

FCC MPE REPORT

FCC Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Address:

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Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:

April 05, 2017

Test Site/Location:

HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Report No.: HCT-R-1704-E003

HCT FRN: 0005866421

FCC ID : A3LSLS-BU10A0

APPLICANT : SAMSUNG Electronics Co., Ltd.

Model: SLS-BU10A

EUT Type: uFemto

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)



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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1704-E003	April 05, 2017	- First Approval Report

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/cm ²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f ²)	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**LTE – 1 TX****3-1. LTE Band 2**

Average Peak output Power at antenna input terminal	26.000	dBm
Average Peak output Power at antenna input terminal	398.107	mW
Prediction distance	30.000	cm
Prediction frequency	1930.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0884	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-2. LTE Band 4

Average Peak output Power at antenna input terminal	26.000	dBm
Average Peak output Power at antenna input terminal	398.107	mW
Prediction distance	30.000	cm
Prediction frequency	1930.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0884	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-3. AWS-3

Average Peak output Power at antenna input terminal	26.000	dBm
Average Peak output Power at antenna input terminal	398.107	mW
Prediction distance	30.000	cm
Prediction frequency	2155.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0884	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

LTE – 2 TX

3-4. LTE Band 2

Average Peak output Power at antenna input terminal	29.000	dBm
Average Peak output Power at antenna input terminal	794.328	mW
Prediction distance	30.000	cm
Prediction frequency	1930.000	MHz
Antenna Gain(typical)	7.000	dBi
Antenna Gain(numeric)	5.012	-
Power density at prediction frequency(S)	0.3520	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-5. LTE Band 4

Average Peak output Power at antenna input terminal	29.000	dBm
Average Peak output Power at antenna input terminal	794.328	mW
Prediction distance	30.000	cm
Prediction frequency	2110.000	MHz
Antenna Gain(typical)	7.000	dBi
Antenna Gain(numeric)	5.012	-
Power density at prediction frequency(S)	0.3520	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-6. AWS-3

Average Peak output Power at antenna input terminal	29.000	dBm
Average Peak output Power at antenna input terminal	794.328	mW
Prediction distance	30.000	cm
Prediction frequency	2155.000	MHz
Antenna Gain(typical)	7.000	dBi
Antenna Gain(numeric)	5.012	-
Power density at prediction frequency(S)	0.3520	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

WiFi

(UNII 1 BAND)

3-7 802.11a (5180 ~5240)

Average Peak output Power at antenna input terminal	22.500	dBm
Average Peak output Power at antenna input terminal	177.828	mW
Prediction distance	30.000	cm
Prediction frequency	5180.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0395	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

(UNII 3 BAND)

3-8 802.11a (5745 ~5825)

Average Peak output Power at antenna input terminal	26.500	dBm
Average Peak output Power at antenna input terminal	446.684	mW
Prediction distance	30.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0992	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

LTE-U 1 TX**3-9 UNII 1 - (5160 ~ 5240)**

Average Peak output Power at antenna input terminal	26.000	dBm
Average Peak output Power at antenna input terminal	398.107	mW
Prediction distance	30.000	cm
Prediction frequency	5160.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0884	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-10 UNII 3 - 5745 ~ 5825)

Average Peak output Power at antenna input terminal	26.000	dBm
Average Peak output Power at antenna input terminal	398.107	mW
Prediction distance	30.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	4.000	dBi
Antenna Gain(numeric)	2.512	-
Power density at prediction frequency(S)	0.0884	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

LTE-U 2 TX

3-11 UNII 1 - (5160 ~ 5240)

Average Peak output Power at antenna input terminal	29.000	dBm
Average Peak output Power at antenna input terminal	794.328	mW
Prediction distance	30.000	cm
Prediction frequency	5160.000	MHz
Antenna Gain(typical)	7.000	dBi
Antenna Gain(numeric)	5.012	-
Power density at prediction frequency(S)	0.3520	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-12 UNII 3 - 5745 ~ 5825)

Average Peak output Power at antenna input terminal	29.000	dBm
Average Peak output Power at antenna input terminal	794.328	mW
Prediction distance	30.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	7.000	dBi
Antenna Gain(numeric)	5.012	-
Power density at prediction frequency(S)	0.3520	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

Simultaneous transmission operations

1. Simultaneous MPE 30 cm is $(0.3520/1.0) + (0.3520/1.0) = 0.704 < 1$
*The Worst case LTE(2 TX) : 29 dBm, LTE-U(2 TX) : 29 dBm is Highest Power.
2. Simultaneous MPE 30 cm is $(0.3520/1.0) + (0.0992/1.0) = 0.4512 < 1$
* The Worst case LTE(2 TX) : 29 dBm, WiFi : 26.5 dBm is Highest Power.

* Unlicensed band and WiFi(Active Probing) is not transmitted simultaneously.