FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 2

CERTIFICATION TEST REPORT

For

Speaker

MODEL NUMBER: AIR4

FCC ID: TQYETONAIR4
IC: 6233A-ETONAIR4

REPORT NUMBER: 4788304691.1-1

ISSUE DATE: January 31, 2018

Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	01/31/2018	Initial Issue	

Summary of Test Results			
Clause	**Test Items**	FCC/IC Rules	Test Results
1	6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a)	PASS
2	Peak Conducted Output Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	PASS
3	Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	PASS
4	Conducted Bandedge and Spurious Emission	FCC 15.247 (d) RSS-247 Clause 5.5	PASS
5	Radiated Bandedge and Spurious Emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	JAZZ HIPSTER CORPORATION
Address:	2Fd., No.512, Yaun-San Rd. Ghang-Ho City Taiwan

Manufacturer Information

Company Name:	ETON Deutschland Electro Acoustic GmbH
Address:	89231 Neu - Ulm, Pfaffenweg 21, Germany

EUT Description

Product Name	Speaker
Brand Name	ETON
Model Name	AIR4
Sample ID	1337271
Sample Status	Good
Sample Received date	January 03, 2018
Date Tested	January 04~January 19, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 4	PASS

Tested By:

Miller Ma
Engineer Project Associate

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB558074 D01 DTS Meas Guidance v04, KDB414788 D01 Radiated Test Site v01, ANSI C63.10-2013 and KDB 662911 D01 Multiple Transmitter Output v02r01.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **IAS (Lab Code: TL-702)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B, the VCCI registration No. is C-20012 and T-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OATS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	Speaker
Model Name	AIR4
Radio Technology	IEEE802.11b/g
Operation frequency	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
Power Supply	AC120V/60Hz
Hardware Version	V1.0
Software Version	V1.0

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit ANTs (NTX)	IEE Std. 802.11	Channel Number	Max Output Power (dBm)
2412-2462	1	b	1-11[11]	18.431
2412-2462	1	g	1-11[11]	24.439

5.3. CHANNEL LIST

Channel List for 802.11b/g (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequenc y(MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452		
2	2417	6	2437	10	2457		
3	2422	7	2442	11	2462		
4	2427	8	2447				

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz

5.5. THE WORSE CASE CONFIGURATIONS

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Software		DutApi_w8887_BrdigeEth					
Modulation Mode	Transmit Antenna Number	Test Channel					
		NCB: 20MHz			NCB: 40MHz		
		CH 1	CH 6	CH 11	CH 3	CH 7	CH 11
802.11b	1	16	16	16	N/A		
802.11g	1	16	16	16			
802.11b	1	16	16	16	N/A		
802.11g	1	16	16	16			

5.6. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	AC 120V/60Hz
	VH	N/A

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2412-2462	FPC+CABLE	4.97
2	2412-2462	FPC+CABLE	4.23

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	☒1TX, 1RX	Antenna 1 or Antenna 2 can be used as transmitting/receiving antenna.
IEEE 802.11g	☒1TX, 1RX	Antenna 1 or Antenna 2 can be used as transmitting/receiving antenna.

Note1: Equipment with 2 diversity antennas but only 1 antenna active at any moment in time.
Note2: The circuit before the two difference antenna are the same, the two antenna types are the same and the gain of antenna 1 is larger, antenna 1 was found to the worst case and recorded.

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	Table PC	ThinkPad	T410	N/A
2	Router	ASUS	RT-AC68U	N/A
3	USB to TTL Serial Cable	N/A	N/A	N/A
4	USB 2.0 Ethernet Network Adapter	UGREEN	20254	N/A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
C-1	RJ45	RJ45	RJ45	1.5	N/A
C-2	RJ45	RJ45	RJ45	1.5	N/A
C-3	USB	USB	USB	1.5	N/A

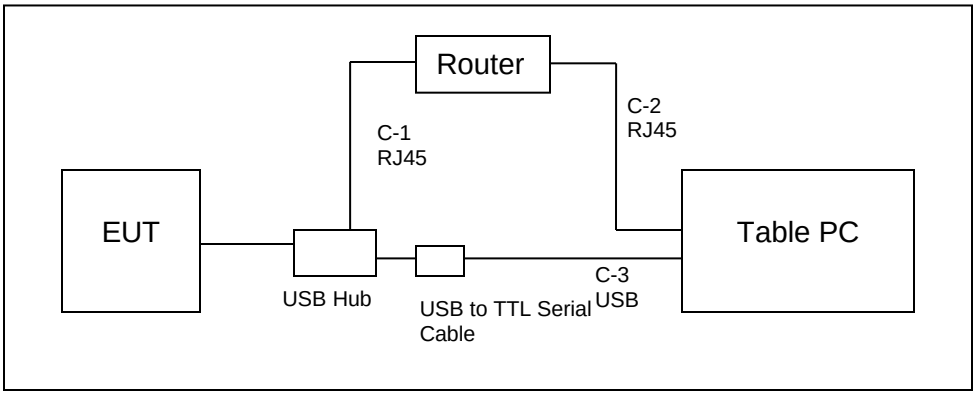
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Remote controller	ETON	N/A	N/A

TEST SETUP

The EUT can work in engineering mode with a software through a PC.

SETUP DIAGRAM FOR TESTS



5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.12, 2017	Dec.12, 2018
☑	Two-Line V-Network	R&S	ENV216	101983	Jan.16, 2018	Jan.16, 2019
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.12, 2017	Dec.12, 2018
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance		UL	Antenna port	Ver. 7.2	
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.12, 2017	Dec.12, 2018
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
☑	Preamplifier	HP	8447D	2944A09099	Dec.12, 2017	Dec.12, 2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12, 2017	Dec.12, 2018
☑	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.12, 2017	Dec.12, 2018
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.12, 2017	Dec.12, 2018
☑	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2019
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Radiated disturbance		Farad	EZ-EMC	Ver. UL-3A1	
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.12, 2017	Dec.12, 2018
☑	Power Meter	Keysight	N9031A	MY55416024	Dec.12, 2017	Dec.12, 2018
☑	Power Sensor	Keysight	N9323A	MY55440013	Dec.12, 2017	Dec.12, 2018
☑	Power Sensor	Keysight	U2021XA	MY57030004	Dec.12, 2017	Dec.12, 2018

6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth and 99% Bandwidth	KDB 558074 D01 DTS Meas Guidance v04	8.0
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v04	9.1.1
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v04	10.2
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v04	11.0
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v04	12.1
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v04	13.3.2
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	7.3

7. ANTENNA PORT TEST RESULTS

Not

7.1. ON TIME AND DUTY CYCLE

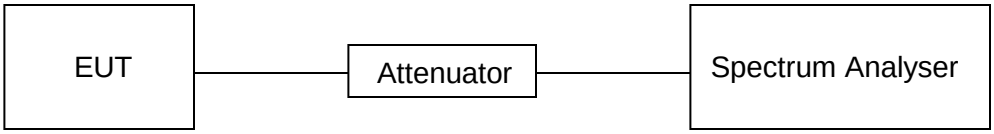
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



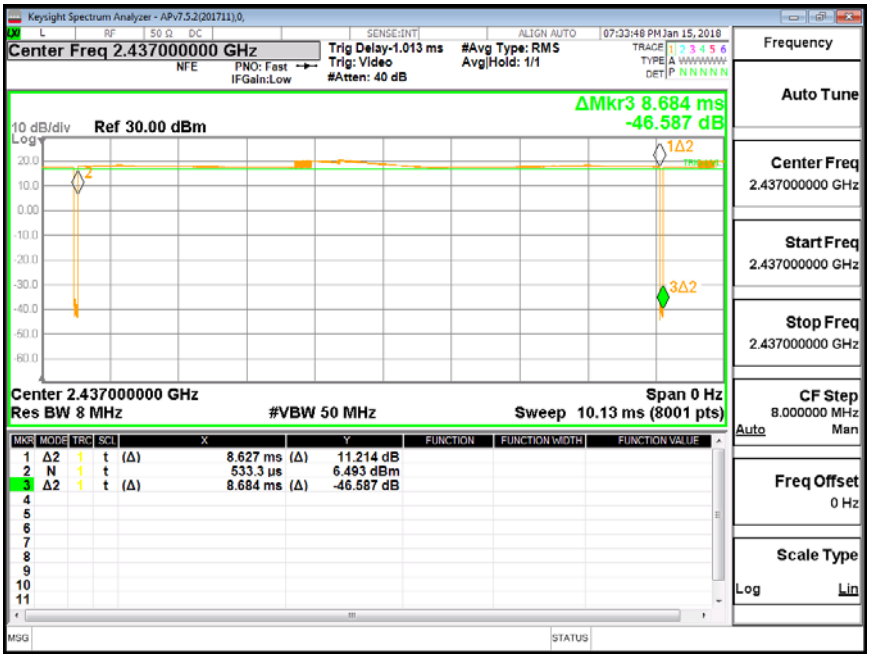
RESULTS

ANTENNA1

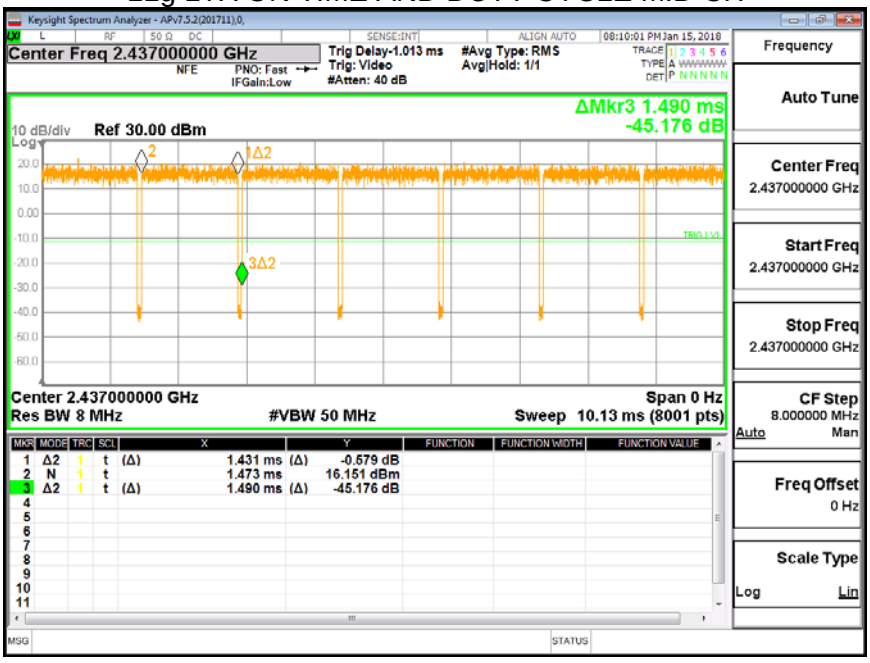
Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/B Minimum VBW (KHz)
11b 1TX	8.627	8.684	0.99	99	0.03	0.12
11g 1TX	1.431	1.490	0.96	96	1.18	0.70

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle (Linear)
Where: B is On Time
Antenna 1 and Antenna 2 has the same duty cycle, only Antenna 1 data show here.

11b 1TX ON TIME AND DUTY CYCLE MID CH



11g 1TX ON TIME AND DUTY CYCLE MID CH



7.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2) RSS-247 5.1 (a)	6 dB Bandwidth	>= 500KHz	2400-2483.5
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.	2400-2483.5

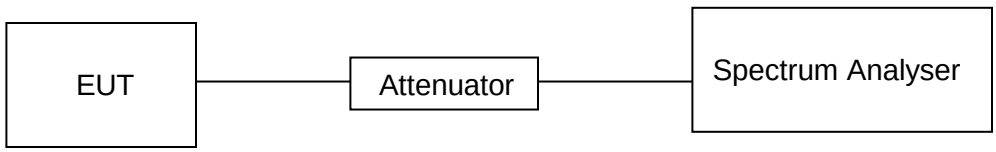
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥3 × RBW For 99% Bandwidth : approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB and 99% relative to the maximum level measured in the fundamental emission.

TEST SETUP



RESULTS

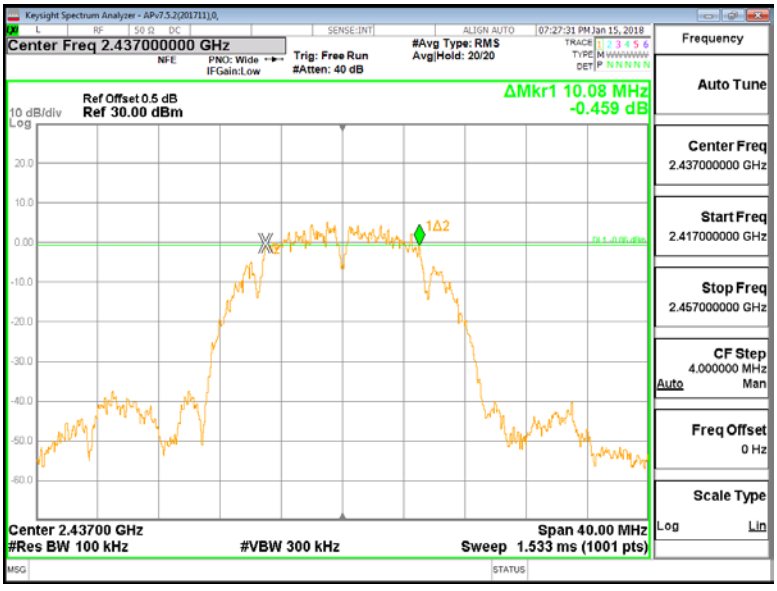
7.2.1. 802.11b SISO MODE

ANTENNA1

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	10.12	13.122	500	Pass
2437	10.08	13.271	500	Pass
2462	9.84	13.301	500	Pass

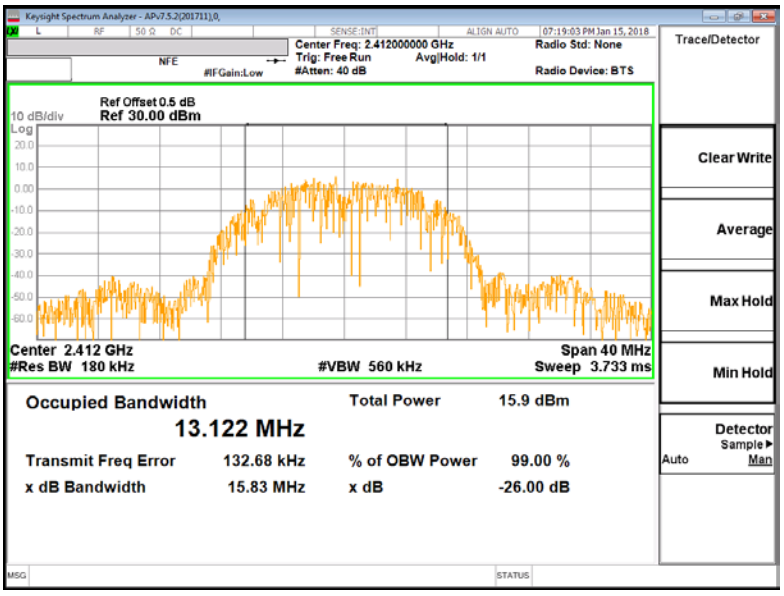
6 dB BANDWIDTH LOW CH

6 dB BANDWIDTH MID CH

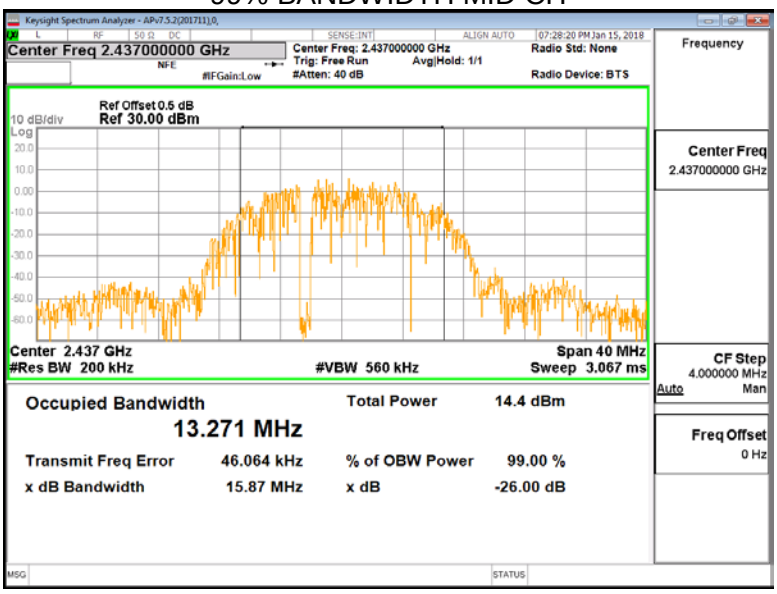


6 dB BANDWIDTH HIGH CH

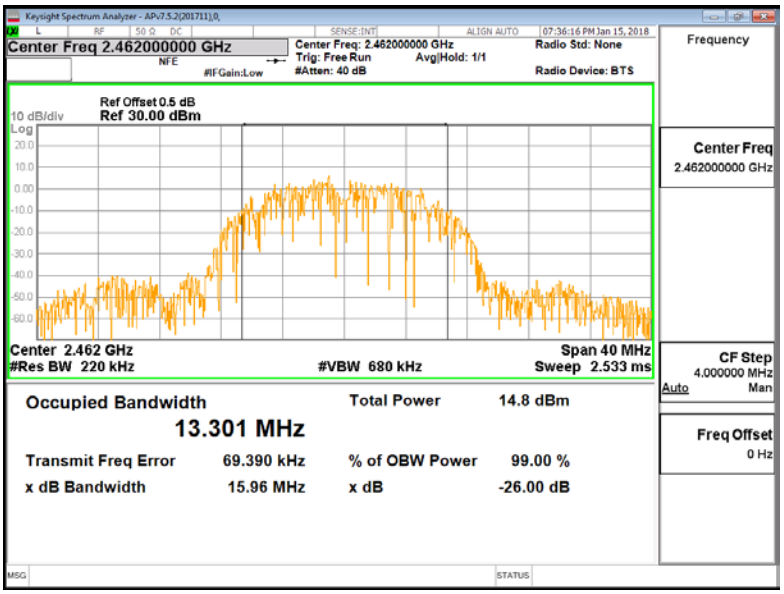
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH

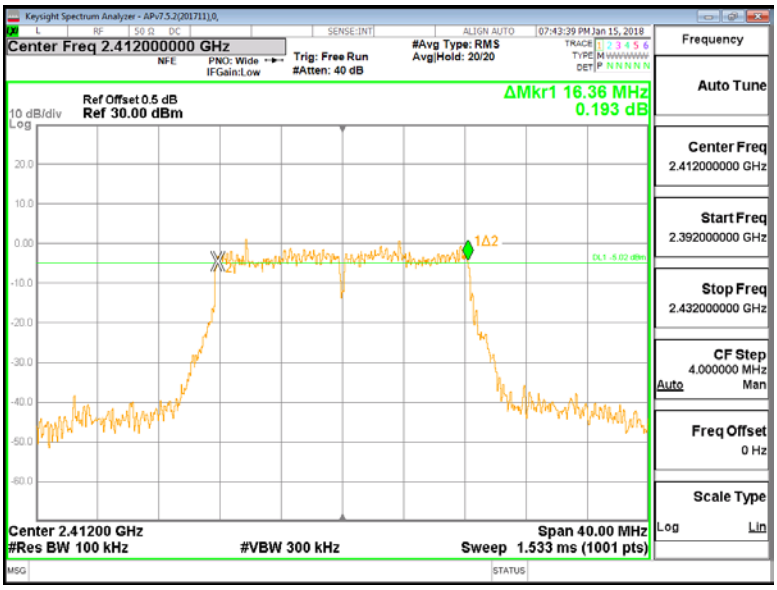


7.2.2. 802.11g SISO MODE

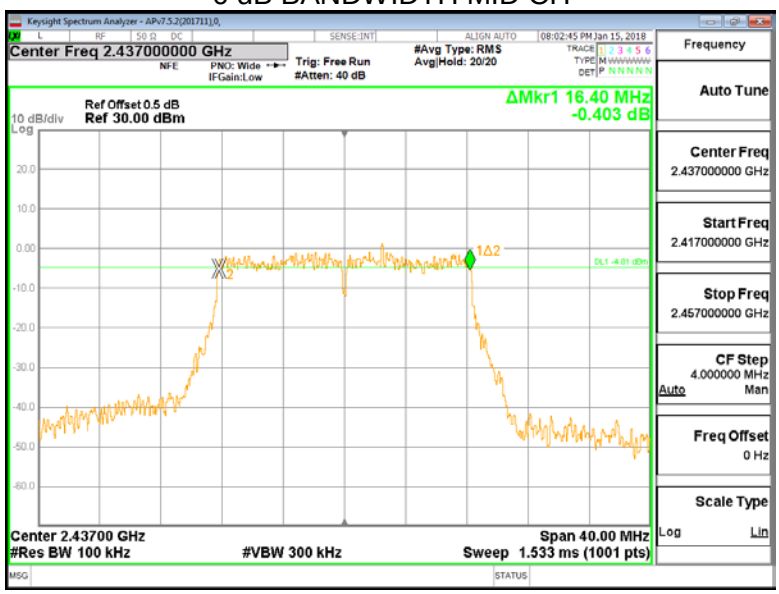
ANTENNA1

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	16.36	16.527	500	Pass
2437	16.40	16.549	500	Pass
2462	16.48	16.550	500	Pass

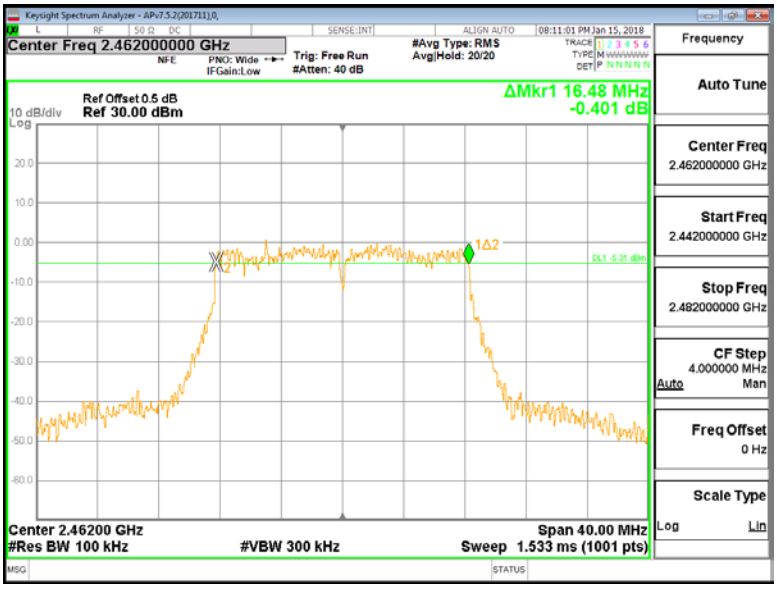
6 dB BANDWIDTH LOW CH



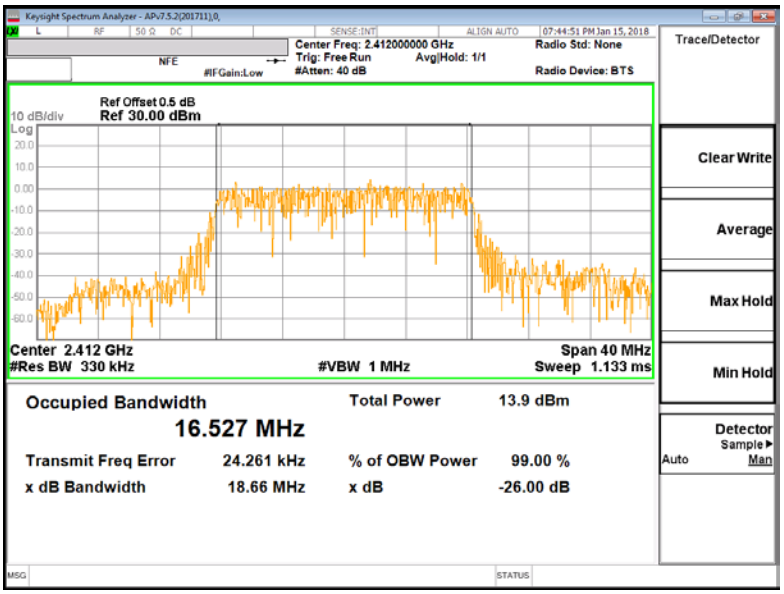
6 dB BANDWIDTH MID CH



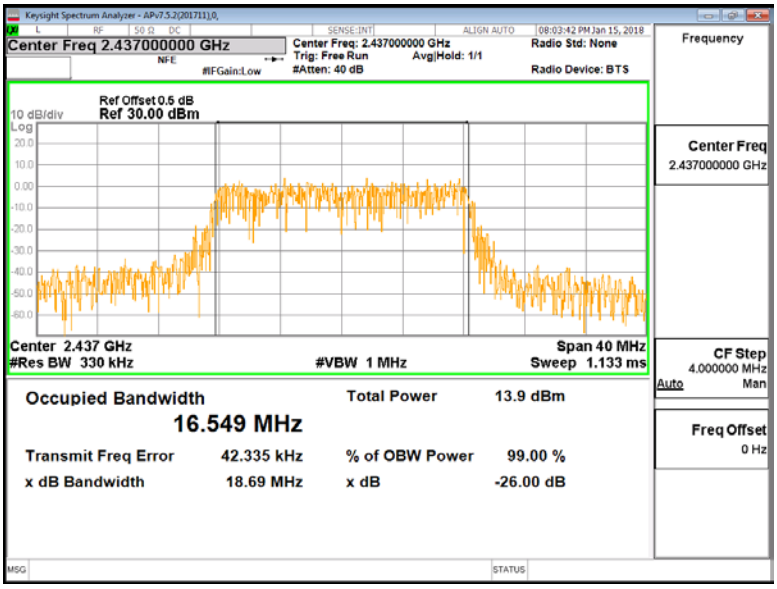
6 dB BANDWIDTH HIGH CH



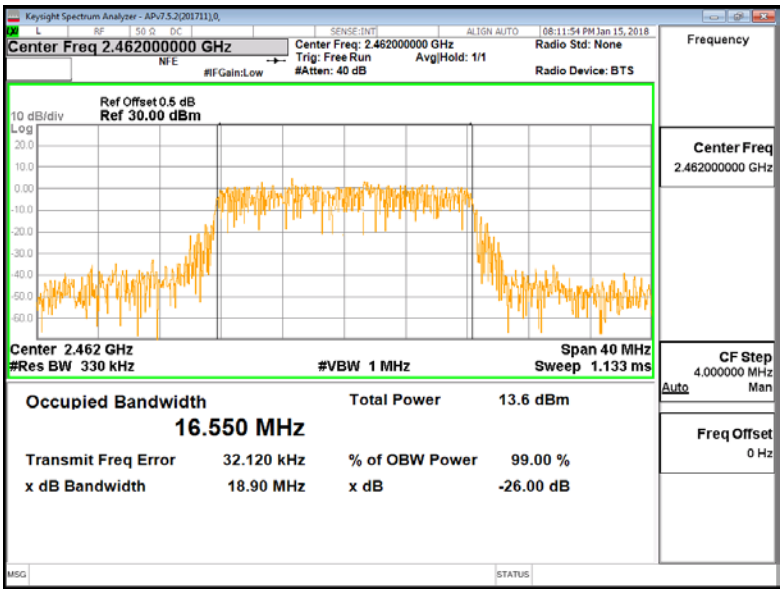
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



7.3. PEAK CONDUCTED OUTPUT POWER

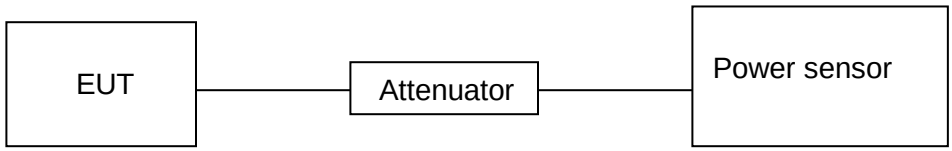
LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3) RSS-247 5.4 (e)	Peak Output Power	1 watt or 30dBm	2400-2483.5

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.
Measure peak power each channel.

