Report No.: 160720149GZU-001
Issued: 2016-12-06

TEST REPORT

Applicant Name & Address	:	SUNWAY INDUSTRIES(HONG KONG)CO.LTD UNIT C, 16/F., CHINAWEAL CENTRE, 414-424 JAFFE ROAD, WANCHAI, HONG KONG
Sample Description		
Product	:	Kitchen Machine (Cooking Blender)
FCC ID	:	2AJMC-1280025848821
Model No.	:	SPM-128L
Electrical Rating	:	AC 120V/60Hz
Date Received	:	22 July 2016
Date Test Conducted	:	23 July 2016 – 30 October 2016
Test standards	:	**47 CFR PART 15 Subpart C: 2015 section 15.247**
Test Result	:	Pass
Conclusion	:	The submitted samples complied with the above rules/standards.
Remark	:	TRF No.: FCC WIFI-a Effective date: 01 July 2016

Prepared and Checked By:

Sky Zhu

Sky Zhu
Project Engineer
Intertek Guangzhou

Approved By:

Helen Ma ***Signature***

Helen Ma
Team Leader
Intertek Guangzhou
06 December 2016 Date

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1.0 Summary of Test

TEST	TEST REQUIREMENT	TEST METHOD	RESULT
Antenna Requirement	FCC PART 15 C section 15.247 (c) and Section 15.203	FCC PART 15 C section 15.247 (c) and Section 15.203	PASS
6 dB Bandwidth (DTS bandwidth)	FCC PART 15 C section 15.247 (a)(2)	ANSI C63.10: Clause 11.8	PASS
Maximum Peak Conducted Output Power	FCC PART 15 C section 15.247(b)(3)	ANSI C63.10: Clause 11.9.1.2	PASS
Peak Power Spectral Density	FCC PART 15 C section 15.247(e)	ANSI C63.10: Clause 11.10.2	PASS
Out of Band Conducted Emissions	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10: Clause 11.11	PASS
Out of Band Radiated Emission	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10: Clause 11.11, 6.4, 6.5 and 6.6	N/A
Radiated Emissions in Restricted Bands	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10: Clause 11.12.1, 6.4, 6.5 and 6.6	PASS
Band Edges Measurement	FCC PART 15 C section 15.247 (d) &15.205	ANSI C63.10: Clause 11.11 and 11.13	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	PASS

Remark:

N/A: not applicable. Refer to the relative section for the details.
EUT: In this whole report EUT means Equipment Under Test.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.
ANSI C63.10: the detail version is ANSI C63.10:2013 in the whole report.

2.0 General Description

2.1 Product Description

Operating Frequency	2412 MHz to 2462 MHz for 802.11b/g/n(HT20) 2422 MHz to 2452 MHz for 802.11n(HT40)
Type of Modulation:	802.11b: DSSS(CCK/QPSK/BPSK) 802.11g: OFDM(BPSK/QPSK/16QAM/64QAM) 802.11n: OFDM (BPSK/QPSK/16QAM/64QAM)
Transmit Data Rate:	802.11b :1/2/5.5/11 Mbps 802.11g :6/9/12/18/24/36/48/54 Mbps 802.11n(HT20): 6.5/13/19.5/26/39/52/58.5/65 /72.2Mbps 802.11n(HT40): 13.5/27/40.5/54/81/108/121.5/135 Mbps
Number of Channels	11 Channels for 802.11b/g/n(HT20) 7 Channels for 802.11n(HT40)
Channel Separation:	5 MHz
Antenna Type	Integral Antenna
Antenna gain:	1.5 dBi
Function:	Communication with 2.4 GHz WIFI
EUT Power Supply:	AC 120V 60 Hz
Power cord:	1.1 m x 3 wires unscreened AC supply cable

EUT channels and frequencies list:

For 802.11b/g/n(HT20): test frequencies are lowest channel 1: 2412 MHz, middle channel 6: 2437 MHz and highest channel 11: 2462 MHz.

For 802.11n(HT40): test frequencies are lowest channel 3: 2422 MHz, middle channel 6: 2437 MHz and highest channel 9: 2452 MHz

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

2.2 Related Submittal(s) Grants

This is an application for certification of:
DTS- Part 15 Digital Transmission Systems (WIFI transmitter portion)
Remaining portions are subject to the following procedures:
1. Receiver portion of WIFI: exempt from technical requirement of this Part.
2. The food maker function: exempt from FCC requirement.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10:2013. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans and final tests were performed in the semi-anechoic chamber to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise.

2.4 Test Facility

All of the tests are performed at:
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch. Located at Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, 510663, China. This test facility and site measurement data have been fully placed on file with the FCC, test firm registration number is 549654.

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. During testing, AC power line was manipulated to produce worst case emissions. It was powered by AC 120V/60Hz supply.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower.
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower.
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified.

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

3.2 EUT Exercising Software

The test was performed under “MT 7601USB” which was provided by manufacture.

3.3 Special Accessories

No special accessories used.

3.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	RF output power (conducted)	1.1 dB
2	Occupied Channel Bandwidth	2.3%
3	Power Spectral Density	1.5dB
4	Spurious Emission (TX)-Radiated	4.7 dB (25 MHz-1 GHz)
		4.8 dB (1 GHz-18 GHz)
5	Spurious Emission (TX)-Conducted	1.5 dB
6	Spurious Emission (RX) -Radiated	4.7 dB (25 MHz-1 GHz)
		4.8 dB (1 GHz-25 GHz)
7	Spurious Emission (RX)-Conducted	1.5 dB
8	Temperature	0.5 °C
9	Humidity	0.4 %
10	Time	1.2%

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by SUNWAY INDUSTRIES(HONG KONG)CO.LTD.will be incorporated in each production model sold / leased in the United States. No modifications were installed by Intertek Testing Services Shenzhen Ltd. Guangzhou Branch.

3.6 Support Equipment List and Description

This product was tested with corresponding accessories as below:

Supplied by Intertek:

Description	Manufacturer	Model No.	SN/Certificate NO
NoteBook	Lenovo	T143	PB-FR45R

4.0 Measurement Results

4.1 Antenna Requirement:

Standard requirement

15.203 requirement:

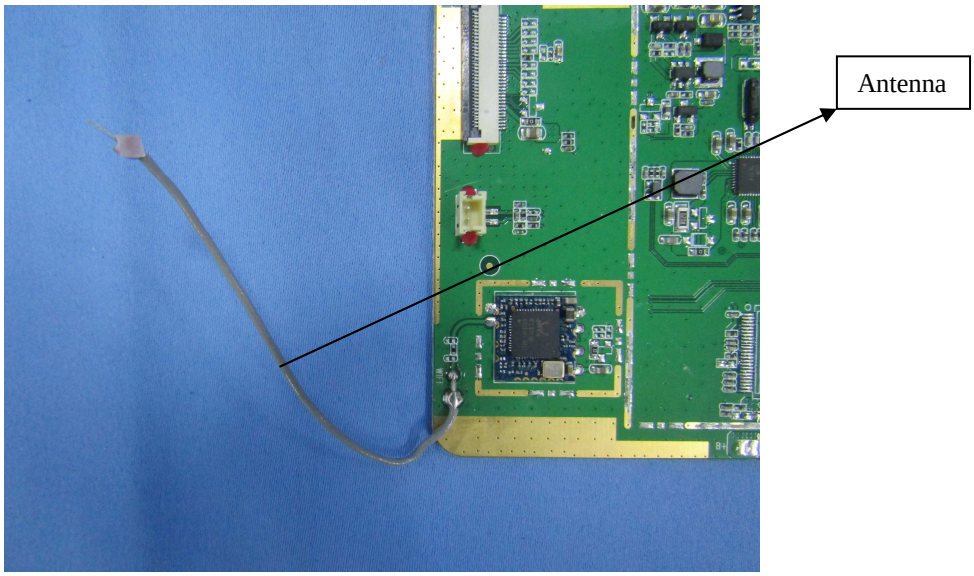
For intentional device. According to 15.203 an intentional radiator shall be designed to Ensure that no antenna other than that furnished by the responsible party shall be used with the device.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz bands that are used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna

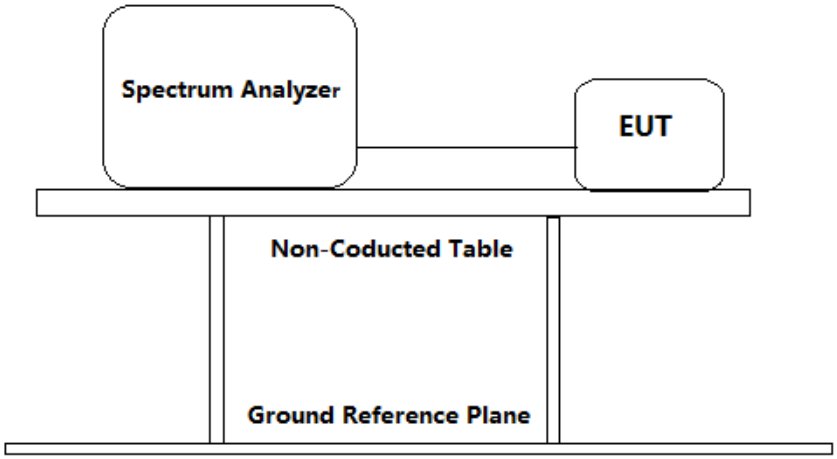
The antenna is an integral antenna and no consideration of replacement. The best case gain of the antenna is 1.5 dBi.



4.2 6 dB Bandwidth (DTS bandwidth):

Test Requirement:	FCC Part 15 C section 15.247 (a)(2)Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10: Clause 11.8
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =0.5 dB) from the antenna port to the spectrum.
2. Set the spectrum analyzer:
   a) Set RBW = 100 kHz
   b) Set the VBW≥ [3 × RBW]
   c) Detector = peak.
   d) Trace mode = max hold.
   e) Sweep = auto couple
   f) Allow the trace to stabilize.
   g) 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 relative to the maximum level measured in the fundamental emission.

h) Span=2*BW~5*BW

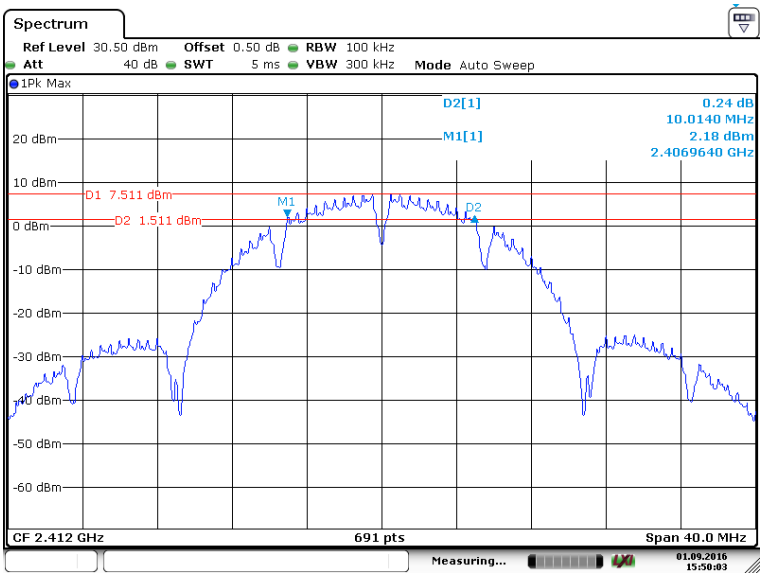
3. Repeat until all the test status is investigated.
4. Report the worst case.

Channel No.	Frequency (MHz)	Mode	Data Rate	Measured 6dB bandwidth (MHz)	Limit	Result
1	2412	802.11b	5.5 Mbps	10.01	≥500KHz	Pass
6	2437		5.5 Mbps	9.96		Pass
11	2462		5.5 Mbps	10.07		Pass
1	2412	802.11g	6 Mbps	16.63		Pass
6	2437		6 Mbps	16.62		Pass
11	2462		6 Mbps	16.49		Pass
1	2412	802.11n (HT20)	65 Mbps	17.90		Pass
6	2437		65 Mbps	17.83		Pass
11	2462		65 Mbps	17.84		Pass
3	2422	802.11n (HT40)	135 Mbps	36.47		Pass
6	2437		135 Mbps	36.43		Pass
9	2452		135 Mbps	36.54		Pass

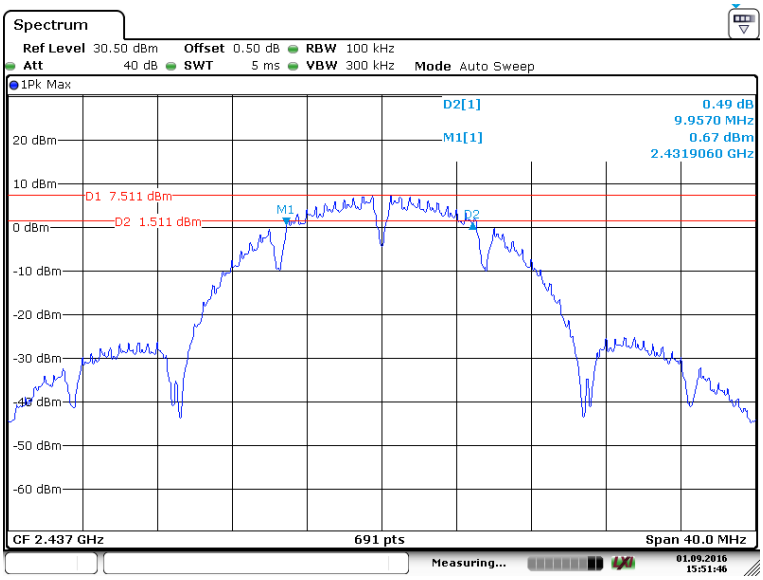
Test result: The unit does meet the FCC requirements.

Result plot as follows:

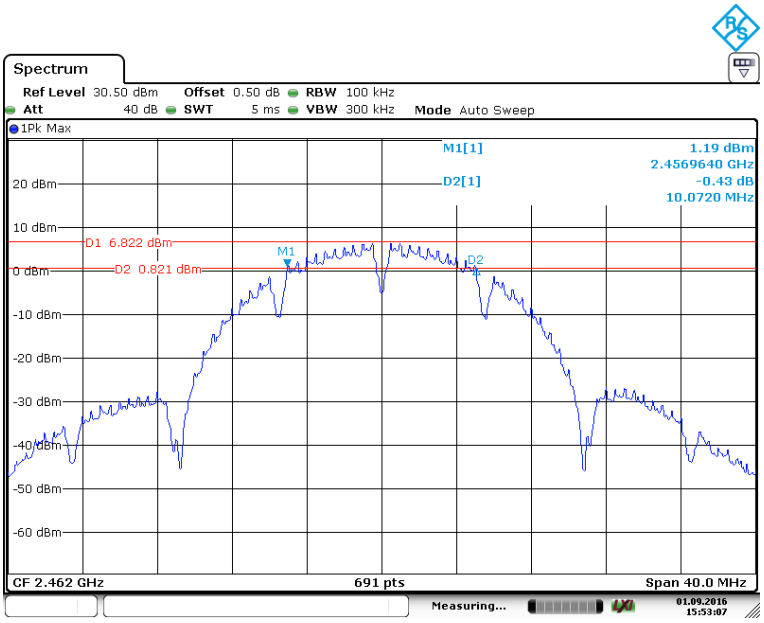
802.11b mode
Channel 1: 2.412GHz:



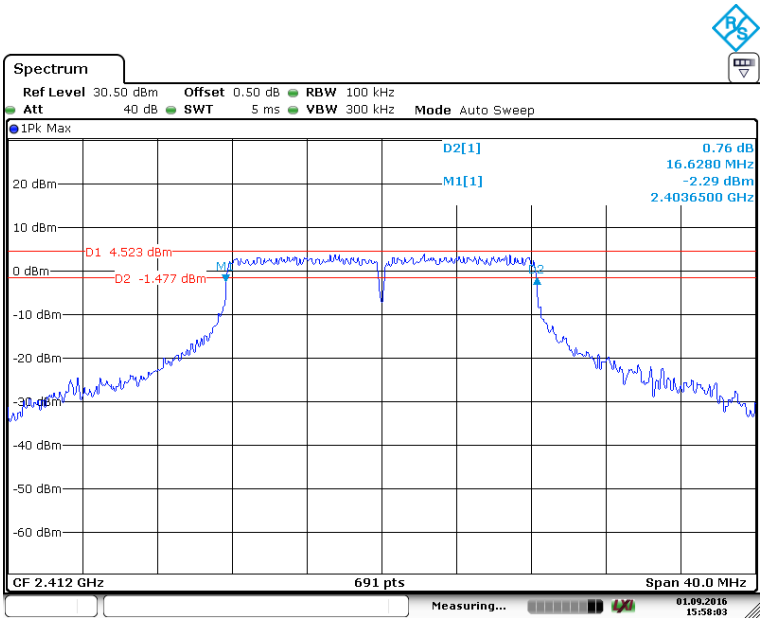
Channel 6: 2.437GHz:



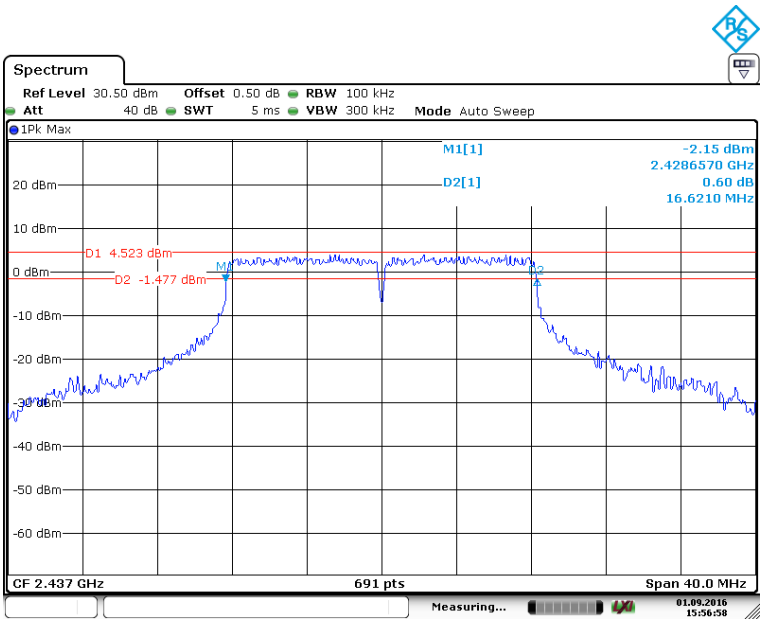
Channel 11: 2.462GHz



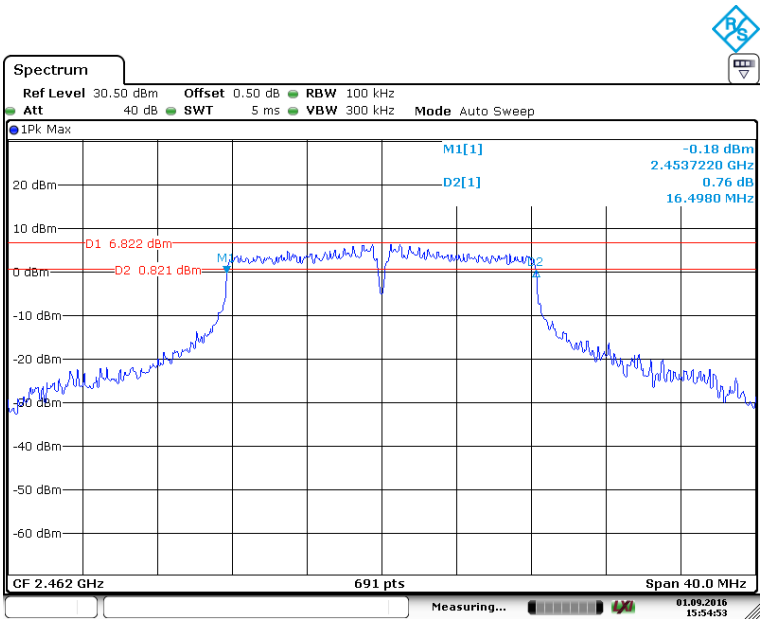
802.11g mode
Channel 1: 2.412GHz:



