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Siemens Cellular Engine XT75 – predictions for Maximum Permissible Exposure

Dear Mr. Liebig,

please find our Maximum Permissible Exposure calculations for the GSM module XT75.

Best Regards

Sven Lüngen

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.