

Test Report

FCC ID: 2AOAA-B-5RC

Date of issue: Oct. 09, 2019

Report number: MTi19090914-4E1

Sample description: 2.4GHz Wireless System

Model(s): B-5RC, B-5

Applicant: Cherub Technology Co., Ltd

Address: Room507, Block 1, Nanhai E-Cool, No.6 Xinghua Road, Shekou,
Nanshan District, Shenzhen City, Guangdong Province, China, 518067

Date of test: Sept. 16, 2019 to Oct. 09, 2019

Shenzhen Microtest Co., Ltd.
<http://www.mtitest.com>

This test report is valid for the tested samples only. It cannot be reproduced except in full without prior written consent of Shenzhen Microtest Co., Ltd.

Table of Contents

1	GENERAL DESCRIPTION	4
1.1	FEATURE OF EQUIPMENT UNDER TEST (EUT).....	4
1.2	OPERATION CHANNEL LIST	4
1.3	TEST FREQUENCY CHANNEL.....	4
1.4	EUT OPERATION MODE	4
1.5	ANCILLARY EQUIPMENT LIST.....	5
2	SUMMARY OF TEST RESULT.....	5
3	TEST FACILITIES AND ACCREDITATIONS	6
3.1	TEST LABORATORY	6
3.2	ENVIRONMENTAL CONDITIONS	6
3.3	MEASUREMENT UNCERTAINTY.....	6
3.4	TEST SOFTWARE	6
4	LIST OF TEST EQUIPMENT.....	7
5	TEST RESULT	8
5.1	ANTENNA REQUIREMENT	8
5.1.1	<i>Standard requirement</i>	8
5.1.2	<i>EUT Antenna</i>	8
5.2	AC POWER LINE CONDUCTED EMISSION	9
5.2.1	<i>Limits</i>	9
5.2.2	<i>Test setup</i>	9
5.2.3	<i>Test procedure</i>	10
5.2.4	<i>Test results</i>	11
5.3	FIELD STRENGTH OF FUNDAMENTAL AND HARMONIC EMISSIONS	15
5.3.1	<i>Limits</i>	15
5.3.2	<i>Test Method</i>	15
5.3.3	<i>Test Result</i>	16
5.4	20dB AND 99% BANDWIDTH	17
5.4.1	<i>Limits</i>	17
5.4.2	<i>Test method</i>	17
5.4.3	<i>Test result</i>	18
5.5	RADIATED SPURIOUS EMISSION	20
5.5.1	<i>Limit</i>	20
5.5.2	<i>Test method</i>	20
5.5.3	<i>Test Result</i>	21
5.5.4	<i>Band edge-radiated</i>	36
	PHOTOGRAPHS OF THE TEST SETUP	40
	PHOTOGRAPHS OF THE EUT	42



Test Result Certification

Applicant's name: Cherub Technology Co., Ltd

Address: Room507, Block 1, Nanhai E-Cool, No.6 Xinghua Road, Shekou,
Nanshan District, Shenzhen City, Guangdong Province, China, 518067

Manufacture's name: Cherub Technology Co., Ltd

Address: Room507, Block 1, Nanhai E-Cool, No.6 Xinghua Road, Shekou,
Nanshan District, Shenzhen City, Guangdong Province, China, 518067

Product name: 2.4GHz Wireless System

Trademark: NUX

Model name: B-5RC, B-5

Standards: FCC Part 15.249

Test procedure: ANSI C63.10-2013

This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:

Danny Xu

Oct. 09, 2019

Reviewed by:

Blue Zheng

Oct. 09, 2019

Approved by:

Smith Chen

Oct. 09, 2019

1 General description

1.1 Feature of equipment under test (EUT)

Equipment:	2.4GHz Wireless System
Trade Name:	NUX
Model Name:	B-5RC
Serial Model:	B-5
Model Difference:	All the model are the same circuit and RF module, except the appearance and model No.
Operation Frequency:	2404 - 2479 MHz
Modulation Type:	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	3.27dBi
Max. Field Strength:	95.19dBuV/m
Power Source:	DC 5V from adapter AC 120V/60Hz or DC 3.7V from battery
Battery:	DC 3.7V 500mAh
Hardware version:	V1.0
Software version:	V1.0

1.2 Operation channel list

Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2404	9	2434	17	2462
2	2408	10	2437	18	2465
3	2412	11	2441	19	2469
4	2416	12	2444	20	2472
5	2420	13	2448	21	2476
6	2424	14	2451	22	2479
7	2428	15	2455		
8	2431	16	2458		

1.3 Test Frequency Channel

Channel	Frequency(MHz)
Low	2404
Middle	2441
High	2479

1.4 EUT operation mode

During testing, RF test program provided by the manufacture to control the Tx operation followed the test requirement.



1.5 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
adapter	EQ-24BCN	/	Huizhou Dongyang Yienbi Electronics Co., Ltd.

2 Summary of Test Result

Test procedures according to the technical standards:

Item	FCC Part No.	Description of Test	Result
1	FCC Part15.203	Antenna Requirement	Pass
2	FCC Part15.207	AC power line conducted emission	Pass
3	FCC Part15.249(a)	Field strength of fundamental and harmonic emissions	Pass
4	FCC Part 15.215	20dB and 99% Bandwidth	Pass
5	FCC Part15.249(d)	Radiated spurious emission	Pass

3 Test Facilities and Accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.	448573

3.2 Environmental conditions

Temperature:	15°C~35°C
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

3.3 Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %

RF frequency	1×10^{-7}
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	± 1 degree
Humidity	± 5 %

3.4 Test software

Software Name	Manufacturer	Model	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscent co, ltd	JS1120-3	2.5.77.0418

4 List of test equipment

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E004	EMI Test Receiver	Rohde&schwarz	ESPI7	100314	2019/10/09	2020/10/08
MTI-E006	TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-872	2018/10/15	2020/10/14
MTI-E014	amplifier	Hewlett-Packard	8447D	3113A06150	2019/10/09	2020/10/08
MTI-E036	Single path vehicle AMN(LISN)	Schwarzbeck	NNBM 8124	01175	2019/10/09	2020/10/08
MTI-E038	Low noise active vertical monopole antenna	Schwarzbeck	VAMP 9243	#565	2019/10/16	2020/10/15
MTI-E039	Biconical antenna	Schwarzbeck	BBA 9106	#164	2019/10/15	2020/10/14
MTI-E041	MXG Vector Signal Generator	Agilent	N5182A	MY49060455	2019/04/16	2020/04/15
MTI-E042	ESG Series Analog signal generator	Agilent	E4421B	GB40051240	2019/05/21	2020/05/20
MTI-E044	Thermometer clock humidity monitor	-	HTC-1	/	2019/04/17	2020/04/16
MTI-E062	Log Periodic Antenna	Schwarzbeck	VUSLP 9111B	#312	2018/04/11	2020/04/10
MTI-E063	Log Periodic Dipole Array Antenna	ETS-LINDGREN	3148B	00224524	2018/04/11	2020/04/10
MTI-E065	Amplifier	EMtrace	RP06A	00117	2019/04/29	2020/04/28
MTI-E071	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2018/10/25	2019/10/24
MTI-E076	EMI Test Receiver	Rohde&schwarz	ESIB26	100273	2019/04/16	2020/04/15
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2019/04/16	2020/04/15
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2019/04/16	2020/04/15
MTI-E093	Artificial mains network	3ctest	LISN J50	ES3911805	2019/04/16	2020/04/15
MTI-E096	Power amplifier	Space-Dtronics	EWLNA0118G-P40	1852001	2019/04/29	2020/04/28
MTI-E097	Current Probe	SOLAR ELECTRONICS CO.	9207-1	220095-1	2019/04/17	2020/04/16
MTI-E098	Loop Sensor	SOLAR ELECTRONICS CO.	7334-1	220095-2	2019/04/21	2020/04/20
Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).						

This test report is valid for the tested samples only. It cannot be reproduced except in full without prior written consent of Shenzhen Microtest Co., Ltd.

5 Test Result

5.1 Antenna requirement

5.1.1 Standard requirement

FCC PART 15.203 and 15.247(b);

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.1.2 EUT Antenna

The antenna is a PCB antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is 3.27dBi.



5.2 AC power line conducted emission

5.2.1 Limits

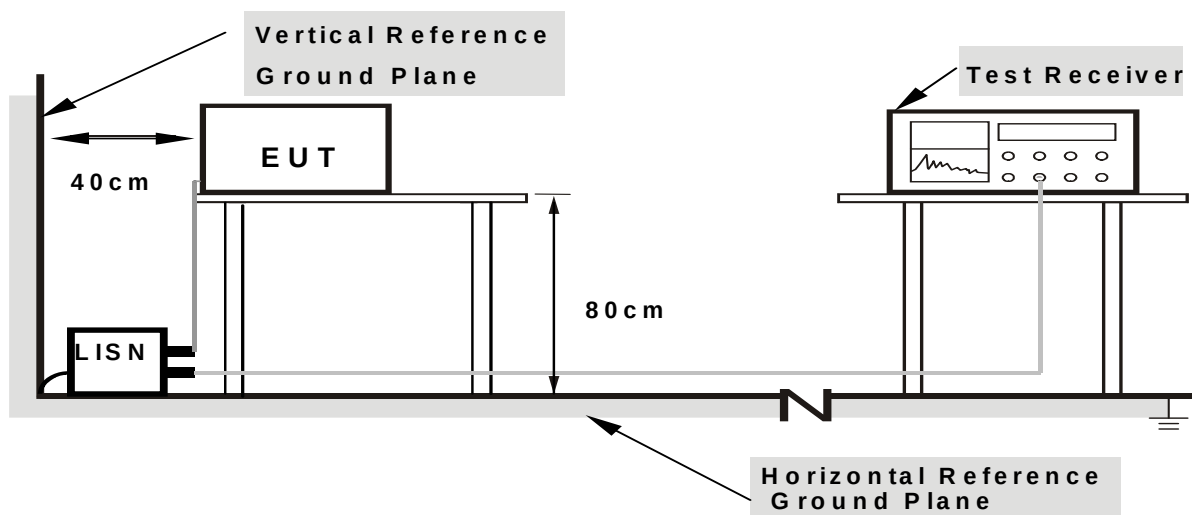
FCC §15.207;

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 ^{note2}	56 - 46 ^{note2}
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note1: The tighter limit applies at the band edges.
Note2: The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

5.2.2 Test setup



- Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.2.3 Test procedure

a. EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b. The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

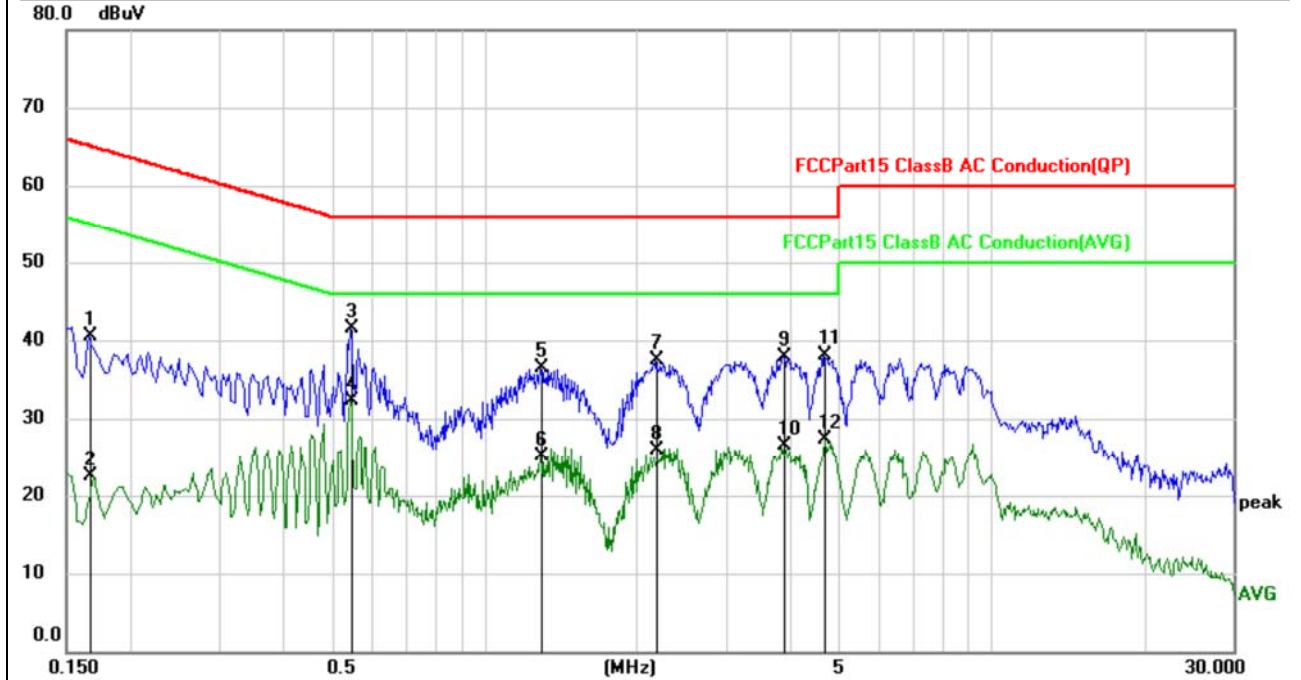
- c. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment's powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- d. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- f. LISN at least 80 cm from nearest part of EUT chassis.

