

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

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Maximum Permissible Exposure (MPE) Evaluation:**Peak Power Output (dBm)**

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
5736.00	10.90	10.90	0.01230	1
5762.00	10.36	10.36	0.01086	1
5814.00	10.65	10.65	0.01161	1

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MPE Prediction

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:	10.65	(dBm)
Maximum peak output power at antenna input terminal:	11.61448614	(mW)
Duty cycle:	96	(%)
Maximum Pav :	11.14990669	(mW)
Antenna gain (typical):	3	(dBi)
Maximum antenna gain:	1.995262315	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5814	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0044281	(mW/cm ²)

Measurement Result

The predicted power density level at 20 cm is 0.00443 mW/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 5814.

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Simultaneous MPE:

As per KDB 447498 D01, Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density, is ≤ 1.0 .

MPE 1 as obtains in 5.8GHz module transmission: $0.0044281 \text{ mW/cm}^2$

MPE 2 as obtains in Bluetooth transmission: $0.0006144 \text{ mW/cm}^2$, where derivation of the power density can be referred EF/2012/C0011

$\Sigma \text{ MPE ratio} = \text{MPE1/MPE Limit} + \text{MPE2/MPE Limit} = 0.0044281/1 + 0.0006144/1 = 0.0050425$
 $0.0050425 < 1.0$,

Therefore, simultaneous transmission MPE test can be excluded.

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