

Prediction of MPE and ERP/ EIRP

As to the TT-3711A BGAN satellite terminal made by Thrane & Thrane A/S, we declare that it complies with the Basic restrictions/Reference levels for electric, magnetic and electromagnetic fields as specified in the following standards for a minimum safety distance of **0.6 m**:

Nr.	Standard	Country/Region
1	47CFR FCC Part 1 (10-1-13 Edition)	USA
2	RSS-102 (Issue 4, March 2010)	Canada
3	EN 62311 / ICNIRP Guideline	EU
4	Radiocommunications (Electromagnetic Radiation-Human Exposure) Standard 2003	AUS/NZ

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:

$$\sum_{i=1}^n \frac{S_{eqn}}{S_{limn}} = \frac{S_{eq1}}{S_{lim1}} + \frac{S_{eq2}}{S_{lim2}} + \dots + \frac{S_{eqn}}{S_{limn}} \leq 1$$

where:

S_{eqn} = the power density when f is i .
 S_{limn} = 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 for Inmarsat (frequency band 1626.5 – 1660.5 MHz):

$$S \leq \frac{P \cdot G (EIRP) \cdot t \cdot Dc}{4 \cdot \pi \cdot R^2} = 9.21 \text{ W/m}^2$$

$$\frac{S}{S_{lim}} \leq 0.921 \text{ (less than 1, compliant)}$$

Where:

$$\begin{aligned} EIRP (P \cdot G) &= 33.11 \text{ W} = 15.2 \text{ dBW (45.2 dBm)} \text{ according to test report 1-8390/14-01-05} \\ t &= \text{Tune up tolerance } (\pm 1.0 \text{ dB}) \\ Dc &= \text{---} \\ R &\geq 0.60 \text{ m} \\ S_{lim} &= 10 \text{ W/m}^2 \end{aligned}$$

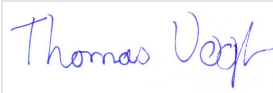
Calculation for WLAN (frequency band 2402 – 2483 MHz) :

$$S \leq \frac{P \cdot G (EIRP) \cdot t \cdot Dc}{4 \cdot \pi \cdot R^2} = 0.0080 \text{ W/m}^2$$

$$\frac{S}{S_{lim}} \leq 0.00080 \text{ (less than 1, compliant)}$$

Where:

$$\begin{aligned} EIRP (P \cdot G) &= 0.029 \text{ W (14.6 dBm)} \text{ according to test report 1-8390/14-01-09} \\ t &= \text{Tune up tolerance } (\pm 1.0 \text{ dB}) \\ Dc &= 1:1 \\ R &\geq 0.60 \text{ m} \\ S_{lim} &= 10 \text{ W/m}^2 \end{aligned}$$

Declaration prepared by:


DN: cn=Thomas Vogler, o=CETECOM ICT
Services GmbH, ou=VOG-100727,
email=thomas.vogler@cetecom.com, c=DE
Datum: 2015.04.23 16:37:45 +02'00'

Thomas Vogler
Professional
Radio Communications & EMC