

Produkte  
Products

**Prüfbericht - Nr.: 14041158 001**

Test Report No.:

Seite 1 von 15

Page 1 of 15

**Auftraggeber:** R2P Pet Ltd  
**Client:** Suite UG305, Chinachem Golden Plaza, 77 Mody Road  
 Tsimshatsui East  
 Hong Kong

**Gegenstand der Prüfung:** Bluetooth Pedometer for Pet  
**Test Item:**

**Bezeichnung:** Please refer to multiple  
**Identification:** models on page 3

**Serien-Nr.:**  
**Serial No.:**

**Engineering sample**

**Wareneingangs-Nr.:** A000230785-001,  
**Receipt No.:** A000230785-002

**Eingangsdatum:** 21.07.2015  
**Date of Receipt:**

**Prüfort:** Hong Kong Productivity Council  
**Testing Location:** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong

**Zustand des Prüfgegenstandes bei Anlieferung:** Test sample(s) is/are not damaged and  
**Condition of test item at delivery:** suitable for testing.

**Prüfgrundlage:** FCC Part 15 Subpart C  
**Test Specification:** RSS-210 Issue 8  
 RSS-Gen Issue 4  
 ANSI C63.10-2013

**Prüfergebnis:** Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben  
**Test Results:** genannter Prüfgrundlage.  
 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:

06.10.2015      Hugo Wan  
 Datum      Name/Stellung  
 Date      Name/Position



kontrolliert/ reviewed by:

06.10.2015      Sharon Li  
 Datum      Name/Stellung  
 Date      Name/Position



**Sonstiges:** FCC ID 2AEMWPAL  
 IC: 20437-PAL

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.

## Table of Content

	Page	
<b>Cover Page .....</b>	<b>1</b>	
<b>Table of Content .....</b>	<b>2</b>	
<b>Product information.....</b>	<b>3</b>	
Manufacturers declarations .....	3	
Product function and intended use.....	3	
Submitted documents.....	3	
Independent Operation Modes .....	4	
Related Submittal(s) Grants .....	4	
<b>Test Set-up and Operation Mode.....</b>	<b>5</b>	
Principle of Configuration Selection .....	5	
Test Operation and Test Software.....	5	
Special Accessories and Auxiliary Equipment.....	5	
Countermeasures to achieve EMC Compliance.....	5	
<b>Test Methodology .....</b>	<b>6</b>	
Radiated Emission .....	6	
Field Strength Calculation.....	6	
<b>List of Test and Measurement Instruments.....</b>	<b>7</b>	
<b>Results FCC Part 15 – Subpart C / RSS-Gen, RSS-210 .....</b>	<b>8</b>	
FCC 15.203 / RSS-Gen 7.1.2 – Antenna Requirement 1 .....	Pass.....	8
FCC 15.204 / RSS-Gen 7.1.2 – Antenna Requirement 2.....	Pass.....	8
RSS-Gen 5.4 – Transmitter External Control.....	Pass.....	8
FCC 15.207 / RSS-Gen 7.2.4 – Disturbance Voltage on AC Mains.....	N/A.....	8
FCC 15.247 (a)(2) / RSS-210 A8.2 (a) – 6dB Bandwidth Measurement.....	Pass.....	9
FCC 15.247 (b) (1), (3) / RSS-210 A8.4 (4) – Maximum Peak Output Power .....	Pass.....	10
FCC 15.247 (d) / RSS-210 A8.5 – Spurious Conducted Emissions.....	Pass.....	11
FCC 15.247 (d) / RSS-Gen 7.2.2, 7.2.5 – Spurious Radiated Emissions.....	Pass.....	12
FCC 15.247 (d) / RSS-210 A8.5 – Band Edge Compliance in conducted emissions...	Pass.....	14
FCC 15.247 (e) / RSS-210 A8.2 (b) – Power Spectral Density.....	Pass.....	15
<b>Appendix 1 – Test protocols .....</b>	<b>16 pages</b>	
<b>Appendix 2 – Test setup .....</b>	<b>2 pages</b>	
<b>Appendix 3 – Photo documentation .....</b>	<b>5 pages</b>	
<b>Appendix 4 – Product documentation .....</b>	<b>10 pages</b>	
<b>Appendix 5 – Radio Frequency Exposure .....</b>	<b>3 pages</b>	

## Product information

### Manufacturers declarations

Transceiver BLE Mode	
Operating frequency range	2402 - 2480 MHz
Type of modulation	GFSK
Number of channels	40
Channel separation	2 MHz
Type of antenna	PCB 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 <sub>nor</sub> : 3.0 VDC
Independent Operation Modes	Transmitting Receiving

### Product function and intended use

The Equipment Under Test (EUT) is a Bluetooth pedometer for pet which connects with the smartphone for logging the pet activity.

