

RF Test Report

Applicant : HIVOX BIOTEK INC.
Product Type : RF MODULE
Trade Name : HIVOX BIOTEK INC.
Model Number : RFM-001
Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2009
Received Date : Dec. 20, 2021
Test Period : Dec. 28, 2021 ~ Mar. 14, 2022
Issued Date : Mar. 31, 2022

Issued by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 334025, Taiwan (R.O.C.)
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330
Frequency Range : 9 kHz to 40 GHz
Test Firm MRA designation number: TW0010

Note:

1. The test results are valid only for samples provided by customers and under the test conditions described in this report.
2. This report shall not be reproduced except in full, without the written approval of A Test Lab Technology Corporation.
3. The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

Revision History

Rev.	Issued Date	Revisions	Revised By
00	Mar. 31, 2022	Initial Issue	Snow Wang

Verification of Compliance

Applicant : HIVOX BIOTEK INC.

Product Type : RF MODULE

Trade Name : HIVOX BIOTEK INC.

Model Number : RFM-001

FCC ID : 2A32IRFM-001

Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2009

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330
<http://www.atl-lab.com.tw/e-index.htm>



A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By :

(Kai Yu Yang)

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1 General Information

1.1. Summary of Test Result

Standard	Item	Result	Remark
15.207	AC Power Conducted Emission	PASS	-----
15.249(a)	Transmitter Radiated Emissions	PASS	-----
15.249(d)	Band Edge Measurement	PASS	-----
15.215(c)	20 dB RF Bandwidth	PASS	-----
15.203	Antenna Requirement	PASS	-----

Standard	Description
CFR47, Part 15, Subpart C	Intentional Radiators
ANSI C63. 10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Decision Rule

- Uncertainty is not included.
- Uncertainty is included.

1.2. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conducted Emission	150 kHz ~ 30 MHz	2.7 dB
Radiated Emission	9 kHz ~ 30 MHz	2.2 dB
	30 MHz ~ 1000 MHz	5.1 dB
	1000 MHz ~ 18000 MHz	5.2 dB
	18000 MHz ~ 26500 MHz	4.6 dB
	26500 MHz ~ 40000 MHz	4.6 dB
RF Bandwidth		4.7 %

2 EUT Description

Applicant	HIVOX BIOTEK INC. 5F., No.123, Xingde Rd., Sanchong Dist., New Taipei City 241, Taiwan, R.O.C.
Product Type	RF MODULE
Trade Name	HIVOX BIOTEK INC.
Model Number	RFM-001
FCC ID	2A32IRFM-001
Frequency Range	2430 MHz
Modulation Type	GFSK
Number of Channel	1 CH
Antenna Type	Planar inverted-F antenna
Antenna Gain	1.5 dBi
Field Strength	94.08 dBuV/m
Operate Temp. Range	-10 ~ +85 °C
EUT Power Rating	DC 2.7 V~3.3 V

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit Mode
Mode 2: Continuous TX mode

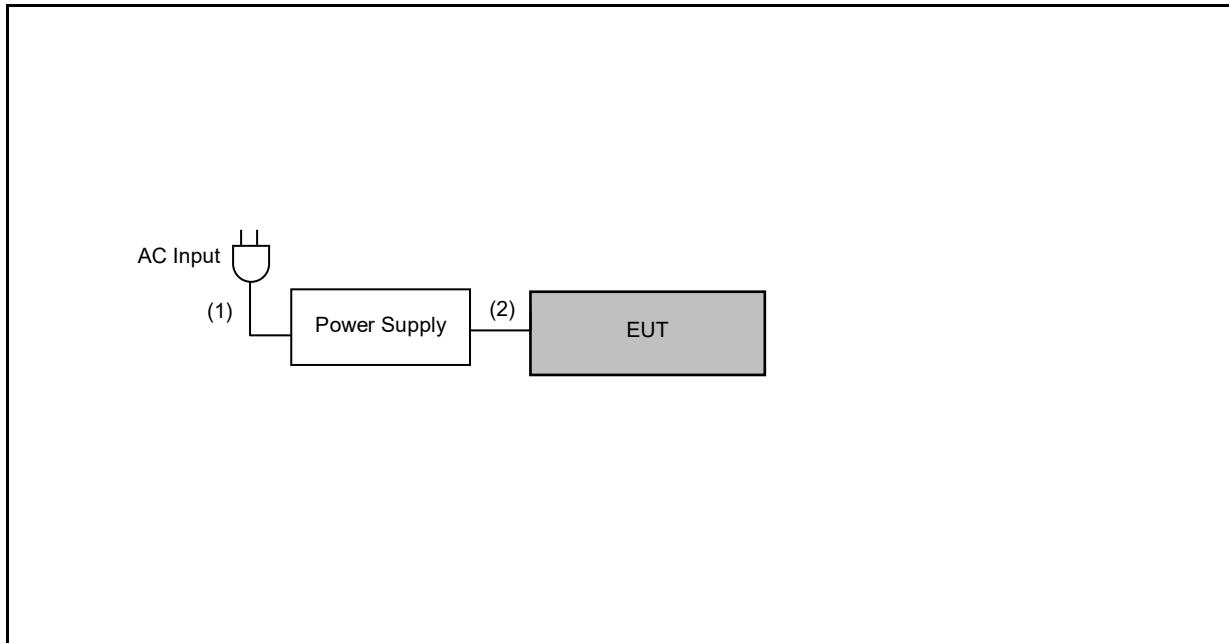
By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

3.2. EUT Test Step

1	Setup the EUT shown on "Configuration of Test System Details".
2	Turn on the power of EUT.

3.3. Configuration of Test System Details

Conducted Emission / Radiated Emission



Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
(1)	Power Cable	I-SHENG	ATL-001	---	---
(2)	DC Power Cable	ATL	ATL-001	---	---

3.4. Test Instruments

For Conducted Emission

Test Period: Jan. 02, 2022

Testing Engineer: Chi Chang

Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCI	100367	May 21, 2021	1 year
<input type="checkbox"/>	Test Receiver	R&S	ESCI	100722	Nov. 02, 2021	1 year
<input type="checkbox"/>	Test Receiver	R&S	ESCI	101000	Nov. 26, 2021	1 year
<input checked="" type="checkbox"/>	LISN	R&S	ENV216	101040	Mar. 29, 2021	1 year
<input checked="" type="checkbox"/>	LISN	R&S	ENV216	101041	Apr. 08, 2021	1 year
<input checked="" type="checkbox"/>	RF Cable	Woken	00100D1380194M	TE-02-03	May 28, 2021	1 year
<input checked="" type="checkbox"/>	Power Supply	KEITHLEY	2303	4045290	Feb. 01, 2021	1 year
<input checked="" type="checkbox"/>	Software	EZ EMC	1.1.4.3	N/A	N.C.R.	---