TEST SETUP



RESULTS

7.3.1. 802.11b SISO MODE

Mode	Channel	ANT	Average. Power [dBm]	Peak. Power [dBm]	Verdict
11B	LCH	1	15.329	18.365	PASS
11B	MCH	1	15.420	18.431	PASS
11B	HCH	1	14.919	18.378	PASS

7.3.2. 802.11g SISO MODE

Mode	Channel	ANT	Average. Power [dBm]	Peak. Power [dBm]	Verdict
11G	LCH	1	13.203	24.195	PASS
11G	MCH	1	13.698	24.439	PASS
11G	HCH	1	13.651	24.278	PASS

7.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e) RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

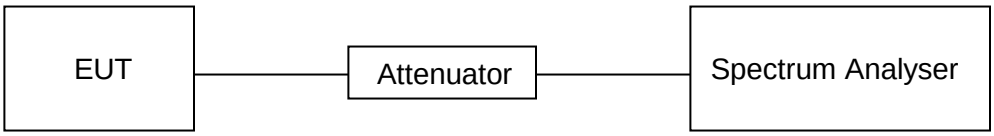
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤ 100 kHz.
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP



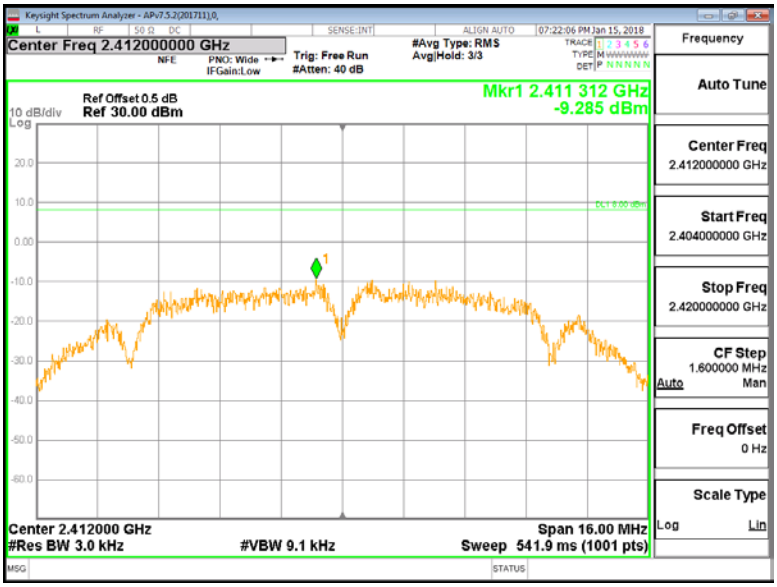
RESULTS

7.4.1. 802.11b SISO MODE

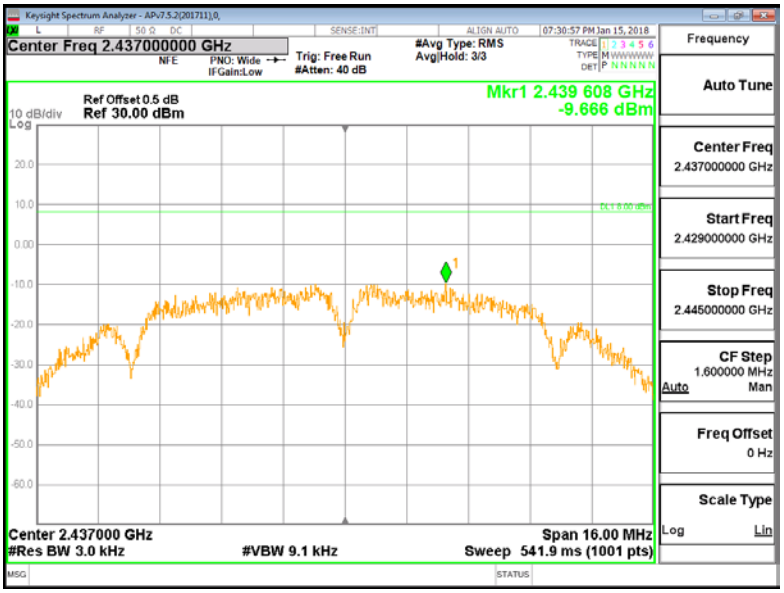
Mode	ANT	Channel	Meas.Level [dBm/3kHz]	Limit (dBm/3kHz)	Verdict
11B	1	LCH	-9.29	8	PASS
11B	1	MCH	-9.67	8	PASS
11B	1	HCH	-9.81	8	PASS

ANTENNA1

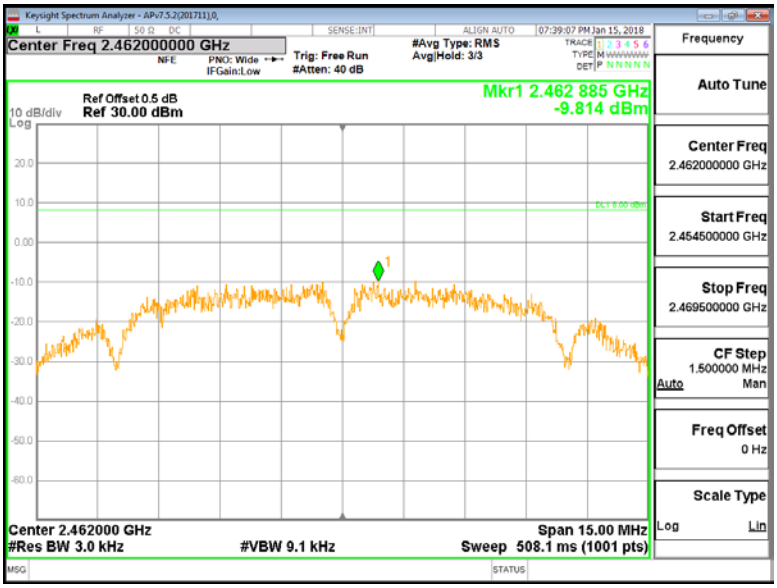
PSD LOW CH



PSD MID CH



PSD HIGH CH

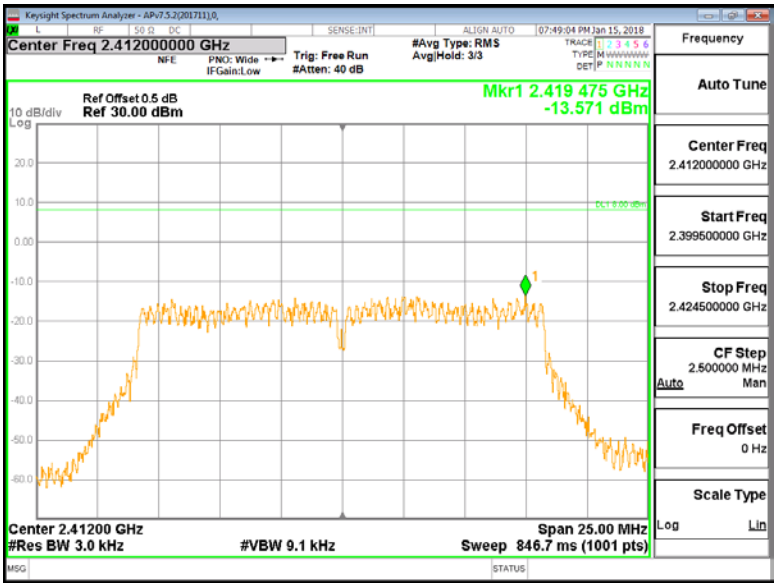


7.4.2. 802.11g SISO MODE

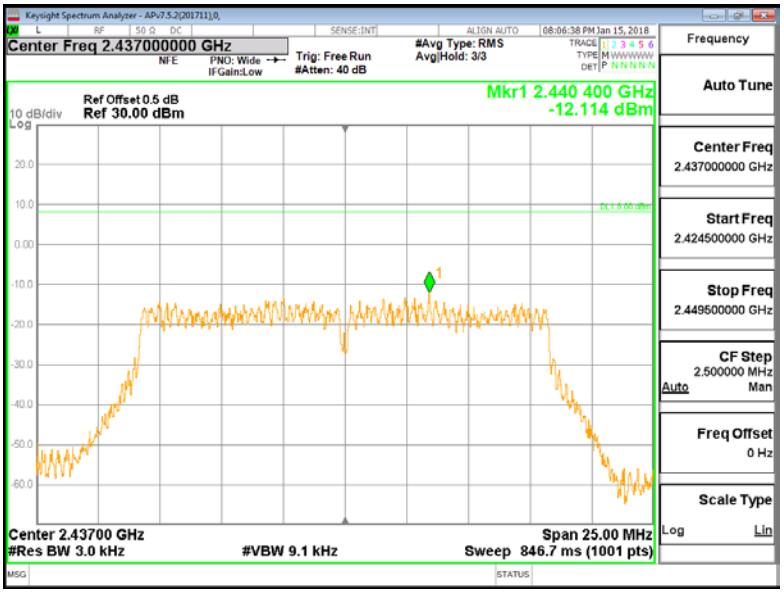
Mode	ANT	Channel	Meas.Level [dBm/3kHz]	Limit (dBm/3kHz)	Verdict
11G	1	LCH	-13.57	8	PASS
11G	1	MCH	-12.11	8	PASS
11G	1	HCH	-12.54	8	PASS

ANTENNA1

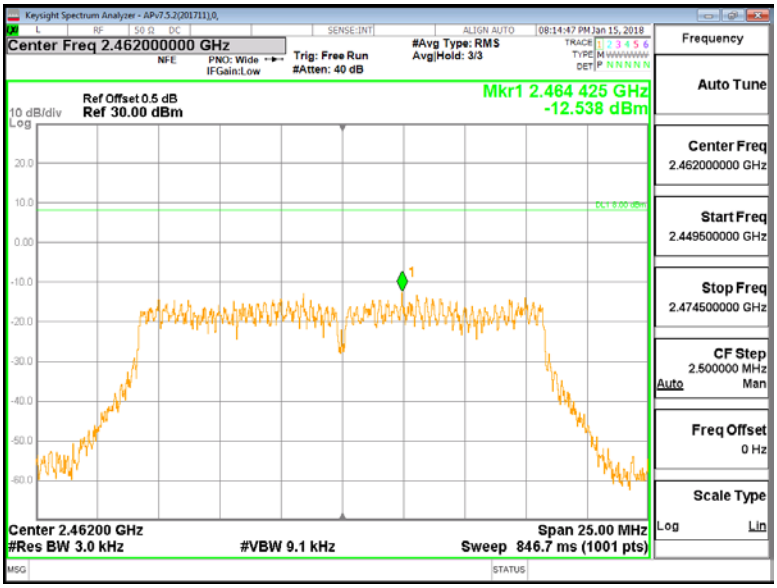
PSD LOW CH



PSD MID CH



PSD HIGH CH



7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2		
Section	Test Item	Limit
FCC §15.247 (d) RSS-247 5.5	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

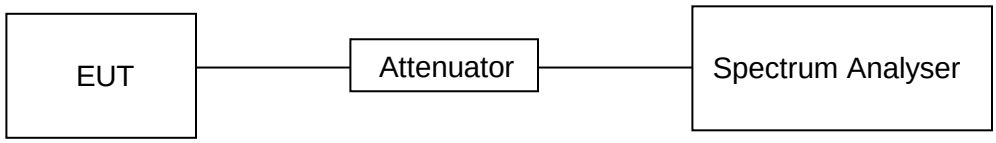
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100K
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level**.**

TEST SETUP

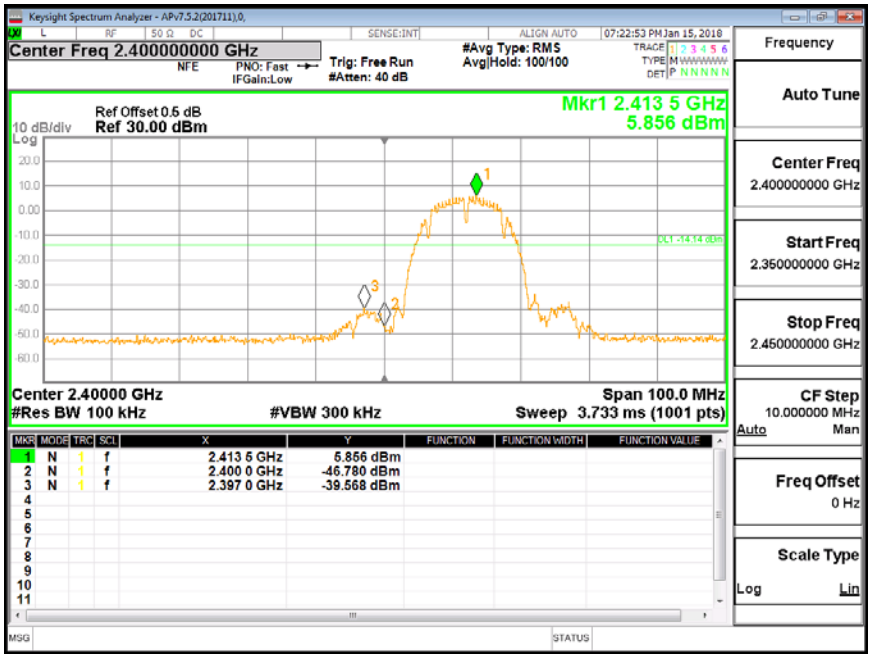


RESULTS

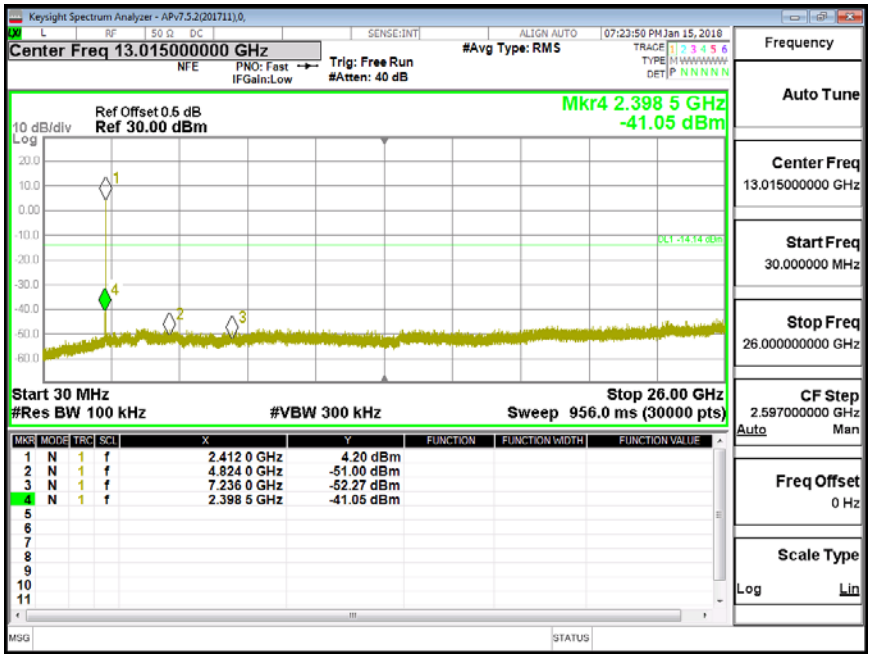
7.5.1. 802.11b SISO MODE

ANTENNA1

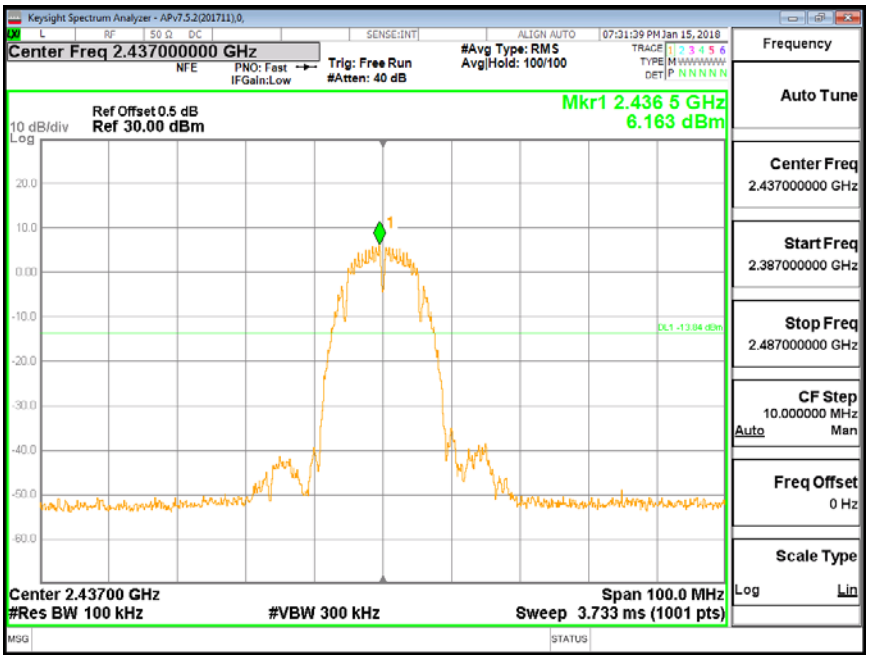
LOW CH BANDEDAGE



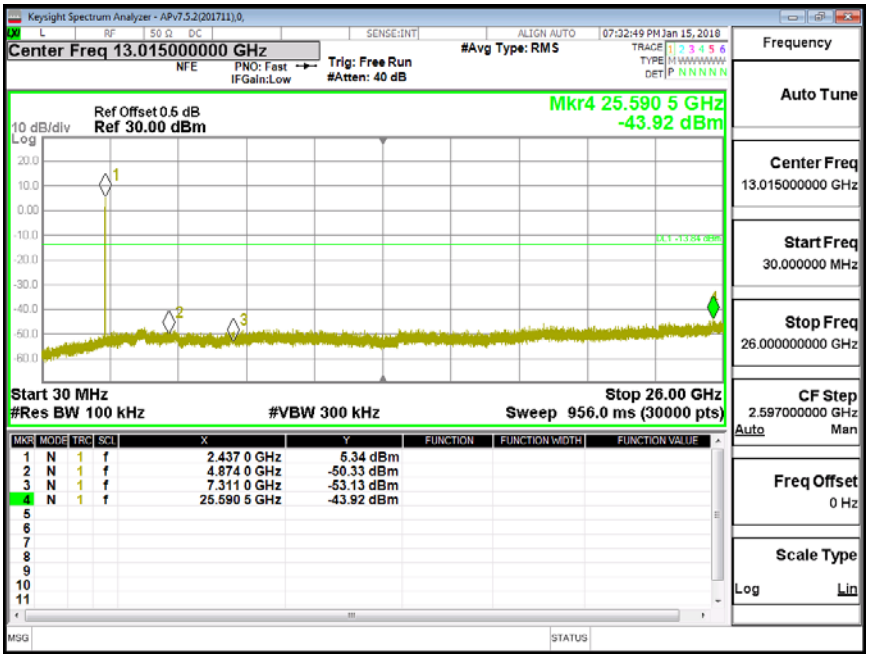
LOW CH SPURIOUS EMISSIONS 30M-26G



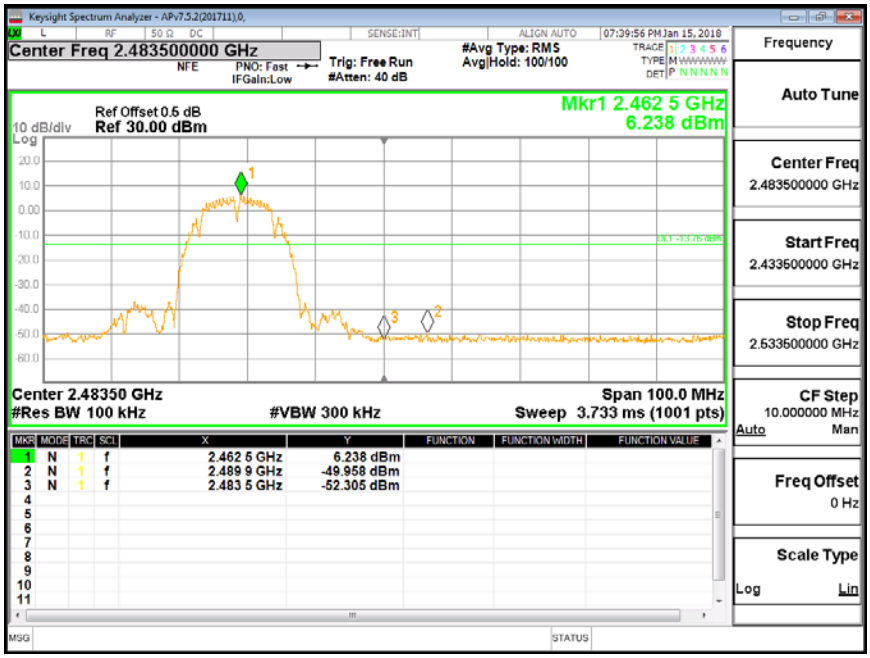
MID CH BANDEDAGE



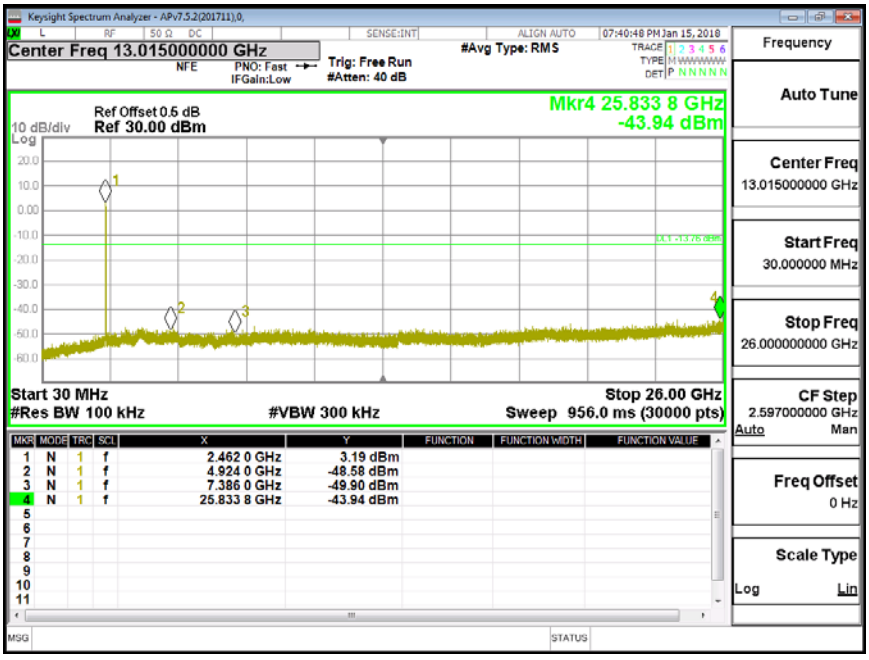
MID CH SPURIOUS EMISSIONS 30M-26G



HIGH CH BANDEDAGE



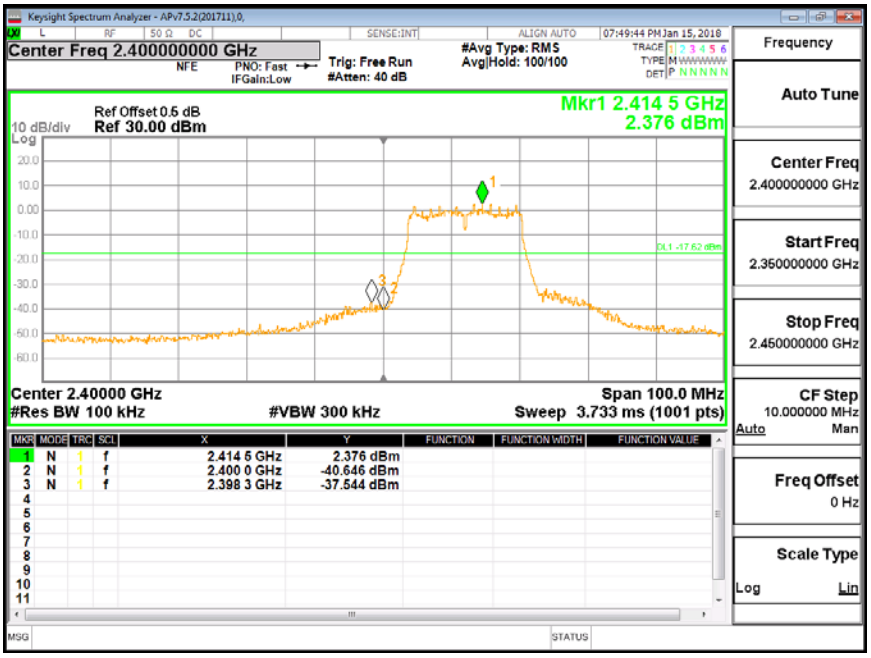
HIGH CH SPURIOUS EMISSIONS 30M-26G



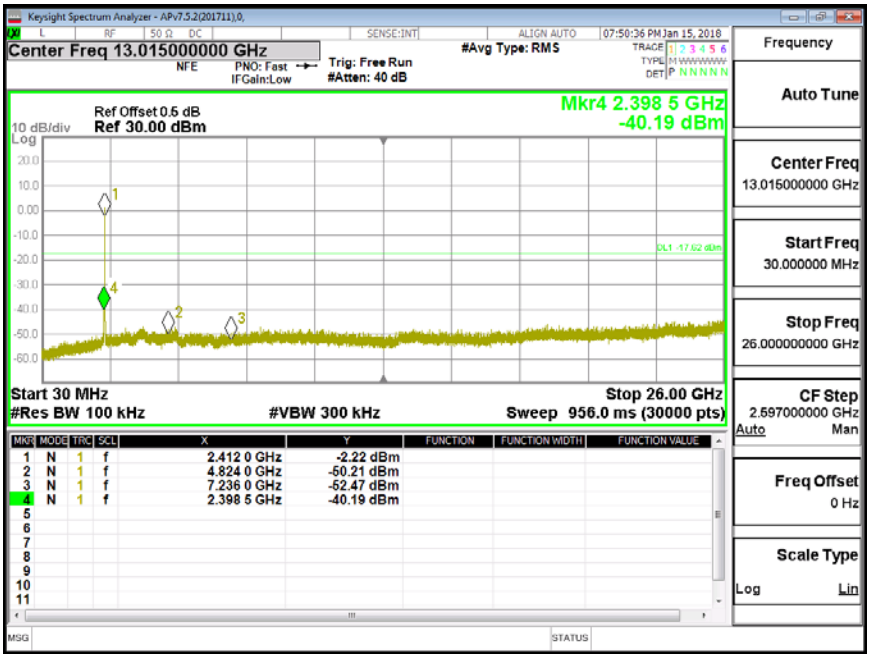
7.5.2. 802.11g SISO MODE

ANTENNA1

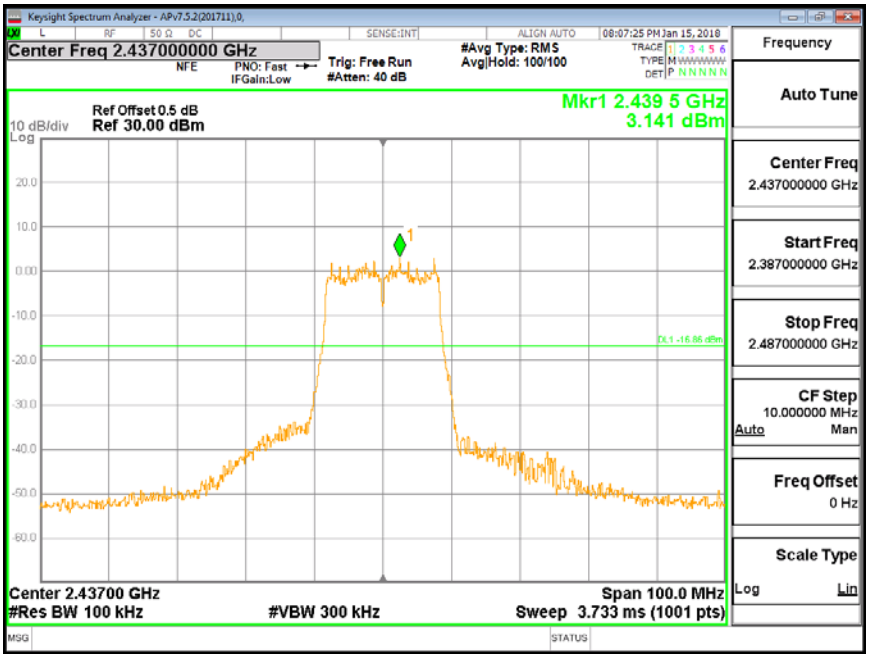
LOW CH BANDEDAGE



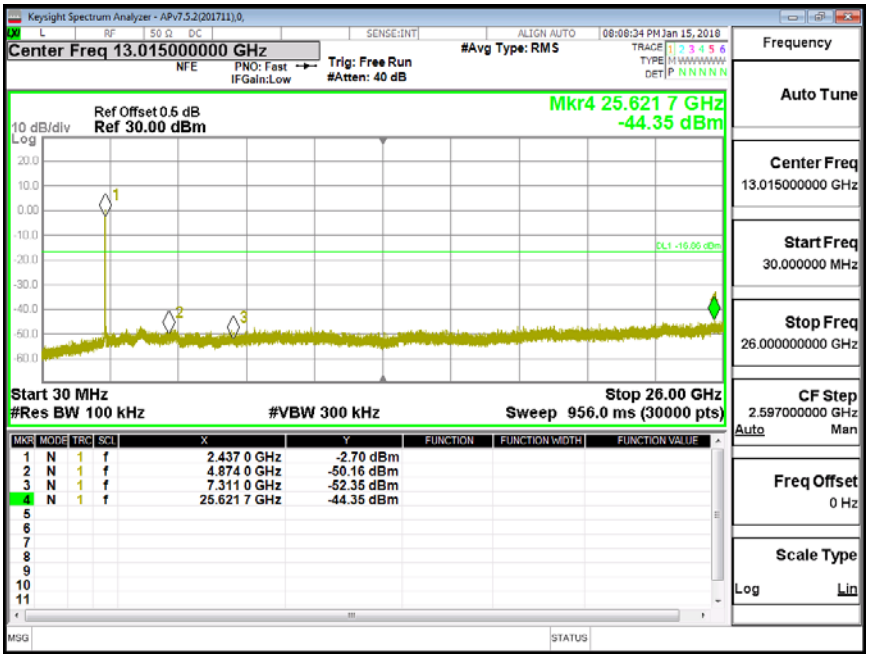
LOW CH SPURIOUS EMISSIONS 30M-26G



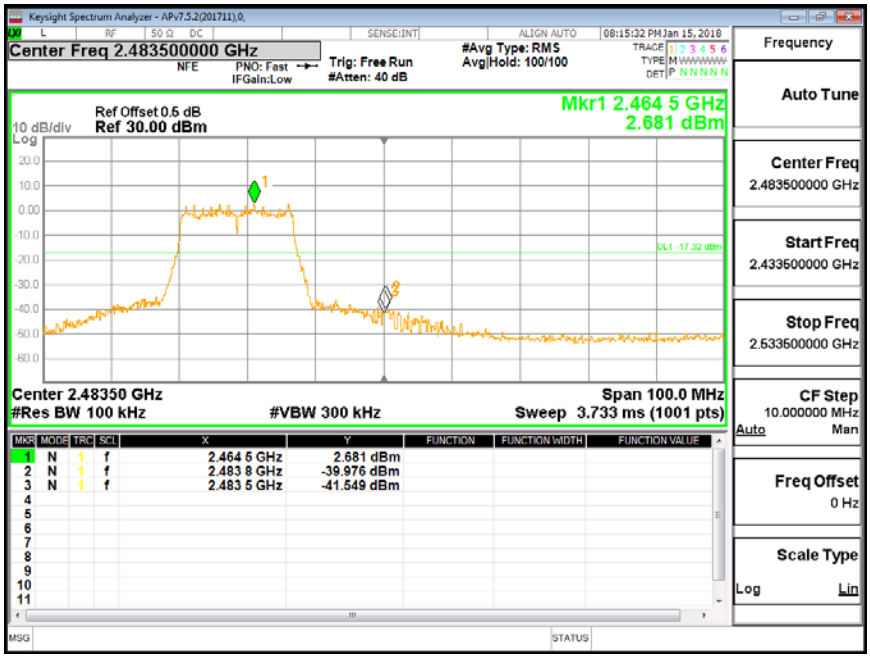
MID CH BANDEDAGE



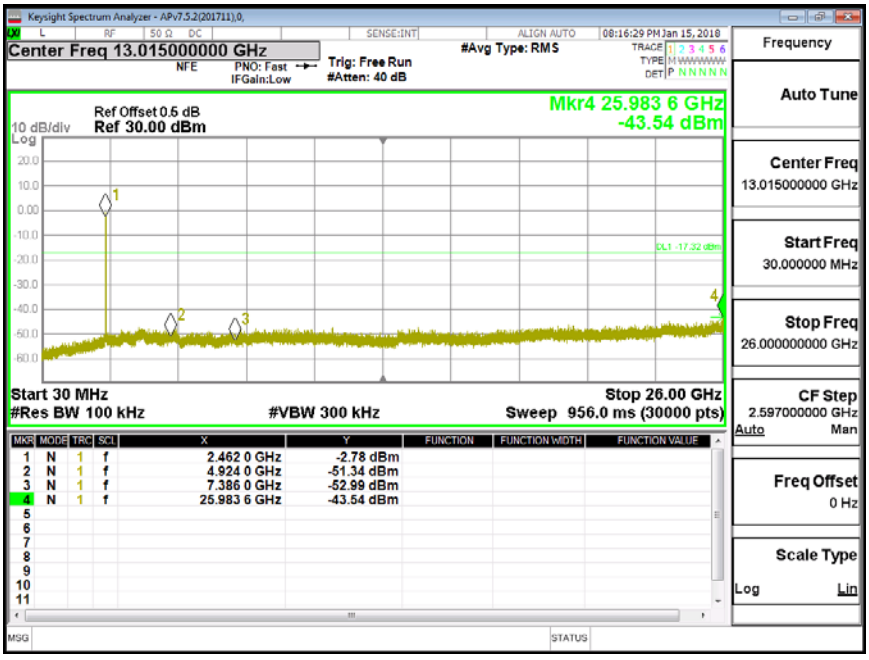
MID CH SPURIOUS EMISSIONS 30M-26G



HIGH CH BANDEDAGE



HIGH CH SPURIOUS EMISSIONS 30M-26G



8. RADIATED TEST RESULTS

LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to RSS-GEN Clause 8.9

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
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
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

