FCC §15.247 (i), §2.1091 – RF Exposure

FCC ID: 2AN9Q-1000

Applied procedures / limit

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

Note: *f* is frequency in MHz

* = Power density limit is applicable at frequencies greater than 100 MHz

Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz

* = Plane-wave equivalent power density

MPE PREDICTION

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna,R=20cm

Test Result of RF Exposure Evaluation

	Target power W/ tolerance (dBm)	Max tune up power tolerance (dBm)	Total Output power to antenna (mW)	Antenna Gain(dBi)	Total Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
GPRS850	33±1.0	34	2511.89	0 (1.0)	0.499978	0.549	Pass
EGPRS850	27±1.0	28	630.96	0 (1.0)	0.125589	0.549	Pass
GPRS1900	28±1.0	29	794.33	0 (1.0)	0.158107	1.000	Pass
EGPRS1900	24±1.0	25	316.23	0 (1.0)	0.062944	1.000	Pass
WCDMA	23±1.0	24	251.19	0 (1.0)	0.049998	1.000	Pass
HSDPA	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
HSUPA	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
802.11b	15±1.0	16	39.81	0 (1.0)	0.007924	1.000	Pass
802.11g	13±1.0	14	25.12	0 (1.0)	0.005	1.000	Pass
GFSK	3±1.0	4	2.51	0 (1.0)	0.0005	1.000	Pass
π/4 DPSK	2±1.0	3	2.00	0 (1.0)	0.000398	1.000	Pass
8DPSK	2±1.0	3	2.00	0 (1.0)	0.000398	1.000	Pass
GFSK(BLE)	-1±1.0	0	1.00	0 (1.0)	0.000199	1.000	Pass
GPRS850+BT	33±1.0	34	2511.89	0 (1.0)	0.499978	0.549	Pass
EGPRS850+ BT	27±1.0	28	630.96	0 (1.0)	0.125589	0.549	Pass
GPRS1900+ BT	28±1.0	29	794.33	0 (1.0)	0.158107	1.000	Pass
EGPRS1900+ BT	24±1.0	25	316.23	0 (1.0)	0.062944	1.000	Pass

WCDMA+BT	23±1.0	24	251.19	0 (1.0)	0.049998	1.000	Pass
HSDPA+BT	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
HSUPA+BT	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
GPRS850+ WIFI	33±1.0	34	2511.89	0 (1.0)	0.499978	0.549	Pass
EGPRS850+ WIFI	27±1.0	28	630.96	0 (1.0)	0.125589	0.549	Pass
GPRS1900+ WIFI	28±1.0	29	794.33	0 (1.0)	0.158107	1.000	Pass
EGPRS1900+ WIFI	24±1.0	25	316.23	0 (1.0)	0.062944	1.000	Pass
WCDMA+ WIFI	23±1.0	24	251.19	0 (1.0)	0.049998	1.000	Pass
HSDPA+WIFI	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
HSUPA+WIFI	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
GPRS850+ Zigbee	33±1.0	34	2511.89	0 (1.0)	0.499978	0.549	Pass
EGPRS850+ Zigbee	27±1.0	28	630.96	0 (1.0)	0.125589	0.549	Pass
GPRS1900+ Zigbee	28±1.0	29	794.33	0 (1.0)	0.158107	1.000	Pass
EGPRS1900+ Zigbee	24±1.0	25	316.23	0 (1.0)	0.062944	1.000	Pass
WCDMA+ Zigbee	23±1.0	24	251.19	0 (1.0)	0.049998	1.000	Pass
HSDPA+ Zigbee	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass
HSUPA+ Zigbee	22±1.0	23	199.53	0 (1.0)	0.039715	1.000	Pass