Hong Kong

FCC / IC – Test report

Report Number	: **60/790.14.017.02**	Date of Issue:	August 13, 2014
Model	: **Duotrap**		
Product Type	: **Bike speed and cadence transmitter**		
Applicant	: DAYTON INDUSTRIAL CO.,LTD		
Address	: 2-12 Kwai Fat Road, Kwai Chung, New Territories, Hong Kong		
Production Facility	: Kendy Electronics (Dongguan) Co.Ltd,		
Address	: 2-12 Kwai Fat Road,11-A Kwai Chung,New Territories,Hong Kong		
Test Result	: ■ **Positive** ☐ **Negative**		
Total pages including Appendices	: 15		

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TÜV SÜD Hong Kong Ltd. reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Hong Kong Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Hong Kong Ltd. issued reports.

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1. Table of Contents

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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:817957

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.:	Duotrap
Serial number:	NIL
Options and accessories:	NIL
FCC ID:	O4GDTRAP
IC:	7666A-DTRAP
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

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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.

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6. General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: O4GDTRAP complies with the FCC Part 15, Subpart C Rules.

This submittal(s) (test report) is intended for IC: 7666A-DTRAP, 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: July 21, 2014

Testing Start Date: July 24, 2014

Testing End Date: July 24, 2014

- TÜV SÜD HONG KONG LTD. -

Reviewed by: Edmond FUNG

Prepared by: CHAN Kwong Ngai

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7. Emission Test Results

7.1 Duty cycle

Date of test : July 24, 2014

Test requirement : FCC Part 15

Test method : Conducted

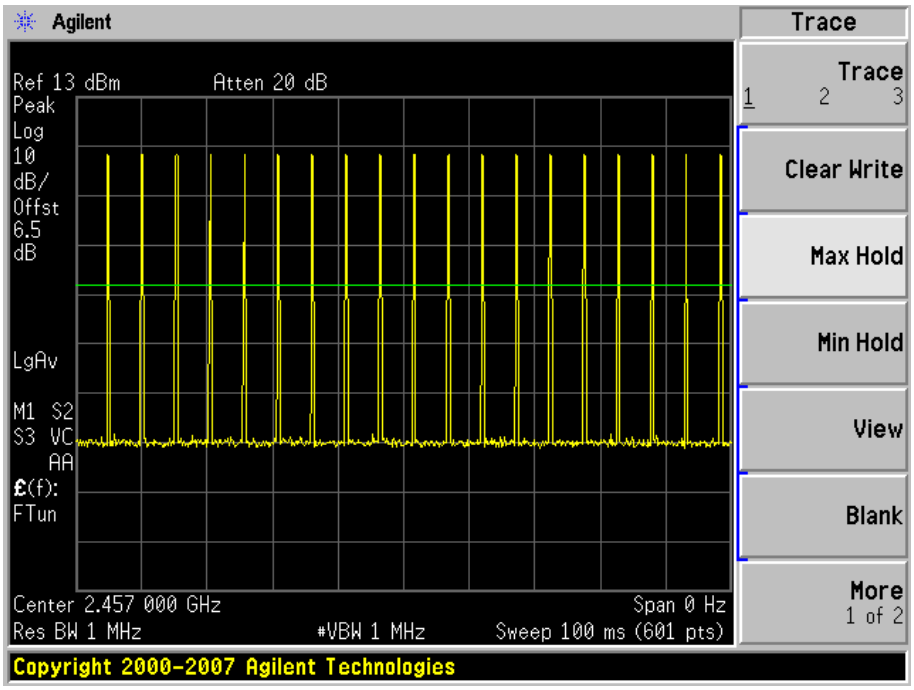
Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : Fundamental

Test Result
☒ Passed
☐ Not Passed

Frequency(MHz)	Ton(μs)	Toff(μs)	Tp =Ton+Tof(μs)	Duty cycle =Ton/Tp	Duty cycle factor =20log(Duty cycle)
2547	250	4872	5122	0.0488	-26.23



