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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMR070300502RFT-1

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FCC ID: ON5HRSENSORC

TEST REPORT

Application No. : GLEMR070300502RF
Applicant: CATEYE Co.,Ltd.
FCC ID: ON5HRSENSORC
Frequency Band 2.410GHz and 2.473GHz
Equipment Under Test (EUT):
Name: HEART RATE CHEST STRAP
Model No.: HR SENSOR C
Standards: FCC PART 15: 2006
Please refer to section 2 for further details.
Date of Receipt: 15 May 2007
Date of Test: 15 to 22 May 2007
Date of Issue: 24 May 2007

Test Result :	PASS *
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In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Stephen Guo
Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Flied Strength of Fundamental	FCC PART 15 :2006	Section 15.249 (a)	PASS
Flied Strength of Unwanted Emissions	FCC PART 15 :2006	Section 15.249 (a) Section 15.249 (d)	PASS
Occupied Bandwidth	FCC PART 15 :2006	Section 15.249	PASS
Band Edges	FCC PART 15 :2006	Section 15.249 (d)	PASS

Remark:

The HEART RATE CHEST STRAP, Model No. HR SENSOR C is a Tx of the set product.

The SPEED CADENCE COMBO, Model No. SPD SENSOR C is a Tx of the set product.

The BIKE COMPUTER, Model No. V3 and V2c are Rx of the set product.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.



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4 General Information

4.1 Client Information

Applicant Name: CATEYE Co.,Ltd.
Applicant Address: 2-8-25 Kuwazu,Higashi-Sumiyoshi-ku,Osaka Japan

4.2 General Description of E.U.T.

Product Name: HEART RATE CHEST STRAP
Model: HR SENSOR C
Power Supply: 3.0V DC (1x"CR2032" cell battery)
Power Cord: N/A
Emission Designation: F9D

4.3 Description of EUT operation

The EUT was a set of equipment:

The HEART RATE CHEST STRAP, Model No. HR SENSOR C is a Tx of the set product.

The SPEED CADENCE COMBO, Model No. SPD SENSOR C is a Tx of the set product.

The BIKE COMPUTER, Model No. V3 and V2c are Rx of the set product.

The Tx have 2 frequencies between 2.410GHz to 2.473GHz ,A channel 2.410GHz used for broadcast connection information, another B channel between 2.410GHz and 2.473GHz used for transfer data. A channel is a fixed frequency channel. Before the receiver be found, B frequency will hop between lowest channel to highest channel in the assigned frequency band. when the Rx be found, B frequency will fixed in one channel and will not change it any more.

Rx receive the data from Tx and display the relative information about it.

It can support the Tx model include HR SENSOR C and SPD SENSOR C simultaneously or relatively.

4.4 Standards Applicable for Testing

The standard used was FCC PART 15, SUBPART C (2006) section 15.249.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.



4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **CNAS L0167**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.

- **Industry Canada (IC)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620B-1.

