



CTK Co., Ltd.  
The Power Leader of Global Engineering Companies

# CTK Co., Ltd.

(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

Tel: +82-31-339-9970 Fax: +82-31-624-9501

www.e-ctk.com

## RF EXPOSURE EVALUATION

FCC ID : ZKJ-WCATA008

ISED certification number : 10229A-WCATA008

### Standard Requirement

The following FCC Rule Parts and procedures are applicable :

*Part 1.1310 Radiofrequency radiation exposure limits*

*Part 2.1091 Radiofrequency radiation exposure evaluation : Mobile device*

*KDB447498 D01 v06 Mobile and Portable Devices RF Exposure Procedures and Equipment*

*Authorization Policies*

Table 1 below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

*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			<b>1.0</b>	30

*f = frequency in MHz \* = Plane-wave equivalent power density*

### RSS-102(Issue5) Exposure Limits

*Table : RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)*

Frequency range (MHz)	Electric field strength (V/m rms)	Magnetic field strength (A/m rms)	Power density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>21</sup>	83	90	-	Instantaneous*
0.1-10	-	0.73 / f	-	6**
1.1-10	87 / f <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07 / f <sup>0.25</sup>	0.1540 / f <sup>0.25</sup>	8.944 / f <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 f <sup>0.3417</sup>	0.008335 f <sup>0.3417</sup>	<b>0.02619 f<sup>0.6834</sup></b>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000 / f <sup>1.2</sup>
150000-300000	0.158 f <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> f <sup>0.5</sup>	6.67 x 10 <sup>-05</sup> f	616000 / f <sup>1.2</sup>

*f is frequency in MHz,*

*\*:Based on nerve stimulation(NS), \*\* :Based on specific absorption rate(SAR)*



### RF Output Power

-802.11b : 26.73 dBm (470.98 mW)  
-802.11g : 22.69 dBm (185.78 mW)  
-802.11n-HT20 : 20.26 dBm (168.27 mW))  
-Bluetooth : LE : 4.09 dBm (2.56 mW)

### MPE calculation

$$S = \text{EIRP} / (4\pi R^2)$$

Where S : Power density  
EIRP : P x G  
P : Maximum transmitter power  
G : Antenna gain  
R : distance to the centre of radiation of the antenna

### FCC-MPE Limits

$$1 \text{ mW/cm}^2$$

### EUT RF Exposure

P : 26.73 dBm (470.98 mW)  
G : 2.00 dBi (x 1.59)  
R : 20 cm

$$S = 0.14 \text{ mW/cm}^2$$

### RSS-102 Limits

$$0.02619 f^{0.6834} \Rightarrow 5.41 \text{ W/m}^2$$

### EUT RF Exposure

P : 26.73 dBm (0.471 W)  
G : 2.00 dBi (x 1.59)  
R : 0.20 m

$$S = 0.02 \text{ W/m}^2$$

### Safety distance(R)

P : 26.73 dBm (55.463 mW)  
G : 2.00 dBi (x 1.383)  
S : 1 mW/cm<sup>2</sup>

$$R \geq 7.71 \text{ cm}$$

### Conclusion

This confirms compliance to the required Radio frequency radiation exposure limit.