, 2017
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-R-1705-E002-2
HCT FRN: 0005866421

FCC ID	**: A3LWEA512I**
APPLICANT	**: SAMSUNG Electronics Co., Ltd.**

Model(s): WEA512i

EUT Type: WLAN Access Point

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by : Jung Lae Cho
Engineer of Telecommunication testing center

Approved by : Jong Seok Lee
Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1705-E002	May 12, 2017	- First Approval Report
HCT-R-1705-E002-1	May 19, 2017	- Revised the result of UNII 2C(802.11a, 802.11n_HT20).
HCT-R-1705-E002-2	May 24, 2017	- Revised the results.

RF Exposure Statement

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f²)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....	.....	.....	f/1500	30
1500 - 100.000.....	.....	.....	1.0	30

F = frequency in MHz
* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

$$S = PG/4\pi R^2$$

S = Power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

3. RESULTS

2.4 GHz Band (DTS)

802.11b

Max Average output Power at antenna input terminal	15.000	dBm
Max Average output Power at antenna input terminal	31.623	mW
Prediction distance	20.000	cm
Prediction frequency	2412.000	MHz
Antenna Gain(typical)	3.470	dBi
Antenna Gain(numeric)	2.223	-
Power density at prediction frequency(S)	0.0140	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11g

Max Average output Power at antenna input terminal	16.500	dBm
Max Average output Power at antenna input terminal	44.668	mW
Prediction distance	20.000	cm
Prediction frequency	2412.000	MHz
Antenna Gain(typical)	5.850	dBi
Antenna Gain(numeric)	3.846	-
Power density at prediction frequency(S)	0.0342	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n

Max Average output Power at antenna input terminal	16.500	dBm
Max Average output Power at antenna input terminal	44.668	mW
Prediction distance	20.000	cm
Prediction frequency	2412.000	MHz
Antenna Gain(typical)	5.850	dBi
Antenna Gain(numeric)	3.846	-
Power density at prediction frequency(S)	0.0342	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

5 GHz Band (UNII 1)
802.11a (5180 -5240)

Max Average output Power at antenna input terminal	17.000	dBm
Max Average output Power at antenna input terminal	50.119	mW
Prediction distance	20.000	cm
Prediction frequency	5180.000	MHz
Antenna Gain(typical)	9.720	dBi
Antenna Gain(numeric)	9.376	-
Power density at prediction frequency(S)	0.0935	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT20 (5180 -5240)

Max Average output Power at antenna input terminal	17.000	dBm
Max Average output Power at antenna input terminal	50.119	mW
Prediction distance	20.000	cm
Prediction frequency	5180.000	MHz
Antenna Gain(typical)	9.720	dBi
Antenna Gain(numeric)	9.376	-
Power density at prediction frequency(S)	0.0935	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT40 (5190 -5230)

Max Average output Power at antenna input terminal	10.000	dBm
Max Average output Power at antenna input terminal	10.000	mW
Prediction distance	20.000	cm
Prediction frequency	5190.000	MHz
Antenna Gain(typical)	9.720	dBi
Antenna Gain(numeric)	9.376	-
Power density at prediction frequency(S)	0.0187	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT20 (5180 -5240)

Max Average output Power at antenna input terminal	17.000	dBm
Max Average output Power at antenna input terminal	50.119	mW
Prediction distance	20.000	cm
Prediction frequency	5180.000	MHz
Antenna Gain(typical)	9.720	dBi
Antenna Gain(numeric)	9.376	-
Power density at prediction frequency(S)	0.0935	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT40 (5190 -5230)

Max Average output Power at antenna input terminal	10.000	dBm
Max Average output Power at antenna input terminal	10.000	mW
Prediction distance	20.000	cm
Prediction frequency	5190.000	MHz
Antenna Gain(typical)	9.720	dBi
Antenna Gain(numeric)	9.376	-
Power density at prediction frequency(S)	0.0187	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT80 (5210)

Max Average output Power at antenna input terminal	9.000	dBm
Max Average output Power at antenna input terminal	7.943	mW
Prediction distance	20.000	cm
Prediction frequency	5210.000	MHz
Antenna Gain(typical)	9.720	dBi
Antenna Gain(numeric)	9.376	-
Power density at prediction frequency(S)	0.0148	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

5 GHz Band (UNII 2A)
802.11a (5260 -5320)

Max Average output Power at antenna input terminal	17.000	dBm
Max Average output Power at antenna input terminal	50.119	mW
Prediction distance	20.000	cm
Prediction frequency	5260.000	MHz
Antenna Gain(typical)	9.430	dBi
Antenna Gain(numeric)	8.770	-
Power density at prediction frequency(S)	0.0874	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT20 (5260 -5320)

Max Average output Power at antenna input terminal	17.500	dBm
Max Average output Power at antenna input terminal	56.234	mW
Prediction distance	20.000	cm
Prediction frequency	5260.000	MHz
Antenna Gain(typical)	9.430	dBi
Antenna Gain(numeric)	8.770	-
Power density at prediction frequency(S)	0.0981	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT40 (5270 -5310)

Max Average output Power at antenna input terminal	10.500	dBm
Max Average output Power at antenna input terminal	11.220	mW
Prediction distance	20.000	cm
Prediction frequency	5270.000	MHz
Antenna Gain(typical)	9.430	dBi
Antenna Gain(numeric)	8.770	-
Power density at prediction frequency(S)	0.0196	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT20 (5260 -5320)

