TÜVRheinland®

Produkte
Products

Prüfbericht - Nr.: *Test Report No.:*	**14037319 001**	**Seite 1 von 12** *Page 1 of 12*
Auftraggeber: *Client:*	**Wincotime Electronic Ltd.** **Rm2, 8th Floor, Fonda Industrial Building** **37-30 Au Pui Wan Street, Fo Tan** **Shatin, N.T. Hong Kong**	
Gegenstand der Prüfung: *Test Item:*	**Short Range Device - Radio Control Toy Transmitter (2.4GHz)**	
Bezeichnung: *Identification:*	**YOO-C**	**Serien-Nr.:** *Serial No.:* **Engineering sample**
Wareneingangs-Nr.: *Receipt No.:*	**A000139075-001**	**Eingangsdatum:** *Date of Receipt:* **03.12.2014**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery:*	Test sample(s) is/are not damaged and suitable for testing.	
Prüfort: *Testing Location:*	**Hong Kong Productivity Council** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong	
Prüfgrundlage: *Test Specification:*	**FCC Part 15 Subpart C** **ANSI C63.4-2003**	
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:*		
07.01.2015	Benny Lau Project Manager		07.01.2015	Sharon Li Department Manager	
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges: **FCC ID: 2ABPTYX3800**
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

Page

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}: 3.0Vdc (1 x 3V CR2032 battery)

Product function and intended use

The equipment under test (EUT) is a Bluetooth Low Energy Transceiver operating at 2.4GHz. It is a pedometer. And it is powered by 3.0Vdc (1 x 3V CR2032 battery).

FCC ID: **2ABPTYX3800**

Models	Product description
YOO-C	Bluetooth-LE Pedometer

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

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 : 3.0VDC
Temperature : 23ºC
Humidity : 50%

Results: Pass

Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2402	2401.564	> 2400	2402.604	< 2483.5
2440	2439.564	> 2400	2440.604	< 2483.5
2480	2479.564	> 2400	2480.620	< 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 : 3.0VDC
Temperature : 23ºC
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	85.33	114.0 / P
2402.000	69.38	94.0 / A

Fundamental Frequency 2402 MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2402.000	91.28	114.0 / P
2402.000	74.07	94.0 / A

Harmonics 2402MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4804.000	53.72	74.0 / P
4804.000	39.72	54.0 / A
7206.000	58.78	74.0 / P
7206.000	45.35	54.0 / A

Harmonics 2402 MHz Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4804.000	52.57	74.0 / P
4804.000	39.48	54.0 / A
7206.000	58.31	74.0 / P
7206.000	44.67	54.0 / A

Fundamental Frequency 2440 MHz Vertical Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2440.000	83.87	114.0 / P
2440.000	68.71	94.0 / A

Fundamental Frequency 2440 MHz Horizontal Polarization

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

2440.000	88.88	114.0 / P
2440.000	72.50	94.0 / A
Harmonics 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
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**
No peak found	---	74.0 / P
No peak found	---	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	81.04	114.0 / P
2480.000	66.45	94.0 / A
Fundamental Frequency 2480 MHz	Horizontal Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
2480.000	84.05	114.0 / P
2480.000	68.82	94.0 / A
Harmonics 2480 MHz	Vertical Polarization	
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
No peak found	---	74.0 / P
No peak found	---	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**
No peak found	---	74.0 / P
No peak found	---	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	: 3.0VDC
Frequency range	: 9kHz to tenth harmonic
Temperature	: 23ºC
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	61.11	74.0 / P
2400.000	48.80	54.0 / A

Tx frequency 2402 MHz — Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2400.000	67.11	74.0 / P
2400.000	53.13	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	51.05	74.0 / P
2483.500	35.66	54.0 / A

Tx frequency 2480 MHz — Horizontal Polarization

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2483.500	54.35	74.0 / P
2483.500	37.22	54.0 / A