TÜVRheinland®

Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14033450 001**	**Seite 1 von 12** *Page 1 of 12*
Auftraggeber: *Client:*	**StickNFind LLC** **3201 Griffin Road** **Fort Lauderdale, FL 33312** **USA**	
Gegenstand der Prüfung: *Test Item:*	**Bluetooth Low Energy Device**	
Bezeichnung: *Identification:*	**Blutracker**	**Serien-Nr.:** *Serial No.:* **Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**00130215059-001**	**Eingangsdatum:** *Date of Receipt:* **15.02.2013**
Prüfort: *Testing Location:*	**TÜV Rheinland Hong Kong Ltd.** 8/F, First Group Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong **Hong Kong Productivity Council** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong	
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample(s) is/are not damaged and suitable for testing.	
Prüfgrundlage: *Test Specification:*	**FCC Part 15 Subpart C** **ANSI C63.4-2003** **CISPR 22:1997**	
Prüfergebnis: *Test Results:*	**Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.** The above mentioned product was tested and **passed**.	
Prüflaboratorium: *Testing Laboratory:*	**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:*		
06.12.2013	Mika Chan Project Manager		06.12.2013	Sharon Li Section Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges: **FCCID: SL6-BLUTRACKER**
Other Aspects

Abkürzungen:				*Abbreviations:*			
	P(ass)	=	*entspricht Prüfgrundlage*		*P(ass)*	=	*passed*
	F(ail)	=	*entspricht nicht Prüfgrundlage*		*F(ail)*	=	*failed*
	N/A	=	*nicht anwendbar*		*N/A*	=	*not applicable*
	N/T	=	*nicht getestet*		*N/T*	=	*not tested*

Table of Content

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Product information

Manufacturers declarations

	Transceiver
Operating frequency range	2402 - 2480 MHz
Type of modulation	GFSK
Number of channels	40
Channel separation	2 MHz
Type of antenna	Chip Helical
Antenna gain (dBi)	3.6
Power level	fix
Type of equipment	stand alone radio device
Connection to public utility power line	No
Nominal voltage	V_{nor}: 4.0V (Li-polymer battery)
Independent Operation Modes	Transmitting Receiving

Product function and intended use

BluTracker is a small device with built in GPS receiver, and Bluetooth Low Energy transmitter. It gets its GPS position, and sends that info via Bluetooth Low Energy. That way, you can put it for example, on a dog, and as long as you are in range to your dog, you know where it is.

It offers the following function:
- Virtual Fence

For details, please refer to the user manual.

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual

Remark

Special accessories and auxiliary equipment

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

Laptop computer
Brand: Lenovo
Model: T61
S/N: L3-X9333 08/05

AC adaptor
Brand: Lenovo
Model: 92P1103
Input rating: 100-240V ~ 1.7A-0.9A, 50/60Hz
Output rating: 2.0V, 4.5A

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Equipment	Manufacturer	Type	S/N	Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	12-Apr-14
Test Receiver	R & S	ESU40	100190	19-Feb-14
Bi-conical Antenna	R & S	HK116	100241	11-Jun-15
Log Periodic Antenna	R & S	HL223	841516/020	10-Jun-15
Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	15-Nov-15
Microwave amplifer 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	03-Oct-13
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	03-Oct-15
Horn Antenna	EMCO	3115	9002-3351	11-Jun-15
Double-Ridge Waveguide Horn	EMCO	3116	2616	11-Jun-15
Active Loop Antenna	EMCO	6502	9107-2651	21-Jun-15
FSP 30 Spectrum Analyser	R & S	FSP 30	100007	17-Sep-13

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Equipment	Manufacturer	Type	S/N	Due Date
Test Receiver	R & S	ESCS30	100201	26 Feb 14
LISN	R & S	ENV216	100273	06 Mar 14

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 15.204 – Antenna Information		**Pass**
Requirement:	Provide information for every antenna proposed for the use with the EUT	
Results:	a) Antenna type: b) Manufacturer and model no: c) Gain with reference to an isotropic radiator:	Chip Helical N.A. 3.6 dBi
Verdict:	Pass	

Subclause 15.207 – Disturbance Voltage on AC Mains **Pass**

Test Port: AC mains input port of the computer
Applied Voltage: 120VAC
Adaptor Model: Please refer to page 4

Mode of operation: Charging + BLE mode

Live measurement

Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.150	53.1	23.4	66 - 56	56 - 46	Pass
	0.170	50.6	21.8	66 - 56	56 - 46	Pass
	0.286	44.0	18.2	66 - 56	56 - 46	Pass
> 0,5 - 5	2.6035	35.0	33.9	56	46	Pass
> 5 - 30	No peak found	---	---	60	50	Pass

Neutral measurement

Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.166	50.9	20.9	66 - 56	56 - 46	Pass
	0.186	47.3	18.9	66 - 56	56 - 46	Pass
> 0,5 - 5	0.54225	46.6	36.2	56	46	Pass
> 5 - 30	No peak found	---	---	60	50	Pass

Results: The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz does not exceed the limits. For test Results plots refer to Appendix 1, page 2-3.

Subclause 15.247 (a)(2) – 6dB Bandwidth Measurement	**Pass**
Requirement:	Systems using digital modulation techniques may operate in the 902 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500kHz. There is no requirement for hybrid system to comply with the 500 KHz minimum bandwidth normally associated with a DTS transmission.