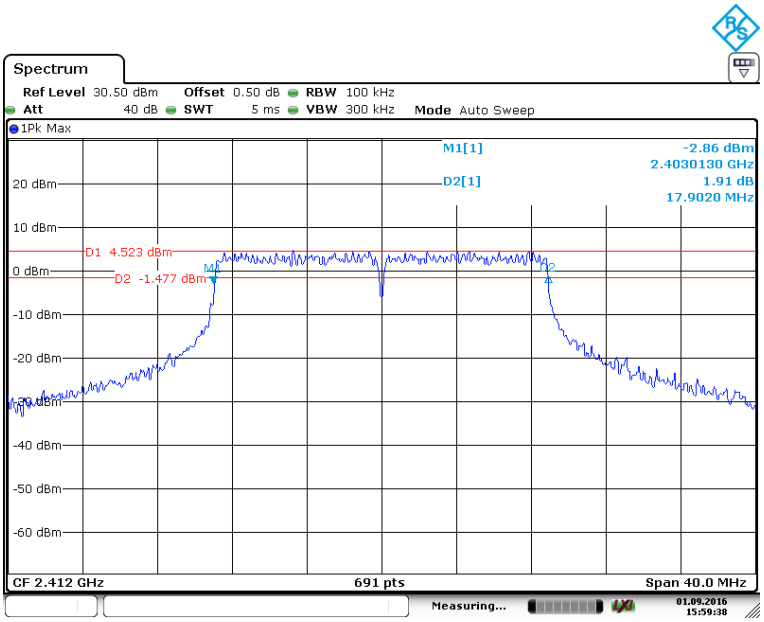
Channel 6: 2.437GHz:



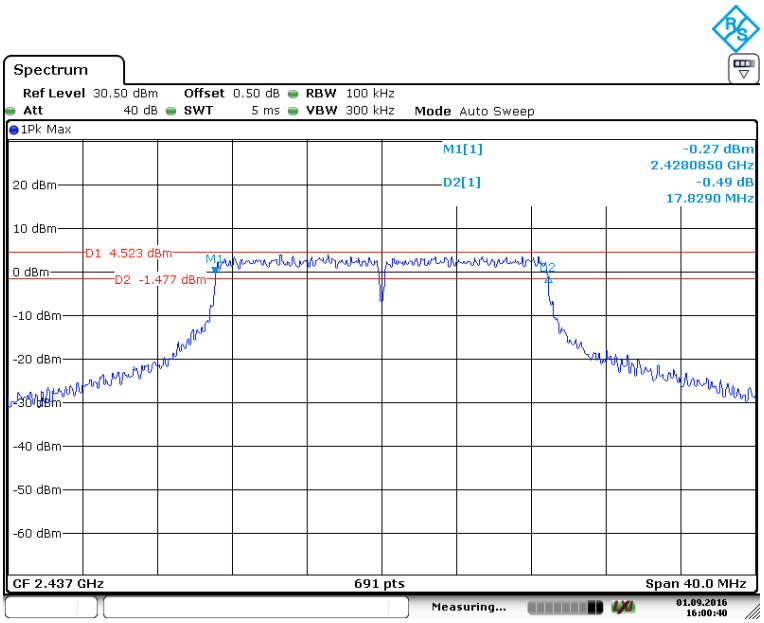
Channel 11: 2.462GHz:



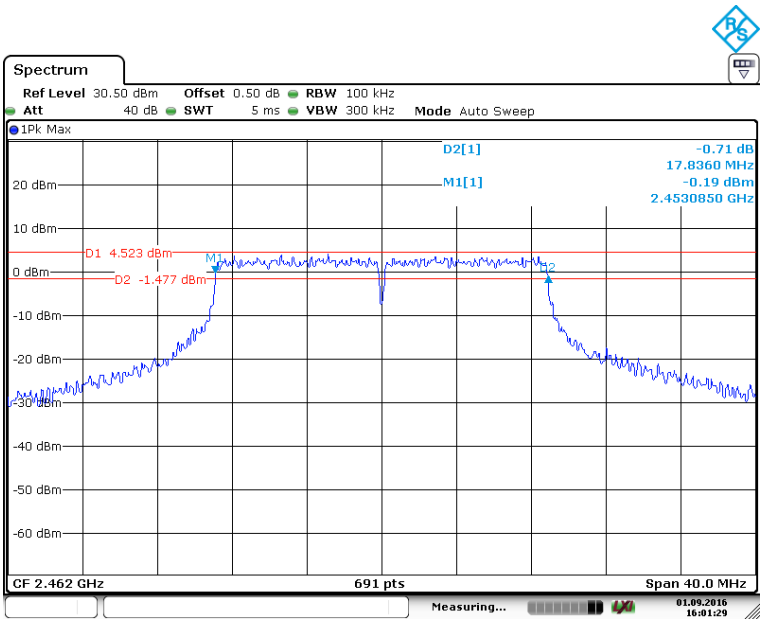
802.11n(HT20) mode
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

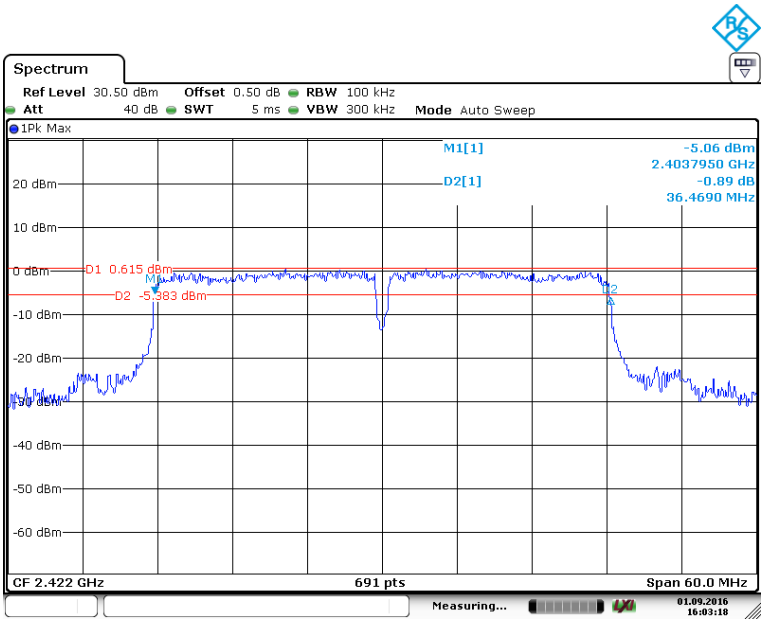


Channel 11: 2.462GHz:

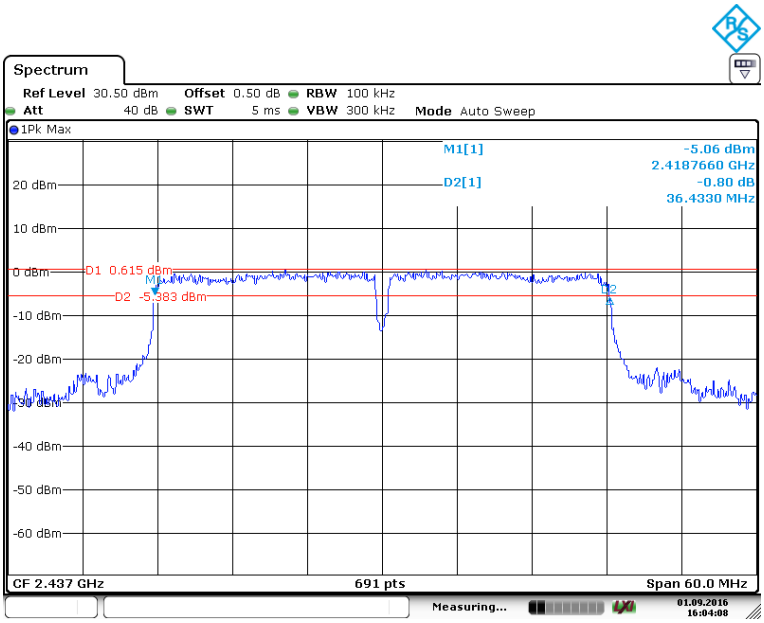


802.11n(HT40) mode

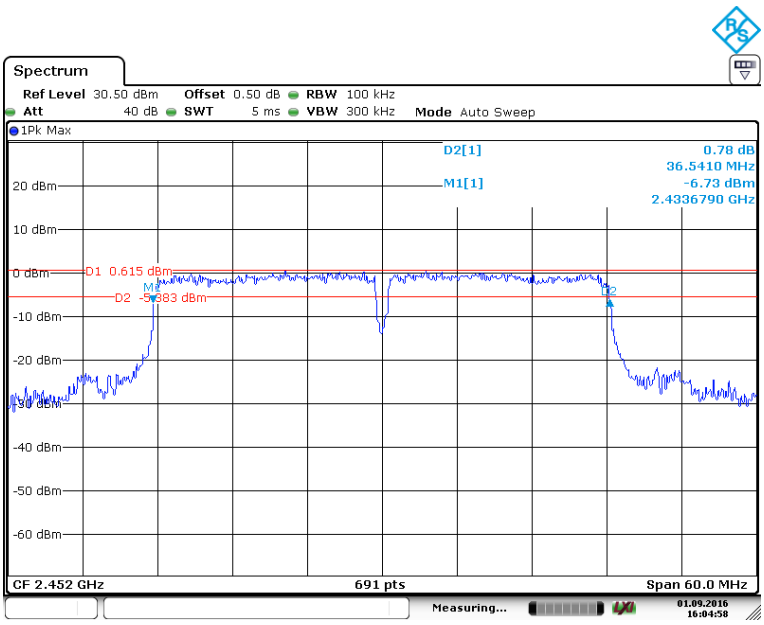
Channel 3: 2.422GHz:



Channel 6: 2.437GHz:



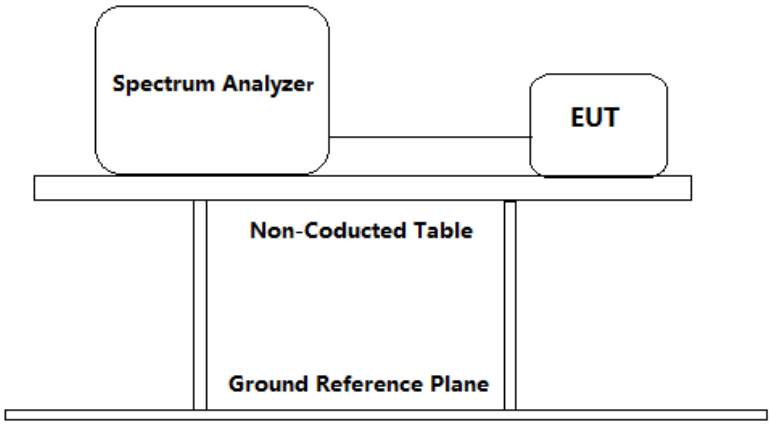
Channel 9: 2.452GHz:



4.3 Maximum Peak Conducted Output Power

Test Requirement:	FCC Part 15 C section 15.247 (b)(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. 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.
Test Method:	ANSI C63.10: Clause 11.9.1.2(Integrated band power method)
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =1 dB) from the antenna port to the spectrum.
2. Set the spectrum analyzer:
   a) Set the RBW = 1 MHz.
   b) Set the VBW⩾[3 × RBW].
   c) Set the span⩾[1.5 × DTS bandwidth].
   d) Detector = peak.
   e) Sweep time = auto couple.
   f) Trace mode = max hold.
   g) Allow trace to fully stabilize.
   h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges.
3. Repeat until all the test status is investigated.
4. Report the worst case.

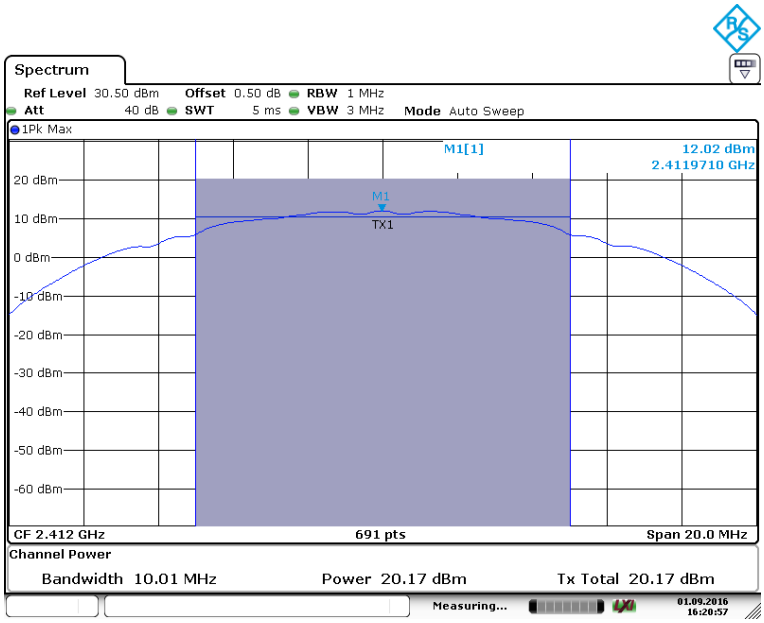
Test result:

Channel No.	Frequency (MHz)	Mode	Data Rate	Measured Channel Power (dBm)	Limit	Result
1	2412	802.11b	11 Mbps	20.17	1W (30dBm)	Pass
6	2437		11 Mbps	19.88		Pass
11	2462		11 Mbps	19.20		Pass
1	2412	802.11g	9 Mbps	20.26		Pass
6	2437		9 Mbps	20.34		Pass
11	2462		9 Mbps	20.63		Pass
1	2412	802.11n (HT20)	6.5 Mbps	20.55		Pass
6	2437		6.5 Mbps	20.68		Pass
11	2462		6.5 Mbps	20.75		Pass
3	2422	802.11n (HT40)	135 Mbps	19.70		Pass
6	2437		135 Mbps	19.70		Pass
9	2452		135 Mbps	20.02		Pass

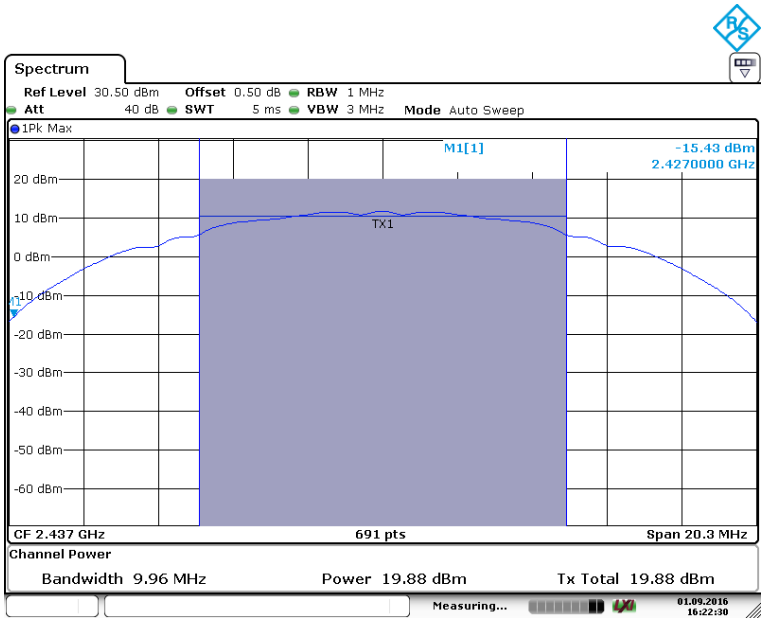
Remark: Level = Read Level + Cable Loss (0.5 dB).
The unit does meet the FCC requirements.

Result plot as follows:

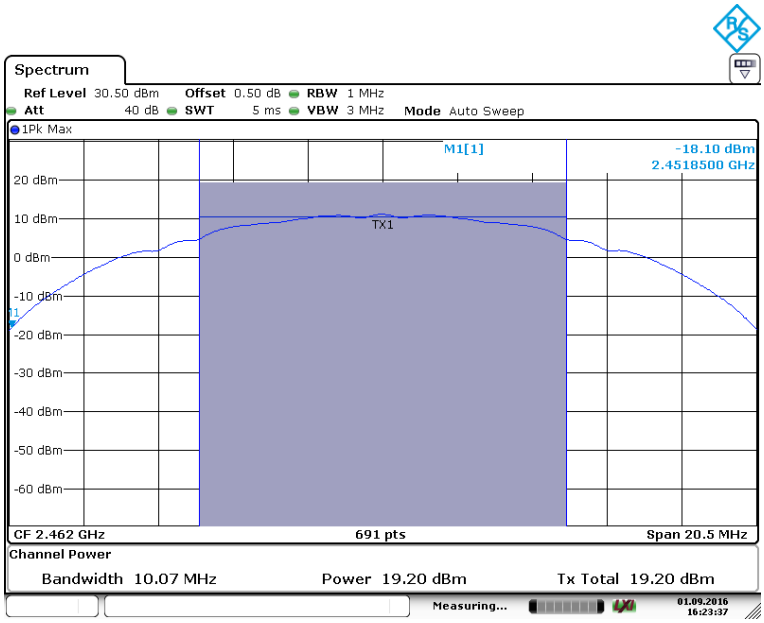
802.11b mode
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

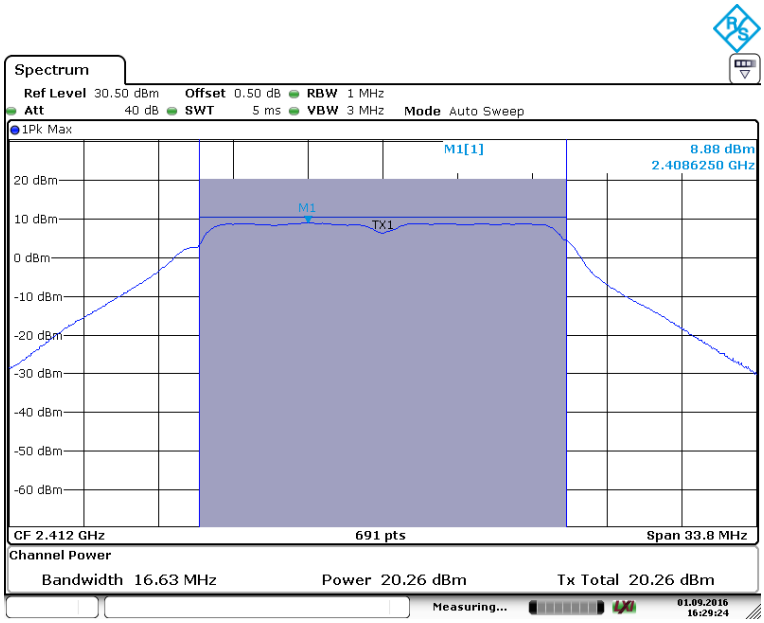


Channel 11: 2.462GHz:

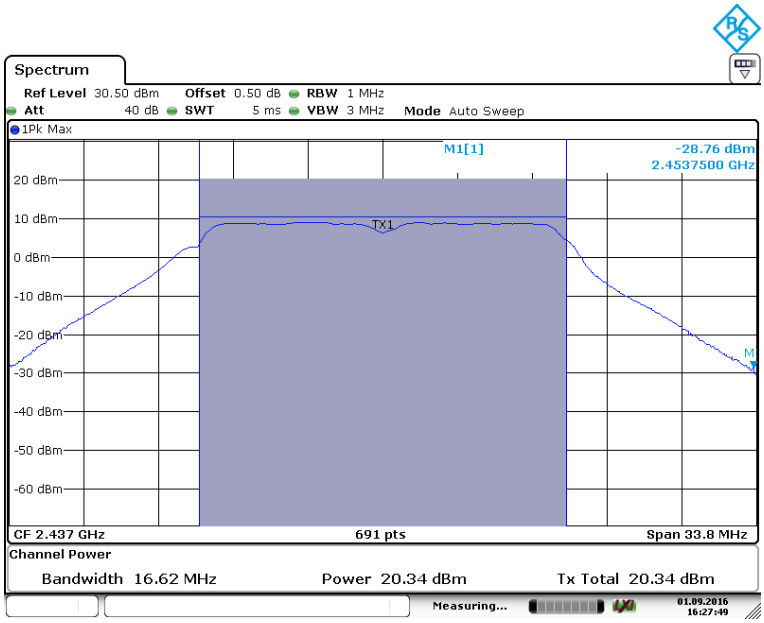


802.11g mode

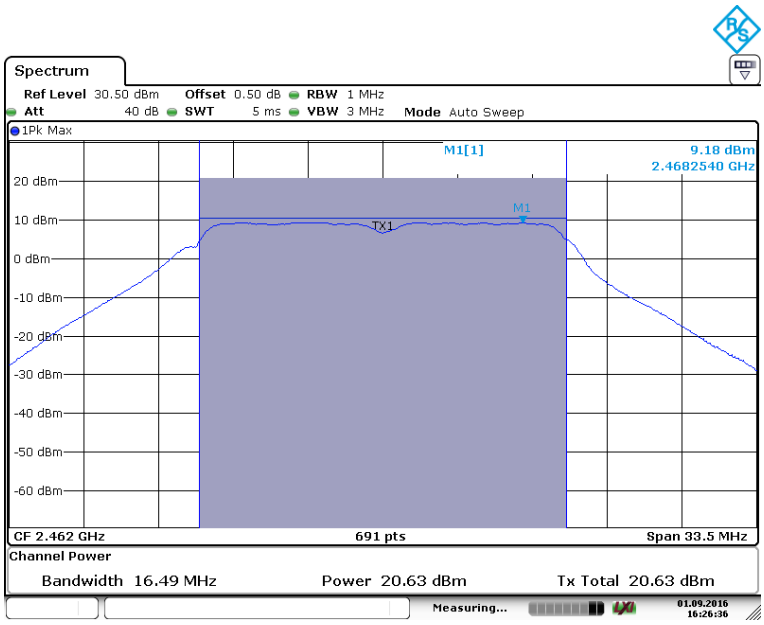
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

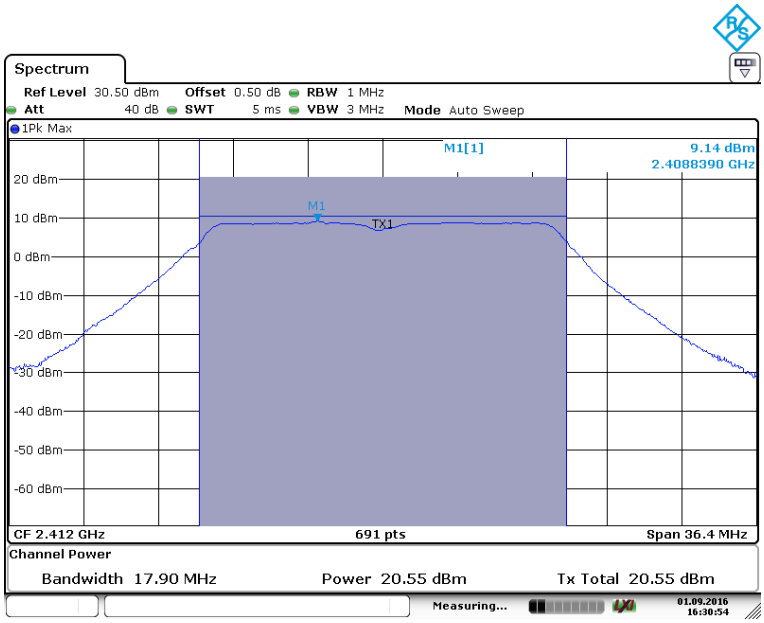


Channel 11: 2.462GHz:

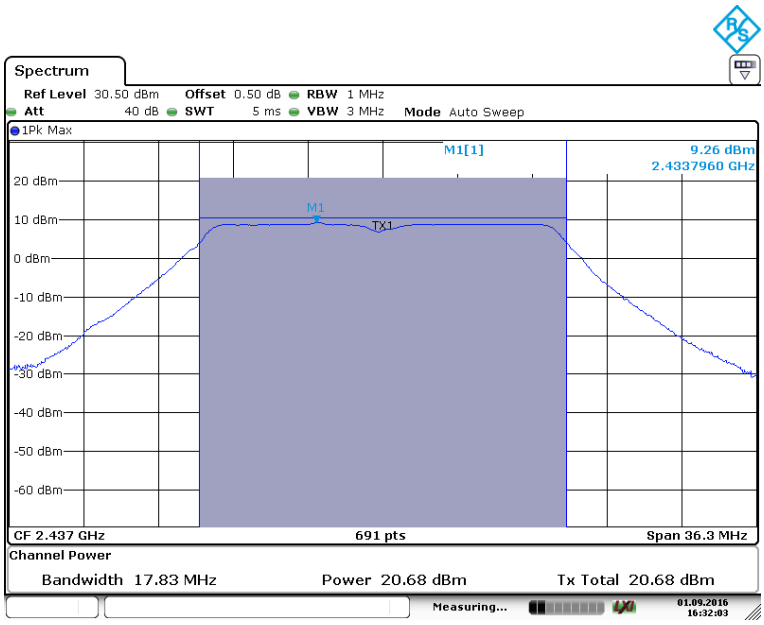


802.11n(HT20) mode

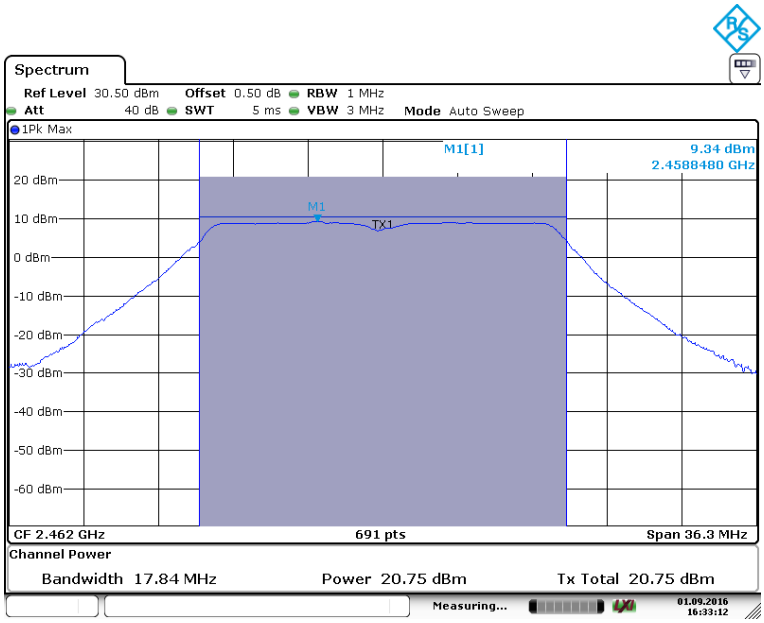
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

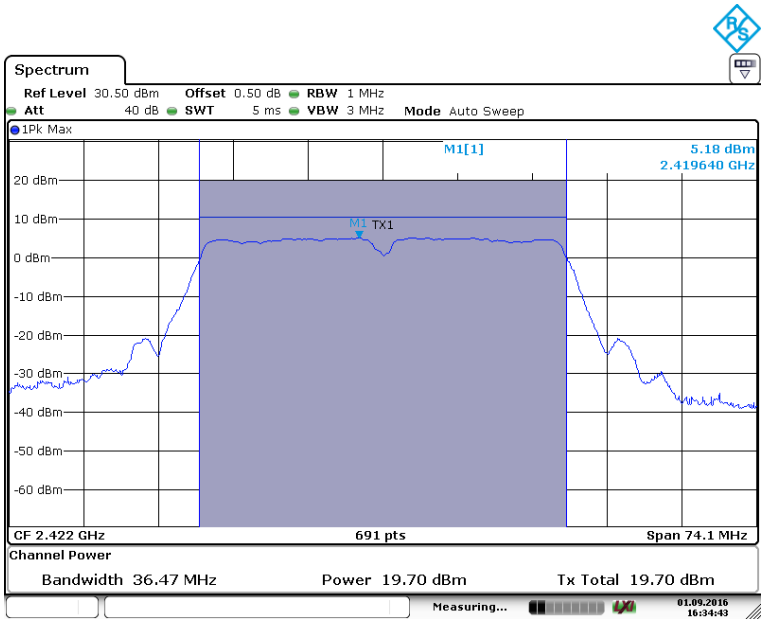


Channel 11: 2.462GHz:

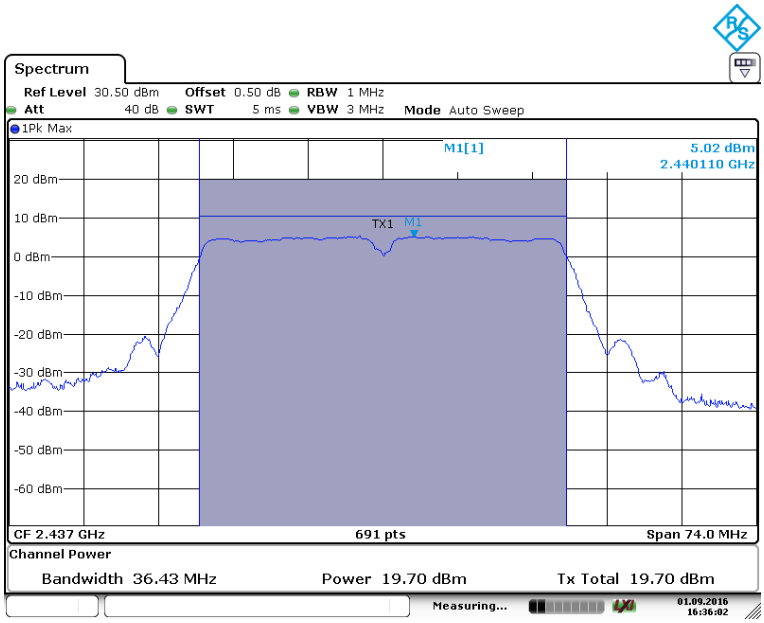


802.11n(HT40) mode

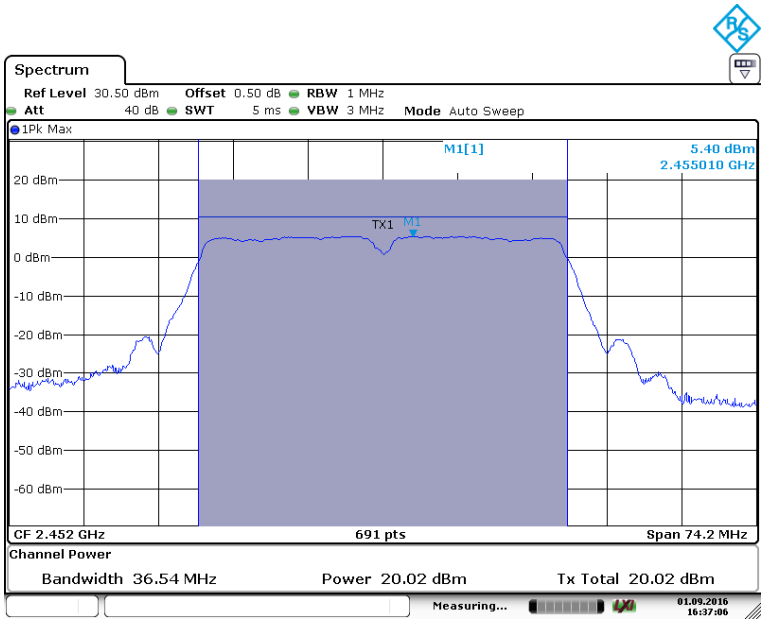
Channel 3: 2.422GHz:



Channel 6: 2.437GHz:



Channel 9: 2.452GHz:



4.4 Peak Power Spectral Density

Test Requirement: FCC Part 15 C section 15.247

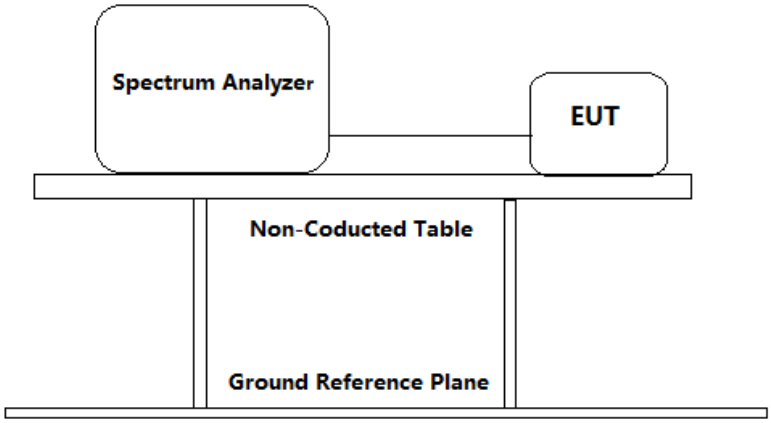
(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Method: ANSI C63.10: Clause 11.10.2

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =0.5 dB) from the antenna port to the spectrum analyzer or power meter.
2. Set the spectrum analyzer:
   a) Set analyzer center frequency to DTS channel center frequency.
   b) Set the span= 1.5 × DTS bandwidth.
   c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
   d) Set the VBW ≥ [3 × RBW].
   e) Detector = peak.
   f) Sweep time = auto couple.
   g) Trace mode = max hold.
   h) Allow trace to fully stabilize.
   i) Use the peak marker function to determine the maximum amplitude level within the RBW.
   j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
3. Measure the Power Spectral Density of the test frequency with special test status.
4. Repeat until all the test status is investigated.
5. Report the worst case.

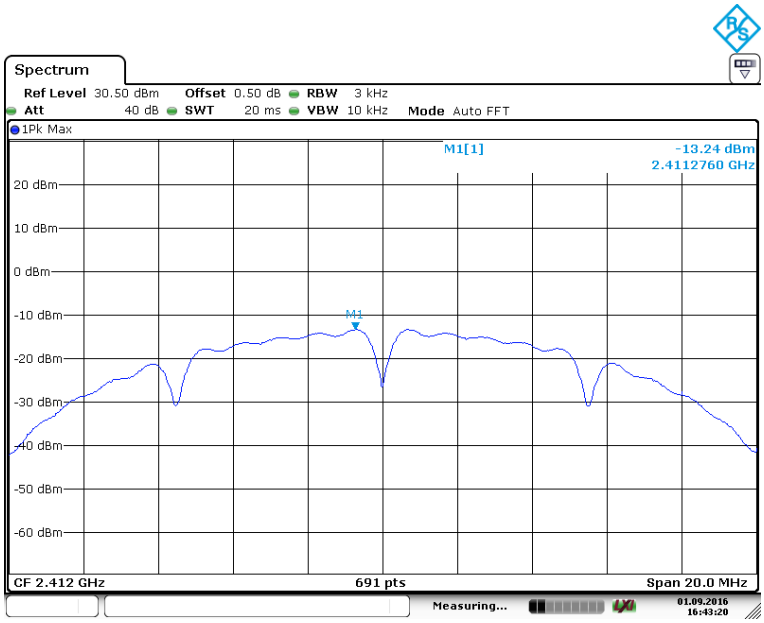
Channel No.	Frequency (MHz)	Mode	Data Rate	Measured Peak Power Spectral Density (dBm/3kHz)	Limit	Result
1	2412	802.11b	11 Mbps	-13.24	8dBm/ 3 kHz	Pass
6	2437		11 Mbps	-13.30		Pass
11	2462		11 Mbps	-13.97		Pass
1	2412	802.11g	9 Mbps	-16.14		Pass
6	2437		9 Mbps	-16.23		Pass
11	2462		9 Mbps	-16.26		Pass
1	2412	802.11n (HT20)	6.5 Mbps	-15.27		Pass
6	2437		6.5 Mbps	-15.17		Pass
11	2462		6.5 Mbps	-15.26		Pass
3	2422	802.11n (HT40)	135 Mbps	-16.55		Pass
6	2437		135 Mbps	-16.41		Pass
9	2452		135 Mbps	-16.39		Pass

Test result: Level = Read Level + Cable Loss (0.5dB).
The unit does meet the FCC requirements.