For the actual test configuration, please refer to the related Item –EUT Test Photos.



5.2.4 Test results

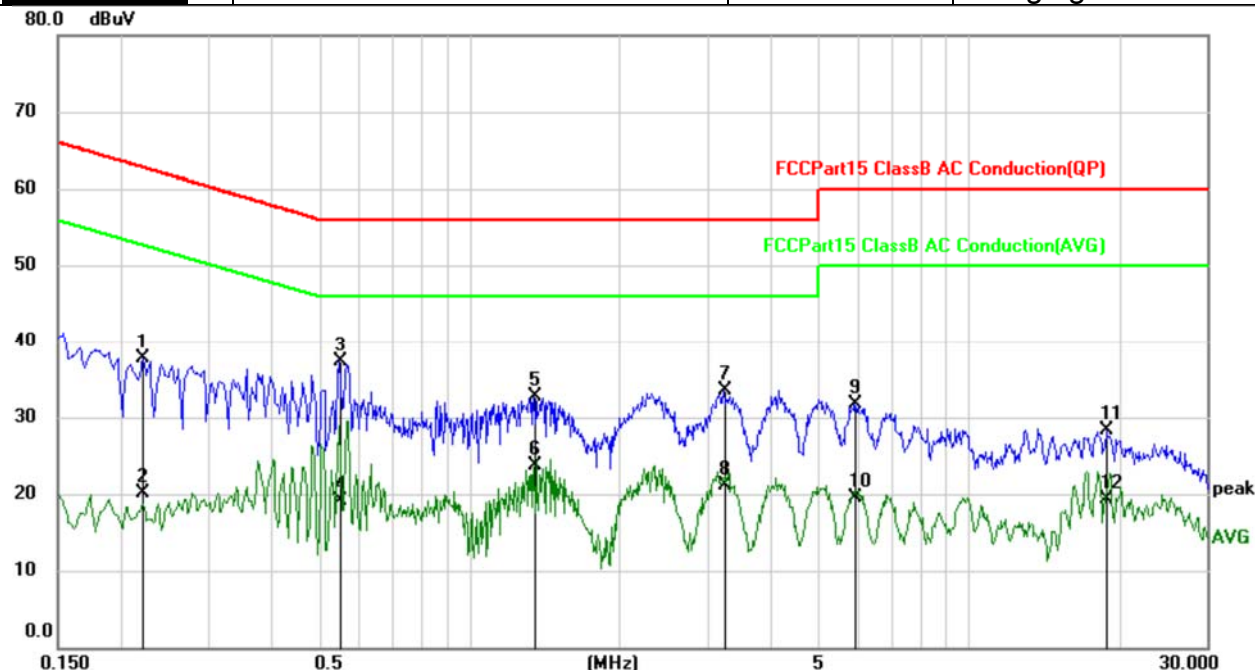
EUT:	2.4GHz Wireless System	Model Name:	B-5RC
Pressure:	1010 hPa	Phase:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	Charging+TX



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1660	30.68	9.73	40.41	65.16	-24.75	QP
2		0.1660	12.79	9.73	22.52	55.16	-32.64	AVG
3		0.5460	31.50	9.93	41.43	56.00	-14.57	QP
4	*	0.5460	22.41	9.93	32.34	46.00	-13.66	AVG
5		1.2940	26.53	9.99	36.52	56.00	-19.48	QP
6		1.2940	15.20	9.99	25.19	46.00	-20.81	AVG
7		2.1859	27.43	10.01	37.44	56.00	-18.56	QP
8		2.1859	15.93	10.01	25.94	46.00	-20.06	AVG
9		3.8860	27.92	10.04	37.96	56.00	-18.04	QP
10		3.8860	16.51	10.04	26.55	46.00	-19.45	AVG
11		4.6939	28.06	10.06	38.12	56.00	-17.88	QP
12		4.6939	17.20	10.06	27.26	46.00	-18.74	AVG



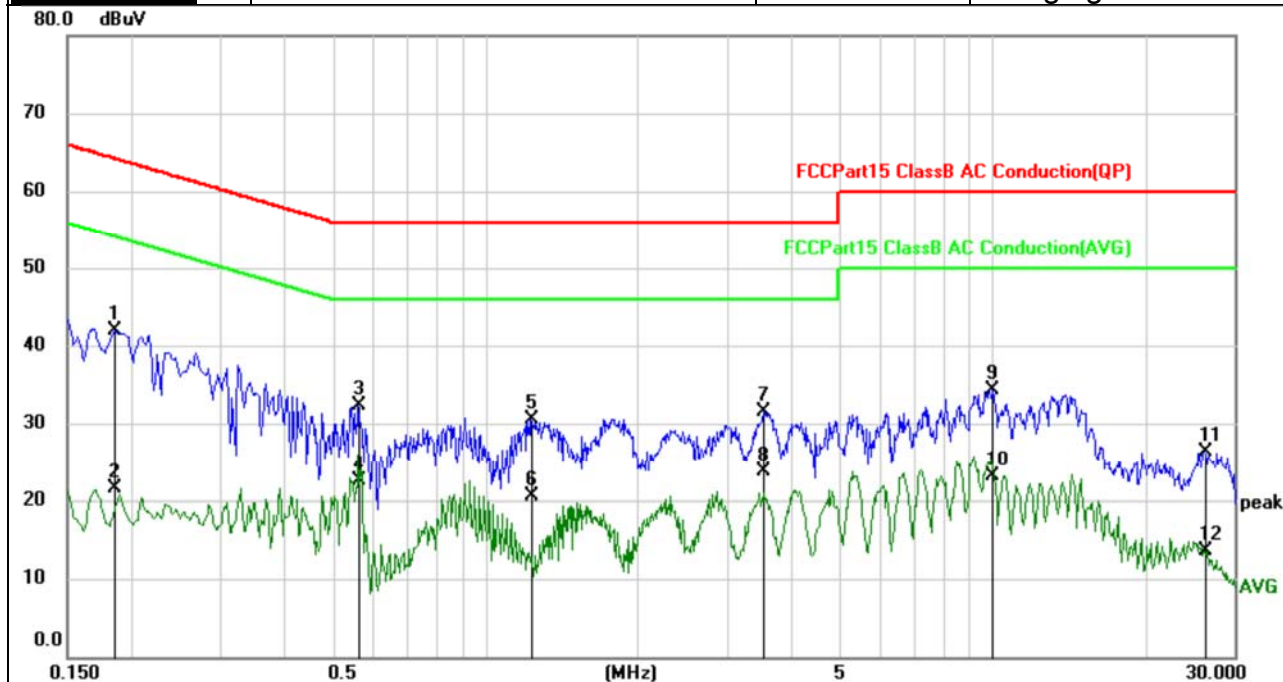
EUT:	2.4GHz Wireless System	Model Name:	B-5RC
Pressure:	1010 hPa	Phase:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	Charging+TX



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2220	27.90	9.73	37.63	62.74	-25.11	QP
2		0.2220	10.43	9.73	20.16	52.74	-32.58	AVG
3	*	0.5500	27.28	9.93	37.21	56.00	-18.79	QP
4		0.5500	9.25	9.93	19.18	46.00	-26.82	AVG
5		1.3460	22.68	9.99	32.67	56.00	-23.33	QP
6		1.3460	13.72	9.99	23.71	46.00	-22.29	AVG
7		3.2300	23.41	10.03	33.44	56.00	-22.56	QP
8		3.2300	11.00	10.03	21.03	46.00	-24.97	AVG
9		5.9060	21.51	10.12	31.63	60.00	-28.37	QP
10		5.9060	9.39	10.12	19.51	50.00	-30.49	AVG
11		18.8420	18.12	10.23	28.35	60.00	-31.65	QP
12		18.8420	9.00	10.23	19.23	50.00	-30.77	AVG



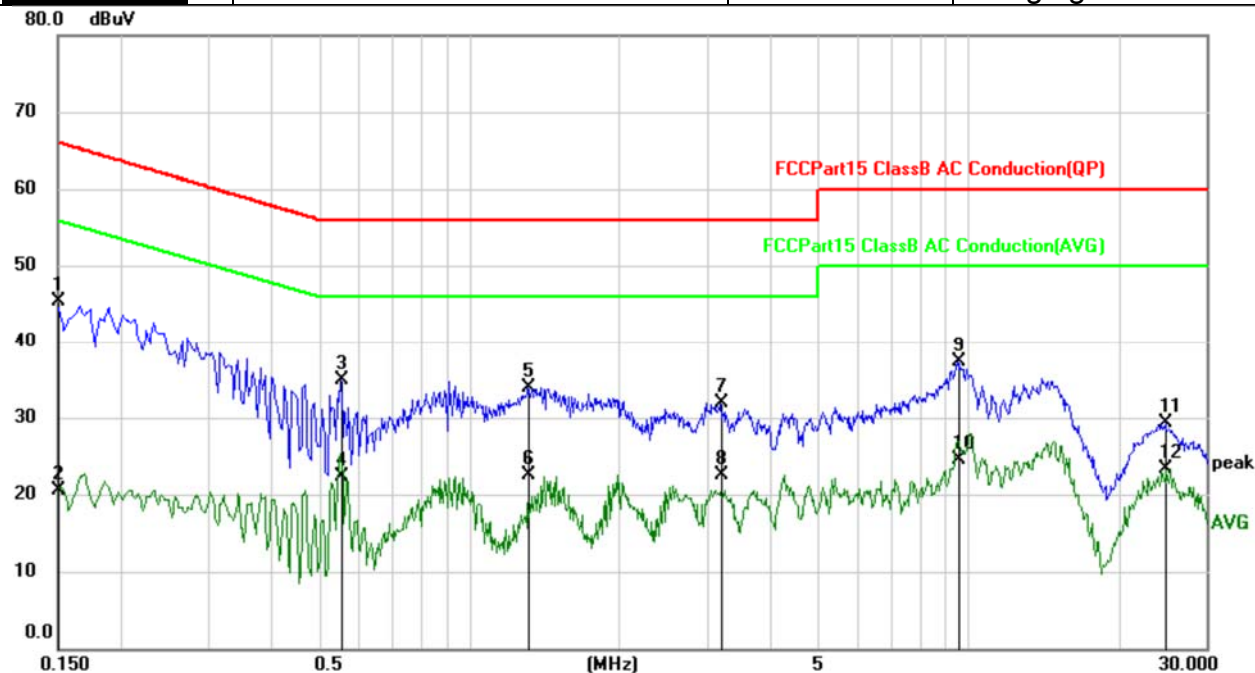
EUT:	2.4GHz Wireless System	Model Name:	B-5RC
Pressure:	1010 hPa	Phase:	L
Test Voltage:	AC 240V/60Hz	Test Mode:	Charging+TX



