16 RF Exposure

KDB 447498

Prediction of MPE limit at a given distance

Equation from IEEE C95.1

$$S = \frac{EIRP}{4\pi R^2}$$

Where:

S = power density
R = distance to the centre of radiation of the antenna
EIRP = EUT Maximum power

The EIRP was calculated by addition of the maximum conducted carrier power plus the maximum directional antenna gain. The directional gain of antenna was calculated as per KDB 662911 D01 Multiple Transmitter Output v02r01

Directional gain = GANT + Array Gain
Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4

Results:

Modulation: 802.11a						
Frequency (MHz)	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (mW)	Minimum Distance (cm)	Power density at distance (mW/cm^2)	Power density limit (S) (mW/cm^2)
5180	13.61	4.2	60.4	20.0	0.012	1
5260	17.27	4.0	134.0	20.0	0.027	1
5320	16.37	3.8	104.0	20.0	0.021	1
5500	16.56	4.3	121.9	20.0	0.024	1
5620	17.37	4.3	146.9	20.0	0.029	1
5720	16.67	4.1	119.4	20.0	0.024	1
5745	16.52	4.6	129.4	20.0	0.026	1
5785	16.41	4.6	126.2	20.0	0.025	1
5825	16.46	4.9	136.8	20.0	0.027	1

Modulation: 802.11n HT20						
Frequency (MHz)	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (mW)	Minimum Distance (cm)	Power density at distance (mW/cm^2)	Power density limit (S) (mW/cm^2)
5180	13.93	4.2	65.0	20.0	0.013	1
5260	17.27	4.0	134.0	20.0	0.027	1
5320	16.12	3.8	98.2	20.0	0.020	1
5500	17.31	4.3	144.9	20.0	0.029	1
5620	17.07	4.3	137.1	20.0	0.027	1
5720	16.76	4.1	121.9	20.0	0.024	1
5745	16.46	4.6	127.6	20.0	0.025	1
5785	16.46	4.6	127.6	20.0	0.025	1
5825	16.41	4.9	135.2	20.0	0.027	1

Modulation: 802.11n HT40						
Frequency (MHz)	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (mW)	Minimum Distance (cm)	Power density at distance (mW/cm^2)	Power density limit (S) (mW/cm^2)
5190	14.02	4.2	66.4	20.0	0.013	1
5270	17.71	4.0	148.3	20.0	0.029	1
5310	15.72	4.0	93.8	20.0	0.019	1
5510	14.51	4.3	76.0	20.0	0.015	1
5630	17.82	4.3	162.9	20.0	0.032	1
5710	17.16	4.1	133.7	20.0	0.027	1
5755	16.87	4.6	140.3	20.0	0.028	1
5795	16.81	4.9	148.3	20.0	0.029	1

Modulation: 802.11ac VHT80						
Frequency (MHz)	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (mW)	Minimum Distance (cm)	Power density at distance (mW/cm^2)	Power density limit (S) (mW/cm^2)
5210	14.14	4.2	68.2	20.0	0.014	1
5290	14.97	4.0	78.9	20.0	0.016	1
5530	13.91	4.3	66.2	20.0	0.013	1
5610	16.17	4.3	111.4	20.0	0.022	1
5690	15.81	4.1	97.9	20.0	0.019	1
5775	15.71	4.9	115.1	20.0	0.023	1