Date of Registration: Jan 15, 2007. Valid until Jan 15, 2009



5 Test Results

5.1 Test Instruments

No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0039	Temperature Chamber	TERCHY	MHG-800RR	0118	05-12-2006	05-12-2007
EMC0009	D.C. Power Supply	Instek	PS-3030	9862036	Check when used	
EMC0007	DMM	Fluke	73	70671122	27-09-2006	27-09-2007
EMC0006	DMM	Fluke	73	70681569	27-09-2006	27-09-2007
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	06-03-2007	06-03-2008
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	22-08-2006	22-08-2007
EMC0502	Biconical Antenna (Rx)	Rohde & Schwarz	HK116	100032	31-07-2006	31-07-2007
EMC0503	Biconical Antenna (Tx)	Rohde & Schwarz	HK116	100033	31-07-2006	31-07-2007
EMC0504	Log-Perd. Dipole Antenna (Rx)	Rohde & Schwarz	HL223	100039	31-07-2006	31-07-2007
EMC0505	Log-Perd. Dipole Antenna (Tx)	Rohde & Schwarz	HL223	100040	31-07-2006	31-07-2007
EMC0517	Horn Antenna (Rx)	Rohde & Schwarz	HF906	100095	29-07-2006	29-07-2007
EMC0519	Bilog Type Antenna	Schaffner Chase	CBL6143	5070	31-07-2006	31-07-2007
EMC0520	0.1-1300 MHz Pre Amplifier	HP	8447D OPT 010	2944A06252	28-03-2007	28-03-2008
EMC0521	1-26.5GHz Pre Amplifier	Agilent	8449B	3008A01649	28-03-2007	28-03-2008
EMC0507	Antenna Mask (Tx)	HD-GmbH	AS620M	620/408	N/A	N/A
EMC0508	Antenna Mask (Rx)	HD-GmbH	MA240	240/619	N/A	N/A
EMC0509	Turntable	HD-GmbH	DT430	N/A	N/A	N/A
EMC0510	Turntable & Antenna Mask Controller	HD-GmbH	HD100	N/A	N/A	N/A
EMC0512	EMI Test Software	Rohde & Schwarz	ES-K1	N/A	N/A	N/A
EMC0511	Coaxial cable	Rohde & Schwarz	N/A	N/A	04-11-2006	03-11-2007
EMC0514	Coaxial cable	Rohde & Schwarz	N/A	N/A	04-11-2006	03-11-2007
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	05-12-2006	05-12-2007
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2006	05-12-2007
EMC0516	Signal Generator	Rohde & Schwarz	SMR20	100416	05-12-2006	05-12-2007
EMC0032	Radio Communication Monitor	Rohde & Schwarz	CMS54	100137	20-12-2006	20-12-2007
EMC0904	Power Meter	Rohde & Schwarz	NRVS	825770/074	22-07-2006	22-07-2007
EMC0905	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	22-07-2006	22-07-2007
EMC0906	Dual Directional Coupler	Werlatone Inc.	C1795	6634	20-11-2006	20-11-2007
EMC1508	Audio Analyzer	Rohde & Schwarz	UPL	100855	11-09-2006	11-09-2007
EMC1005	Digital Oscilloscope	Tektronix	TDS3012	B015508	14-07-2006	14-07-2007
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0001	Temp. Humidity/Barometer	Oregon Scientific	BA-888	EMC0001	20-09-2007	20-09-2008



5.2 E.U.T. Operation

Input voltage:	3.0V DC (1 x 'CR2032' Size Cell Battery)
Operating Environment:	
Temperature:	24 °C~26°C
Humidity:	55 % RH~62 % RH
Atmospheric Pressure:	996 ~ 1006 mbar
EUT Operation:	Test in transmitting mode: 1. For mode 1: channel A: 2.410GHz(lowest channel) , channel B:2.436GHz(middle channel) 2. For mode 2: channel A: 2.410GHz(lowest channel), channel B:2.473GHz(highest channel)



5.3 Test Procedure & Measurement Data

5.3.1 Radiated Emissions

5.3.1.1 Test in transmitting mode

Test Requirement: FCC Part15 C Section 15.249(a) & (d)
Test Method: Based on FCC Part15 C Section 15.249 & ANSI C63.4
Test Date: 18 May 2007
Measurement Distance: 3m (Semi-Anechoic Chamber)
Frequency range: 30 MHz – 25GHz for transmitting mode.
Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 M – 25GHz)
Operation: Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal

Requirements:

FCC Part 15.249(a)

Table with 3 columns: Fundamental Frequency (MHz), Field Strength of Fundamental (dBuV/m @ 3m), Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m). Rows include frequency bands like 902 to 928, 2400 to 2483.5, etc.

FCC Part 15.249(d)

