

FCC ID: X2U-SHAMU-PCIE

Maximum Permissible Exposure

as specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure

Frequency range (MHz)	Power density (mW/cm ²)
300 – 1,500	f/1500
1,500 – 100,000	1.0

Calculations 850 MHz band (824.7 – 848.31 MHz)

Maximum peak output power at antenna input terminal: 24.67 dBm (~0.293 W)

Predicted distance **R**: 20 cm

Predicted frequency: 824,7 MHz

MPE limit **S**: 0.5498 mW/cm²

Equation OET bulletin 65, page 18, edition 97-01: $S = P \cdot G / (4\pi R^2)$

S = power density

P = power input to the antenna

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

R = distance to the centre of radiation of the antenna

Maximum allowable antenna gain: max **9.74 dBi**

Prediction

The maximum allowable MPE value of 0,5498 mW/cm² will be reached in a distance of 20 cm in case that an antenna with an antenna gain of **9.74 dBi** will be used. This means that the power density levels in a distance of 20 cm are in accordance with the FCC regulations as long as the used antenna has a gain below **9.74 dBi**.

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Frequency range (MHz)	Power density (mW/cm ²)
300 – 1,500	f/1500
1,500 – 100,000	1.0

Calculations 1900 MHz band (1851.25 – 1908.75 MHz)

Maximum peak output power at antenna input terminal: 24.04 dBm (~0.2535 W)

Prediction distance **R**: 20 cm

Prediction frequency: 1880 MHz

MPE limit **S**: 1 mW/cm²

Equation OET bulletin 65, page 18, edition 97-01: $S = P \cdot G / (4\pi R^2)$

S = power density

P = power input to the antenna

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

R = distance to the centre of radiation of the antenna

Maximum allowable antenna gain relating to MPE Limit: **12.97 dBi**

Maximum allowable antenna gain relating to EIRP limit: **8.96 dBi**

Prediction

The maximum allowable MPE value of 1 mW/cm² will be reached in a distance of 20 cm in case that an antenna with an antenna gain of **12.97 dBi** will be used. This means that the power density levels in a distance of 20 cm are in accordance with the FCC regulations as long as the used antenna has a gain below **12.97**. For mobile and portable stations the EIRP is restricted to 2.0 Watts, (§24.232 (c)). Therefore the maximum antenna gain is **8.96 dBi**.

The maximum allowed antenna gain used with the module to comply with all limits is: **8.96 dBi**