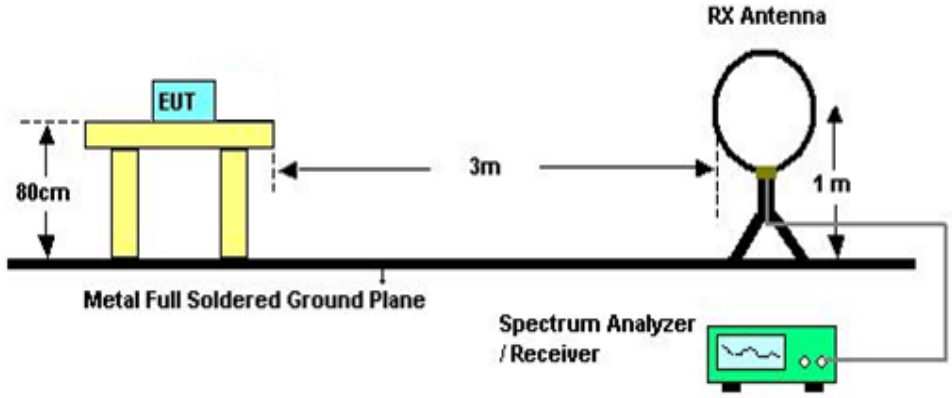
Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz



The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

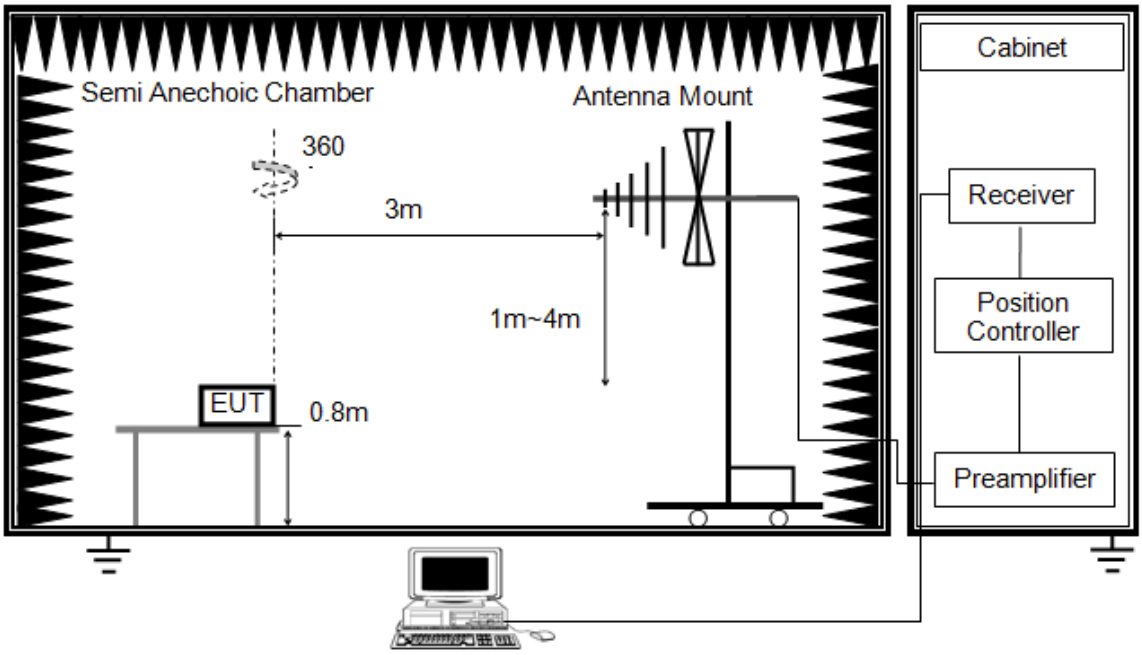
3. The EUT was placed on a turntable with 0.8 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G



The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

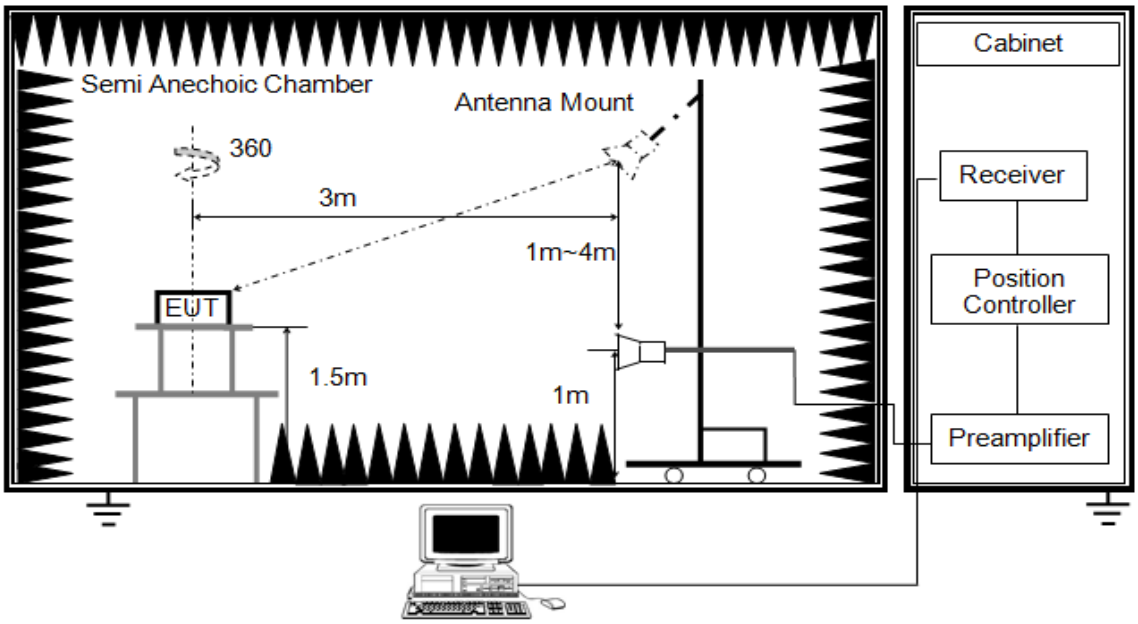
3. The EUT was placed on a turntable with 0.8 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

6. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

ABOVE 1G



The setting of the spectrum analyser

RBW	1M
VBW	PEAK: 3M AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

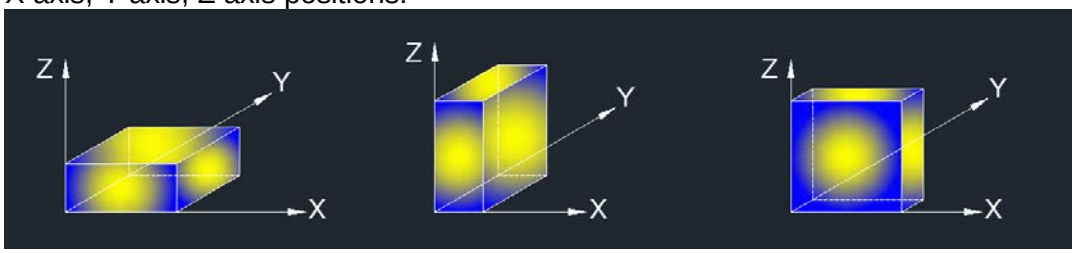
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector. For the Duty Cycle and Correction Factor please refer to clause 7.1.ON TIME AND DUTY CYCLE. If the EUT is configured to transmit with D ≥ 98%, then set VBW ≤ RBW / 100, but not less than 10 Hz. If the EUT D is < 98%, then set

VBW ≥ 1 / T.

7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (Y axis) data recorded in the report

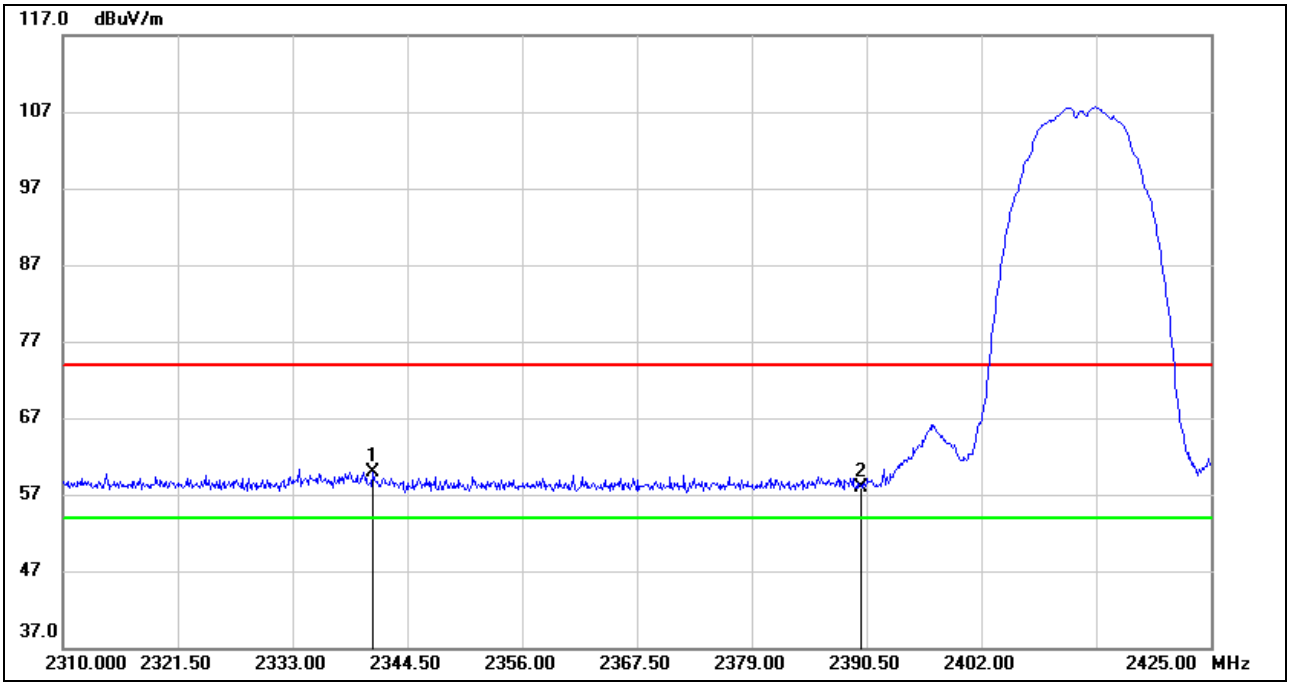
8.1. RESTRICTED BANDEDGE

8.1.1. 802.11b SISO MODE

ANTENNA1 (WORST-CASE CONFIGURATION)

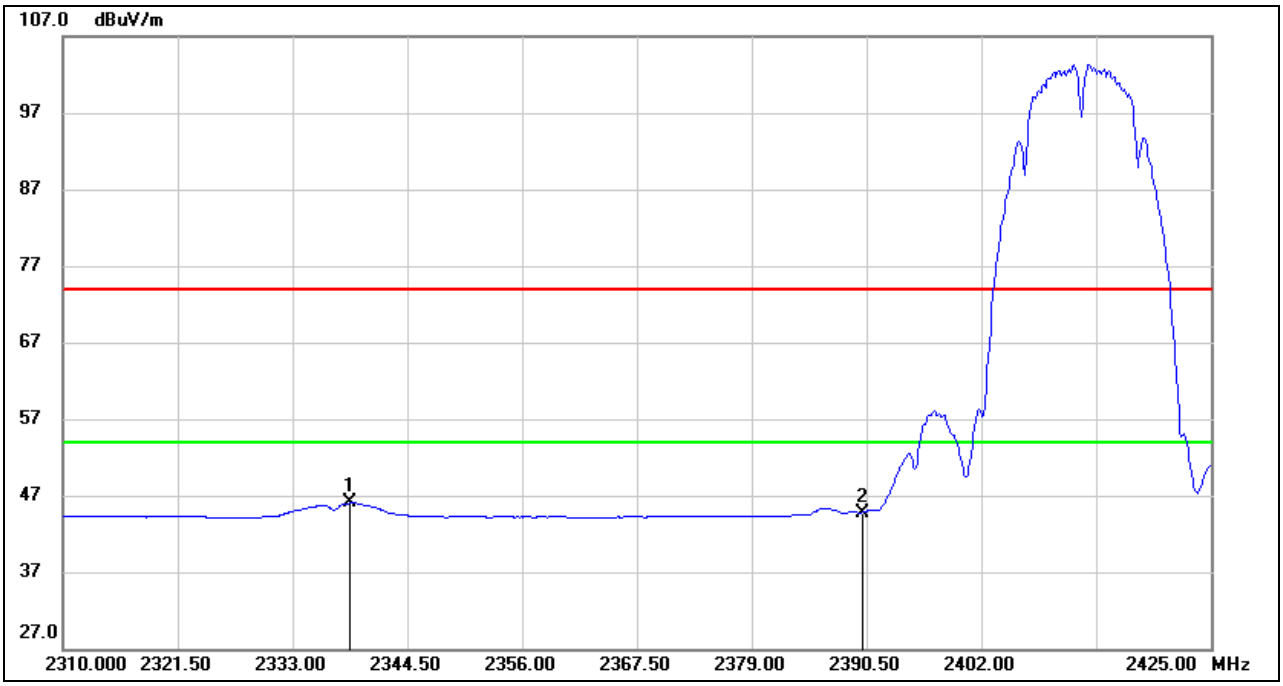
RESTRICTED BANDEDGE (CHANNEL1, HORIZONTAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2341.050	26.37	33.49	59.86	74.00	-14.14	peak
2	2390.000	24.71	33.14	57.85	74.00	-16.15	peak

AVG

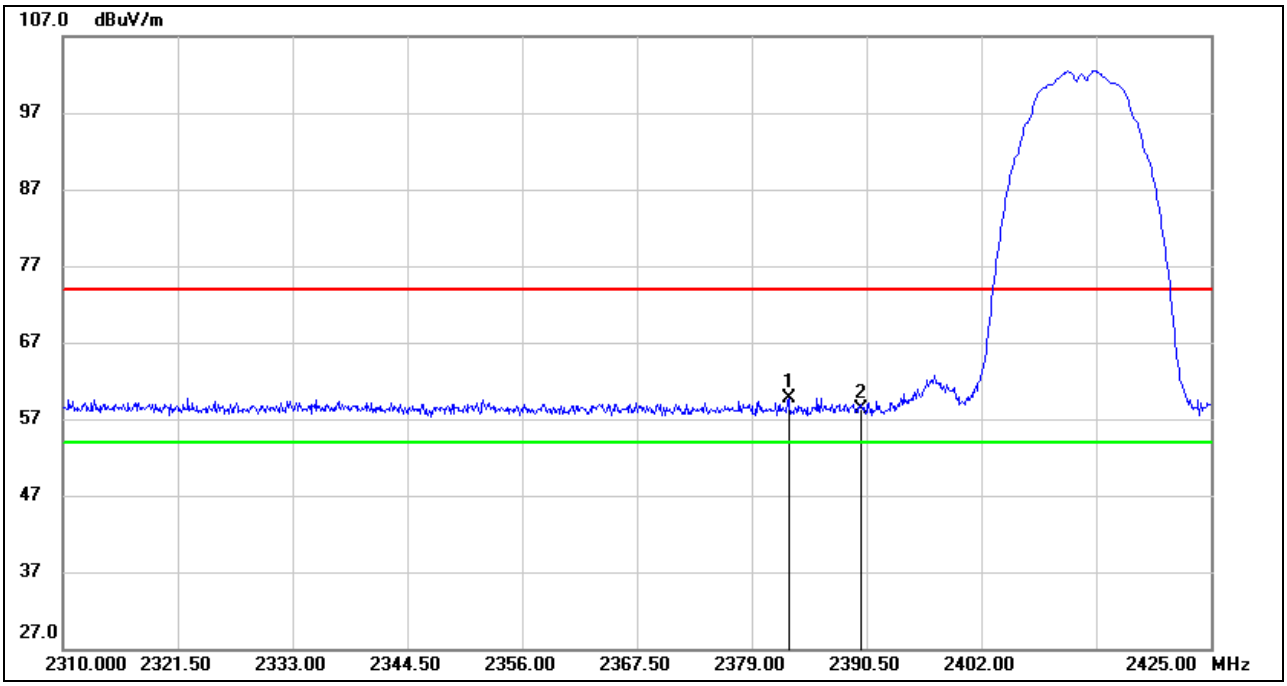


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2338.750	12.54	33.51	46.05	54.00	-7.95	AVG
2	2390.000	11.66	33.14	44.80	54.00	-9.20	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

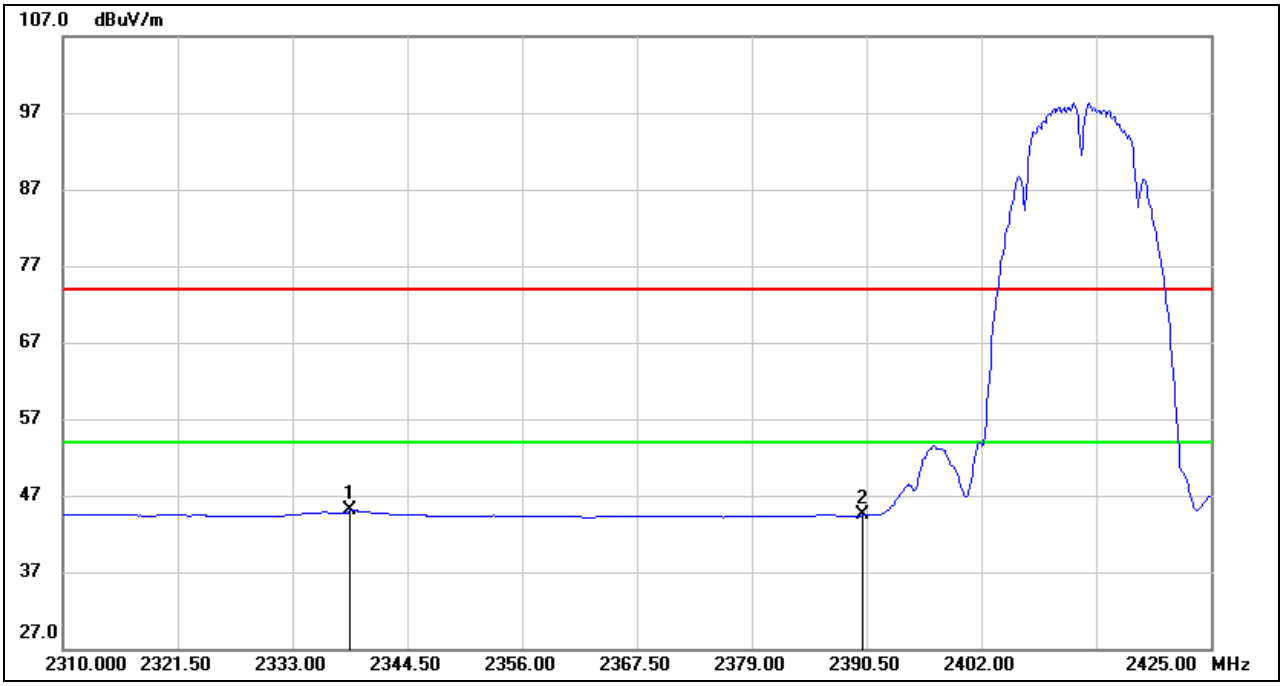
RESTRICTED BANDEDGE (CHANNEL1, VERTICAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2382.680	26.36	33.30	59.66	74.00	-14.34	peak
2	2390.000	24.98	33.24	58.22	74.00	-15.78	peak

AVG

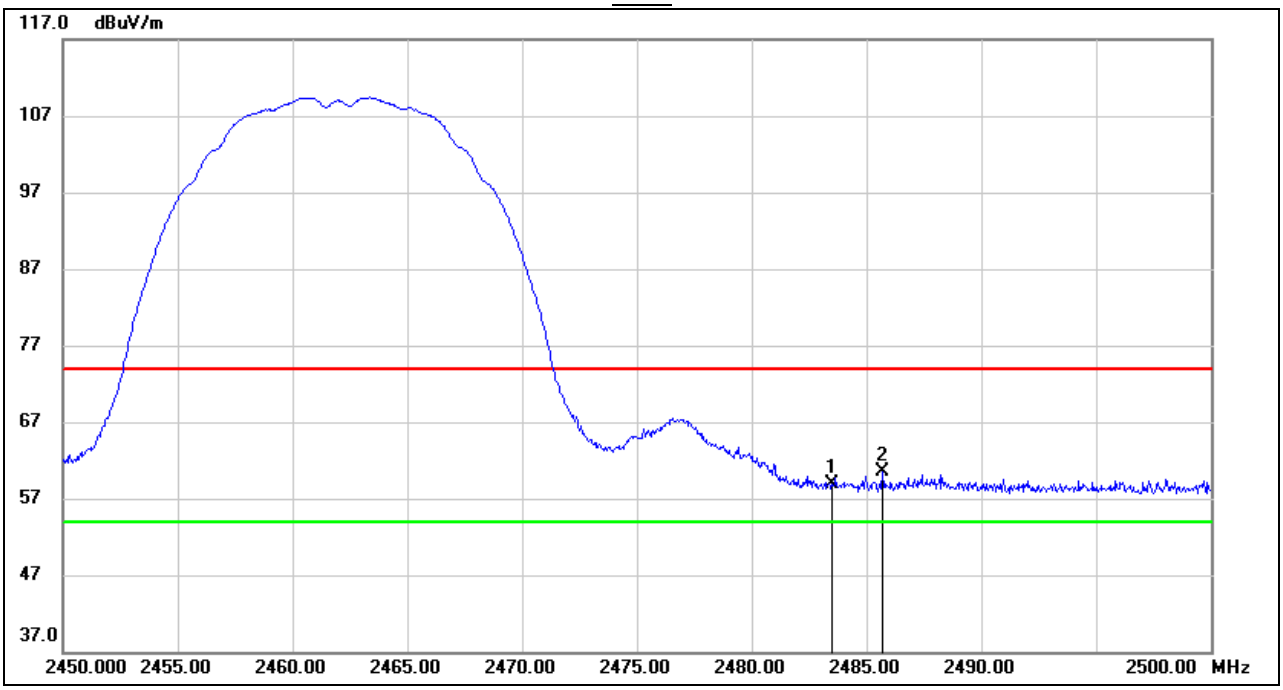


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2338.750	11.45	33.63	45.08	54.00	-8.92	AVG
2	2390.000	11.17	33.24	44.41	54.00	-9.59	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

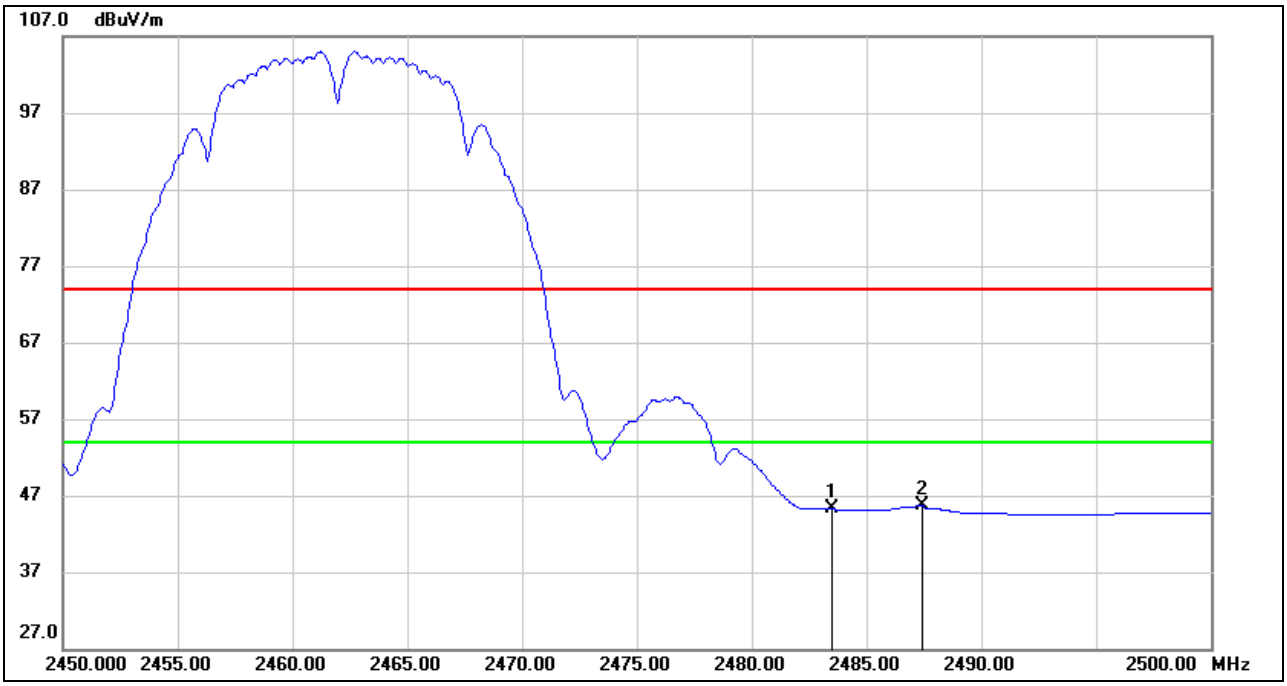
RESTRICTED BANDEDGE (CHANNEL11, HORIZONTAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	26.09	32.78	58.87	74.00	-15.13	peak
2	2485.700	27.76	32.79	60.55	74.00	-13.45	peak

