RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

MPE Calculation Method

E (V/m) = $\frac{\sqrt{30 * P * G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = Average RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 * P * G}{377 * D^2}$

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

MAX OUTPUT POWER

WIFI

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	802.11b	2412	13.61	0	13.61	30	Pass
NVNT	802.11b	2437	13.69	0	13.69	30	Pass
NVNT	802.11b	2462	13.93	0	13.93	30	Pass
NVNT	802.11g	2412	12.84	0	12.84	30	Pass
NVNT	802.11g	2437	12.98	0	12.98	30	Pass
NVNT	802.11g	2462	13.12	0	13.12	30	Pass
NVNT	802.11n(HT20)	2412	12.71	0	12.71	30	Pass
NVNT	802.11n(HT20)	2437	12.78	0	12.78	30	Pass
NVNT	802.11n(HT20)	2462	13.08	0	13.08	30	Pass
NVNT	802.11n(HT40)	2422	11.69	0	11.69	30	Pass
NVNT	802.11n(HT40)	2437	11.72	0	11.72	30	Pass
NVNT	802.11n(HT40)	2452	11.95	0	11.95	30	Pass

Measurement Result

Operation Frequency: WIFI: 2412-2462MHz for 802.11b/g/11n(HT20); 2422-2452MHz for 802.11n(HT40);
Power density limited: 1mW/ cm^2
Antenna Type: External Antenna
Antenna gain:3 dBi,
R=20cm
WIFI:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	(dBi)	Numeric		
2412	802.11b	13.61	13±1	14	25.119	3.00	2.00	0.0100	1
2437		13.69	13±1	14	25.119	3.00	2.00	0.0100	1
2462		13.93	13±1	14	25.119	3.00	2.00	0.0100	1
2412	802.11g	12.84	13±1	14	25.119	3.00	2.00	0.0100	1
2437		12.98	13±1	14	25.119	3.00	2.00	0.0100	1
2462		13.12	13±1	14	25.119	3.00	2.00	0.0100	1
2412	802.11n HT20	12.71	13±1	14	25.119	3.00	2.00	0.0100	1
2437		12.78	13±1	14	25.119	3.00	2.00	0.0100	1
2462		13.08	13±1	14	25.119	3.00	2.00	0.0100	1
2412	802.11n HT40	11.69	11±1	12	15.849	3.00	2.00	0.0063	1
2437		11.72	11±1	12	15.849	3.00	2.00	0.0063	1
2452		11.95	11±1	12	15.849	3.00	2.00	0.0063	1

Conclusion:
For the max result : 0.0100≤ 1.0 for Max Power Density, compliance RF exposure.

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Signature: **Date:** 2019-07-15

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