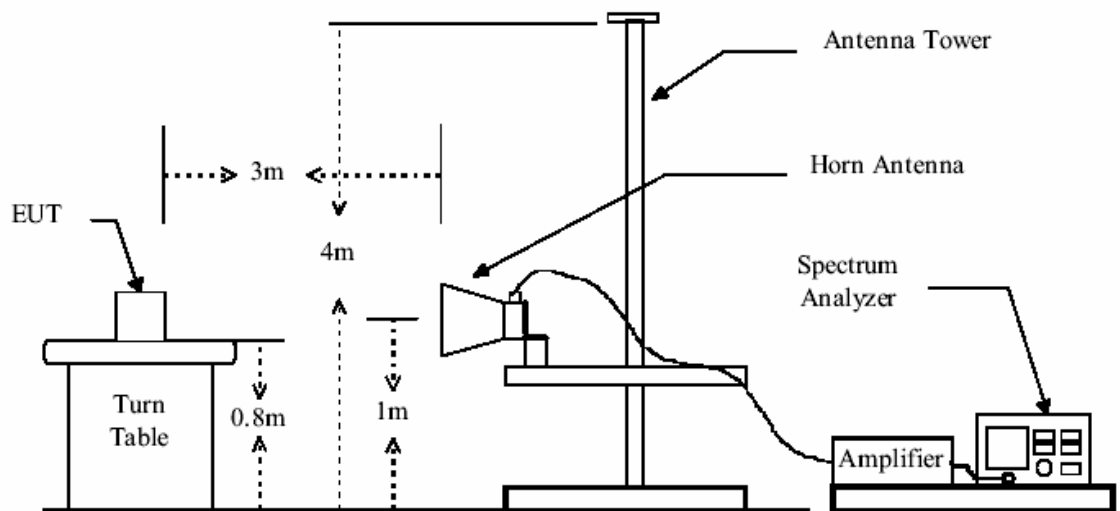
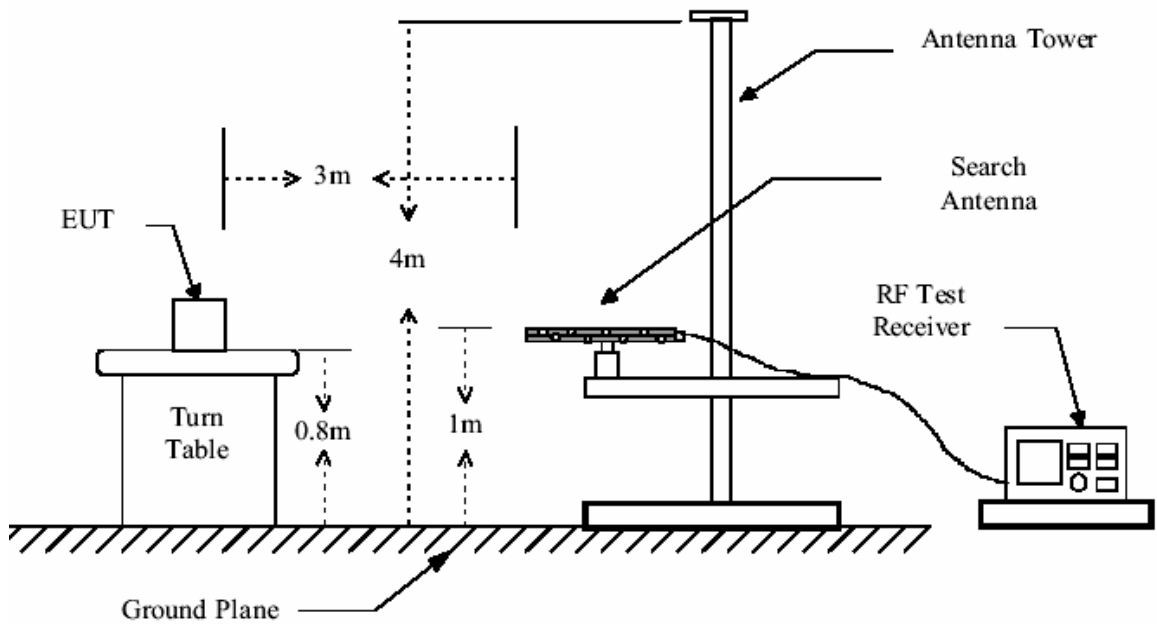
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Remark:

The fundamental frequency of the EUT is between 2400 to 2483.5MHz
The limit for average field strength dBuv/m for the fundamental frequency = 94.0 dBuV/m.
No fundamental is allowed in the restricted bands.
The limit for average field strength dBuV/m for the harmonics = 54.0 dBuV/m.
Spurious in the restricted bands must be less than 44.0 dBuV/m or 54.0 dBuV/m in 15.209. Here is 54.0 dBuV/m according to FCC Part 15.249(d).