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1860	32.12	9.73	41.85	64.21	-22.36	QP
2		0.1860	11.77	9.73	21.50	54.21	-32.71	AVG
3		0.5620	22.40	9.93	32.33	56.00	-23.67	QP
4		0.5620	12.49	9.93	22.42	46.00	-23.58	AVG
5		1.2340	20.43	9.99	30.42	56.00	-25.58	QP
6		1.2340	10.48	9.99	20.47	46.00	-25.53	AVG
7		3.5300	21.45	10.04	31.49	56.00	-24.51	QP
8		3.5300	13.59	10.04	23.63	46.00	-22.37	AVG
9		9.9819	24.02	10.33	34.35	60.00	-25.65	QP
10		9.9819	12.85	10.33	23.18	50.00	-26.82	AVG
11		26.2020	15.99	10.38	26.37	60.00	-33.63	QP
12		26.2020	3.12	10.38	13.50	50.00	-36.50	AVG



EUT:	2.4GHz Wireless System	Model Name:	B-5RC
Pressure:	1010 hPa	Phase:	N
Test Voltage:	AC 240V/60Hz	Test Mode:	Charging+TX



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1500	35.56	9.73	45.29	66.00	-20.71	QP
2		0.1500	10.73	9.73	20.46	56.00	-35.54	AVG
3		0.5540	24.99	9.93	34.92	56.00	-21.08	QP
4		0.5540	12.40	9.93	22.33	46.00	-23.67	AVG
5		1.3140	23.97	9.99	33.96	56.00	-22.04	QP
6		1.3140	12.46	9.99	22.45	46.00	-23.55	AVG
7		3.1980	21.88	10.03	31.91	56.00	-24.09	QP
8		3.1980	12.54	10.03	22.57	46.00	-23.43	AVG
9		9.5180	27.04	10.30	37.34	60.00	-22.66	QP
10		9.5180	14.28	10.30	24.58	50.00	-25.42	AVG
11		24.8500	19.01	10.34	29.35	60.00	-30.65	QP
12		24.8500	12.87	10.34	23.21	50.00	-26.79	AVG



5.3 Field strength of fundamental and harmonic emissions

5.3.1 Limits

FCC §15.249(a);

The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.

The field strength limits shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

Frequency	Field Strength(dBuv/m)	Detector
Fundamental	114	PK
Fundamental	94	AV
Harmonic emissions	74	PK
Harmonic emissions	54	AV

Note: 50mV/m=50000uv/m

$20 \cdot \log(50000 \text{ uV/m}) = 94 \text{ dBuV/m}$

PK limit reference 15.249(e)

5.3.2 Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

3. Use the following spectrum analyser settings:

Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for $f \geq 1 \text{ GHz}$, 100 kHz for $f < 1 \text{ GHz}$, VBW $\geq$ RBW, Sweep = auto, Detector function = peak, Trace = max hold

4. Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

5. The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

5.3.3 Test Result

Transmitter channel: 2404MHz

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dB μ V/m	dB μ V/m		
2404	V	90.30	114	PK	
2404	H	91.45	114	PK	
2404	V	83.41	94	AV	
2404	H	83.60	94	AV	
4808	V	55.90	74	PK	
4808	H	56.45	74	PK	
4808	V	44.12	54	AV	
4808	H	45.35	54	AV	

Transmitter channel: 2441MHz

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dB μ V/m	dB μ V/m		
2441	V	90.11	114	PK	
2441	H	91.37	114	PK	
2441	V	83.27	94	AV	
2441	H	83.48	94	AV	
4882	V	55.98	74	PK	
4882	H	56.78	74	PK	
4882	V	47.21	54	AV	
4882	H	47.12	54	AV	

Transmitter channel: 2479MHz

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dB μ V/m	dB μ V/m		
2479	V	92.34	114	PK	
2479	H	95.19	114	PK	
2479	V	85.26	94	AV	
2479	H	87.37	94	AV	
4958	V	56.55	74	PK	
4958	H	57.50	74	PK	
4958	V	48.40	54	AV	
4958	H	47.96	54	AV	

5.4 20dB and 99% bandwidth

5.4.1 Limits

FCC §15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4.2 Test method

Use the following spectrum analyzer settings:

For 20 dB bandwidth

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW $\geq 1\%$ of the 20 dB bandwidth

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission

5.4.3 Test result

Frequency (MHz)	20dB bandwidth (MHz)
2404	2.345
2441	2.371
2479	2.360

Test plots



This test report is valid for the tested samples only. It cannot be reproduced except in full without prior written consent of Shenzhen Microtest Co., Ltd.



2479MHz



5.5 Radiated spurious emission

5.5.1 Limit

FCC PART 15.249(a);

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics ($\mu\text{V/m}$)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500

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 §15.209, whichever is the lesser attenuation.

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

5.5.2 Test method

- The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- Use the following spectrum analyser settings:
 - Span = wide enough to fully capture the emission being measured
 - RBW = 1 MHz for $f \geq 1\text{GHz}$, 100 kHz for $f < 1\text{GHz}$
 - VBW $\geq$ RBW, Sweep = auto
 - Detector function = peak
 - Trace = max hold
- Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

5.5.3 Test Result

Note: If the PK measured values lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

Below 30MHz

EUT:	2.4GHz Wireless System	Model name. :	B-5RC
Pressure:	1010 hPa	Test voltage:	DC 3.7V from battery
Test mode:	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

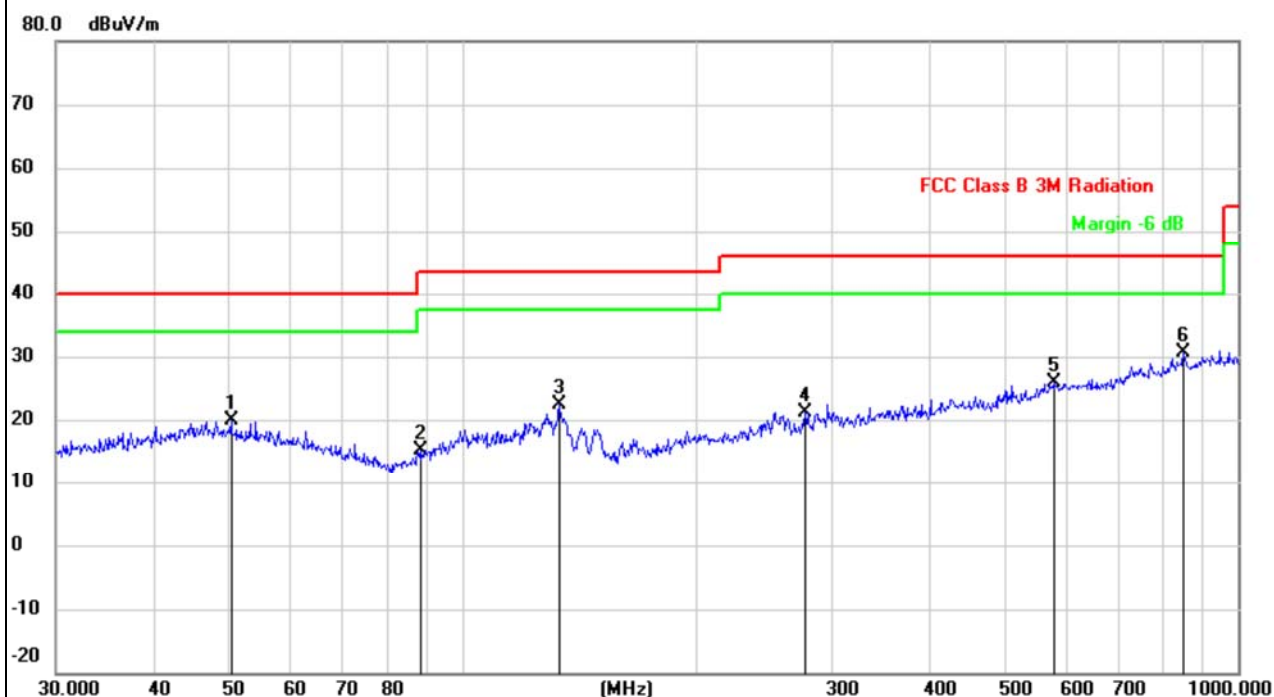
Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.



Radiation (30MHz – 1GHz)

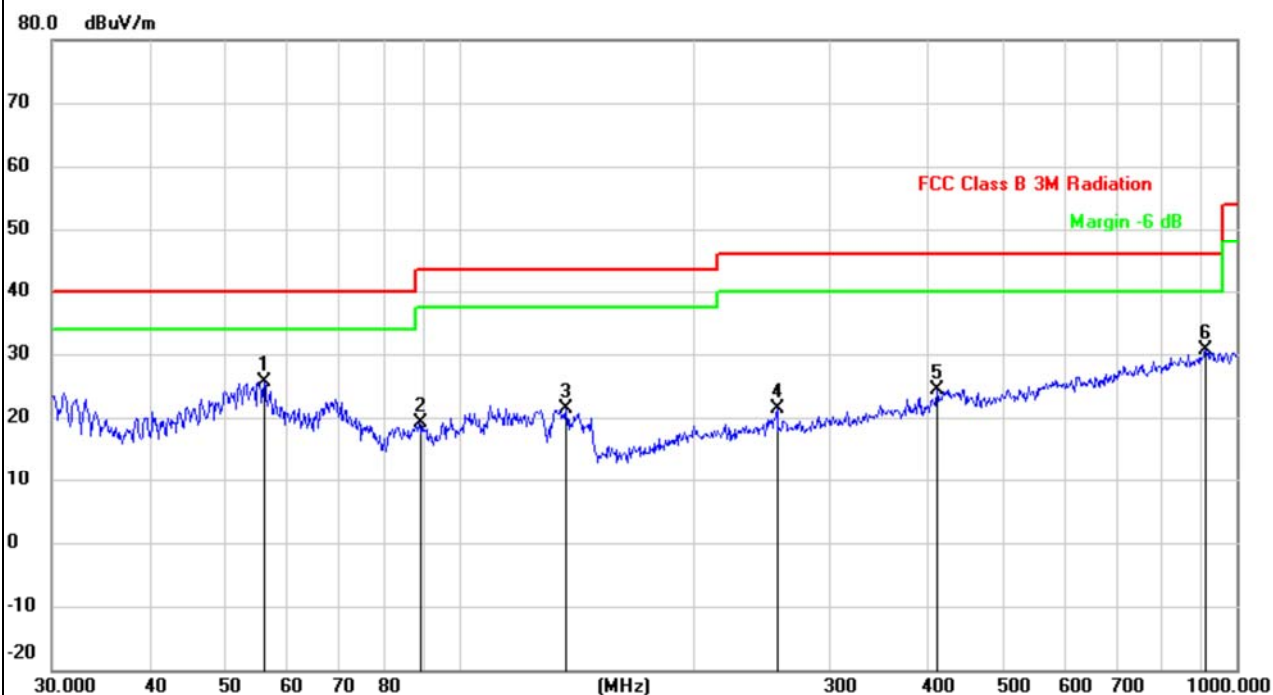
EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	H
Test voltage:	DC 3.7V from battery	Test mode:	TX



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		50.4089	26.57	-6.59	19.98	40.00	-20.02	QP
2		88.6524	25.25	-10.09	15.16	43.50	-28.34	QP
3		133.6188	33.36	-11.06	22.30	43.50	-21.20	QP
4		277.0935	26.93	-5.74	21.19	46.00	-24.81	QP
5		578.6699	26.20	-0.40	25.80	46.00	-20.20	QP
6	*	851.0353	27.83	2.72	30.55	46.00	-15.45	QP



EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	V
Test voltage:	DC 3.7V from battery	Test mode:	TX

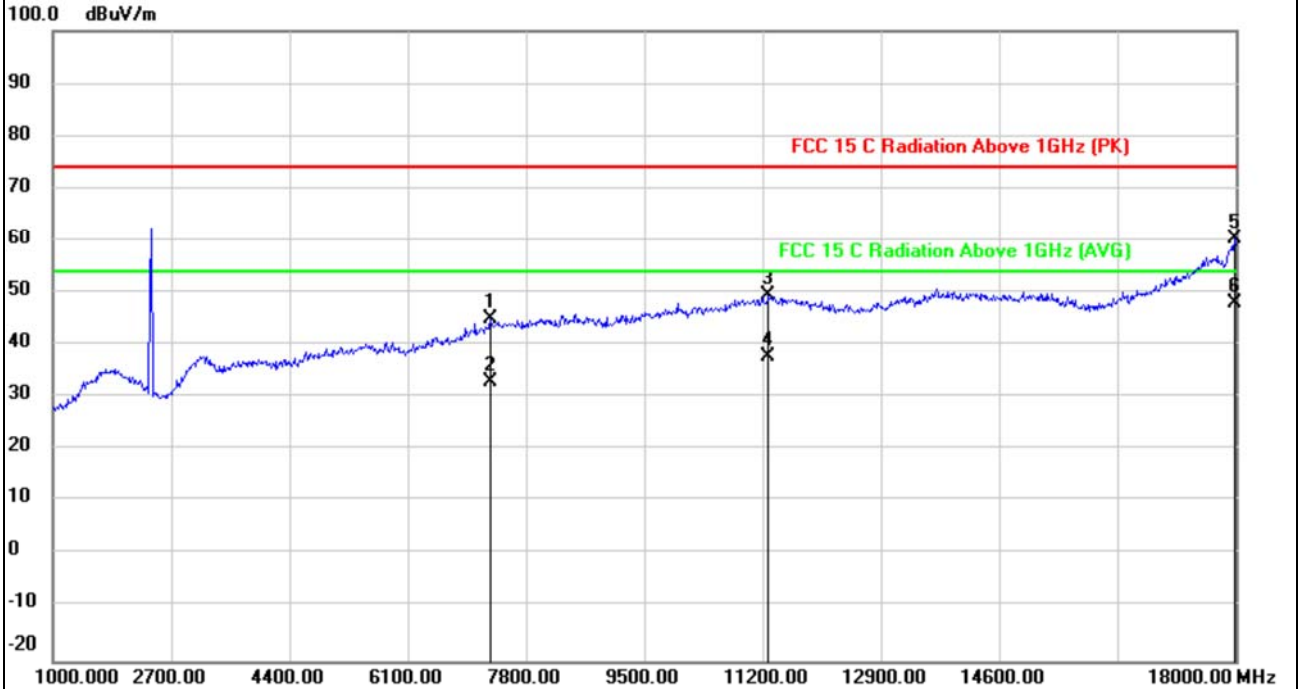


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1	*	56.1974	33.21	-7.56	25.65	40.00	-14.35	QP
2		88.9639	29.13	-10.02	19.11	43.50	-24.39	QP
3		137.4202	32.31	-10.87	21.44	43.50	-22.06	QP
4		256.5211	27.13	-5.75	21.38	46.00	-24.62	QP
5		411.8240	27.91	-3.42	24.49	46.00	-21.51	QP
6		912.8620	26.81	3.72	30.53	46.00	-15.47	QP

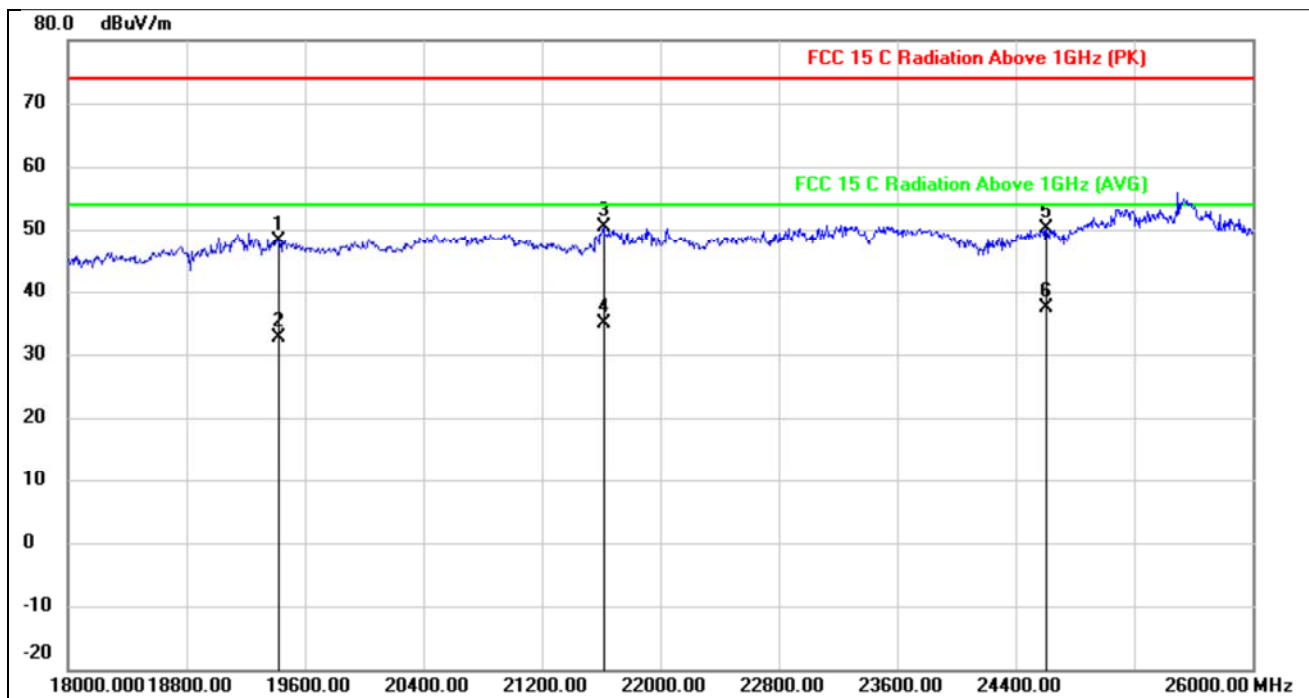


Above 1GHz:

EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	H
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2404MHz		



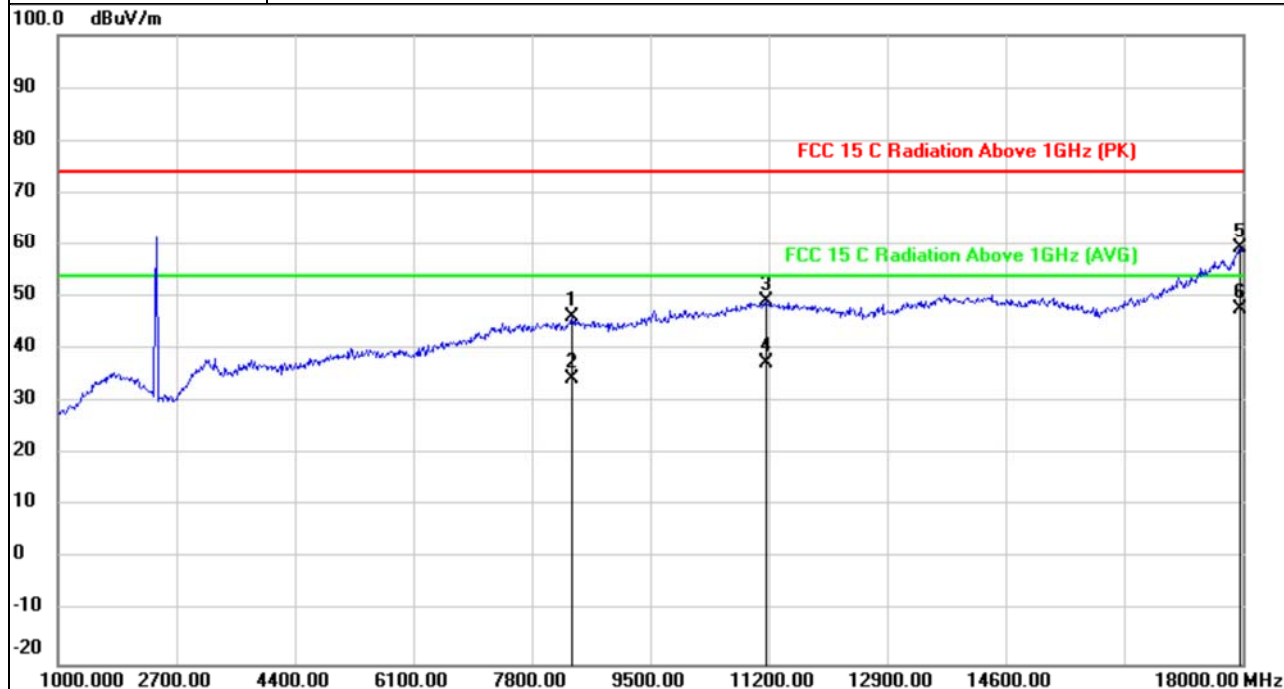
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		7290.000	45.01	-0.03	44.98	74.00	-29.02	peak
2		7290.000	33.13	-0.03	33.10	54.00	-20.90	AVG
3		11285.000	44.60	4.87	49.47	74.00	-24.53	peak
4		11285.000	32.81	4.87	37.68	54.00	-16.32	AVG
5		17983.000	46.22	13.99	60.21	74.00	-13.79	peak
6	*	17983.000	33.92	13.99	47.91	54.00	-6.09	AVG



