

Produkte
Products

Prüfbericht - Nr.: 14041158 001			Seite 1 von 15		
<i>Test Report No.:</i>			<i>Page 1 of 15</i>		
Auftraggeber: <i>Client:</i>		R2P Pet Ltd Suite UG305, Chinachem Golden Plaza, 77 Mody Road Tsimshatsui East Hong Kong			
Gegenstand der Prüfung: Bluetooth Pedometer for Pet <i>Test Item:</i>					
Bezeichnung: <i>Identification:</i>	Please refer to multiple models on page 3		Serien-Nr.: <i>Serial No.:</i>	Engineering sample	
Wareneingangs-Nr.: <i>Receipt No.:</i>	A000230785-001, A000230785-002		Eingangsdatum: <i>Date of Receipt:</i>	21.07.2015	
Prüfart: <i>Testing Location:</i>		Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>			Test sample(s) is/are not damaged and suitable for testing.		
Prüfgrundlage: <i>Test Specification:</i>		FCC Part 15 Subpart C RSS-210 Issue 8 RSS-Gen Issue 4 ANSI C63.10-2013			
Prüfresultat: <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:		
06.10.2015 Hugo Wan Senior Project Manager			06.10.2015 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 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. <i>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.</i>					

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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 _{nor} : 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
FCC Requirement:	No antenna other than that furnished by the responsible party shall be used with the device	
IC Requirement:	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.	
Results:	Permanent attached antenna	
Verdict:	Pass	

FCC 15.204 / RSS-Gen 7.1.2 – Antenna Requirement 2		Pass
FCC Requirement:	Provide information for every antenna proposed for the use with the EUT	
IC Requirement:	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.	
Results:	a) Antenna type: PCB Antenna b) Manufacturer: N/A c) model no: N/A d) Gain with reference to an isotropic radiator: 0 dBi	
Verdict:	Pass	

RSS-Gen 5.4 – Transmitter External Control		Pass
IC Requirement:	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.	
Results:	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.	
Verdict:	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
FCC 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.			
IC Requirement: 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%			
Results: 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		

FCC 15.247 (b) (1), (3) / RSS-210 A8.4 (4) – Maximum Peak Output Power					Pass
FCC Requirement: For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz bands: 1 Watt (30dBm)					
IC Requirement: 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%					
Results: 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 %					
FCC 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.					
IC Requirement: 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.					
Results: 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%		
FCC 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 section15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).		
IC Requirement: Spurious emissions from licence-exempt transmitters shall comply with the field strength limits shown in RSS-Gen table 5. 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.		
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 dBµV/m	Limit/ Detector dBµV/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 dBµV/m	Limit/ Detector dBµV/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 dBµV/m	Limit/ Detector dBµV/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 dBµV/m	Limit/ Detector dBµV/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 dBµV/m	Limit/ Detector dBµV/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 dBµV/m	Limit/ Detector dBµV/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%					
FCC 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.					
IC Requirement: 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.					
Results: 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
<p>FCC 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.</p> <p>IC Requirement: 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.</p>			
<p>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 : ≥ 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%</p>			
<p>Results: For test protocols please refer to Appendix 1, page 21-22.</p>			
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