Periodic

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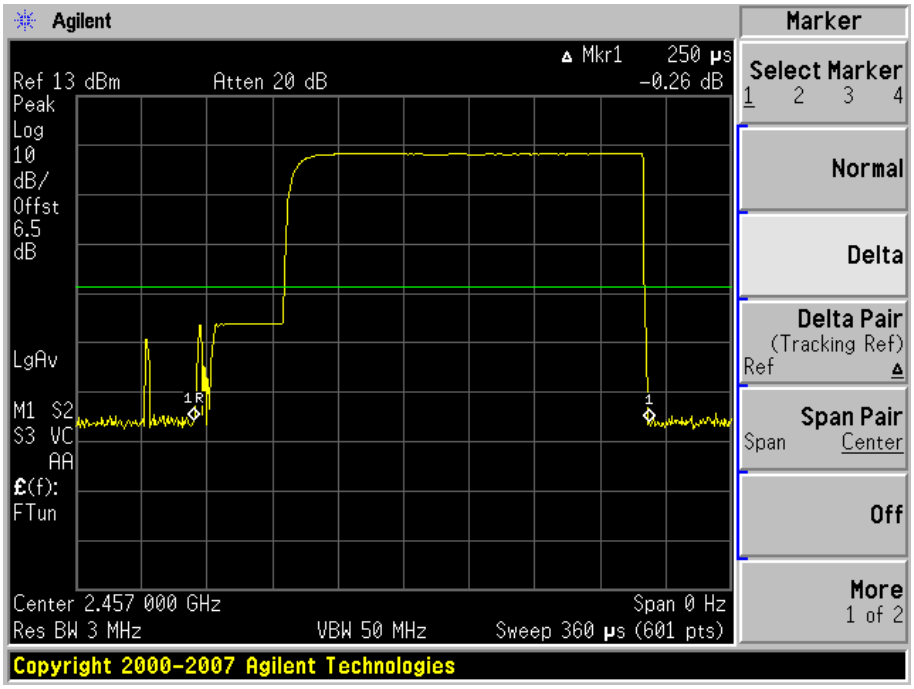
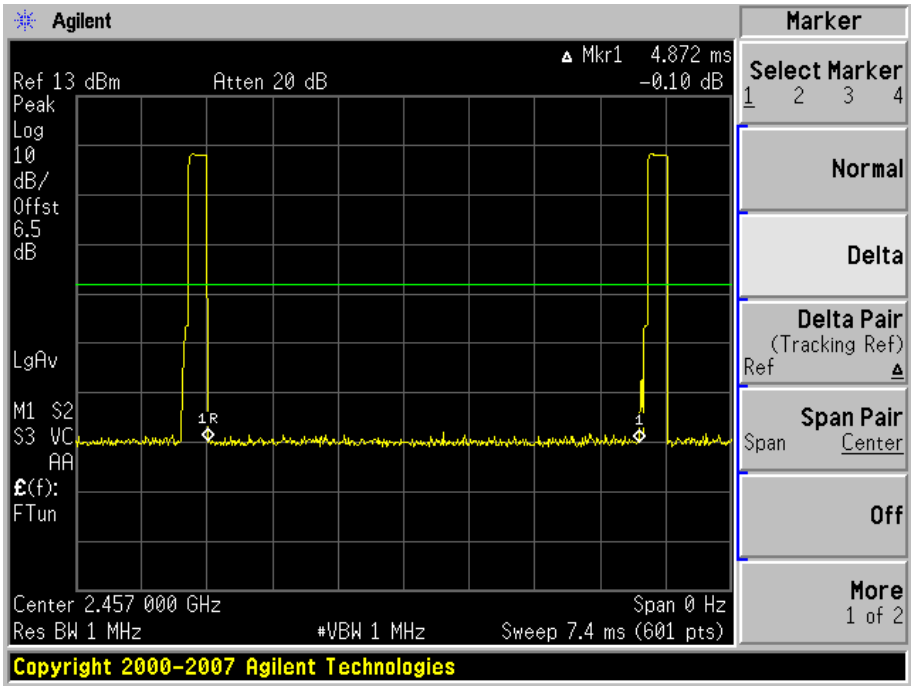


Time-On



Time-Off

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7.2 Radiated Emission Test

Date of test : July 24, 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 (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
2457.000	H	31.8	86.65	114	-27.35	Peak
2457.000	V	31.8	92.15	114	-21.85	Peak
2457.000	H	31.8	60.42	94	-33.58	Average
2457.000	V	31.8	65.92	94	-28.08	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-26.23

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Date of test : July 24, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : 9kHz-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
53.258	H	14.0	18.1	40.00	-21.9	Quasi Peak
62.366	H	13.6	17.5	40.00	-22.5	Quasi Peak
181.520	H	11.5	14.9	43.50	-28.6	Quasi Peak
428.575	H	18.0	21.2	46.00	-24.8	Quasi Peak
665.852	H	19.2	22.9	46.00	-23.1	Quasi Peak
787.566	H	22.3	26.5	46.00	-19.5	Quasi Peak
4914.000	H	5.4	61.4	74.00	-12.6	Peak
4914.000	H	5.4	35.2	54.00	-18.8	Average
7371.000	H	2.2	63.2	74.00	-10.8	Peak
7371.000	H	2.2	37.0	54.00	-17.0	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