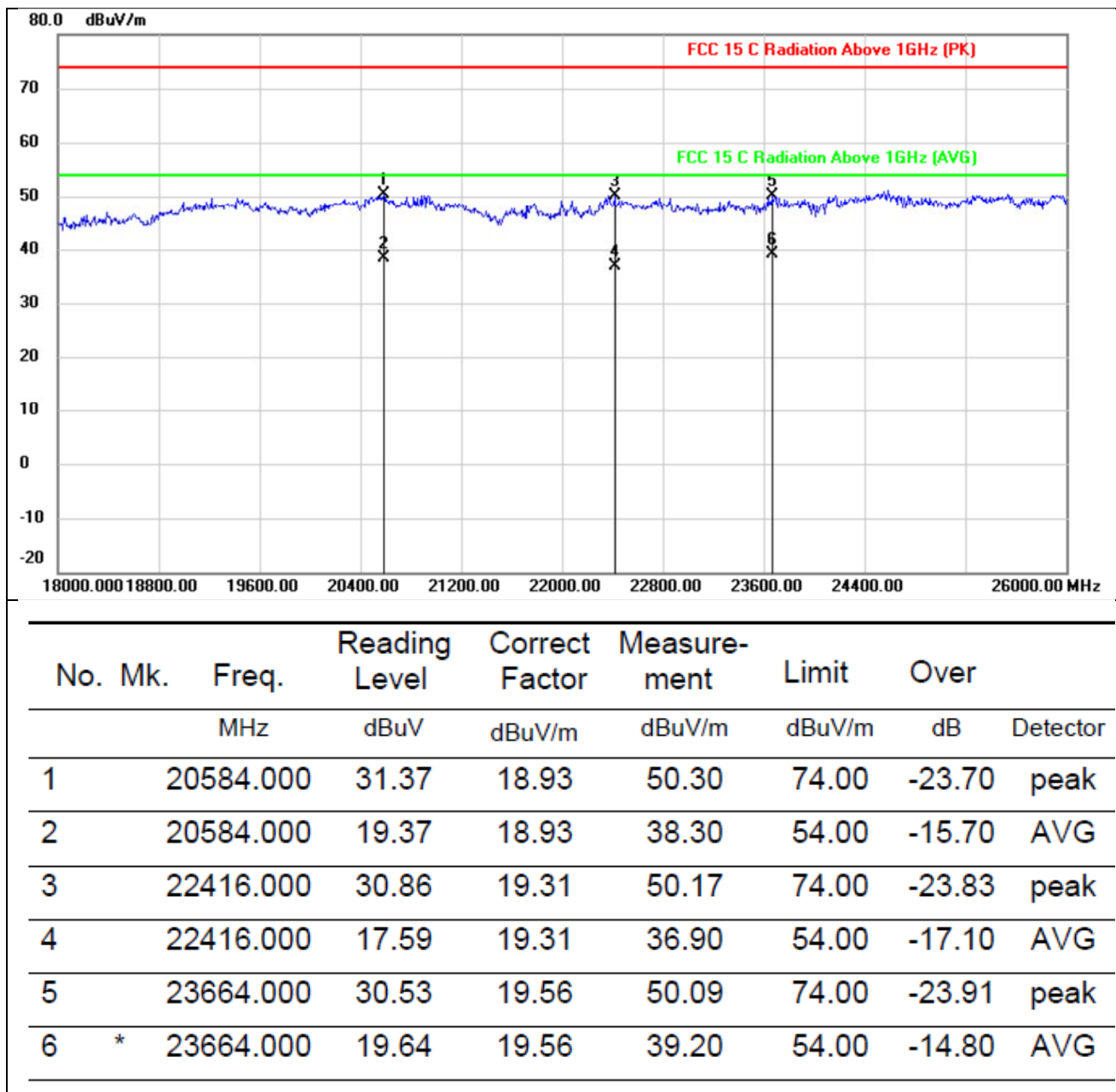
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		19424.000	29.19	19.00	48.19	74.00	-25.81	peak
2		19424.000	13.60	19.00	32.60	54.00	-21.40	AVG
3		21616.000	31.17	19.14	50.31	74.00	-23.69	peak
4		21616.000	15.66	19.14	34.80	54.00	-19.20	AVG
5		24608.000	30.32	19.76	50.08	74.00	-23.92	peak
6	*	24608.000	17.74	19.76	37.50	54.00	-16.50	AVG



EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	V
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2404MHz		

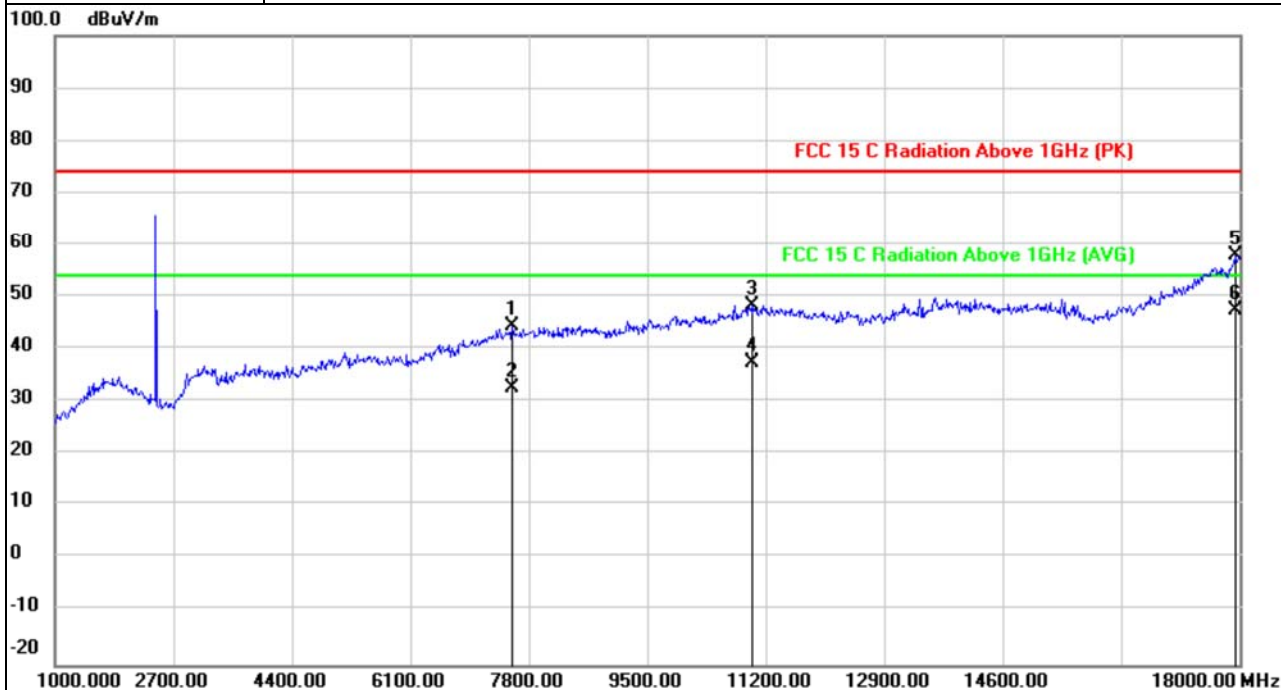


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		8378.000	44.84	1.37	46.21	74.00	-27.79	peak
2		8378.000	33.03	1.37	34.40	54.00	-19.60	AVG
3		11166.000	44.12	4.96	49.08	74.00	-24.92	peak
4		11166.000	32.46	4.96	37.42	54.00	-16.58	AVG
5		17966.000	45.38	13.85	59.23	74.00	-14.77	peak
6	*	17966.000	33.78	13.85	47.63	54.00	-6.37	AVG

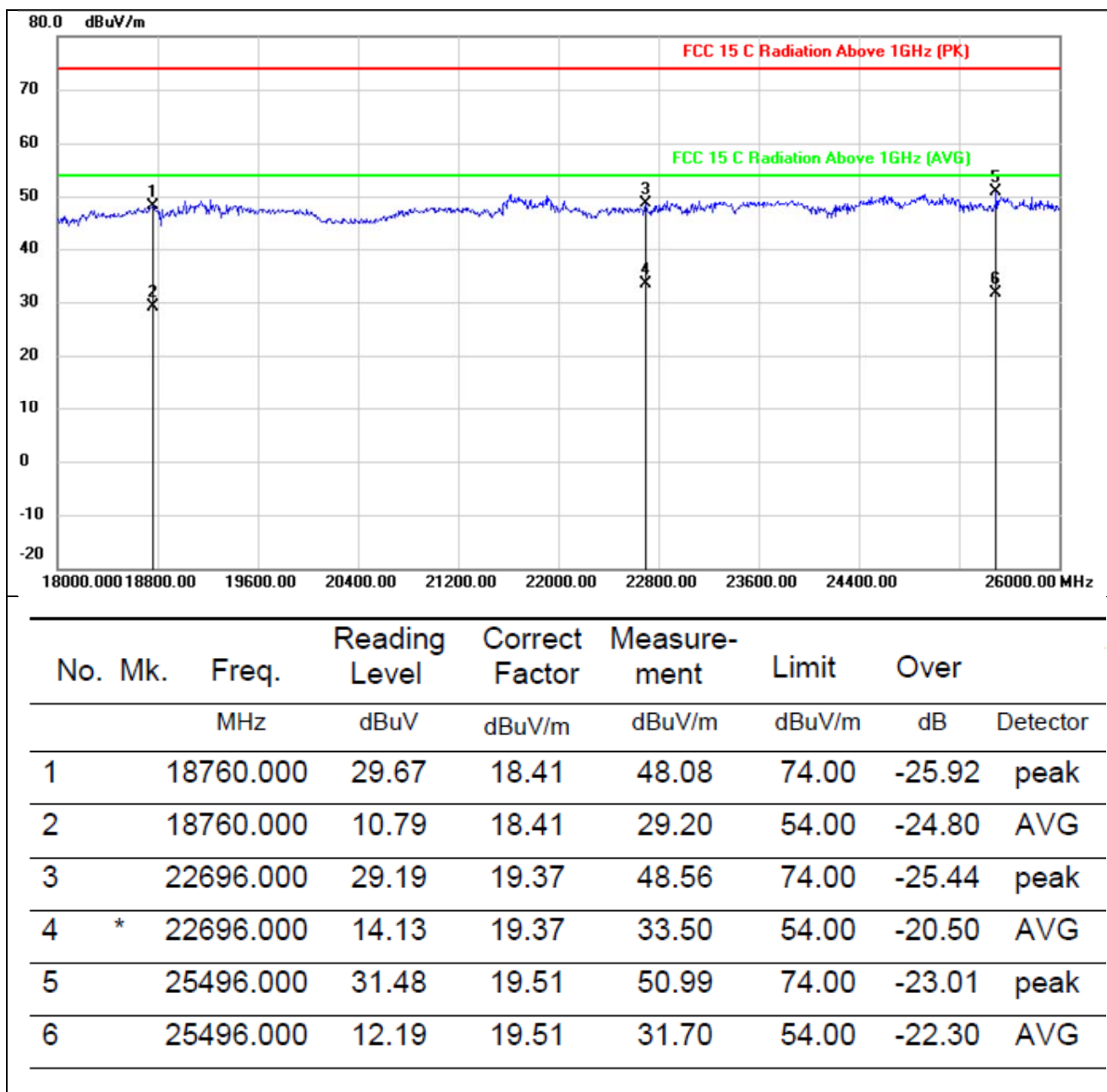




EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	H
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2441MHz		

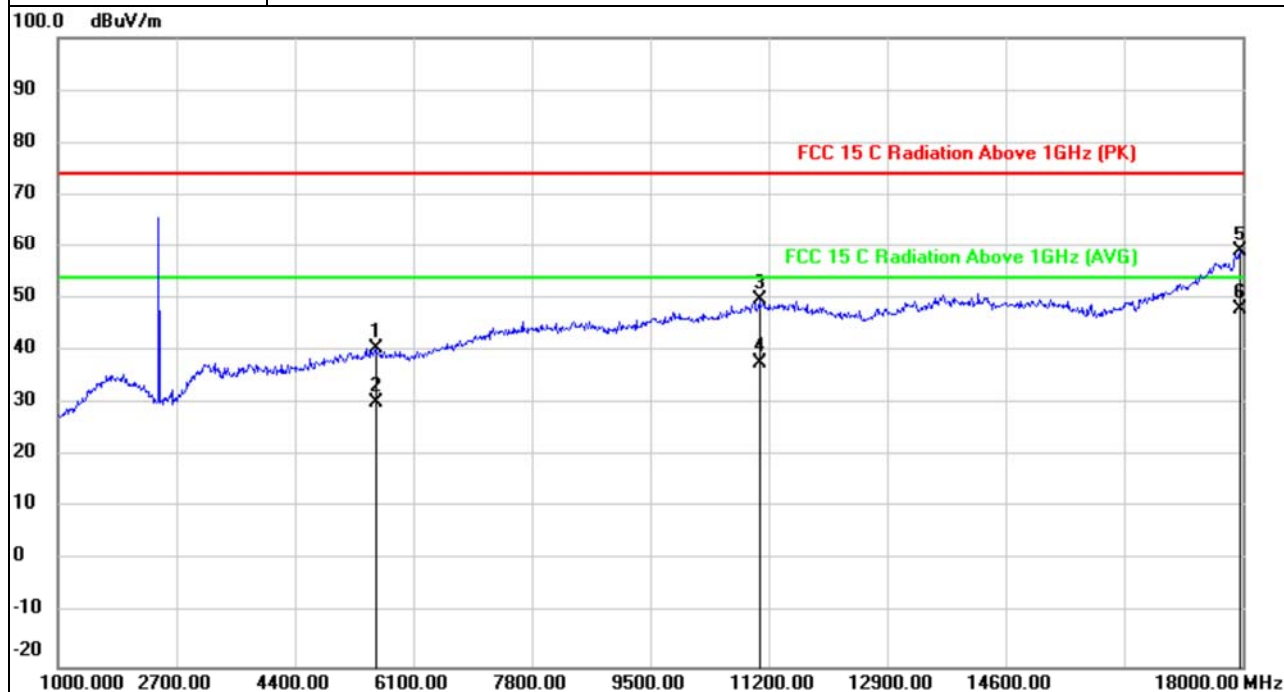


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		7562.000	43.70	0.65	44.35	74.00	-29.65	peak
2		7562.000	31.95	0.65	32.60	54.00	-21.40	AVG
3		10996.000	43.17	5.07	48.24	74.00	-25.76	peak
4		10996.000	32.39	5.07	37.46	54.00	-16.54	AVG
5		17932.000	44.16	13.61	57.77	74.00	-16.23	peak
6	*	17932.000	33.83	13.61	47.44	54.00	-6.56	AVG

