



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

CTK Co., Ltd.

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RF EXPOSURE EVALUATION

Applicant : Samsung Electronics Co., Ltd.

Applicant Address : 129, Samsung-ro Yeongtong-gu, Suwon-si,
Gyeonggi-do, Korea, 16677

Kind of Product : WLAN Access Point

**Equipment
model name** : WEA524i

Antenna type : IFA Antenna(ANT 0), Dipole Antenna(ANT 1, 2, 3)

*** Antenna Gain** : 3.2 dBi(Ant0), 5.6 dBi(Ant1, 2, 3) @2.4GHz
4.2 dBi(Ant0), 6.7 dBi(Ant1, 2, 3) @5GHz

* * MPE Calculations * *

The EUT will only be used with a separation of 50 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:

$\text{EIRP} = P + G$	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/cm²) 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 (50cm = limit for MPE)
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The Maximum permissible exposure (MPE) for the general population is 1 mW/cm².
The power density at 50cm 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 (50cm = limit for MPE)
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ANT : Single Streams (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	18.06	63.97	5.6	0.0462	4.30
802.11g	14.85	30.55		0.0284	3.37
802.11n HT20	13.72	23.55		0.0219	2.96

ANT : 2 Spatial Streams (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	17.90	61.66	5.6	0.0445	4.22
802.11n HT20	16.78	47.64		0.0344	3.71

ANT : 3 Spatial Streams (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	19.64	92.04	5.6	0.0665	5.16
802.11n HT20	18.52	71.12		0.0514	4.53

ANT : 4 Spatial Streams (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	20.93	123.88	5.6	0.0895	5.98
802.11n HT20	19.75	94.41		0.0682	5.22

ANT : Single Streams (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	14.86	30.62	6.7	0.0285	3.38
802.11n_HT20	16.43	43.95		0.0409	4.04
802.11n HT40	16.31	42.76		0.0398	3.99
802.11ac_VHT20	16.75	47.32		0.0440	4.20
802.11ac VHT40	16.52	44.87		0.0418	4.09
802.11ac VHT80	14.37	27.35		0.0255	3.19
802.11ac VHT160	15.82	38.19		0.0355	3.77



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ANT : 2 Spatial Streams (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	19.70	93.33	6.7	0.0868	5.89
802.11n_HT20	19.26	84.33		0.0785	5.60
802.11n HT40	19.28	84.72		0.0788	5.62
802.11ac_VHT20	19.57	90.57		0.0843	5.81
802.11ac VHT40	19.50	89.13		0.0829	5.76
802.11ac VHT80	14.89	30.83		0.0287	3.39
802.11ac VHT160	18.48	70.47		0.0656	5.12

ANT : 3 Spatial Streams (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	21.40	138.04	6.7	0.1284	7.17
802.11n_HT20	21.04	127.06		0.1182	6.88
802.11n HT40	21.05	127.35		0.1185	6.88
802.11ac_VHT20	21.28	134.28		0.1249	7.07
802.11ac VHT40	21.19	131.52		0.1224	7.00
802.11ac VHT80	17.65	58.21		0.0542	4.65

ANT : 4 Spatial Streams (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	22.54	179.47	6.7	0.1670	8.17
802.11n_HT20	22.24	167.49		0.1559	7.90
802.11n HT40	22.23	167.11		0.1555	7.89
802.11ac_VHT20	22.42	174.58		0.1625	8.06
802.11ac VHT40	22.31	170.22		0.1584	7.96
802.11ac VHT80	18.27	67.14		0.0625	5.00

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	20.93	123.88	5.6	449.78		
5 GHz	22.54	179.47	6.7	839.46		
Combined				1289.24	0.2565	10.13