



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, 16677 Republic of Korea

Kind of Product : Wi-Fi Transceiver

**Equipment
model name** : WDN220M

FCC ID : A3LWDN220M

**Certification
Number IC** : 649E-WDN220M

Antenna type : Metal Antenna

Antenna Gain : ANT0 : 1.83 dBi, ANT1 : 1.67 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 : Single Streams

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11b	19.50	89.13	1.83	0.0270	20
802.11g	18.65	73.28		0.0222	
802.11n HT20	18.26	66.99		0.0203	
802.11n HT40	16.30	42.66		0.0129	

ANT : 2 Spatial Streams

Mode	P (dBm)	P (mW)	G (dBi)	S (mW/cm ²)	R (cm)
802.11g	21.42	138.68	4.76	0.0826	20
802.11n HT20	20.98	125.31		0.0746	
802.11n HT40	19.30	85.11		0.0507	