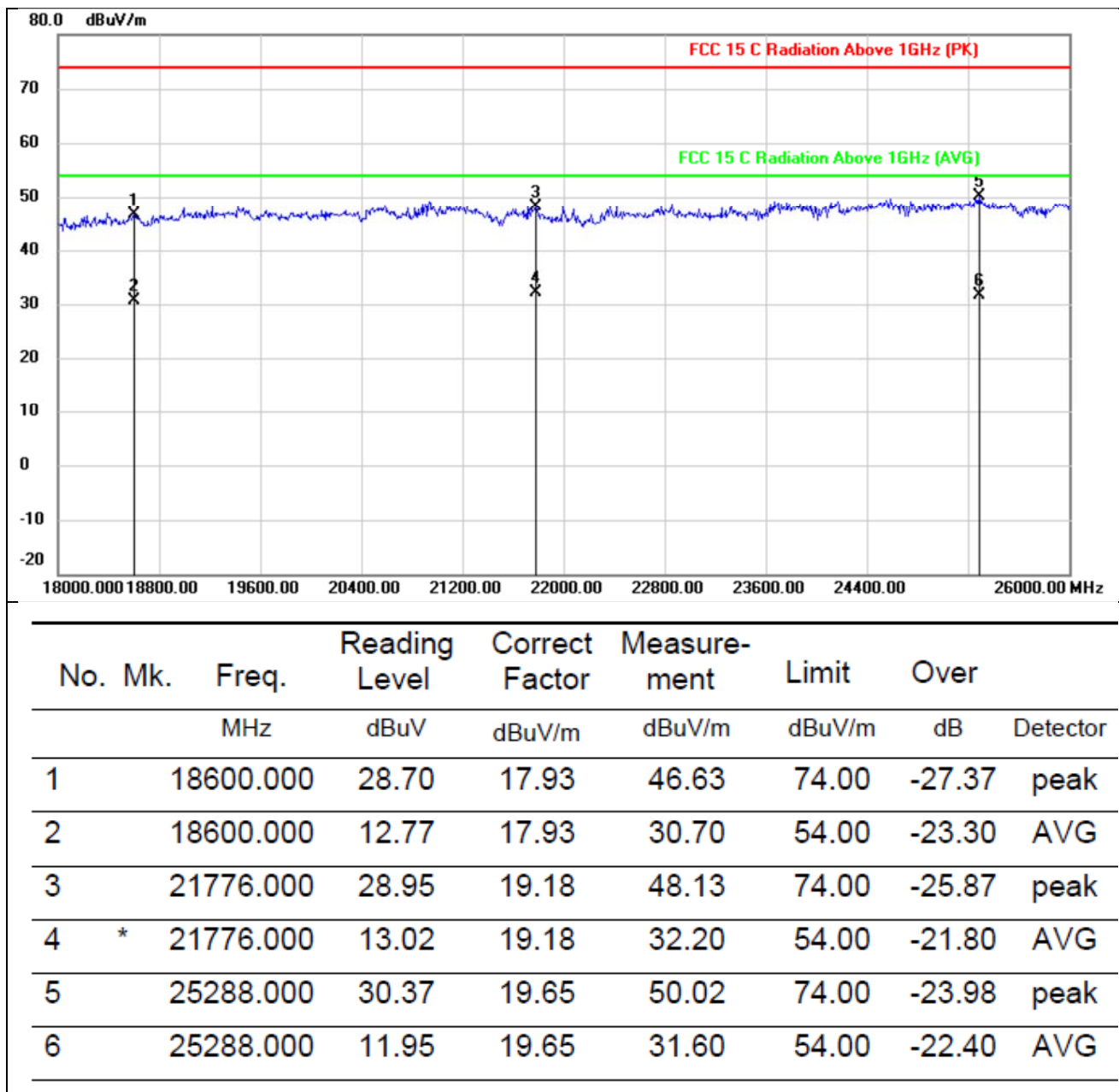




EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	V
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2441MHz		

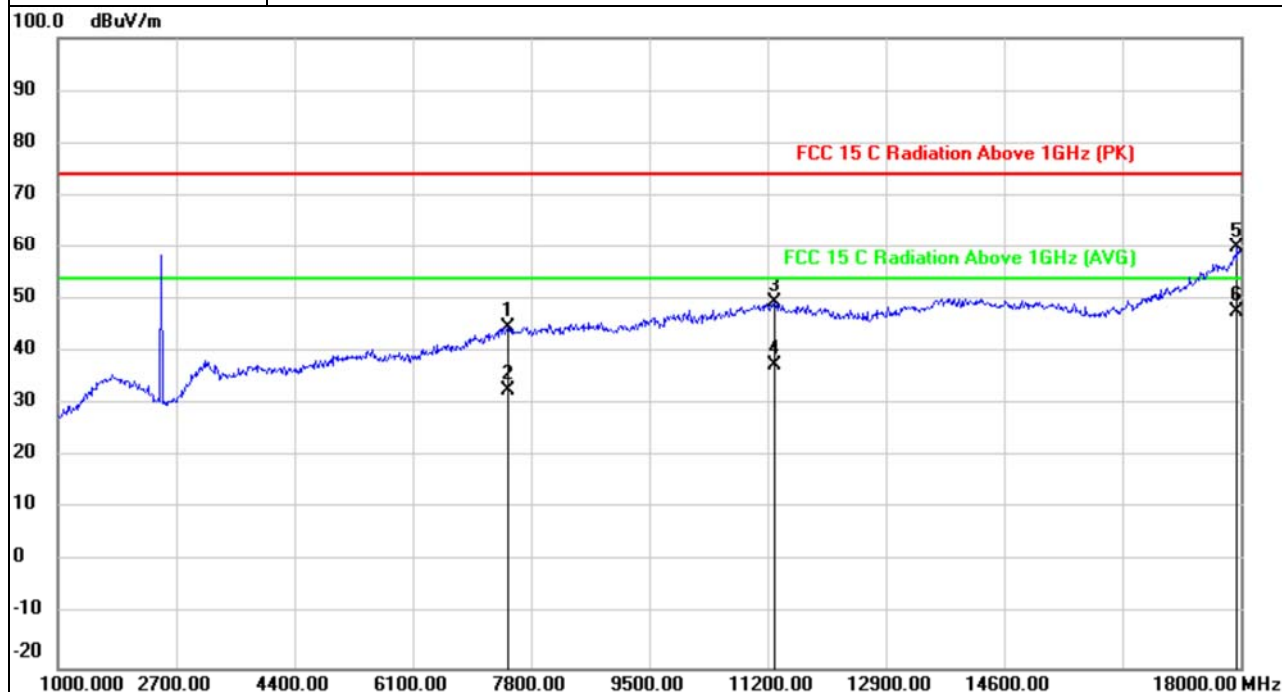


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		5556.000	45.91	-5.42	40.49	74.00	-33.51	peak
2		5556.000	35.74	-5.42	30.32	54.00	-23.68	AVG
3		11064.000	44.63	5.03	49.66	74.00	-24.34	peak
4		11064.000	32.66	5.03	37.69	54.00	-16.31	AVG
5		17966.000	45.13	13.85	58.98	74.00	-15.02	peak
6	*	17966.000	34.15	13.85	48.00	54.00	-6.00	AVG

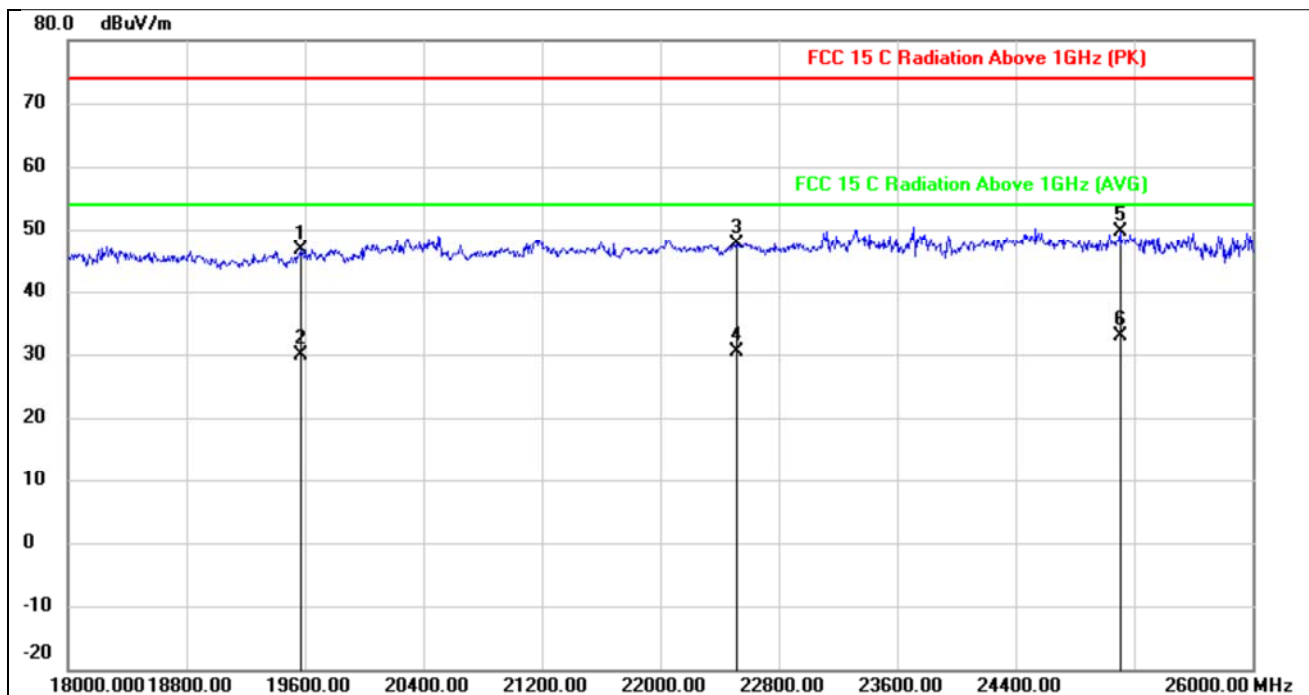




EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	H
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2479MHz		



