



TEST REPORT

Test Report No. : UL-RPT-RP80655JD23A V6.0

Manufacturer : Satellite Tracking of People LLC
Model No. : Blu+
FCC ID : S5E1106MM1
IC Certification No. : 9086A-BT70212
Technology : RFID – 128 kHz
Test Standard(s) : FCC Part 15.209 and 15.215 (c), Industry Canada RSS-Gen Sections 4.6.3, 4.8, 4.9 and RSS-210 Section A2.9

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 6.0 supersedes Test Report Serial Number RFI-RPT-RP80655JD23A V5.0. The original test report was issued under the previous company name of RFI Global Services Ltd.

Date of Issue: 31 JULY 2015

Checked by:

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Senior Engineer, Radio Laboratory

Issued by :

pp

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This laboratory is accredited by UKAS.
The tests reported herein have been
performed in accordance with its terms
of accreditation.

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Table of Contents

1. Customer Information.....	4
2. Summary of Testing.....	5
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	5
2.4. Deviations from the Test Specification	6
3. Equipment Under Test (EUT)	7
3.1. Identification of Equipment Under Test (EUT)	7
3.2. Description of EUT	7
3.3. Modifications Incorporated in the EUT	7
3.4. Additional Information Related to Testing	7
3.5. Support Equipment	7
4. Operation and Monitoring of the EUT during Testing	8
4.1. Operating Modes	8
4.2. Configuration and Peripherals	8
5. Measurements, Examinations and Derived Results.....	9
5.1. General Comments	9
5.2. Test Results	10
5.2.1. Transmitter Radiated Emissions (Fundamental)	10
5.2.2. Transmitter Radiated Spurious Emissions	11
5.2.3. Transmitter 20 dB Bandwidth	13
6. Measurement Uncertainty	14
7. Report Revision History	15
Appendix 1. Test Equipment Used	16

1. Customer Information

Company Name:	Satellite Tracking of People LLC
Address:	1212 North Post Oak Road Suite 100 Houston Texas 77055

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.209 and 47CFR15.215
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Sections 15.209 and 15.215
Specification Reference:	RSS-Gen Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-210 Issue 8 December 2010
Specification Title:	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
Site Registration:	FCC: 209735, Industry Canada: 3245B-2
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Date:	9 May 2012

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.209	RSS-Gen 4.8 and RSS-210 A2.9	Transmitter Radiated Emissions (Fundamental)	
Part 15.209	RSS-Gen 4.9 and RSS-210 A2.9	Transmitter Radiated Emissions	
Part 15.215(c)	RSS-Gen 4.6.3	Transmitter 20 dB Bandwidth	
Key to Results  = Complied  = Did not comply			

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices
Reference:	RSS-210 Issue 8 December 2010
Title:	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
Reference:	RSS-GEN Issue 3 December 2010
Title:	General Requirements and Information for the Certification of Radio Apparatus

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Blutag
Model Name or Number:	Blu+
Hardware Version Number:	GG79-009
Software Version Number:	RFI_V104 (Used to enable testing)
Unique Identification/IMEI	353197040010826
FCC ID:	S5E1106MM1
IC Certification Number:	9086A-BT70212

3.2. Description of EUT

The equipment under test was an ankle worn tracking device containing a 128.4 kHz transmitter module.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	RFID	
Power Supply Requirement:	Nominal	3.7 VDC
Type of Unit:	Transmitter	
Transmit Frequency	128.4 kHz	

3.5. Support Equipment

No support equipment was used to exercise the EUT during testing.

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Transmit mode.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- The EUT was enabled into a test mode which allowed for continuous transmission, as soon as the battery was connected.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6 Measurement Uncertainty* for details.

