

FCC / IC – Test report

Report Number : **60/790.14.022.02** Date of Issue: October 30, 2014

Model : **WFBTSC02**

Product Type : **Bike speed and cadence transmitter**

Applicant : **DAYTON INDUSTRIAL CO.,LTD**

Address : **2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong Kong**

Production Facility : **KENDY ENTERPRISE LTD**

Address : **2-12 Kwai Fat Road,11-A Kwai Chung, New Territories, Hong Kong**

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : **14**

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2. Details about the Test Laboratory

Details about the Test Laboratory

Test site 1

Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

Test site 2

Company name: Shenzhen Academy of Metrology and Quality Inspection
No.4 TongFa Road, Xili Town Nanshan District, Shenzhen, China
Test Firm FCC Registration number:994606

National Digital Electronic Product Test
No.4 TongFa Road, Xili Town Nanshan District, Shenzhen, China
IC Assigned Code: 11177A

3. Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	Bike speed and cadence transmitter
Model no.:	WFBTSC02
Serial number:	NIL
Options and accessories:	NIL
FCC ID:	O4GBTSC02
IC:	7666A-BTSC02
Rated Voltage:	3 VDC
Rated Current:	NIL
Rated Power:	NIL
Frequency:	2457MHz
RF Transmission Frequency:	2457MHz
Antenna gain:	0 dBi
No. of Operated Channel:	1
Modulation:	GFSK
Description of the EUT:	Battery operated – 1x 3.0V CR2032 battery

4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators
RSS-Gen Issue 3 December 2010	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 Issue 8 December 2010	RSS-210 — Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

5. Summary of Test Standards and Results

Emission Tests					
Test Condition	Pages	Test site	Test Result		
			Pass	Fail	N/A
Conducted Emission (47 CFR 15.207, 15.209 & RSS-GEN 7.2.4)	NIL	/	☐	☐	☒ *
Radiated Emission (47 CFR 15.249, 15.209 & RSS-210 A2.9, GEN 7.2.5 & RSS-GEN 6.1)	8	Site 2	☒	☐	☐
20dB Bandwidth (47 CFR 15.215)	12	Site 2	☒	☐	☐
99% occupied bandwidth (RSS-GEN 4.6.1)	12	Site 2	☒	☐	☐
Bandedge Emission (47 CFR 15.249)	14	Site 2	☒	☐	☐

Remark: 1. NA: Battery operated only.

2. For Spurious Radiated Emissions test, three set-up directions(X,Y,Z) were pretested, but only direction Y test data was recorded in this report for it is the worst case.

6. General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: O4GBTSC02 complies with the FCC Part 15, Subpart C Rules.

This submittal(s) (test report) is intended for IC: 7666A-BTSC02, complies with the IC RSS 210 and RSS-GEN Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

SUMMARY:

All tests according to the regulations cited on page 6 were

- - Performed
- - **Not** Performed

The Equipment Under Test

- - **Fulfills** the general approval requirements.
- - **Does not** fulfill the general approval requirements.

Sample Received Date: September 22, 2014

Testing Start Date: October 16, 2014

Testing End Date: October 22, 2014

- TÜV SÜD HONG KONG LTD. -

Reviewed by:


Edmond FUNG

Prepared by:


CHAN Kwong Ngai



7. Emission Test Results

7.1 Radiated Emission Test

Date of test : October 16, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : Fundamental

Test Result

☒ Passed

☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Factor (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
2457.000	H	31.8	81.64	114	-32.36	Peak
2457.000	V	31.8	82.33	114	-31.67	Peak
2457.000	H	31.8	76.25	94	-17.75	Average
2457.000	V	31.8	78.17	94	-15.83	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.
The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable. The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.
Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.
Adjust the emission and slightly height of the antenna to locate the position with maximum reading.

