

RF Exposure

MPE Calculation

KDB 447498

Prediction of MPE limit at a given distance

Equation from IEEE C95.1

$$S = \frac{EIRP}{4\pi R^2} \text{ re - arranged } R = \sqrt{\frac{EIRP}{S 4\pi}}$$

where:

S = power density

R = distance to the centre of radiation of the antenna

EIRP = EUT Maximum power

Note:

The EIRP was calculated by addition of the maximum conducted carrier power plus the maximum directional antenna gain (determined as per kdb 662911)

Result

Modulation: 802.11a						
Prediction Frequency (MHz)	Maximum Conducted Power (mW)	Antenna Gain (dBi)	Maximum EIRP (mW)	Power density at distance (mW/cm ²)	Minimum Distance (cm)	Power density limit (S) (mW/cm ²)
5180	233.42	8.73	1743.37	0.34683	20	1
5200	254	8.22	1685.79	0.33538	20	1
5240	204.11	8.42	1417.56	0.28201	20	1
5745	182.95	8.20	1207.46	0.24022	20	1
5785	138.79	8.34	947.80	0.18856	20	1
5825	161.81	8.49	1144.14	0.22762	20	1

Modulation: 802.11ac VHT20						
Prediction Frequency (MHz)	Maximum Conducted Power (mW)	Antenna Gain (dBi)	Maximum EIRP (mW)	Power density at distance (mW/cm ²)	Minimum Distance (cm)	Power density limit (S) (mW/cm ²)
5180	132.57	8.73	990.14	0.19698	20	1
5200	179.65	8.22	1192.33	0.23721	20	1
5240	168.81	8.42	1172.39	0.23324	20	1
5745	132.57	8.20	874.95	0.17407	20	1
5785	179.65	8.34	1226.83	0.24407	20	1
5825	168.81	8.49	1193.64	0.23747	20	1

Modulation: 802.11ac VHT40						
Prediction Frequency (MHz)	Maximum Conducted Power (mW)	Antenna Gain (dBi)	Maximum EIRP (mW)	Power density at distance (mW/cm ²)	Minimum Distance (cm)	Power density limit (S) (mW/cm ²)
5190	115.92	8.73	865.79	0.17224	20	1
5210	542.21	8.42	3768.49	0.74972	20	1
5755	93.71	8.2	619.14	0.12317	20	1
5795	200.43	8.49	1415.67	0.28164	20	1

Modulation: 802.11ac VHT80						
Prediction Frequency (MHz)	Maximum Conducted Power (mW)	Antenna Gain (dBi)	Maximum EIRP (mW)	Power density at distance (mW/cm ²)	Minimum Distance (cm)	Power density limit (S) (mW/cm ²)
5210	87.26	8.22	579.18	0.11522	20	1
5775	38.39	8.34	261.95	0.05211	20	1