

Met Laboratories  
 914 West Patapsco Ave.  
 Baltimore, MD 21230

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RE: RF exposure information    FCC ID: QSHAIRRFI

<u>FCC ID Number</u>	<u>Product</u>	<u>Title / Model</u>
QSHAIRRFI		Bluetooth RFID Tag Reader with/without Barcode Reader - Baracoda Dualrunners and TagRunner

This device is categorically excluded from routine environmental, because it operates at very low power level. The product stated above complies with the FCC limits for Human exposure to RF emissions.

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
1.34 – 30	180/f (MHz) <sup>2</sup>	30
300 – 1500	f (MHz) /1500	30

Based on the above table the limits are:

For 13.56 MHz frequency band device: 0.98 mW/cm<sup>2</sup>  
 For 2.4 GHz MHz frequency band device: 1 mW/cm<sup>2</sup>

Using the equation from page 19 of OET Bulletin 65, Edition 97-01:

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)  
 P = power input to the antenna (in appropriate units, e.g., mW)  
 G = power gain of the antenna in the direction of interest relative to an isotropic radiator  
 R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For an evaluation distance of 20 cm. Compliance with MPE limits can be guaranteed as the calculation below shows:

**13.56 MHz frequency band**

Mode	Maximum Field strength (dBuV/m@3m)	Equivalent EIRP (mW)	Duty cycle	S <sub>RFID</sub> Power Spectral Density (mW/cm <sup>2</sup> )	S <sub>Limit_RFID</sub> Limit of Power Spectral density (mW/cm <sup>2</sup> )	S <sub>RFID</sub> /S <sub>Limit_RFID</sub>
RFID	65.01	0,0009502630621	100 %	1,89*10 <sup>-7</sup>	0.98	1,93*10 <sup>-7</sup>

**2.45 GHz frequency band**

Mode	Maximum EIRP (dBm)	Maximum EIRP (mW)	Duty cycle	$S_{BT}$ Power Spectral Density (mW/cm <sup>2</sup> )	$S_{Limit\_BT}$ Limit of Power Spectral density (mW/cm <sup>2</sup> )	$S_{BT}/S_{Limit\_BT}$
Bluetooth	18.21	66.22	100 %	0,013174378745	1	0,013174378745

**Collocation considerations:**

Compliance criteria:  $S_{RFID}/S_{Limit\_RFID} + S_{BT}/S_{Limit\_BT} < 1$

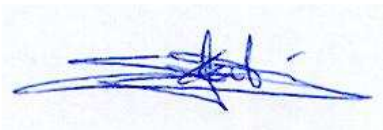
$S_{RFID}/S_{Limit\_RFID} + S_{BT}/S_{Limit\_BT} = 0,01317457165 < 1$

**Conclusion**

The equipment complies with exposure requirements.

Sincerely,

P.A.



Thierry Fortune  
 Engineer  
 Baracoda Wireless Technology  
 36, rue de Turin 75008 Paris, FRANCE  
 Phone: +33 (0) 1 30 08 89 00  
 e-mail: [Thierry.Fortune@baracoda.com](mailto:Thierry.Fortune@baracoda.com)