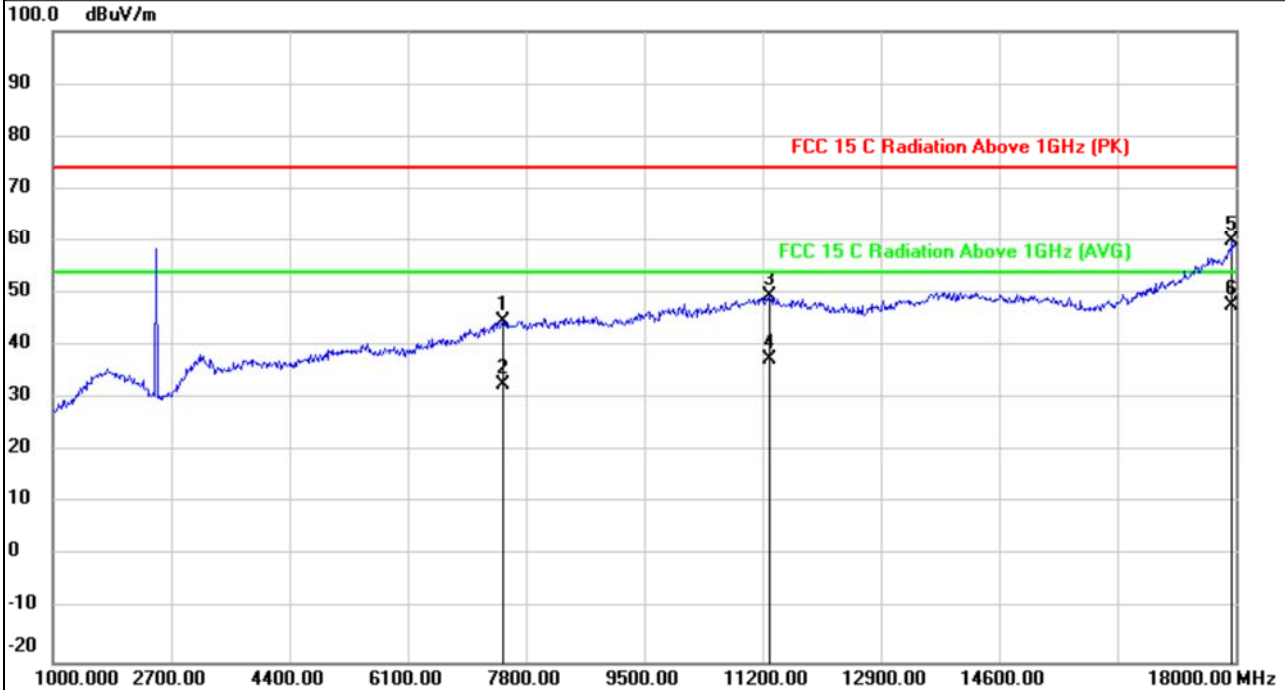
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		7698.000	44.36	0.62	44.98	74.00	-29.02	peak
2		7698.000	32.18	0.62	32.80	54.00	-21.20	AVG
3		11200.000	44.15	4.94	49.09	74.00	-24.91	peak
4		11200.000	32.70	4.94	37.64	54.00	-16.36	AVG
5		17983.000	44.75	13.99	58.74	74.00	-15.26	peak
6	*	17983.000	34.04	13.99	48.03	54.00	-5.97	AVG



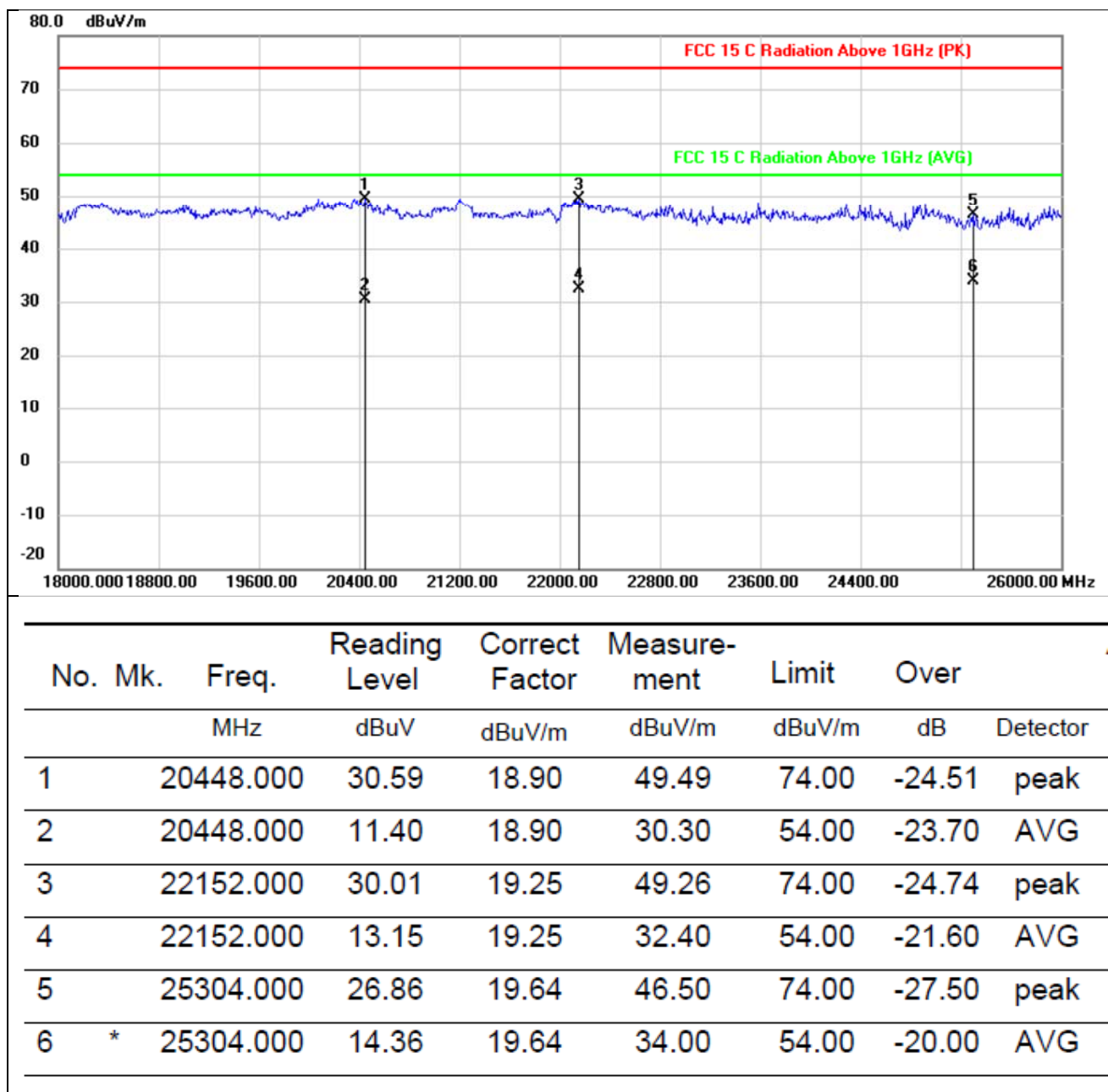
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		19568.000	27.79	18.95	46.74	74.00	-27.26	peak
2		19568.000	10.85	18.95	29.80	54.00	-24.20	AVG
3		22512.000	28.35	19.33	47.68	74.00	-26.32	peak
4		22512.000	11.17	19.33	30.50	54.00	-23.50	AVG
5		25104.000	29.75	19.77	49.52	74.00	-24.48	peak
6	*	25104.000	13.13	19.77	32.90	54.00	-21.10	AVG



EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	V
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2479MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV		dBuV/m	dBuV/m	dB	Detector
1		7477.000	44.07	0.60	44.67	74.00	-29.33	peak
2		7477.000	31.93	0.60	32.53	54.00	-21.47	AVG
3		11302.000	44.61	4.85	49.46	74.00	-24.54	peak
4		11302.000	32.67	4.85	37.52	54.00	-16.48	AVG
5		17949.000	46.20	13.74	59.94	74.00	-14.06	peak
6	*	17949.000	33.91	13.74	47.65	54.00	-6.35	AVG