AVG

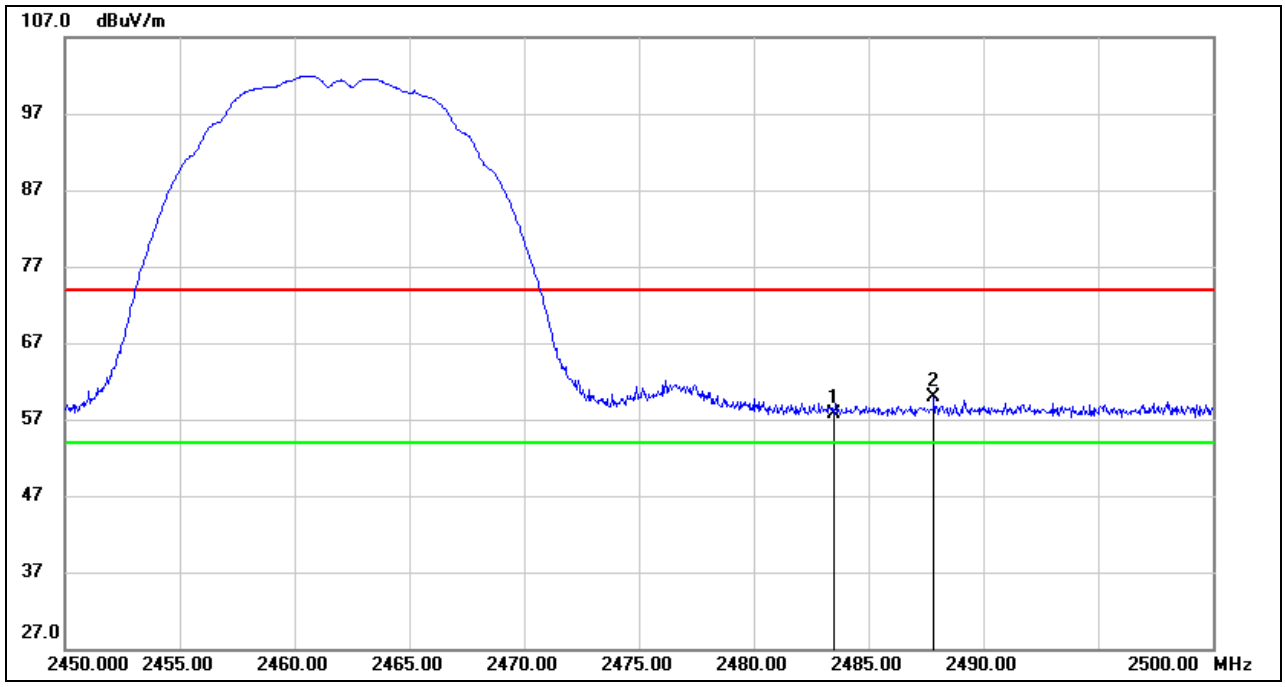


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	12.52	32.78	45.30	54.00	-8.70	AVG
2	2487.450	12.94	32.79	45.73	54.00	-8.27	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

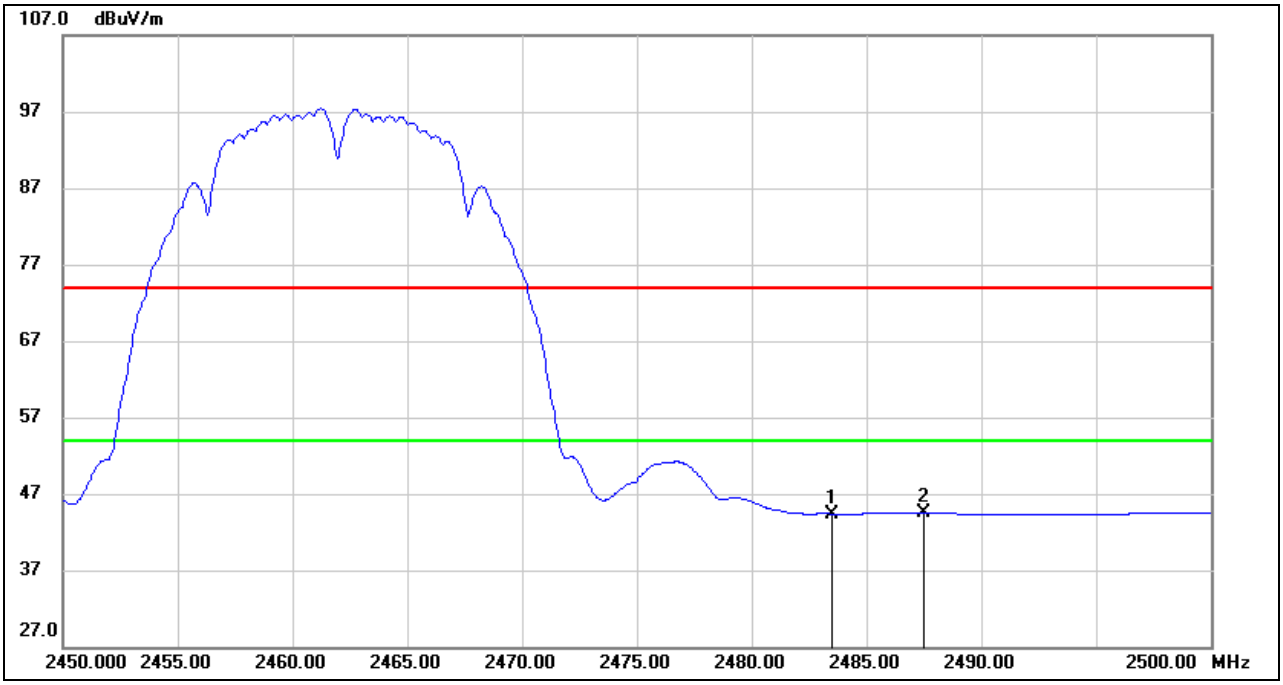
RESTRICTED BANDEDGE (CHANNEL11, VERTICAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	24.83	32.88	57.71	74.00	-16.29	peak
2	2487.850	26.93	32.88	59.81	74.00	-14.19	peak

AVG



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	11.51	32.88	44.39	54.00	-9.61	AVG
2	2487.500	11.71	32.88	44.59	54.00	-9.41	AVG

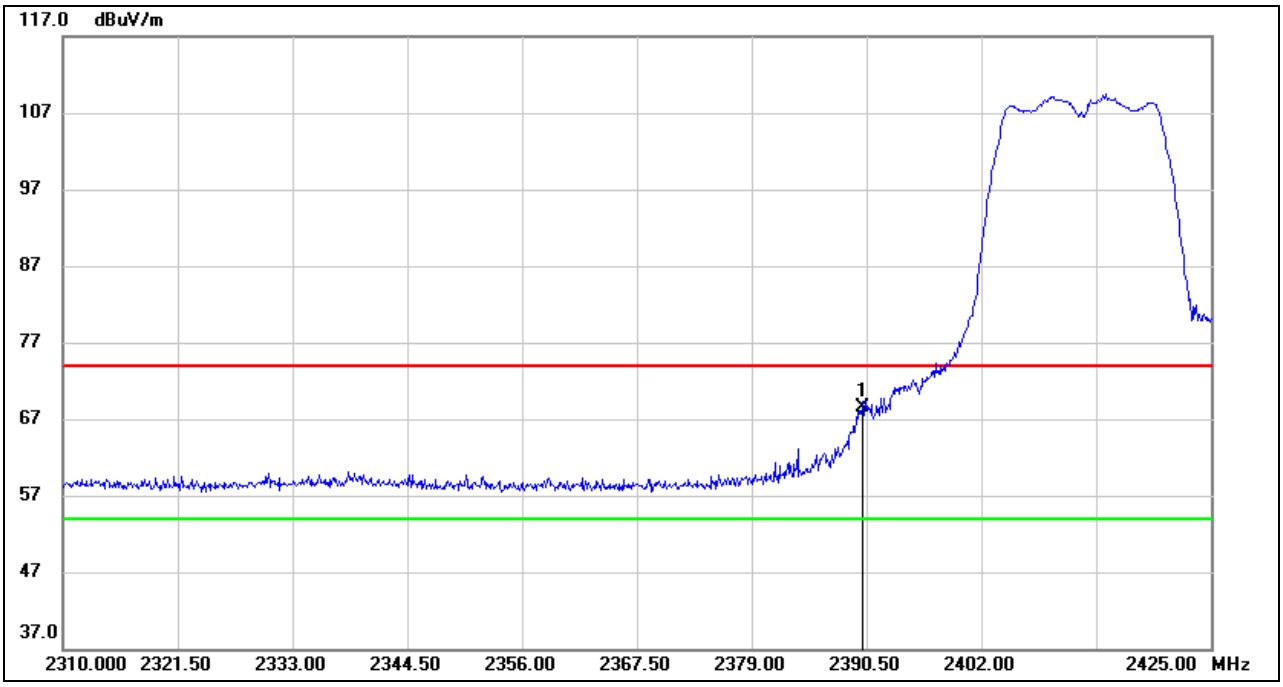
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

8.1.2. 802.11g SISO MODE

ANTENNA1 (WORST-CASE CONFIGURATION)

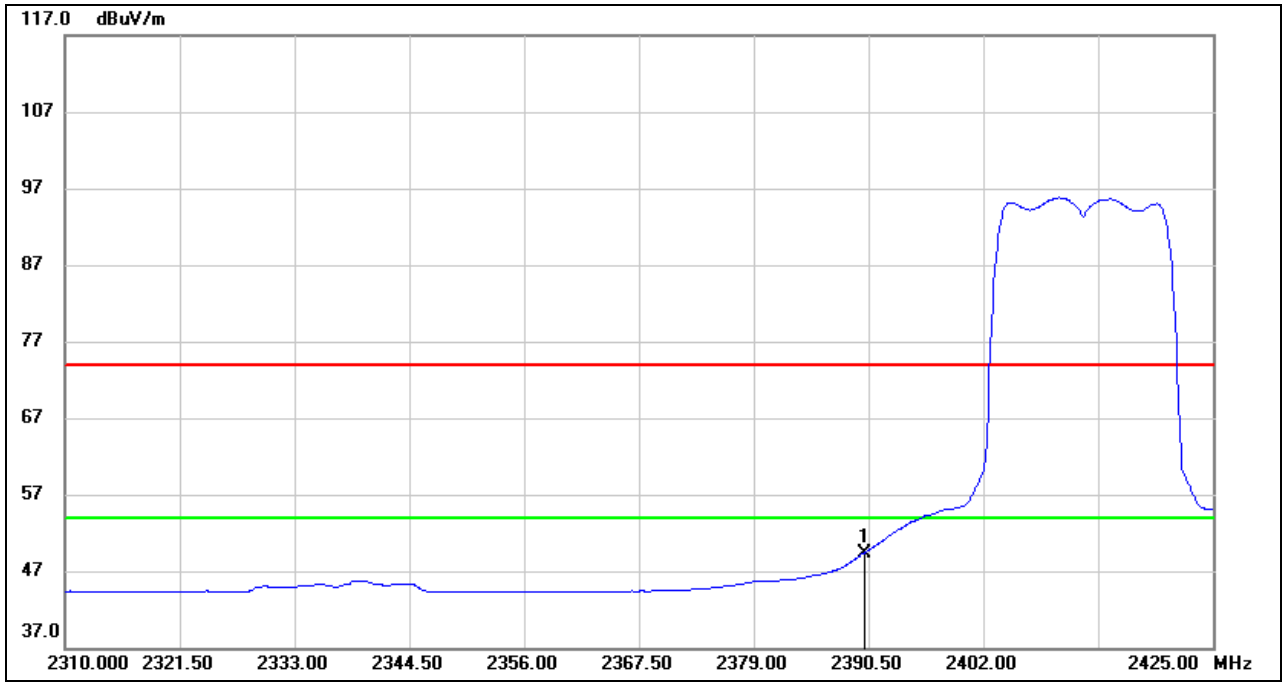
RESTRICTED BANDEDGE (CHANNEL1, HORIZONTAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	35.30	33.14	68.44	74.00	-5.56	peak

AVG

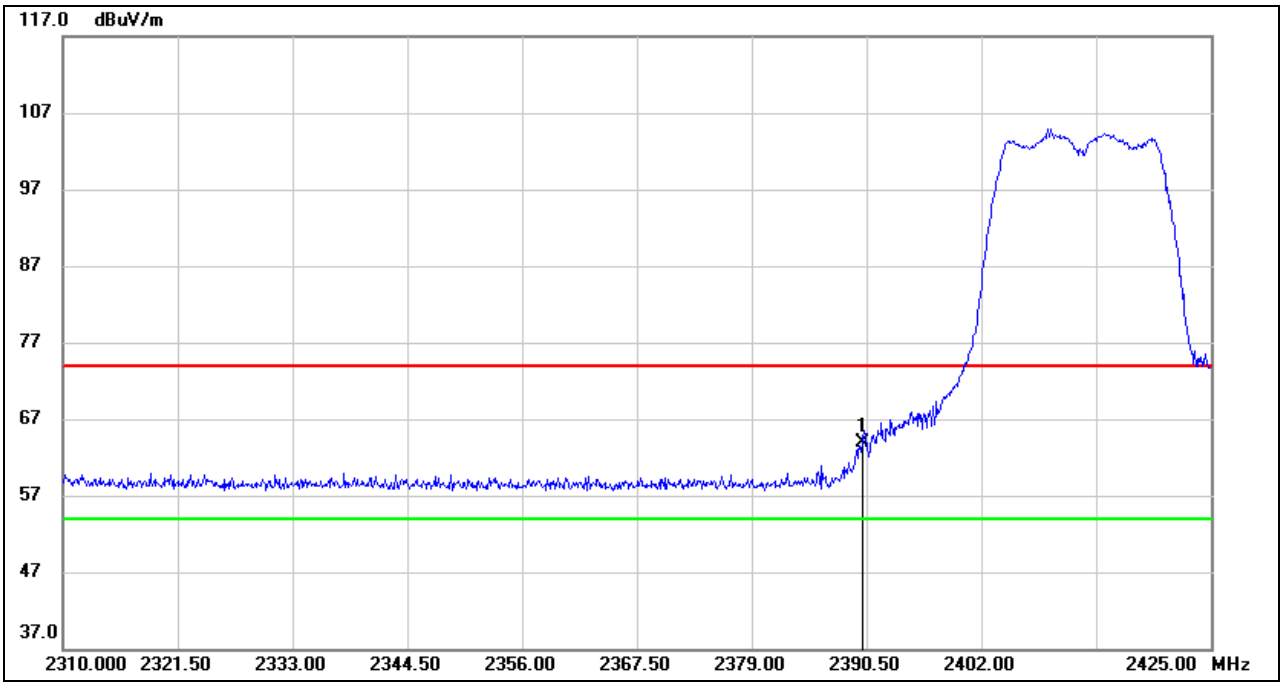


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	16.25	33.14	49.39	54.00	-4.61	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

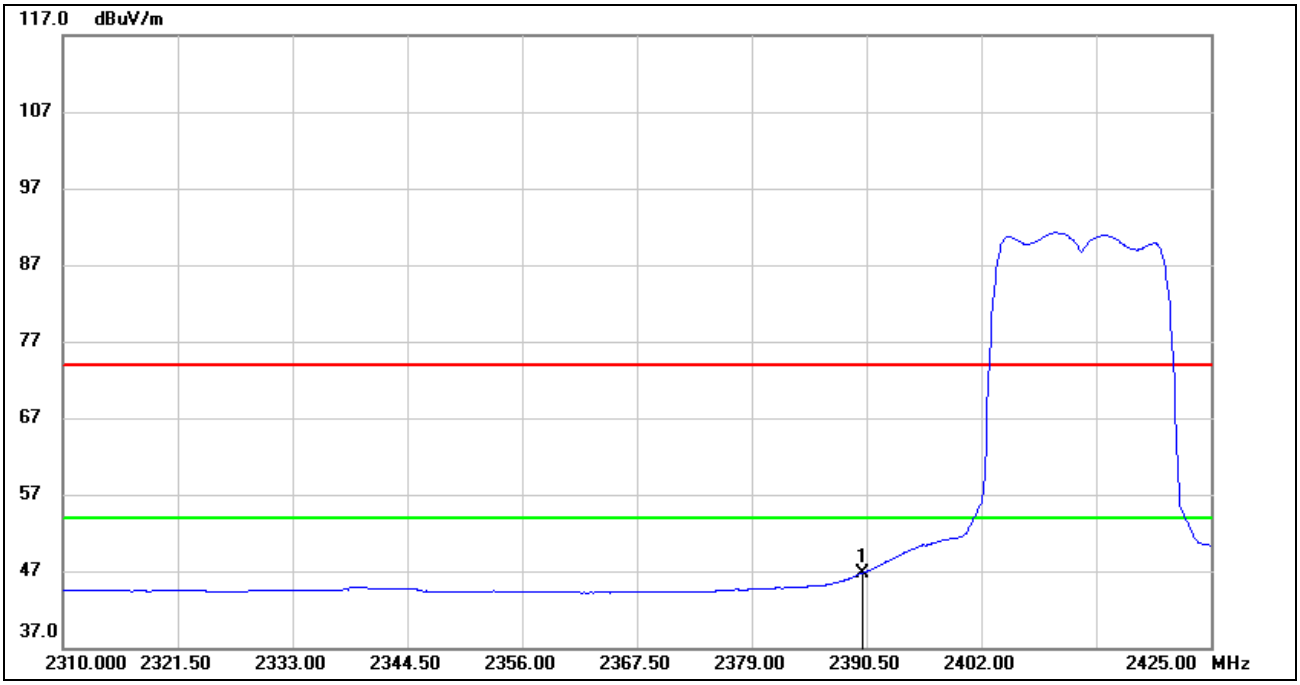
RESTRICTED BANDEDGE (CHANNEL1, VERTICAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	30.67	33.24	63.91	74.00	-10.09	peak

AVG

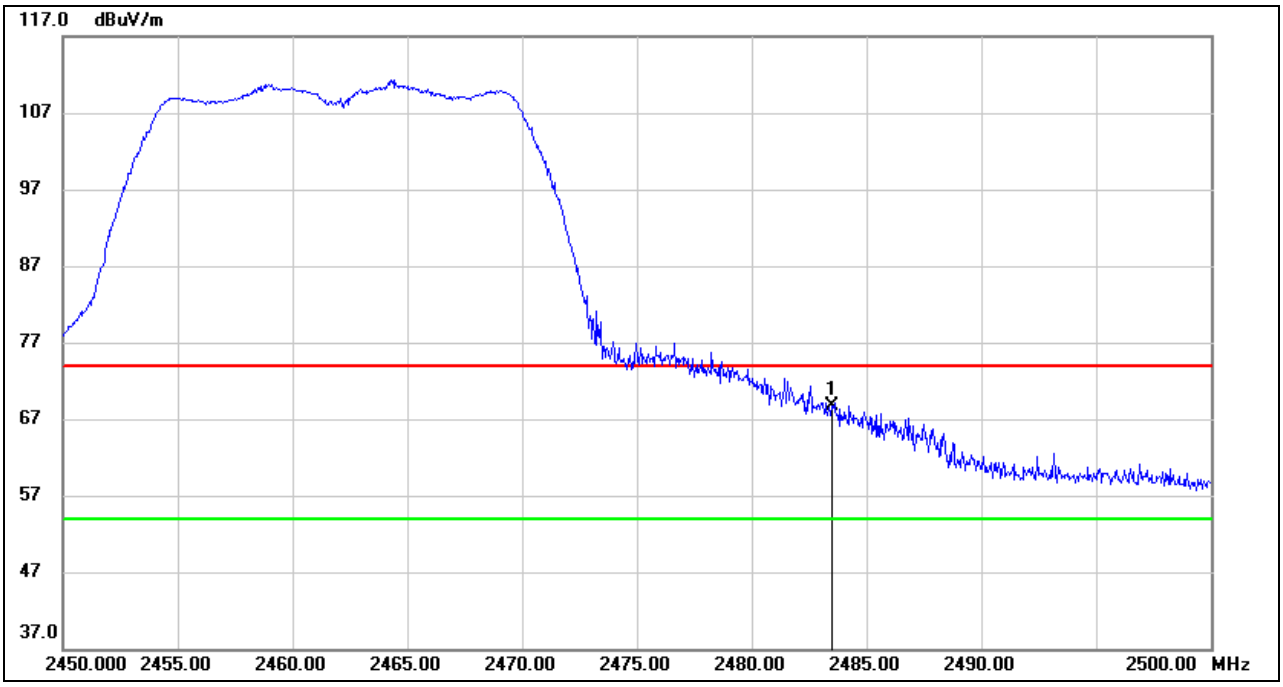


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	13.49	33.24	46.73	54.00	-7.27	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

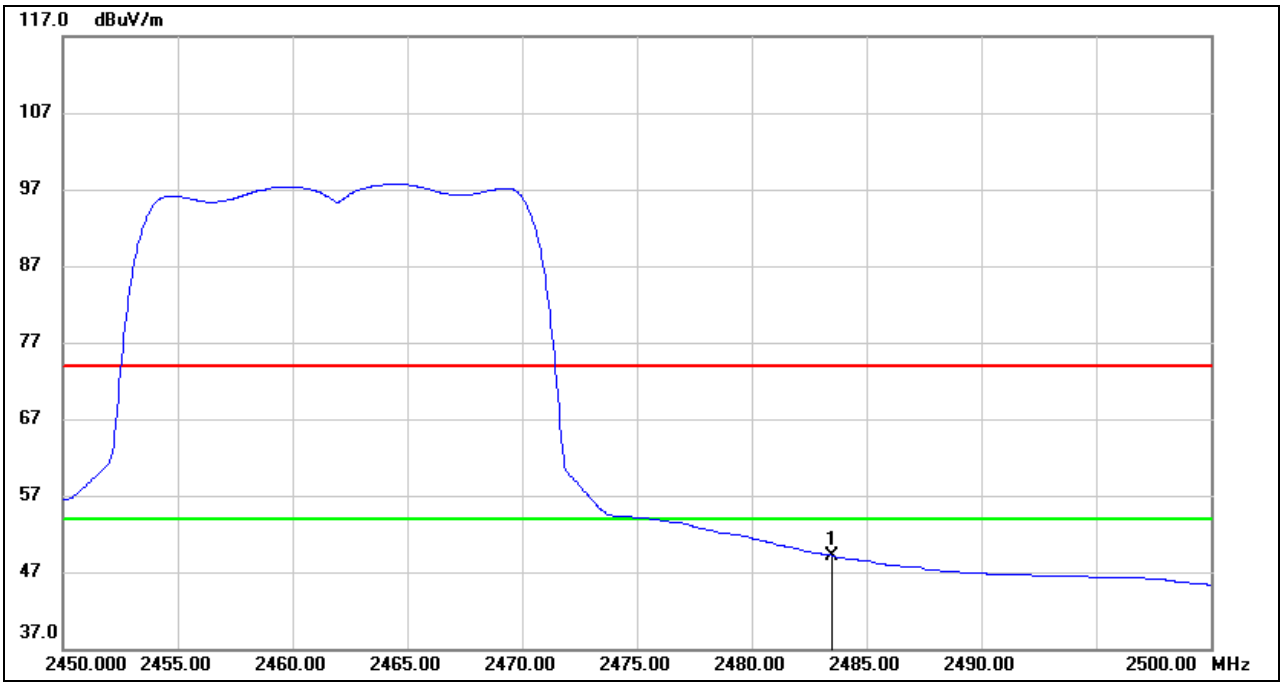
RESTRICTED BANDEDGE (CHANNEL11, HORIZONTAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	35.91	32.78	68.69	74.00	-5.31	peak

AVG

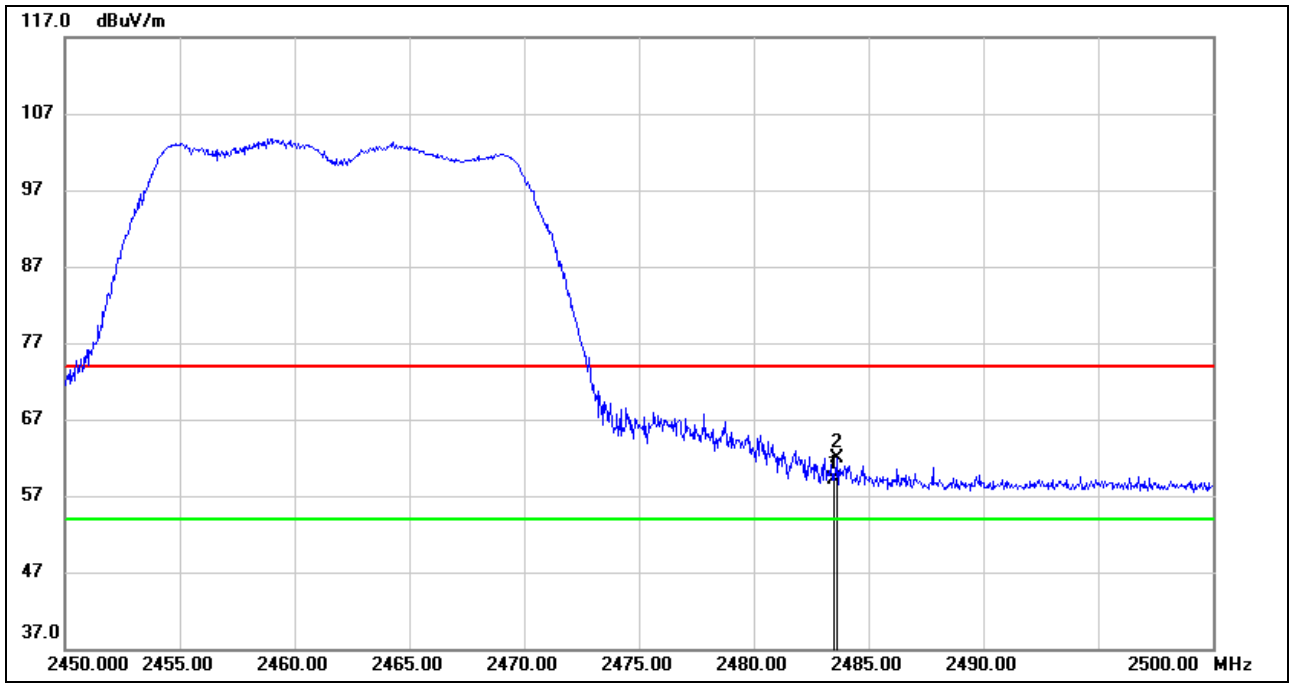


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	16.40	32.78	49.18	54.00	-4.82	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

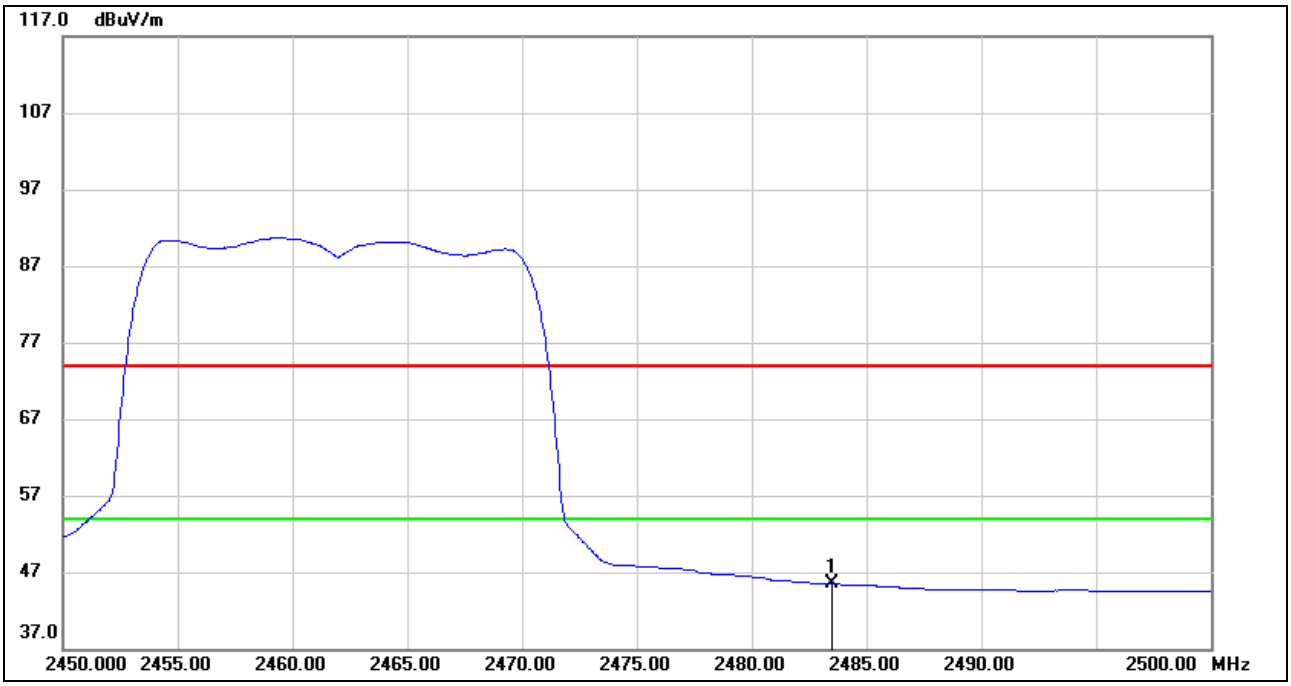
RESTRICTED BANDEDGE (CHANNEL11, VERTICAL)

Peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	26.21	32.88	59.09	74.00	-14.91	peak
2	2483.650	29.01	32.88	61.89	74.00	-12.11	peak

AVG



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	12.56	32.88	45.44	54.00	-8.56	AVG

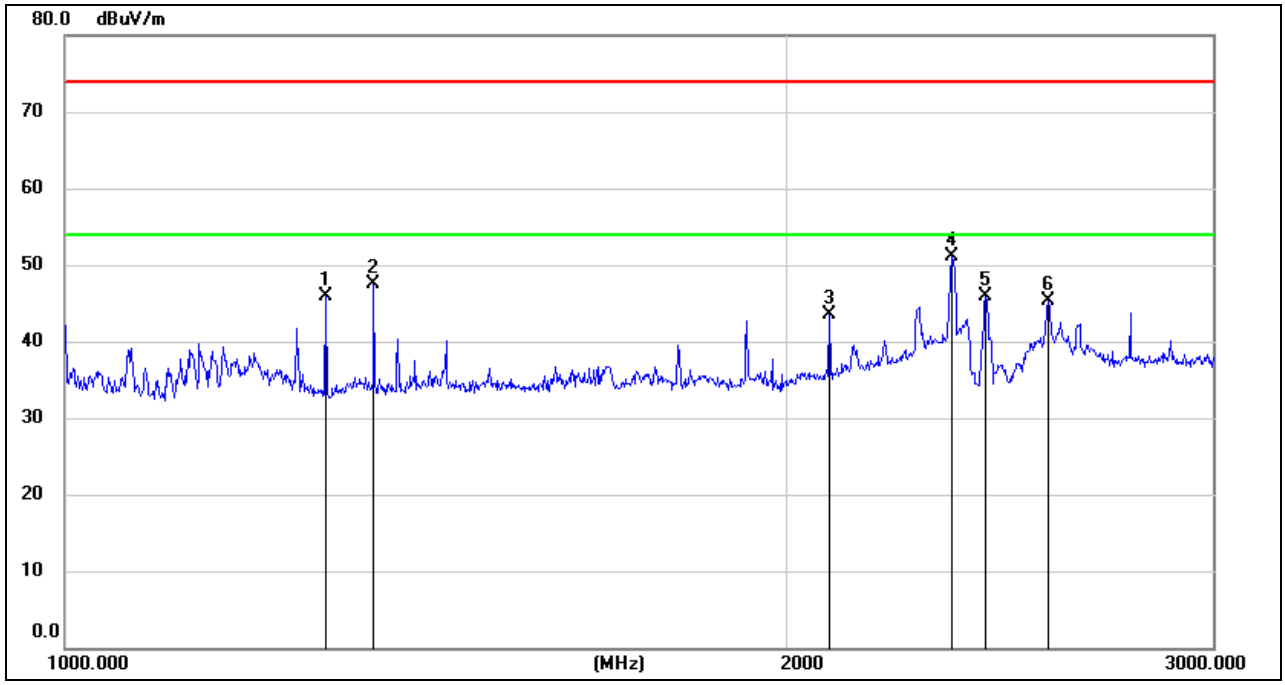
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

8.2. SPURIOUS EMISSIONS (1~18GHz)

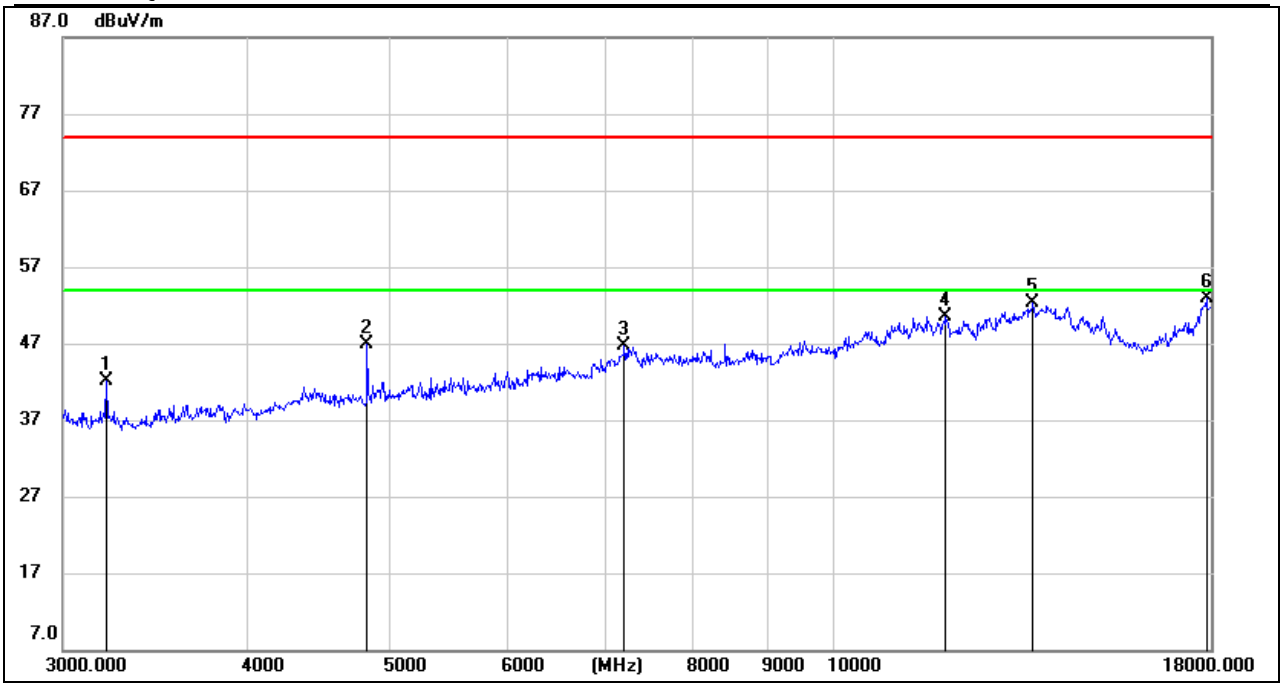
8.2.1. 802.11b SISO MODE

ANTENNA1 (WORST-CASE CONFIGURATION)

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL1, HORIZONTAL)



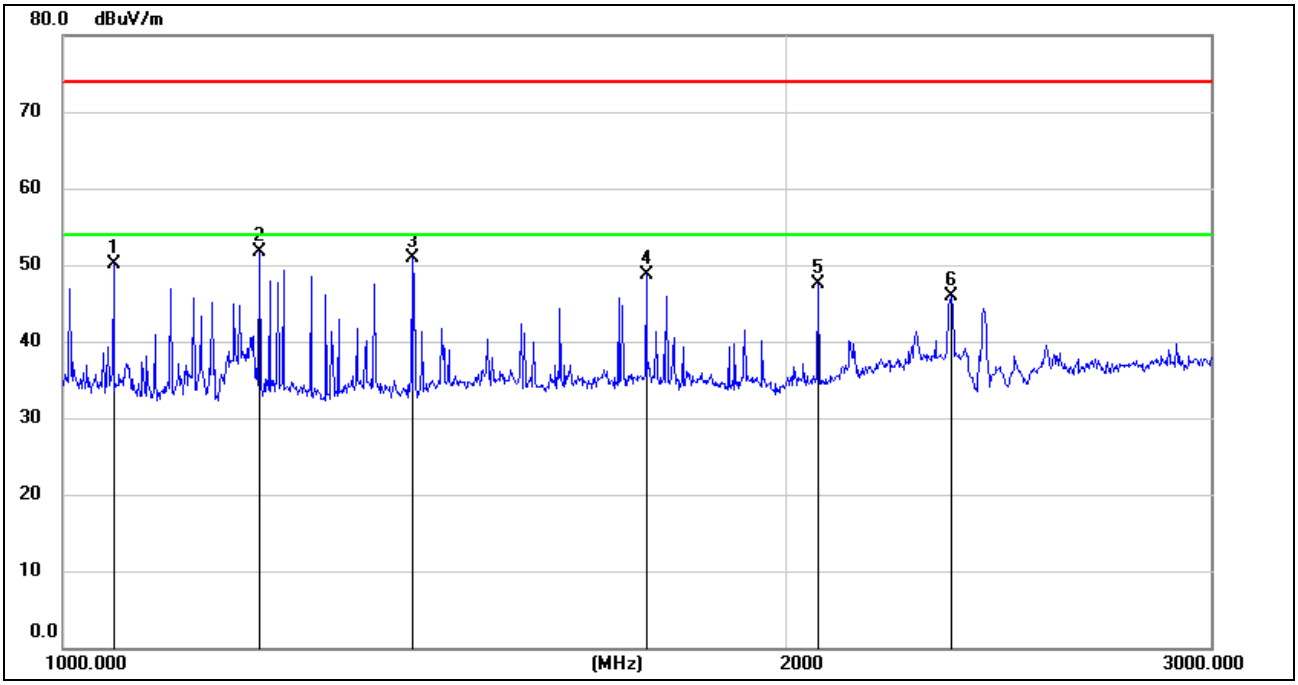
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	1283.236	58.52	-12.54	45.98	74.00	-28.02	peak
2	1343.834	59.85	-12.37	47.48	74.00	-26.52	peak
3	2078.561	53.36	-9.84	43.52	74.00	-30.48	peak
4	2337.840	58.76	-7.66	51.10	74.00	-22.90	peak
5	2413.522	54.05	-8.16	45.89	74.00	-28.11	peak
6	2563.852	53.67	-8.28	45.39	74.00	-28.61	peak



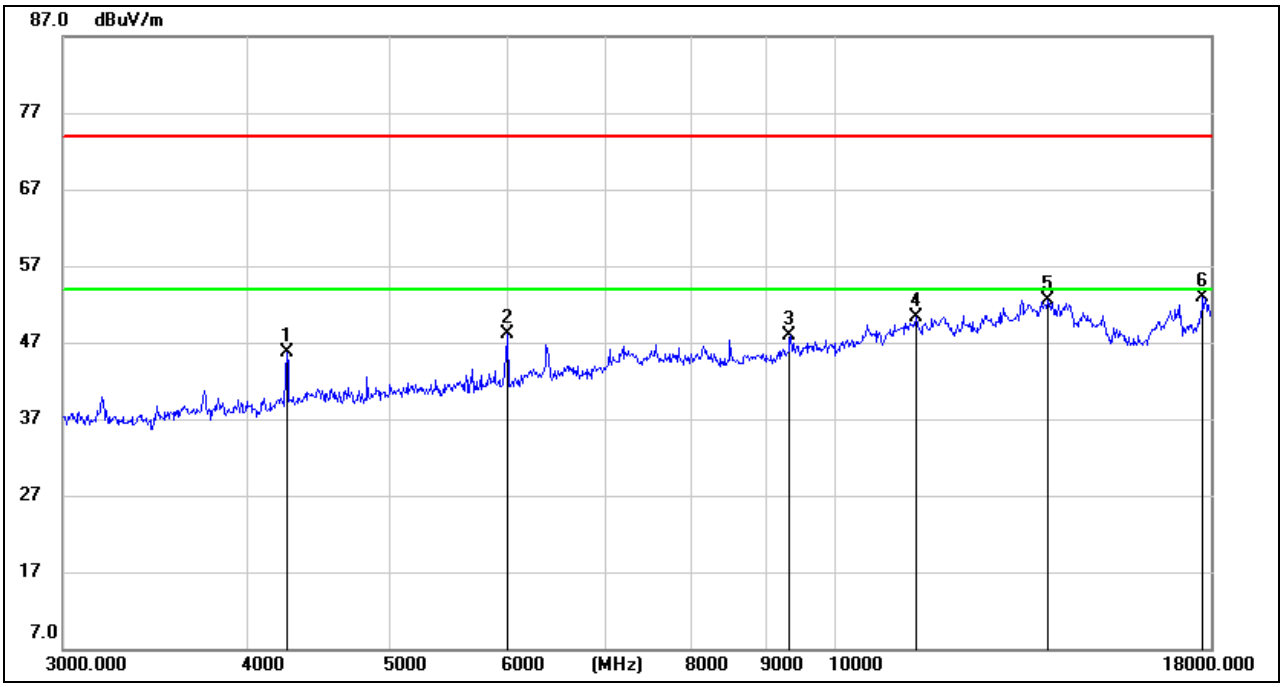
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3211.375	46.84	-4.74	42.10	74.00	-31.90	peak
2	4823.156	47.16	-0.27	46.89	74.00	-27.11	peak
3	7205.054	38.85	7.76	46.61	74.00	-27.39	peak
4	11920.589	33.71	16.81	50.52	74.00	-23.48	peak
5	13635.123	31.93	20.47	52.40	74.00	-21.60	peak
6	17871.455	26.54	26.36	52.90	74.00	-21.10	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL1, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1049.526	64.05	-13.93	50.12	74.00	-23.88	peak
2	1206.668	64.83	-13.11	51.72	74.00	-22.28	peak
3	1396.513	63.44	-12.46	50.98	74.00	-23.02	peak
4	1747.341	60.02	-11.28	48.74	74.00	-25.26	peak
5	2062.637	57.67	-10.14	47.53	74.00	-26.47	peak
6	2340.410	53.44	-7.56	45.88	74.00	-28.12	peak

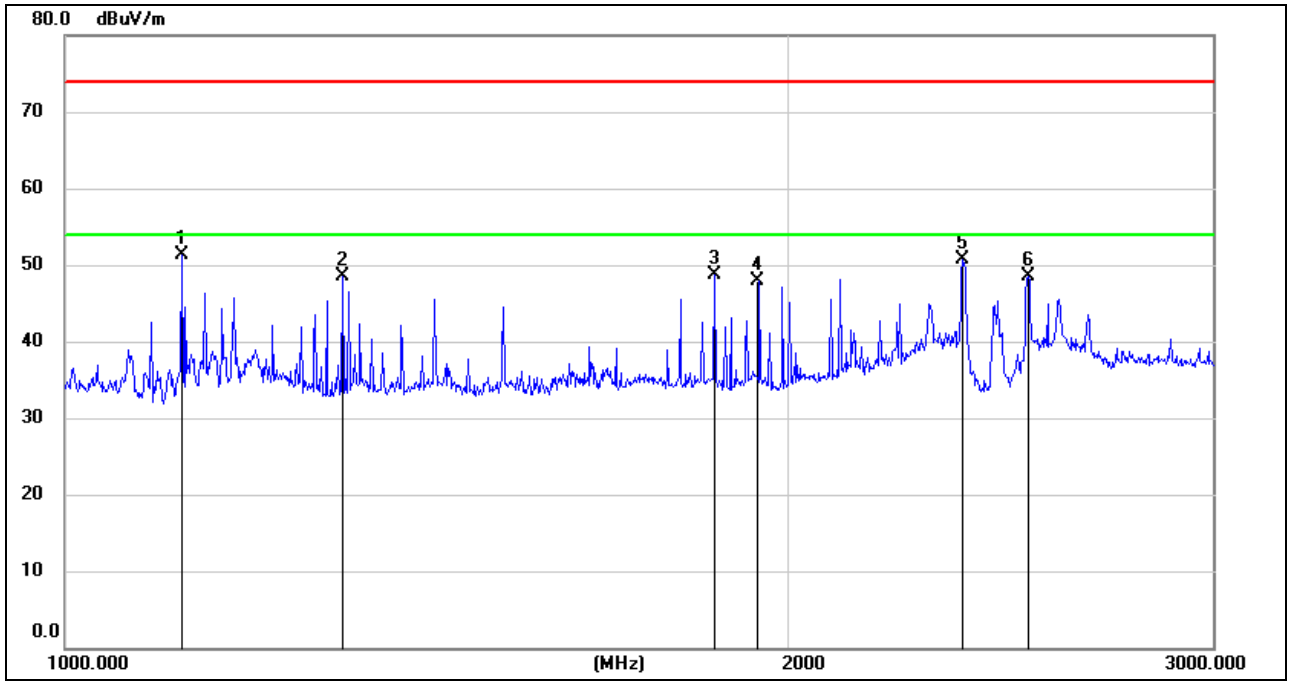


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	4254.620	47.63	-1.85	45.78	74.00	-28.22	peak
2	6001.583	44.79	3.32	48.11	74.00	-25.89	peak
3	9342.630	36.88	10.93	47.81	74.00	-26.19	peak
4	11357.628	34.81	15.54	50.35	74.00	-23.65	peak
5	13956.452	31.70	20.78	52.48	74.00	-21.52	peak
6	17775.648	26.34	26.59	52.93	74.00	-21.07	peak

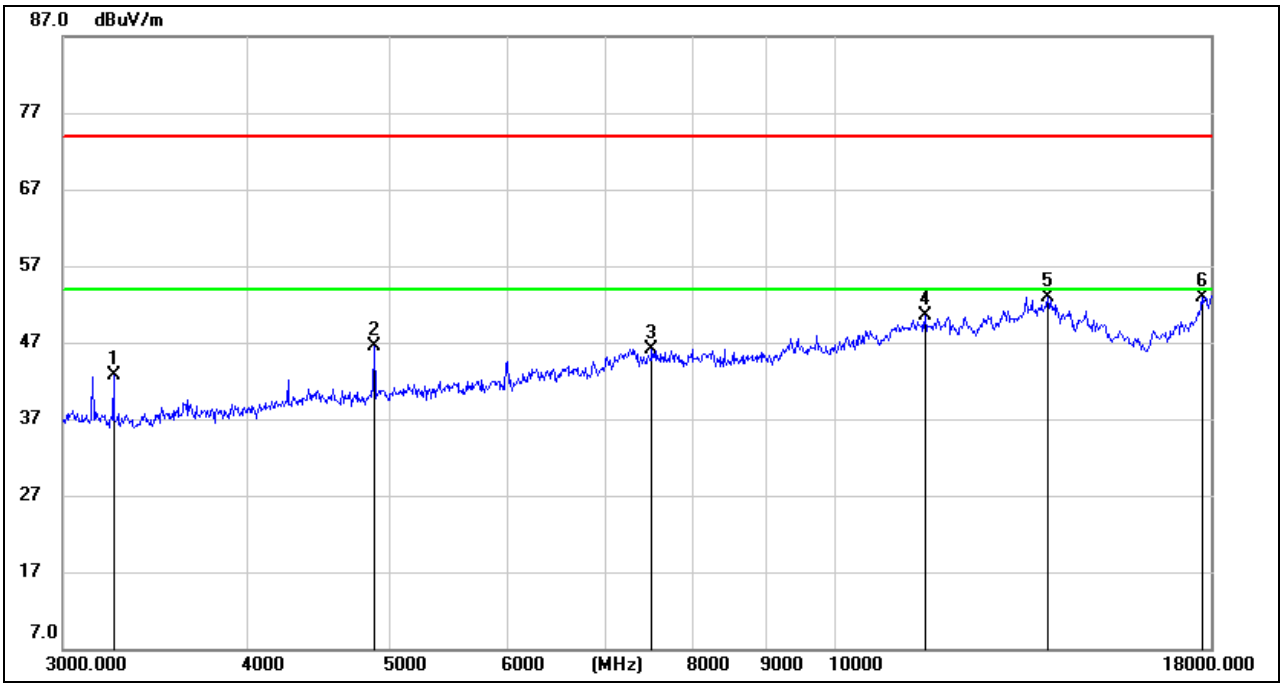
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

Note: All the antennas had been tested, but only the worst data record in the report.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL6, HORIZONTAL)



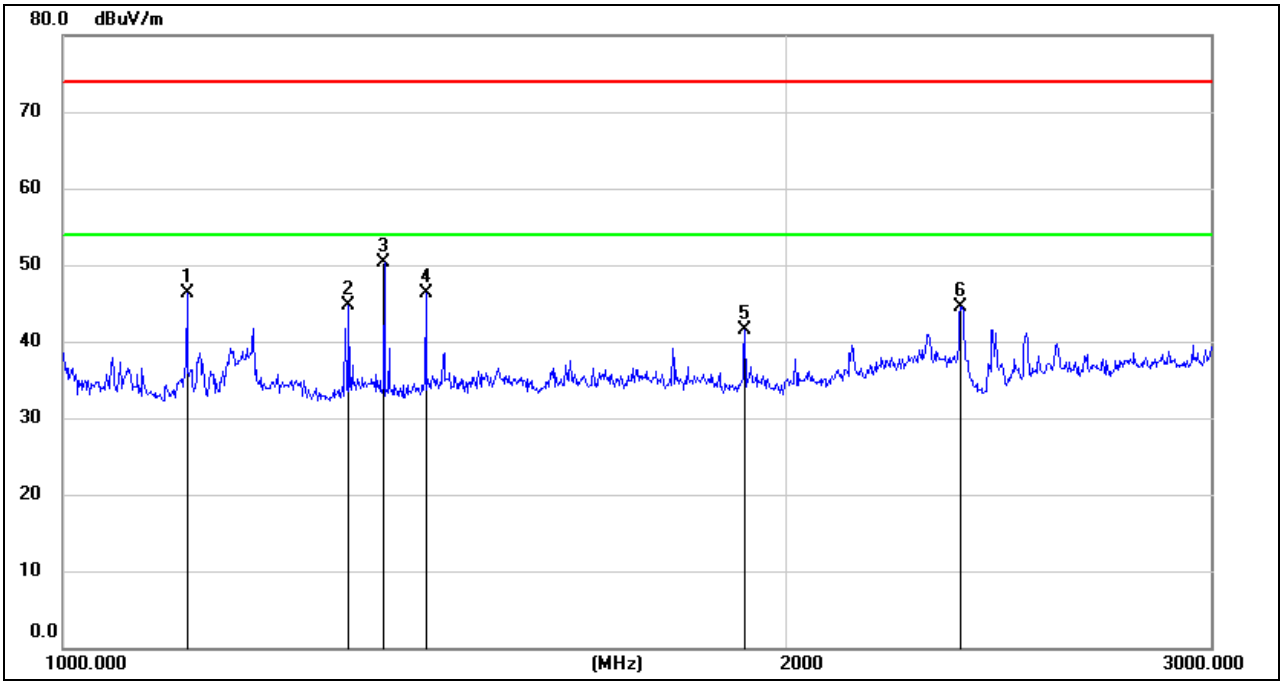
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1118.578	64.74	-13.48	51.26	74.00	-22.74	peak
2	1304.558	60.87	-12.39	48.48	74.00	-25.52	peak
3	1862.304	59.61	-10.85	48.76	74.00	-25.24	peak
4	1943.830	58.54	-10.69	47.85	74.00	-26.15	peak
5	2363.665	58.46	-7.85	50.61	74.00	-23.39	peak
6	2513.650	56.97	-8.38	48.59	74.00	-25.41	peak



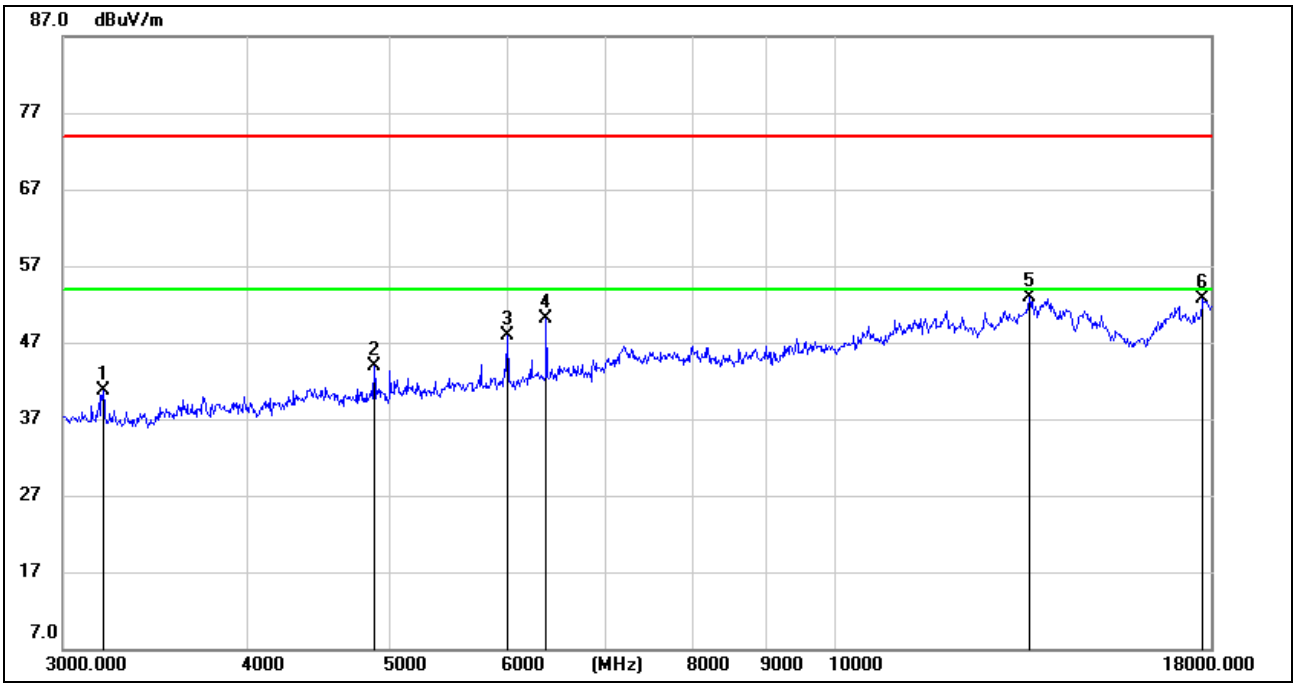
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3251.907	47.42	-4.80	42.62	74.00	-31.38	peak
2	4875.288	46.06	0.39	46.45	74.00	-27.55	peak
3	7521.645	37.94	8.21	46.15	74.00	-27.85	peak
4	11521.601	34.79	15.74	50.53	74.00	-23.47	peak
5	13956.452	32.14	20.68	52.82	74.00	-21.18	peak
6	17743.827	27.10	25.85	52.95	74.00	-21.05	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL6, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	1125.976	60.02	-13.71	46.31	74.00	-27.69	peak
2	1314.629	57.32	-12.59	44.73	74.00	-29.27	peak
3	1360.172	62.79	-12.40	50.39	74.00	-23.61	peak
4	1415.045	58.75	-12.40	46.35	74.00	-27.65	peak
5	1920.481	52.25	-10.82	41.43	74.00	-32.57	peak
6	2363.665	52.22	-7.75	44.47	74.00	-29.53	peak

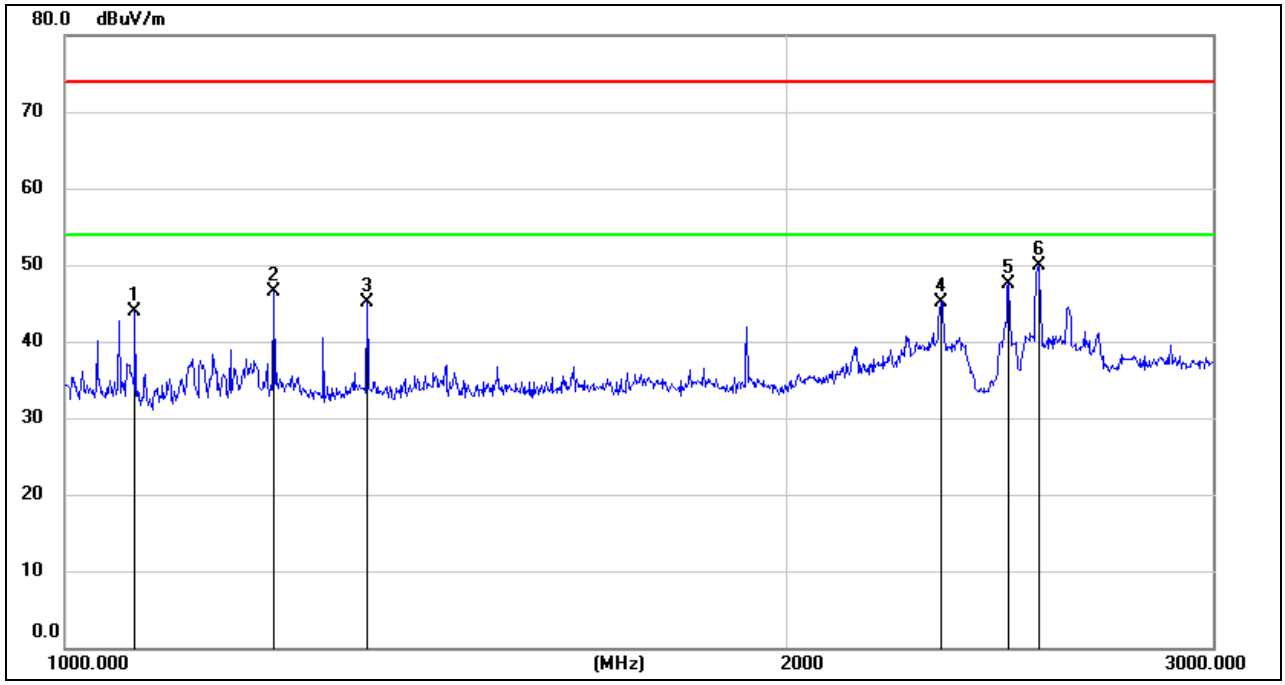


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3194.159	45.35	-4.74	40.61	74.00	-33.39	peak
2	4875.288	43.52	0.34	43.86	74.00	-30.14	peak
3	6001.583	44.64	3.32	47.96	74.00	-26.04	peak
4	6378.564	45.44	4.71	50.15	74.00	-23.85	peak
5	13586.349	32.31	20.51	52.82	74.00	-21.18	peak
6	17775.648	26.17	26.59	52.76	74.00	-21.24	peak

