

MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to §1.1307(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 Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

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

F = frequency in MHz

* = Plane-wave equipment power density

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Maximum Permissible Exposure (MPE) Evaluation

802.11b Power Table

| Frequency (MHz) | Reading Power (dBm) | Cable Loss | Output Power (dBm) | Output Power (W) | Limit (W) |
|-----------------|---------------------|------------|--------------------|------------------|-----------|
| 2412.00 | 18.25 | 0.00 | 18.25 | 0.06683 | 1 |
| 2437.00 | 18.14 | 0.00 | 18.14 | 0.06516 | 1 |
| 2462.00 | 18.04 | 0.00 | 18.04 | 0.06368 | 1 |

MPE Prediction (802.11b)

Prediction of MPE limit at a given distance

Equation from page 18 of 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

| | | |
|--|-------------|-----------------------|
| Maximum peak output power at antenna input terminal: | 18.25 | (dBm) |
| Maximum peak output power at antenna input terminal: | 66.83439176 | (mW) |
| Duty cycle: | 100 | (%) |
| Maximum Pav : | 66.83439176 | (mW) |
| Antenna gain (typical): | 2.88 | (dBi) |
| Maximum antenna gain: | 1.940885878 | (numeric) |
| Prediction distance: | 20 | (cm) |
| Prediction frequency: | 2412 | (MHz) |
| MPE limit for uncontrolled exposure at prediction | 1 | (mW/cm ²) |
| Power density at predication frequency at 20 (cm) | 0.0258197 | (mW/cm ²) |

Measurement Result

The predicted power density level at 20 cm is 0.02582 mW/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2412MHz.

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802.11g Power Table

| Frequency (MHz) | Reading Power (dBm) | Cable Loss | Output Power (dBm) | Output Power (W) | Limit (W) |
|-----------------|---------------------|------------|--------------------|------------------|-----------|
| 2412.00 | 15.18 | 0.00 | 15.18 | 0.03296 | 1 |
| 2437.00 | 18.34 | 0.00 | 18.34 | 0.06823 | 1 |
| 2462.00 | 15.08 | 0.00 | 15.08 | 0.03221 | 1 |

MPE Prediction (802.11g)

Prediction of MPE limit at a given distance

Equation from page 18 of 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

| | | |
|--|-------------|-----------------------|
| Maximum peak output power at antenna input terminal: | 18.34 | (dBm) |
| Maximum peak output power at antenna input terminal: | 68.23386941 | (mW) |
| Duty cycle: | 100 | (%) |
| Maximum Pav : | 68.23386941 | (mW) |
| Antenna gain (typical): | 2.88 | (dBi) |
| Maximum antenna gain: | 1.940885878 | (numeric) |
| Prediction distance: | 20 | (cm) |
| Prediction frequency: | 2437 | (MHz) |
| MPE limit for uncontrolled exposure at prediction | 1 | (mW/cm ²) |
| Power density at predication frequency at 20 (cm) | 0.0263603 | (mW/cm ²) |

Measurement Result

The predicted power density level at 20 cm is 0.02636mW/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2437.

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802.11n_20MHz Power Table

| Frequency (MHz) | Reading Power (dBm) | Cable Loss | Output Power (dBm) | Output Power (W) | Limit (W) |
|-----------------|---------------------|------------|--------------------|------------------|-----------|
| 2412.00 | 15.23 | 0.00 | 15.23 | 0.03334 | 1 |
| 2437.00 | 18.08 | 0.00 | 18.08 | 0.06427 | 1 |
| 2462.00 | 15.18 | 0.00 | 15.18 | 0.03296 | 1 |

MPE Prediction (802.11n_20M)

Prediction of MPE limit at a given distance

Equation from page 18 of 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

| | | |
|--|-------------|-----------------------|
| Maximum peak output power at antenna input terminal: | 18.08 | (dBm) |
| Maximum peak output power at antenna input terminal: | 64.26877173 | (mW) |
| Duty cycle: | 100 | (%) |
| Maximum Pav : | 64.26877173 | (mW) |
| Antenna gain (typical): | 2.88 | (dBi) |
| Maximum antenna gain: | 1.940885878 | (numeric) |
| Prediction distance: | 20 | (cm) |
| Prediction frequency: | 2437 | (MHz) |
| MPE limit for uncontrolled exposure at prediction | 1 | (mW/cm ²) |
| Power density at predication frequency at 20 (cm) | 0.0248285 | (mW/cm ²) |

Measurement Result

The predicted power density level at 20 cm is 0.02483 mW/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2437.

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