

## 5 RF Exposure – FCC - for RFID Device

### 5.1 Exposure Requirements – FCC KDB # 447498 DO1

FCC KDB # 447498 DO1 V05r02 - Mobile and Portable Device RF Exposure and Procedures and Equipment, Appendix C shows that the SAR Text Exclusion Threshold for a device with a separation distance of  $\leq 50$  mm at  $\leq 100$  MHz is 237 mW

#### 5.1.1 Test Procedure

If the antenna is located  $> 20$ cm from the user, then an MPE calculation is acceptable.

If the antenna is located  $< 20$ cm (portable / mobile / hand-held device) from the user, then SAR evaluation is required.

#### 5.1.2 Evaluation

The EUT will be used as a portable device where the antenna will be located less than 20cm from the user, therefore SAR evaluation is required.

##### 5.1.2.1 Evaluation for FCC

FCC 447498 DO1 Mobile Portable RF Exposure V05r02, Appendix C shows that the SAR Text Exclusion Threshold for a device with a worst-case separation distance of  $< 50$  mm and  $< 100$  MHz is 237 mW.

The minimum power that requires SAR testing with a separation distance of 50 mm at  $< 100$  MHz is 237 mW.

The maximum EiRP peak power output of the EUT is:  $< 0.1$  mW

The 0.1 mW EiRP of the EUT is well below the 237 mW power level that requires SAR Testing.

#### 5.1.3 Conclusion

##### SAR data is not required for FCC

Note: The  $< 0.1$  mW power level includes the 100% Duty Cycle factor.  
This is considered to be the absolute worst case.

#### 5.1.4 Calculated EiRP Level

Notes: The EUT does not have a means to make direct measurements.

This EiRP calculation was made using the maximum Peak Field value of 27.80 dB $\mu$ V/m at 1m.

The Duty Cycle was at 100%

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### **5.1.5 Antenna Gain:**

The antenna used in the EUT is a Loop antenna which is etched onto a flexible PCB.

According to the manufacturer, the antenna has a theoretical gain of 0 dBi or numeric gain of 1 (unity gain).

The stated Maximum EIRP power of the EUT is < 0.1 mW (100% Duty Cycle)

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## 6 RF Exposure – FCC for Bluetooth Device

### 6.1 Exposure Requirements – FCC KDB # 447498 DO1

FCC KDB # 447498 DO1 V05r02 - Mobile and Portable Device RF Exposure and Procedures and Equipment, Appendix A shows that the SAR Text Exclusion Threshold for a device with a separation distance of 5 mm at 2450 MHz is 10 mW

#### 6.1.1 Test Procedure

If the antenna is located  $> 20\text{cm}$  from the user, then an MPE calculation is acceptable.

If the antenna is located  $< 20\text{cm}$  (portable / mobile / hand-held device) from the user, then SAR evaluation is required.

#### 6.1.2 Evaluation

The EUT will be used as a portable device where the antenna will be located less than 20cm from the user, therefore SAR evaluation is required.

##### 6.1.2.1 Evaluation for FCC

FCC 447498 DO1 Mobile Portable RF Exposure V05r02, Appendix C shows that the SAR Text Exclusion Threshold for a device with a worst-case separation distance of  $< 5\text{ mm}$  at 2450 MHz is 10 mW.

The minimum power that requires SAR testing with a separation distance of 5 mm at  $< 50\text{ MHz}$  is 308 mW.

The maximum EiRP peak power output of the EUT is: 7 mW

The 7 mW EiRP of the EUT is well below the 10 mW power level that requires SAR Testing.

#### 6.1.3 Conclusion

##### **SAR data is not required for FCC**

Note: The 7 mW power level includes the 100% Duty Cycle factor.  
This is considered to be the absolute worst case.

#### 6.1.4 Calculated EiRP Level

Notes: The EUT does not have a means to make direct measurements.

This EiRP calculation was made using the maximum Peak Field value of 8.21 dBm at 3m.

The Duty Cycle was at 100%

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**6.1.5 Antenna Gain:**

According to the manufacturer, the antenna has a theoretical gain of -0.23 dBi or numeric gain of 0.95 (unity gain).

The stated Maximum EIRP power of the EUT is 7 mW (100% Duty Cycle)

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