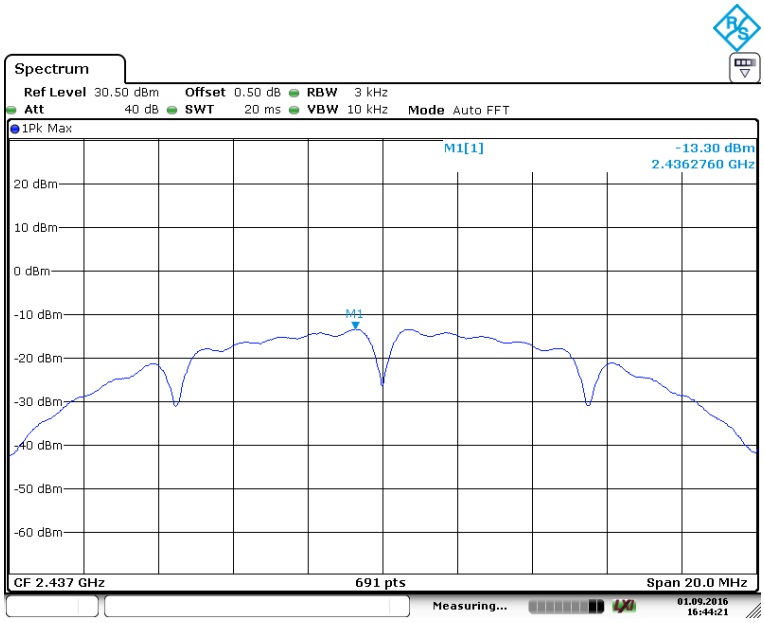
Result plot as follows:

802.11b mode

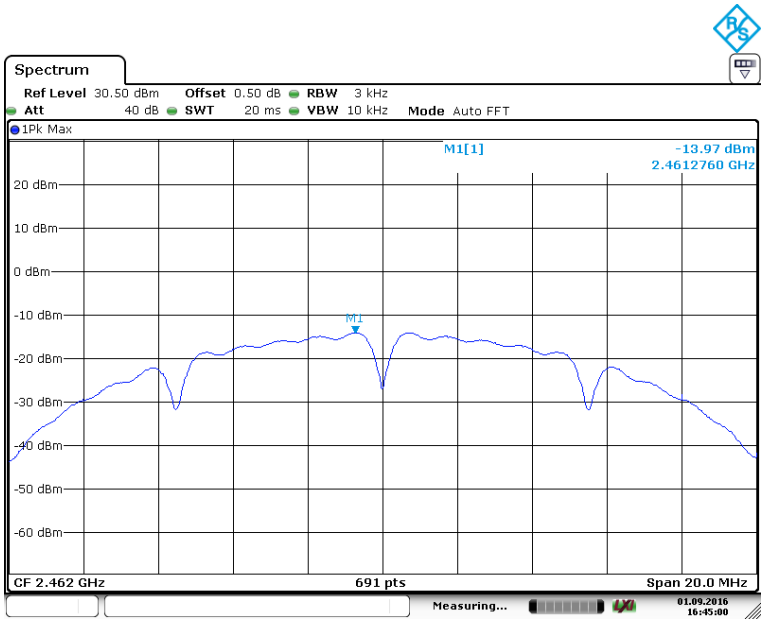
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

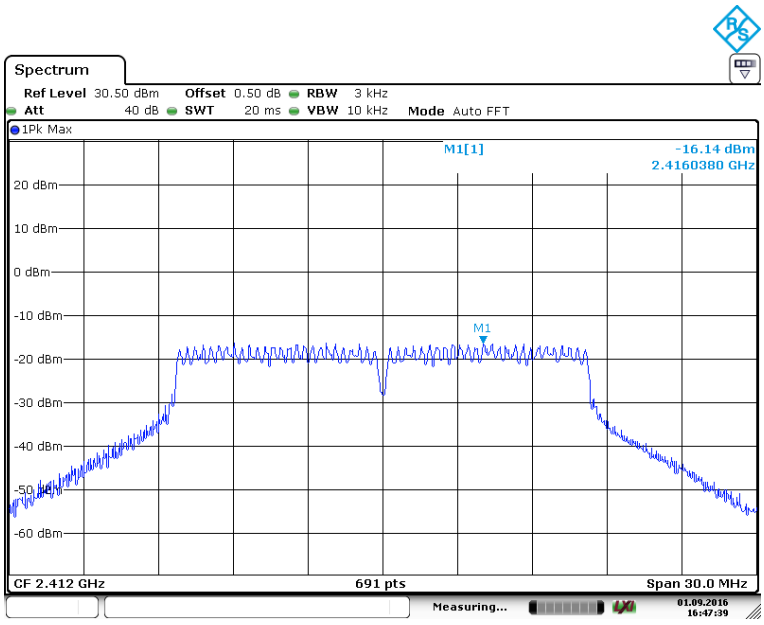


Channel 11: 2.462GHz:

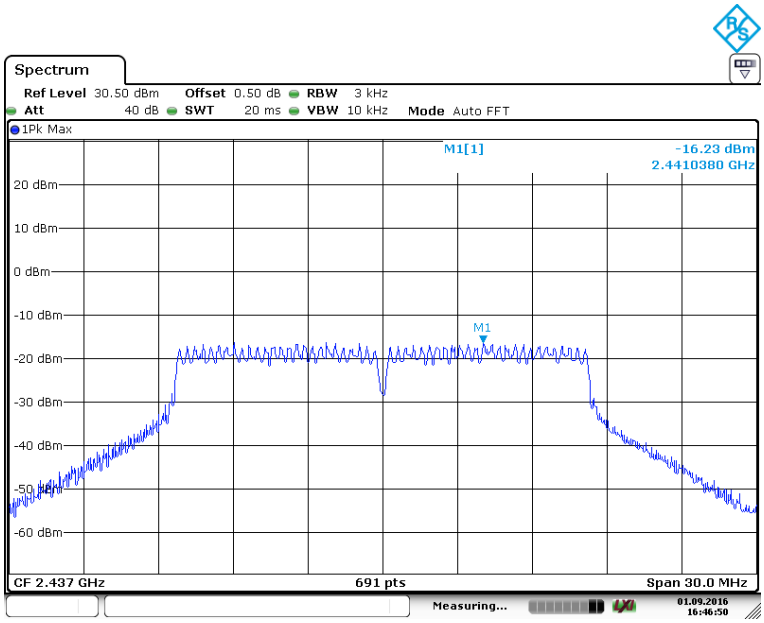


802.11g mode

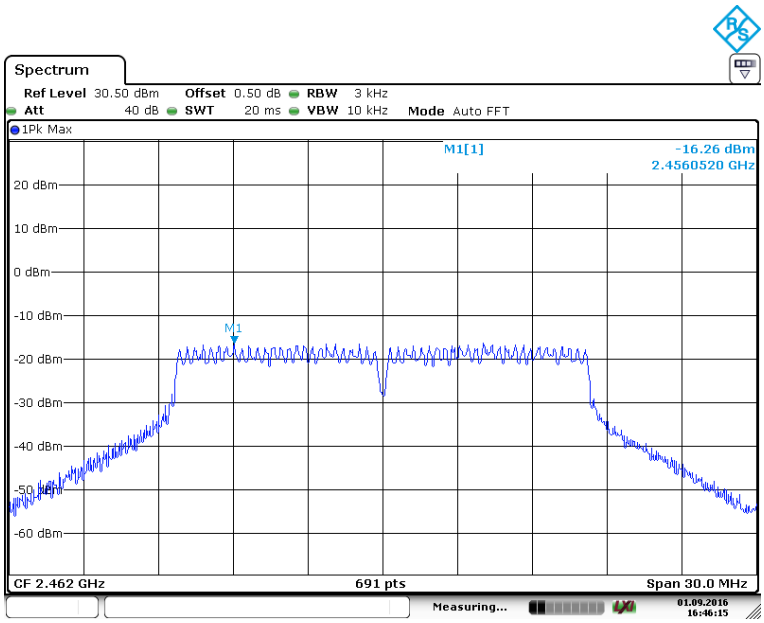
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

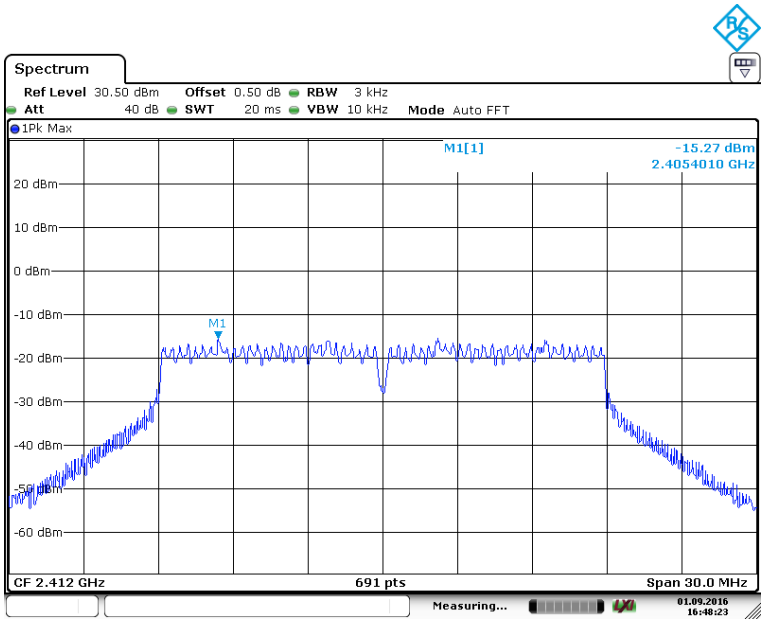


Channel 11: 2.462GHz:

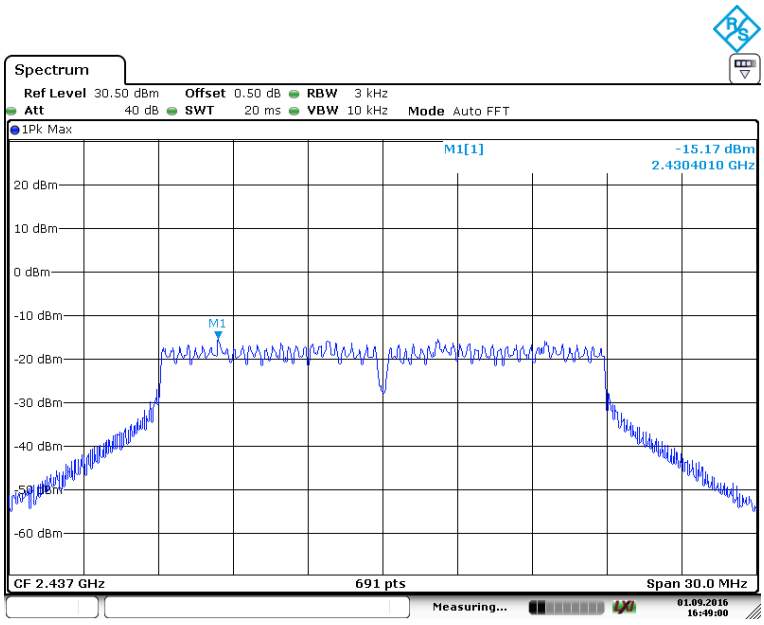


802.11n(HT20) mode

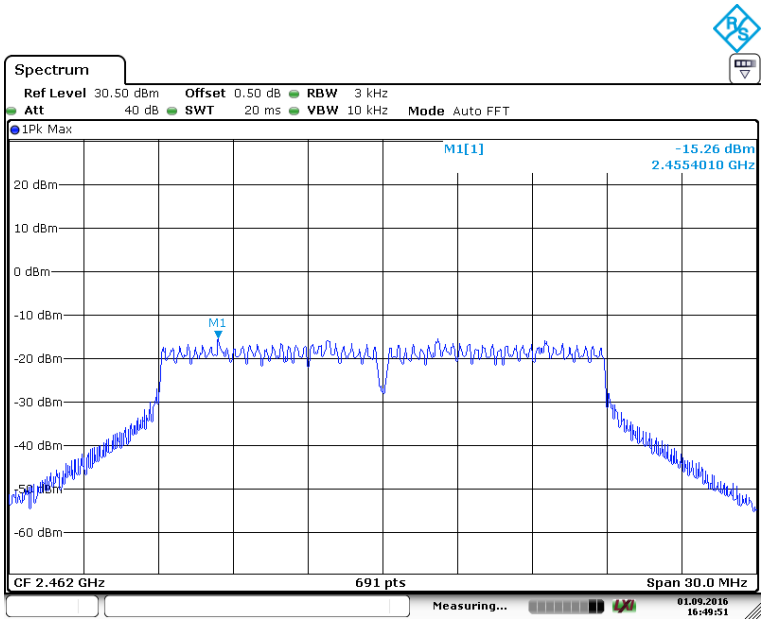
Channel 1: 2.412GHz:



Channel 6: 2.437GHz:

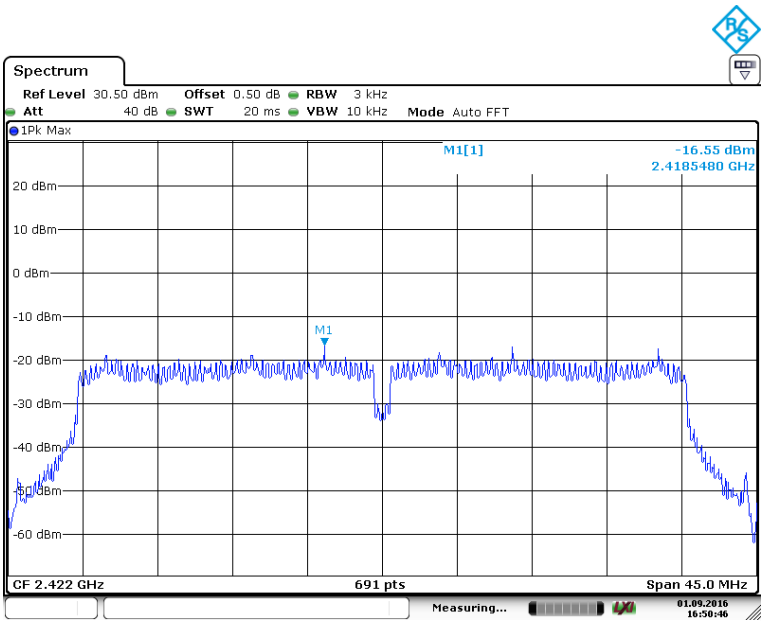


Channel 11: 2.462GHz:

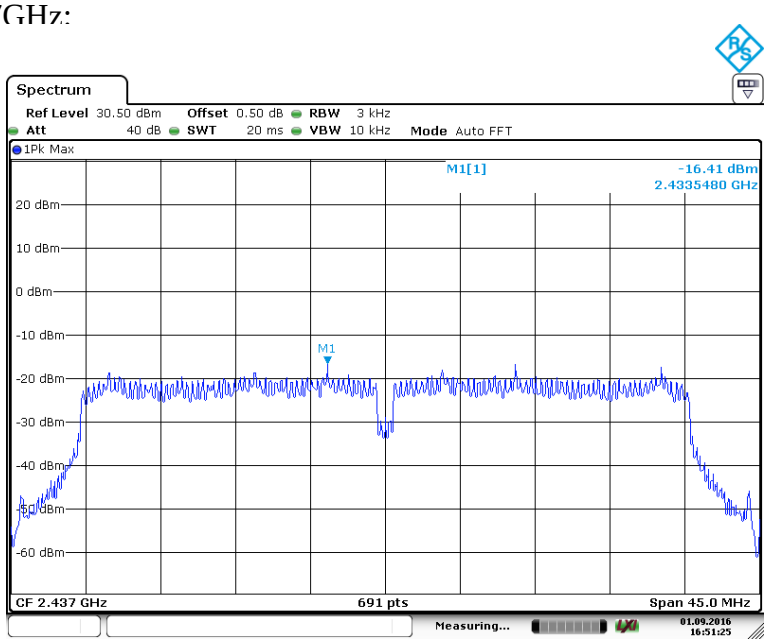


802.11n(HT40) mode

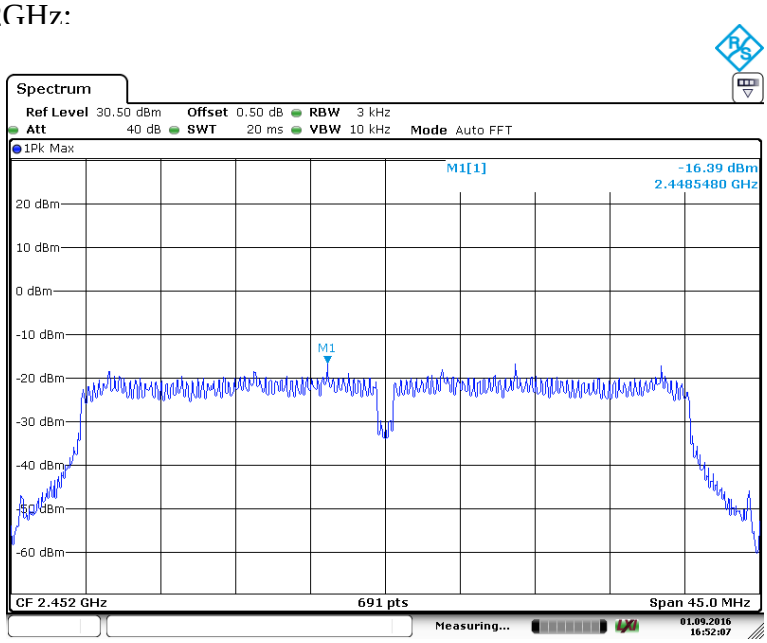
Channel 3: 2.422GHz:



Channel 6: 2.437GHz:



Channel 9: 2.452GHz:



4.5 Out of Band Conducted Emissions

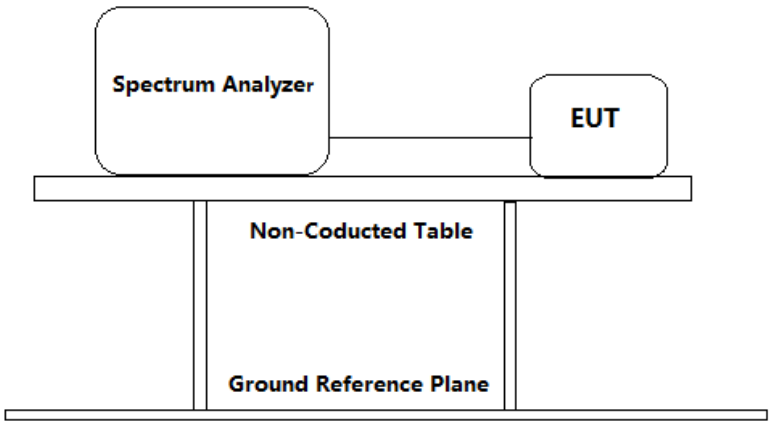
Test Requirement: FCC Part 15 C section 15.247

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Based on either an RF conducted or a radiated measurement. Provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Method: ANSI C63.10: Clause 11.11

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable (cable loss =1dB) from the antenna port to the spectrum analyzer or power meter.
2. Establish a reference level by using the following procedure:
   a) Set instrument center frequency to DTS channel center frequency.
   b) Set the span to ≥ 1.5 × DTS bandwidth.
   c) Set the RBW = 100 kHz.
   d) Set the VBW ≥ [3 × RBW].
   e) Detector = peak.
   f) Sweep time = auto couple.

g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.

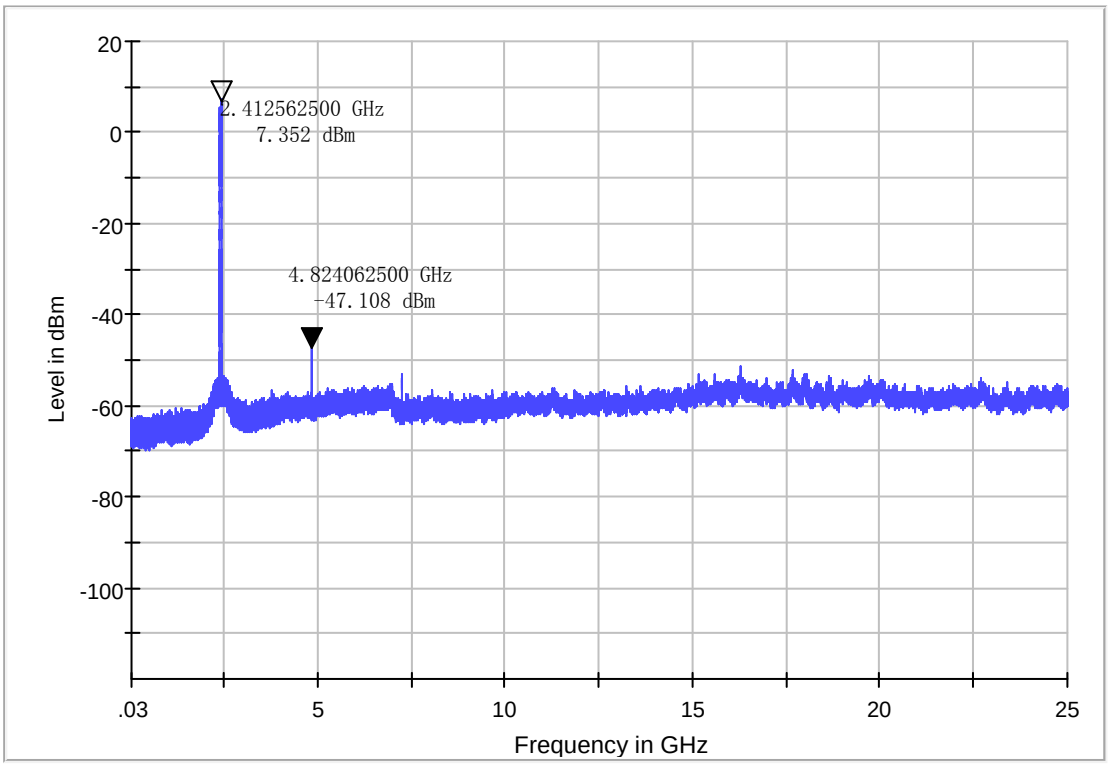
Note that the channel found to contain the maximum PSD level can be used to establish the reference level

3. Emission level measurement

   a) Set the center frequency and span to encompass frequency range to be measured.
   b) Set the RBW = 100 kHz.
   c) Set the VBW ⩾ [3 × RBW].
   d) Detector = peak.
   e) Sweep time = auto couple.
   f) Trace mode = max hold.
   g) Allow trace to fully stabilize.
   h) Use the peak marker function to determine the maximum amplitude level.
4. Measure the Conducted unwanted Emissions of the test frequency with special test status.
5. Repeat until all the test status is investigated.
6. Report the worst case.

