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Model: GE864-QUAD V2
FCC-ID : R3ZRTX3371V2
IC : 1231D-RTX3371V2

Maximum Permissible Exposure calculation

Dear Madams/Sirs,

Please find here our Maximum Permissible Exposure calculations for the GE864-QUAD V2.The GE864-QUAD V2 is a GSM module with is co-located with the Bluetooth transceiver model: RTX3371. (FCC ID: R3ZRTX3371B IC:1231D-RTX3371B)

Best Regards

Patrick Lomax

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 GSM 850 MHz band

Equivalent Isotropic Radiated Power (EIRP):

1737 mW *(Reference: FCC ID:* R3ZRTX3371V2*)*

Prediction distance **R**: 20 cm
Prediction frequency: 850 MHz
Prediction Antenna Gain **G***: 1.4 dBi = 1.32 (numeric)
* including cable loss

MPE limit $\mathbf{S_{limit}}$: 0.566 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

$\mathbf{S_{850}}$ = (1740 x 1.32) / $4\pi(20)^2$ = 0.465 mW/cm²

$$\frac{\mathbf{S_{850}}}{\mathbf{S_{limit}}} = \frac{0.456}{0.566}$$

Calculations GSM 1900 MHz

Equivalent Isotropic Radiated Power (EIRP):

930 mW *(Reference: FCC ID:* R3ZRTX3371V2*)*

Prediction distance **R**: 20 cm
Prediction frequency: 1900 MHz
Prediction Antenna Gain **G**: 1.0 dBi = 1.260 (numeric)

MPE limit $\mathbf{S_{limit}}$: 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

$\mathbf{S_{1900}}$ = (355.63 x 1.260) / $4\pi(20)^2$ = 0.2331 mW/cm²

$$\frac{\mathbf{S_{1900}}}{\mathbf{S_{limit}}} = \frac{0.2331}{1}$$

Calculations Bluetooth

FCC ID: R3ZRTX3371B IC:1231D-RTX3371B

Equivalent Isotropic Radiated Power (EIRP): **4.93 mW**

(Reference: 7Layers AG Test Report: MDE_Tunst_1001_FCCd*)*

Prediction distance **R**: 20 cm
Prediction frequency: 2400 MHz
Prediction Antenna Gain **G**: 5.0 dBi = 3.162 (numeric)

MPE limit $\mathbf{S_{limit}}$: 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

$\mathbf{S_{BT}} = (4.93 \times 3.162) / 4\pi(20)^2 =$ 0.001 mW/cm²

$$\frac{\mathbf{S_{BT}}}{\mathbf{S_{limit}}} = \frac{0.001}{1}$$

Simultaneous Exposure

GSM 850 + Bluetooth

$$\frac{S_{850}}{S_{limit}} + \frac{S_{BT}}{S_{limit}} = \frac{0.456}{0.566} + \frac{0.001}{1} = \underline{0.806} < 1 = \text{Compliant}$$

GSM 1900 + Bluetooth

$$\frac{S_{1900}}{S_{limit}} + \frac{S_{BT}}{S_{limit}} = \frac{0.2331}{1} + \frac{0.001}{1} = \underline{0.041} < 1 = \text{Compliant}$$