For Conducted

Test Period: Mar. 14, 2022

Testing Engineer: Brian Lin

Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
<input type="checkbox"/>	Power Sensor	Anritsu	MA2411B	1126022	Sep. 03, 2021	1 year
<input type="checkbox"/>	Power Meter	Anritsu	ML2495A	1135009	Sep. 03, 2021	1 year
<input type="checkbox"/>	Power Sensor	Agilent	N1921A	MY45241957	Dec. 06, 2021	1 year
<input type="checkbox"/>	Power Meter	Agilent	N1911A	MY45101619	Dec. 06, 2021	1 year
<input checked="" type="checkbox"/>	Spectrum Analyzer (10 Hz~26.5 GHz)	Keysight	N9010B	MY59071418	Mar. 17, 2021	1 year
<input type="checkbox"/>	Spectrum Analyzer (9 kHz~26.5 GHz)	Agilent	N9010A	MY48030518	Jul. 23, 2021	1 year
<input type="checkbox"/>	Spectrum Analyzer (20 Hz~26.5 GHz)	Agilent	N9020A	US47520902	Sep. 09, 2021	1 year
<input type="checkbox"/>	Spectrum Analyzer (3 Hz~50 GHz)	Agilent	N9030A	MY53120541	Jan. 05, 2022	1 year
<input type="checkbox"/>	Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	Mar. 30, 2021	1 year
<input type="checkbox"/>	Signal Generator	Keysight	N5182B	MY53052569	Apr. 20, 2021	1 year
<input type="checkbox"/>	Signal Generator	Keysight	N5182BX07	MY59360221	Apr. 20, 2021	1 year
<input type="checkbox"/>	Bluetooth Tester	R&S	CBT	100350	Mar. 17, 2021	2 years
<input type="checkbox"/>	Wireless Connectivity Tester	R&S	CMW270	102208	Jun. 02, 2021	1 year
<input checked="" type="checkbox"/>	Power Supply	KEITHLEY	2303	4045290	Jan. 19, 2022	1 year
<input type="checkbox"/>	RF Communication Test Set	HP	8920A	3344A03297	Aug. 10, 2021	1 year

Note: N.C.R. = No Calibration Request.

For Radiated Emissions

Test Period: Dec. 28, 2021 ~ Mar. 08, 2022

Testing Engineer: Hung Chou, Marc Yeh

Radiation test sites		Semi Anechoic Room				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
<input type="checkbox"/>	Spectrum Analyzer (10 Hz~44 GHz)	Keysight	N9010A	MY52221312	Jan. 18, 2021 Jan. 13, 2022	1 year
<input type="checkbox"/>	Spectrum Analyzer (3 Hz~50 GHz)	Agilent	N9030A	MY53120541	Jan. 08, 2021 Jan. 05, 2022	1 year
<input checked="" type="checkbox"/>	Spectrum Analyzer (2 Hz~50 GHz)	Keysight	N9030B	MY57143537	Apr. 19, 2021	1 year
<input checked="" type="checkbox"/>	Amplifier (100 kHz~1.3 GHz)	Agilent	8447D	2944A11119	Jan. 15, 2021 Jan. 14, 2022	1 year
<input type="checkbox"/>	Amplifier (100 kHz~1.3 GHz)	Agilent	8447D	2944A10961	Jul. 06, 2021	1 year
<input type="checkbox"/>	Broadband Amplifier (100 kHz~1 GHz)	Titan	T0910E00014330 A1F	001	Jul. 23, 2021	1 year
<input type="checkbox"/>	Amplifier (1 GHz~26.5 GHz)	Agilent	8449B	3008A02237	Oct. 21, 2021	1 year
<input checked="" type="checkbox"/>	Broadband Amplifier (1 GHz~26.5 GHz)	Titan	T0912E01263025 A1F	002	Jul. 26, 2021	1 year
<input type="checkbox"/>	Preamplifier (26.5 GHz~40 GHz)	EMCI	EMC2654045	980028	Aug. 19, 2021	1 year
<input checked="" type="checkbox"/>	Loop Antenna (9 kHz~30 MHz)	COM-POWER CORPORATION	AL-130	121014	Apr. 07, 2021	1 year
<input checked="" type="checkbox"/>	Trilog Broadband Antenna (30 kHz~1 GHz)	Schwarzbeck Mess-Elektronik	VULB9168	01146	Jul. 19, 2021	1 year
<input type="checkbox"/>	Trilog Broadband Antenna (30 kHz~1 GHz)	Schwarzbeck Mess-Elektronik	VULB9168	416	Nov. 17, 2021	1 year
<input checked="" type="checkbox"/>	Broadband Horn Antenna (1 GHz~18 GHz)	Schwarzbeck Mess-Elektronik	9120D	02207	Jul. 09, 2021	1 year
<input type="checkbox"/>	Broadband Horn Antenna (1 GHz~18 GHz)	Schwarzbeck Mess-Elektronik	9120D	9120D-550	Aug. 24, 2021	1 year
<input checked="" type="checkbox"/>	Broadband Horn Antenna (18 GHz~40 GHz)	Schwarzbeck Mess-Elektronik	9170	9170-320	Aug. 24, 2021	1 year
<input type="checkbox"/>	Horn Antenna (18 GHz~40 GHz)	ETS	3116	00086467	Dec. 03, 2021	1 year
<input type="checkbox"/>	RF Cable	EMCI	EMC104-N-N-600 0	TE01-1	Feb. 19, 2021 Feb. 18, 2022	1 year
<input type="checkbox"/>	Microwave Cable	EMCI	EMC104-SM-SM- 13000	170814	Feb. 19, 2021 Feb. 18, 2022	1 year
<input type="checkbox"/>	Microwave Cable	EMCI	EMC102-KM-KM- 14000	151001	Feb. 19, 2021 Feb. 18, 2022	1 year

Radiation test sites		Semi Anechoic Room				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
<input checked="" type="checkbox"/>	Coaxial Cable	Titan	T0710AT327A10A 100	J11005	Aug. 06, 2021	1 year
<input checked="" type="checkbox"/>	Coaxial Cable	Titan	T0710AT327A10A 900	J11004	Aug. 06, 2021	1 year
<input checked="" type="checkbox"/>	Coaxial Cable	Titan	CFD400NL-LW	001	Aug. 06, 2021	1 year
<input type="checkbox"/>	Bluetooth Tester	R&S	CBT	100350	Mar. 17, 2021	2 years
<input type="checkbox"/>	Wireless Connectivity Tester	R&S	CMW270	102208	Jun. 02, 2021	1 year
<input checked="" type="checkbox"/>	Power Supply	KEITHLEY	2303	4045290	Feb. 01, 2021 Jan. 19, 2022	1 year
<input checked="" type="checkbox"/>	Software	EZ EMC	1.1.4.4	N/A	N.C.R.	---

Note: N.C.R. = No Calibration Request.

3.5. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	20-30
Humidity (%RH)	25-75	45-75

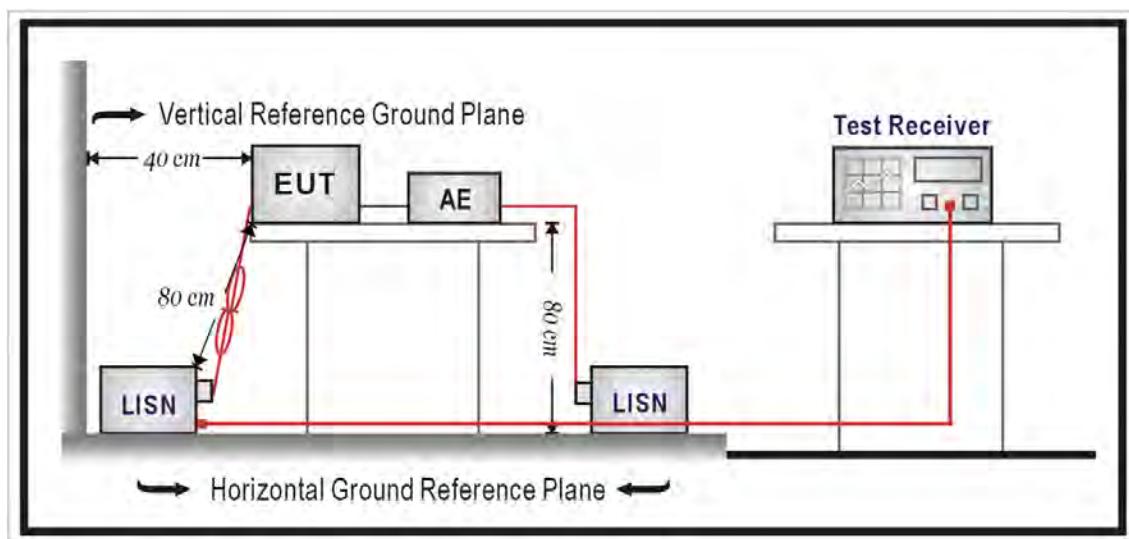
4 Measurement Procedure

4.1. AC Power Line Conducted Emission Measurement

■ Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

■ Test Setup



■ Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50Ω // $50 \mu\text{H}$ coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω // $50 \mu\text{H}$ coupling impedance with 50Ω termination.

