MDE_PEIKER_1010

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Maximum Permissible Exposure for product: V1082-x13

Dear Mr. Herold,

please find enclosed your Maximum Permissible Exposure calculations for the ***V1082-x13*** module.

Best regards,

i.A. René Houx

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(Project Manager)

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/cm²)*
300 – 1500	f/1500
1,500 – 100000	1.0

General Comment
Calculations 850 MHz band

Maximum RMS output power at Antenna terminal: 29.63 dBm
(Max RMS Power = 32.64 dBm – 3.01 dBm duty cycle)

Prediction distance R: 20 cm
Prediction frequency: 848.8 MHz

MPE limit S: 0.5659 mW/cm²

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

S = power density
P = power input to the antenna
G = power 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 permissible antenna gain (Table 1B of 47 CFR 1.1310): **4.91 dBi**

Maximum permissible antenna gain for mobile / portable stations: **7.34 dBi**
(Considering 7 Watts ERP FCC 22.931: G=10*log(7000)-33.25+2.14)

Prediction

The maximum allowed MPE value of 0.5659 mW/cm²will be reached in a distance of 20 cm in case that an antenna with an antenna gain of 4.91 dBi is used. Considering the max output power of 7 Watts ERP (FCC §22.931) for mobile stations the maximum antenna gain is 7.34 dBi, which is higher than 4.91 dBi. For mobile and portable stations the antenna gain is limited to 4.91 dBi in accordance to the FCC regulations.

Calculations 1900 MHz band

Maximum Peak output power at Antenna terminal: 27.43 dBm
(Max RMS Power = 30.44 dBm – 3.01 dBm duty cycle)

Prediction distance R: 20 cm
Prediction frequency: 1909.8 MHz

MPE limit S: 1 mW/cm²

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

S = power density
P = power input to the antenna
G = power 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 permissible antenna gain (Table 1B of 47 CFR 1.1310): **9.58 dBi**

Maximum permissible antenna gain for mobile / portable stations: **1.33 dBi**
(Considering 2 Watts EIRP FCC §24.235: G=10*log(2000)-31.68)

Prediction

The maximum allowed 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 9.58 dBi is used. Considering the max output power of 2 Watts EIRP (FCC §24.235) for mobile / portable stations the maximum antenna gain is 1.33 dBi, which is lower than 9.58 dBi. For mobile and portable stations the antenna gain is limited to 1.33 dBi in accordance with the FCC regulations.