

# FCC MPE REPORT

## Certification

**Applicant Name:**  
GS Instech Co., Ltd.**Address:**  
70, Gilpa-ro 71beon-gil, Nam-gu, Inchen, Korea**Date of Issue:**  
December 12, 2018**Location of test lab:**  
HCT CO., LTD.,  
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Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA**Report No.:** HCT-RF-1812-FC020**FCC ID:** U88-VOLTEX50**APPLICANT:** GS Instech Co., Ltd.**Model:** VOLTEX50**EUT Type:** Cell Phone Signal Booster

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-RF-1812-FC020	December 12, 2018	- First Approval Report

## 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	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

\* Because of calculation result of downlink power density is very low compared to uplink, downlink result is omitted.

#### - Lower 700 MHz – Uplink

Max peak output power at antenna input terminal (dBm)	20.930	dBm
Max peak output power at antenna input terminal (mW)	123.880	mW
Prediction distance	20.000	cm
Prediction frequency	707.240	MHz
Coupled gain (typical)	4.050	dBi
Coupled gain (numeric)	2.541	-
Power density at prediction frequency	0.063	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.471	mW/cm <sup>2</sup>

#### - Upper 700 MHz – Uplink

Max peak output power at antenna input terminal (dBm)	22.390	dBm
Max peak output power at antenna input terminal (mW)	173.380	mW
Prediction distance	20.000	cm
Prediction frequency	781.126	MHz
Coupled gain (typical)	3.840	dBi
Coupled gain (numeric)	2.421	-
Power density at prediction frequency	0.084	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.521	mW/cm <sup>2</sup>

## - Cellular – Uplink

Max peak output power at antenna input terminal (dBm)	21.870	dBm
Max peak output power at antenna input terminal (mW)	153.815	mW
Prediction distance	20.000	cm
Prediction frequency	830.250	MHz
Coupled gain (typical)	3.840	dBi
Coupled gain (numeric)	2.421	-
Power density at prediction frequency	0.074	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.554	mW/cm <sup>2</sup>

## - AWS-1 – Uplink

Max peak output power at antenna input terminal (dBm)	21.080	dBm
Max peak output power at antenna input terminal (mW)	128.233	mW
Prediction distance	20.000	cm
Prediction frequency	1 724.850	MHz
Coupled gain (typical)	4.250	dBi
Coupled gain (numeric)	2.661	-
Power density at prediction frequency	0.068	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>

## - Broadband PCS – Uplink

Max peak output power at antenna input terminal (dBm)	20.450	dBm
Max peak output power at antenna input terminal (mW)	110.917	mW
Prediction distance	20.000	cm
Prediction frequency	1 899.270	MHz
Coupled gain (typical)	4.190	dBi
Coupled gain (numeric)	2.624	-
Power density at prediction frequency	0.058	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>