

Prüfbericht - Nr.:

Test Report No.

**Appendix 5** 

# 19660146 004

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# **RF Exposure Report**

## **RF Exposure Measurement**

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an overprediction for near field power density. It is taken as worst case to specify the safety range.

# **RF Exposure Limit**

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density			
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm²)			
Limits for Occupational / controlled Exposures						
300 - 1500			F/300			
1500 – 100000			5.0			
Limits for General population / Uncontrolled Exposure						
300 - 1500			F/1500			
1500 – 100000			1.0			

F= Frequency in MHz



# **Appendix 5**

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#### Friss Formula

Friss Transmission Formula:  $Pd = (Pout * G) / (4*pi*r^2)$ 

Where  $Pd = power density in mW/cm^2$  Pout = output power to antenna in mW G = gain of antenna in linear scale Pi = 3.1416R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

## **EUT Operation condition**

EUT was enabled to transmit and receive at lowest, middle and highest channels.

## Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

## **Test Results**

Gain (G) = 4.9 dBi at 5GHz
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Frequency Band	Protocol	Output Power to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm²)
5250MHz – 5350MHz	802.11a_20MHz	5.48	0.0034	1.000
	802.11n_20MHz	8.41	0.0052	1.000
5470MHz – 5725MHz	802.11a_20MHz	5.07	0.0031	1.000
	802.11n_20MHz	8.47	0.0052	1.000