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Tx mode, hopping off
Port of testing : Temporary antenna port
Detector : Peak
RBW/VBW : 100KHz/ 300KHz
Supply voltage : 4.0 VDC from Battery
Temperature : 23ºC
Humidity : 50%

Results: For test protocols please refer to Appendix 1, page 4-5.

Channel	Channel frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Verdict
LOW	2402	0.690	0.5	Pass
MID	2440	0.666	0.5	Pass
HIGH	2480	0.672	0.5	Pass

Subclause 15.247 (b)(3) – Maximum Peak Output Power	**Pass**
Requirement:	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt (30dBm)

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Tx mode, hopping off
Port of testing : Temporary antenna port
Detector : Peak
RBW/VBW : >=DTS BW / >=3xRBW
Span : >=RBW
Supply voltage : 4.0 VDC from Battery
Temperature : 23ºC
Humidity : 50%

Results: For test protocols please refer to Appendix 1, page 6-7.

Channel	Channel frequency (MHz)	Peak Power Output (dBm)	Limit (dBm)	Verdict
LOW	2402	13.00	30	Pass
MID	2440	12.52	30	Pass
HIGH	2480	11.83	30	Pass

Subclause 15.247 (d) – Spurious Conducted Emissions **Pass**

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Tx mode (2402MHz, 2440MHz, 2480MHz), hopping off
Port of testing : Temporary antenna port
Detector : Peak
RBW/VBW : 100 kHz / 300 kHz
Supply voltage : 3.0 VDC from Battery
Temperature : 23 ºC
Humidity : 50 %

Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Results: There is no peak found outside any 100kHz bandwidth of the operating frequency band in the three transmit frequency. All three transmit frequency modes comply with the limit stated in subclause 15.247(d). For test protocols refer to Appendix 1, page 8-9.

Operating frequency (MHz)	Spurious frequency (MHz)	Spurious Level (dBm)	Reference value (dBm)	Delta (dB)	Verdict
2402	14400	-41.73	10.86	52.59	Pass
2440	8340	-48.58	11.29	61.28	Pass
2480	7140	-43.25	12.29	55.54	Pass

Subclause 15.247 (d) – Spurious Radiated Emissions **Pass**

Test Specification : ANSI C63.4 – 2003
Mode of operation : Tx mode (2402MHz, 2440MHz, 2480MHz), hopping off
Port of testing : Enclosure
Detector : Peak
RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz
1 MHz / 1 MHz for f > 1 GHz
Supply voltage : 3.0 VDC from Battery
Temperature : 23ºC
Humidity : 50%

Requirement: In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limit specified in Section 12.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in section15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).

Results: Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.

Tx frequency 2402MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4803.685	60.18	74.0 / P
4804.071	40.42	54.0 / A
7205.279	54.33	74.0 / P
7206.208	37.88	54.0 / A
9608.211	64.99	74.0 / P
9608.147	44.45	54.0 / A

Tx frequency 2402MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4804.135	62.20	74.0 / P
4804.022	40.87	54.0 / A
9606.994	63.40	74.0 / P
9608.083	43.72	54.0 / A

Tx frequency 2440MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4879.621	61.64	74.0 / P
4880.006	40.93	54.0 / A
9759.006	65.74	74.0 / P
9760.032	44.44	54.0 / A

Tx frequency 2440MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m

4879.455	58.77	74.0 / P
4880.064	40.05	54.0 / A
9759.935	59.99	74.0 / P
9760.048	42.50	54.0 / A
Tx frequency 2480MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4960.673	56.82	74.0 / P
4960.080	39.45	54.0 / A
9920.288	56.55	74.0 / P
9920.576	40.69	54.0 / A
Tx frequency 2480MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
4960.480	56.96	74.0 / P
4960.032	39.54	54.0 / A

Subclause 15.247 (d) – Band Edge Emissions	**Pass**
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2480MHz) Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 100 kHz / 300 kHz Supply voltage : 4.0 VDC from Battery Temperature : 23ºC Humidity : 50%	
Requirement:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Results:	There is no peak found outside any 100 kHz bandwidth of the operating frequency band. For test protocols refer to Appendix 1, page 10.

Subclause 15.205 – Band edge compliance of radiated emissions	**Pass**
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2480MHz) Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 1 MHz / 1 MHz Supply voltage : 4.0 VDC from Battery Temperature : 23ºC Humidity : 50%	
Requirement:	Radiated emissions which fall in the restricted bans, as defined in 15.205 (a), must also comply with the radiated emission limits specified in 15.209(a).
Results:	There is no peak found in the restricted bands. For test protocols refer to Appendix 1, page 11-18.

Subclause 15.247 (e) – Power Spectral Density	**Pass**
Requirement:	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Tx mode (2402MHz, 2440MHz, 2480MHz), hopping off
Port of testing : Temporary antenna port
Detector : Peak
RBW/VBW : 3 KHz – 100 KHz / >=3xRBW
span : >=1.5 x DTS BW
Supply voltage : 3.0 VDC from Battery
Temperature : 23ºC
Humidity : 50%

Results: For test protocols please refer to Appendix 1, page 19-20.

Operating frequency (MHz)	**Power density (dBm)**	**Limit (dBm)**	**Verdict**
2402	1.04	8.0	Pass
2440	1.54	8.0	Pass
2480	0.37	8.0	Pass

Verdict: Pass