Date of test : October 16, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

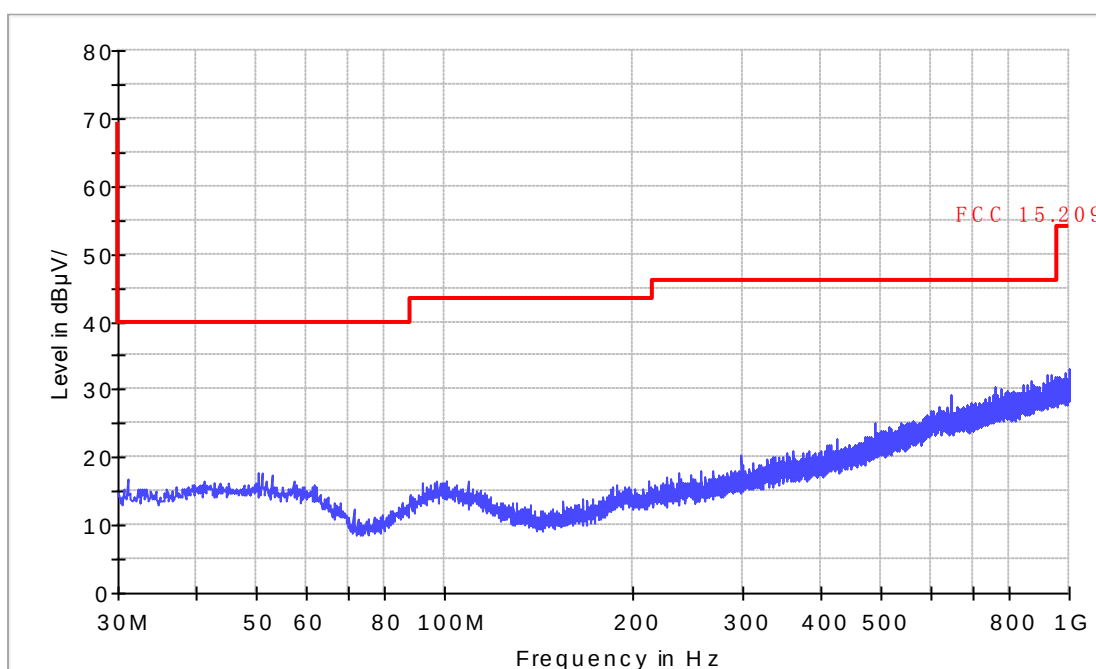
Frequency channel : 2457MHz

Remarks : 9kHz-1GHz(Spurious)

Test Result	
☒	Passed
☐	Not Passed

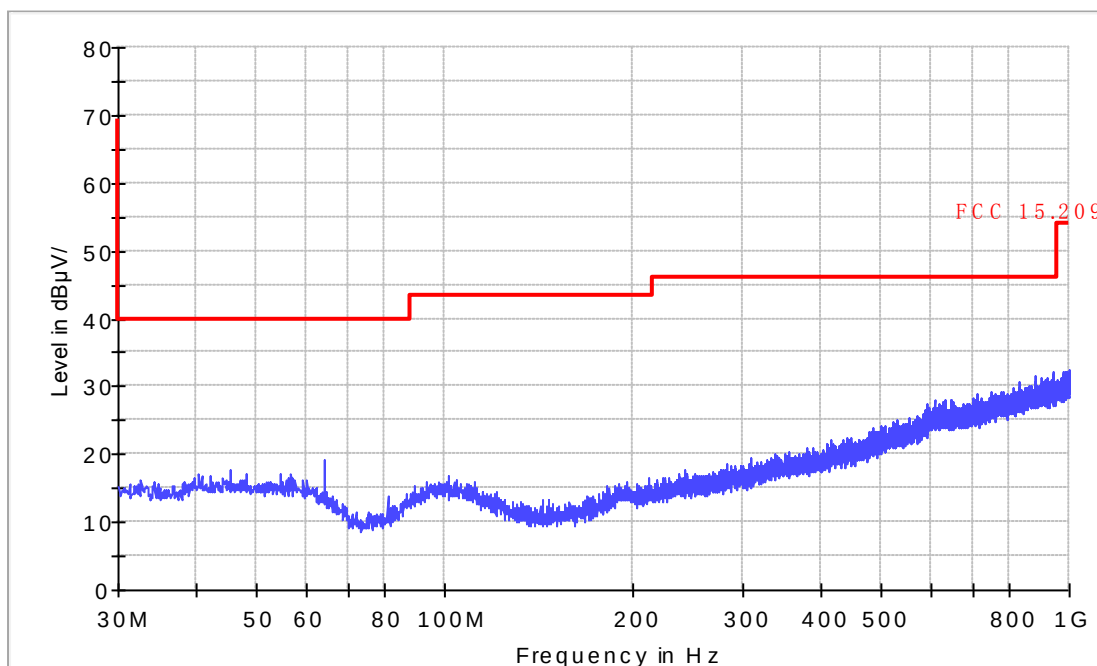
Horizontal

Electric Field Strength 30M-1GHz



Vertical

Electric Field Strength 30M-1GHz



Frequency (MHz)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
32.5	-35.7	13.2	40	-26.8	QP	H
56.8	-34.4	12.7	40	-27.3	QP	H
105.4	-34.9	12.5	43.5	-31.0	QP	H
304.9	-33.4	13.9	46	-32.1	QP	H
602.6	-26.7	22.6	46	-23.4	QP	H
609.5	-26.6	23.8	46	-22.2	QP	H
32.5	-36.9	12.8	40	-27.2	QP	V
56.8	-34.7	14.1	40	-25.9	QP	V
105.4	-34.2	11.4	43.5	-32.1	QP	V
304.9	-33.7	14.9	46	-31.1	QP	V
602.6	-27.2	24.8	46	-21.2	QP	V
609.5	-27.2	25.2	46	-20.8	QP	V

Remark: 1.No emissions can be detected between 9 kHz and 30 MHz.

