



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 : Wi-Fi/BT Transceiver

**Equipment
model name** : WCK720Q

Antenna type : Metal Inverted F Antenna

Antenna Gain : 1.9 dBi @2.4GHz, 3.9 dBi @5GHz

* * 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:

$\text{EIRP} = P + G$	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 (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 : A0 (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	16.08	40.55	1.9	0.0125	2.24
802.11g	14.81	30.27		0.0093	1.93
802.11n HT20	15.21	33.19		0.0102	2.02
802.11n HT40	14.52	28.31		0.0087	1.87

ANT : A1 (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	13.69	23.39	1.9	0.0072	1.70
802.11n HT20	14.49	28.12		0.0087	1.86
802.11n HT40	13.23	21.04		0.0065	1.61

ANT : A0+A1 (2.4 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	18.06	63.97	1.9	0.0197	2.81
802.11n HT20	17.62	57.81		0.0178	2.67
802.11n HT40	16.93	49.32		0.0152	2.47

ANT : A0 (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	15.46	35.16	3.9	0.0172	2.62
802.11n_HT20	15.15	32.73		0.0160	2.53
802.11n HT40	13.94	24.77		0.0121	2.20
802.11ac_VHT20	15.46	35.16		0.0172	2.62
802.11ac_VHT40	13.77	23.82		0.0116	2.16
802.11ac_VHT80	12.41	17.42		0.0085	1.84



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ANT : A1 (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	14.03	25.29	3.9	0.0124	2.22
802.11n_HT20	13.29	21.33		0.0104	2.04
802.11n HT40	11.91	15.52		0.0076	1.74
802.11ac_VHT20	13.14	20.61		0.0101	2.01
802.11ac_VHT40	11.63	14.55		0.0071	1.69
802.11ac_VHT80	10.59	11.46		0.0056	1.50

ANT : A0+A1 (5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11a	17.55	56.89	3.9	0.0278	3.33
802.11n_HT20	17.19	52.36		0.0256	3.20
802.11n HT40	15.91	38.99		0.0190	2.76
802.11ac_VHT20	17.20	52.48		0.0256	3.20
802.11ac VHT40	15.54	35.81		0.0175	2.64
802.11ac VHT80	14.28	26.79		0.0131	2.29

Multiple chain transmitters (2.4 GHz + 5 GHz)

Mode	P (dBm)	P (mW)	G (dBi)	EIRP (mW)	S (mW/cm ²)	R (cm)
5 GHz	15.46	35.16	3.9	86.30		
2.4 GHz	16.08	40.55	1.9	62.81		
Combined				149.11	0.0297	3.44