



CTK Co., Ltd.
The Prime Leader of Global Regulatory Compliance

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RF EXPOSURE EVALUATION

Applicant : S-winnus Co.,Ltd

Applicant Address : NO. 1504, 1505, Centum Sky Biz A, 97, Centum
jungang-ro, Haeundae-gu, Busan, Korea

Kind of Product : ConTracer-R

**Equipment
model name** : CTR-S200

FCC ID : 2AJOX-CTR-S200



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Standard Requirement

The following RF exposure procedures are applicable :

- FCC Rules
Part 1.1310 Radiofrequency radiation exposure limits

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 ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			<u>f/1500</u>	30
1,500-100,000			<u>1.0</u>	30

f = frequency in MHz

* = Plane-wave equivalent power density



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MPE Calculations

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$EIRP = P + G$	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)
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The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} (\text{dB antenna gain} / 10)$$

Power density at the specific separation:

$S = PG / (4R^2\pi)$	Where, S = Maximum power density (mW/cm ²) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)
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Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$	Where, P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)
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RF Exposure Results

Mode	P (dBm)	G (dBi)	EIRP (dBm)	P (mW)	Power Density	Limit	R (cm)
					(mW/cm ²)	(mW/cm ²)	
LTE Band 5	25.00	1.84	26.84	316.23	0.0961	0.549	20
LTE Band 7	25.00	0.59	25.59	316.23	0.0721	1.000	
WCDMA II	25.00	1.42	26.42	316.23	0.0872	1.000	
WCDMA IV	25.00	0.39	25.39	316.23	0.0688	1.000	
WCDMA V	25.00	1.84	26.84	316.23	0.0961	0.551	
BLE	3.57	-1.6	1.97	2.28	0.0003	1.000	

Simultaneous transmitter

Mode	MPE ratios	Limit
LTE Band 5	0.1750	-
LTE Band 7	0.0721	
WCDMA II	0.0872	
WCDMA IV	0.0688	
WCDMA V	0.1744	
BLE	0.0003	
Combined	0.1753	1

*MPE ratios = MPE/MPE limit at each frequency