

# FCC MPE REPORT

## Certification

**Applicant Name:**

GS Instech Co., Ltd.

**Date of Issue:**

December 04, 2018

**Address:**

70, Gilpa-ro 71beon-gil, Nam-gu, Inchen, Korea

**Location of test lab:**HCT CO., LTD.,  
74, Seoicheon-ro 578beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA**Report No.:** HCT-RF-1812-FC001**FCC ID:****U88-B10K****APPLICANT:****GS Instech Co., Ltd.****Model:**

B-10K

**EUT Type:**

Industrial Booster

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-1812-FC001	December 04, 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 EUT does not provide an antenna, maximum available antenna gain is used in the formula.

- Lower 700 MHz – LTE 10 MHz\_Uplink

Max peak output power at antenna input terminal (dBm)	20.010	dBm
Max peak output power at antenna input terminal (mW)	100.231	mW
Prediction distance	20.000	cm
Prediction frequency	709.0000	MHz
Antenna gain (typical)	9.000	dBi
Antenna gain (numeric)	7.943	-
Power density at prediction frequency	0.1584	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.4727	mW/cm <sup>2</sup>

- Lower 700 MHz – LTE 10 MHz\_Downlink

Max peak output power at antenna input terminal (dBm)	4.930	dBm
Max peak output power at antenna input terminal (mW)	3.112	mW
Prediction distance	20.000	cm
Prediction frequency	739.0000	MHz
Antenna gain (typical)	7.000	dBi
Antenna gain (numeric)	5.012	-
Power density at prediction frequency	0.0031	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.4927	mW/cm <sup>2</sup>

## - Upper 700 MHz – LTE 10 MHz\_Uplink

Max peak output power at antenna input terminal (dBm)	19.800	dBm
Max peak output power at antenna input terminal (mW)	95.499	mW
Prediction distance	20.000	cm
Prediction frequency	782.0000	MHz
Antenna gain (typical)	9.000	dBi
Antenna gain (numeric)	7.943	-
Power density at prediction frequency	0.1509	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.5213	mW/cm <sup>2</sup>

## - Upper 700 MHz – LTE 10 MHz\_Downlink

Max peak output power at antenna input terminal (dBm)	5.040	dBm
Max peak output power at antenna input terminal (mW)	3.192	mW
Prediction distance	20.000	cm
Prediction frequency	751.0000	MHz
Antenna gain (typical)	7.000	dBi
Antenna gain (numeric)	5.012	-
Power density at prediction frequency	0.0032	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.5007	mW/cm <sup>2</sup>

- Cellular – CDMA\_Uplink

Max peak output power at antenna input terminal (dBm)	19.810	dBm
Max peak output power at antenna input terminal (mW)	95.719	mW
Prediction distance	20.000	cm
Prediction frequency	831.0600	MHz
Antenna gain (typical)	9.000	dBi
Antenna gain (numeric)	7.943	-
Power density at prediction frequency	0.1513	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.5540	mW/cm <sup>2</sup>

- Cellular – LTE 5 MHz\_Uplink

Max peak output power at antenna input terminal (dBm)	20.360	dBm
Max peak output power at antenna input terminal (mW)	108.643	mW
Prediction distance	20.000	cm
Prediction frequency	831.0600	MHz
Antenna gain (typical)	9.000	dBi
Antenna gain (numeric)	7.943	-
Power density at prediction frequency	0.1717	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.5540	mW/cm <sup>2</sup>

- Cellular – CDMA\_Downlink

Max peak output power at antenna input terminal (dBm)	5.360	dBm
Max peak output power at antenna input terminal (mW)	3.436	mW
Prediction distance	20.000	cm
Prediction frequency	873.8800	MHz
Antenna gain (typical)	7.000	dBi
Antenna gain (numeric)	5.012	-
Power density at prediction frequency	0.0034	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.5826	mW/cm <sup>2</sup>

- Cellular – LTE 5 MHz\_Downlink

Max peak output power at antenna input terminal (dBm)	4.990	dBm
Max peak output power at antenna input terminal (mW)	3.155	mW
Prediction distance	20.000	cm
Prediction frequency	873.8800	MHz
Antenna gain (typical)	7.000	dBi
Antenna gain (numeric)	5.012	-
Power density at prediction frequency	0.0031	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	0.5826	mW/cm <sup>2</sup>

## - AWS-1 – LTE 10 MHz\_Uplink

Max peak output power at antenna input terminal (dBm)	19.980	dBm
Max peak output power at antenna input terminal (mW)	99.541	mW
Prediction distance	20.000	cm
Prediction frequency	1725.530	MHz
Antenna gain (typical)	11.000	dBi
Antenna gain (numeric)	12.589	-
Power density at prediction frequency	0.249305	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>

## - AWS-1 – LTE 10 MHz\_Downlink

Max peak output power at antenna input terminal (dBm)	5.280	dBm
Max peak output power at antenna input terminal (mW)	3.373	mW
Prediction distance	20.000	cm
Prediction frequency	2124.400	MHz
Antenna gain (typical)	10.000	dBi
Antenna gain (numeric)	10.000	-
Power density at prediction frequency	0.006710	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>



- PCS – CDMA\_Uplink

Max peak output power at antenna input terminal (dBm)	19.690	dBm
Max peak output power at antenna input terminal (mW)	93.111	mW
Prediction distance	20.000	cm
Prediction frequency	1888.840	MHz
Antenna gain (typical)	11.000	dBi
Antenna gain (numeric)	12.589	-
Power density at prediction frequency	0.233201	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>

- PCS – LTE 20 MHz\_Uplink

Max peak output power at antenna input terminal (dBm)	19.580	dBm
Max peak output power at antenna input terminal (mW)	90.782	mW
Prediction distance	20.000	cm
Prediction frequency	1888.840	MHz
Antenna gain (typical)	11.000	dBi
Antenna gain (numeric)	12.589	-
Power density at prediction frequency	0.227368	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>

- PCS – CDMA\_Downlink

Max peak output power at antenna input terminal (dBm)	5.390	dBm
Max peak output power at antenna input terminal (mW)	3.459	mW
Prediction distance	20.000	cm
Prediction frequency	1957.600	MHz
Antenna gain (typical)	10.000	dBi
Antenna gain (numeric)	10.000	-
Power density at prediction frequency	0.006882	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>

- PCS – LTE 20 MHz\_Downlink

Max peak output power at antenna input terminal (dBm)	5.110	dBm
Max peak output power at antenna input terminal (mW)	3.243	mW
Prediction distance	20.000	cm
Prediction frequency	1957.600	MHz
Antenna gain (typical)	10.000	dBi
Antenna gain (numeric)	10.000	-
Power density at prediction frequency	0.006453	mW/cm <sup>2</sup>
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm <sup>2</sup>