Tabletop device shall be placed on a non-conducting platform, of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The wall of screened room shall be located 40 cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80 cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12 mm insulating material.

Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a resolution bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. When all of peak value were complied with quasi-peak and average limit from 150 kHz to 30 MHz then quasi-peak and average measurement was unnecessary.

The AMN shall be placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for AMNs mounted on top of the ground reference plane. This distance is between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8 m from the AMN. If the mains power cable is longer than 1 m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4 m. All of 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 cm to 40 cm long. All of EUT and AE shall be separate place more than 0.1 m. All 50Ω ports of the LISN shall be resistively terminated into 50Ω loads when not connected to the measuring instrument.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

4.2. Radiated Emission Measurement

■ Limit

Frequency (MHz)	Field Strength (μ V/m at meter)	Measurement Distance (meter)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3 m. Other 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 comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note: (1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20 log Emission level (uV/m).

Limits of Radiated Emission Measurement (FCC 15.209)

Frequency (MHz)	Class A (dBuV/m) (at 3 m)		Class B (dBuV/m) (at 3 m)	
	Peak	AVG	Peak	AVG
0.009 – 0.490	80	60	74	54

Notes: (1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

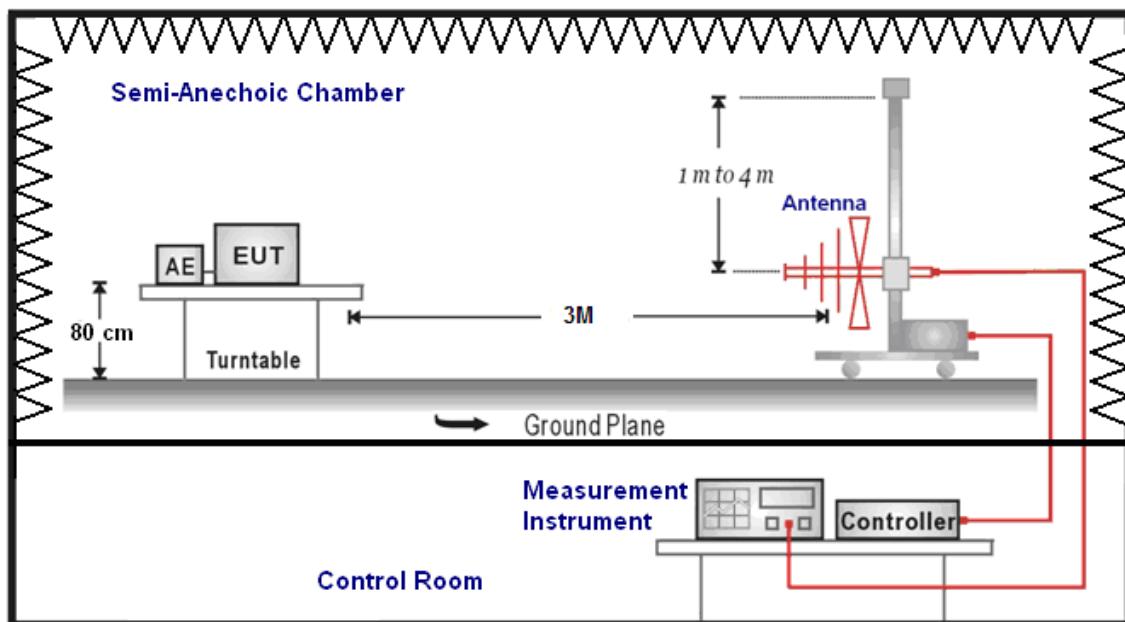
(3) Emission level (dBuV/m)=20 log Emission level (uV/m).

Limits of Radiated Emission Measurement (FCC Part 15.249)

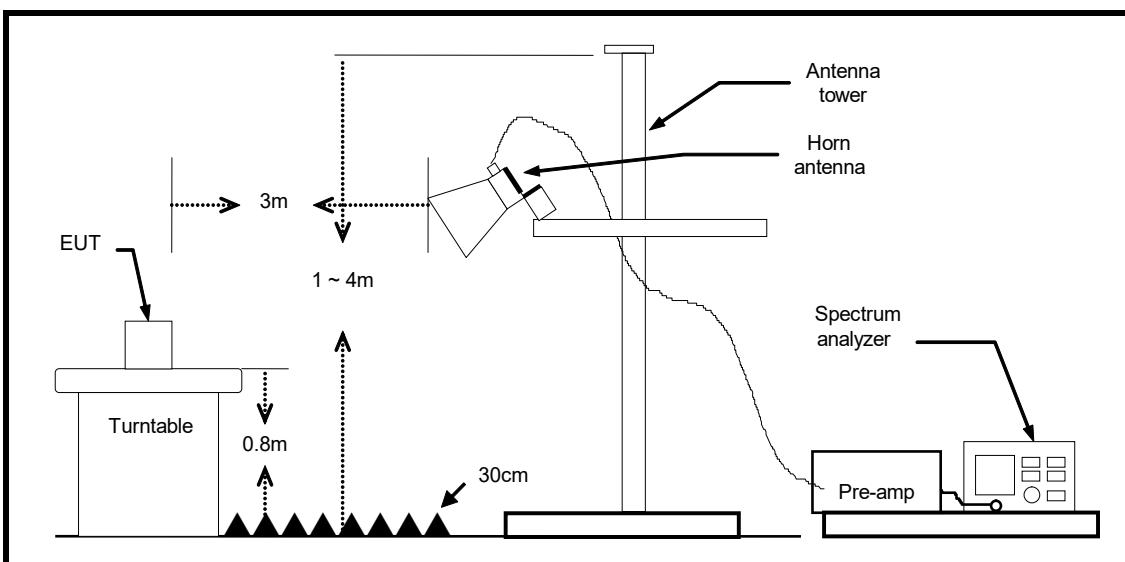
Frequency Range (MHz)	Limit
2400-2483.5	Field strength of fundamental 50000 μ V/m (94 dB μ V/m) @ 3 m
Above 2483.5	Field strength of harmonics 500 μ V/m (54 dB μ V/m) @ 3 m

■ Setup

Below 1 GHz



Above 1 GHz



■ Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20 dB/decade).