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Test Configuration:





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The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier . The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

The following test results were performed on the EUT:

For **Mode 1:** (1). Fundamental emission

Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
2.410	93.7	84.4	114.0	20.3	29.6
2.436	94.7	87.8	114.0	19.3	26.2
Average Measurement					
2.410	62.8	57.2	94.0	31.2	36.8
2.436	63.0	59.2	94.0	31.0	34.8

(2). Harmonics & Spurious Emissions

Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
1) 4.820	50.6	52.2	74.0	23.4	21.8
2) 4.872	51.5	53.2	74.0	22.5	20.8
3) 7.230	52.1	53.1	74.0	21.9	20.9
4) 7.308	52.6	52.9	74.0	21.4	21.1
5) 9.640	53.0	51.9	74.0	21.0	22.1
6) 9.744	52.7	51.6	74.0	21.3	22.4
Average Measurement					
1) 4.820	31.4	32.5	54.0	22.6	21.5
2) 4.872	32.1	33.8	54.0	21.9	20.2
3) 7.230	31.8	32.9	54.0	22.2	21.1
4) 7.308	32.0	33.4	54.0	22.0	20.6
5) 9.640	32.8	32.7	54.0	21.2	21.3
6) 9.744	31.7	33.6	54.0	22.3	20.4

Remark:

- 1). According to 15.249 (e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 2) Sweep from 30MHz to 25GHz, find the max radiated emissions and record it at least 6 point include the noise level point.



TEST RESULTS: The unit does meet the FCC requirements.

The following test results were performed on the EUT:

For **Mode 2:** (1). Fundamental emission

Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
2.410	94.1	85.6	114.0	19.9	28.4
2.473	94.7	86.9	114.0	19.3	27.1
Average Measurement					
2.410	63.0	57.6	94.0	31.0	36.4
2.473	66.0	58.0	94.0	28.0	36.0

(2). Harmonics & Spurious Emissions

Peak Measurement

Test Frequency (GHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
1) 4.820	52.5	52.1	74.0	21.5	21.9
2) 4.946	51.3	53.6	74.0	22.7	20.4
3) 7.230	51.0	51.3	74.0	23.0	22.7
4) 7.419	49.9	50.2	74.0	24.1	23.8
5) 9.640	53.2	51.3	74.0	20.8	22.7
6) 9.892	53.4	52.3	74.0	20.6	21.7
Average Measurement					
1) 4.820	33.6	31.8	54.0	20.4	22.2
2) 4.946	34.1	34.8	54.0	19.9	19.2
3) 7.230	33.6	32.9	54.0	20.4	21.1
4) 7.419	31.8	33.0	54.0	22.2	21.0
5) 9.640	34.1	32.8	54.0	19.9	21.2
6) 9.892	32.3	32.7	54.0	21.7	21.3

Remark:

- 1). According to 15.249 (e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 2) Sweep from 30MHz to 25GHz, find the max radiated emissions and record it at least 6 point include the noise level point.

TEST RESULTS: The unit does meet the FCC requirements.

