## 13 MAXIMUM PERMISSIBLE EXPOSURE（MPE）

## 13．1 Standard Applicable

According to $\S 1.1307(\mathrm{~b})(1)$ ，systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Com－ mission＇s guideline．

This is a Mobile device，the MPE is required．

According to $\S 1.1310$ and $\S 2.1093$ RF exposure is calculated．

Limits for Maximum Permissive Exposure（MPE）

| Frequency Range <br> $(\mathrm{MHz})$ | Electric Field <br> Strength $(\mathrm{V} / \mathrm{m})$ | Magnetic Field <br> Strength $(\mathrm{A} / \mathrm{m})$ | Power Density <br> $\left(\mathrm{mW} / \mathrm{cm}^{2}\right)$ | Averaging Time <br> $($ minute $)$ |
| :---: | :---: | :---: | :---: | :---: |
| Limits for General Population／Uncontrolled Exposure |  |  |  |  |
| $0.3-1.34$ | 614 | 1.63 | $*(100)$ | 30 |
| $1.34-30$ | $824 / \mathrm{f}$ | $2.19 / \mathrm{f}$ | $*\left(180 / \mathrm{f}^{2}\right)$ | 30 |
| $30-300$ | 27.5 | 0.073 | 0.2 | 30 |
| $300-1500$ | $/$ | $/$ | $\mathrm{F} / 1500$ | 30 |
| $1500-15000$ | $/$ | $/$ | 1.0 | 30 |

$\mathrm{F}=$ frequency in MHz
＊＝Plane－wave equipment power density

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## 13．2 Maximum Permissible Exposure（MPE）Evaluation

| Frequency <br> （MHz） | Output Power <br> $\mathbf{( d B m})$ | Output Power <br> $\mathbf{( W )}$ | Limit <br> （W） |
| :---: | :---: | :---: | :---: |
| 2405 | -1.09 | 0.0008 | 1 |
| 2440 | $-\mathbf{0 . 7 6}$ | 0.0008 | 1 |
| 2480 | -7.19 | 0.0002 | 1 |

Prediction of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65，Edition 97－01
$S=P G / 4 \pi R^{2}$
Where： $\mathrm{S}=$ Power density
P＝Power input to antenna
$\mathrm{G}=$ Power gain of the antenna in the direction of interest relative to an isotropic radiator
$\mathrm{R}=$ Distance to the center of radiation of the antenna

| Maximum peak output power at antenna input terminal： | -0.76 | $(\mathrm{dBm})$ |
| ---: | :--- | :--- |
| Maximum peak output power at antenna input terminal： | 0.839459987 | $(\mathrm{~mW})$ |
| Duty cycle： | 100 | $(\%)$ |
| Maximum Pav ： | 0.839459987 | $(\mathrm{~mW})$ |
| Antenna gain（Peak）： | 2 | $(\mathrm{dBi})$ |
| Antenna gain（linear）： | 1.584893192 | $(\mathrm{numeric})$ |
| Prediction distance： | 20 | $(\mathrm{~cm})$ |
| Prediction frequency： | 2440 | $(\mathrm{MHz})$ |
| MPE limit for uncontrolled exposure at prediction | 1 |  |
| Power density at predication frequency at 20 $(\mathrm{cm})$ | 0.0002648 | $(\mathrm{~mW} / \mathrm{cm} \wedge 2)$ |

## Measurement Result

The predicted power density level at 20 cm is $0.0002648 \mathrm{~mW} / \mathrm{cm}^{2}$ ．This is below the uncontrolled ex－ posure limit of $1 \mathrm{~mW} / \mathrm{cm}^{2}$ at 2440 MHz ．