For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dB_{uV/m}) is determined by algebraically adding the measured reading in dB_{uV}, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \text{ Amplitude (dB}_{uV/m}\text{)} = \text{FI (dB}_{uV}\text{)} + \text{AF (dB}_{uV}\text{)} + \text{CL (dB}_{uV}\text{)} - \text{Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \text{ Actual Amplitude (dB}_{uV/m}\text{)} = \text{Amplitude (dB}_{uV}\text{)} - \text{Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30 dBm

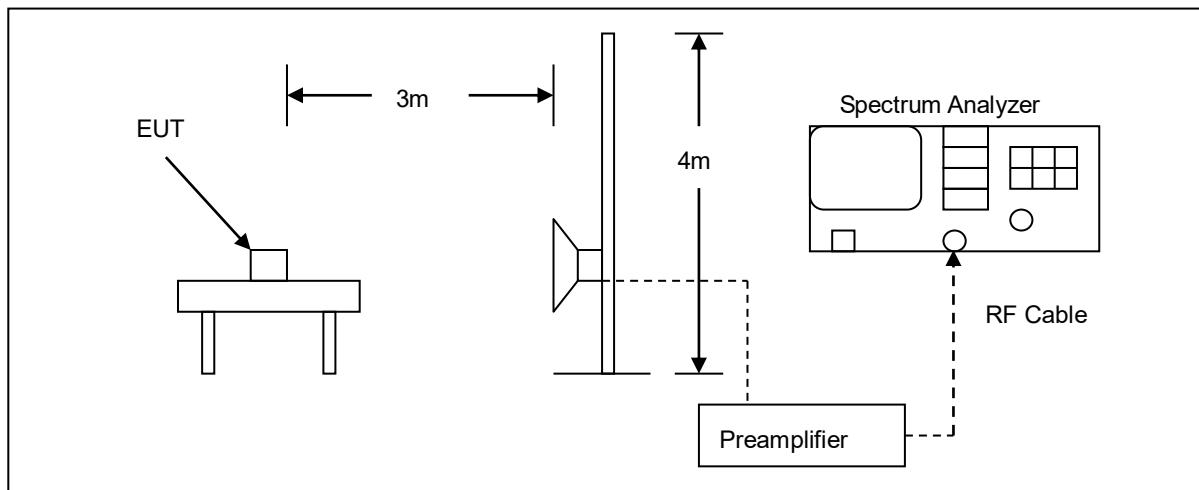
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

4.3. Band Edges Measurement

■ Limit

In any 100 kHz bandwidth outside the frequency band, the radio frequency power is at least 50 dB below that in the 100 kHz bandwidth within the band that contains the highest lever of the desired power.

■ Test Setup



■ Test Procedure

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

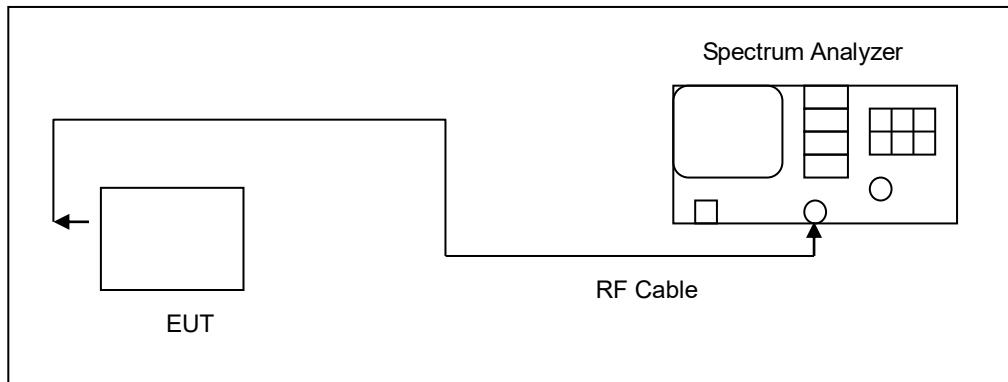
For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

4.4. 20 dB Bandwidth Measurement

- **Limit**

N/A

- **Test Setup**



- **Test Procedure**

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth shall be set to as close to 1 % of the selected span as is possible without being below 1 %.

The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded

4.5. Antenna Measurement

■ Limit

For intentional device, according to 15.203, 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.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

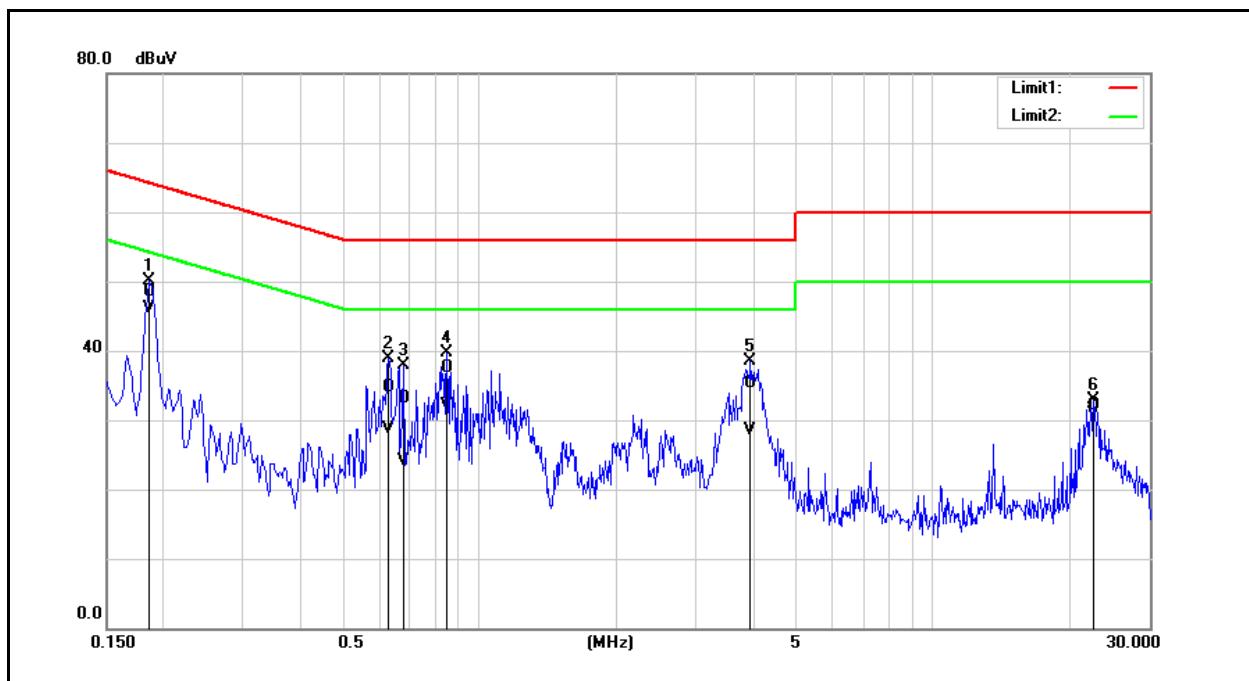
■ Antenna Connector Construction

See section 2 – antenna information.