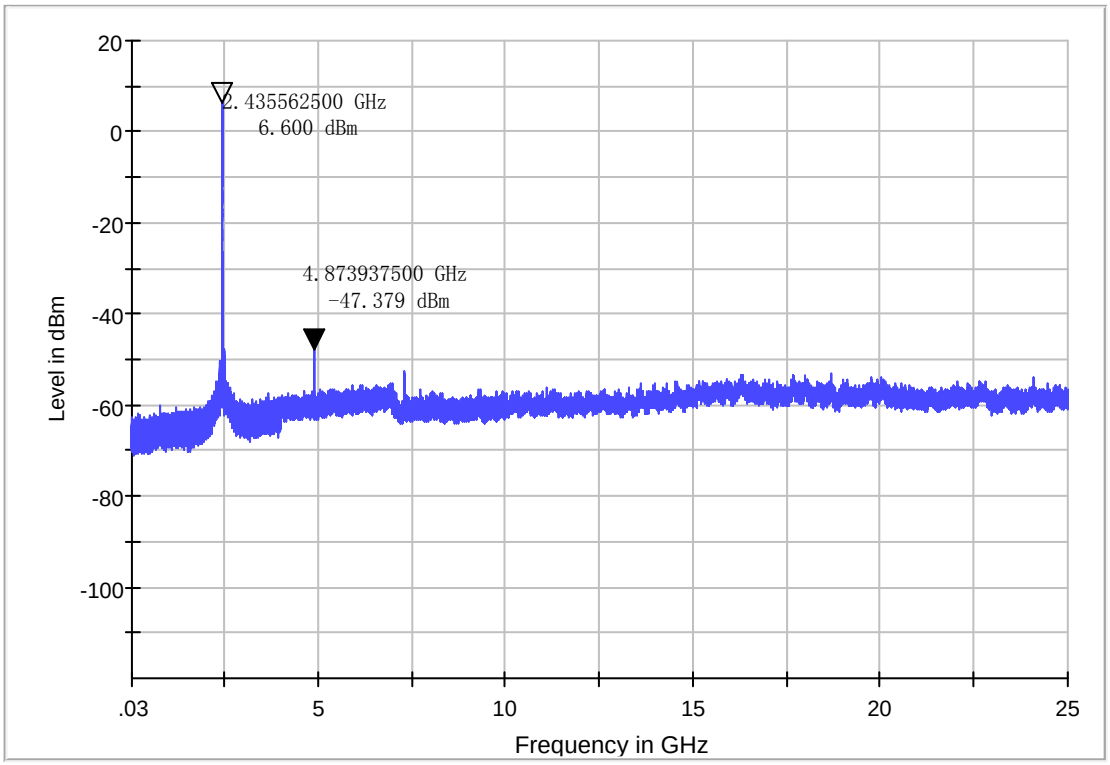
Result plot as follows:

802.11b mode with 11Mbps data rate
Channel 1: 2.412GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

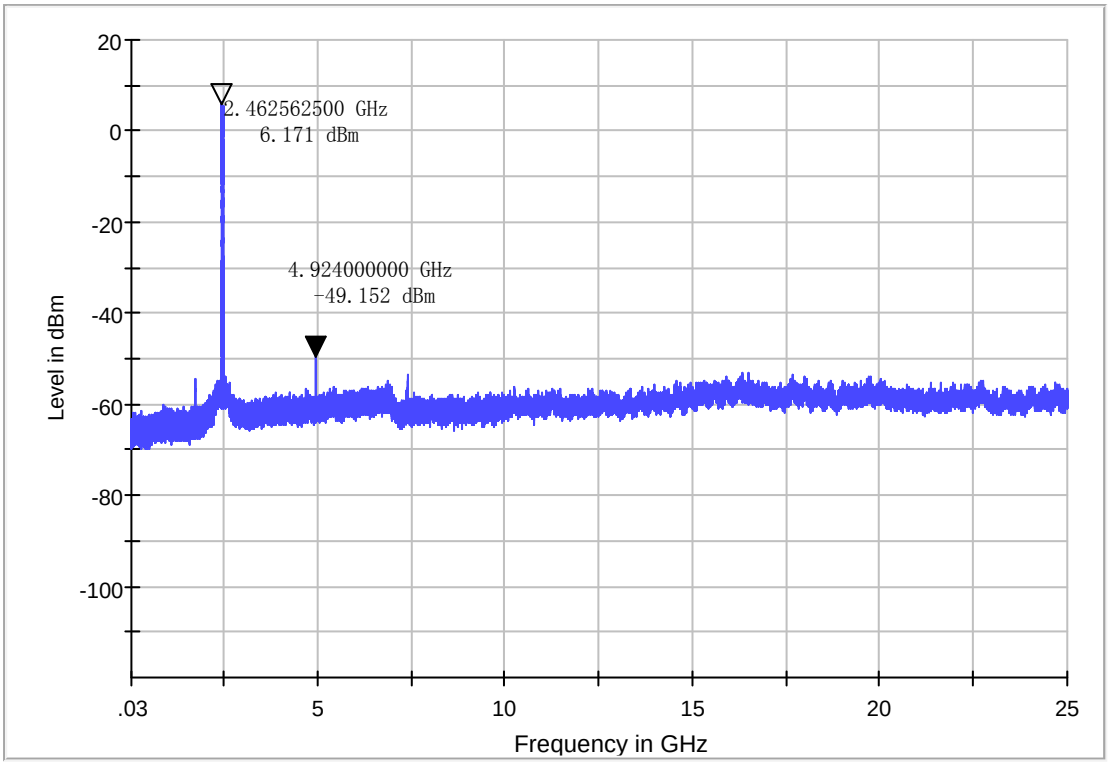
802.11b mode with 11Mbps data rate
Channel 6: 2.437GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

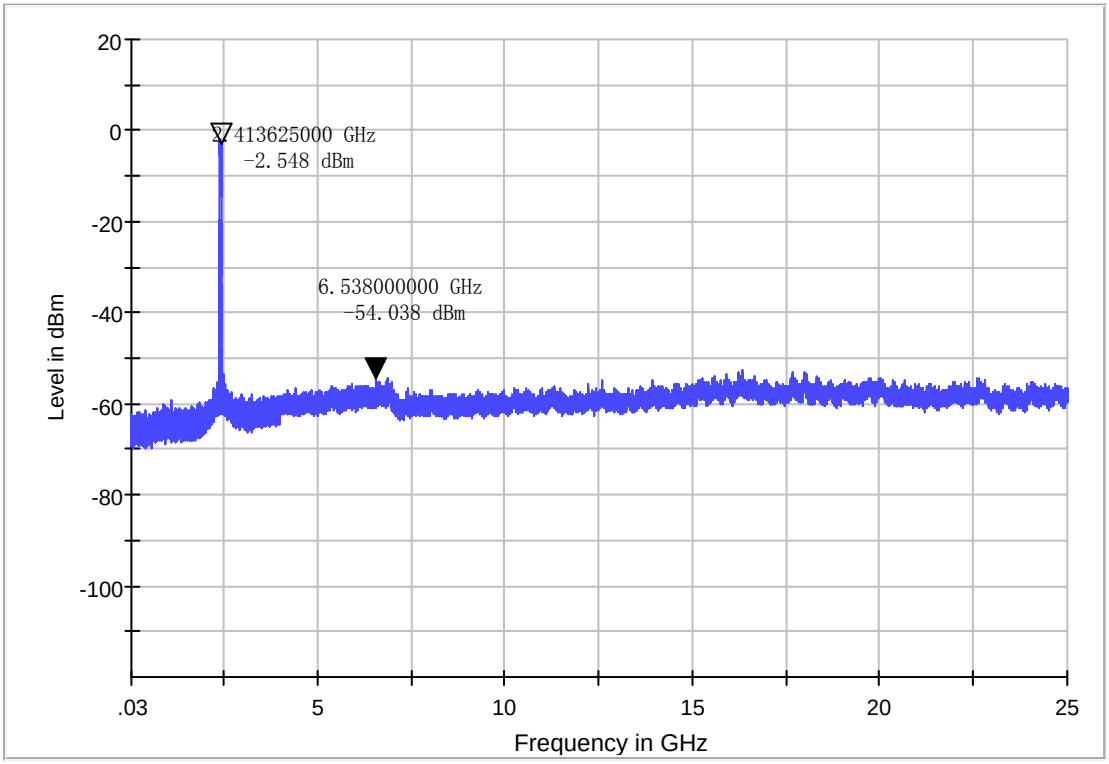
802.11b mode with 11Mbps data rate

Channel 11:2.462 GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

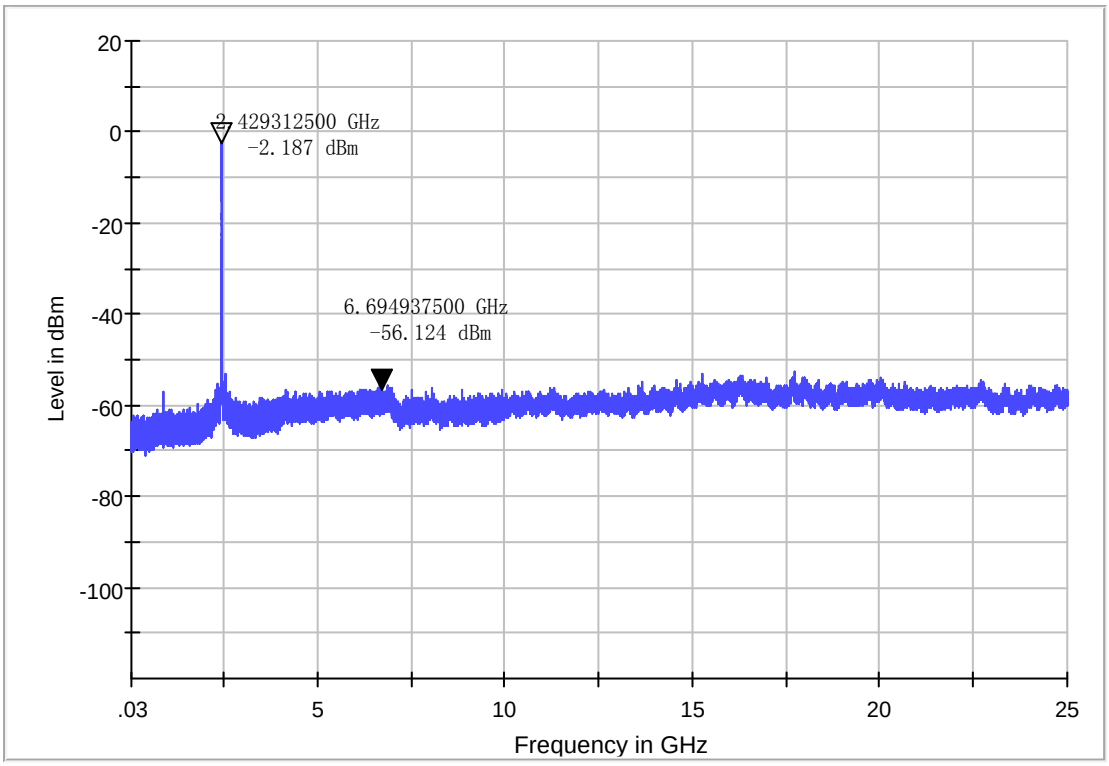
802.11g mode with 9Mbps data rate
Channel 1: 2.412GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

802.11g mode with 9Mbps data rate

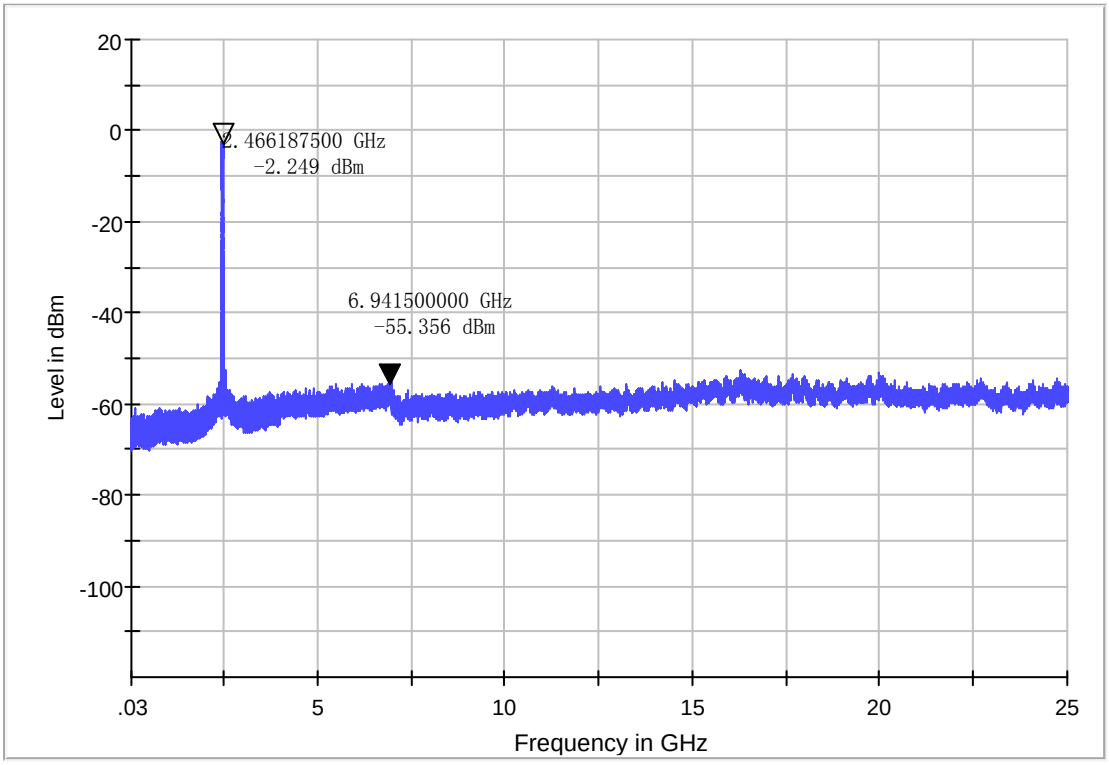
Channel 6: 2.437GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

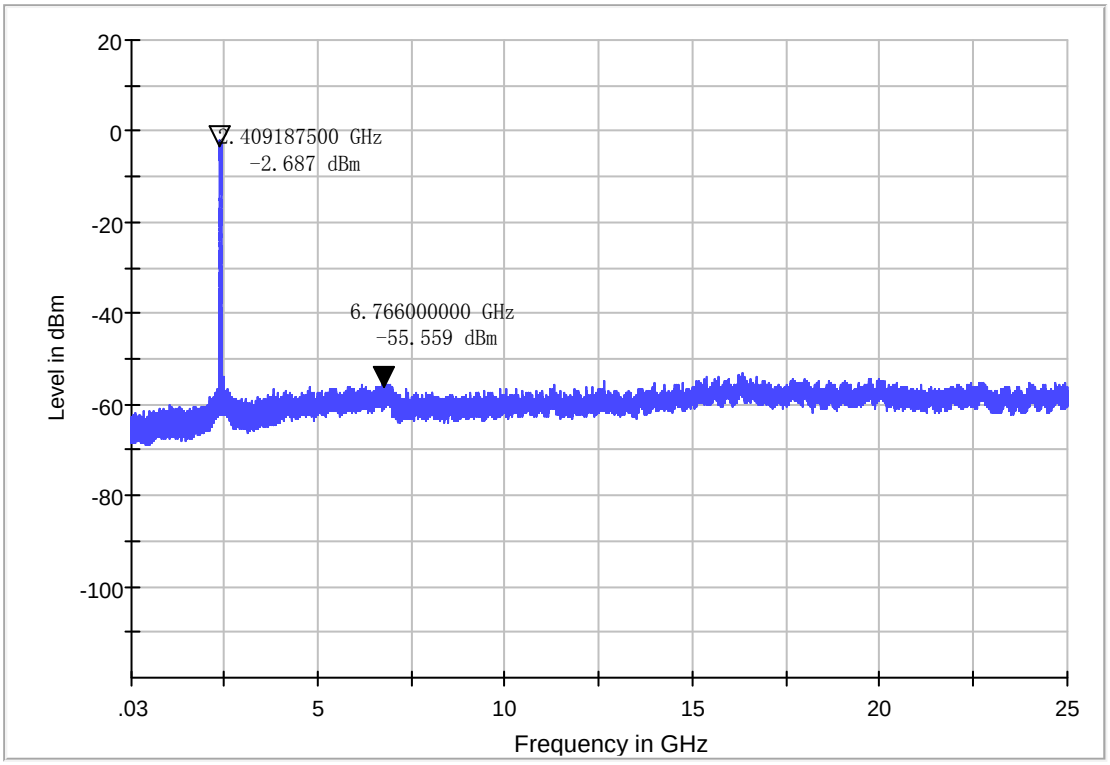
802.11g mode with 9Mbps data rate

Channel 11:2.462 GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

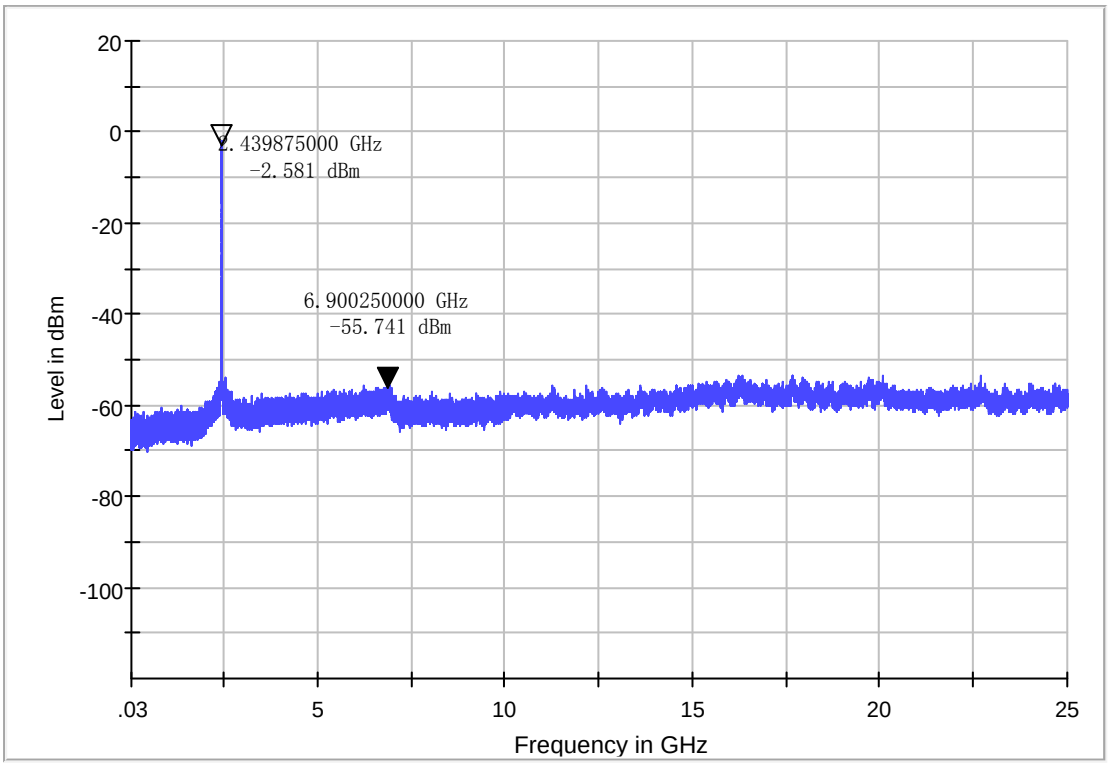
802.11n(HT20) mode with 6.5Mbps data rate
Channel 1: 2.412GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