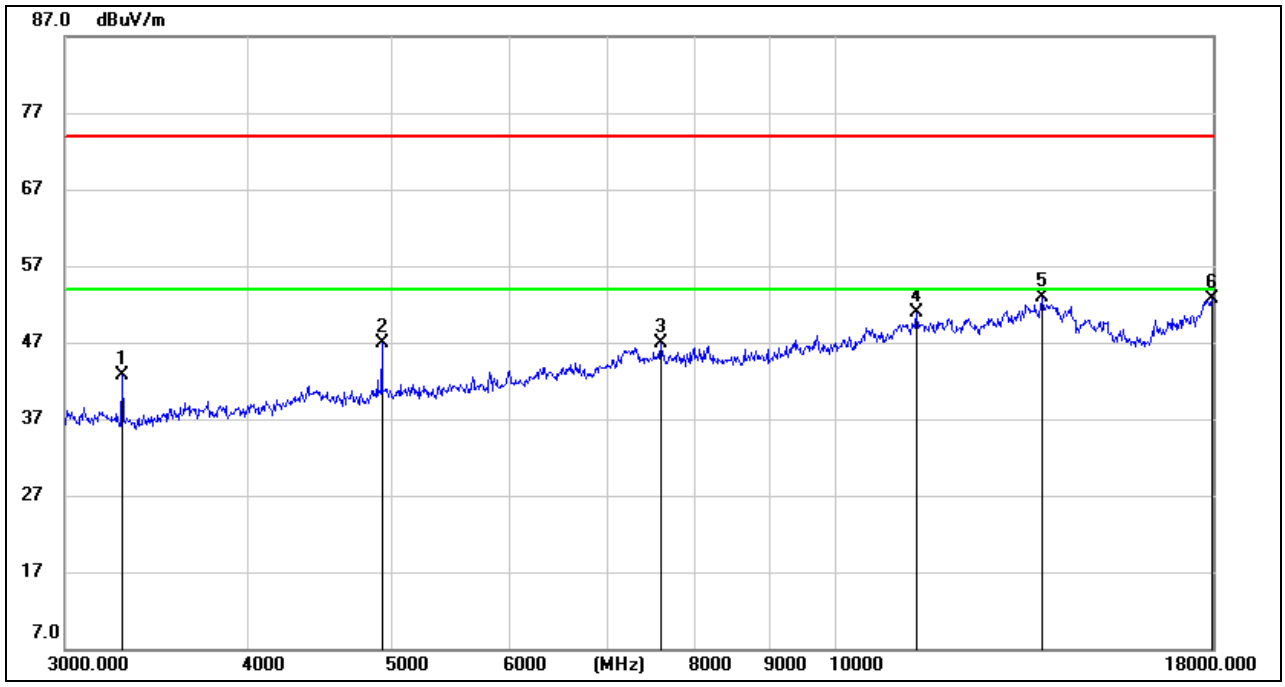
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

Note: All the antennas had been tested, but only the worst data record in the report.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL11, HORIZONTAL)



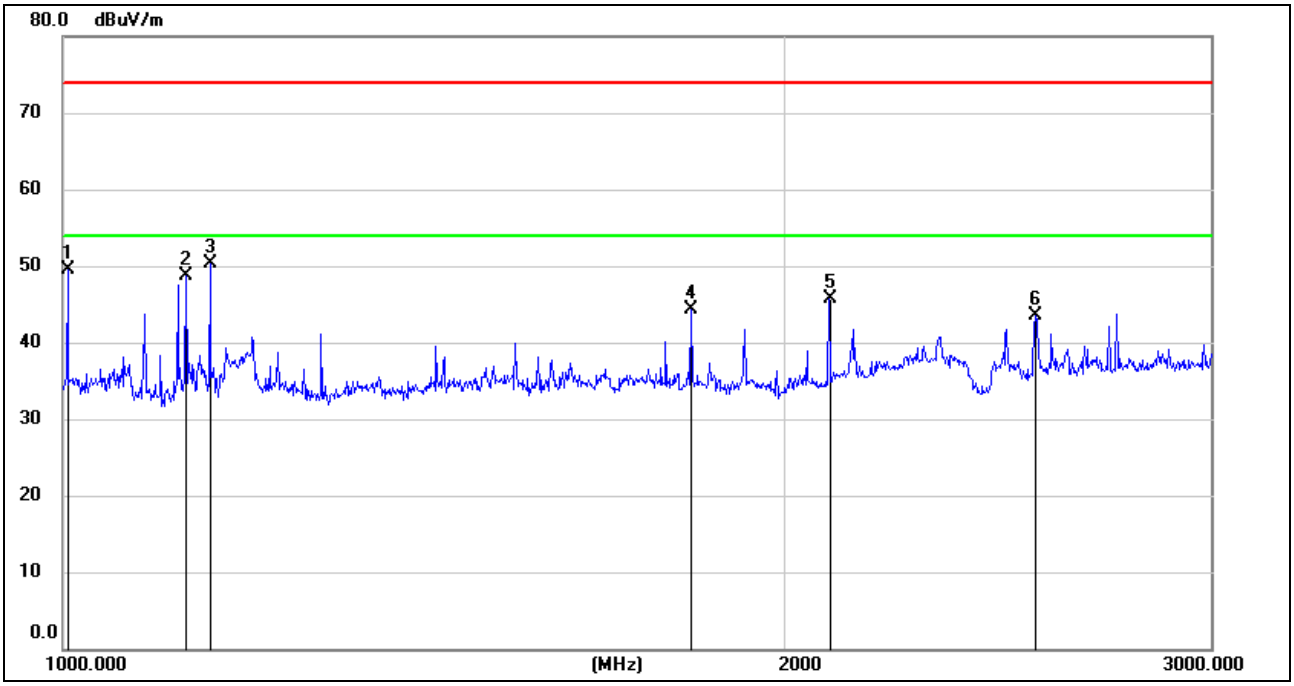
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1070.487	57.56	-13.61	43.95	74.00	-30.05	peak
2	1222.681	59.37	-12.96	46.41	74.00	-27.59	peak
3	1336.472	57.42	-12.37	45.05	74.00	-28.95	peak
4	2314.838	52.60	-7.50	45.10	74.00	-28.90	peak
5	2467.139	55.86	-8.37	47.49	74.00	-26.51	peak
6	2541.417	58.33	-8.36	49.97	74.00	-24.03	peak



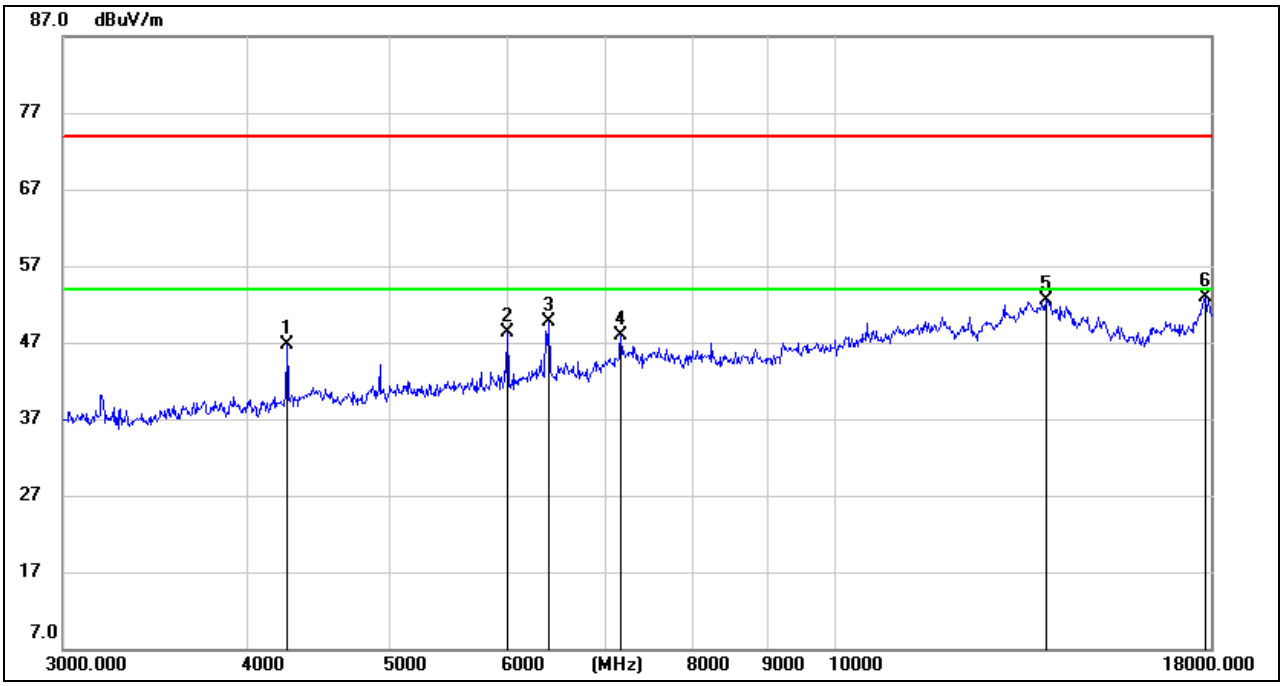
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3281.171	47.51	-4.86	42.65	74.00	-31.35	peak
2	4919.161	46.33	0.66	46.99	74.00	-27.01	peak
3	7602.943	38.80	8.14	46.94	74.00	-27.06	peak
4	11337.296	35.72	15.09	50.81	74.00	-23.19	peak
5	13782.499	32.12	20.75	52.87	74.00	-21.13	peak
6	17967.777	25.74	27.04	52.78	74.00	-21.22	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL11, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1004.404	63.55	-14.00	49.55	74.00	-24.45	peak
2	1124.740	62.44	-13.71	48.73	74.00	-25.27	peak
3	1150.990	63.91	-13.56	50.35	74.00	-23.65	peak
4	1825.839	55.40	-11.00	44.40	74.00	-29.60	peak
5	2083.133	55.59	-9.89	45.70	74.00	-28.30	peak
6	2538.627	51.74	-8.26	43.48	74.00	-30.52	peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4254.620	48.56	-1.85	46.71	74.00	-27.29	peak
2	6001.583	45.03	3.32	48.35	74.00	-25.65	peak
3	6401.463	44.87	4.76	49.63	74.00	-24.37	peak
4	7166.428	39.99	7.82	47.81	74.00	-26.19	peak
5	13906.528	31.68	20.84	52.52	74.00	-21.48	peak
6	17839.462	26.59	26.26	52.85	74.00	-21.15	peak

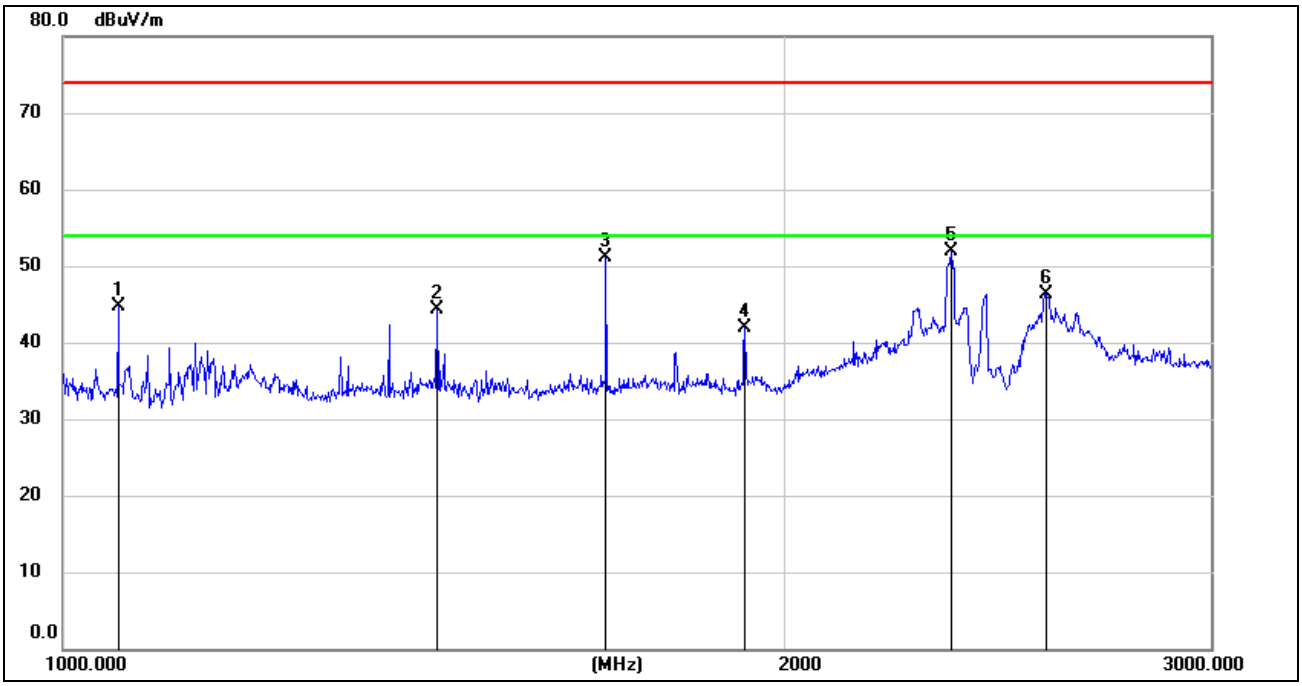
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=10Hz.
5. For transmit duration, please refer to clause 7.1.

Note: All the antennas had been tested, but only the worst data record in the report.

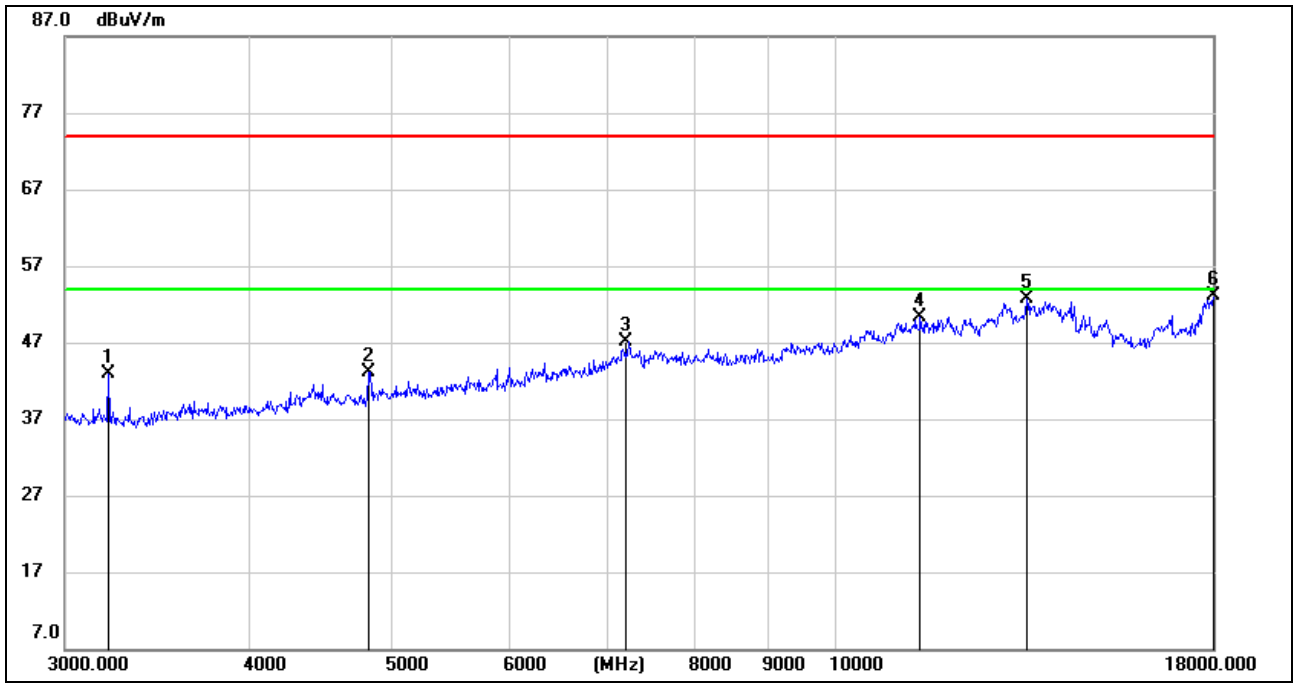
8.2.1. 802.11g SISO MODE

ANTENNA1 (WORST-CASE CONFIGURATION)

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL1, HORIZONTAL)



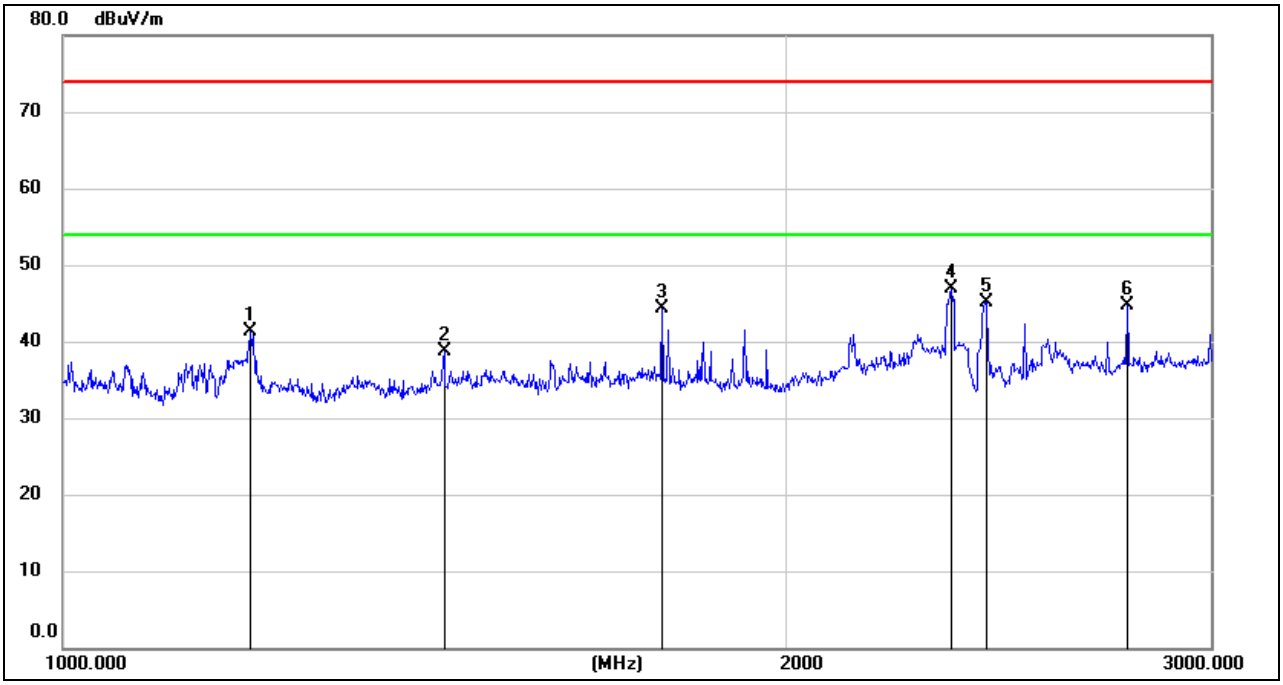
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1055.307	58.38	-13.63	44.75	74.00	-29.25	peak
2	1430.677	56.58	-12.18	44.40	74.00	-29.60	peak
3	1681.428	62.81	-11.61	51.20	74.00	-22.80	peak
4	1920.481	52.64	-10.72	41.92	74.00	-32.08	peak
5	2340.410	59.57	-7.68	51.89	74.00	-22.11	peak
6	2563.852	54.65	-8.28	46.37	74.00	-27.63	peak



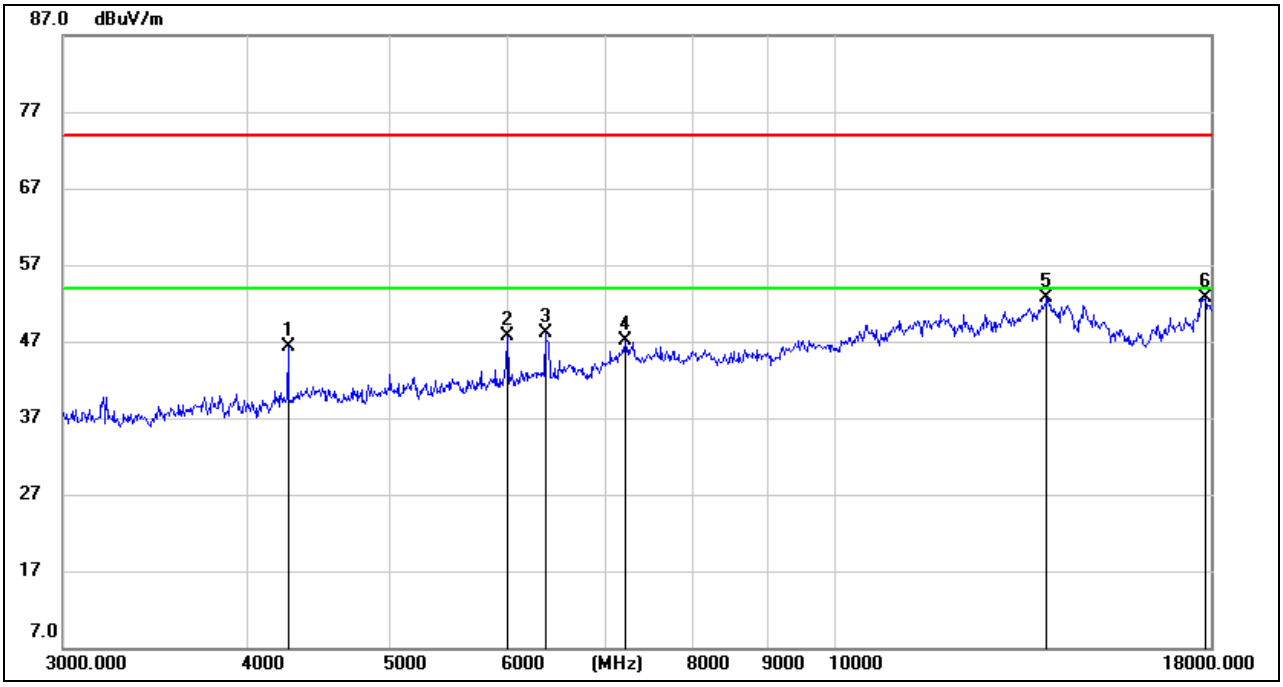
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	3211.375	47.72	-4.74	42.98	74.00	-31.02	peak
2	4823.156	43.45	-0.27	43.18	74.00	-30.82	peak
3	7230.919	39.34	7.81	47.15	74.00	-26.85	peak
4	11398.401	34.72	15.67	50.39	74.00	-23.61	peak
5	13465.175	32.63	20.10	52.73	74.00	-21.27	peak
6	18000.000	26.02	27.06	53.08	74.00	-20.92	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL1, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1196.109	54.51	-13.20	41.31	74.00	-32.69	peak
2	1440.139	51.05	-12.30	38.75	74.00	-35.25	peak
3	1774.424	55.57	-11.21	44.36	74.00	-29.64	peak
4	2340.410	54.42	-7.56	46.86	74.00	-27.14	peak
5	2418.831	53.28	-8.09	45.19	74.00	-28.81	peak
6	2768.799	51.89	-7.20	44.69	74.00	-29.31	peak

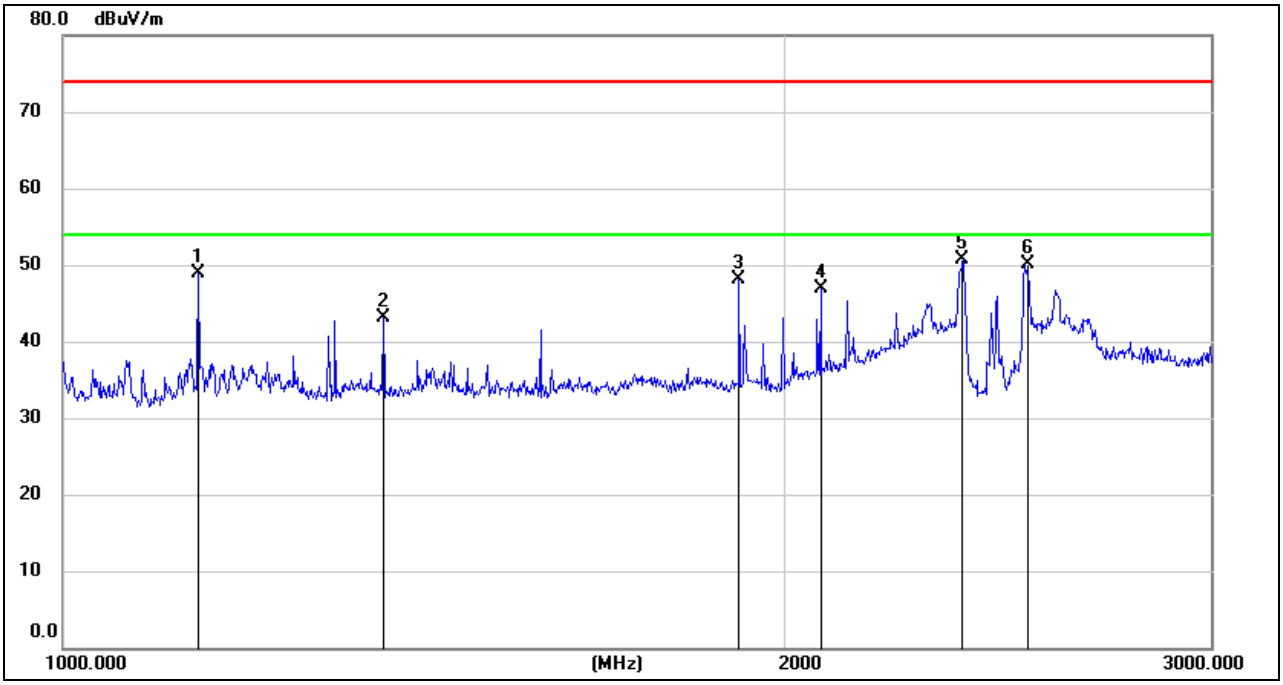


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4262.250	48.12	-1.78	46.34	74.00	-27.66	peak
2	6001.583	44.32	3.32	47.64	74.00	-26.36	peak
3	6367.146	43.42	4.68	48.10	74.00	-25.90	peak
4	7230.919	39.34	7.79	47.13	74.00	-26.87	peak
5	13931.468	31.85	20.81	52.66	74.00	-21.34	peak
6	17839.462	26.51	26.26	52.77	74.00	-21.23	peak

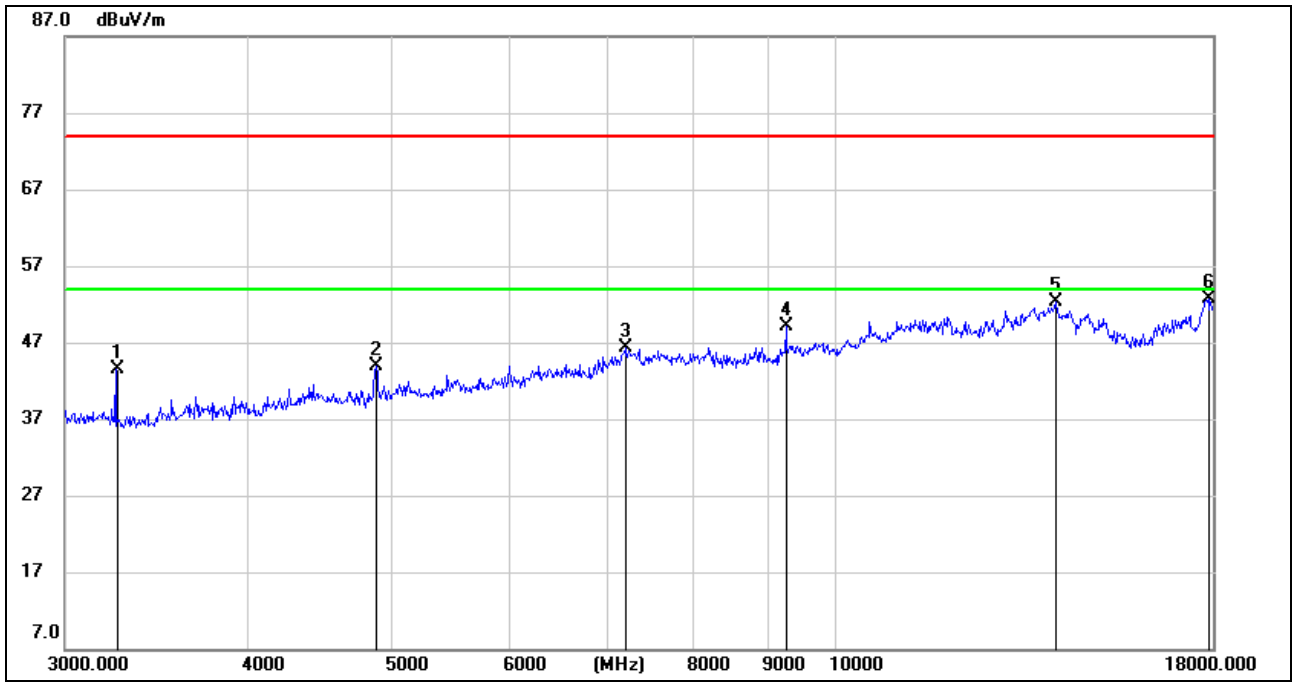
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

