



RF Exposure Evaluation

Limits

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 Exposures				
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
300–1500			f/300	6
1500–100,000			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
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

Friis transmission formula: $Pd = (P_{out} * G) / (4 * \pi * r^2)$

Where

Pd = power density in mW/cm², **P_{out}** = output power to antenna in mW;

G = gain of antenna in linear scale, **Pi** = 3.1416;

R = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



Test Result of RF Exposure Evaluation

SISO ANT A								
Mode	Frequency (MHz)	Peak Output Power (dBm)	Tune UP tolerance (dBm)	Max Tune UP power (dBm)	Max Tune UP power (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
802.11a	5825	16.524	17.5+0/-2	17.5	56.23	0.077396	1.0	PASS
802.11n20	5825	17.500	17.5+0/-2	17.5	56.23	0.077396	1.0	PASS
802.11n40	5795	15.722	17.5+0/-2	17.5	56.23	0.077396	1.0	PASS
802.11ac20	5825	17.404	17.5+0/-2	17.5	56.23	0.077396	1.0	PASS
802.11ac40	5795	15.804	17.5+0/-2	17.5	56.23	0.077396	1.0	PASS
802.11ac80	5775	15.527	17.5+0/-2	17.5	56.23	0.077396	1.0	PASS
SISO ANT B								
802.11a	5745	16.453	16.5+0/-2	16.5	44.67	0.042729	1.0	PASS
802.11n20	5745	15.891	16.5+0/-2	16.5	44.67	0.042729	1.0	PASS
802.11n40	5755	14.968	16.5+0/-2	16.5	44.67	0.042729	1.0	PASS
802.11ac20	5745	15.682	16.5+0/-2	16.5	44.67	0.042729	1.0	PASS
802.11ac40	5755	14.809	16.5+0/-2	16.5	44.67	0.042729	1.0	PASS
802.11ac80	5775	14.176	16.5+0/-2	16.5	44.67	0.042729	1.0	PASS
MIMO ANT A+B								
802.11n20	5825	17.289	17.5+0/-2	17.5	56.23	0.129933	1.0	PASS
802.11n40	5795	15.590	17.5+0/-2	17.5	56.23	0.129933	1.0	PASS
802.11ac20	5825	17.103	17.5+0/-2	17.5	56.23	0.129933	1.0	PASS
802.11ac40	5795	15.617	17.5+0/-2	17.5	56.23	0.129933	1.0	PASS
802.11ac80	5775	15.858	17.5+0/-2	17.5	56.23	0.129933	1.0	PASS

Antenna is SISO ANT A is 8.40dBi, B is 6.82dBi and MIMO ANT A+B is 10.65dBi

All model has been tested, only the worst-case data has been evaluated.