802.11n(HT20) mode with 6.5Mbps data rate

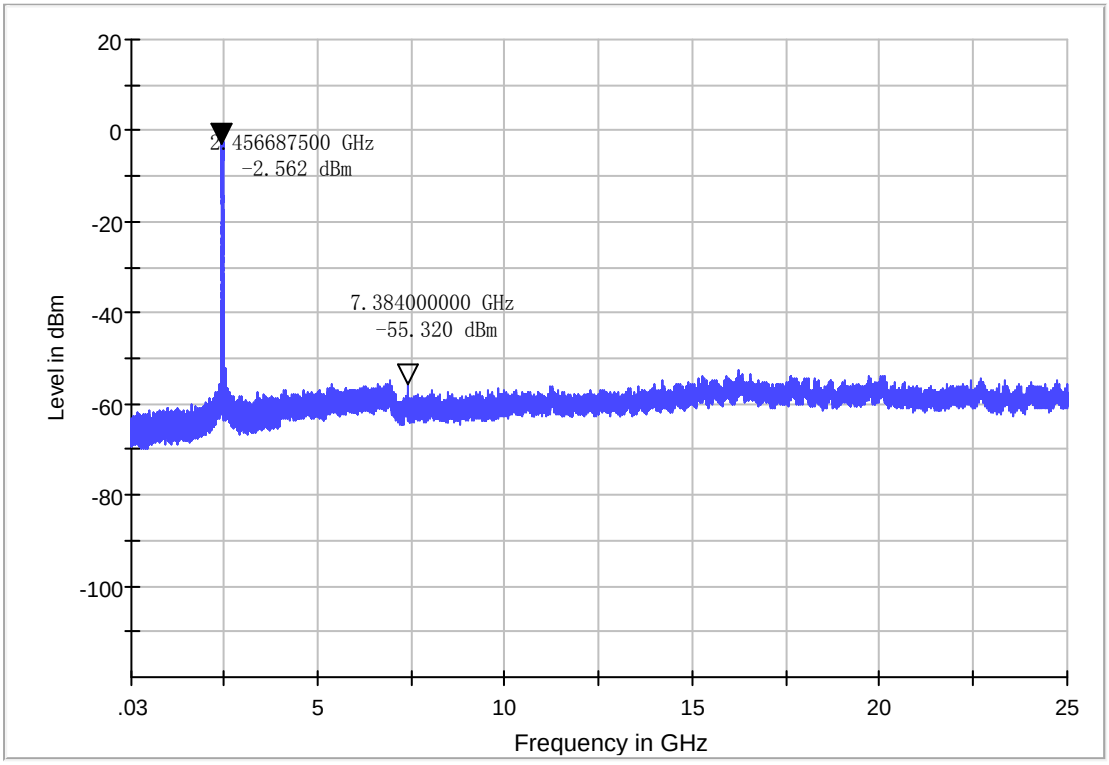
Channel 6: 2.437GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

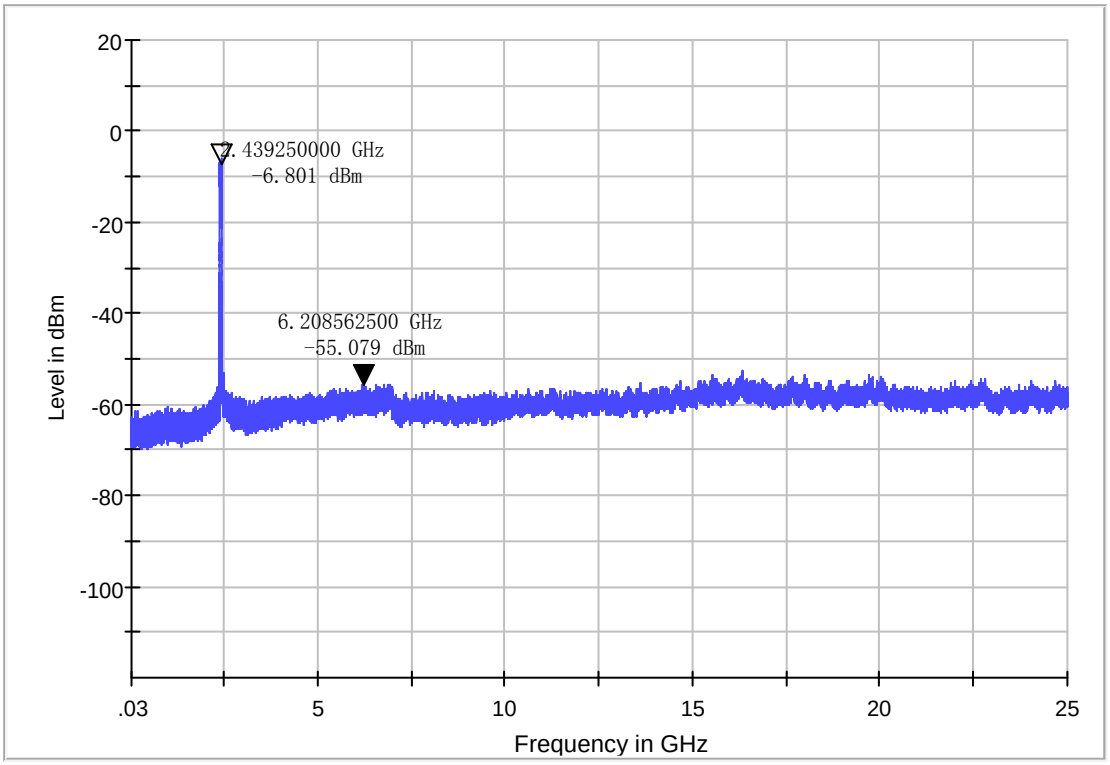
802.11n(HT20) mode with 6.5Mbps data rate

Channel 11:2.462 GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

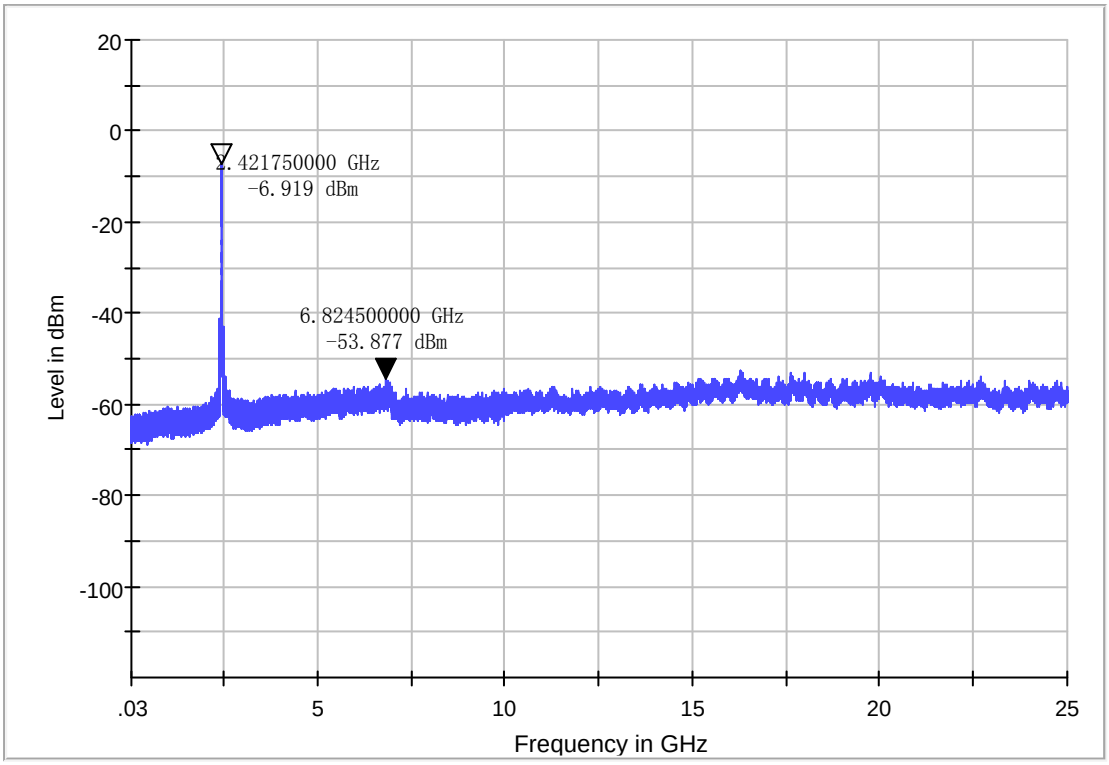
802.11n(HT40) mode with 135Mbps data rate
Channel 3: 2.422GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

802.11n(HT40) mode with 135Mbps data rate

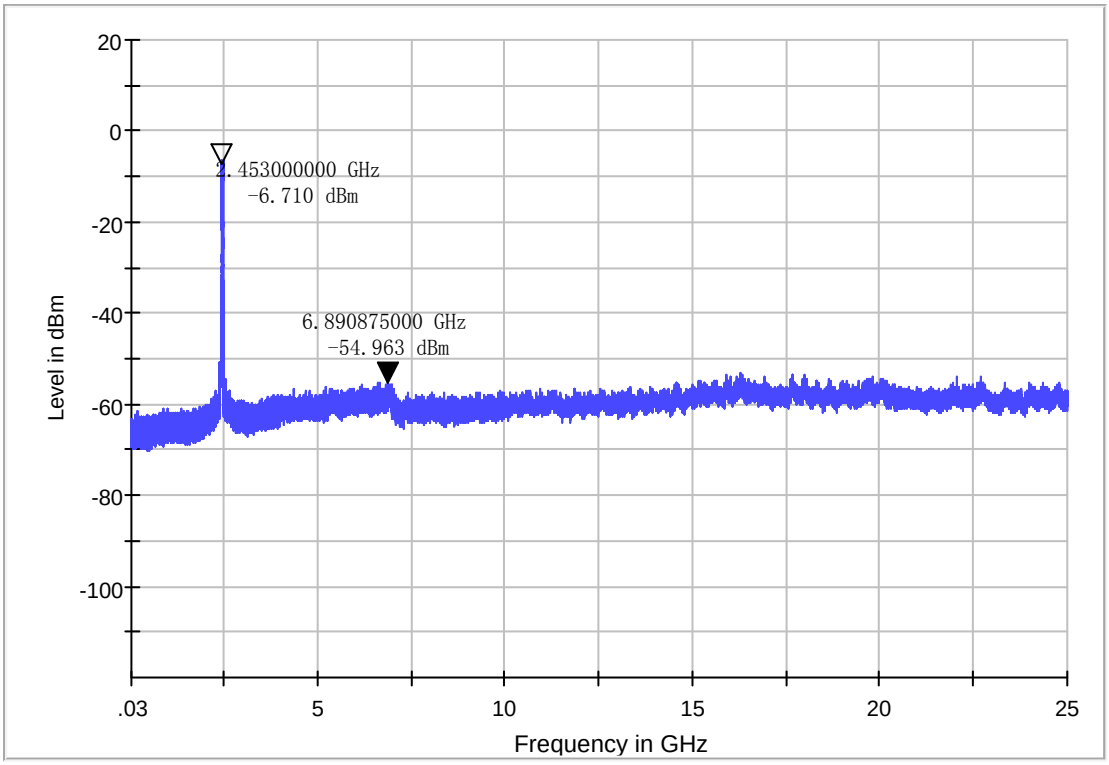
Channel 6: 2.437GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

802.11n(HT40) mode with 135Mbps data rate

Channel 9: 2.452 GHz:



In any 100kHz bandwidth, the Conducted Spurious Emissions from 30 MHz to 25 GHz were greater than 20dB below the peak emission within the band that contains the highest level of the desired power.

4.6 Out of Band Radiated Emissions

For out of band radiated emissions into Non-Restricted Frequency Bands were performed at a 3m separation distance to determine whether these emissions complied with the 20dB attenuation requirement.

[×] Not required, since all emissions are more than 20dB below fundamental
[ ] See attached data sheet

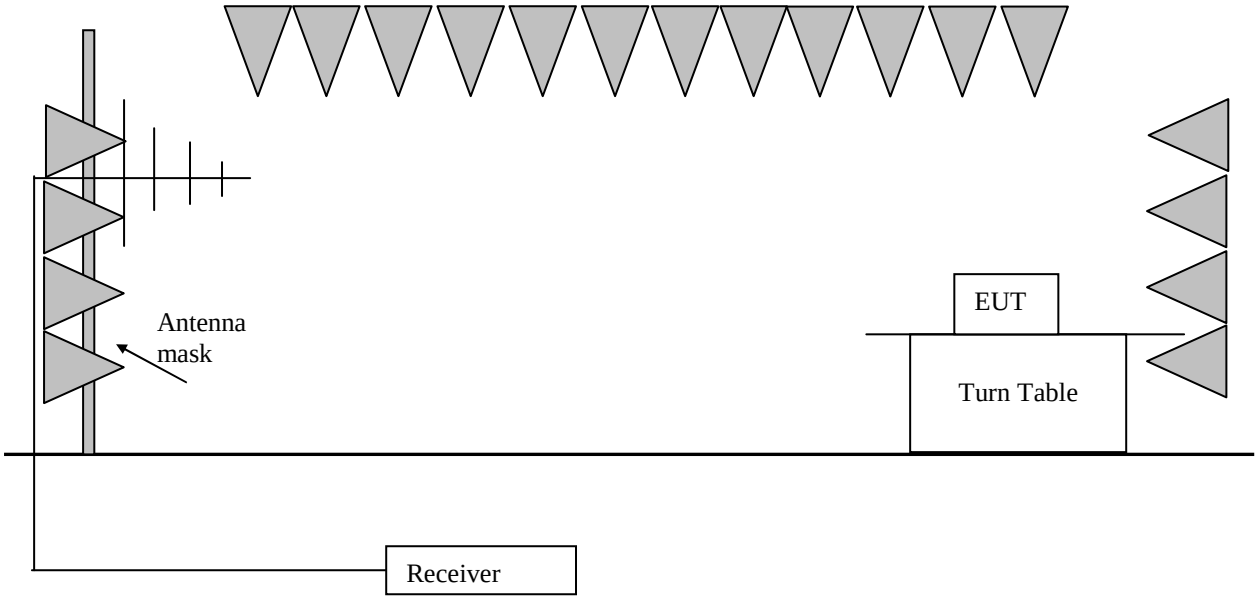
4.7 Radiated Emissions in Restricted Bands

Test Requirement:	FCC Part 15 C section 15.247 (d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI C63.10: Clause 11.12.1, 6.4, 6.5 and 6.6
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit:	40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; 54.0 dBμV/m above 960MHz.
Detector:	For Peak and Quasi-Peak value: RBW = 1 MHz for f ≥ 1 GHz, 200 Hz for 9 kHz to 150 kHz 9 kHz for 150 kHz to 30 MHz 120 kHz for 30 MHz to 1GHz VBW ≥ RBW Sweep = auto Detector function = peak for f ≥ 1 GHz, QP for f < 1 GHz Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz VBW=3 MHz Detector function=AV detector Sweep = auto Trace = max hold

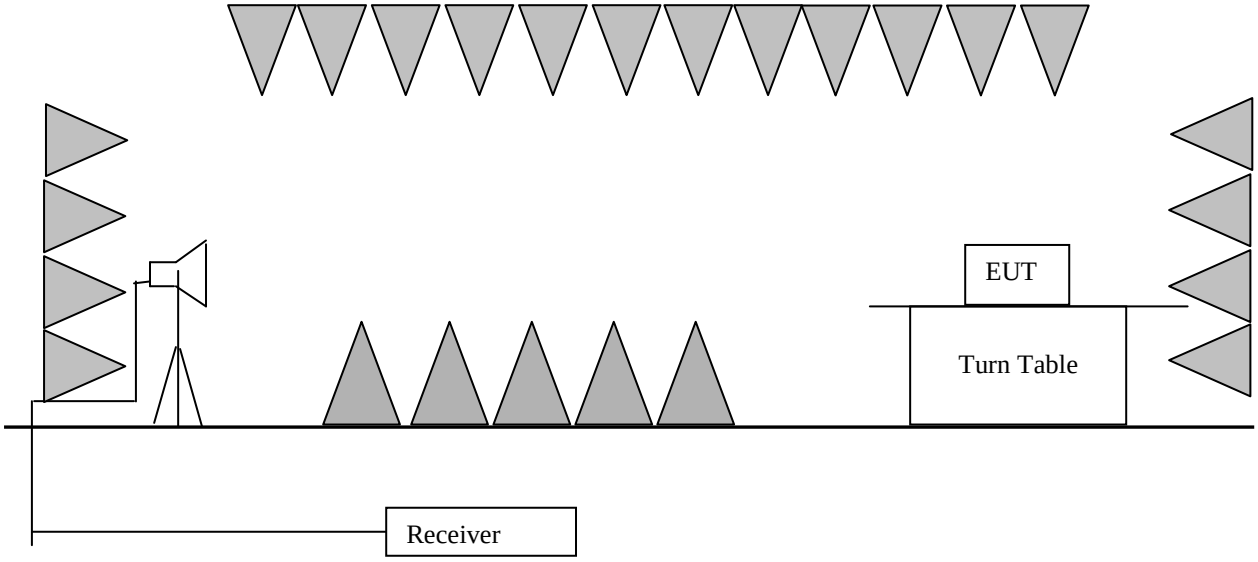
Section 15.205 Restricted bands of operation.
(a) Except as shown in paragraph (d) of this section. Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110 [1]0.495 - 0.505 2.1735 - 2.1905 4.125 - 4.128 4.17725 - 4.17775 4.20725 - 4.20775 6.215 - 6.218 6.26775 - 6.26825 6.31175 - 6.31225 8.291 - 8.294 8.362 - 8.366 8.37625 - 8.38675 8.41425 - 8.41475 12.29 - 12.293 12.51975 - 12.52025 12.57675 - 12.57725 13.36 - 13.41	16.42 - 16.423 16.69475 - 16.69525 16.80425 - 16.80475 25.5 - 25.67 37.5 - 38.25 73 - 74.6 74.8 - 75.2 108 - 121.94 123 - 138 149.9 - 150.05 156.52475 - 156.52525 156.7 - 156.9 162.0125 - 167.17 167.72 - 173.2 240 - 285 322 - 335.4	399.9 - 410 608 - 614 960 - 1240 1300 - 1427 1435 - 1626.5 1645.5 - 1646.5 1660 - 1710 1718.8 - 1722.2 2200 - 2300 2310 - 2390 2483.5 - 2500 2655 - 2900 3260 - 3267 3332 - 3339 3345.8 - 3358 3600 - 4400	4.5 - 5.15 5.35 - 5.46 7.25 - 7.75 8.025 - 8.5 9.0 - 9.2 9.3 - 9.5 10.6 - 12.7 13.25 - 13.4 14.47 - 14.5 15.35 - 16.2 17.7 - 21.4 22.01 - 23.12 23.6 - 24.0 31.2 - 31.8 36.43 - 36.5

Test Configuration:
1) 30 MHz to 1 GHz emissions:



2) 1 GHz to 40 GHz emissions:



Test Procedure:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2010 was used to perform radiated emission test above 1 GHz.

