



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

CTK Co., Ltd.

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RF EXPOSURE EVALUATION

Applicant : KAONMEDIA Co., Ltd.

Applicant Address : KAONMEDIA Building, 884-3 Seongnam-daero,
Bundang-gu, Seongnam-si, Gyeonggi-do, Korea

Kind of Product : IP Set-top-box(OTT STB)

**Equipment
model name** : KSTB2100

FCC ID : WQTKSTB2100R



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			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density



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	R (cm)
					(mW/cm ²)	
BT	10.97	1.74	12.71	12.50	0.0037	20
BLE	8.18	1.74	9.92	6.58	0.0020	
RF4CE	6.85	3.18	10.03	4.84	0.0020	
WLAN 2.4 GHz	25.76	7.92	33.68	376.70	0.4642	
WLAN 5 GHz	25.86	7.95	33.81	385.48	0.4783	

Multiple chain transmitters

Mode	P (dBm)	G (dBi)	EIRP (dBm)	P (mW)	Power Density	R (cm)
					(mW/cm ²)	
BT (Worst Case)	10.97	1.74	12.71	12.50	/	20
RF4CE	6.85	3.18	10.03	4.84		
WLAN 2.4 GHz	25.76	7.92	33.68	376.70		
WLAN 5 GHz	25.86	7.95	33.81	385.48		
Combined				779.526		