



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1**

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT
FOR
SPIKE**

MODEL NUMBER: IKE-SP02

**FCC ID: 2ACBGSP02
IC ID: 11952A-SP02**

REPORT NUMBER: 16U22667-E1V2

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Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	5/17/2016	Initial issue	C.VERGONIO
V2	5/27/2016	Updated Section 6.3 and added Radiated spot check data in Section 7.	C.VERGONIO

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ikeGPS

EUT DESCRIPTION: SPIKE

MODEL: IKE-SP02

SERIAL NUMBER: 2175294 (Conducted) ; 2175293 (Radiated)

DATE TESTED: JULY 30 –AUGUST 10, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 ISSUE 1	Pass
INDUSTRY CANADA RSS-GEN ISSUE 4	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 revision 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 any government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013 for FCC, FCC CFR 47 Part 2, and FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☒ Chamber B	☐ Chamber E
☐ Chamber C	☐ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

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

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance, 1000 to 6000 MHz	3.86 dB
Radiated Disturbance, 6000 to 18000 MHz	4.23 dB
Radiated Disturbance, 18000 to 26000 MHz	5.30 dB
Radiated Disturbance, 26000 to 40000 MHz	5.23 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a BLE SPIKE.

6. REUSE OF TEST DATA

6.1. INTRODUCTION

According to manufacturer attestation letter, FCC ID: 2ACBG3000, IC ID: 11952A-3000 and FCC ID: 2ACBGSP02, IC ID: 1195A-SP02 unlicensed radios (BLE) are electrically identical. They share the same chipset, same power and same antenna performance including antenna gain. The FCC ID: 2ACBG3000, IC ID: 11952A-3000 test data shall remain representative of FCC ID: 2ACBGSP02, IC ID: 1195A-SP02 so FCC ID: 2ACBGSP02, IC ID: 1195A-SP02 leverage test data from FCC ID: 2ACBG3000, IC ID: 11952A-3000.

The applicant takes full responsibility that the test data as referenced in this section represent compliance for this FCC/IC ID.

6.2. DEVICES DIFFERENCES

Difference between FCC ID: 2ACBG3000, IC ID: 11952A-3000 and FCC ID: 2ACBGSP02, IC ID: 1195A-SP02: Mostly the difference is the naming of the product and the product color. Please refer to the Attestation Letter document for detail information.

6.3. SPOT CHECK VERIFICATION

Spot check verification has been done on device FCC ID: 2ACBGSP02, IC ID: 1195A-SP02 for radiated harmonic spurious. Test results were consistent with FCC ID: 2ACBG3000, IC ID: 11952A-3000.

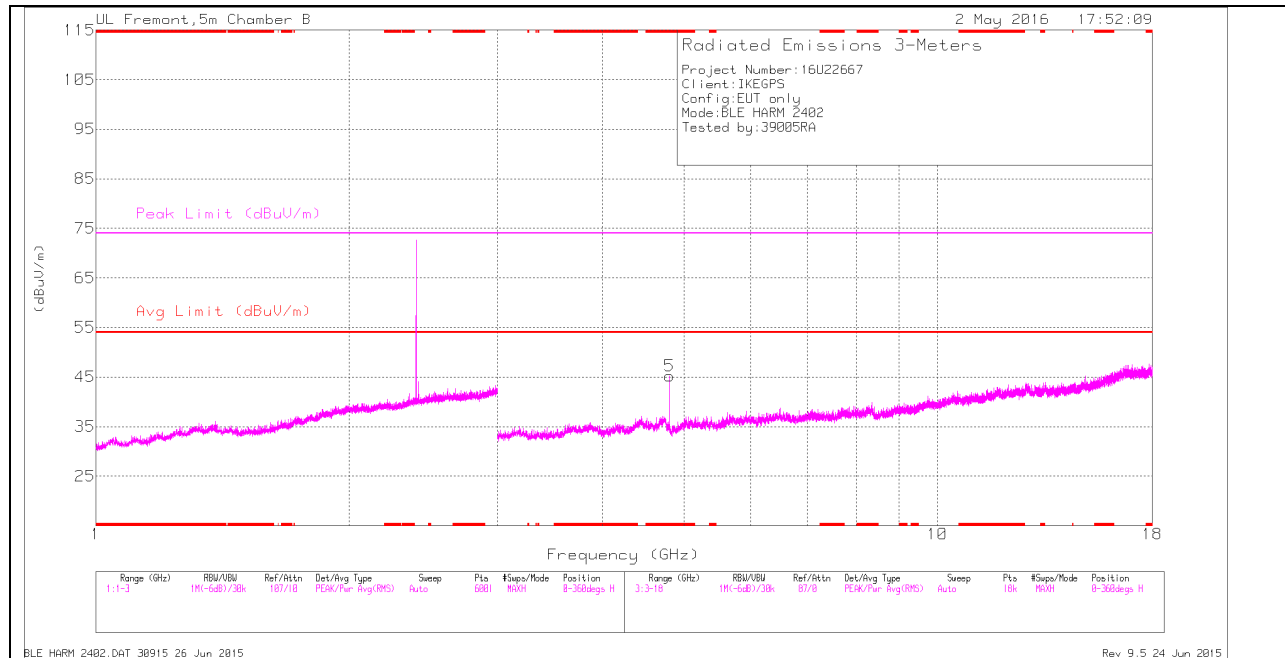
6.4. REFERENCE DETAIL

Equipment Class	Reference FCC/IC ID	Report Title/Section
BLE	FCC ID: 2ACBG3000, IC ID: 11952A-3000	15R21104-E1A FCC IC BLE Report Final

