MDE_SIEM_0605#HC25

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Maximum Permissible Exposure for product: HC25, FCC ID:QIP-HC25, IC: 7830A-HC25

Dear Liebig,

please find enclosed your Maximum Permissible Exposure calculations for the HC25.

Best Regards

Holger Leutfeld (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

Calculations 850 MHz band

Maximum output power at Antenna terminal 32.30 dBm
(see 7 layers test report MDE_SIEM_0605 _FCCa)
Maximum output power under consideration of the duty cycle effect 26.28 dBm
(MS Class 10, -6.02 dBm)

Prediction distance R: 20 cm
Prediction frequency: 824.20 MHz

MPE limit **S**: 0.5495 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 considering S limit **8.13 dBi**

Maximal permissible antenna gain considering output power limitation of 7 Watts ERP (FCC §22.931).

G=10*log(7000)-32.3+2.15 **8.29 dBi**

Prediction

The maximum allowed MPE value of 0.5495 mW/cm² will be reached in a distance of 20 cm in case that an antenna with an antenna gain of 8.13 dBi is used. Considering the max output power of 7 Watts ERP (FCC §22.913) for mobile stations the maximum antenna gain is 8.29 dBi, which is higher than 8.13 dBi. For mobile stations the antenna gain is limited to 8.13 dBi in accordance to the FCC regulations.

Calculations 1900 MHz band

Maximum peak output power at antenna input terminal: *(see 7 layers test report MDE_SIEM_0605 _FCCb)*	30.00 dBm
Maximum output power under consideration of the duty cycle effect (MS Class 10, -6.02 dBm)	23.08 dBm

Prediction distance **R**: 20 cm
Prediction frequency: 1850.2 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):	**13.03 dBi**
Maximum permissible antenna gain for mobile / portable stations: (Considering 2 Watts EIRP FCC §24.235: G=10*log(2000)-30.00)	**3.01 dBi**

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 13.03 dBi is 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 13.03 dBi. Considering the max output power of 2 Watts EIRP (FCC §24.235) for mobile / portable stations the maximum antenna gain is 3.01 dBi, which is lower than 13.03 dBi. For mobile and portable stations the antenna gain is limited to 3.01 dBi in accordance with the FCC regulations.