5.2. Test Results

5.2.1. Transmitter Radiated Emissions (Fundamental)

Test Summary:

Test Engineer:	Andrew Edwards	Test Date:	09 May 2012
Test Sample IMEI No:	353197040010826		

FCC Part:	15.209
FCC Test Method Used:	ANSI C63.10 Section 6.4
Industry Canada Reference:	RSS-Gen 4.8 and RSS-210 A2.9
Test Method Used:	RSS-Gen clause 7.2.5 table 6

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	38

Results: Quasi Peak

Frequency (kHz)	Antenna Polarity	Level (dBμV/m)	Limit at 300 m (dBμV/m)	Margin (dB)	Result
128.4	90° to EUT	-15.8	25.4	41.2	Complied

Results: Average

Frequency (kHz)	Antenna Polarity	Level (dBμV/m)	Limit at 300 m (dBμV/m)	Margin (dB)	Result
128.4	90° to EUT	-15.8	25.4	41.2	Complied

Note(s):

1. The limit is specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), and RSS-Gen Section 4.11, measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres. The transducer factor has a 40 dB extrapolation at a distance of 30 metres (1 decade). Measurements below 490 kHz should be performed at a distance of 300 metres (2 decades) therefore another 40 dB was subtracted from the measured value. The quasi peak level was measured as 4.2 dBμV/m – 40 = -35.8 dBμV/m.

Note: An additional 20 dB has been added to attain the final value shown in the table; this is to account for a transducer factor that was not included during the original measurement.

$$i.e.: -35.8 \text{ dBuV/m} + 20 \text{ dB} = -15.8 \text{ dBuV/m}$$

5.2.2. Transmitter Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	09 May 2012
Test Sample IMEI No:	353197040010826		

FCC Part:	15.209
Industry Canada Reference:	RSS-Gen 4.9 and RSS-210 A2.9
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3, 6.4 and 6.5 referencing ANSI C63.4
Frequency Range:	9 kHz to 1000 MHz

Environmental Conditions:

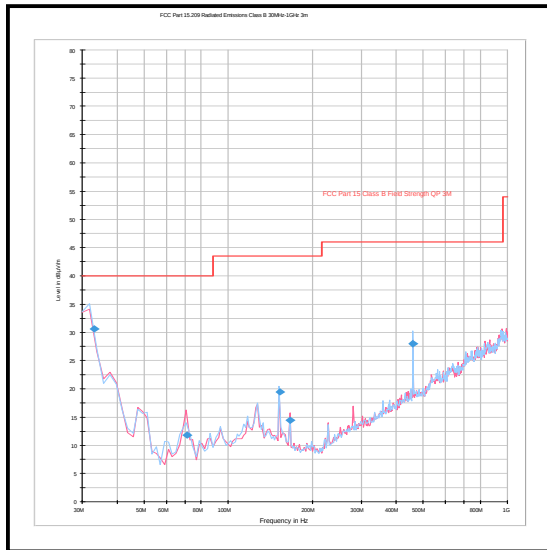
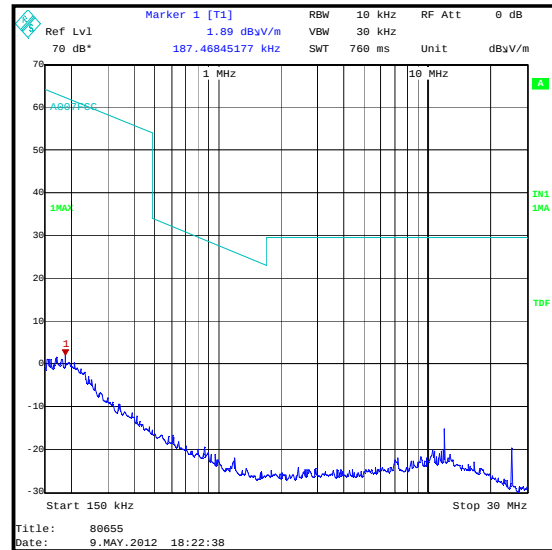
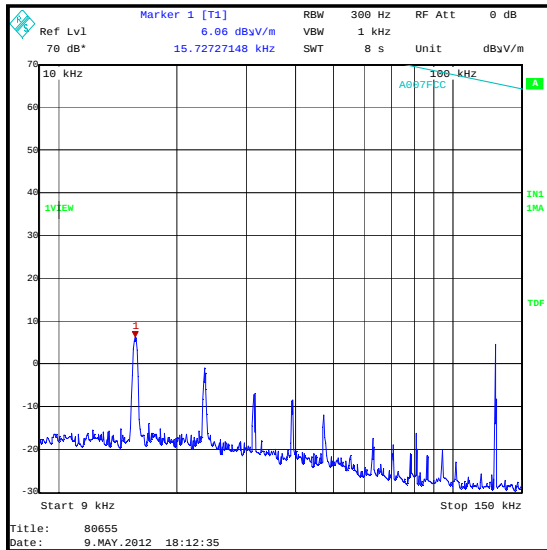
Temperature (°C):	27
Relative Humidity (%):	38