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Date of test : July 24, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : 9kHz-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
53.258	V	14.0	15.2	40.00	-24.8	Quasi Peak
62.366	V	13.6	16.8	40.00	-23.2	Quasi Peak
181.520	V	11.5	18.5	43.50	-25.0	Quasi Peak
428.575	V	18.0	21.5	46.00	-24.5	Quasi Peak
665.852	V	19.2	24.2	46.00	-21.8	Quasi Peak
787.566	V	22.3	26.9	46.00	-19.1	Quasi Peak
4914.000	V	5.4	62.8	74.00	-11.2	Peak
4914.000	V	5.4	36.6	54.00	-17.4	Average
7371.000	V	2.2	65.9	74.00	-8.1	Peak
7371.000	V	2.2	39.7	54.00	-14.3	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

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7.3 20dB & 99% bandwidth measurement

Date of test : July 24, 2014

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

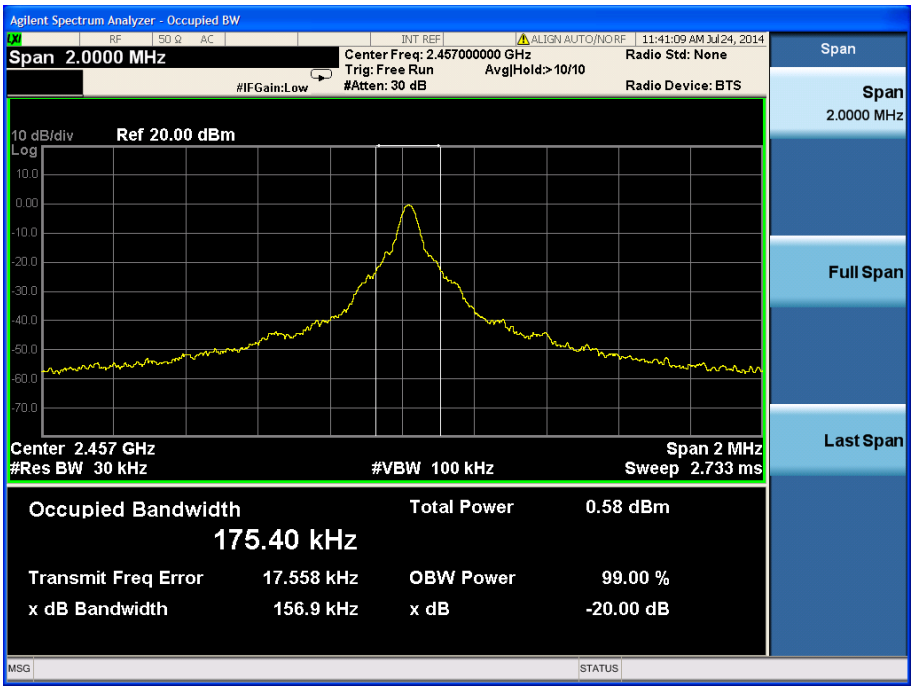
Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

20 dB Bandwidth	99% OBW	Result
kHz	kHz	
156.9	175.4	Pass



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8. Test Equipment List

DESCRIPTION	Type No.	Serial No.	Calibrated date	Calibrated until
Antenna	VULB9163	9163 330	2014.02.25	2015.02.24
Antenna	3117	00066577	2014.04.02	2015.04.01
Antenna	3160-09	00118388	2013.09.06	2014.09.05
Loop Antenna	6512	29604	2013.09.25	2014.09.24
Spectrum Analyzer	N9020A	MY53420615	2014.05.12	2015.05.11
Spectrum Analyzer	FSP 40	100378	2013.12.23	2014.12.22
EMI Test Receiver	ESCI	100701	2013.08.04	2014.08.03
Spectrum Analyzer	FSV40	100903	2014.01.27	2015.01.26
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
EMI Test Receiver	ESI26	SB3436	2014.01.20	2015.01.19

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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 (dBµV/m)	U=3.59dB (9kHz-30MHz) U=5.08dB (30MHz-1GHz) U=4.56dB (1GHz-18GHz) U=4.42dB (18GHz-25GHz)
CE	Disturbance Voltage (dBµV)	U=2.7dB

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