Note: All the antennas had been tested, but only the worst data record in the report.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL6, HORIZONTAL)



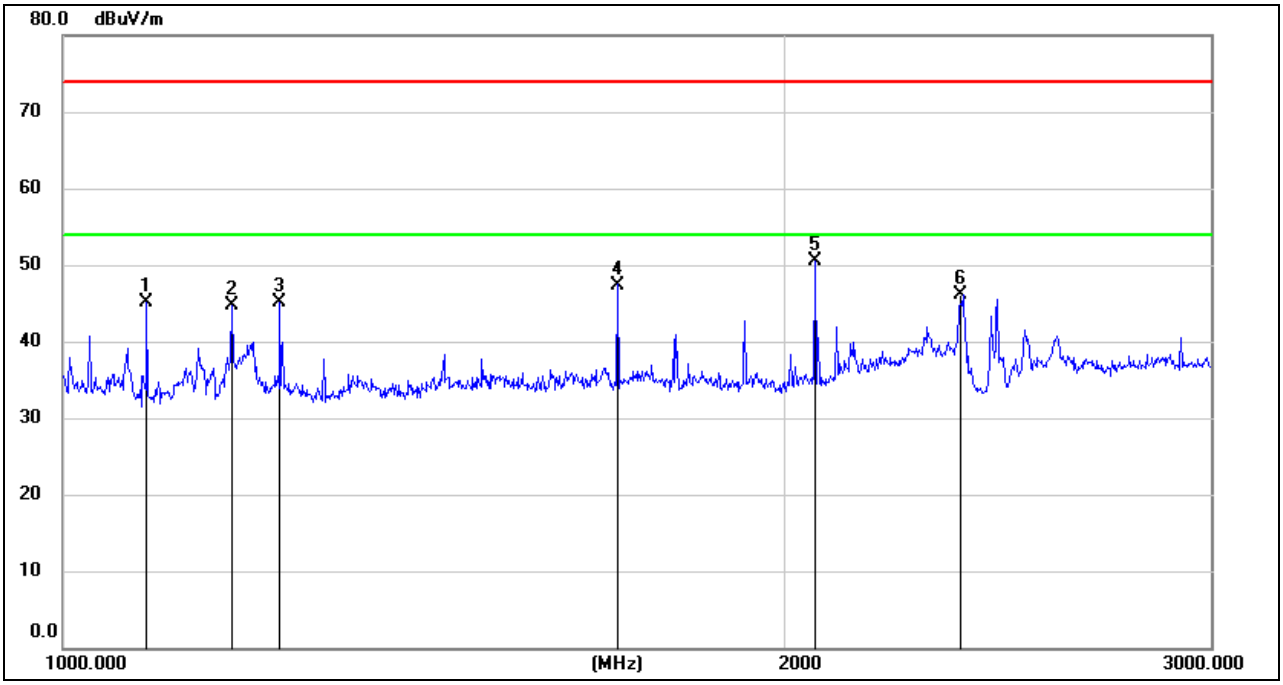
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1138.414	62.28	-13.40	48.88	74.00	-25.12	peak
2	1360.172	55.44	-12.32	43.12	74.00	-30.88	peak
3	1909.961	58.89	-10.73	48.16	74.00	-25.84	peak
4	2064.905	56.83	-10.01	46.82	74.00	-27.18	peak
5	2366.263	58.49	-7.87	50.62	74.00	-23.38	peak
6	2513.650	58.47	-8.38	50.09	74.00	-23.91	peak



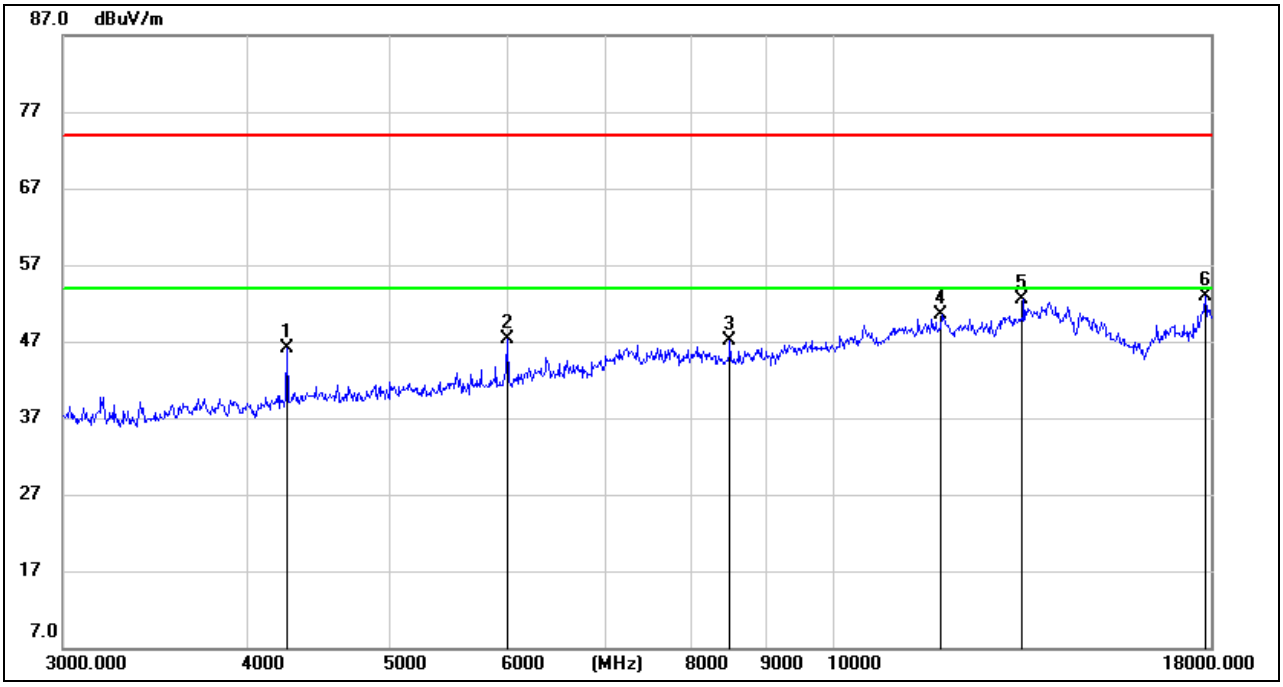
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3251.907	48.34	-4.80	43.54	74.00	-30.46	peak
2	4875.288	43.56	0.39	43.95	74.00	-30.05	peak
3	7192.155	38.49	7.74	46.23	74.00	-27.77	peak
4	9242.729	38.75	10.37	49.12	74.00	-24.88	peak
5	14082.047	31.61	20.66	52.27	74.00	-21.73	peak
6	17871.455	26.29	26.36	52.65	74.00	-21.35	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL6, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	1083.502	58.96	-13.88	45.08	74.00	-28.92	peak
2	1175.268	58.13	-13.37	44.76	74.00	-29.24	peak
3	1230.767	57.92	-12.89	45.03	74.00	-28.97	peak
4	1700.003	58.92	-11.52	47.40	74.00	-26.60	peak
5	2053.593	60.84	-10.25	50.59	74.00	-23.41	peak
6	2366.263	53.87	-7.77	46.10	74.00	-27.90	peak

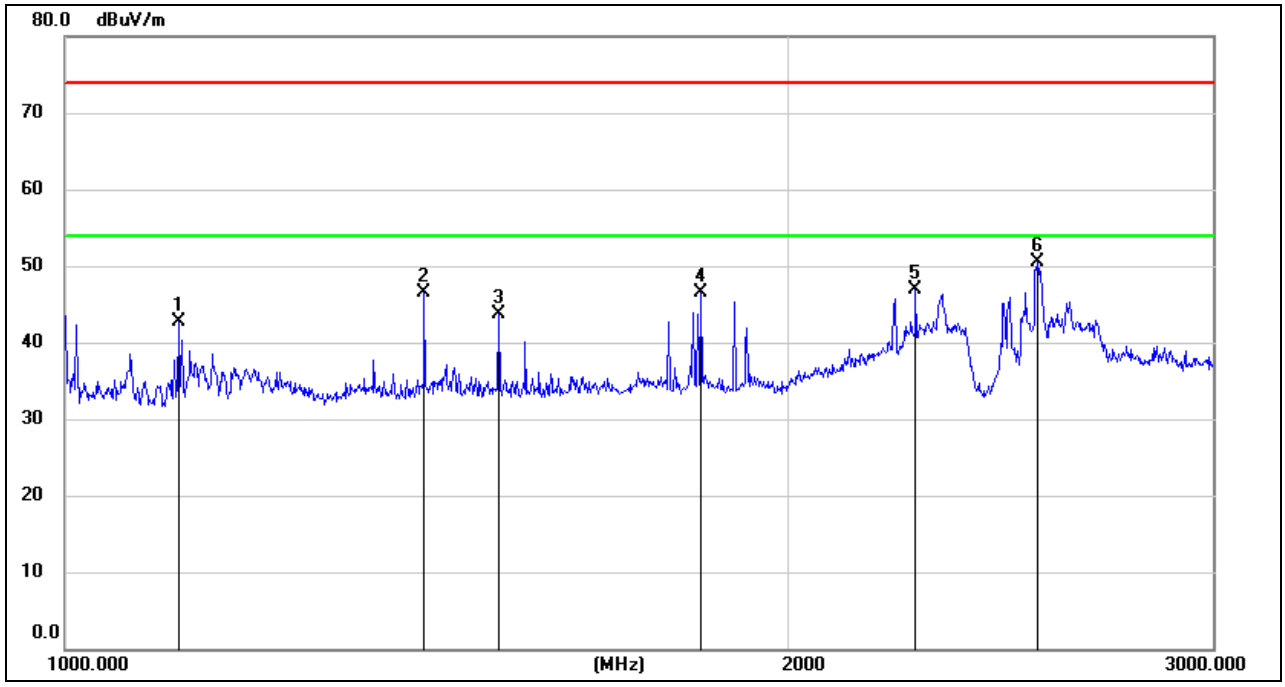


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4254.620	48.04	-1.85	46.19	74.00	-27.81	peak
2	6001.583	44.08	3.32	47.40	74.00	-26.60	peak
3	8496.247	38.65	8.49	47.14	74.00	-26.86	peak
4	11835.459	33.98	16.61	50.59	74.00	-23.41	peak
5	13441.070	32.52	19.96	52.48	74.00	-21.52	peak
6	17839.462	26.60	26.26	52.86	74.00	-21.14	peak

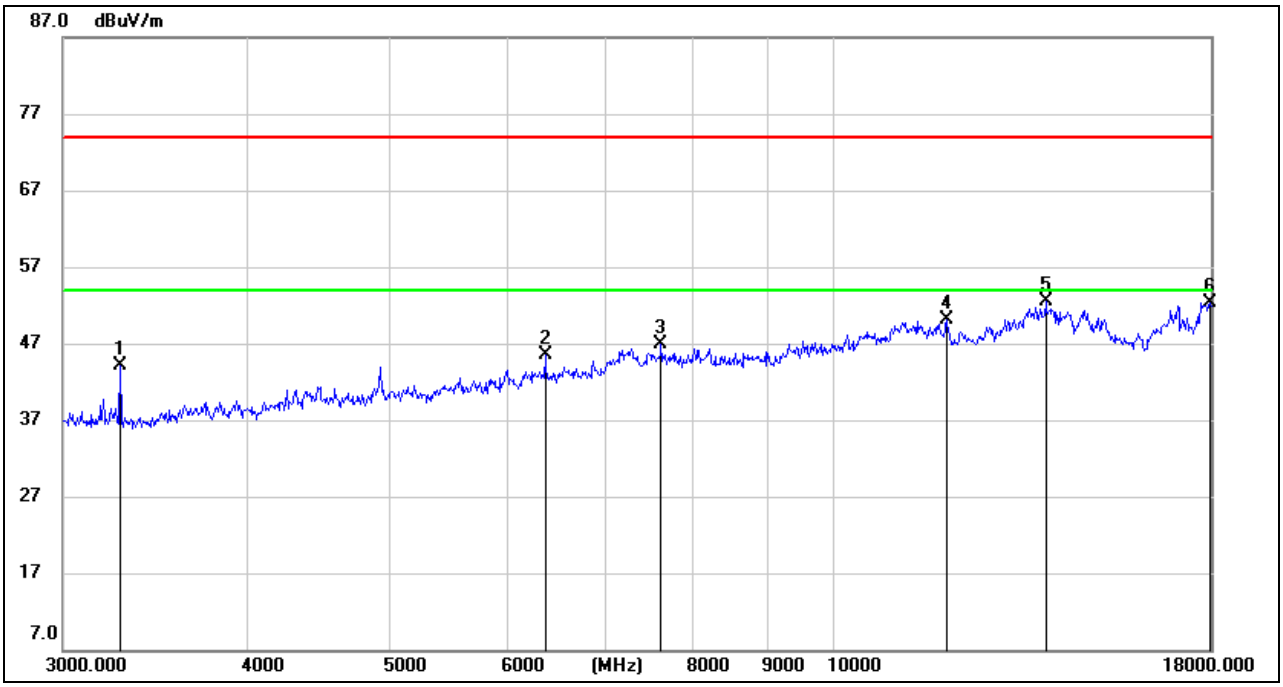
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

Note: All the antennas had been tested, but only the worst data record in the report.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL11, HORIZONTAL)



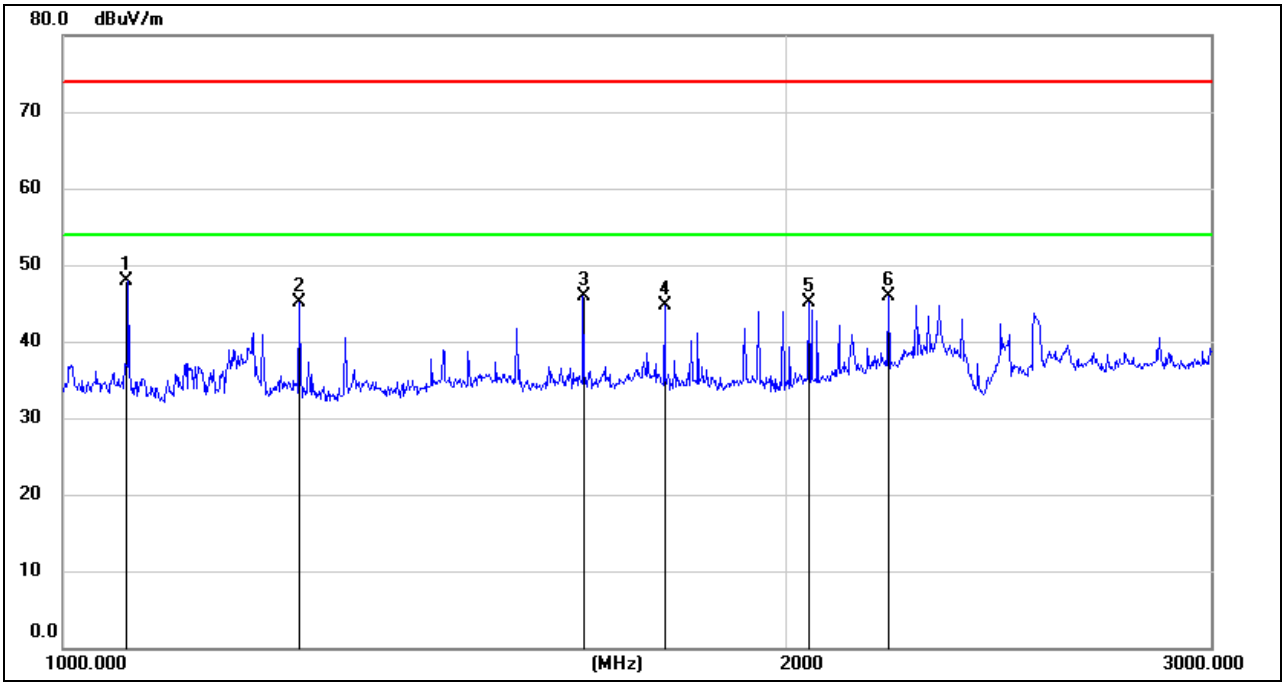
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1116.123	56.19	-13.50	42.69	74.00	-31.31	peak
2	1410.389	58.61	-12.10	46.51	74.00	-27.49	peak
3	1514.788	55.92	-12.24	43.68	74.00	-30.32	peak
4	1837.914	57.38	-10.94	46.44	74.00	-27.56	peak
5	2259.560	54.44	-7.56	46.88	74.00	-27.12	peak
6	2538.627	58.94	-8.36	50.58	74.00	-23.42	peak



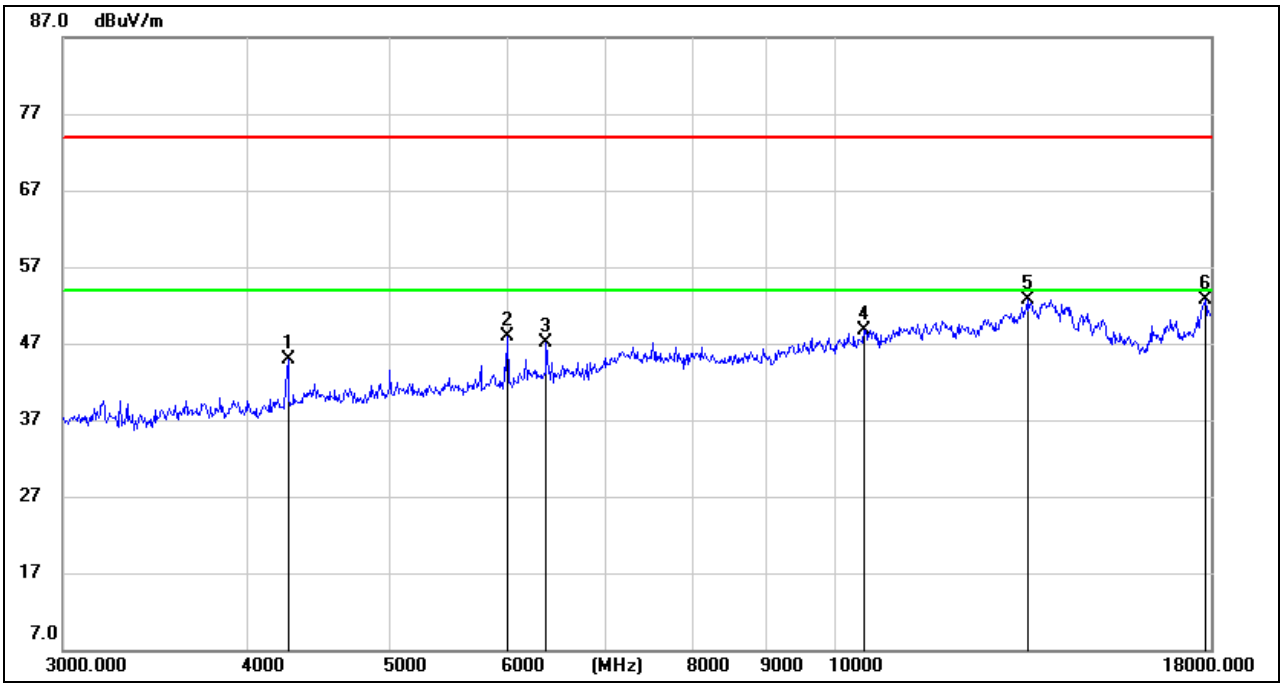
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3281.171	49.00	-4.86	44.14	74.00	-29.86	peak
2	6367.146	40.81	4.65	45.46	74.00	-28.54	peak
3	7630.238	38.80	8.08	46.88	74.00	-27.12	peak
4	11941.967	33.56	16.48	50.04	74.00	-23.96	peak
5	13906.528	31.85	20.65	52.50	74.00	-21.50	peak
6	17967.777	25.32	27.04	52.36	74.00	-21.64	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL11, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.623	61.91	-13.92	47.99	74.00	-26.01	peak
2	1253.970	57.90	-12.73	45.17	74.00	-28.83	peak
3	1646.695	57.59	-11.75	45.84	74.00	-28.16	peak
4	1778.327	55.89	-11.19	44.70	74.00	-29.30	peak
5	2042.344	55.43	-10.35	45.08	74.00	-28.92	peak
6	2203.181	54.22	-8.24	45.98	74.00	-28.02	peak



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	4262.250	46.67	-1.78	44.89	74.00	-29.11	peak
2	6001.583	44.67	3.32	47.99	74.00	-26.01	peak
3	6378.564	42.40	4.71	47.11	74.00	-26.89	peak
4	10477.817	35.10	13.68	48.78	74.00	-25.22	peak
5	13537.749	31.88	20.83	52.71	74.00	-21.29	peak
6	17839.462	26.42	26.26	52.68	74.00	-21.32	peak

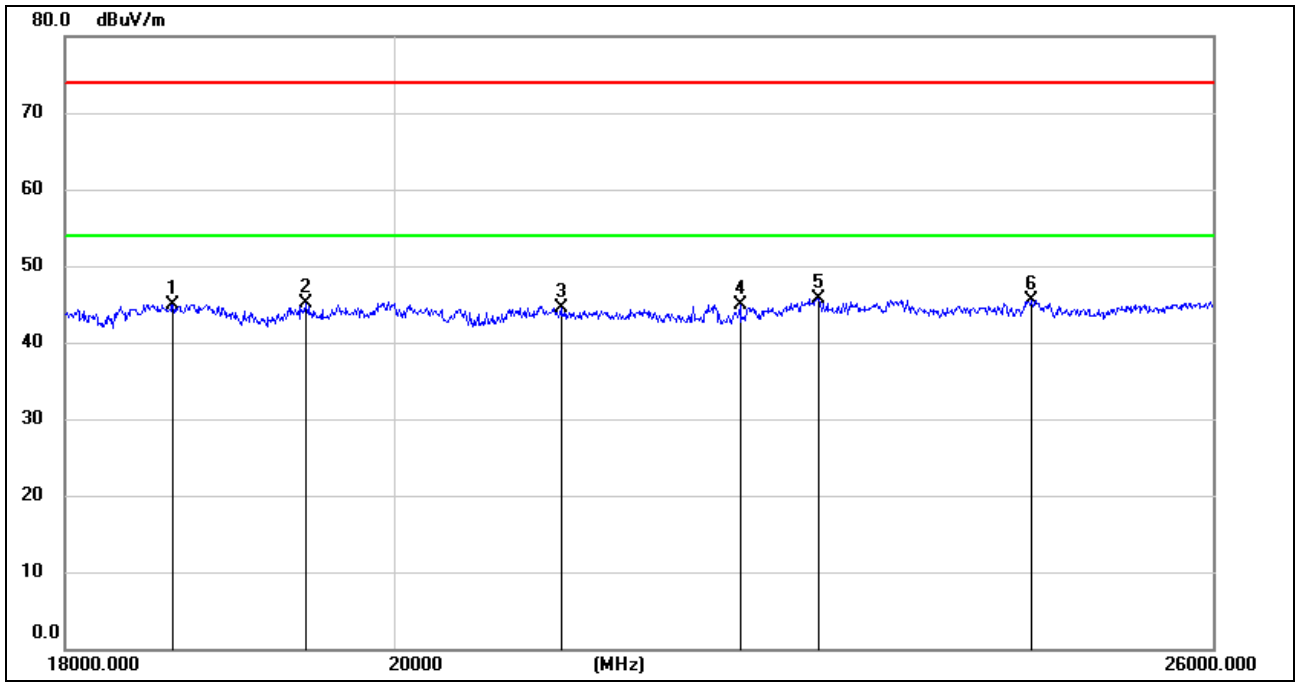
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/T.
5. For transmit duration, please refer to clause 7.1.

Note: All the antennas had been tested, but only the worst data record in the report.

8.3. SPURIOUS EMISSIONS (18~25GHz)

8.3.1. 802.11b SISO MODE

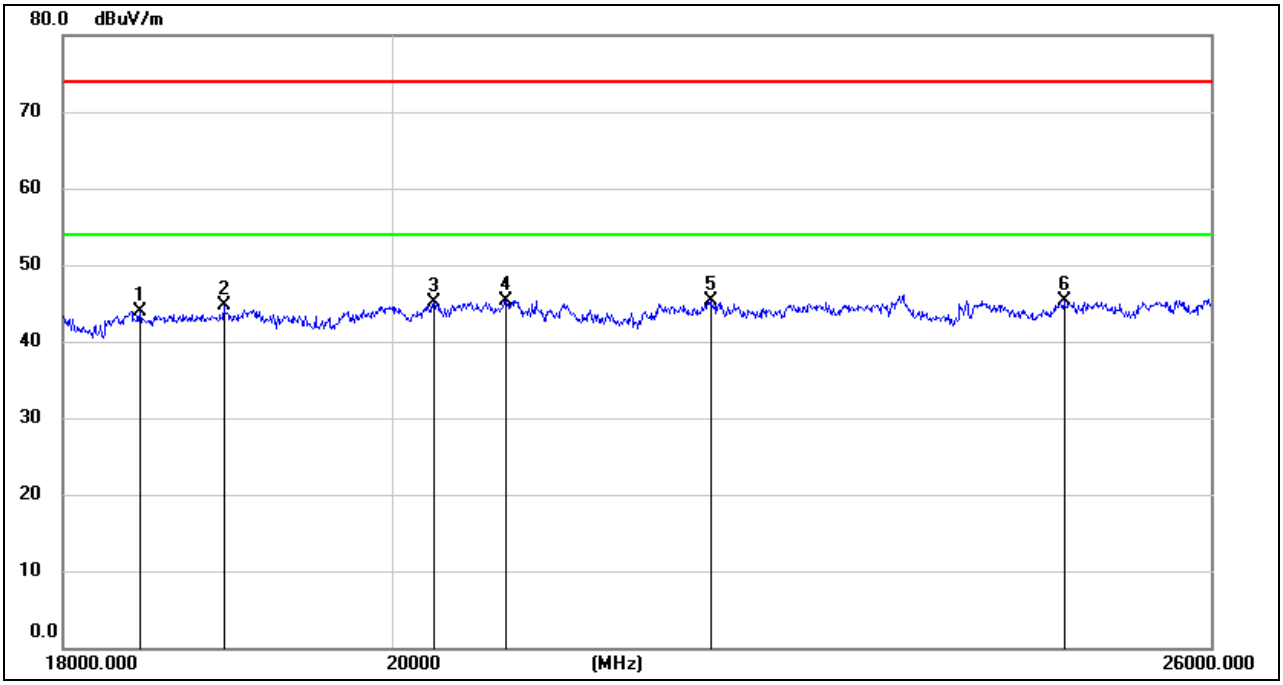
SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18633.069	50.24	-5.34	44.90	74.00	-29.10	peak
2	19445.078	50.59	-5.56	45.03	74.00	-28.97	peak
3	21099.068	49.32	-4.83	44.49	74.00	-29.51	peak
4	22344.806	49.00	-4.09	44.91	74.00	-29.09	peak
5	22910.589	49.32	-3.53	45.79	74.00	-28.21	peak
6	24532.433	47.85	-2.31	45.54	74.00	-28.46	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	18448.984	49.27	-5.32	43.95	74.00	-30.05	peak
2	18950.934	49.99	-5.26	44.73	74.00	-29.27	peak
3	20270.099	50.64	-5.60	45.04	74.00	-28.96	peak
4	20745.172	50.49	-5.12	45.37	74.00	-28.63	peak
5	22156.619	49.63	-4.32	45.31	74.00	-28.69	peak
6	24804.566	47.55	-2.27	45.28	74.00	-28.72	peak