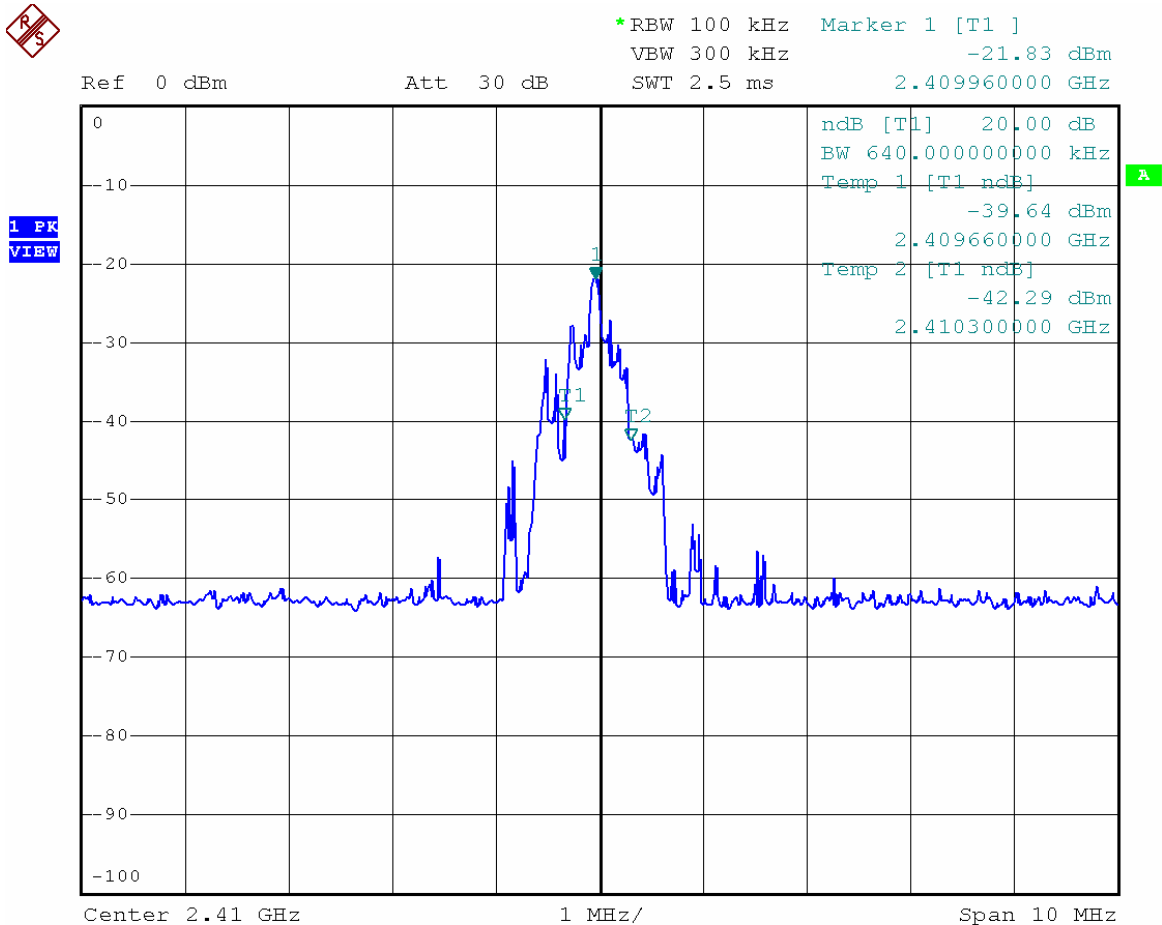
5.3.2 Occupied Bandwidth & Band Edge

Test Requirement: FCC Part 15 C Section 15.249
 Test Method: ANSI C63.4 and FCC Part 2.1049
 Operation within the band 2.4000 – 2.4835GHz
 Test Date: 22 May 2007
 Requirements: 15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
 Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

