

FCC MPE REPORT

FCC Class II Permissive Change

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Date of Issue:
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Report No.: HCT-RF-1805-FC032-R1

FCC ID: A3LRFV01U-D2A

APPLICANT: SAMSUNG Electronics Co.,Ltd.

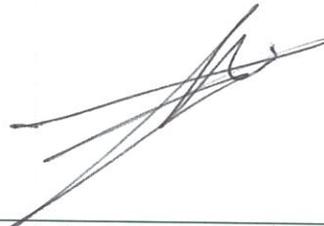
Model: RFV01U-D2A

EUT Type: RRU(RFV01U)

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.



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Manager of telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1805-FC032	May 24, 2018	- First Approval Report
HCT-RF-1805-FC032-R1	May 30, 2018	- Revised the MPE calculation for simultaneous transmissions.

RF Exposure Statement

1. Limit

- According to § 1.1310 RF exposure is calculated.

Table 1 – Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			f/1500	30
1,500-100,000			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 to the antenna in the direction of interest relative to an isotropic radiator
- R = Distance to the center of radiation of the antenna

3. Results

3-1. Band 13 LTE (40 W, 4 Tx)

Max Average output Power for Multi input Multi output (MIMO)	54.040 dBm
Max Average output Power for Multi input Multi output (MIMO)	253512.863 mW
Prediction distance	1000.000 cm
Prediction frequency	751.000 MHz
Antenna gain (typical)	10.865 dBi
Antenna gain (numeric)	12.204 -
Power density at prediction frequency	0.2462 mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5007 mW/cm ²

3-1-1. Band 13 LTE (34.5 W, 4 Tx)

Max Average output Power for Multi input Multi output (MIMO)	53.400 dBm
Max Average output Power for Multi input Multi output (MIMO)	138038.426 mW
Prediction distance	1000.000 cm
Prediction frequency	751.000 MHz
Antenna gain (typical)	10.865 dBi
Antenna gain (numeric)	12.204 -
Power density at prediction frequency	0.2125 mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5007 mW/cm ²

3-1-2. Band 13 NB-IoT (5.5 W, 4 Tx)

Max Average output Power for Multi input Multi output (MIMO)	44.420 dBm
Max Average output Power for Multi input Multi output (MIMO)	21978.599 mW
Prediction distance	1000.000 cm
Prediction frequency	746.200 MHz
Antenna gain (typical)	10.865 dBi
Antenna gain (numeric)	12.204 -
Power density at prediction frequency	0.0269 mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4975 mW/cm ²

3-2. LTE Band 5 (40 W, 4 Tx)

Max Average output Power for Multi input Multi output (MIMO)	54.040 dBm
Max Average output Power for Multi input Multi output (MIMO)	253512.863 mW
Prediction distance	1000.000 cm
Prediction frequency	871.500 MHz
Antenna gain (typical)	10.865 dBi
Antenna gain (numeric)	12.204 -
Power density at prediction frequency	0.2462 mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5810 mW/cm ²

※ Manufacturer does not provide an antenna.

※ The antenna gain in the table above is virtual value of the available range.

Simultaneous transmission operations

Simultaneous MPE 10 m is

1. Band 13_LTE (0.2462/0.5007) + Band 5_LTE (0.2462/0.5810) = 0.9155 < 1.0
2. Band 13_LTE (0.2125/0.5007) + Band 13_NB-IoT (0.0269/0.4975) + LTE Band 5 (0.2462/0.5810)
= 0.9022 < 1.0