

1. Maximum Permissible Exposure

1.1 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

MPE Calculation Method

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

E = Electric field (V/m)

P = Peak 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

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak 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.

1.2. Test Procedure

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

1.3. Test Result

Frequency (MHz)	Antenna	Output power to antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
5190	1	11.16863	0.003521437	1.0	PASS
	2	11.04079	0.003481127	1.0	PASS
	3	11.83042	0.003730095	1.0	PASS
	4	12.13389	0.003825779	1.0	PASS
5230	1	9.057326	0.002855748	1.0	PASS
	2	9.289664	0.002929004	1.0	PASS
	3	9.332543	0.002942523	1.0	PASS
	4	9.885531	0.003116879	1.0	PASS
5755	1	9.099133	0.00286893	1.0	PASS
	2	9.484185	0.002990335	1.0	PASS
	3	9.616123	0.003031935	1.0	PASS
	4	9.954054	0.003138484	1.0	PASS
5795	1	8.511380	0.002683613	1.0	PASS
	2	8.830799	0.002784325	1.0	PASS
	3	9.162205	0.002888816	1.0	PASS
	4	9.638290	0.003038925	1.0	PASS
5835	1	7.311391	0.002305260	1.0	PASS
	2	7.655966	0.002413904	1.0	PASS
	3	7.798301	0.002458781	1.0	PASS
	4	7.979947	0.002516054	1.0	PASS

Sum output power:

Frequency (MHz)	Sum Output power to antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
5190	46.1737227	0.014558439	1.0	PASS
5230	37.5650638	0.011844154	1.0	PASS
5755	38.1534943	0.012029684	1.0	PASS
5795	36.1426745	0.011395679	1.0	PASS
5835	30.7456049	0.009693999	1.0	PASS

Remark: antenna gain=2.0dBi