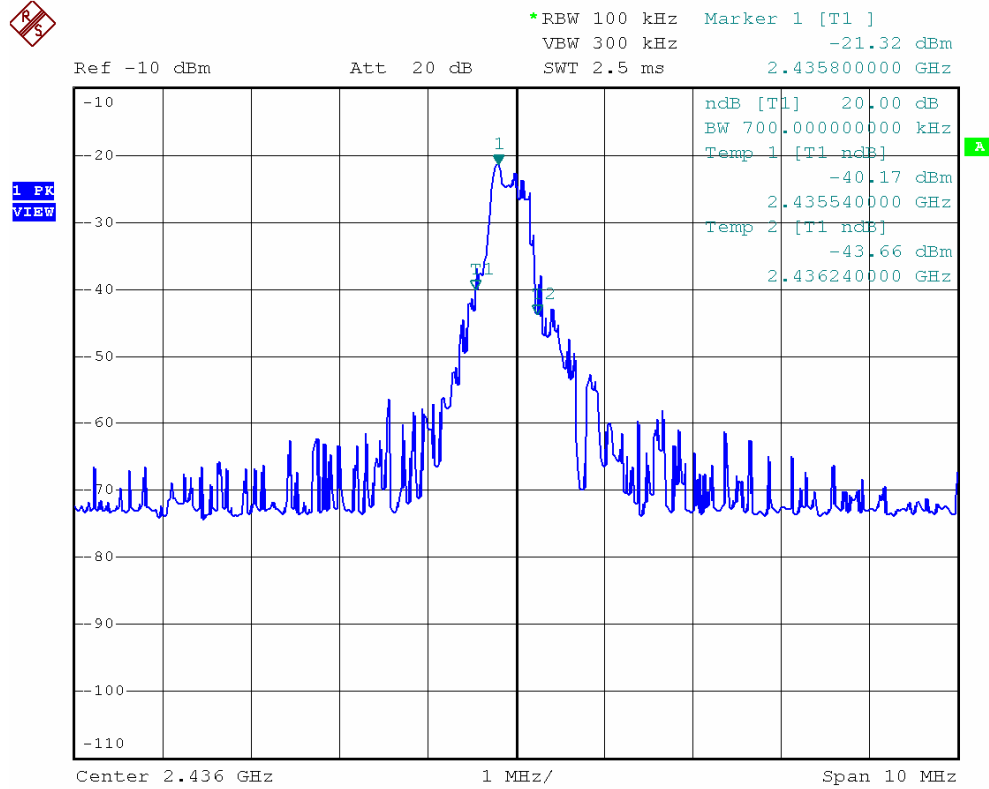
(1). For Mode 1:

(i)The occupied bandwidth as below:

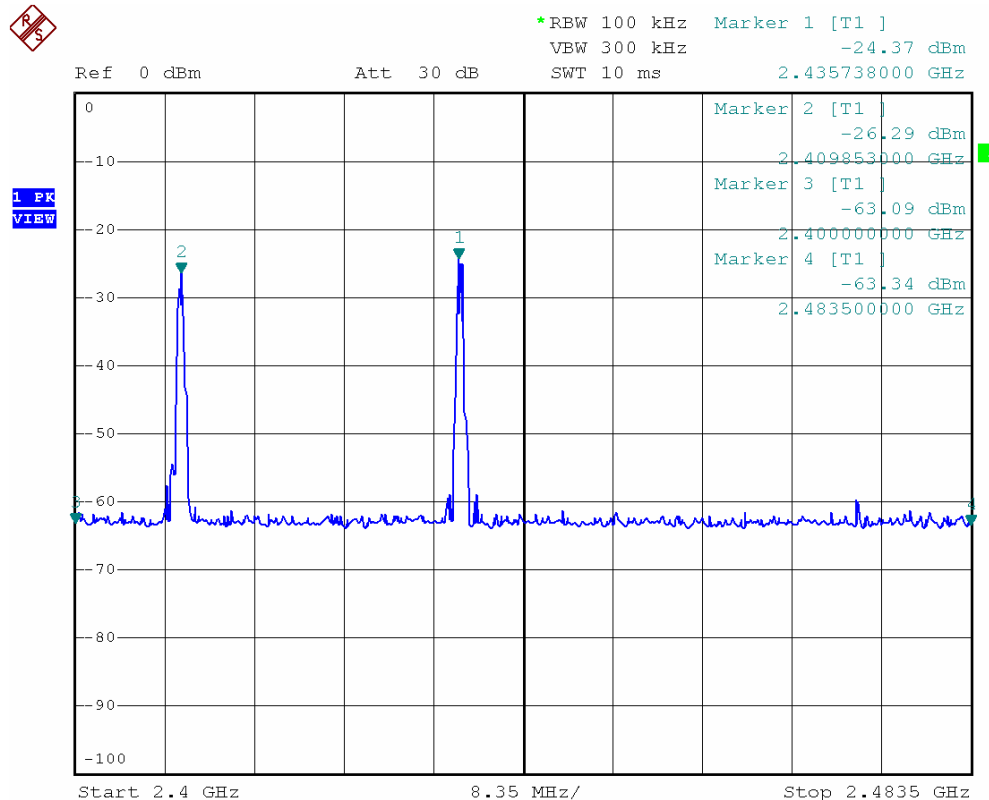
A channel:



B channel:



(ii) Band Edge:





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The test result for the Emissions radiated outside of the specified frequency bands , please refer the section 5.3.1 of this report.