Max Average output Power at antenna input terminal	17.500	dBm
Max Average output Power at antenna input terminal	56.234	mW
Prediction distance	20.000	cm
Prediction frequency	5260.000	MHz
Antenna Gain(typical)	9.430	dBi
Antenna Gain(numeric)	8.770	-
Power density at prediction frequency(S)	0.0981	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT40 (5270 -5310)

Max Average output Power at antenna input terminal	10.500	dBm
Max Average output Power at antenna input terminal	11.220	mW
Prediction distance	20.000	cm
Prediction frequency	5270.000	MHz
Antenna Gain(typical)	9.430	dBi
Antenna Gain(numeric)	8.770	-
Power density at prediction frequency(S)	0.0196	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT80 (5290)

Max Average output Power at antenna input terminal	9.500	dBm
Max Average output Power at antenna input terminal	8.913	mW
Prediction distance	20.000	cm
Prediction frequency	5290.000	MHz
Antenna Gain(typical)	9.430	dBi
Antenna Gain(numeric)	8.770	-
Power density at prediction frequency(S)	0.0155	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

5 GHz Band (UNII 2C)
802.11a (5500-5720)

Max Average output Power at antenna input terminal	16.500	dBm
Max Average output Power at antenna input terminal	44.668	mW
Prediction distance	20.000	cm
Prediction frequency	5500.000	MHz
Antenna Gain(typical)	10.640	dBi
Antenna Gain(numeric)	11.588	-
Power density at prediction frequency(S)	0.1030	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT20 (5500-5720)

Max Average output Power at antenna input terminal	16.500	dBm
Max Average output Power at antenna input terminal	44.668	mW
Prediction distance	20.000	cm
Prediction frequency	5500.000	MHz
Antenna Gain(typical)	10.640	dBi
Antenna Gain(numeric)	11.588	-
Power density at prediction frequency(S)	0.1030	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT40 (5510-5710)

Max Average output Power at antenna input terminal	11.000	dBm
Max Average output Power at antenna input terminal	12.589	mW
Prediction distance	20.000	cm
Prediction frequency	5510.000	MHz
Antenna Gain(typical)	10.640	dBi
Antenna Gain(numeric)	11.588	-
Power density at prediction frequency(S)	0.0290	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT20 (5500-5720)

Max Average output Power at antenna input terminal	16.500	dBm
Max Average output Power at antenna input terminal	44.668	mW
Prediction distance	20.000	cm
Prediction frequency	5500.000	MHz
Antenna Gain(typical)	10.640	dBi
Antenna Gain(numeric)	11.588	-
Power density at prediction frequency(S)	0.1030	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT40 (5510-5710)

Max Average output Power at antenna input terminal	11.000	dBm
Max Average output Power at antenna input terminal	12.589	mW
Prediction distance	20.000	cm
Prediction frequency	5510.000	MHz
Antenna Gain(typical)	10.640	dBi
Antenna Gain(numeric)	11.588	-
Power density at prediction frequency(S)	0.0290	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT80 (5530-5690)

Max Average output Power at antenna input terminal	10.000	dBm
Max Average output Power at antenna input terminal	10.000	mW
Prediction distance	20.000	cm
Prediction frequency	5530.000	MHz
Antenna Gain(typical)	10.640	dBi
Antenna Gain(numeric)	11.588	-
Power density at prediction frequency(S)	0.0231	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

5 GHz Band (UNII 3)
802.11a (5745-5825)

Max Average output Power at antenna input terminal	19.000	dBm
Max Average output Power at antenna input terminal	79.433	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	9.250	dBi
Antenna Gain(numeric)	8.414	-
Power density at prediction frequency(S)	0.1330	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT20 (5745-5825)

Max Average output Power at antenna input terminal	19.000	dBm
Max Average output Power at antenna input terminal	79.433	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	9.250	dBi
Antenna Gain(numeric)	8.414	-
Power density at prediction frequency(S)	0.1330	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11n_HT40 (5755-5795)

Max Average output Power at antenna input terminal	12.000	dBm
Max Average output Power at antenna input terminal	15.849	mW
Prediction distance	20.000	cm
Prediction frequency	5755.000	MHz
Antenna Gain(typical)	9.250	dBi
Antenna Gain(numeric)	8.414	-
Power density at prediction frequency(S)	0.0265	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT20 (5745-5825)

Max Average output Power at antenna input terminal	19.000	dBm
Max Average output Power at antenna input terminal	79.433	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	9.250	dBi
Antenna Gain(numeric)	8.414	-
Power density at prediction frequency(S)	0.1330	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT40 (5755-5795)

Max Average output Power at antenna input terminal	12.000	dBm
Max Average output Power at antenna input terminal	15.849	mW
Prediction distance	20.000	cm
Prediction frequency	5755.000	MHz
Antenna Gain(typical)	9.250	dBi
Antenna Gain(numeric)	8.414	-
Power density at prediction frequency(S)	0.0265	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

802.11ac_VHT80 (5775)

Max Average output Power at antenna input terminal	11.000	dBm
Max Average output Power at antenna input terminal	12.589	mW
Prediction distance	20.000	cm
Prediction frequency	5775.000	MHz
Antenna Gain(typical)	9.250	dBi
Antenna Gain(numeric)	8.414	-
Power density at prediction frequency(S)	0.0211	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm^2

Simultaneous transmission operations

1. The power density level at 20 cm is **0.0342 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm²** at **WLAN(2.4 GHz).**

2. The power density level at 20 cm is **0.1330 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm²** at **WLAN(5 GHz).**

   ->Simultaneous MPE 20cm is (0.0342/1.0) + (0.1330/1.0) = 0.1672 < 1
   * The Worst case WLAN(2.4 GHz): 16.5 dBm, WLAN(5 GHz): 19 dBm is Higest Power.