

FCC MPE REPORT

Certification

Applicant Name:
WISOL CO., LTD

Address:
531-7, Gajang-ro, Osan-si Gyeonggi-do, 18103, Korea

Date of Issue:

August 2, 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-1706-E007-3

HCT FRN: 0005866421

ISED Registration Number: 5944A-5

FCC ID: 2ABA2SFM20R4

APPLICANT: WISOL CO., LTD

Model(s): SFM20R4

EUT Type: Sigfox Quad-mode module

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-1706-E007	June 12, 2017	- First Approval Report
HCT-R-1706-E007-1	July 10, 2017	- Added the results for Simultaneous transmission operations
HCT-R-1706-E007-2	July 18, 2017	- Revised results
HCT-R-1706-E007-3	August 2, 2017	- Revised the Ant gain (Sigfox)

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

3-1. Sigfox Mode

Max Peak output Power at antenna input terminal	23.639	dBm
Max Peak output Power at antenna input terminal	231.153	mW
Prediction distance	20.000	cm
Prediction frequency	920.138	MHz
Antenna Gain(typical)	2.010	dBi
Antenna Gain(numeric)	1.589	-
Power density at prediction frequency(S)	0.0731	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.613	mW/cm ²

3-2. Bluetooth LE Mode

Max Peak output Power at antenna input terminal	7.480	dBm
Max Peak output Power at antenna input terminal	5.598	mW
Prediction distance	20.000	cm
Prediction frequency	2480.000	MHz
Antenna Gain(typical)	4.440	dBi
Antenna Gain(numeric)	2.780	-
Power density at prediction frequency(S)	0.0031	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-3. WLAN Mode

Max Peak output Power at antenna input terminal	22.000	dBm
Max Peak output Power at antenna input terminal	158.489	mW
Prediction distance	20.000	cm
Prediction frequency	2437.000	MHz
Antenna Gain(typical)	4.440	dBi
Antenna Gain(numeric)	2.780	-
Power density at prediction frequency(S)	0.0876	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 **0.0731 mW/cm²**, which is below the uncontrolled exposure limit of **0.613 mW/cm²** at **Sigfox**.
2. The power density level at 20 cm is **0.0031 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm²** at **Bluetooth LE**.
3. The power density level at 20 cm is **0.0876 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm²** at **WLAN**.

->Simultaneous MPE 20cm is Sigfox(0.0731/1.0) + BT LE(0.0031/1.0) = 0.0762 mW/cm² < 0.613 mW/cm²

->Simultaneous MPE 20cm is BT LE(0.0031/1.0) + WLAN(0.0876/1.0) = 0.0907 mW/cm² < 1.000 mW/cm²