

FCC §15.407(f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.407(f) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

DTS Band:

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2437	14	25.12	21.99	158.12	35	0.258	1.0
802.11g	2437	14	25.12	22.17	164.82	35	0.269	1.0
802.11n HT20	2412	14	25.12	20.03	100.69	35	0.164	1.0
02.11n HT40	2422	14	25.12	20.58	114.29	35	0.187	1.0

UNII Band:

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11a	5825	14.5	28.18	24.09	256.45	35	0.470	1.0
802.11n HT20	5755	14.5	28.18	24.07	255.27	35	0.468	1.0
802.11n HT40	5795	14.5	28.18	23.71	234.96	35	0.430	1.0

According to KDB 447498 D01 General RF exposure guidance v05r02, EUT has 5GHz and 2.4GHz transmitting simultaneously. So the sum of MPE ratio for four antennas is 0.737 which is less than 1.0, So the collocation exposure exclusion applies.

Result: The device meet FCC MPE at 35 cm distance.