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 : WiFi Extender

Equipment model name : AR2040

Antenna type : PCB Antenna(ANT 1, 2, 3,4)

***Antenna Gain**

		Antenna Gain
2.4GHz	ANT 1	1.9 dBi
	ANT 2	1.9 dBi
5GHz	ANT 1	2.0 dBi
	ANT 2	2.0 dBi
	ANT 3	2.0 dBi
	ANT 4	2.0 dBi

Standard Requirement

The following RF exposure procedures are applicable :

Part 1.1310 Radiofrequency radiation exposure limits
Part 2.1091 Radiofrequency radiation exposure evaluation : Mobile device

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)

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$G = Log^{-1}$ (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)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm^2 .
The power density at 20cm does not exceed the 1 mW/cm^2 limit.

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)

WLAN 2.4 GHz

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm^2)	Limit (mW/cm^2)
ANT1	18.95	78.52	1.9	**0.0248**	**1**
ANT2	18.42	69.50	1.9	**0.0194**	

WLAN 5 GHz

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm^2)	Limit (mW/cm^2)
ANT1	19.01	79.62	2.0	**0.0251**	**1**
ANT2	19.06	80.54	2.0	**0.0254**	
ANT3	18.74	74.82	2.0	**0.0236**	
ANT4	18.72	74.47	2.0	**0.0235**	

Multiple chain transmitters (2.4 GHz + 5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm^2)	Limit (mW/cm^2)
Combined	-	-	-	**0.1418**	**1**