The receiver was scanned from 9 kHz to 25 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

The field strength is calculated by adding the Antenna Factor and Cable Factor,and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

→ FS = RA + Correct Factor

where FS = Field Strength in dBμV/m

RA = Receiver Amplitude (including preamplifier) in dBμV

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

Correct Factor = AF + CF – AG

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RA + Correct Factor

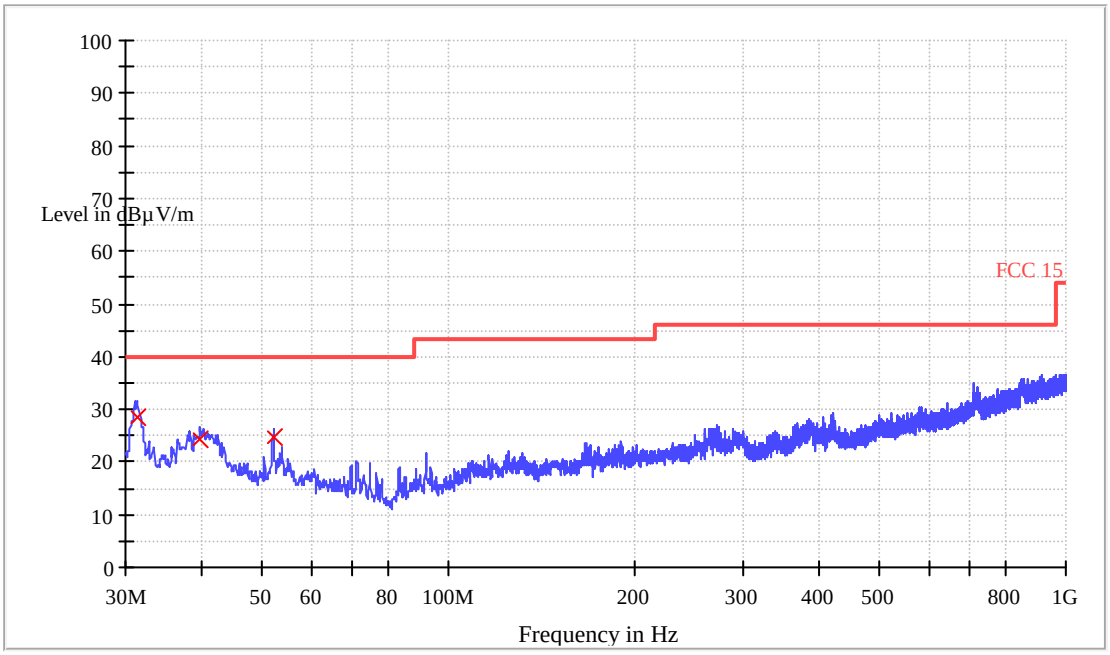
802.11b mode with 11Mbps data rate

9 kHz~30 MHz Field Strength of Unwanted Emissions for Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

Test at Channel 1 (2.412 GHz) in transmitting status.

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement.

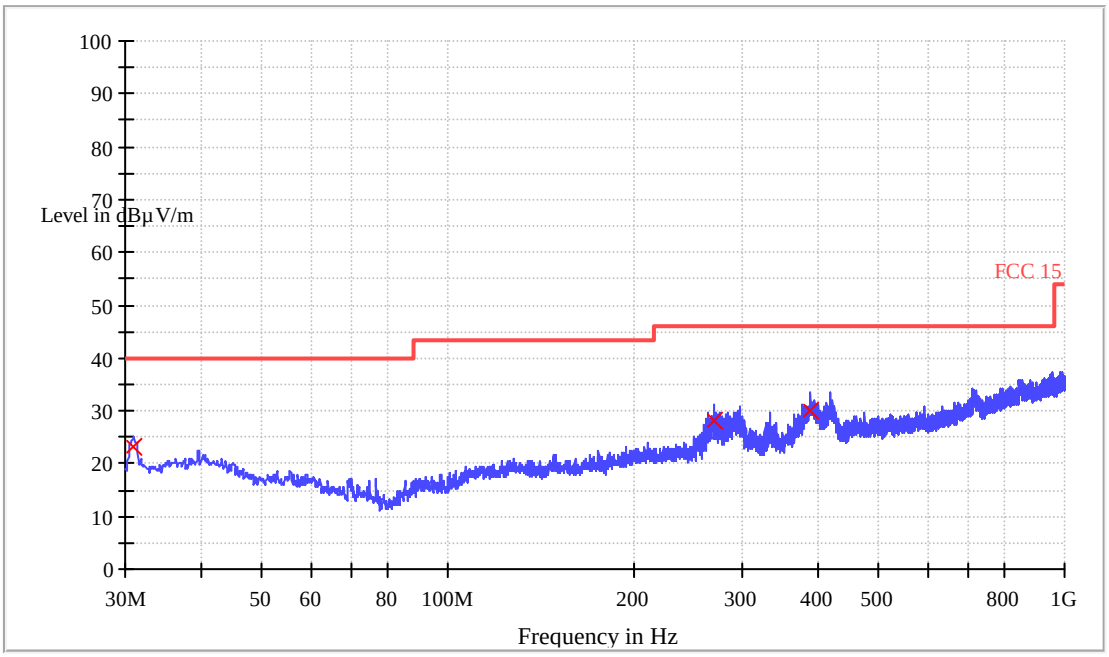
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.360000	28.6	120.000	V	13.3	11.4	40.0
39.600000	24.5	120.000	V	15.9	15.6	40.0
52.120000	24.6	120.000	V	11.8	15.4	40.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.920000	23.3	120.000	H	13.2	16.7	40.0
269.800000	28.2	120.000	H	16.0	17.8	46.0
388.120000	30.0	120.000	H	18.7	16.0	46.0

1~25 GHz Radiated Emissions.

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	4384.000	43.0	/	-0.9	74.0	/	54.0	-11.0
Horizontal	7767.000	47.2	/	4.8	74.0	/	54.0	-6.8
Horizontal	9884.000	48.8	/	7.2	74.0	/	54.0	-5.2
Vertical	4824.000	46.2	/	-0.5	74.0	/	54.0	-7.8
Vertical	7696.000	47.4	/	4.7	74.0	/	54.0	-6.6
Vertical	11375.000	49.1	/	8.1	74.0	/	54.0	-4.9

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

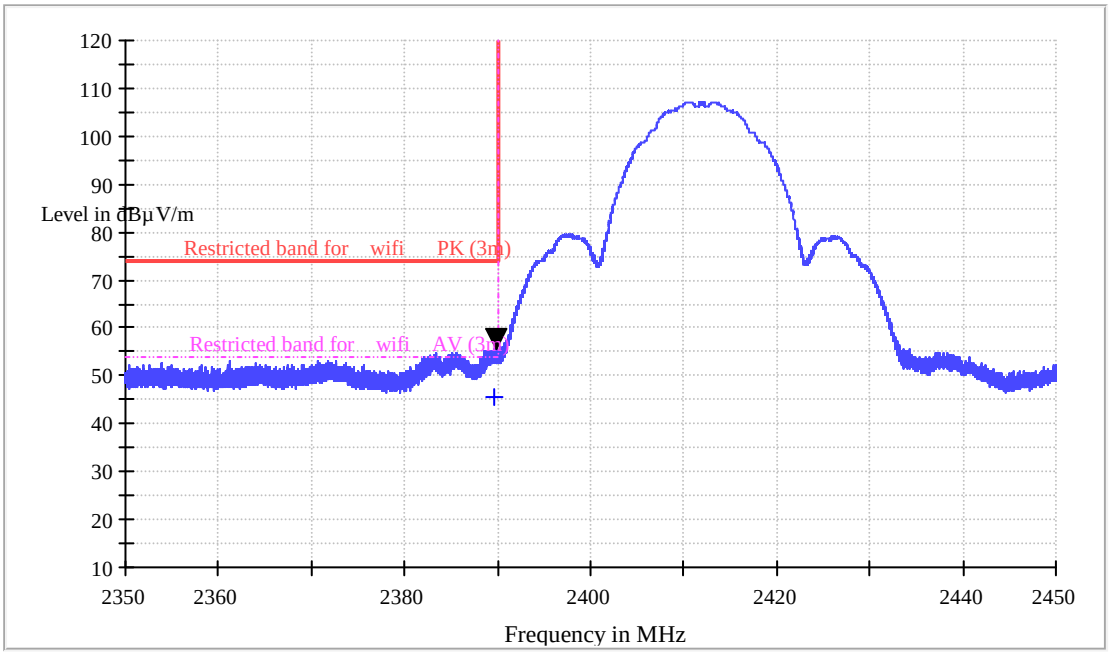
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

Horizontal



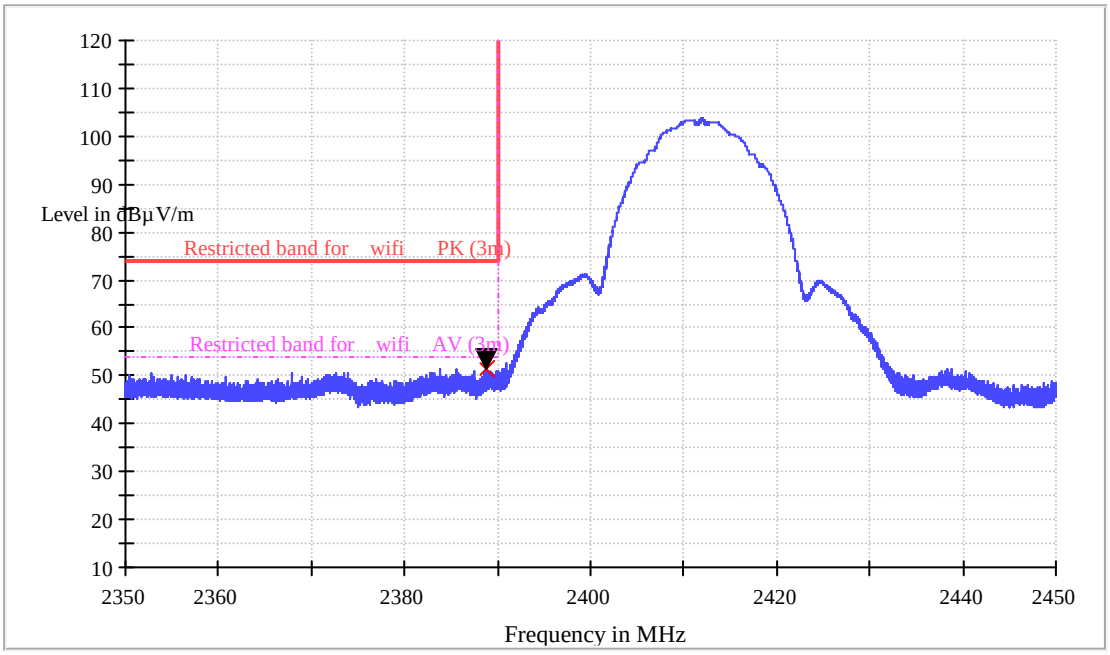
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2389.600000	55.8	1000.0	1000.000	130.0	H	1.0	-2.3	74

Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2389.600000	45.4	1000.0	1000.000	130.0	H	1.0	-2.3	54

Vertical



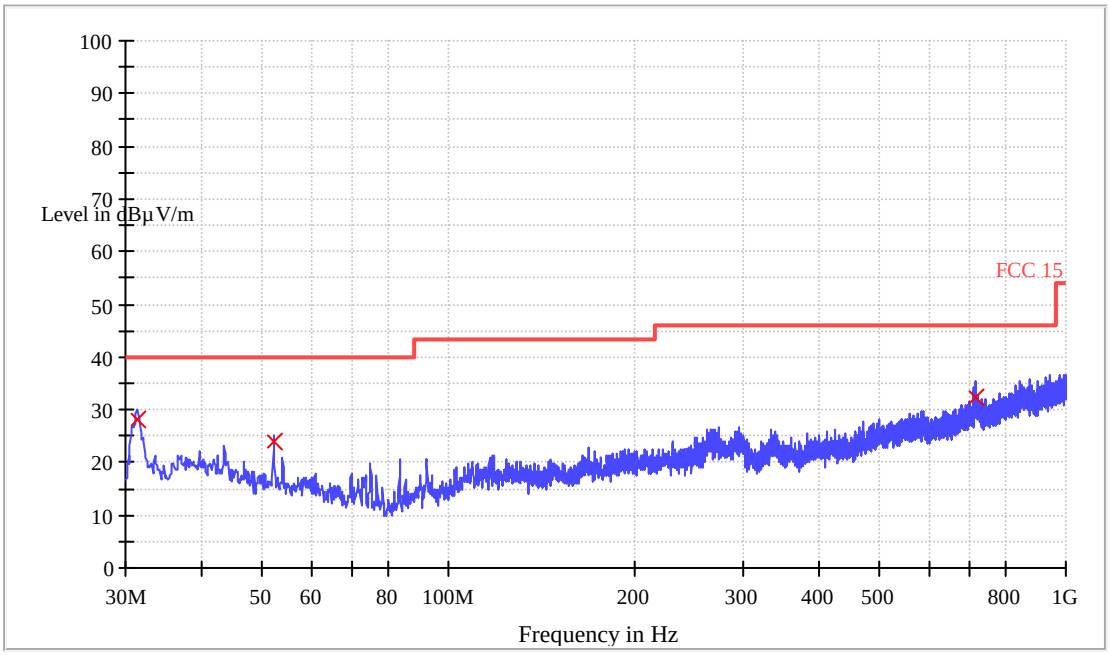
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2388.800000	51.3	1000.0	1000.000	130.0	V	359.0	-2.3	54

Test at Channel 6 (2.437 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

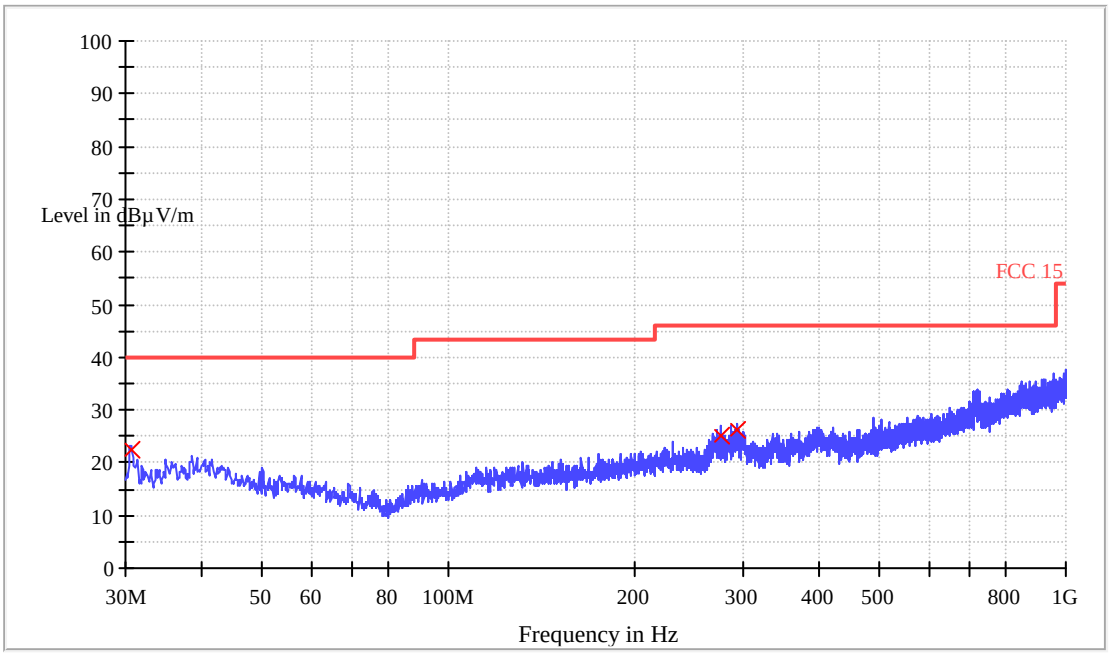
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.360000	28.2	120.000	V	13.3	11.9	40.0
52.200000	23.8	120.000	V	11.7	16.2	40.0
714.320000	32.2	120.000	V	24.1	13.8	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.680000	22.5	120.000	H	13.1	17.5	40.0
276.680000	25.1	120.000	H	16.2	21.0	46.0
294.280000	26.1	120.000	H	17.2	19.9	46.0

1~25 GHz Radiated Emissions.