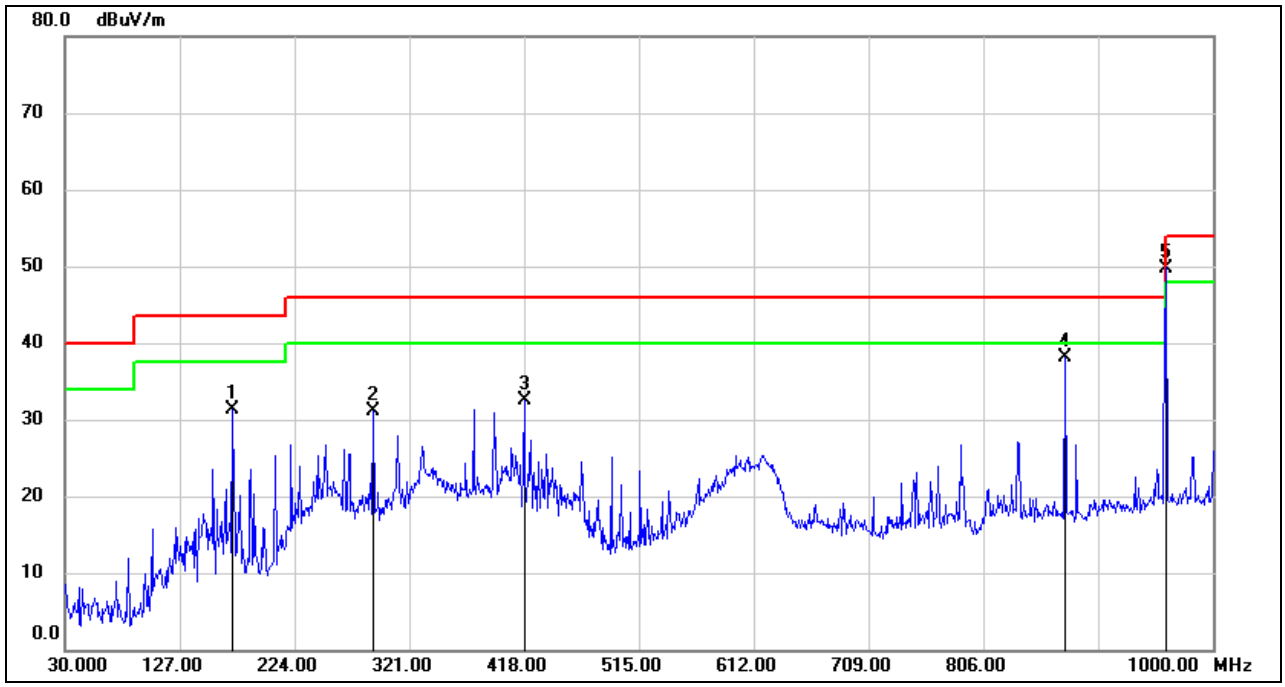
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

8.4. SPURIOUS EMISSIONS (30M ~ 1 GHz)

8.4.1. 802.11b SISO MODE

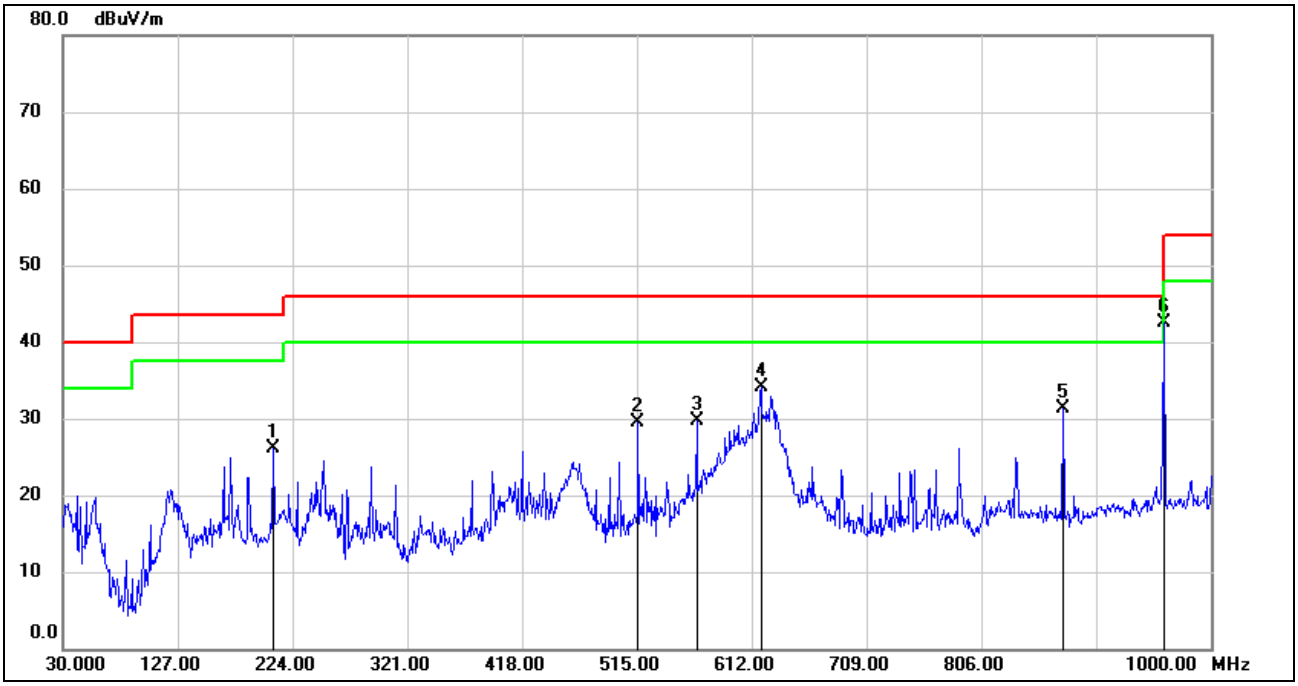
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	171.6200	59.72	-28.33	31.39	43.50	-12.11	QP
2	290.9300	59.09	-28.01	31.08	46.00	-14.92	QP
3	418.0000	57.17	-24.59	32.58	46.00	-13.42	QP
4	874.8700	55.39	-17.24	38.15	46.00	-7.85	QP
5	960.2300	65.04	-15.41	49.63	54.00	-4.37	QP

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	207.5100	53.93	-27.91	26.02	43.50	-17.48	QP
2	515.9699	51.14	-21.62	29.52	46.00	-16.48	QP
3	565.4400	51.03	-21.32	29.71	46.00	-16.29	QP
4	619.7600	54.49	-20.40	34.09	46.00	-11.91	QP
5	874.8700	48.58	-17.24	31.34	46.00	-14.66	QP
6	960.2300	57.92	-15.41	42.51	54.00	-11.49	QP

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

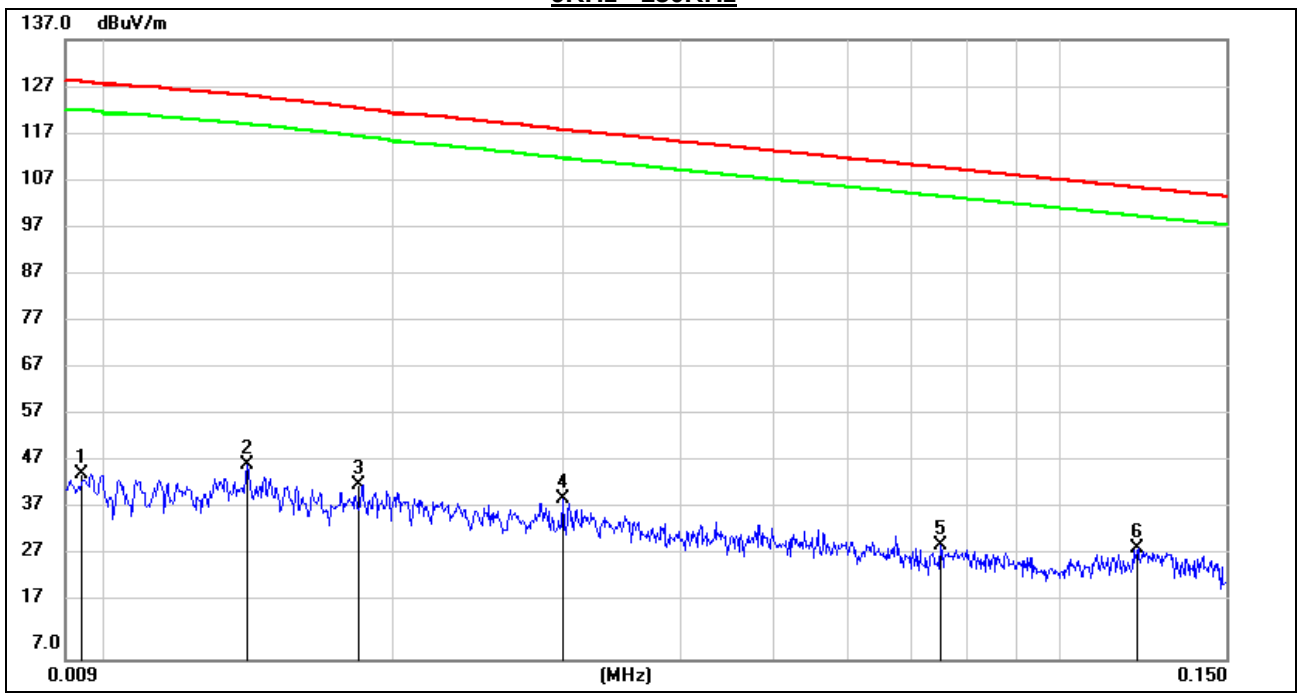
Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

8.5. SPURIOUS EMISSIONS BELOW 30M

8.5.1. 802.11b SISO MODE

SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)

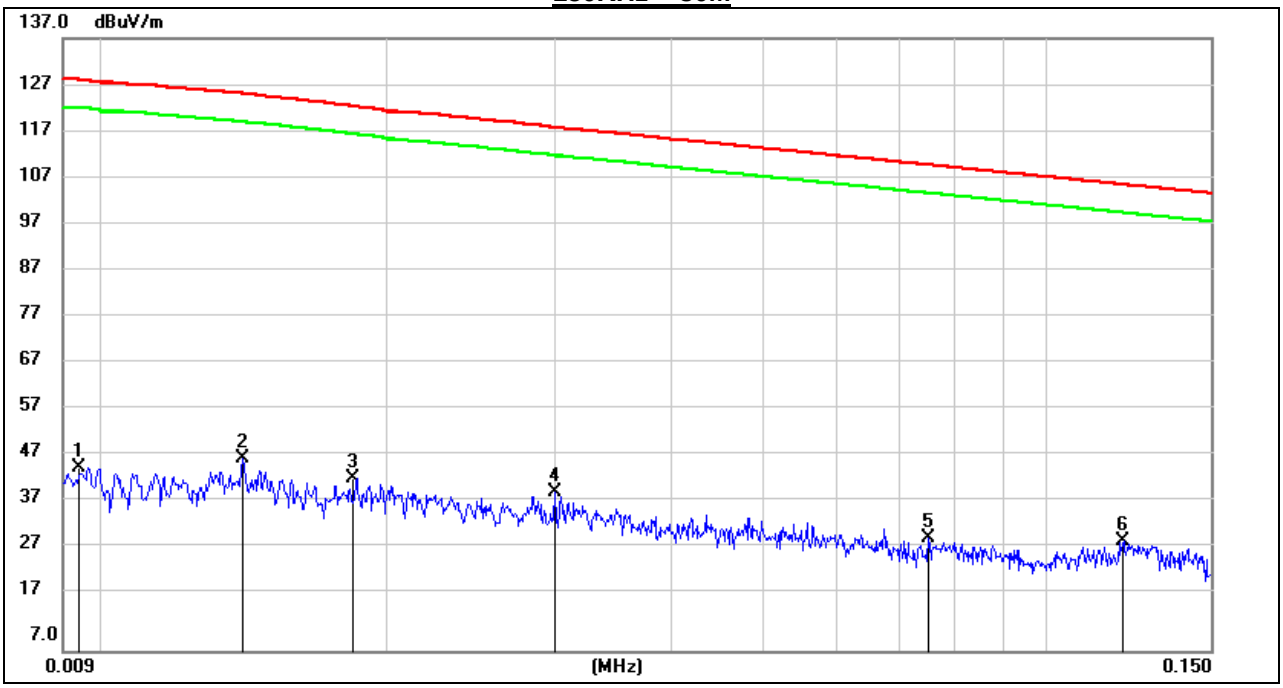
9KHz~ 150KHz



No.	Frequency (KHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0094	25.44	20.26	45.70	128.06	-82.36	QP
2	0.0140	27.42	20.25	47.67	125.19	-77.52	QP
3	0.0183	23.34	20.29	43.63	122.60	-78.97	QP
4	0.0300	20.37	20.31	40.68	118.06	-77.38	QP
5	0.0751	10.43	20.31	30.74	110.11	-79.37	QP
6	0.1208	9.91	20.30	30.21	105.96	-75.75	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

150KHz ~ 30M

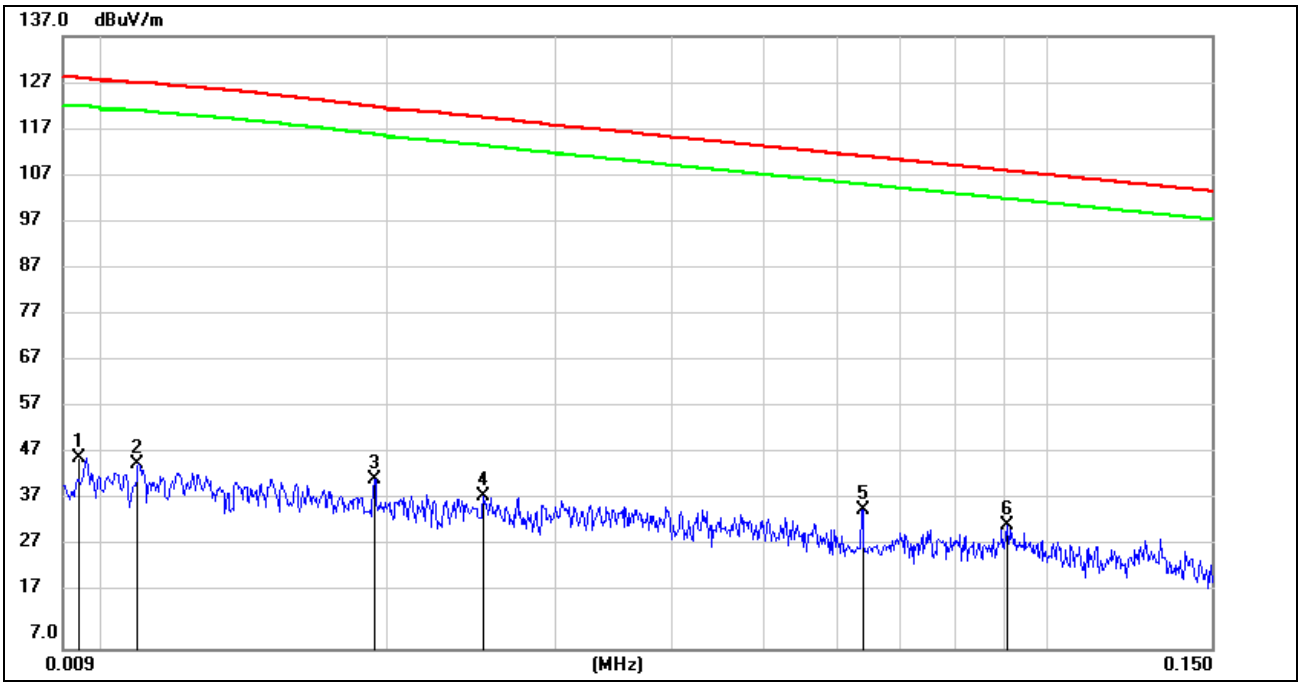


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0094	25.44	20.26	45.70	128.06	-82.36	QP
2	0.0140	27.42	20.25	47.67	125.19	-77.52	QP
3	0.0183	23.34	20.29	43.63	122.60	-78.97	QP
4	0.0300	20.37	20.31	40.68	118.06	-77.38	QP
5	0.0751	10.43	20.31	30.74	110.11	-79.37	QP
6	0.1208	9.91	20.30	30.21	105.96	-75.75	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)

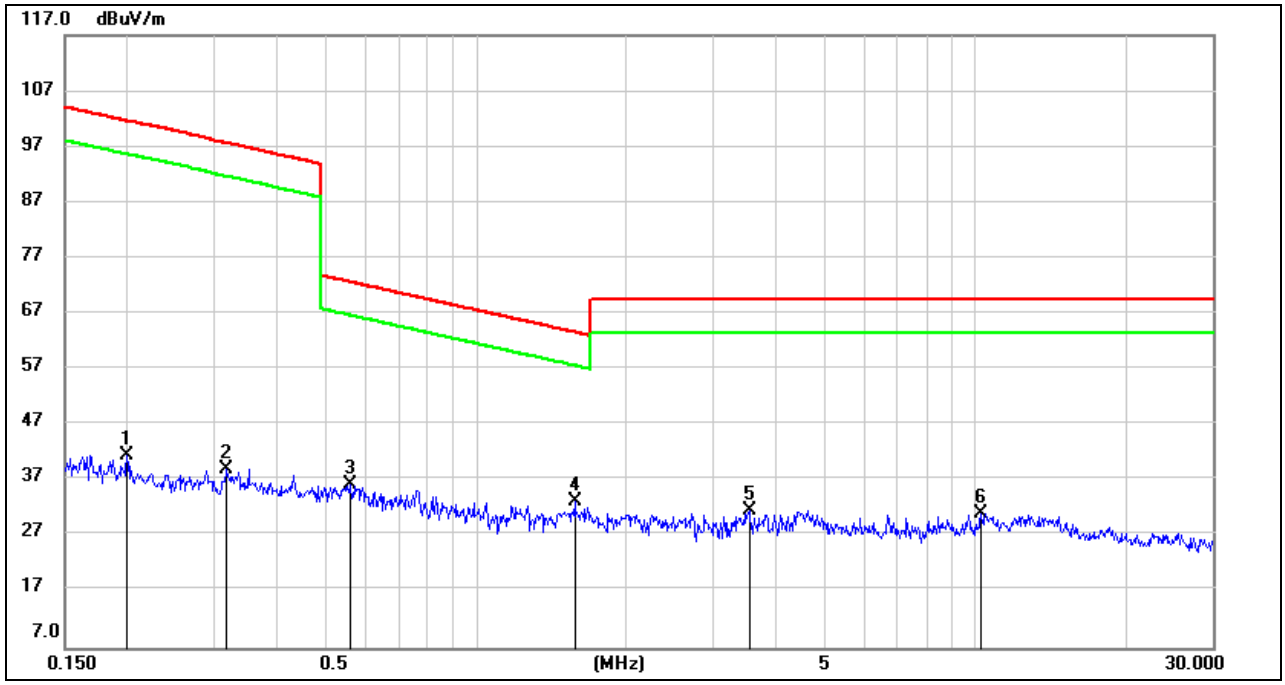
9KHz~ 150KHz



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0094	27.12	20.26	47.38	128.06	-80.68	QP
2	0.0108	25.96	20.22	46.18	127.12	-80.94	QP
3	0.0193	22.68	20.30	42.98	122.00	-79.02	QP
4	0.0252	19.01	20.31	39.32	119.75	-80.43	QP
5	0.0637	16.10	20.31	36.41	111.54	-75.13	QP
6	0.0908	13.06	20.26	33.32	108.45	-75.13	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

150KHz ~ 30M



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1995	21.05	20.37	41.42	101.60	-60.18	QP
2	0.3165	18.77	20.30	39.07	97.65	-58.58	QP
3	0.5581	16.00	20.26	36.26	72.71	-36.45	QP
4	1.5766	12.69	20.58	33.27	63.65	-30.38	QP
5	3.5278	10.67	20.98	31.65	69.54	-37.89	QP
6	10.2873	9.91	21.05	30.96	69.54	-38.58	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

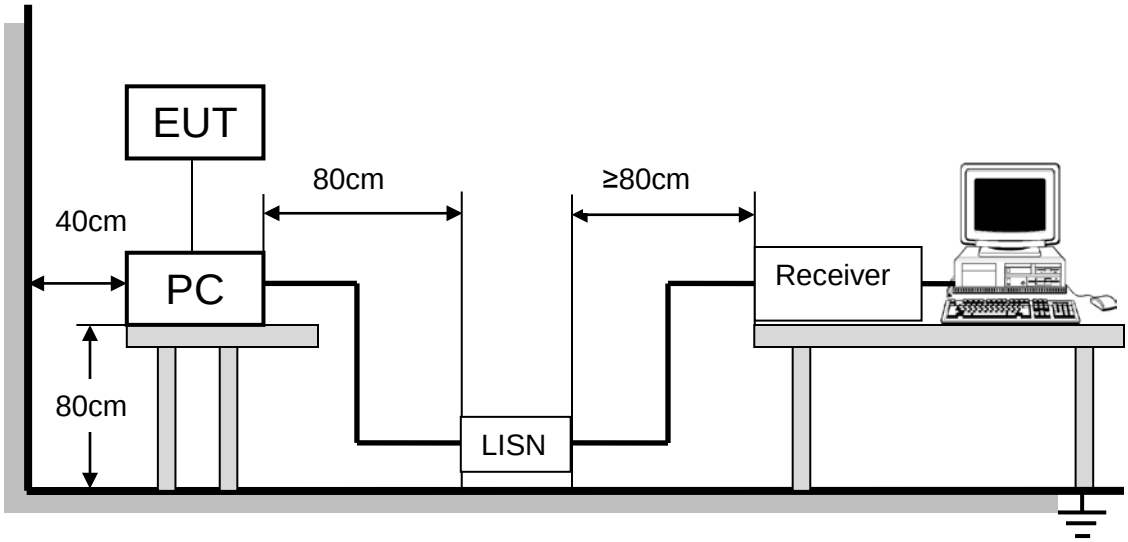
9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

Please refer to FCC §15.207 (a) and RSS-Gen Clause 8.8.

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

TEST SETUP AND PROCEDURE



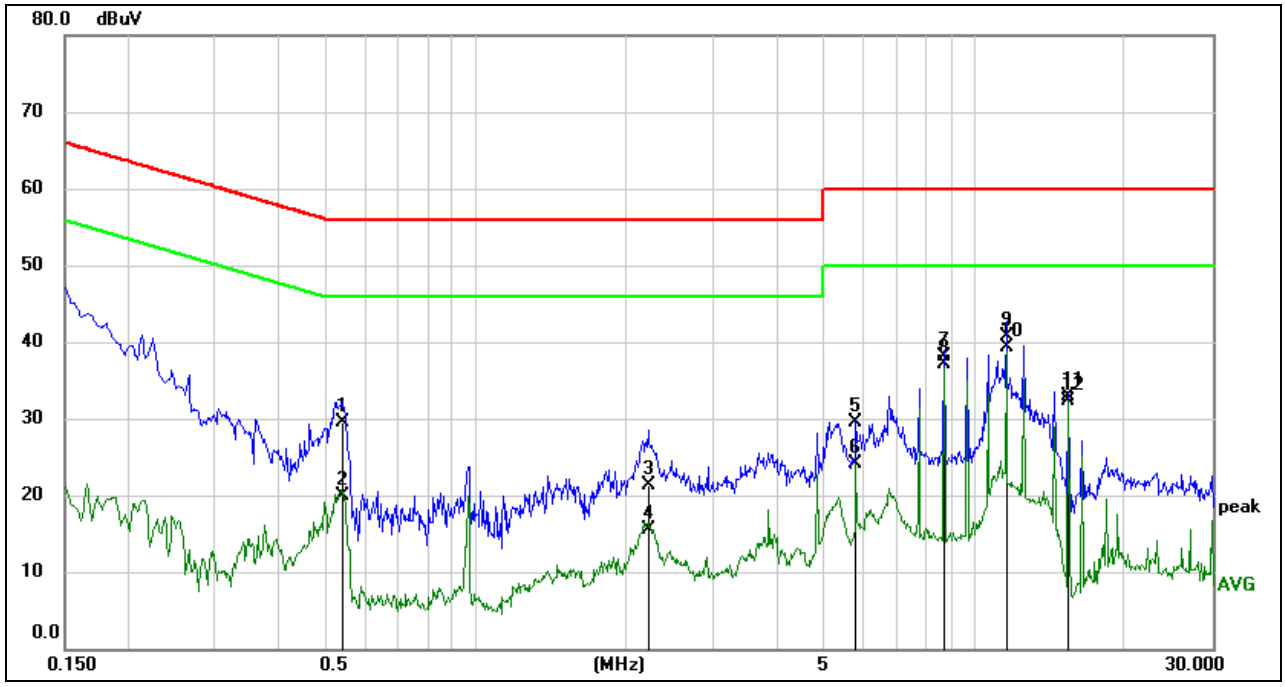
The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10 -2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST RESULTS

9.1.1. 802.11b SISO MODE

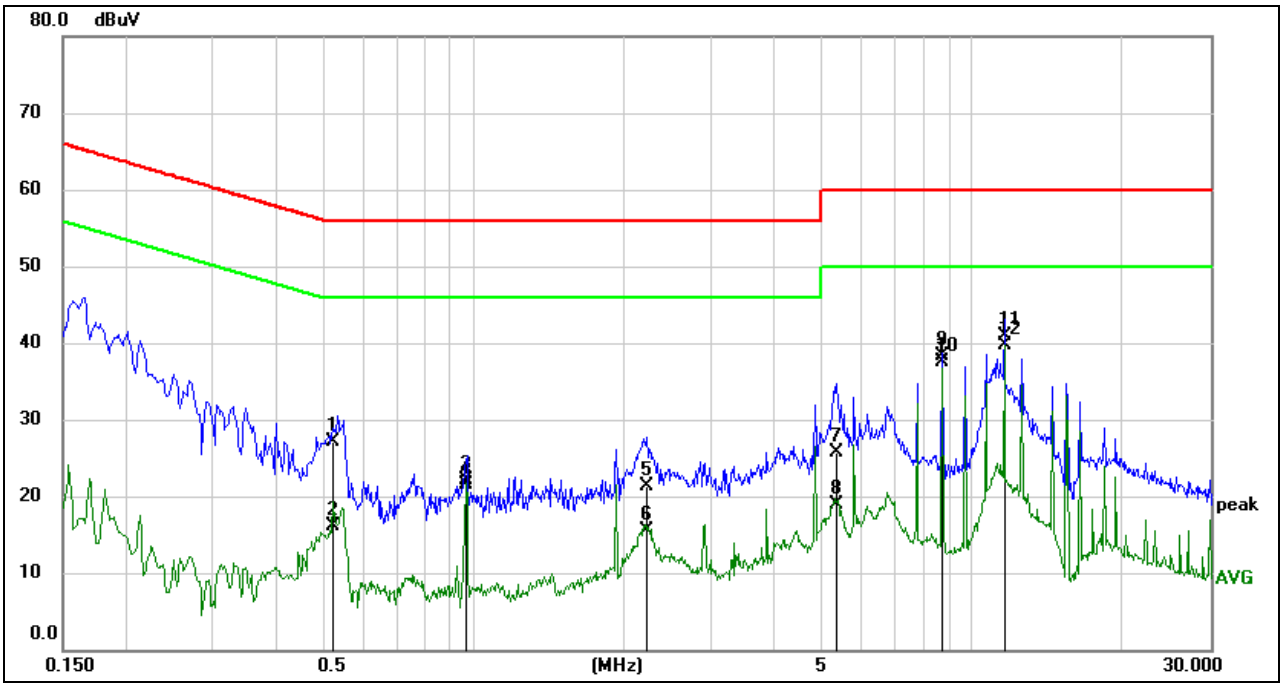
LINE N RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5416	19.94	9.65	29.59	56.00	-26.41	QP
2	0.5416	10.19	9.65	19.84	46.00	-26.16	AVG
3	2.2234	11.70	9.67	21.37	56.00	-34.63	QP
4	2.2234	5.84	9.67	15.51	46.00	-30.49	AVG
5	5.8018	19.74	9.73	29.47	60.00	-30.53	QP
6	5.8018	14.32	9.73	24.05	50.00	-25.95	AVG
7	8.7012	28.38	9.77	38.15	60.00	-21.85	QP
8	8.7012	27.33	9.77	37.10	50.00	-12.90	AVG
9	11.6006	30.83	9.80	40.63	60.00	-19.37	QP
10	11.6006	29.54	9.80	39.34	50.00	-10.66	AVG
11	15.4657	23.01	9.84	32.85	60.00	-27.15	QP
12	15.4657	22.44	9.84	32.28	50.00	-17.72	AVG

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

LINE L RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.5248	17.38	9.65	27.03	56.00	-28.97	QP
2	0.5248	6.46	9.65	16.11	46.00	-29.89	AVG
3	0.9657	12.52	9.66	22.18	56.00	-33.82	QP
4	0.9657	11.94	9.66	21.60	46.00	-24.40	AVG
5	2.2076	11.71	9.68	21.39	56.00	-34.61	QP
6	2.2076	5.74	9.68	15.42	46.00	-30.58	AVG
7	5.3516	15.98	9.72	25.70	60.00	-34.30	QP
8	5.3516	9.18	9.72	18.90	50.00	-31.10	AVG
9	8.7010	28.52	9.77	38.29	60.00	-21.71	QP
10	8.7010	27.73	9.77	37.50	50.00	-12.50	AVG
11	11.6016	31.13	9.80	40.93	60.00	-19.07	QP
12	11.6016	29.86	9.80	39.66	50.00	-10.34	AVG

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

10. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §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. 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.

Please refer to FCC §15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ANTENNA CONNECTOR

EUT has an external antenna with antenna connector, it will be installed in a specific environment and users cannot change the antenna.

ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

END OF REPORT