Product Service

MPE Calculation

Applicant: Fujian Ruijie Networks Co., Ltd.
Address: 19#Building, Juyuanzhou Industrial Park, No.618 Jinshan Avenue, Cangshan District, Fuzhou
Product: Wireless Access Point
Model No.: RG-AP220-E, RG-AP220-SE

According to subpart 15.407(f)and subpart §1.1307(b)(1), §2.1091, §2.1093systems 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/cm2)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	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:

1) For Operation frequency band: 2412-2462MHz:

Maximum peak output power at antenna input terminal (dBm):	23.91
Maximum peak output power at antenna input terminal (mW):	246.0
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
The worst case is power density at predication frequency at 20 cm (mW/cm2):	0.097
MPE limit for general population exposure at prediction frequency (mW/cm2):	1.0

0.097 (mW/cm2) < 1 (mW/cm2)

Result: Compliant

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2) For Operation frequency band: 5180-5240MHz:

Maximum peak output power at antenna input terminal (dBm):	16.41
Maximum peak output power at antenna input terminal (mW):	43.752
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
The worst case is power density at predication frequency at 20 cm (mW/cm2):	0.0174
MPE limit for general population exposure at prediction frequency (mW/cm2):	1.0

0.0174 (mW/cm2) < 1 (mW/cm2)

Result: Compliant

3) For Operation frequency band: 5745-5825MHz:

Maximum peak output power at antenna input terminal (dBm):	26.05
Maximum peak output power at antenna input terminal (mW):	402.717
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
The worst case is power density at predication frequency at 20 cm (mW/cm2):	0.2404
MPE limit for general population exposure at prediction frequency (mW/cm2):	1.0

0.2404 (mW/cm2) < 1 (mW/cm2)

Result: Compliant

Remark:
The only difference between two models is that RG-AP220-E has two same radio modules, RG-AP220-SE only has one radio module. So estimation of exposure of human to electromagnetic fields is applied on RG-AP220-E, RG-AP220-SE is deemed to fulfill relevant requirement without further estimation.

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Reviewed by:

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