



Radio Frequency Exposure Evaluation Report

FOR:

Whistle Labs Inc.

Model Name:
Whistle 3

Product Description:
Pet GPS tracker and activity monitor

FCC ID: S8W-W03A
IC ID: 10959A-W03A

Applied Rules and Standards:
CFR 47 Part 2 (2.1093),
FCC KDB 447498 D01 General RF Exposure Guidance v06
IC RSS-102 Issue 5

Report number: EMC-WHIST-003-16001-SAR-EX-Rev1

DATE: Dec 22, 2016



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1. Assessment

The following device was evaluated against the limits for general population uncontrolled exposure specified in CFR 47 Part 2.1093 according to SAR evaluation exclusion requirements specified in FCC regulation as listed in KDB 447498, and IC RSS-102 Issue 5.

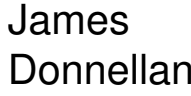
The device meets the requirements for SAR exclusion as stipulated by the above given FCC/IC rules.

Company	Description	Model #
Whistle Labs Inc.	Pet GPS tracker and activity monitor	Whistle 3

Responsible for Testing Laboratory:

Dec 22, 2016	Compliance	Franz Engert (Compliance Manager)	 Digitally signed by Franz Engert DN: cn=Franz Engert, c=US, o=CETECOM, ou=Compliance, email=franz.engert@cetecom. com
Date	Section	Name	Signature

Responsible for the Report:

Dec 22, 2016	Compliance	James Donnellan (Sr. EMC Engineer)	 Digitally signed by James Donnellan DN: cn=James Donnellan, c=US, o=Cetecom Inc., ou=Compliance, email=james.donnellan@cetecom. com Date: 2016.12.22 18:07:39 -08'00'
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section3.

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2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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Compliance Manager:	Franz Engert
Responsible Project Leader:	James Donnellan

2.2. Identification of the Client / Manufacturer

Applicant's Name:	Whistle Labs INC
Street Address:	1355 Market St. #210.
City/Zip Code	San Francisco, CA, 94103
Country	USA
Contact Person:	George Dang
Phone No.	1-973-960-0503
e-mail:	george@whistle.com

3. Equipment under Assessment

Model No	Whistle 3
HW Version	EVT 2
SW Version	0.0.1-C150591-S
FCC-ID	S8W-W03A
IC ID	10959A-W03A
Product Description	Pet GPS tracker and activity monitor.
Device Category	☐ Fixed Installation ☐ Mobile ☒ Portable ☐ Mixed Mobile and Portable
Frequency Range / number of channels	UMTS FDD BAND V: 826 - 847 MHz; 288 channels; UMTS FDD BAND II: 1852 - 1908 MHz; 107 channels; Wifi: 2412 MHz (Ch. 1) – 2462 (Ch.11), 11 channels BT LE: 2402(ch 0) – 2480(ch 39), 40 channels
Type(s) of Modulation	UMTS II/V: QPSK Modulation Bluetooth version 4.0: GFSK modulation 80211.b,g,n: BPSK, QPSK, 16 QAM, 64 QAM
Modes of Operation / Declared Output power	UMTS II/V = 24dBm 80211.b,g,n = 15dBm Bluetooth LE= 0 dBm
Max. declared antenna gain	FPC Antennas: 2.4GHz = 1dBi 850MHz = 0.01dBi 1900 MHz = -4dB1
Minimum distance of antenna or radiating parts to user	5mm
Power Supply/ Rated Operating Voltage Range	Lithium-ion battery. Vmin: 3.0V / Vnom: 3.7V / Vmax: 4.4V DC
Operating Temperature Range	-20 °C to 60 °C
Other Radios included in the device	N/A
Co-located Transmitters / Antennas	☒ Yes ☐ No
Sample Revision	☐ Prototype ☐ Production ☒ Pre-Production
Exposure Category	☐ Occupational/ Controlled ☒ General Population/ Uncontrolled

4. FCC and IC Exemption Limits for Routine Evaluation

4.1. FCC SAR test exclusions per KDB 447498

KDB 447498 D01 General RF Exposure Guidance v06 Section: 4.3.1.

