

Produkte
Products

Prüfbericht - Nr.: 14037488 001			Seite 1 von 13		
<i>Test Report No.:</i>			<i>Page 1 of 13</i>		
Auftraggeber: <i>Client:</i>		BluVision, Inc 3201 Griffin Rd, Bld Sutie 200 Fort Lauderdale, Florida United States			
Gegenstand der Prüfung: <i>Test Item:</i>		Bluetooth Low Energy Location Sticker			
Bezeichnung: <i>Identification:</i>	BeeksiBeek	Serien-Nr.: <i>Serial No.:</i>	Engineering sample		
Wareneingangs-Nr.: <i>Receipt No.:</i>	A000139187-003	Eingangsdatum: <i>Date of Receipt:</i>	03.12.2014		
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>		Test sample(s) is/are not damaged and suitable for testing.			
Prüfort: <i>Testing Location:</i>		Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong			
Prüfgrundlage: <i>Test Specification:</i>		FCC Part 15 Subpart C ANSI C63.4-2003			
Prüfergebnis: <i>Test Results:</i>		Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage. The above mentioned product was tested and passed .			
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland Hong Kong Ltd. 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong			
geprüft/ tested by:			kontrolliert/ reviewed by:		
20.05.2015 Benny Lau Senior Project Manager			20.05.2015 Sharon Li Department Manager		
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges: FCC ID: SL6-BEEKSIBEEK Other Aspects					
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet			Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested		
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.					

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Test Summary

Conducted Emissions

Result: N/A

20dB bandwidth

Result: Pass

Radiated Emission of Carrier Frequency

Result: Pass

Spurious Radiated Emissions

Result: Pass

Product information

Manufacturers declarations

	Transceiver
Operating frequency range	2402-2480 MHz
Type of modulation	GFSK
Number of channels	40
Type of antenna	Integral PCB Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	V_{nor} : 3.6Vdc

Product function and intended use

The equipment under test (EUT) is a Bluetooth Low Energy Transceiver operating at 2.4GHz. It is a location sticker. And it is powered by 3.6Vdc.

FCC ID: **SL6-BEEKSIBEEK**

Models	Product description
BeeksiBeek	Bluetooth Low Energy location sticker

Submitted documents

Circuit Diagram
 Block Diagram
 Bill of material
 User manual
 Rating Label

Independent Operation Modes

The basic operation modes are:

- Transmitting Bluetooth signal .

For further information refer to User Manual

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

Remark

- None.

Test Set-up and Operation Mode

Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Test Operation and Test Software

Test operation should refer to test methodology.

- Test software provided by the applicant is used to fix the transmitting channel.

Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

- none

Countermeasures to achieve EMC Compliance

- none

Test Methodology

Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63.4-2003.

The equipment under test (EUT) was placed at the middle of the 80 cm height turntable, and the turntable is 3 meters far from the measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360 °, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Cal. Interval	Cal. Due date
Semi-anechoic Chamber	Frankonia	Nil	Nil	1 year	14-Apr-15
Cable	Hubersuhner	SUCOFLEX 104	N/A	2 years	31-Mar-16
Test Receiver	R & S	ESU40	72799 /6	1 year	20-Jun-15
Bi-conical Antenna	R & S	HK116	100190	2 years	11-Jun-15
Log Periodic Antenna	R & S	HL223	100241	2 years	10-Jun-15
Coaxial cable	Harbour	LL335	841516/017	2 years	10-Jun-16
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	N/A	2 years	30-Dec-15
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	3123A00437	2 years	28-Oct-15
Horn Antenna	EMCO	3115	9829213	2 years	11-Jun-15
Active Loop Antenna	EMCO	6502	9002-3347	1 year	17-May-15

Bandwidth Measurement

Equipment	Manufacturer	Type	S/N	Cal. Interval	Cal Due Date
Spectrum Analyzer	R & S	FSP30	Nil	2 years	12-Jan-2017

Results FCC Part 15 – Subpart C

Subclause 15.203 – Antenna Information		Pass		
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device			
Results:	Permanent attached antenna			
Verdict:	Pass			

Subclause 15.207 – Conducted Emission on AC Mains		N/A		
There is no AC power input or output ports on the EUT.				

Subclause 15.215 (c) – 20 dB Bandwidth		Pass		
Requirement:	The intentional radiators must be designed to ensure that the 20dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.			
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 10 kHz/ 30 kHz Supply voltage : 3.6VDC Test date : 16.12.2014 Temperature : 23°C Humidity : 50%				
Results:	Pass			
Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2402	2401.532	> 2400	2402.652	< 2483.5
2440	2439.532	> 2400	2440.648	< 2483.5
2480	2479.536	> 2400	2480.652	< 2483.5

Subclause 15.249 (a) – Radiated Emission (Fundamental and Harmonics)		Pass
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 120 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : 3.6VDC Frequency range : 9kHz to tenth harmonic Test date : 08.12.2014 Temperature : 23°C Humidity : 50%		
Requirement: The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limit.		
Results: Pass		
Fundamental Frequency 2402 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2402.000	99.22	114.0 / P
2402.000	74.34	94.0 / A
Fundamental Frequency 2402 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2402.000	98.56	114.0 / P
2402.000	73.76	94.0 / A
Harmonics 2402MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4804.000	56.43	74.0 / P
4804.000	45.12	54.0 / A
7206.000	59.81	74.0 / P
7206.000	45.55	54.0 / A
Harmonics 2402 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4804.000	53.16	74.0 / P
4804.000	40.35	54.0 / A
7206.000	60.48	74.0 / P
7206.000	46.74	54.0 / A
Fundamental Frequency 2440 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2440.000	96.39	114.0 / P
2440.000	72.24	94.0 / A
Fundamental Frequency 2440 MHz Horizontal Polarization		

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2440.000	96.93	114.0 / P
2440.000	72.79	94.0 / A
Harmonics 2440 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4880	53.42	74.0 / P
4880	40.25	54.0 / A
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Harmonics 2440 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4880	54.98	74.0 / P
4880	42.10	54.0 / A
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Fundamental Frequency 2480 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2480.000	94.33	114.0 / P
2480.000	71.03	94.0 / A
Fundamental Frequency 2480 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2480.000	97.66	114.0 / P
2480.000	73.06	94.0 / A
Harmonics 2480 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4960	53.28	74.0 / P
4960	39.88	54.0 / A
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Harmonics 2480 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4960	53.95	74.0 / P
4960	40.72	54.0 / A
No peak found	---	74.0 / P
No peak found	---	54.0 / A

Subclause 15.205, 15.249 (d) – Spurious Radiated Emissions		Pass
Test Specification : ANSI C63.4 - 2003 Mode of operation : Tx mode Port of testing : Enclosure Detector : Peak RBW/VBW : 120 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : 3.6VDC Test date : 08.12.2014 Frequency range : 9kHz to tenth harmonic Temperature : 23°C Humidity : 50%		
Requirement: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.		
Results: Pass All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.		
Tx frequency 2402 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2400.000	62.08	74.0 / P
2400.000	37.20	54.0 / A
Tx frequency 2402 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2400.000	61.42	74.0 / P
2400.000	36.62	54.0 / A
Tx frequency 2440 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Tx frequency 2440 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Tx frequency 2480 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2483.500	69.06	74.0 / P
2483.500	42.71	54.0 / A
Tx frequency 2480 MHz Horizontal Polarization		

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2483.500	72.10	74.0 / P
2483.500	44.70	54.0 / A