

TEST REPORT

FCC MPE Test for HOME 7500
Certification

APPLICANT
GS Instech Co., Ltd.

REPORT NO.
HCT-RF-1911-FC007

DATE OF ISSUE
November 07, 2019

HCT Co., Ltd.

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TEST REPORT

FCC MPE Test for
HOME 7500

REPORT NO.
HCT-RF-1911-FC007

DATE OF ISSUE
November 07, 2019

FCC ID
U88-HOME7500

Applicant **GS Instech Co., Ltd.**
70, Gilpa-ro 71beon-gil, Nam-gu, Inchen, Korea

Eut Type	Cell Phone Signal Booster
Model Name	HOME 7500

This test results were applied only to the test methods required by the standard.

Tested by
Kyung Soo Kang

(signature)

Technical Manager
Jong Seok Lee

(signature)

HCT CO., LTD.

Soo Chan Lee
SooChan Lee / CEO

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	November 07, 2019	Initial Release

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

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.

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 MPE calculation for standalone operations

- Lower 700 MHz – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	706.500	MHz
Coupled gain (typical)	6.300	dB
Coupled gain (numeric)	4.266	-
Power density at prediction frequency	0.0429	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4710	mW/cm ²

- Lower 700 MHz – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	736.500	MHz
Coupled gain (typical)	2.340	dB
Coupled gain (numeric)	1.714	-
Power density at prediction frequency	0.0017	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4910	mW/cm ²

- Upper 700 MHz – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	778.500	MHz
Coupled gain (typical)	6.218	dB
Coupled gain (numeric)	4.186	-
Power density at prediction frequency	0.0421	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5190	mW/cm ²

- Upper 700 MHz – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	748.500	MHz
Coupled gain (typical)	2.475	dB
Coupled gain (numeric)	1.768	-
Power density at prediction frequency	0.0018	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4990	mW/cm ²

- Cellular – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	826.500	MHz
Coupled gain (typical)	6.218	dB
Coupled gain (numeric)	4.186	-
Power density at prediction frequency	0.0421	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5510	mW/cm ²

- Cellular – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	871.500	MHz
Coupled gain (typical)	3.369	dB
Coupled gain (numeric)	2.172	-
Power density at prediction frequency	0.0022	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5810	mW/cm ²

- AWS-1 – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	1712.500	MHz
Coupled gain (typical)	7.482	dB
Coupled gain (numeric)	5.600	-
Power density at prediction frequency	0.0564	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- AWS-1 – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	2112.500	MHz
Coupled gain (typical)	4.010	dB
Coupled gain (numeric)	2.518	-
Power density at prediction frequency	0.0025	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	1852.500	MHz
Coupled gain (typical)	7.175	dB
Coupled gain (numeric)	5.218	-
Power density at prediction frequency	0.0525	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	1932.500	MHz
Coupled gain (typical)	5.740	dB
Coupled gain (numeric)	3.750	-
Power density at prediction frequency	0.0037	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

3.2 MPE calculation for simultaneous transmission operations

- Lower 700 MHz –Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	706.500	MHz
Coupled gain (typical)	6.300	dB
Coupled gain (numeric)	4.266	-
Power density at prediction frequency	0.0429	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4710	mW/cm ²

- Upper 700 MHz – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	778.500	MHz
Coupled gain (typical)	6.218	dB
Coupled gain (numeric)	4.186	-
Power density at prediction frequency	0.0421	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5190	mW/cm ²

- 700 MHz Band – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	736.500	MHz
Coupled gain (typical)	2.340	dB
Coupled gain (numeric)	1.714	-
Power density at prediction frequency	0.0017	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.4910	mW/cm ²

- Cellular – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	826.500	MHz
Coupled gain (typical)	6.218	dB
Coupled gain (numeric)	4.186	-
Power density at prediction frequency	0.0421	mW/cm ²
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- Cellular – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
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Prediction distance	20.00	cm
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Coupled gain (typical)	3.369	dB
Coupled gain (numeric)	2.172	-
Power density at prediction frequency	0.0022	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.5810	mW/cm ²

- AWS-1 – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	1712.500	MHz
Coupled gain (typical)	7.482	dB
Coupled gain (numeric)	5.600	-
Power density at prediction frequency	0.0564	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- AWS-1 – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
Max peak output power at antenna input terminal (mW)	5.012	mW
Prediction distance	20.00	cm
Prediction frequency	2112.500	MHz
Coupled gain (typical)	4.010	dB
Coupled gain (numeric)	2.518	-
Power density at prediction frequency	0.0025	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – Uplink

Max peak output power at antenna input terminal (dBm)	25.000	dBm
Max peak output power at antenna input terminal (mW)	316.228	mW
Prediction distance	50.00	cm
Prediction frequency	1852.500	MHz
Coupled gain (typical)	7.175	dB
Coupled gain (numeric)	5.218	-
Power density at prediction frequency	0.0525	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Broadband PCS – Downlink

Max peak output power at antenna input terminal (dBm)	7.000	dBm
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Prediction distance	20.00	cm
Prediction frequency	1932.500	MHz
Coupled gain (typical)	5.740	dB
Coupled gain (numeric)	3.750	-
Power density at prediction frequency	0.0037	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

- Uplink

Band	MPE Ratio (Power density / Limit)	Sum of MPE Ratio	
Lower 700 MHz	0.0912	0.3577	≤ 1
Upper 700 MHz	0.0812		
Cellular	0.0765		
Broadband PCS	0.0564		
AWS-1	0.0525		

* Note

1. The result of each band was applied to the worst value.
2. MPE ratios are calculated as

$$[(\text{Power density1} / \text{MPE Limit}) + [(\text{Power density2} / \text{MPE Limit}) + \dots] \leq 1$$

- Downlink

Band	MPE Ratio (Power density / Limit)	Sum of MPE Ratio	
700 MHz	0.0035	0.0135	≤ 1
Cellular	0.0037		
Broadband PCS	0.0025		
AWS-1	0.0037		

* Note

1. The result of each band was applied to the worst value.
2. MPE ratios are calculated as

$$[(\text{Power density1} / \text{MPE Limit}) + [(\text{Power density2} / \text{MPE Limit}) + \dots] \leq 1$$