5 Test Results

5.1 Conducted Emission

Standard:	FCC Part 15.249	Line:	L1
Test item:	Conducted Emission	Power:	AC 120 V/60 Hz
Mode:	Mode 1		
Description:			

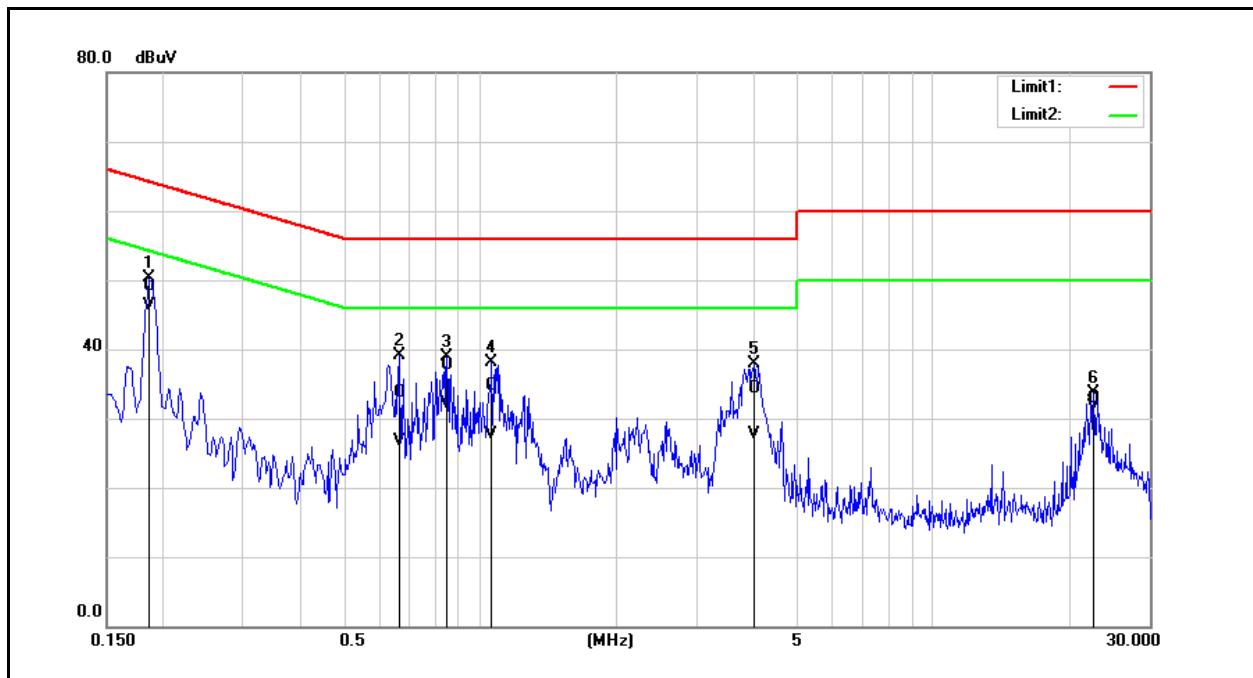


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1860	38.86	36.40	9.74	48.60	46.14	64.21	54.21	-15.61	-8.07	Pass
2	0.6300	24.92	19.03	9.75	34.67	28.78	56.00	46.00	-21.33	-17.22	Pass
3	0.6780	23.35	14.29	9.75	33.10	24.04	56.00	46.00	-22.90	-21.96	Pass
4	0.8460	27.80	22.30	9.75	37.55	32.05	56.00	46.00	-18.45	-13.95	Pass
5	3.9540	25.53	18.67	9.84	35.37	28.51	56.00	46.00	-20.63	-17.49	Pass
6	22.6500	22.02	20.89	10.06	32.08	30.95	60.00	50.00	-27.92	-19.05	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15.249	Line:	N
Test item:	Conducted Emission	Power:	AC 120 V/60 Hz
Mode:	Mode 1		
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	Avg reading (dBuV)	Correction factor (dB)	QP result (dBuV)	Avg result (dBuV)	QP limit (dBuV)	Avg limit (dBuV)	QP margin (dB)	Avg margin (dB)	Remark
1	0.1860	39.36	36.50	9.73	49.09	46.23	64.21	54.21	-15.12	-7.98	Pass
2	0.6620	24.01	16.87	9.74	33.75	26.61	56.00	46.00	-22.25	-19.39	Pass
3	0.8460	27.90	22.26	9.75	37.65	32.01	56.00	46.00	-18.35	-13.99	Pass
4	1.0620	24.96	17.89	9.76	34.72	27.65	56.00	46.00	-21.28	-18.35	Pass
5	4.0140	24.38	17.80	9.85	34.23	27.65	56.00	46.00	-21.77	-18.35	Pass
6	22.6500	22.64	21.54	10.21	32.85	31.75	60.00	50.00	-27.15	-18.25	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5.2 Conducted Test Results

20 dB Bandwidth Measurement

Test Mode	Mode 2
Frequency (MHz)	Measurement Results (MHz)
2430	1.156

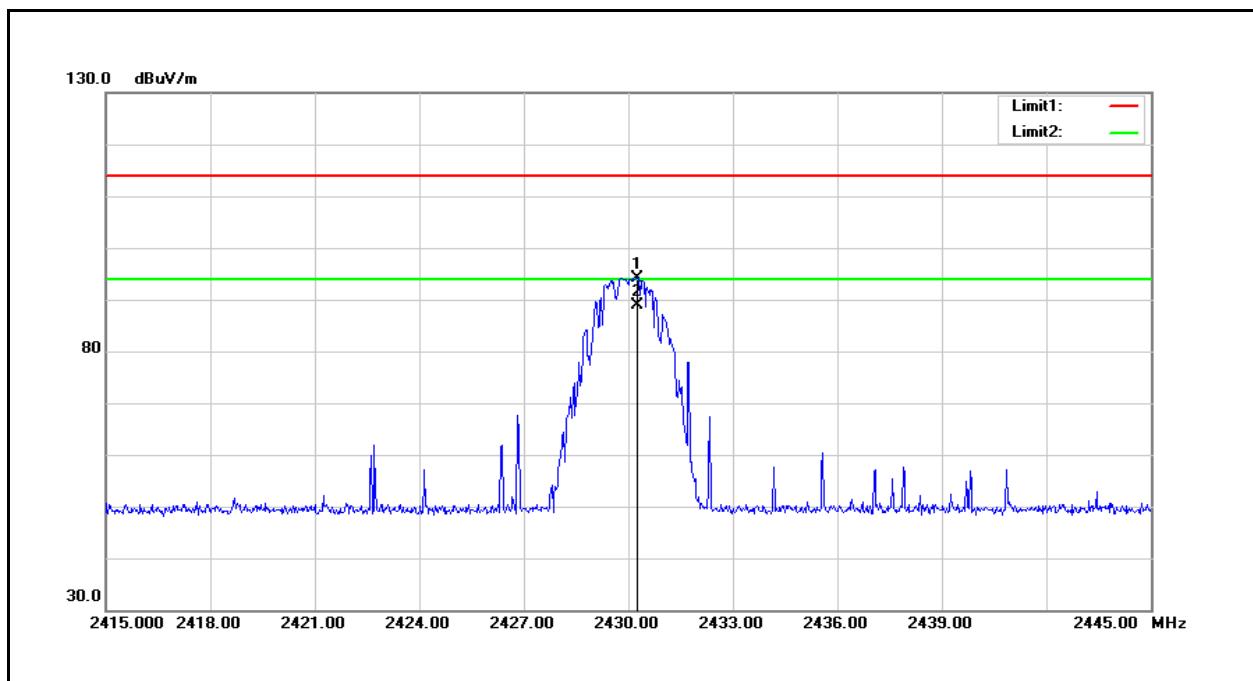
■ Test Graphs



5.3 Radiated Emission Measurement

Fundamental

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Fundamental		
Mode:	Mode 2		
Frequency:	2430 MHz		
Ant.Polar.:	Horizontal		



