

FCC ID: 2ALP4-NST101W RF Exposure Report

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091 & KDB 447498 D01 General RF Exposure Guidance v06

Requirements

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 levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

MPE Calculation Method

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = output power 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)

From the peak EUT RF output power, the minimum mobile separation distance, R=20cm, as well as the gain of the used antenna, the RF power density can be obtained

For Wi-Fi Transmitter Module:

Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum conducted peak output power (dBm)	Maximum conducted peak output power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Result
1.0	1.259	15.58	36.14	0.0091	1	Compliance

For Z-wave Transmitter Module:

Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum output power (dBm)	Maximum output power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Result
-3.74	0.42	-2.30	0.59	0.000049	1	Compliance

Note: the following is maximum output power Calculation:

Frequency	maximum output power	Substituted (0dBm)	maximum output power
(MHz)	(dBμV/m)	(dBμV/m)	(dBm)
908.42	92.90	95.20	-2.30

For RTS Transmitter:

Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum output power (dBm)	Maximum output power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Result
-8.0	0.16	-13.84	0.041	0.0000013	1	Compliance

Note: the following is maximum output power Calculation:

Frequency	maximum output power	Substituted (0dBm)	maximum output power
(MHz)	(dBμV/m)	(dBμV/m)	(dBm)
433.42	81.36	95.20	-13.84

For Wi-Fi Transmitter Module and Z-wave Transmitter Module and RTS Transmitter simultaneous emissions:

Power Density ratio for Wi-Fi (%)	Power Density ratio for Z-wave(%)	Power Density ratio for RTS(%)	Power Density ratio for simultaneous emissions(%)	Limit of Power Density ratio(%)	Result
0.91	0.0049	0.00013	0.915	100	Compliance