Date of test : October 16, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : 1GHz-25GHz(Harmonics and spurious)

Test Result

☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
4914.000	H	5.4	54.1	74.00	-19.9	Peak
4914.000	H	5.4	49.3	54.00	-4.7	Average
7371.000	H	2.2	51.6	74.00	-22.4	Peak
7371.000	H	2.2	46.5	54.00	-7.5	Average
4914.000	V	5.4	55.5	74.00	-18.5	Peak
4914.000	V	5.4	51.8	54.00	-2.2	Average
7371.000	V	2.2	49.4	74.00	-24.6	Peak
7371.000	V	2.2	45.2	54.00	-8.8	Average

Remark: 1.The EUT was placed on the top of the turntable in test site area.
The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.
The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.
Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.
Adjust the emission and slightly height of the antenna to locate the position with maximum reading.
2.Average value=Peak value + duty cycle factor= Peak value-26.2

7.2 20dB & 99% bandwidth measurement

Date of test : October 21, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

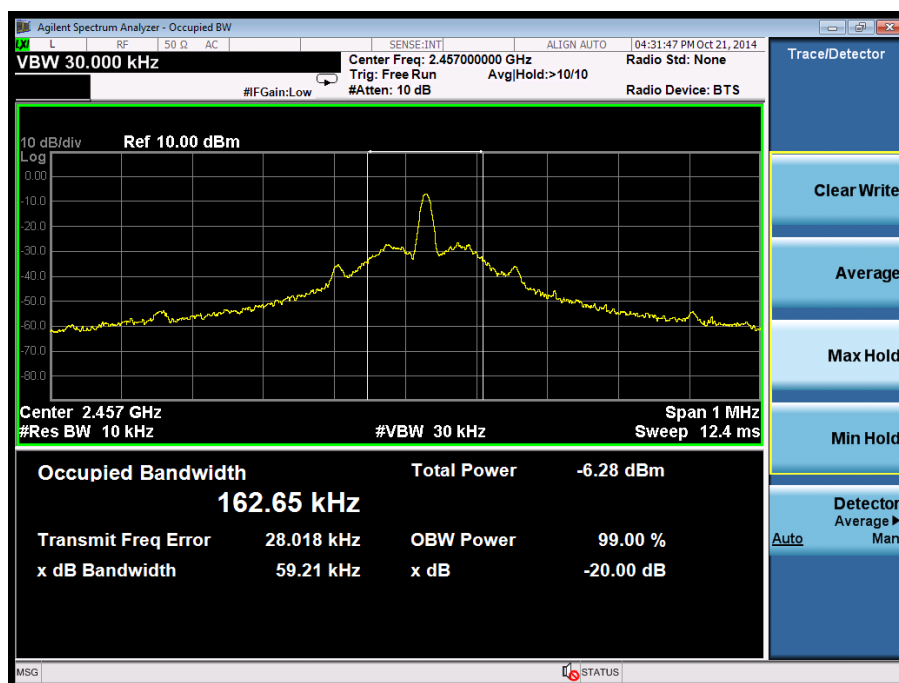
Remarks : NIL

Test Result

☒ Passed

☐ Not Passed

20 dB Bandwidth	99% OBW	Result
kHz	kHz	
59.21	162.65	Pass



8. Test Equipment List

DESCRIPTION	Type No.	Serial No.	Calibrated date	Calibrated until
EMI Test Receiver	ESU40	SB8501/09	2014.05.16	2015.05.15
Bilog Antenna	Schwarzbeck	SB8501/04	2014.01.20	2015.01.19
Horn Antenna	HF906	SB3435	2014.01.20	2015.01.19
Amplifier(1-18GHz)	--	SB3435/01	2014.01.20	2015.01.19
Amplifier(18-40GHz)	--	SB3435/02	2014.01.20	2015.01.19
Horn Antenna	AT4560	SB5392/02	2014.05.16	2015.05.15
3m Semi-anechoic chamber	9X6X6	SB3450/01	2014.10.12	2015.10.11
Loop Antenna	6512	29604	2014.09.25	2015.09.24
RF cable(0.4m)	/	S02-1404-09-065	2014.05.11	2015.05.10
RF cable(3.5m)	/	S02-1404-09-047	2014.05.11	2015.05.10
RF cable(1.2m)	/	S02-1404-09-052	2014.05.11	2015.05.10
Spectrum Analyzer	N9020A	MY53420615	2014.05.12	2015.05.11
Power Sensor	U2021XA	MY53180015	2014.05.24	2015.05.23
Power Sensor	U2021XA	MY53260040	2014.05.24	2015.05.23
Power Sensor	U2021XA	MY53360002	2014.05.24	2015.05.23
Power Sensor	U2021XA	MY53360006	2014.05.24	2015.05.23
USB Modular Simultaneous Data Acquisition	U2531A	TW53353509	N.C.R	/
USB Modular Simultaneous Data Acquisition	U2531A	TW53353511	N.C.R	/
EMI Test Receiver	ESC130	SB3319	2014.01.20	2015.01.19
LISN	ENV216	SB4357	2014.01.20	2015.01.19
Spectrum Analyzer	E4445A	MY46181814	2013.12.11	2014.12.10
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.18	2015.02.17
Amplifier	150A250	326446	2014.03.19	2015.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.22	2014.11.21

N.C.R: No calibration request

9. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	U=3.59dB (9kHz-30MHz) U=5.08dB (30MHz-1GHz) U=4.56dB (1GHz-18GHz) U=4.42dB (18GHz-25GHz)
CE	Disturbance Voltage (dB μ V)	U=2.7dB