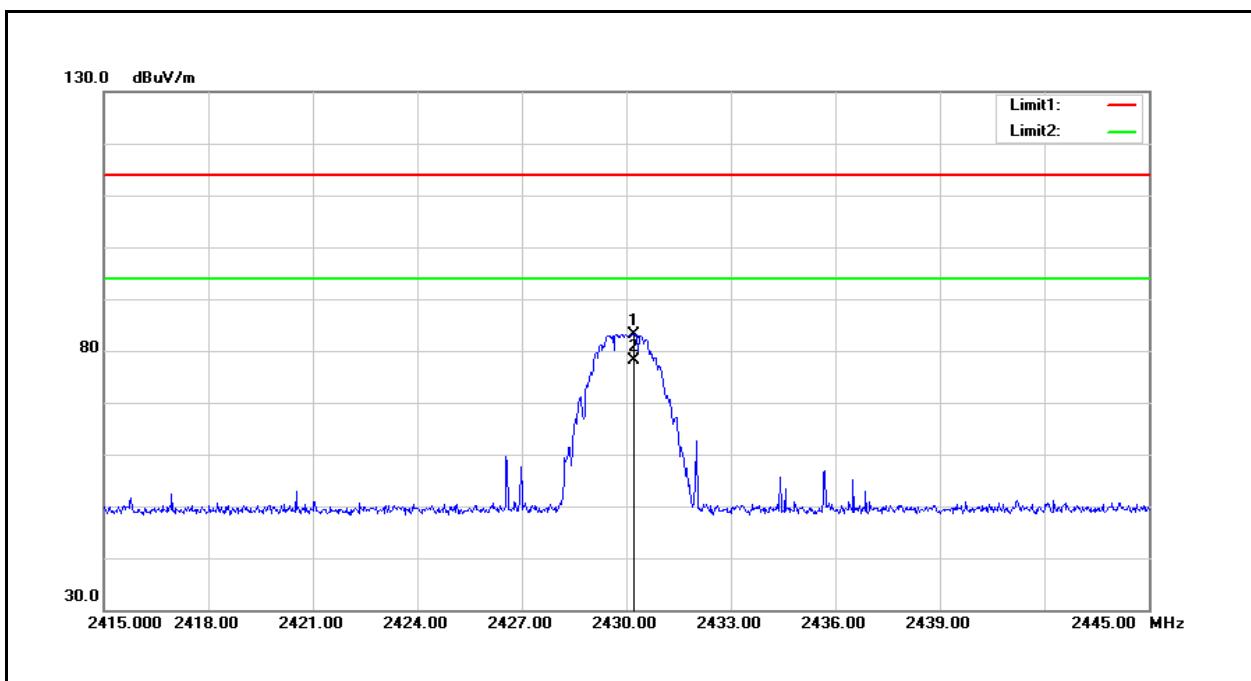
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2430.240	101.23	-7.15	94.08	114.00	-19.92	peak
2	2430.240	96.06	-7.15	88.91	94.00	-5.09	AVG

Note: 1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Fundamental		
Mode:	Mode 2		
Frequency:	2430 MHz		
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2430.210	90.40	-7.15	83.25	114.00	-30.75	peak
2	2430.210	85.27	-7.15	78.12	94.00	-15.88	AVG

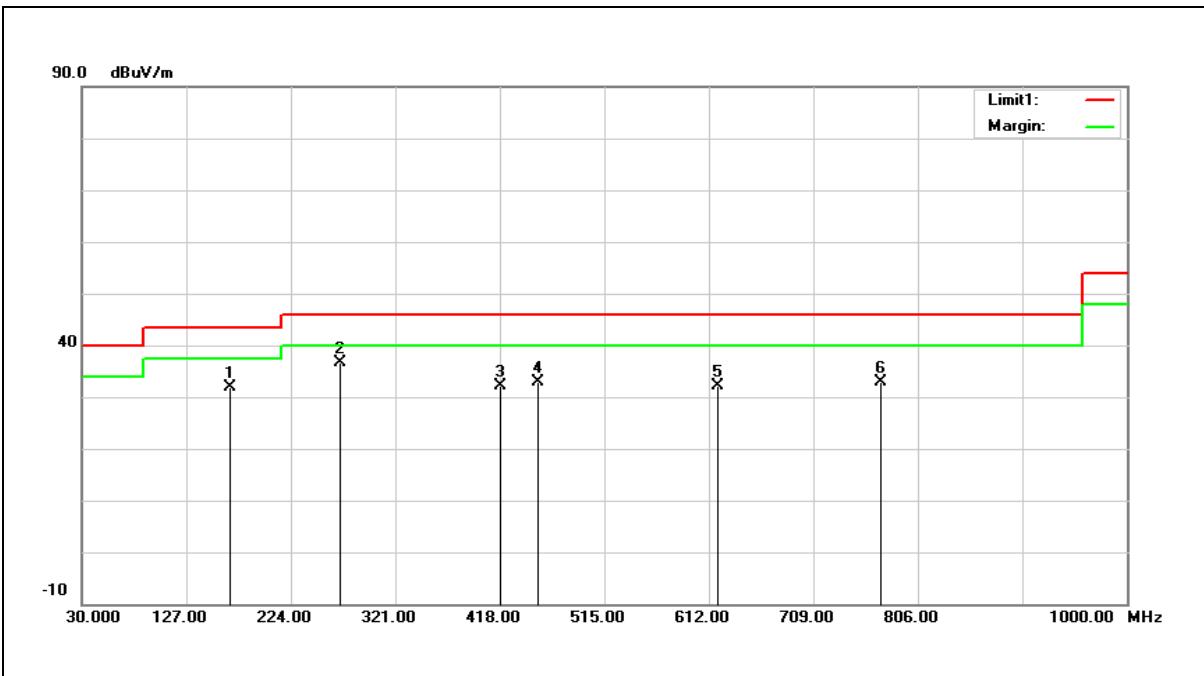
Note: 1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correct factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Below 1 GHz

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Radiated Emission		
Mode:	Mode 1		
Ant.Polar.:	Horizontal		



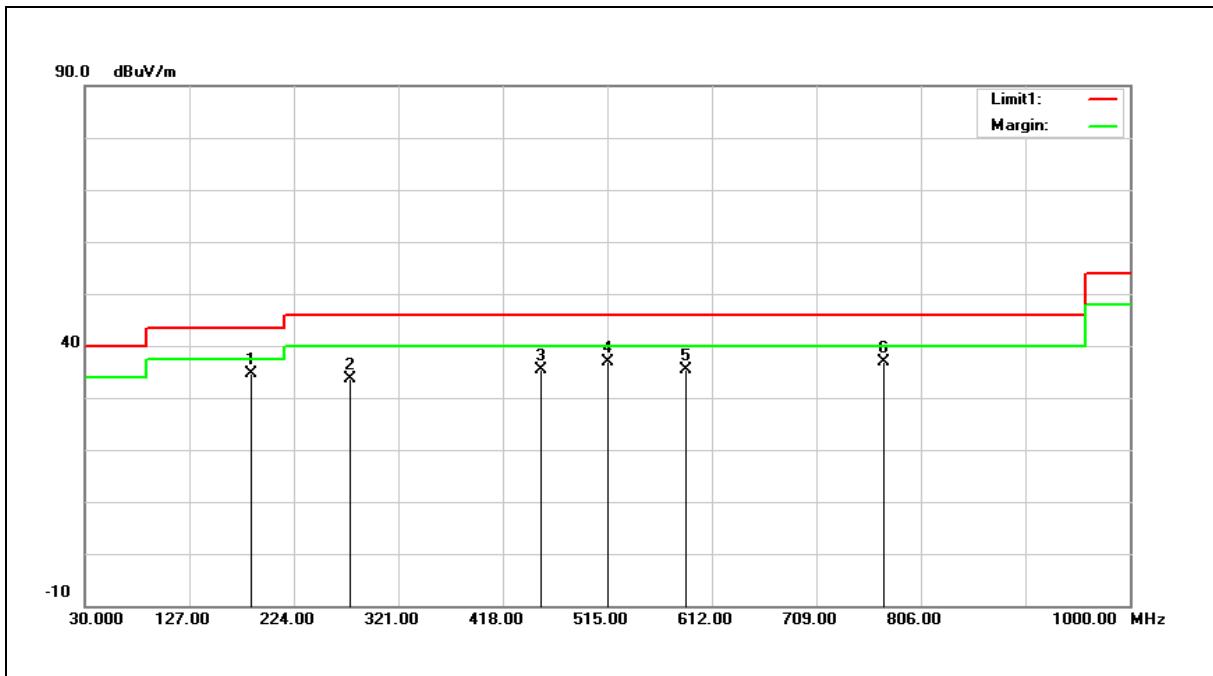
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	167.7400	38.63	-6.67	31.96	43.50	-11.54	QP
2	269.5900	43.06	-6.36	36.70	46.00	-9.30	QP
3	418.9700	35.08	-3.01	32.07	46.00	-13.93	QP
4	452.9200	35.45	-2.51	32.94	46.00	-13.06	QP
5	620.7300	31.36	0.79	32.15	46.00	-13.85	QP
6	772.0500	29.64	3.36	33.00	46.00	-13.00	QP