For details, please refer to the user manual.

There are 5 models as shown in below table. They are identical to each other in schematics, PCB layouts, components used and housing except model number and color only. Due to equivalence of the 5 models, model PAL was selected as a representative model for testing.

**FCC ID 2AEMWPAL**  
**IC: 20437-PAL**

Models
PAL
Details PAL
Details Pet Activity Link
PAL "Pet Activity Link"
Pet Activity Link

### Submitted documents

Circuit Diagram  
Block Diagram  
Bill of material  
User manual  
Rating Label  
Declaration of equivalence letter

## **Independent Operation Modes**

The basic operation modes are:

- Bluetooth communication link maintained with data transfer.

For further information refer to User Manual

## **Related Submittal(s) Grants**

This is a single application for certification of the transmitter.

## 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 mode operating firmware was downloaded into EUT. The EUT can transmit at 2402, 2440 or 2480MHz channel upon pressing of button.

### 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 C63.10-2013.

For emission measurement at or below 1GHz, the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For emission testing above 1GHz, the EUT was placed at the middle of 1.5m height turntable. In above two measurement, 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, IC Registration number: 4780A-1)**

Equipment	Manufacturer	Type	S/N	Cal. Date	Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	14 Apr 2015	14 Apr 2016
Cable	Hubersuhner	SUCOFLEX 104	72799 /6	31 Mar 2014	31 Mar 2016
Test Receiver	R & S	ESU26	100050	12 Feb 2015	12 Feb 2016
Bi-conical Antenna	R & S	HK116	100241	11 Jun 2013	22 Oct 2015
Log Periodic Antenna	R & S	HL223	841516/017	10 Jun 2013	16 Oct 2015
Coaxial cable	Harbour	LL335	N/A	10 Jun 2014	10 Jun 2016
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	17 Jul 2014	17 Jul 2016
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	28 Oct 2013	28 Oct 2015
Horn Antenna	EMCO	3115	9002-3347	11 Jun 2013	07 Oct 2015
Active Loop Antenna	EMCO	6502	9107-2651	17 May 2014	28 Oct 2015
Spectrum Analyzer	Rohde & Schwarz	FSP30	100007	13 Jan 2015	13 Jan 2017

## Results FCC Part 15 – Subpart C / RSS-Gen, RSS-210

FCC 15.203 / RSS-Gen 7.1.2 – Antenna Requirement 1		Pass
<b>FCC Requirement:</b> No antenna other than that furnished by the responsible party shall be used with the device		
<b>IC Requirement:</b> A transmitter can only be sold or operated with antennas with which it was approved. Any antenna of the same type having equal or lesser gain as an antenna that had been successfully tested with the transmitter, will also be considered approved with the transmitter, and may be used and marketed with the transmitter.		
<b>Results:</b>	Permanent attached antenna	
<b>Verdict:</b>	Pass	
FCC 15.204 / RSS-Gen 7.1.2 – Antenna Requirement 2		Pass
<b>FCC Requirement:</b> Provide information for every antenna proposed for the use with the EUT		
<b>IC Requirement:</b> When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer.		
<b>Results:</b>	a) Antenna type:	PCB Antenna
	b) Manufacturer	N/A
	c) model no	N/A
	d) Gain with reference to an isotropic radiator:	0 dBi
<b>Verdict:</b>	Pass	
RSS-Gen 5.4 – Transmitter External Control		Pass
<b>IC Requirement:</b> The device shall not have any external controls accessible to the user that enable it to be adjusted, selected or programmed to operate in violation of the limits prescribed in the applicable RSS.		
<b>Results:</b>	The device does not have any transmitter external controls accessible to the user that can be adjusted and operated in violation of the limits of this standard.	
<b>Verdict:</b>	Pass	
FCC 15.207 / RSS-Gen 7.2.4 – Disturbance Voltage on AC Mains		N/A
The EUT does not have AC mains power input power, hence this test is not applicable.		

