Prediction of MPE and ERP/ EIRP

As to the product AFIM5002 made by ZF Friedrichshafen AG, we declare that it complies with the Basic restrictions/Reference levels for electric, magnetic and electromagnetic fields as specified in the following standards:

Nr.	Standard
1	47CFR FCC Part 1 (10-1-13 Edition)
2	RSS-102 (Issue4, March 2010)

The compliance is demonstrated based on the following calculation model assessment:

1. The power density according to far-field model is:

$$S = \frac{PG}{4\pi R^2}$$

where:

S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

2. For single or multiple RF sources, the calculated power density should comply with the following:

$$\sum_{1}^{n} \frac{S_{eqn}}{S_{\lim n}} = \frac{S_{eq1}}{S_{\lim 1}} + \frac{S_{eq2}}{S_{\lim 2}} + \ldots + \frac{S_{eqn}}{S_{\lim n}} \leq 1$$

where:

S_{eqn} = the power density when f is i.
$S_{lim\,n}$ = the reference level requirement for power density when f is i

3. The calculation of the power density or safe distance is:

Note 1	The RF exposure is based on the far-field and the radiation exposure is over-estimated.
Note 2	The maximum output power level is taken into account as a worst case for the purpose of the calculation of power density or safe distance.
Note 3	The minimum antenna feed cable loss (assumed no cable loss) is taken into account as a worst case for the purpose of the calculation of power density or safe distance
Note 4	The maximum antenna radiation exposure orientation and maximum antenna gain is taken into account as a worst case for the purpose of the calculation of power density and safe distance.

Calculation 915 MHz transmitter:

$$S \leq \frac{P \cdot G}{4 \cdot \pi \cdot R^2} = 0.005 \text{ W/m}^2$$

$$\frac{S}{S_{lim}} \leq 0.0005 \text{ (less than 1, complied)}$$

P	=	6 mW (7.6 dBm)
G	=	-3.8 dBi
$EIRP\ (P \cdot G)$	=	2 mW (3.8 dBm)
R	≥	0.20m
S_{lim}	=	10 W/m^2

FCC ID: GDD AFIM-5002
IC: 11057A-AFIM5002

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