



CTK Co., Ltd.
The Prime 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, 443-742

Kind of Product : Access Point

Equipment model name : WEA302i

Antenna type : Dipole antenna

Antenna Gain : [M1/M2] 2412 - 2462 MHz : 4.60 dBi
5180 - 5825 MHz : 6.53 dBi
[A1/A3] 5180 - 5825 MHz : 7.57 dBi
[A5/A7] 2412 - 2462 MHz : 3.91 dBi

**** 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 : A1 (5GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	12.32	7.57	0.019	2.79
802.11an HT20	12.36		0.020	2.80
802.11an HT40	11.19		0.015	2.45

Ant : A3 (5GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	10.50	7.57	0.013	2.26
802.11an HT20	10.54		0.013	2.27
802.11an HT40	10.42		0.013	2.24

Ant : M1 (5GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	8.77	6.53	0.007	1.64
802.11an HT20	8.96		0.007	1.68
802.11an HT40	8.13		0.006	1.53

Ant : M2 (5GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	8.55	6.53	0.006	1.60
802.11an HT20	9.00		0.007	1.69
802.11an HT40	7.76		0.005	1.46



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Ant : A5 (2.4GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	11.70	3.91	0.007	1.70
802.11g	12.21		0.008	1.80
802.11n HT20	12.12		0.008	1.79
802.11n HT40	12.33		0.008	1.83

Ant : A7 (2.4GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	11.81	3.91	0.007	1.72
802.11g	12.20		0.008	1.80
802.11n HT20	12.20		0.008	1.80
802.11n HT40	12.58		0.009	1.88

Ant : M1 (2.4GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	9.07	4.60	0.005	1.36
802.11g	10.40		0.006	1.59
802.11n HT20	10.38		0.006	1.58
802.11n HT40	10.74		0.007	1.65

Ant : M2 (2.4GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	8.70	4.60	0.004	1.30
802.11g	10.34		0.006	1.58
802.11n HT20	10.32		0.006	1.57
802.11n HT40	10.33		0.006	1.57



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Ant : A1+A3 (5GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	14.51	10.58	0.064	5.07
802.11an HT20	14.55		0.065	5.09
802.11an HT40	13.83		0.055	4.69

Ant : M1+M2 (5GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	11.67	9.54	0.026	3.24
802.11an HT20	11.99		0.028	3.36
802.11an HT40	10.96		0.022	2.99

Ant : A5+A7 (2.4GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	14.77	6.92	0.029	3.43
802.11g	15.22		0.033	3.61
802.11n HT20	15.17		0.032	3.59
802.11n HT40	15.47		0.034	3.71

Ant : M1+M2 (2.4GHz)

Mode	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	11.69	7.61	0.017	2.60
802.11g	13.23		0.024	3.11
802.11n HT20	13.18		0.024	3.09
802.11n HT40	13.55		0.026	3.22



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Ant : Multiple chain transmitters

Ant	P (mW)	G (dBi)	EIRP (mW)	S (mW/cm ²)	R (cm)
A1	12.36	7.57	70.63		
A3	10.54	7.57	60.23		
A5	12.33	3.91	30.34		
A7	12.58	3.91	30.95		
M1	8.96	6.53	40.30		
M2	9.00	6.53	40.48		
Combined			272.94	0.054	4.66