



# TEST REPORT

**Report Number. : 13156692-E3V4**

**Applicant :** EVERACTIVE  
2986 OAKMEAD VILLAGE CT  
SANTA CLARA, CA 95051  
U.S.A.

**Model :** 830-00001

**FCC ID :** 2AO7C-83000001

**ISED ID :** 23743-83000001

**EUT Description :** 915MHz Transmitter

**Test Standard(s) :** FCC Part 1 Subpart I  
FCC Part 2 Subpart J  
INDUSTRY CANADA RSS 102 ISSUE 5

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**Prepared by:**  
UL Verification Services Inc.  
47173 Benicia Street  
Fremont, CA 94538 U.S.A.  
TEL: (510) 771-1000  
FAX: (510) 661-0888

Revision History

| Rev. | Issue Date | Revisions   | Revised By   |
|------|------------|---|--------------|
| V1   | 5/08/2020  | Initial Issue   | -            |
| V2   | 5/22/2020  | Report revised based on reviewer's comments.                    | Bobby Bayani |
| V3   | 5/27/2020  | Report revised based on reviewer's comments.<br>Sec. 2 updated. | Bobby Bayani |
| V4   | 6/24/2020  | Report revised based on reviewer's comments.<br>Added FSK mode. | Bobby Bayani |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** EVERACTIVE  
2986 OAKMEAD VILLAGE CT  
SANTA CLARA, CA 95051  
U.S.A.

**EUT DESCRIPTION:** 915 MHz Transmitter

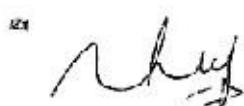
**MODEL:** 830-00001

| APPLICABLE STANDARDS                    |              |
|---|--------------|
| STANDARD                                | TEST RESULTS |
| FCC PART 1 SUBPART I & PART 2 SUBPART J | Pass         |
| INDUSTRY CANADA RSS 102 ISSUE 5         | Pass         |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For  
UL Verification Services Inc. By:



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THU CHAN  
CONSUMER TECHNOLOGY DIVISION  
OPERATIONS LEADER  
UL Verification Services Inc.

Calculated By:



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BOBBY BAYANI  
CONSUMER TECHNOLOGY DIVISION  
LEAD PROJECT ENGINEER  
UL Verification Services Inc

## 2. TEST METHODOLOGY

All calculations were made in accordance with the following:

- KDB 447498 D01
- KDB 447498 D03

## 3. REFERENCES

All measurements were made as documented in test report no. 13156692-E1V4.

Duty cycle, Antenna gain, and output power data is excerpted from the applicable test reports.

## 4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

## 5. MAXIMUM PERMISSIBLE RF EXPOSURE

### 5.1. FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range (MHz)  | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                               |                               |                                     |                          |
| 0.3-3.0  | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30   | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300   | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500  |                               |                               | f/300                               | 6                        |
| 1,500-100,000  |                               |                               | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34   | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30  | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                       |
| 30-300   | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1,500  |                               |                               | f/1500                              | 30                       |
| 1,500-100,000  |                               |                               | 1.0                                 | 30                       |

f = frequency in MHz

\* = Plane-wave equivalent power density

#### Notes:

- (1) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
- (2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

## 5.2. IC RULES

IC Safety Code 6 (2015), Section 2.2.2: To ensure compliance with the basic restrictions outlined in Section 2.1, at frequencies between 10 MHz and 300 GHz, the reference levels for electric- and magnetic-field strength and power density must be complied with.

**Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)**

| Frequency Range (MHz)  | Electric Field (V/m rms) | Magnetic Field (A/m rms)          | Power Density (W/m <sup>2</sup> ) | Reference Period (minutes) |
|------------------------|--------------------------|-----------------------------------|-----------------------------------|----------------------------|
| 0.003-10 <sup>21</sup> | 83                       | 90                                | -                                 | Instantaneous*             |
| 0.1-10                 | -                        | 0.73/ $f^{0.5}$                   | -                                 | 6**                        |
| 1.1-10                 | 87/ $f^{0.5}$            | -                                 | -                                 | 6**                        |
| 10-20                  | 27.46                    | 0.0728                            | 2                                 | 6                          |
| 20-48                  | 58.07/ $f^{0.25}$        | 0.1540/ $f^{0.25}$                | 8.944/ $f^{0.5}$                  | 6                          |
| 48-300                 | 22.06                    | 0.05852                           | 1.291                             | 6                          |
| 300-6000               | 3.142 $f^{0.3417}$       | 0.008335 $f^{0.3417}$             | 0.02619 $f^{0.6834}$              | 6                          |
| 6000-15000             | 61.4                     | 0.163                             | 10                                | 6                          |
| 15000-150000           | 61.4                     | 0.163                             | 10                                | 616000/ $f^{1.2}$          |
| 150000-300000          | 0.158 $f^{0.5}$          | 4.21 x 10 <sup>-4</sup> $f^{0.5}$ | 6.67 x 10 <sup>-5</sup> $f$       | 616000/ $f^{1.2}$          |

**Note:**  $f$  is frequency in MHz.  
 \*Based on nerve stimulation (NS).  
 \*\* Based on specific absorption rate (SAR).

