

407060D

SAILOR 600 Viasat Ka

Near field power density calculation

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1. Scope and Purpose

The scope of this document is to describe the near field power density calculation for the SAILOR 600 Viasat Ka, to determine the safety distance.

1.1. Related Documents

(1) "GRASP technical description" from TICRA

1.2. References

[1] N/A

1.3. Abbreviations

BUC	Block Up Convert
TBD	To Be Defined
TBC	To Be Confirmed

2. Introduction

The near field power density is calculated using GRASP simulation software. The input to the calculation is the antenna dimension of the SAILOR 600 Viasat Ka, BUC power and loss in the RF components and the radome, adjusted to fit measured gain.

2.1. Calculation

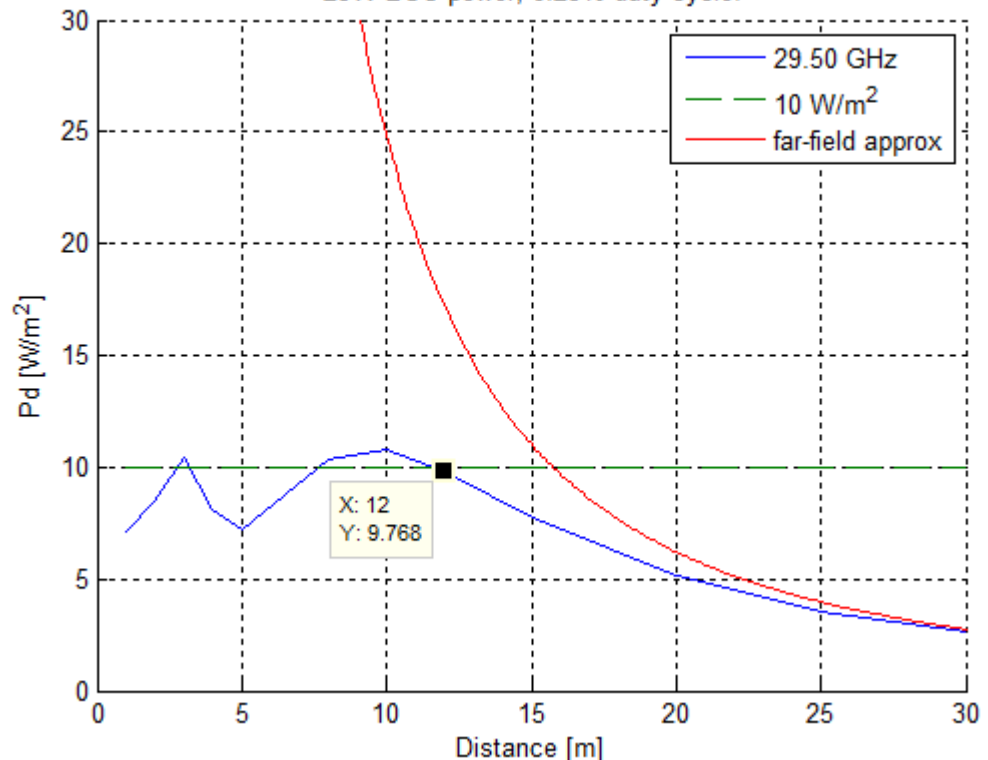
The near field power density is calculated using GRASP simulation software. A series of plane cuts in varying distance from the source are made and for each cut the maximum power flux is found by Poynting's vector. The field is assumed to behave approximately as a plane wave (e.g. an aperture field), and the equation can be used, giving the result in W/m^2

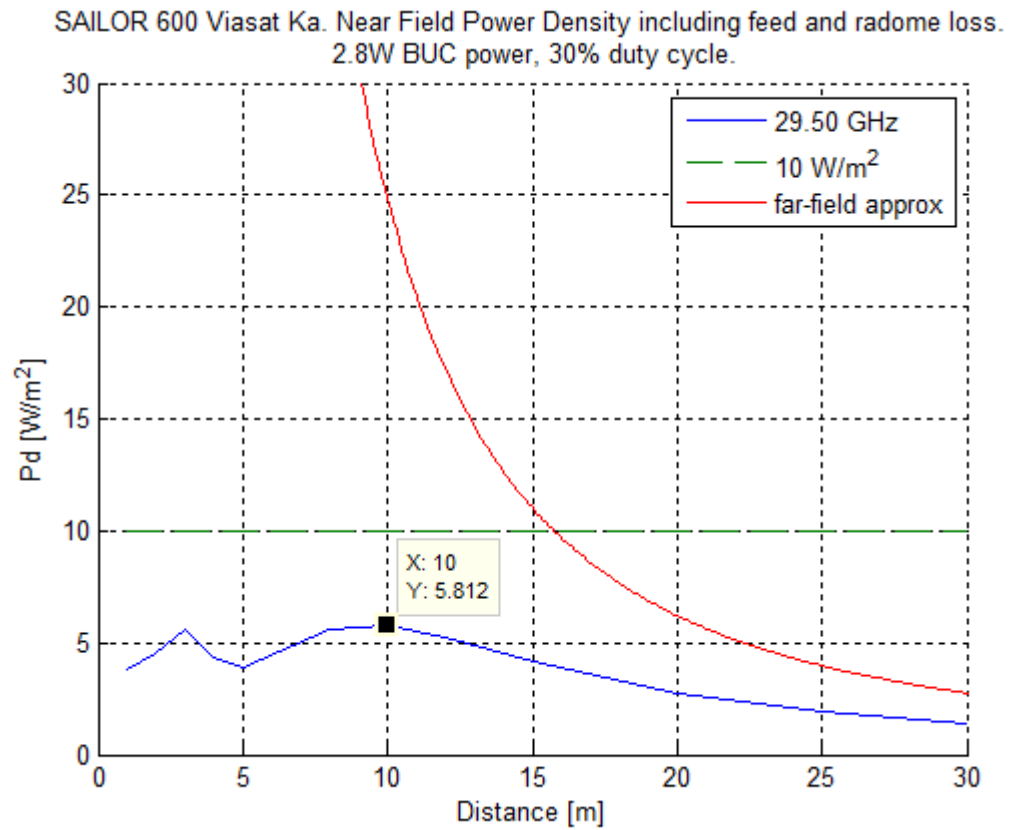
$$\vec{P} = \frac{1}{2} \text{Re}(\vec{E}_{SI} \times \vec{H}_{SI}^*)$$

Loss of the radome and feed network are added to fit measured gain. Chapter 4.1 in "GRASP technical description" from TICRA was used for this calculation. <http://www.ticra.com/>

The safety distance is found when the power density is lower than $10 W/m^2$ ($1mW/cm^2$). The calculation is made across the frequency band 27.5 – 31 GHz and the highest value is shown in the graphs below.

SAILOR 600 Viasat Ka. Near Field Power Density including feed and radome loss.
25W BUC power, 6.25% duty cycle.





2.2. Conclusion

The safe distance of the S600 Viasat Ka is **12** meters, with a 25 W BUC and 6.25 % duty cycle.

For a 2.8W BUC 30% duty cycle the safety distance is **0** meters.