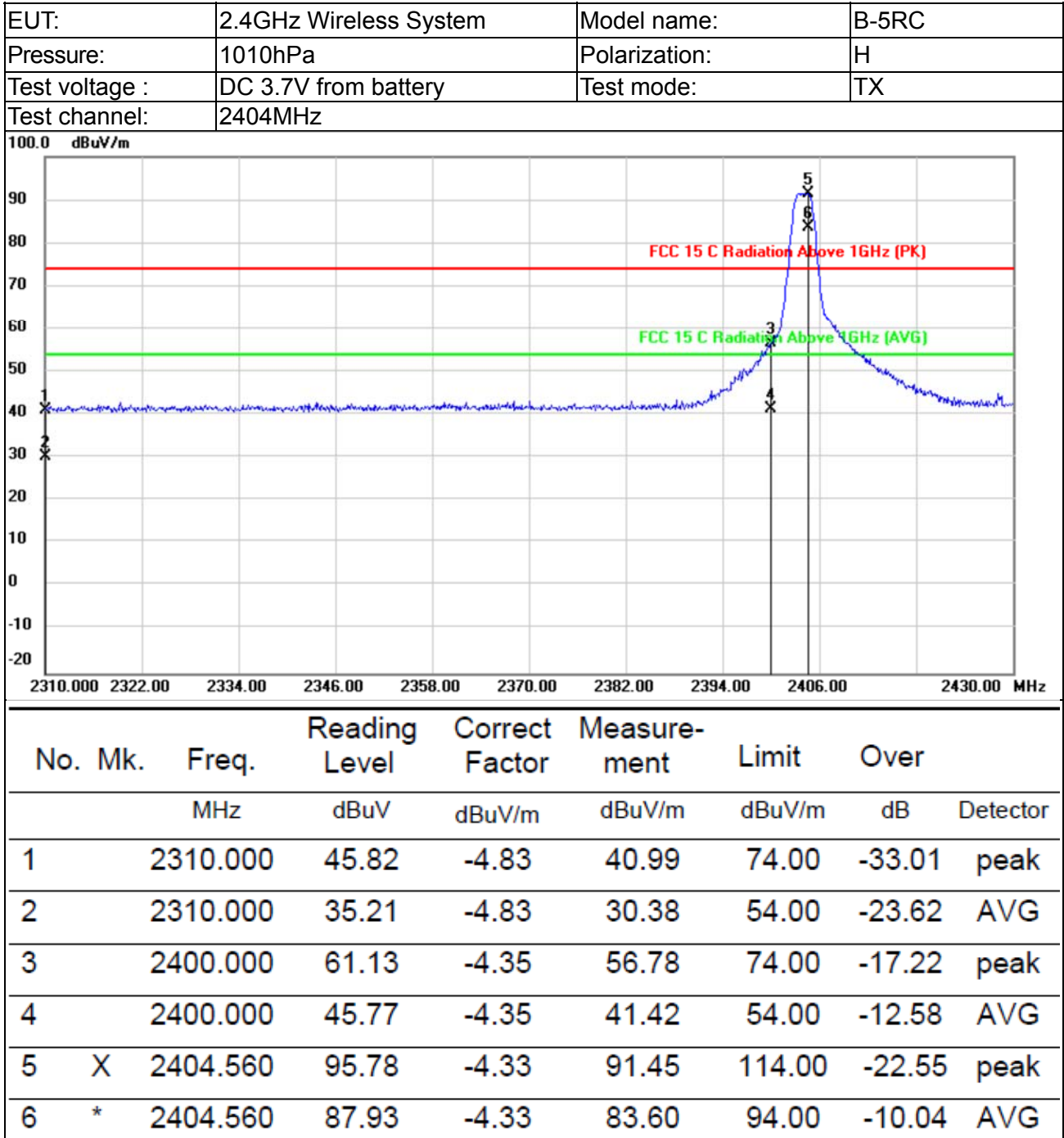




5.5.4 Band edge-radiated

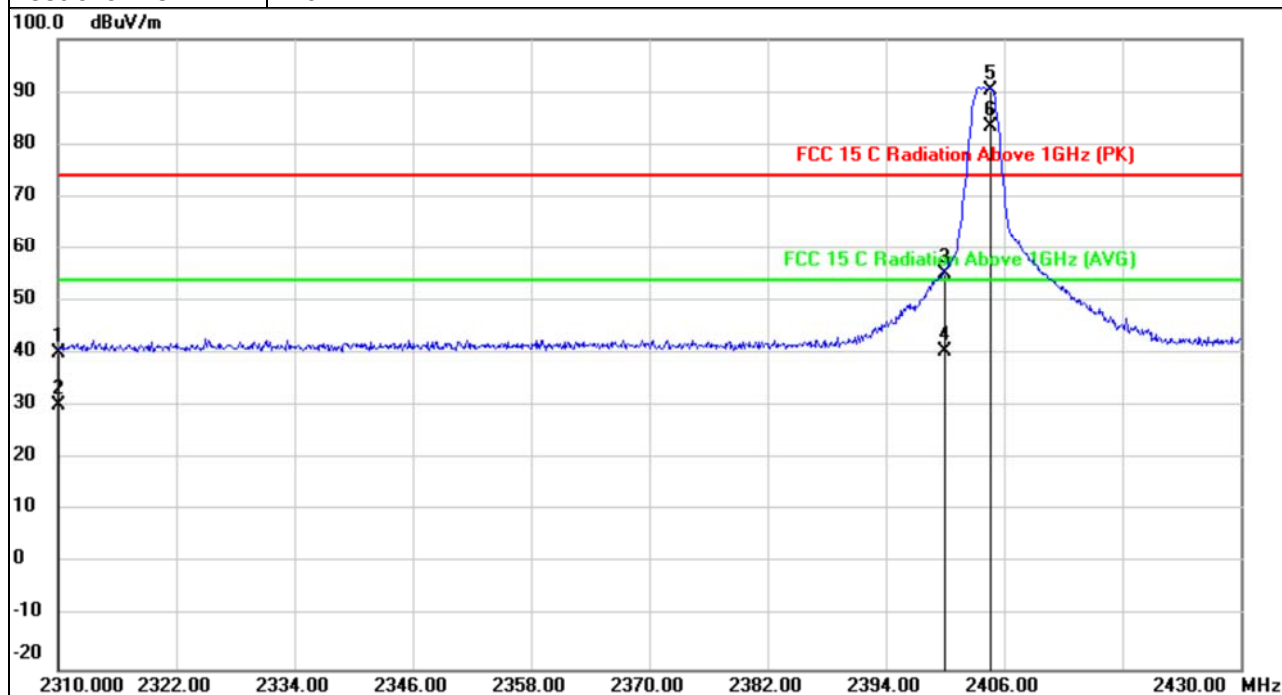
- Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
(2) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
(3) All other emissions more than 20dB below the limit.

All the modulation modes have been tested, and the worst result was report as below:





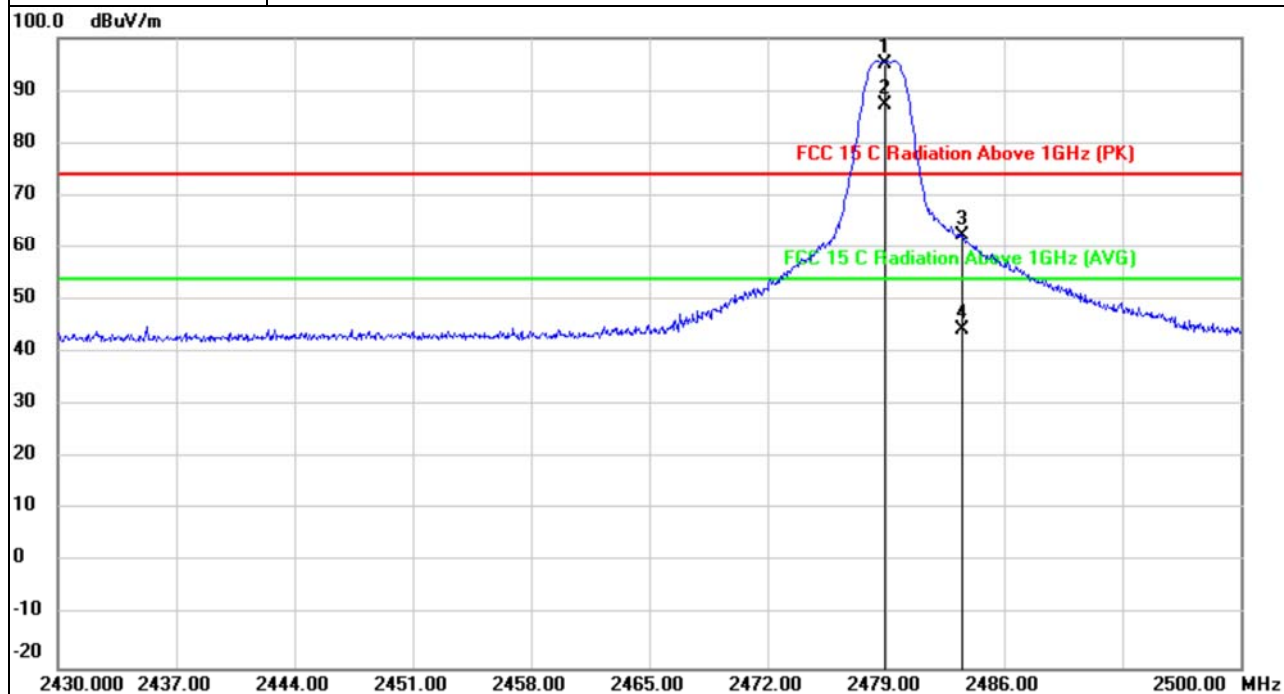
EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	V
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2404MHz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2310.000	44.99	-4.83	40.16	74.00	-33.84	peak
2		2310.000	35.13	-4.83	30.30	54.00	-23.70	AVG
3		2400.000	59.63	-4.35	55.28	74.00	-18.72	peak
4		2400.000	44.75	-4.35	40.40	54.00	-13.60	AVG
5	X	2404.560	94.63	-4.33	90.30	114.00	-23.70	peak
6	*	2404.560	87.74	-4.33	83.41	94.00	-10.59	AVG



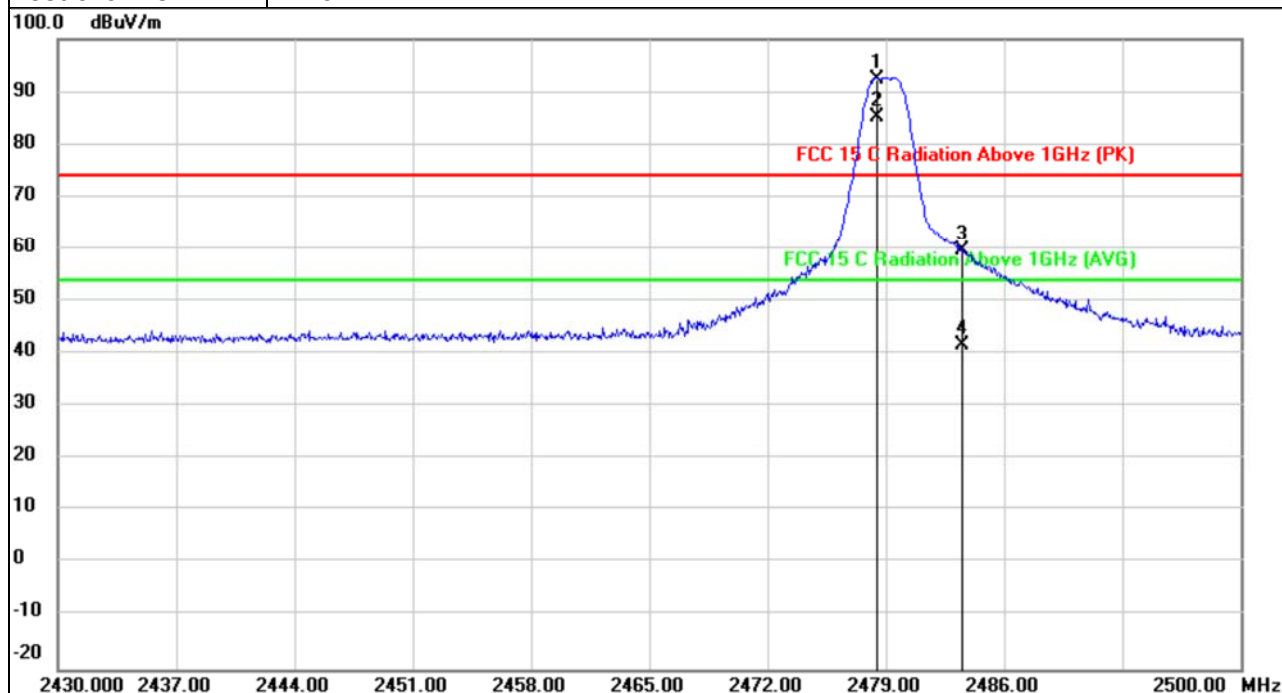
EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	H
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2479MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1	X	2478.930	99.12	-3.93	95.19	114.00	-18.81	peak
2	*	2478.930	91.30	-3.93	87.37	94.00	-6.63	AVG
3		2483.500	66.34	-3.91	62.43	74.00	-11.57	peak
4		2483.500	48.13	-3.91	44.22	54.00	-9.78	AVG



EUT:	2.4GHz Wireless System	Model name:	B-5RC
Pressure:	1010hPa	Polarization:	V
Test voltage :	DC 3.7V from battery	Test mode:	TX
Test channel:	2479MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1	X	2478.440	96.27	-3.93	92.34	114.00	-21.66	peak
2	*	2478.440	89.19	-3.93	85.26	94.00	-8.74	AVG
3		2483.500	63.58	-3.91	59.67	74.00	-14.33	peak
4		2483.500	45.54	-3.91	41.63	94.00	-12.37	AVG



Photographs of the Test Setup

Radiated emission – below 1GHz

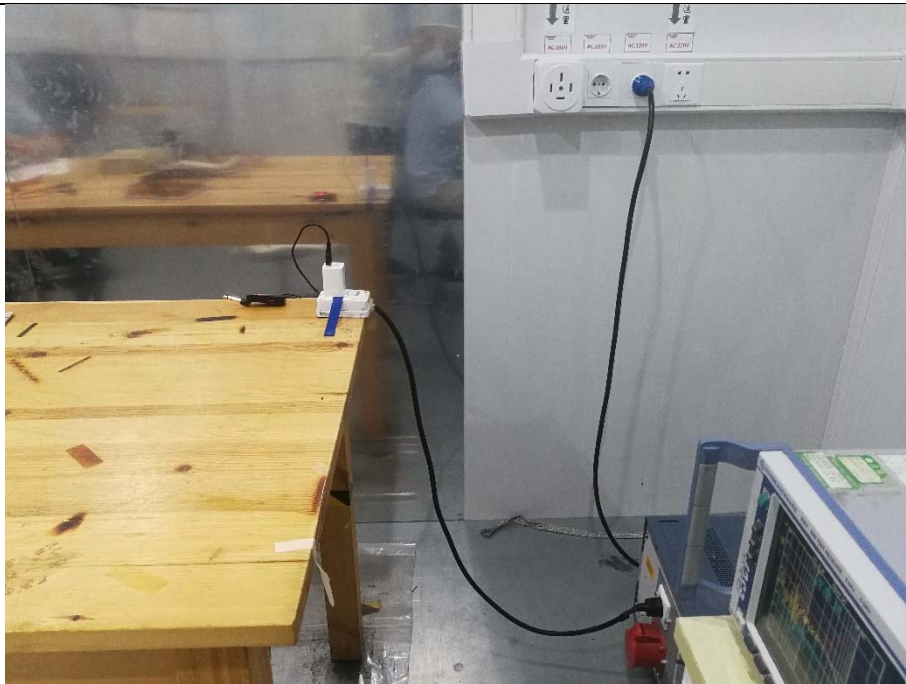


Radiated emission – above 1GHz





Conducted emission



Photographs of the EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi19090914-4E1-1.

----END OF REPORT----