**Table 6: RF Field Strength Limits for Controlled Use Devices (Controlled Environment)**

| Frequency Range (MHz)  | Electric Field (V/m rms) | Magnetic Field (A/m rms)          | Power Density (W/m <sup>2</sup> ) | Reference Period (minutes) |
|------------------------|--------------------------|-----------------------------------|-----------------------------------|----------------------------|
| 0.003-10 <sup>23</sup> | 170                      | 180                               | -                                 | Instantaneous*             |
| 0.1-10                 | -                        | 1.6/ $f^{0.5}$                    | -                                 | 6**                        |
| 1.29-10                | 193/ $f^{0.5}$           | -                                 | -                                 | 6**                        |
| 10-20                  | 61.4                     | 0.163                             | 10                                | 6                          |
| 20-48                  | 129.8/ $f^{0.25}$        | 0.3444/ $f^{0.25}$                | 44.72/ $f^{0.5}$                  | 6                          |
| 48-100                 | 49.33                    | 0.1309                            | 6.455                             | 6                          |
| 100-6000               | 15.60 $f^{0.25}$         | 0.04138 $f^{0.25}$                | 0.6455 $f^{0.5}$                  | 6                          |
| 6000-15000             | 137                      | 0.364                             | 50                                | 6                          |
| 15000-150000           | 137                      | 0.364                             | 50                                | 616000/ $f^{1.2}$          |
| 150000-300000          | 0.354 $f^{0.5}$          | 9.40 x 10 <sup>-4</sup> $f^{0.5}$ | 3.33 x 10 <sup>-4</sup> $f$       | 616000/ $f^{1.2}$          |

**Note:**  $f$  is frequency in MHz.  
 \*Based on nerve stimulation (NS).  
 \*\* Based on specific absorption rate (SAR).

### 5.3. EQUATIONS

#### POWER DENSITY

Power density is given by:

$$S = \text{EIRP} / (4 * \pi * D^2)$$

Where

S = Power density in mW/cm<sup>2</sup>

EIRP = Equivalent Isotropic Radiated Power in mW

D = Separation distance in cm

Power density in units of mW/cm<sup>2</sup> is converted to units of W/m<sup>2</sup> by multiplying by 10.

#### DISTANCE

Distance is given by:

$$D = \sqrt{(\text{EIRP} / (4 * \pi * S))}$$

Where

D = Separation distance in cm

EIRP = Equivalent Isotropic Radiated Power in mW

S = Power density in mW/cm<sup>2</sup>

#### SOURCE-BASED DUTY CYCLE

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

$$\text{Source-based time-averaged EIRP} = (\text{DC} / 100) * \text{EIRP}$$

Where

DC = Duty Cycle in %, as applicable

EIRP = Equivalent Isotropic Radiated Power in W

### **MIMO AND COLOCATED TRANSMITTERS (IDENTICAL LIMIT FOR ALL TRANSMITTERS)**

For multiple chain devices, and colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the EIRP (in linear units) of each transmitter.

Total EIRP = (EIRP1) + (EIRP2) + ... + (EIRPn)

where

EIRPx = Source-based time-averaged EIRP of chain x or transmitter x

The total EIRP is then used to calculate the Power Density or the Distance as applicable.

### **MIMO AND COLOCATED TRANSMITTERS**

For multiple colocated transmitters operating simultaneously in frequency bands where different limits apply:

The Power Density at the specified separation distance is calculated for each transmitter chain or transmitter.

The fraction of the exposure limit is calculated for each chain or transmitter as (Power Density of chain or transmitter) / (Limit applicable to that chain or transmitter).

The fractions are summed.

Compliance is established if the sum of the fractions is less than or equal to one.

## 5.4. IC EXEMPTION

### INDUSTRY CANADA EXEMPTION

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $4.49/f0.5$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f0.6834$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

## 6. RF EXPOSURE RESULTS

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

(Single chain transmitters, no colocation, MPE distance > 20 cm)

| Frequency Range (MHz) | Mode | FCC Limit (mW/cm^2) | IC Limit (W/m^2) | Max. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Duty Cycle (%) | EIRP (mW) | FCC Power Density (mW/cm^2) | IC Power Density (W/m^2) |
|-----------------------|------|---------------------|------------------|-------------------------|--------------------|------------|----------------|-----------|-----------------------------|--------------------------|
| 902 - 928             | OOK  | 0.60                | 2.7              | 30.00                   | 2.00               | 32.00      | 51.48          | 815.9     | 0.162                       | 1.624                    |
| 902 - 928             | FSK  | 0.60                | 2.7              | 30.00                   | 2.00               | 32.00      | 40.80          | 646.6     | 0.129                       | 1.287                    |

At or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than **1.4W** ( $1.31 \times 10^{-2} f^{0.6834}$  W, adjusted for tune-up tolerance), where  $f$  is in MHz; therefore, the device is exempted from routine RF exposure evaluation.

### Notes:

- 1) The manufacturer configures output power so that the maximum power will never exceed the maximum power level measured.
- 2) The antenna gain in the tables above is the maximum antenna gain among various channels within the specified band.

## END OF REPORT