

RF Exposure information

Calculations can be made to predict RF field strength and power density levels around typical RF sources using the general equations (3) and (4) on page 19 of the following FCC document:
“OET Bulletin 65, Edition 97-01 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”.

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2 \quad (3)$$

Where S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units e.g. mW)

G = power gain of the antenna in the direction of interest relative to the isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units e.g. cm)

or,
$$S = EIRP/4\pi R^2 \quad (4)$$

Where $EIRP$ = Equivalent Isotropically radiated power

General Limits:

§1.1310 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(B) Limits for General Population/Uncontrolled Exposure

300–1500 MHz: $f/1500$ mW/cm²

1500–100,000 MHz: 1.0 mW/cm²

Prediction for Part 22

Maximum radiated power EIRP: 31.29 dBm (1346 mW) @ 824.2MHz

Lowest limit for 850 MHz fixed operations (@20cm) where no routine evaluation is required is § 1.1310:

$(f/1500)\text{mW/cm}^2 = 0.55 \text{ mW/cm}^2$

Calculated at distance of 20cm for reference antenna:

Power density $= 1346 / (4 \times \pi \times 20^2) = 0.268 \text{ mW/cm}^2$

Result: Configuration complies with rules as power density is below MPE limit.

Prediction for Part 24

Maximum radiated power EIRP: 29.94 dBm (986mW) @ 1909.8MHz

Lowest limit for 1900 MHz fixed operations (@20cm) where no routine evaluation is required is § 1.1310:

1 mW/cm²

Calculated at distance of 20cm:

Power density $= 986 / (4 \times \pi \times 20^2) = 0.196 \text{ mW/cm}^2$

Result: Configuration complies with rules as power density is below MPE limit.

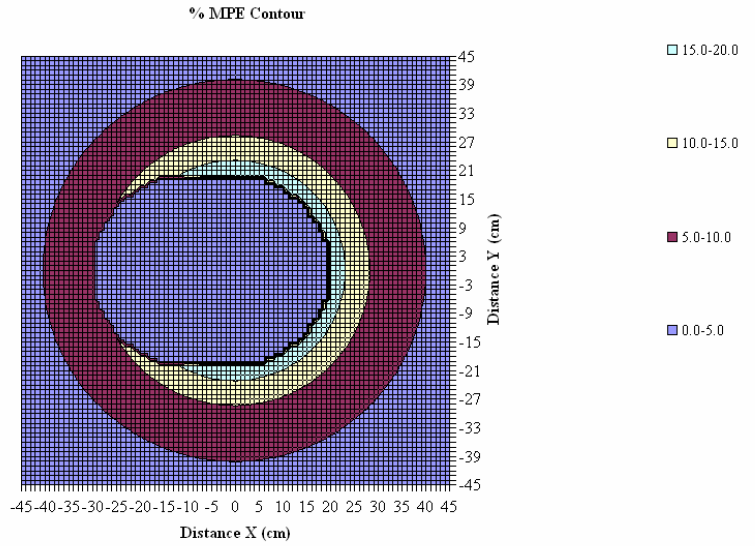
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4393B-I210GPRS

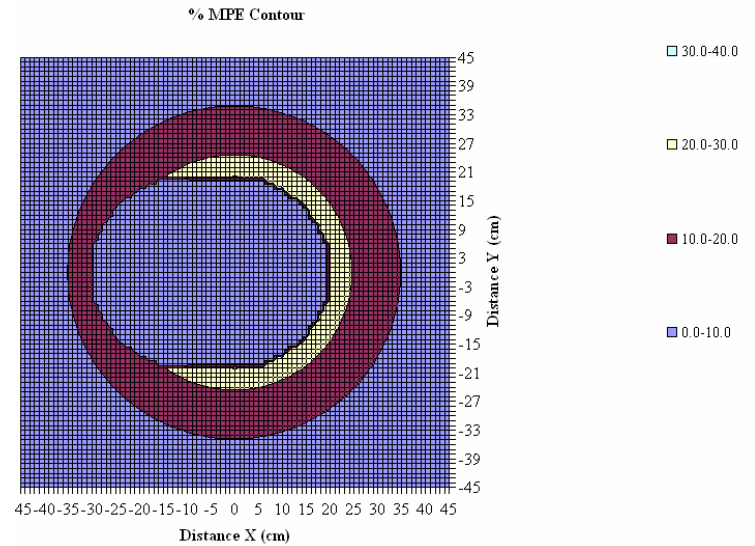


Simultaneous Transmission

Antenna No.		Total	1	2
Tx Status			On	On
Frequency	MHz		1910	2430
MPE Limit	mW/cm ²		1.00	1.00
Max % MPE	%	20.0	19.6	0.5
Power	(W)	1.032	1.000	0.032
Antenna Gain	dBi		0.06	1.43
EIRP	(W)	1.01	0.986	0.023
X	(cm)		0.0	-10.0
Y	(cm)		0.0	0.0
Sector			FALSE	FALSE
Arc			FALSE	FALSE



Antenna No.		Total	1	2
Tx Status			On	On
Frequency	MHz		824	2430
MPE Limit	mW/cm ²		0.55	1.00
Max % MPE	%	30.2	29.8	0.5
Power	(W)	2.032	2.000	0.032
Antenna Gain	dBi		3.85	1.43
EIRP	(W)	0.85	0.824	0.023
X	(cm)		0.0	-10.0
Y	(cm)		0.0	0.0
Sector			FALSE	FALSE
Arc			FALSE	FALSE



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Marc Douat
Test Lab Manager