

RF EXPOSURE

FCC : 2BRSL-S807

1. FCC Regulation

According to §15.247(i), 407(f) 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 levels in excess of the Commission's guidelines.

See § 1.1307(b)(1) of this Chapter.

Limits for Maximum Permissible Exposure: RF exposure is calculated.

Frequency Range	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 ~ 1 500	/	/	f/1 500	30
1 500 ~ 15 000	/	/	1	30

f=frequency in MHz, *= plane-wave equivalent power density

MPE (Maximum Permissible Exposure) Prediction

Predication of MPE limit at a given distance: Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2 \quad (\Rightarrow R = \sqrt{PG/4\pi S})$$

S = power density [mW/cm²]

P = Power input to antenna [mW]

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 [cm]

2. RF Exposure Compliance Issue

The information should be included in the user's manual:

This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter. A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.

MPE Calculations : WLAN2.4G

- Frequency Range : 2412 MHz ~ 2462 MHz
- Measured RF Maximum Output Power : 25.57 dBm
- Target Power & Tolerance 25.00 dBm & $\pm$ 1.00 dB
(Maximum : 26.00 dBm & Minimum : 24.00 dBm)
- Maximum Peak Antenna Gain : 3.00 dBi
- Maximum Output Power for the Calculation : 26.00 dBm

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE Calculations for this exposure is shown below.

- EIRP = P + G = <u>26.00</u> dBm + <u>3.00</u> dBi = <u>29.00</u> dBm = <u>794.33</u> mW	- NOTE P : Max tuneup Power (dBm) G : Maximum Peak Antenna Gain (dBi)
---	--

Power Density at the specific separation

- S = EIRP / (4 X R²π) = 794.33 / (4 X ^2 X π) = <u>0.158 027</u> mW/cm² (Limit : 1.00)	- NOTE S : Maximum Power Density (mW/cm²) EIRP : Equivalent Isotropic Radiated Power (mW) R : Distance to the center of the radiation of the antenna (<u>20</u> cm)
---	--

MPE Calculations : WLAN5G

- Frequency Range : 5180 MHz ~ 5825 MHz
- Measured RF Maximum Output Power : 19.51 dBm
- Target Power & Tolerance 19.50 dBm & $\pm$ 1.00 dB
(Maximum : 20.50 dBm & Minimum : 18.50 dBm)
- Maximum Peak Antenna Gain : 3.50 dBi
- Maximum Output Power for the Calculation : 20.50 dBm

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE Calculations for this exposure is shown below.

- EIRP = P + G = <u>20.50</u> dBm + <u>3.50</u> dBi = <u>24.00</u> dBm = <u>251.19</u> mW	- NOTE P : Max tuneup Power (dBm) G : Maximum Peak Antenna Gain (dBi)
---	--

Power Density at the specific separation

- S = EIRP / (4 X R²π) = 251.19 / (4 X ^2 X π) = <u>0.049 972</u> mW/cm² (Limit : 1.00)	- NOTE S : Maximum Power Density (mW/cm²) EIRP : Equivalent Isotropic Radiated Power (mW) R : Distance to the center of the radiation of the antenna (<u>20</u> cm)
---	--

MPE Calculations : WLAN6G

- Frequency Range : 5955 MHz ~ 7115 MHz
- Measured RF Maximum Output Power : 18.87 dBm
- Target Power & Tolerance 19.00 dBm & $\pm$ 1.00 dB
(Maximum : 20.00 dBm & Minimum : 18.00 dBm)
- Maximum Peak Antenna Gain : 3.50 dBi
- Maximum Output Power for the Calculation : 20.00 dBm

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE Calculations for this exposure is shown below.

- EIRP = P + G = <u>20.00</u> dBm + <u>3.50</u> dBi = <u>23.50</u> dBm = <u>223.87</u> mW	- NOTE P : Max tuneup Power (dBm) G : Maximum Peak Antenna Gain (dBi)
---	--

Power Density at the specific separation

- S = EIRP / (4 X R²π) = <u>223.87</u> / (4 X ^2 X π) = <u>0.044 538</u> mW/cm² (Limit : 1.00)	- NOTE S : Maximum Power Density (mW/cm²) EIRP : Equivalent Isotropic Radiated Power (mW) R : Distance to the center of the radiation of the antenna (<u>20</u> cm)
---	--

MPE Calculations : WLAN2.4G + WLAN5G + WLAN6G

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the
The MPE Calculations for this exposure is shown below.

simultaneous MPE for Wi-Fi

WLAN2.4G + WLAN5G + WLAN6G

- Total (%) = $ \begin{aligned} & [\text{WLAN2.4G Result(mW/cm2)} / \text{Limit(mW/cm2)}] + \\ & [\text{WLAN5G Result(mW/cm2)} / \text{Limit(mW/cm2)}] + \\ & [\text{WLAN6G Result(mW/cm2)} / \text{Limit(mW/cm2)}] * 100 \\ & = [\underline{0.158\ 027} / 1] + \\ & \quad [\underline{0.049\ 972} / 1] + \\ & \quad [\underline{0.044\ 538} / 1] * 100 \\ & = \underline{25.254} \% \end{aligned} $	- NOTE WLAN2.4G + WLAN5G + WLAN6G WLAN2.4G = <u>0.158 027</u> mW/cm2 WLAN5G = <u>0.049 972</u> mW/cm2 WLAN6G = <u>0.044 538</u> mW/cm2 Distance to the center of the radiation of the antenna (<u>20</u> cm) Limit : ≤ 100 %
---	---