Calculation: RF-Exposure for 24 GHz transmitter

Type identification: **RMS320-343300**

In accordance to the **CFR Part 47, §1.1310** and **RSS-102 Issue 5**

S: Limit for power density according to
- CFR Part 47, §1.1310: 10 W/m^2
- RSS-102 Issue 5, Table 4: 10 W/m^2

Because the EUT has no antenna connector, which presents the power delivered to the antenna, the measured peak value of the field strength (refer test report F170913E2 of PHOENIX TESTLAB GmbH) was used to calculate the peak radiated power. According to ANSI C63.10-2013 this the field strength value was converted to a radiated peak power with the following formula:

Calculated peak radiated output power [W] = (field strength [V/m] * measuring distance [m])^2 / 30

The peak value of the field strength was measured with 105.2 dBμV/m, which is equal to 0.182 V/m

Calculated peak radiated output power = 9.9 mW = (0.182 V/m * 3 m)^2 / 30

P: 9.9 mW (peak value, refer calculation above)

G: 0 dBi = 1 (power is measured radiated, including antenna gain)

D: Duty cycle: 100 % = 1

R: Distance in what the limit of S has to be reached: 0.2 m (refer also to the manufacturers installation / user manual)

$$S = \frac{P \cdot G \cdot D}{4 \cdot p \times R^2} \quad \triangleright \quad S = \frac{0.0099\,W \cdot 1 \cdot 1}{4 \times p \times (0.2\,m)^2} = 0.02 \frac{W}{m^2}$$

The value of the power density is below the limit of CFR Part 47, §1.1310 for the "General population / Uncontrolled Exposure" and below the limit of RSS-102 Issue 5, Table 4 "General Public (uncontrolled environment)".
Base of the above calculations is the lowest possible frequency in combination with the highest output power of the EUT.