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## RF Exposure Evaluation

**FCC ID:** 2AH2P-BC90019

**APPLICANT:** DECATHLON USA LLC

**Application Type:** Certification

**Product:** GPS BIKE COMPUTER

**Model No.:** BC900

**Trademark:** **DECATHLON**

**FCC Rule Part(s):** Part 2.1091 (Mobile)

**Test Procedure(s):** KDB 447498 D01v06

**Received Date:** August 2, 2019

**Test Date:** August 28 ~ September 5, 2019

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**Reviewed By** : *Paddy Chen*

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Testing Laboratory  
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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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## Revision History

Report No.	Version	Description	Issue Date	Note
1908TW8501-U4	1.0	Original Report	2019-09-19	

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

Product Name	GPS BIKE COMPUTER
Model No.	BC900
Trademark	
Supports Radios Spec.	BLE 4.2 ANT+ GPS
Bluetooth Specification	V4.2 LE
Operating Frequency	2402~2480MHz
Type of modulation	GFSK
Battery	DC 3.7V / 1.3Wh / 350mAh
Item code	2538963
Conception code	124542
Model code	8487158

### 1.2. Antenna Description

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Advanced Ceramic X	AT3216-B2R7HAA	Chip	0.5dBi

## 2. RF Exposure Evaluation

### 2.1. FCC Limits

According to FCC KDB 447498 Section 4.3 - General SAR test exclusion guidance

For 100 MHz to 6 GHz and test separation distances  $\leq$  50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR,}$

where

1.  $f(\text{GHz})$  is the RF channel transmit frequency in GHz
2. Power and distance are rounded to the nearest mW and mm before calculation
3. The result is rounded to one decimal place for comparison
4. The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below

The test exclusions are applicable only when the minimum test separation distance is  $\leq$  50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $<$  5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

### 2.2. IC Limits

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW
Frequency (MHz)	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance.

### **2.3. Simultaneous transmission SAR test exclusion considerations**

When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$ , for test separation distances  $\leq 50 \text{ mm}$ ;

where  $x = 7.5$  for 1-g SAR and  $x = 18.75$  for 10-g extremity SAR.

When the sum of 1-g or 10-g extremity SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

## 2.4. Test Result of RF Exposure Evaluation

### Standalone :

Mode	Frequency Band (MHz)	Output Power (dBm)	Output Power (mW)	FCC SAR Test Exclusion Threshold (mW)	Antenna Gain (dBi)	EIRP (mW)	IC SAR Test Exclusion Threshold (mW)
BLE	2402~2480	-2.5	0.56	10	0.5	0.63	4
ANT+	2402~2480	-2.5	0.56	10	0.5	0.63	4

### Simultaneous :

Mode	Frequency Band (MHz)	Output Power (dBm)	Output Power (mW)	SAR test exclusion criteria (W/Kg)
BLE	2402~2480	-2.5	0.56	0.02
ANT+	2402~2480	-2.5	0.56	0.02

BLE: 0.02W/Kg + ANT+:0.02= 0.04W/Kg, so this device can comply the SAR test exclusion.

The End