Standalone SAR test exclusion considerations states

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

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

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

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 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.

4.2. IC SAR test exclusions per IC RSS-102 Issue 5

IC RSS-102 Section: 2.5.1 Exemption Limits for Routine Evaluation — SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1. 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.

5. Stand-Alone SAR Evaluation Exclusion

5.1. SAR Exclusion Calculation Tables

FCC SAR Exclusion Calculations

Band	d[mm]	f[GHz]	Max Power + tune up [mW]	Source based duty cycle. ¹	Load based duty cycle based on Maximum payload. ²	Effective average max power [mW]	FCC Limit @ 5 mm [mW]	Exclusion
UMTS V	5	0.85	251.2	1	0.0007	0.183	16.27	OK
UMTS II	5	1.9	251.2	1	0.0007	0.183	10.88	OK
Wifi	5	2.4	31.6	1	0.0018	0.058	9.68	OK
BTLE	5	2.4	1	1	0.0009	0.001	9.68	OK

Note1: We will use the most conservative source based duty cycle for all the radios.

Note 2: The load base Duty cycle for UMTS is based on a worst case scenario where the pet is outside the geo-fence and in close contact with a person, and the owner is continuously requesting location information which is a max of 100 byte payload being uploaded every 90 seconds and using a worst case 12.2kbit/s RMC uplink coding rate (excluding overhead, with lowest order modulation, and lowest coding rate).

The load base Duty cycle for WiFi is based on the scenario where the pet is inside the geo-fence and using the single worst daily transfer rate found over 797 Device days of 19.7 Megabytes with a worst case coding for 1mbps.

The load base Duty cycle for BTLE is based on the broadcast packet of 29 bytes every second with a conservative 250kbps transfer rate.

Industry Canada SAR Exclusion Calculations

Band	d[mm]	f[GHz]	Max Power + tune up + antenna gain [mW] ¹	Source based duty cycle. ²	Time Averaged Duty Factor based on Maximum payload. ³	Effective average max power [mW]	IC Limit @ 5mm from Table 1 RSS 102	Exclusion
UMTS V	5	0.85	257	1	0.0007	0.187	17.00	OK
UMTS II	5	1.9	251.2	1	0.0007	0.183	7.00	OK
Wifi	5	2.4	39.9	1	0.0018	0.073	4.00	OK
BTLE	5	2.4	1.26	1	0.0009	0.001	4.00	OK

Note1: For Industry Canada we add positive antenna gain as appropriate to the conducted output power as a worst case.

Note 2: We will use the most conservative source based duty cycle for all the radios.

Note 3: The load base Duty cycle for UMTS is based on a worst case scenario where the pet is outside the geo-fence and in contact with a person and the owner is continuously requesting location information which is a max of 100 byte every 90 seconds and using a worst case 12.2kbit/s RMC uplink coding rate (excluding overhead, with lowest order modulation, and lowest coding rate).

The load base Duty cycle for WiFi is based on the scenario where the pet is inside the geo-fence and using the single worst daily transfer rate found over 797 Device days of 19.7 Megabytes with a worst case coding for 1mbps.

The load base Duty cycle for BTLE is based on the broadcast packet of 29 bytes every second with a conservative 250kbps transfer rate.

5.2. Justification for use of load based time averaging

Based on information provided by Whistle I used the worst case loading found for each of the radios as outlined in the notes in Section 5.1.

5.3. Justification for using the 5 mm Distance

The distance is conservative at 5mm as the device is worn around a pet's neck, and to get this close to the device would be quite challenging.

6. Revision History

Date	Report Name	Changes to report	Report prepared by
Dec 13, 2016	EMC-WHIST-003-16001-SAR-EX	Initial version	James Donnellan
Dec 22, 2016	EMC-WHIST-003-16001-SAR-EX-Rev1	Corrected table in section 5.1 and updated note 2.	James Donnellan