7. RADIATED SPOT CHECK TEST DATA

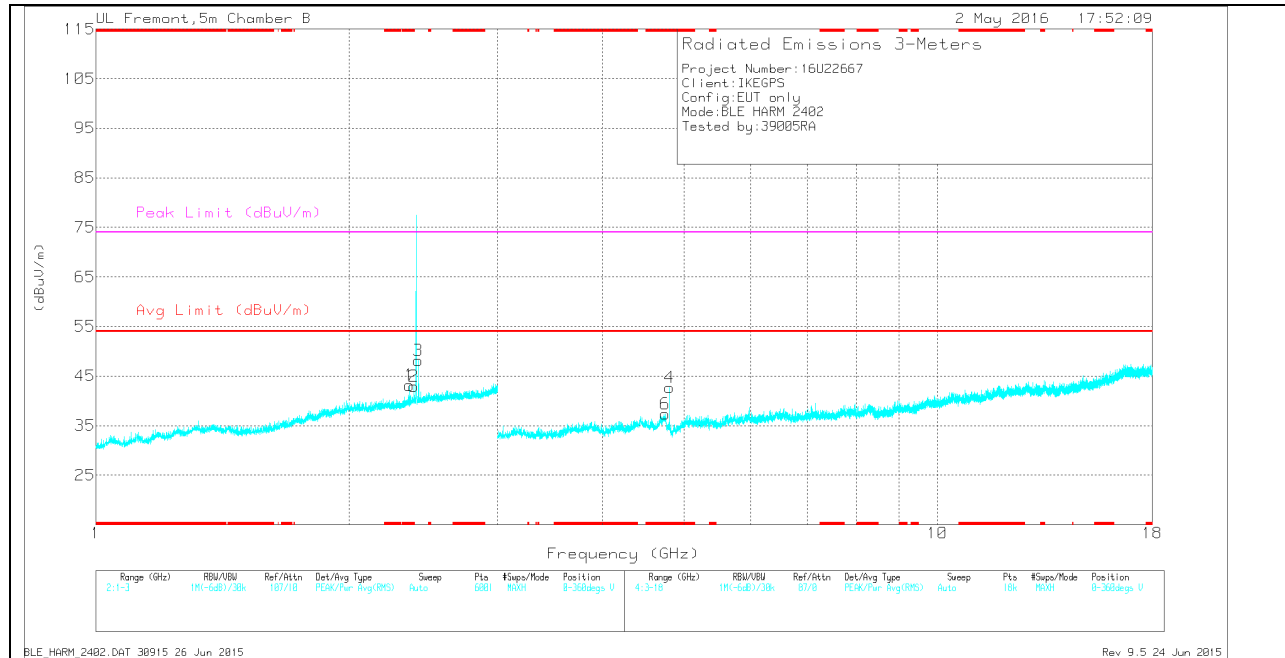
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.356	33.53	Pk	31.9	-22.3	0	43.13	-	-	74	-30.87	0-360	199	V
2	* 2.386	33.12	Pk	32.1	-22.3	0	42.92	-	-	74	-31.08	0-360	101	V
5	* 4.804	42.77	Pk	33.8	-31.3	0	45.27	-	-	74	-28.73	0-360	101	H
4	* 4.804	40.21	Pk	33.8	-31.3	0	42.71	-	-	74	-31.29	0-360	101	V
6	* 4.746	34.25	Pk	34	-30.9	0	37.35	-	-	74	-36.65	0-360	101	V
3	2.417	38.33	Pk	32.2	-22.4	0	48.13	-	-	-	-	0-360	199	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.357	36.15	PK2	31.9	-22.3	0	45.75	-	-	74	-28.25	123	259	V
* 2.357	26.7	MAV1	31.9	-22.3	6.54	42.84	54	-11.16	-	-	123	259	V
* 2.386	33.27	PK2	32.1	-22.4	0	42.97	-	-	74	-31.03	105	135	V
* 2.386	26.82	MAV1	32.1	-22.4	6.54	43.06	54	-10.94	-	-	105	135	V
* 4.804	38.65	PK2	33.8	-31.3	0	41.15	-	-	74	-32.85	347	169	H
* 4.804	37.43	MAV1	33.8	-31.3	6.54	46.47	54	-7.53	-	-	347	169	H
* 4.804	37.53	PK2	33.8	-31.3	0	40.03	-	-	74	-33.97	267	133	V
* 4.804	34.19	MAV1	33.8	-31.3	6.54	43.23	54	-10.77	-	-	267	133	V
* 4.74	42.78	PK2	34	-30.9	0	45.88	-	-	74	-28.12	197	293	V
* 4.741	30.66	MAV1	34	-30.9	6.54	40.3	54	-13.7	-	-	197	293	V
2.417	34.64	PK2	32.2	-22.4	0	44.44	-	-	74	-29.56	83	181	V
2.417	29.36	MAV1	32.2	-22.4	6.54	45.7	54	-8.3	-	-	83	181	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

END OF TEST REPORT