4_SIEM_0906_GSM

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Siemens Cellular Engine XT65 – predictions for Maximum Permissible Exposure

Dear Mr. Liebig,

please find our Maximum Permissible Exposure calculations for the GSM module XT65.

Best Regards

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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 – 1,500	f/1500
1,500 – 100,000	1.0

Calculations 850 MHz band

Maximum peak output power at antenna input terminal: 33.4 dBm (2187,76 mW)
(see 7 layers test report 4_SIEM_0406_UMTS_FCCa)

Prediction distance **R**: 20 cm
Prediction frequency: 848,8 MHz

MPE limit **S**: 0.5658 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: **1,1398 dBi**

Prediction

The maximum allowed MPE value of 0.5658 mW/cm²will be reached in a distance of 20 cm in case that an antenna with an antenna gain of 1,1398 dBi would 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 1,1398 dBi.

Calculations 1900 MHz band

Maximum peak output power at antenna input terminal: 29.8 dBm (954,99 mW)
(see 7 layers test report 4_SIEM_0406_GSM_FCCb)

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: **7.2127 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 7,2127 dBi would 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 7,2127 dBi.