



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

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(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

Applicant : KAONMEDIA Co., Ltd.

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

Kind of Product : Layer3 TV

**Equipment
model name** : Client VM3000C

FCC ID : WQTVM3000C

Antenna type : PCB Antenna(2.4GHz, 5GHz)

Antenna Gain : 2 dBi(2.4GHz, 5GHz)



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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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The Maximum permissible exposure (MPE) for the general population is 1 mW/cm² .
The power density at 20cm does not exceed the 1 mW/cm² 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)
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ANT : Single Streams (2.4GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	23.57	227.51	2.00	0.0717	20
802.11g	11.46	14.00		0.0044	
802.11n_HT20	10.48	11.17		0.0035	
802.11n_HT40	6.78	4.76		0.0015	

ANT : 2 Spatial Streams (2.4GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	13.91	24.60	5.01	0.0155	20
802.11n_HT20	13.04	20.14		0.0127	
802.11n_HT40	9.68	9.29		0.0059	

ANT : 3 Spatial Streams (2.4GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	15.87	38.64	6.77	0.0365	20
802.11n_HT20	14.84	30.48		0.0288	
802.11n_HT40	11.40	13.80		0.0131	



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ANT : Single Streams (5GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	17.39	54.83	2.00	0.0173	20
802.11n_HT20	16.65	46.24		0.0146	
802.11n_HT40	15.91	38.99		0.0123	
802.11ac_VHT20	17.32	53.95		0.0170	
802.11ac_VHT40	15.86	38.55		0.0122	
802.11ac_VHT80	15.44	34.99		0.0110	

ANT : 2 Spatial Streams (5GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	19.96	99.08	5.01	0.0625	20
802.11n_HT20	19.32	85.51		0.0539	
802.11n_HT40	18.70	74.13		0.0467	
802.11ac_VHT20	20.06	101.39		0.0639	
802.11ac_VHT40	18.67	73.62		0.0464	
802.11ac_VHT80	18.39	69.02		0.0435	

ANT : 3 Spatial Streams (5GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	21.88	154.17	6.77	0.1458	20
802.11n_HT20	21.13	129.72		0.1227	
802.11n_HT40	20.21	104.95		0.0992	
802.11ac_VHT20	21.82	152.05		0.1438	
802.11ac_VHT40	20.24	105.68		0.0999	
802.11ac_VHT80	19.99	99.77		0.0943	

ANT : 4 Spatial Streams (5GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	22.90	194.98	8.02	0.2459	20
802.11n_HT20	22.22	166.72		0.2102	
802.11n_HT40	21.42	138.68		0.1749	
802.11ac_VHT20	22.89	194.54		0.2453	
802.11ac_VHT40	21.43	139.00		0.1753	
802.11ac_VHT80	21.11	129.12		0.1628	



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Multiple chain transmitters (2.4 GHz + 5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	EIRP (mW)	S (mW/cm ²)	R (cm)
2.4 GHz	15.87	38.64	6.77	183.65		
5 GHz	22.90	194.98	8.02	1235.95		
Combined				1419.60	0.4476	20