FCC 15.247 (a)(2) / RSS-210 A8.2 (a) – 6dB Bandwidth Measurement		Pass	
<b>FCC Requirement:</b> 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.			
<b>IC Requirement:</b> The minimum -6 dB bandwidth shall be at least 500 kHz.			
Test Specification : KDB 558074 D01 DTS Measurement Guidance v03r02 / RSS-Gen Mode of operation : BLE Tx mode, (2402MHz, 2440MHz, 2480MHz) Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 100KHz/ 300KHz Supply voltage : 3.0 VDC from DC power supply Temperature : 23°C Humidity : 50%			
<b>Results:</b> For test protocols please refer to Appendix 1, page 2-3, 15-16.			
Channel frequency (MHz)	6 dB left (MHz)	6 dB right (MHz)	6dB bandwidth (MHz)
2402	0.342	0.306	0.648
2440	0.330	0.312	0.642
2480	0.336	0.312	0.648
Channel frequency (MHz)	99% bandwidth (MHz)		
2402	0.996		
2440	1.008		
2480	1.014		

<b>FCC 15.247 (b) (1), (3) / RSS-210 A8.4 (4) – Maximum Peak Output Power</b>		<b>Pass</b>			
<b>FCC Requirement:</b> For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt (30dBm)					
<b>IC Requirement:</b> For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W.					
Test Specification : KDB 558074 D01 DTS Measurement Guidance v03r02 / RSS-Gen Mode of operation : BLE Tx mode, (2402MHz, 2440MHz, 2480MHz) Port of testing : Temporary antenna port Detector : Peak RBW/VBW : $\geq$ DTS BW / $\geq$ 3xRBW Span : $\geq$ 3 x RBW Supply voltage : 3.0 VDC from DC power supply Temperature : 23°C Humidity : 50%					
<b>Results:</b> For test protocols please refer to Appendix 1, page 4-5.					
Frequency (MHz)	Maximum peak output power (dBm)	Cable attenuation (dB)	Output power (dBm)	Limit (W/dBm)	Verdict
2402	-4.18	0.00	-4.18	1 / 30.0	Pass
2440	-4.91	0.00	-4.91	1 / 30.0	Pass
2480	-5.43	0.00	-5.43	1 / 30.0	Pass

FCC 15.247 (d) / RSS-210 A8.5 – Spurious Conducted Emissions		Pass			
Test Specification : KDB 558074 D01 DTS Measurement Guidance v03r02 / RSS-Gen					
Mode of operation : Tx mode (2402MHz, 2440MHz, 2480MHz)					
Port of testing	Temporary antenna port				
Detector	Peak				
RBW/VBW	: 100 kHz / 300 kHz				
Supply voltage	: 3.0 VDC from DC power supply				
Temperature	: 23 °C				
Humidity	: 50 %				
<b>FCC Requirement:</b> 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.					
<b>IC Requirement:</b> In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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, provided that the transmitter demonstrates compliance with the peak conducted power limits.					
<b>Results:</b> All three transmit frequency modes comply with the limit stated in subclause 15.247(d). For test protocols refer to Appendix 1, page 6-11.					
Operating frequency (MHz)	Spurious frequency (MHz)	Spurious Level (dBm)	Reference value (dBm)	Delta (dB)	Verdict
2402	0.0690	-28.45	-4.48	-23.97	Pass
	2328.780	-43.74	-4.48	-39.26	Pass
	4804.000	-32.61	-4.48	-28.13	Pass
2440	0.0690	-25.42	-5.14	-20.28	Pass
	1218.000	-47.70	-5.14	-42.56	Pass
	4848.000	-33.92	-5.14	-28.78	Pass
2480	0.0690	-35.60	-5.68	-29.92	Pass
	1241.760	-47.30	-5.68	-41.62	Pass
	4936.000	-33.00	-5.68	-27.32	Pass