Note: 1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correct factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Radiated Emission		
Mode:	Mode 1		
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	184.2300	42.76	-8.13	34.63	43.50	-8.87	QP
2	276.3800	39.81	-6.07	33.74	46.00	-12.26	QP
3	452.9200	37.93	-2.51	35.42	46.00	-10.58	QP
4	515.9700	38.53	-1.56	36.97	46.00	-9.03	QP
5	587.7500	35.20	0.20	35.40	46.00	-10.60	QP
6	772.0500	33.46	3.36	36.82	46.00	-9.18	QP

Note: 1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

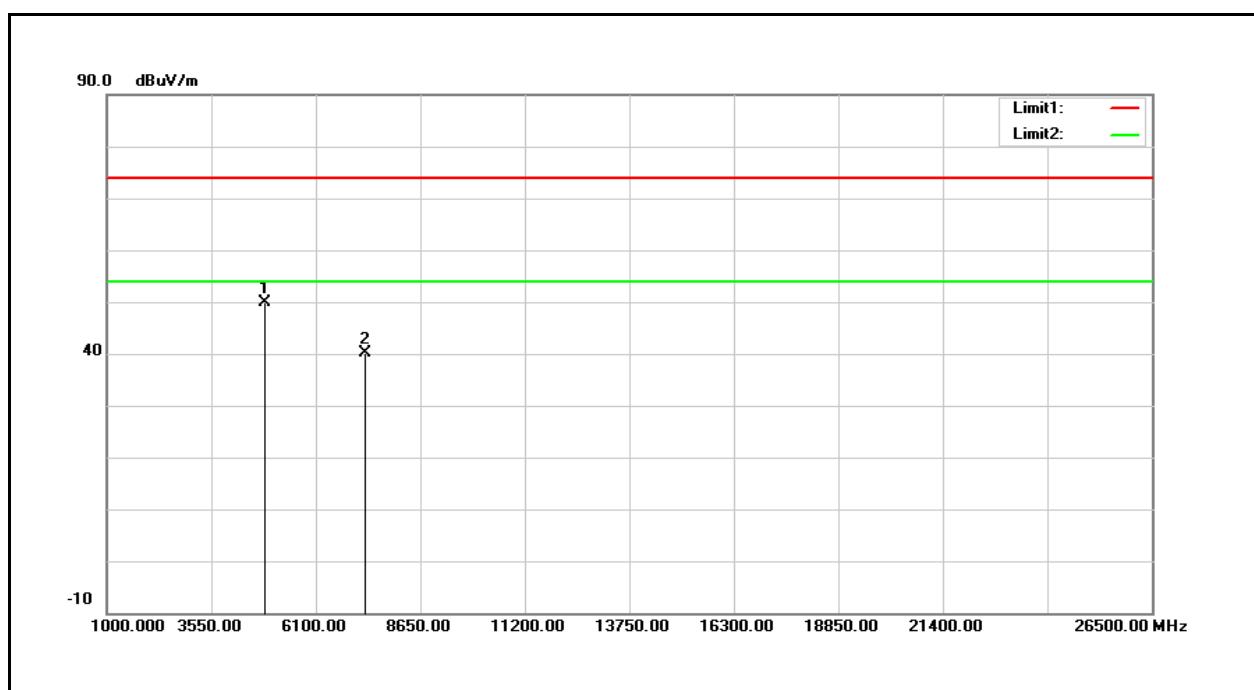
2.Correct factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Harmonic

Above 1 GHz

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Harmonic		
Test Mode:	Mode 2		
Frequency:	2430 MHz		
Ant.Polar.:	Horizontal		



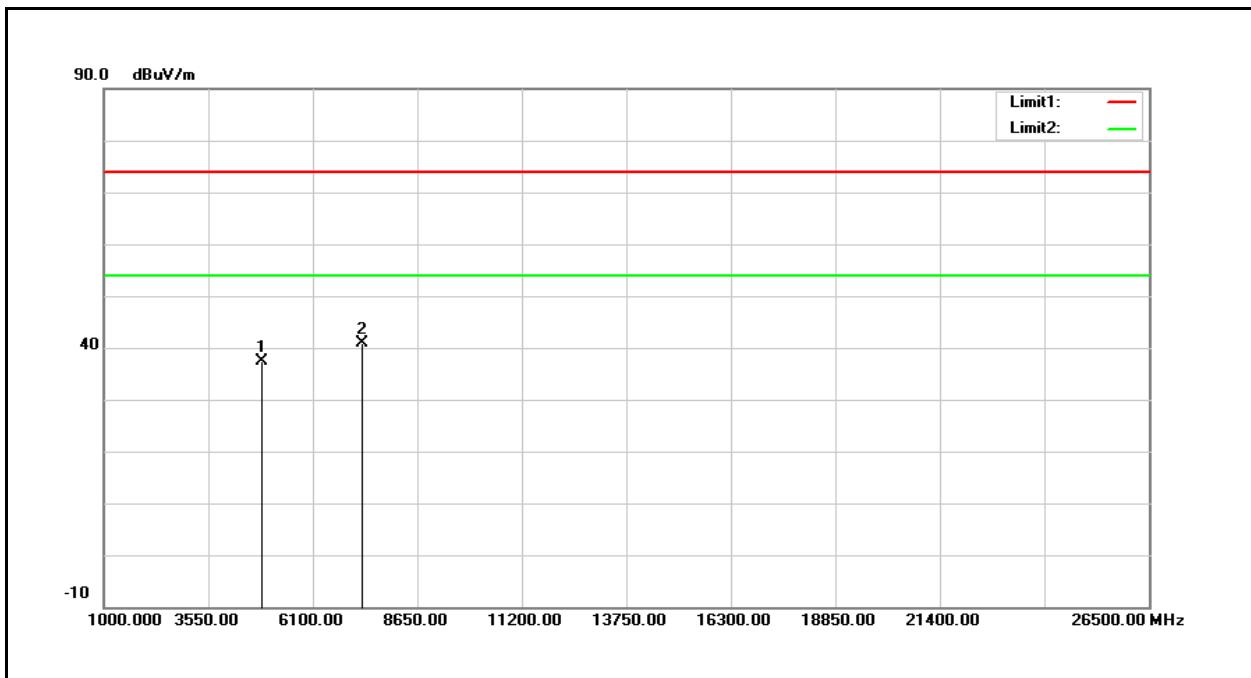
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	50.65	-0.85	49.80	74.00	-24.20	peak
2	7290.000	33.66	6.37	40.03	74.00	-33.97	peak

