

Produkte
 Products

Prüfbericht - Nr.: 14030943 001

Test Report No.:

Seite 1 von 10

Page 1 of 10

Auftraggeber: Bluetrek Technologies Limited
Client: 8/F., Tai Yip Building
 141 Thomson Road
 Wanchai
 Hong Kong

Gegenstand der Prüfung: Bluetooth Low Energy Device
Test Item:

Bezeichnung: LostDog smart keyfob
Identification:

Serien-Nr.:
 Serial No.:

Engineering sample

Wareneingangs-Nr.: 00120706064-001
Receipt No.:

Eingangsdatum: 06.07.2012
Date of Receipt:

Prüfort: TÜV Rheinland Hong Kong Ltd.
Testing Location: 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: Test sample(s) is/are not damaged and suitable for testing.
Condition of test item at delivery:

Prüfgrundlage: FCC Part 15 Subpart C
Test Specification: ANSI C63.4-2003
 CISPR 22:1997

Prüfergebnis: Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.
Test Results: The above mentioned product was tested and **passed**.

Prüflaboratorium: TÜV Rheinland Hong Kong Ltd.
Testing Laboratory: 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay Kowloon, Hong Kong

geprüft/ tested by:

kontrolliert/ reviewed by:

24.10.2012	Mika Chan Senior Project Engineer		24.10.2012	Sharon Li Section Manager	
Datum Date	Name/Stellung Name/Position	Unterschrift Signature	Datum Date	Name/Stellung Name/Position	Unterschrift Signature

Sonstiges: FCCID: QIT2541
 Other Aspects

Abkürzungen: P(pass) = entspricht Prüfgrundlage
 F(fail) = entspricht nicht Prüfgrundlage
 N/A = nicht anwendbar
 N/T = nicht getestet

Abbreviations: P(pass) = passed
 F(fail) = 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.

Table of Content

	Page
Cover Page	1
Table of Content	2
Product information.....	3
Manufacturers declarations	3
Product function and intended use.....	4
Submitted documents.....	4
Remark	4
List of Test and Measurement Instruments.....	5
Results FCC Part 15 – Subpart C	6
Subclause 15.203 – Antenna Information	Pass.....
Subclause 15.204 – Antenna Information	Pass.....
Subclause 15.207 – Disturbance Voltage on AC Mains.....	N/A.....
Subclause 15.247 (a)(2) – 6dB Bandwidth Measurement.....	Pass.....
Subclause 15.247 (b)(3) – Maximum Peak Output Power	Pass.....
Subclause 15.247 (d) – Spurious Conducted Emissions	Pass.....
Subclause 15.247 (d) – Spurious Radiated Emissions.....	Pass.....
Subclause 15.247 (d) – Band Edge Emissions	Pass.....
Subclause 15.205 – Band edge compliance of radiated emissions	Pass.....
Subclause 15.247 (e) – Power Spectral Density	Pass.....
Appendix 1 – Test protocols	20 pages
Appendix 2 – Test setup	2 pages
Appendix 3 – Photo documentation	6 pages
Appendix 4 – Product documentation	8 pages

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 Antenna
Antenna gain (dBi)	0
Power level	fix
Type of equipment	stand alone radio device
Connection to public utility power line	No
Nominal voltage	V _{nor} : 3.0V
Independent Operation Modes	Transmitting Receiving

Product function and intended use

LostDog smart keyfob is a perfect gift for you or someone you know who either travels frequently or is notoriously forgetful.

It works with most of the Bluetooth smart ready enabled mobile and tablet, alerts you when you get out of range of your paired device and help you find it by a simple button press.

It offers the following functions:

- Notifies you when you leave your phone behind. Helps you find your phone, key, your luggage or even briefcase.
- Informs you when your phone battery runs low
- Enables one-button Facebook check-in or save your location on the map
- Remotely triggers the camera shutter on your phone or tablet

Much more features available. Settings via the freely downloadable APP for iOS and Android.

Submitted documents

Circuit Diagram

Block Diagram

Bill of material

User manual

Remark

Special accessories and auxiliary equipment

-

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	25-May-13
Test Receiver	R & S	ESU40	100190	26-May-13
Bi-conical Antenna	R & S	HK116	100242	05-May-13
Log Periodic Antenna	R & S	HL223	841516/020	06-May-13
Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	15-Nov-13
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	03-Oct-13
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	28-Oct-13
Horn Antenna	EMCO	3115	9002-3351	11-May-13
Active Loop Antenna	EMCO	6502	9107-2651	21-Jun-13
FSP 30 Spectrum Analyser	R & S	FSP 30	100007	17-Sep-13

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 Antenna N.A. 0 dBi
Verdict:	Pass	

Subclause 15.207 – Disturbance Voltage on AC Mains		N/A
The EUT is powered by battery.		

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. In addition, the EBW is required information for subsequent band power measurement.			
EBW				
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 : 1-5% of EBW / >=3xRBW Supply voltage : 3.0 VDC from Battery Temperature : 23°C Humidity : 50%				
Results:	For test protocols please refer to Appendix 1, page 2-3.			
Channel	Channel frequency (MHz)	Emission Bandwidth (MHz)	Limit (MHz)	Verdict
LOW	2402	0.710	-	-

MID	2440	0.740	-	-
High	2480	0.720	-	-
6dB BW				
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 : 3.0 VDC from Battery Temperature : 23°C 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	0.710	0.5	Pass
MID	2440	0.700	0.5	Pass
HIGH	2480	0.690	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 : \geq EBW / \geq 3xRBW Span : zero Supply voltage : 3.0 VDC from Battery Temperature : 23°C 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	-4.45	30	Pass
MID	2440	-4.69	30	Pass
HIGH	2480	-4.89	30	Pass
Verdict:	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 °C				
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	4800	-32.66	-6.79	39.45	Pass
2440	4850	-34.90	-6.65	41.55	Pass
2480	4950	-37.87	-6.90	44.77	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	: 23°C				
Humidity	: 50%				
Requirement:	In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in section 15.205(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	

4804.583	54.23	74.0 / P
4804.022	47.90	54.0 / A
Tx frequency 2402MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4804.647	50.97	74.0 / P
4805.935	43.67	54.0 / A
Tx frequency 2440MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4880.352	50.60	74.0 / P
4879.983	43.68	54.0 / A
Tx frequency 2440MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4880.528	50.19	74.0 / P
4879.983	42.26	54.0 / A
Tx frequency 2480MHz		Vertical Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4959.679	50.40	74.0 / P
4960.032	42.22	54.0 / A
Tx frequency 2480MHz		Horizontal Polarization
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4958.125	49.55	74.0 / P
4957.996	42.08	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	: 3.0 VDC from Battery	
Temperature	: 23°C	
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	: 3.0 VDC from Battery	
Temperature	: 23°C	
Humidity	: 50%	
Requirement:	Radiated emissions which fall in the restricted bands, 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	: 100 KHz / 300 KHz			
Supply voltage	: 3.0 VDC from Battery			
Temperature	: 23°C			
Humidity	: 50%			
BWCF	: -15.2dB			
Results:	For test protocols please refer to Appendix 1, page 19-20.			
Operating frequency (MHz)	Reading (dBm)	Power density (dBm)	Limit (dBm)	Verdict
2402	-4.35	-19.55	8.0	Pass
2440	-4.60	-19.80	8.0	Pass
2480	-4.84	-20.04	8.0	Pass
Verdict:	Pass			