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
33.186	Horizontal	30.6	40.0	9.4	Complied
71.163	Vertical	11.8	40.0	28.2	Complied
153.325	Vertical	19.5	43.5	24.0	Complied
166.077	Vertical	14.4	43.5	29.1	Complied
458.777	Horizontal	28.0	46.0	18.0	Complied

Note(s):

- Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
- A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
- Final measurement values include corrections for antenna factor and cable losses.
- The emission shown at approximately 128.4 kHz is the fundamental.
- All emissions on the 9 kHz to 150 kHz plot were investigated and found to be ambient.
- All other emissions shown on the pre-scan plots were investigated and found to be >20 dB below the applicable limit or below the measurement system noise floor.
- Measurements in the range 30 MHz to 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Radiated Spurious Emissions (continued)

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying table.

5.2.3. Transmitter 20 dB Bandwidth**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	09 May 2012
Test Sample IMEI No:	353197040010826		

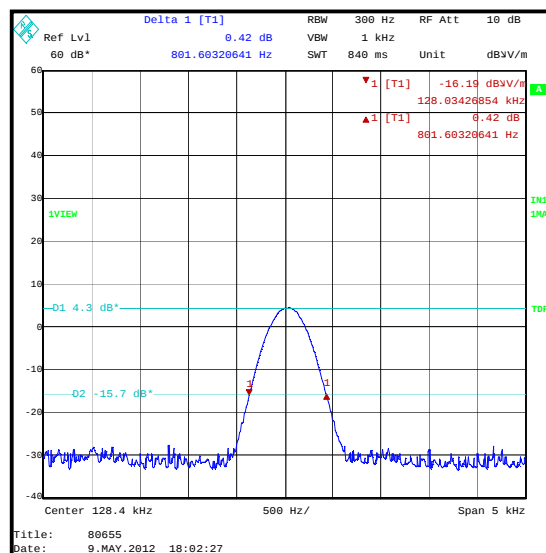
FCC Part:	15.215(c)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1
Industry Canada Reference:	RSS-Gen 4.6.3
Test Method Used:	See below

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	38

Results:

20 dB Bandwidth (Hz)
801.6 Hz



The EUTs carrier is an unmodulated narrowband signal and has a narrower bandwidth than the lowest IF filter bandwidth available in RF spectrum analysers. Therefore the plot shown above is taken using 300 Hz RBW to show the worst case EUT bandwidth is narrower than a standard CISPR measuring bandwidth at this frequency.

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
20 dB Bandwidth	128 kHz	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
5.0	-	-	Previous Version
6.0	10	-	Corrected previously reported emission level by +20 dB. Corrected Note 2 and included 30 to 300 metre distance extrapolation.

Appendix 1. Test Equipment Used

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (months)
A1834	Attenuator	Hewlett Packard	8491B	10444	29 Jan 2013	12
A553	Antenna	Chase	CBL6111A	1593	15 Feb 2013	12
G0543	Amplifier	Sonoma Instrument Co.	310N	230801	13 Jul 2012	3
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	03 Feb 2013	12
M1568	Magnetic Loop Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	08 Feb 2013	12

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.

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