Note: 1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Harmonic		
Test Mode:	Mode 2		
Frequency:	2430 MHz		
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	38.35	-0.85	37.50	74.00	-36.50	peak
2	7290.000	34.62	6.37	40.99	74.00	-33.01	peak

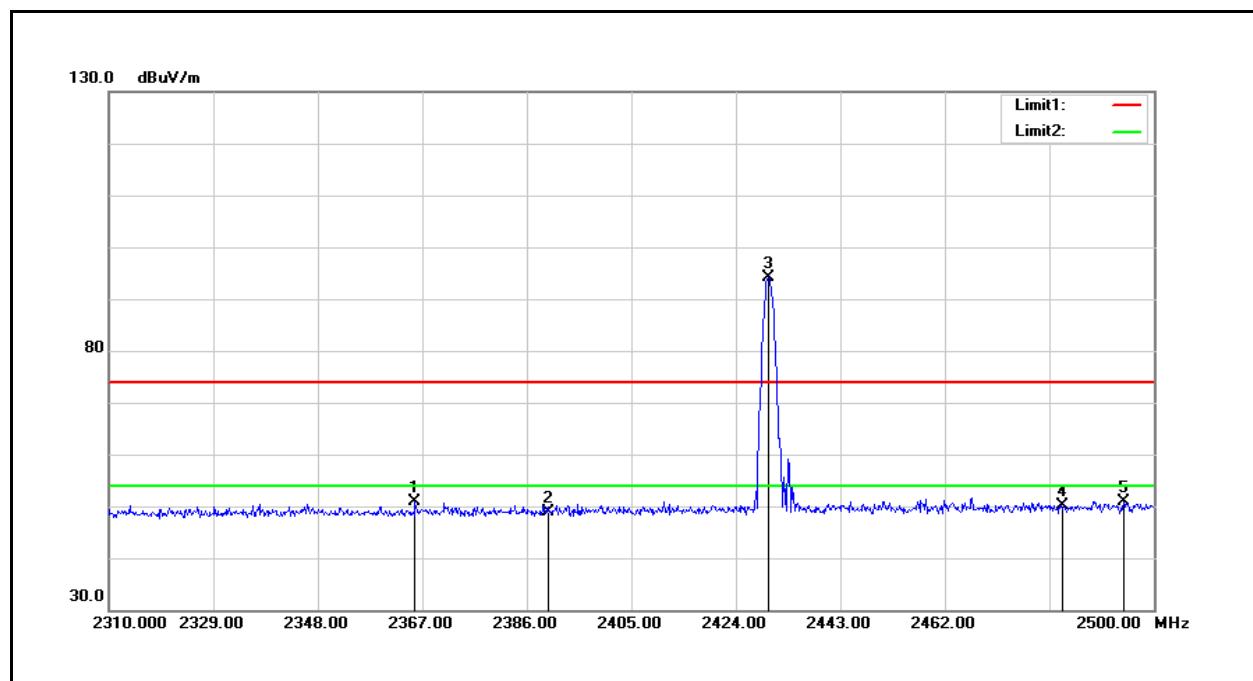
Note: 1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correct factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Band edge

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Band edge		
Test Mode:	Mode 2		
Frequency:	2430 MHz		
Ant.Polar.:	Horizontal		



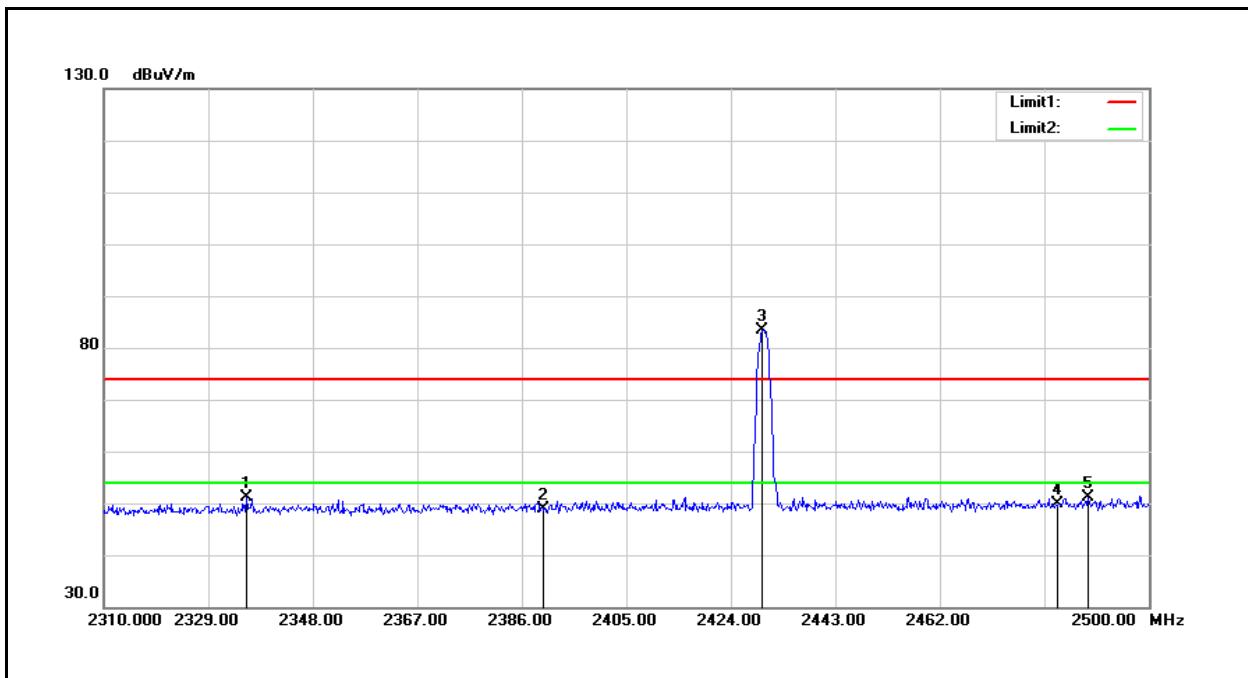
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2365.670	58.29	-7.41	50.88	74.00	-23.12	peak
2	2390.000	56.07	-7.30	48.77	74.00	-25.23	peak
3	2429.890	101.28	-7.15	94.13	74.00	20.13	peak
4	2483.500	57.09	-6.94	50.15	74.00	-23.85	peak
5	2494.490	57.89	-6.90	50.99	74.00	-23.01	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

Standard:	FCC Part 15.249	Test Distance:	3 m
Test item:	Band edge		
Test Mode:	Mode 2		
Frequency:	2430 MHz		
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2336.030	58.72	-7.52	51.20	74.00	-22.80	peak
2	2390.000	56.20	-7.30	48.90	74.00	-25.10	peak
3	2429.700	90.48	-7.15	83.33	74.00	9.33	peak
4	2483.500	56.88	-6.94	49.94	74.00	-24.06	peak
5	2488.980	58.04	-6.91	51.13	74.00	-22.87	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.When the peak results are less than average limit, so not need to evaluate the average.

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