FCC 15.247 (d) / RSS-Gen 7.2.2, 7.2.5 – Spurious Radiated Emissions		Pass
Test Specification	: ANSI C63.10 – 2014	
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 / 3 MHz for f > 1 GHz	
Supply voltage	: 3.0 VDC from battery	
Temperature	: 23°C	
Humidity	: 50%	
<b>FCC Requirement:</b>	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).	
<b>IC Requirement:</b>	<p>Spurious emissions from licence-exempt transmitters shall comply with the field strength limits shown in RSS-Gen table 5.</p> <p>Unwanted emissions falling into restricted bands of Table 3 shall comply with the limits specified in RSS-Gen. Unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.</p>	
<b>Results:</b>	<p>Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.</p> <p>All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.</p>	
Tx frequency 2402MHz	Vertical Polarization	
Freq MHz	Level dB $\mu$ V/m	Limit/ Detector dB $\mu$ V/m
2366.128	50.63	74.0 / P
2366.064	33.32	54.0 / A
4803.376	53.77	74.0 / P
4804.008	40.85	54.0 / A
7206.592	60.67	74.0 / P
7206.056	49.25	54.0 / A
Tx frequency 2402MHz	Horizontal Polarization	
Freq MHz	Level dB $\mu$ V/m	Limit/ Detector dB $\mu$ V/m
2310.832	55.77	74.0 / P
2310.832	33.33	54.0 / A
4804.128	55.00	74.0 / P
4803.968	43.76	54.0 / A
7205.920	59.19	74.0 / P
7206.104	47.13	54.0 / A
Tx frequency 2440MHz	Vertical Polarization	
Freq MHz	Level dB $\mu$ V/m	Limit/ Detector dB $\mu$ V/m
4880.472	56.76	74.0 / P

4879.952	48.66	54.0 / A
7319.672	59.22	74.0 / P
7319.904	47.22	54.0 / A
Tx frequency 2440MHz		Horizontal Polarization
Freq MHz	Level dB $\mu$ V/m	Limit/ Detector dB $\mu$ V/m
4879.608	53.87	74.0 / P
4879.912	43.26	54.0 / A
7320.552	58.97	74.0 / P
7319.808	46.06	54.0 / A
Tx frequency 2480MHz		Vertical Polarization
Freq MHz	Level dB $\mu$ V/m	Limit/ Detector dB $\mu$ V/m
2484.741	48.85	74.0 / P
2483.500	34.01	54.0 / A
4960.368	56.94	74.0 / P
4959.928	48.62	54.0 / A
7439.224	59.60	74.0 / P
7439.856	48.19	54.0 / A
Tx frequency 2480MHz		Horizontal Polarization
Freq MHz	Level dB $\mu$ V/m	Limit/ Detector dB $\mu$ V/m
2484.758	54.31	74.0 / P
2483.500	39.22	54.0 / A
4960.600	54.60	74.0 / P
4959.925	43.30	54.0 / A
7439.188	58.49	74.0 / P
7439.650	45.26	54.0 / A

FCC 15.247 (d) / RSS-210 A8.5 – Band Edge Compliance in conducted emissions		Pass			
Test Specification	: KDB 558074 D01 DTS Measurement Guidance v03r02 / RSS-Gen				
Mode of operation	: BLE Tx mode (2402MHz, 2480MHz)				
Port of testing	: Temporary antenna port				
Detector	: Peak				
RBW/VBW	: 100 kHz / 300 kHz				
Supply voltage	: 3.0 VDC from DC power supply				
Temperature	: 23°C				
Humidity	: 50%				
<b>FCC Requirement:</b> 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.					
<b>IC Requirement:</b> In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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, provided that the transmitter demonstrates compliance with the peak conducted power limits.					
<b>Results:</b> The peak found outside any 100 kHz bandwidth of the operating frequency band comply with the requirement. For test protocols refer to Appendix 1, page 12.					
Operating frequency (MHz)	Spurious frequency (MHz)	Spurious Level (dBm)	Reference value (dBm)	Delta (dB)	Verdict
2402	2399.560	-49.37	-4.48	-44.89	Pass
2480	2483.580	-55.52	-5.68	-49.84	Pass

FCC 15.247 (e) / RSS-210 A8.2 (b) – Power Spectral Density		Pass	
<b>FCC Requirement:</b> 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.			
<b>IC Requirement:</b> The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.			
Test Specification : KDB 558074 D01 DTS Measurement Guidance v03r02 / RSS-Gen Mode of operation : BLE Tx mode (2402MHz, 2440MHz, 2480MHz) Port of testing : Temporary antenna port Detector : Peak RBW/VBW : $\geq 100$ KHz / $\geq 3 \times$ RBW span : $\geq 1.5 \times$ DTS BW Supply voltage : 3.0 VDC from DC power supply Temperature : 23°C Humidity : 50%			
<b>Results:</b> For test protocols please refer to Appendix 1, page 21-22.			
Operating frequency (MHz)	Power density (dBm)	Limit (dBm)	Verdict
2402	-4.48	8.0	Pass
2440	-5.14	8.0	Pass
2480	-5.68	8.0	Pass