The worst case is peak value 53.2dBuV/m at frequency 4.872GHz, it's below the limits 74.0 base Section 15.209 .

For the field strength of Lower Edges:2.4000GHz is 50.2dBuV/m(peak value).

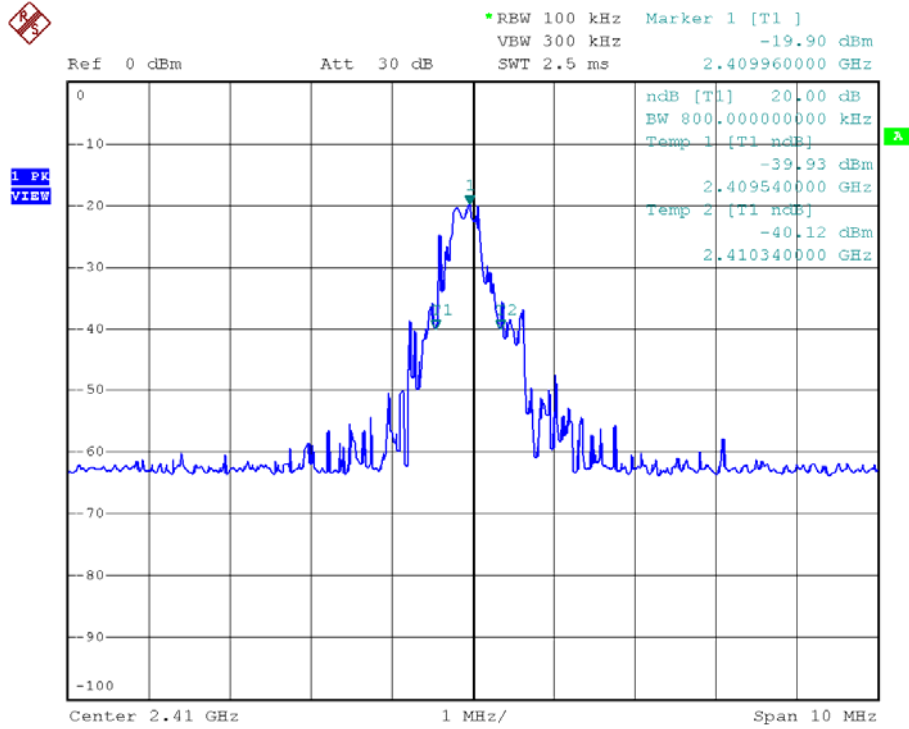
For the field strength of Upper Edges:2.4835GHz is 51.1dBuV/m(peak value).

The results: The unit does meet the FCC requirements.

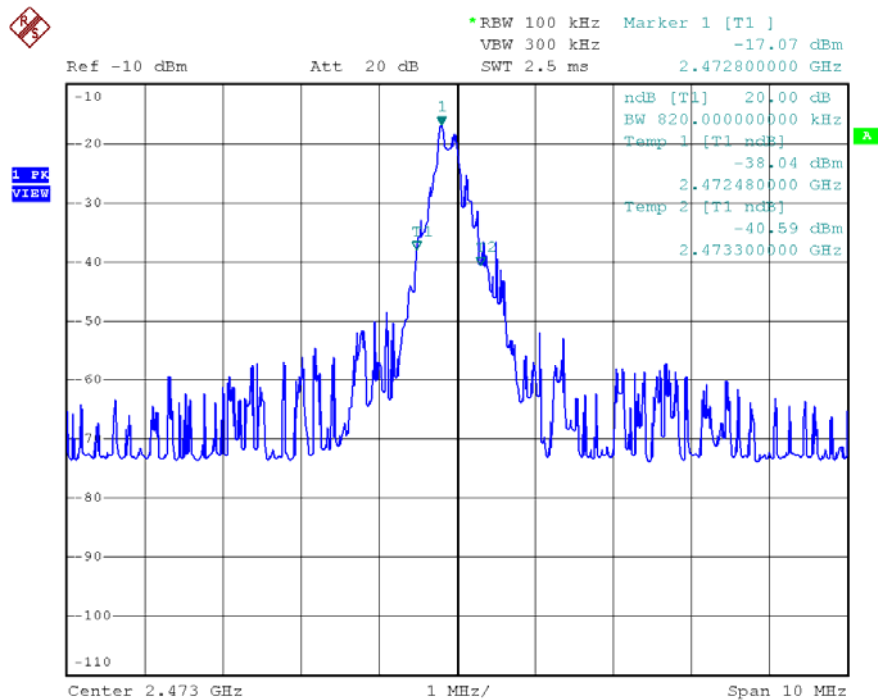
(2) For Mode 2:

(i).The occupied bandwidth as below:

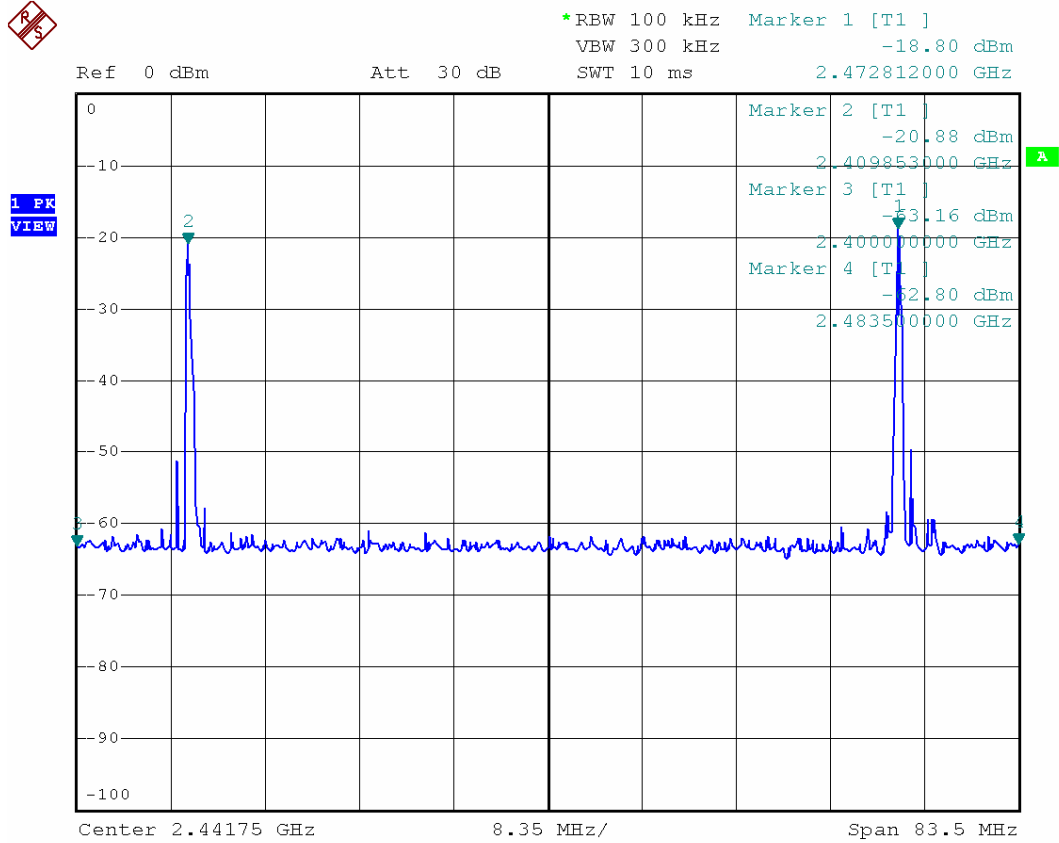
A channel:



B channel:



(ii). Band Edge:



The test result for the Emissions radiated outside of the specified frequency bands , please refer the section 5.3.1 of this report.

The worst case is peak value 53.6dBuV/m at frequency 4.946GHz, it's below the limits 74.0 base Section 15.209.

For the field strength of Lower Edges:2.4000GHz is 50.5dBuV/m(peak value).

For the field strength of Upper Edges:2.4835GHz is 51.0.0dBuV/m(peak value).

The results: The unit does meet the FCC requirements.