

# RF Exposure

FCC ID: M9MLHP30300

## 1.0 INTRODUCTION

These calculations are based on the highest EIRP possible from the EUT, measured in the radiated mode for the RFID portion and Conducted mode for the Bluetooth.

EIRP was calculated using the following.

$$EIRP = (E \times d)^2 / 30$$

where:

- **E** = electric field strength in V/m,
- **d** = measurement distance in meters (m).

It was measured to be 78.4 dBuV/m at 125 kHz at 3 meters or -16.8 dBm (0.021 mW) EIRP.  
 It was measured to be 66.5 dBuV/m at 13.56 MHz at 3 meters or -28.7 dBm (0.0013 mW) EIRP.

See section 11.3.1 of RP-9688 test report for the field strength test data. The field strength is calculated without distance correction factors.

## 2.0 SAR EXCLUSION RESULT BLUETOOTH

In accordance with FCC KDB Publication 447498 D01 V06 Clause 4.3.1 a), the 1-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$[(\text{max. power, mW}) / (\text{min. separation distance, mm})] \times [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g extremity SAR,}$$

where  $f(\text{GHz})$  is the RF channel transmit frequency in GHz

The antenna has a 0.34 dB gain

MHz	Max Power dBm	Tune up tolerance dB	Max Ant Gain dBi	Duty Cycle %	EIRP mW	Min Sep mm	SAR Exc Threshold 4.3.1 a)	Limit 1-g	Result
2402	8.5	0.0	0.34	100.0	7.656	5	2.3731	3.0	Exempt

Judgement: The product is exempt from SAR testing

## 3.0 FCC RF EXPOSURE COMPLIANCE RESULT:

In accordance with FCC KDB Publication 447498 D01 V06 Clause 4.3.1 c) for transmit frequencies below 100 MHz:

- 1) For *test separation distances*  $>50$  mm and  $<200$  mm, the power threshold at the corresponding test separation distance at 100 MHz in section 4.3.1 step b) is multiplied by  $[1 + \log(100/f(\text{MHz}))]$
- 2) For *test separation distances*  $\leq 50$  mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by  $\frac{1}{2}$

This table is for devices with a separation of less than 50 mm

MHz	Max Power dBm	Duty Cycle %	EUT EIRP mW	Min Sep mm	SAR Exc Threshold at 50mm 4.3.1 a) in mW	SAR Exclusion threshold per 4.3.1 b)1) in mW	SAR Exclusion threshold per 4.3.1 c) 2) in mW	Result	Notes
13.56	-28.7	100.0	0.0013	5	47.4	17.4	16.3	Exempt	Peak
0.125	-16.8	100.0	0.0209	5	47.4	17.4	34.0	Exempt	Peak

EUT EIRP << SAR exclusion threshold per 4.3.1 c) 2)

### 3.1 Calculations for Simultaneous Transmission.

In accordance with FCC KDB Publication 447498 D01 V06 Clause 7.2 (a)

From Clause 4.3.2 (b) 2) For distances > 50mm, 0.4 W/kg limit is used for 1-g SAR limit

	Freq. (MHz)	Max Power (dBm)	Duty Cycle %	Average Power per channel (mW)	Min Sep (mm)	SAR Calculation as per 4.3.2 b)1 W/kg	SAR Exc Threshold per 7.2 & 4.3.2 b) 1 g limit (W/kg)	Result
RFID	13.56	-28.7	100.0	0.0013	5	4.19E-06	0.4	
RFID	0.125	-16.8	100.0	0.021	5	6.23E-06	0.4	
Bluetooth	2402	8.5	100.0	7.08	5	2.93E-01	0.4	
					Total	2.93E-01	0.4	Exempt