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	4874.000	47.7	/	-0.5	74.0	/	54.0	-6.3
Horizontal	7312.000	48.9	/	3.8	74.0	/	54.0	-5.1
Horizontal	10270.800	50.0	/	7.7	74.0	/	54.0	-4.0
Vertical	4874.000	45.7	/	-0.5	74.0	/	54.0	-8.3
Vertical	7213.600	46.9	/	3.4	74.0	/	54.0	-7.1
Vertical	11244.800	48.4	/	8.1	74.0	/	54.0	-5.6

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

Final Test Level =Receiver Reading + Correction Factor

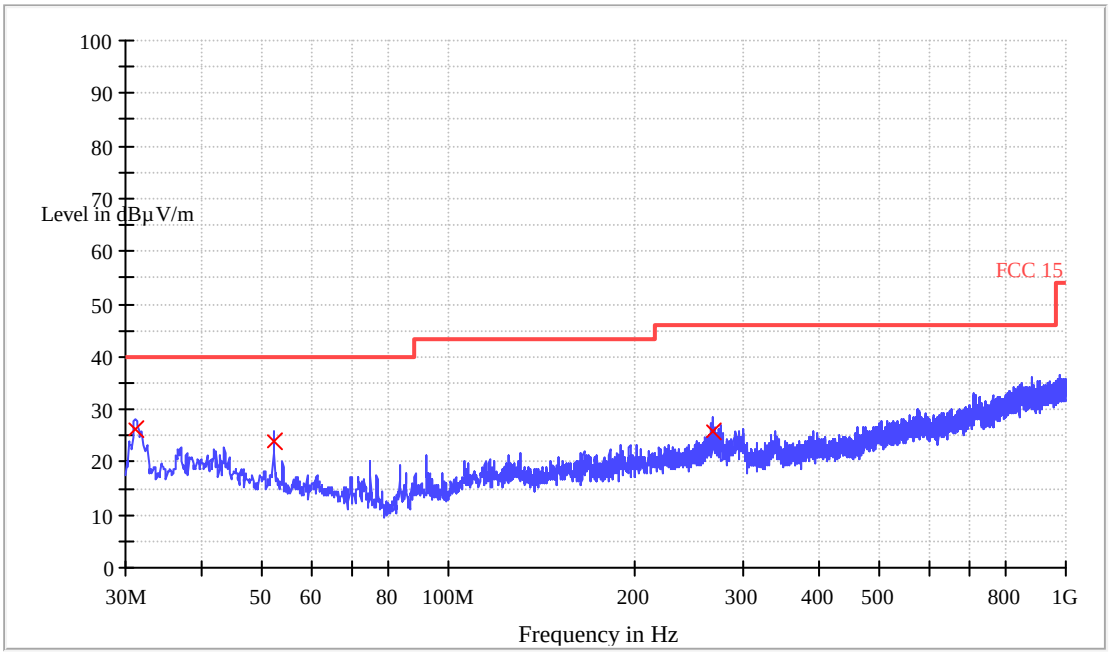
Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Test at Channel 11 (2.462 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

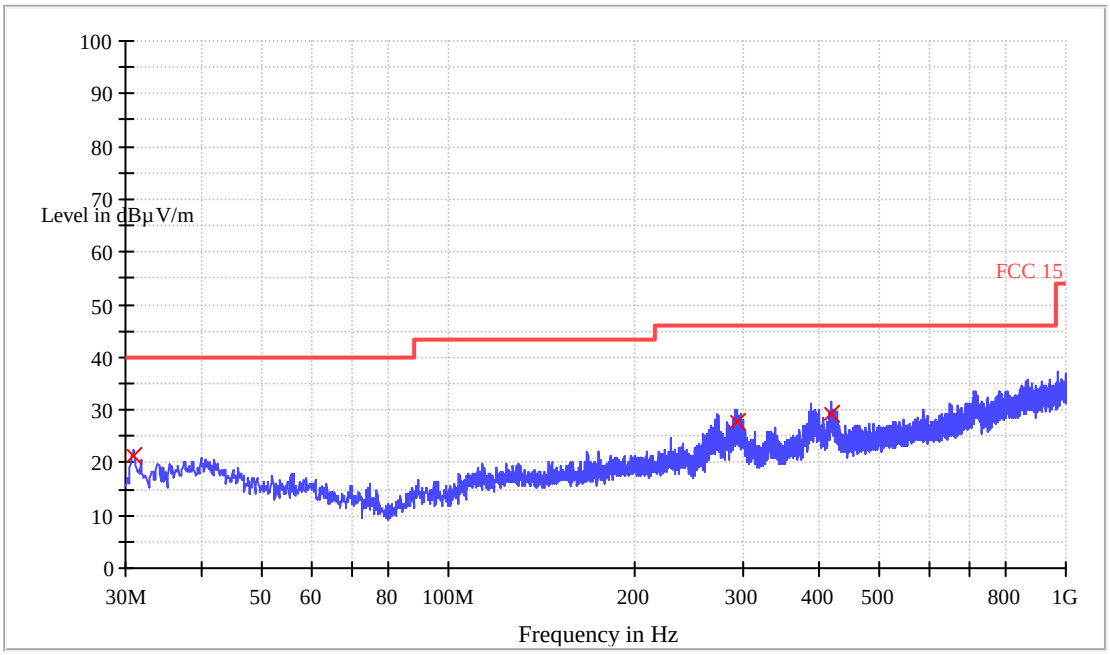
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.120000	26.1	120.000	V	13.2	13.9	40.0
52.120000	24.1	120.000	V	11.8	15.9	40.0
268.200000	25.8	120.000	V	16.0	20.2	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.000000	21.3	120.000	H	13.2	18.7	40.0
292.560000	27.6	120.000	H	17.1	18.4	46.0
416.080000	29.2	120.000	H	19.0	16.8	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBμV/m)	AV Net at 3m (dBμV/m)	Correction Factor (dB)	PK Limit at 3m (dBμV/m)	PK Margin (dB)	AV Limit at 3m (dBμV/m)	AV Margin (dB)
Horizontal	4924.000	46.7	/	-0.5	74.0	/	54.0	-7.3
Horizontal	7716.400	47.9	/	4.7	74.0	/	54.0	-6.1
Horizontal	10462.800	49.4	/	7.8	74.0	/	54.0	-4.6
Vertical	4924.000	46.4	/	-0.5	74.0	/	54.0	-7.6
Vertical	7606.000	48.2	/	4.6	74.0	/	54.0	-5.8
Vertical	9847.600	51.7	/	7.1	74.0	/	54.0	-2.3

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

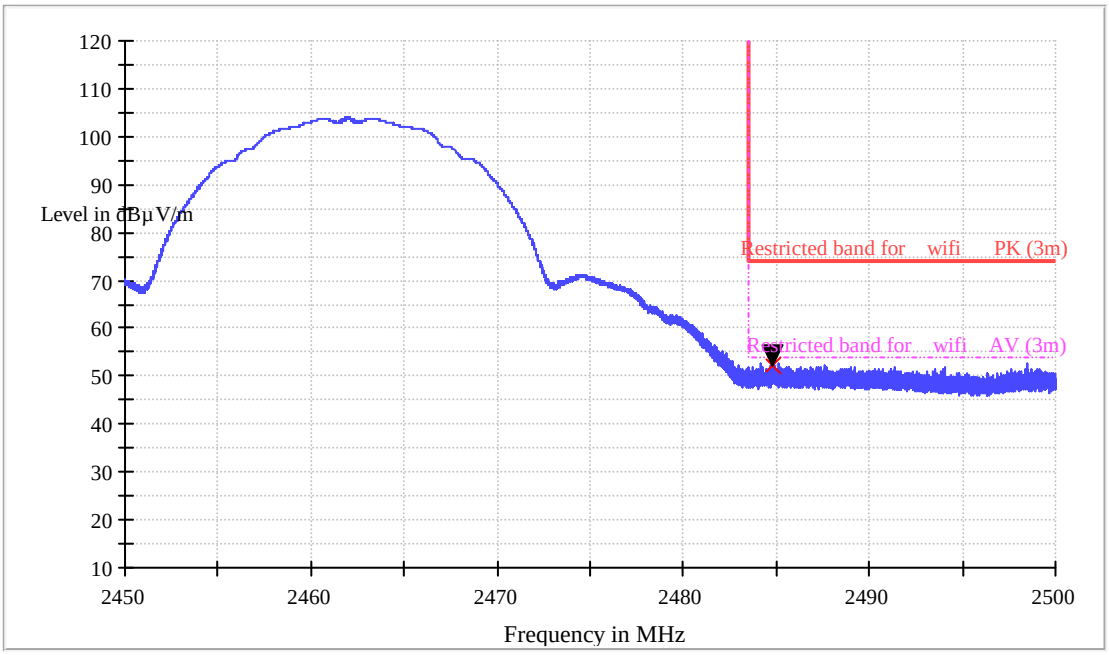
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

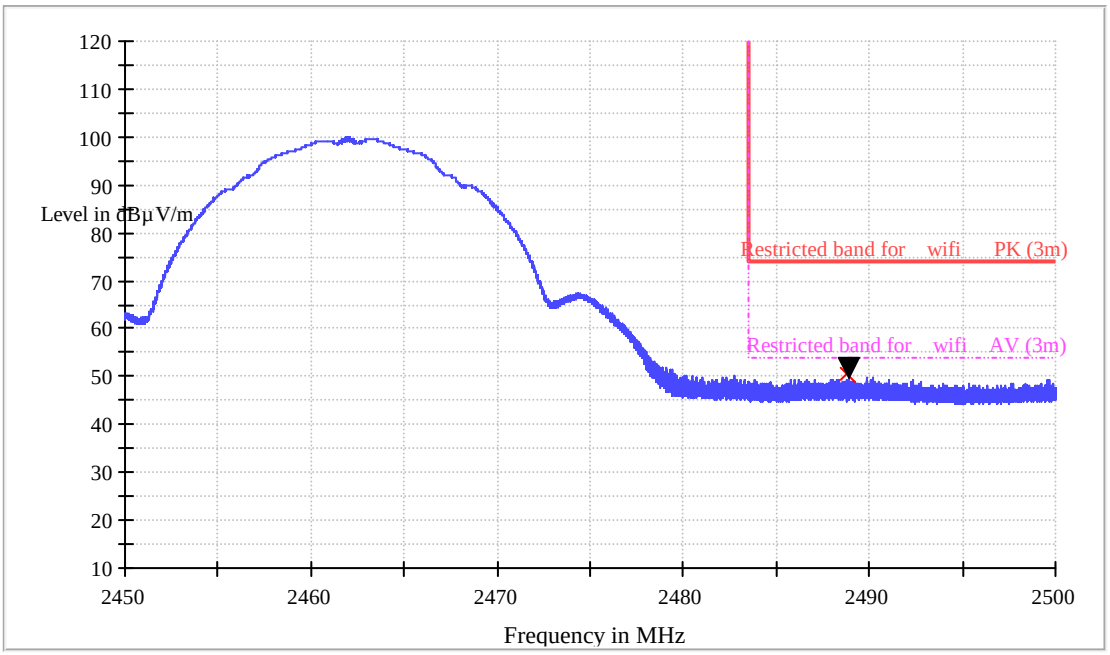
Horizontal



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2484.800000	52.2	1000.0	1000.000	130.0	H	359.0	-2.1	54

Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2488.800000	50.7	1000.0	1000.000	130.0	V	1.0	-2.1	54

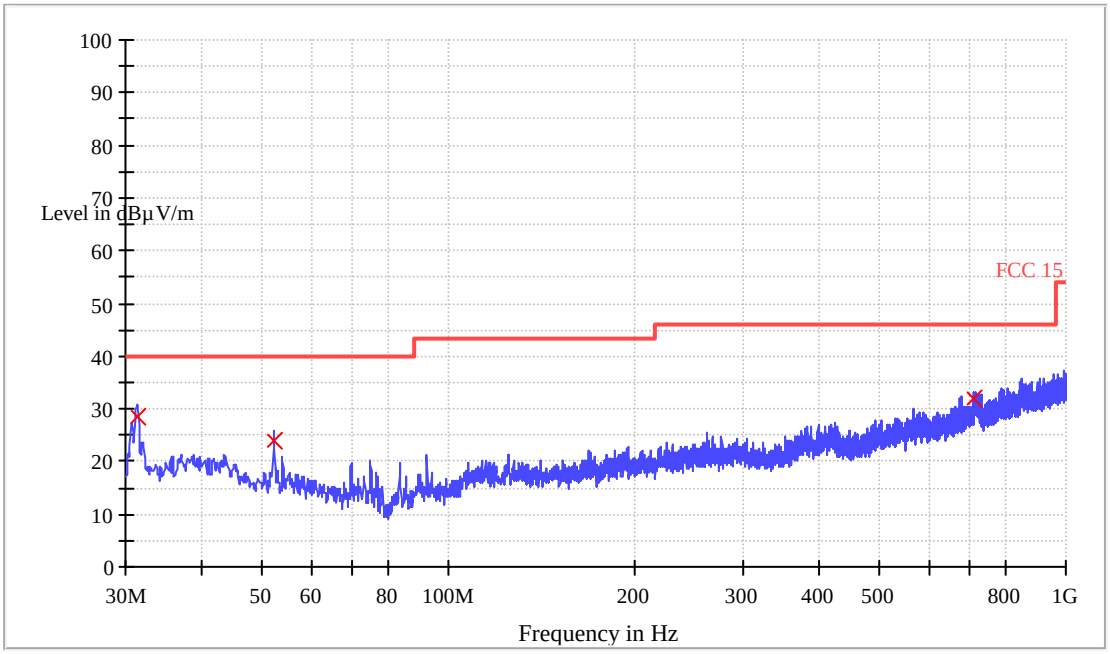
802.11g mode with 9Mbps data rate

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

Test at Channel 1 (2.412 GHz) in transmitting status

30 MHz~1 Radiated Emissions .Quasi-Peak Measurement

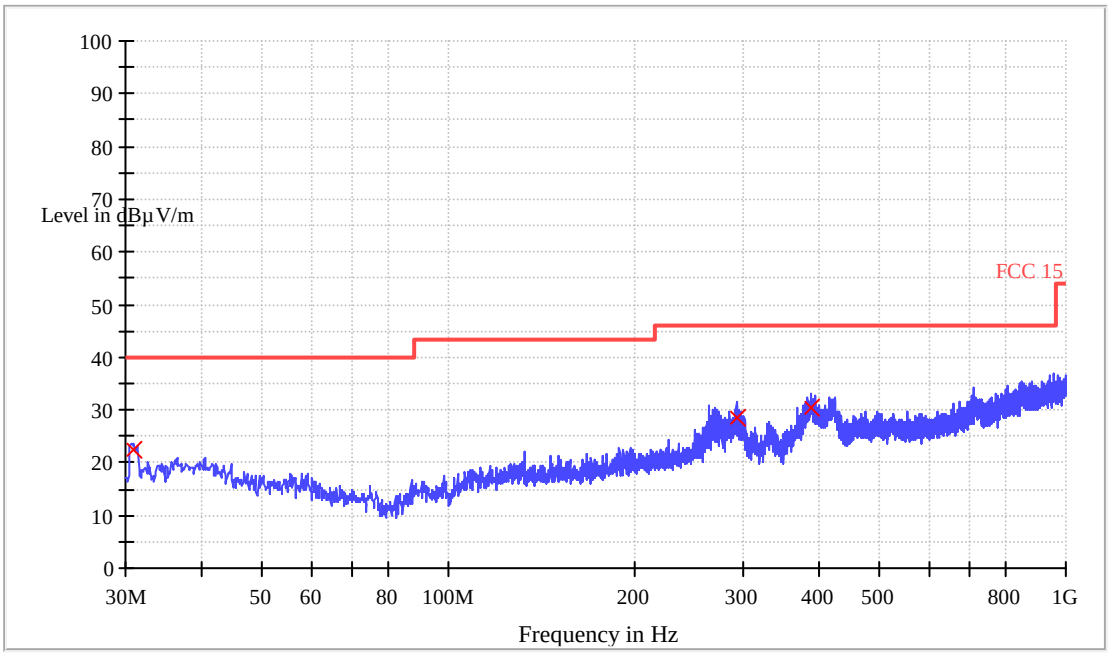
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.480000	28.5	120.000	V	13.3	11.5	40.0
52.200000	23.9	120.000	V	11.7	16.1	40.0
709.680000	31.9	120.000	V	23.9	14.2	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.000000	22.4	120.000	H	13.2	17.6	40.0
292.360000	28.6	120.000	H	17.1	17.4	46.0
388.000000	30.5	120.000	H	18.7	15.5	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	5465.600	43.5	/	0.2	74.0	/	54.0	-10.5
Horizontal	10272.800	49.8	/	7.7	74.0	/	54.0	-4.2
Horizontal	10855.200	50.0	/	8.0	74.0	/	54.0	-4.0
Vertical	5750.000	44.8	/	1.4	74.0	/	54.0	-9.2
Vertical	7650.800	47.6	/	4.6	74.0	/	54.0	-6.4
Vertical	10381.200	50.0	/	7.8	74.0	/	54.0	-4.0

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

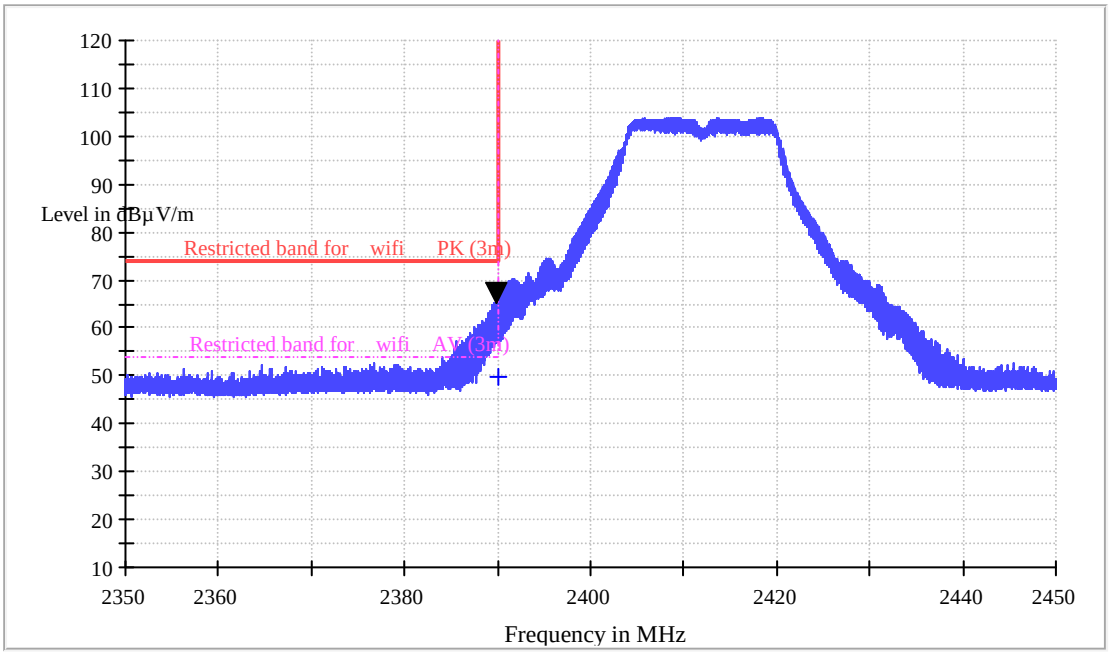
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

Horizontal



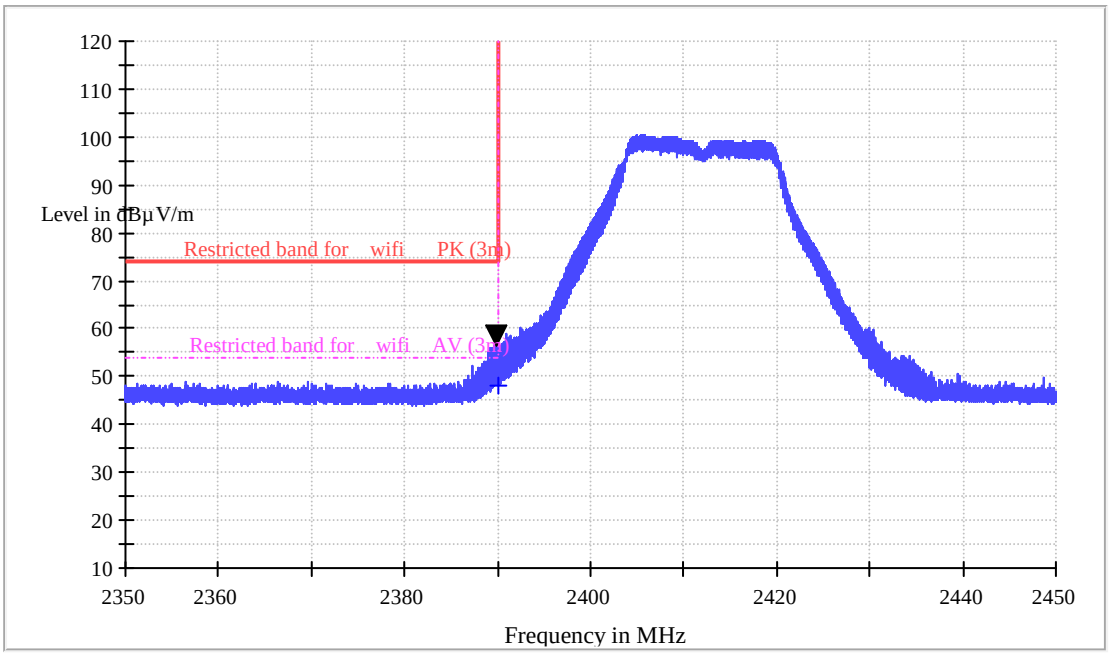
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2390.000000	65.6	1000.0	1000.000	130.0	H	359.0	-2.3	74

Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2390.000000	49.7	1000.0	1000.000	130.0	H	359.0	-2.3	54

Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2389.000000	56.9	1000.0	1000.000	130.0	H	359.0	-2.3	74

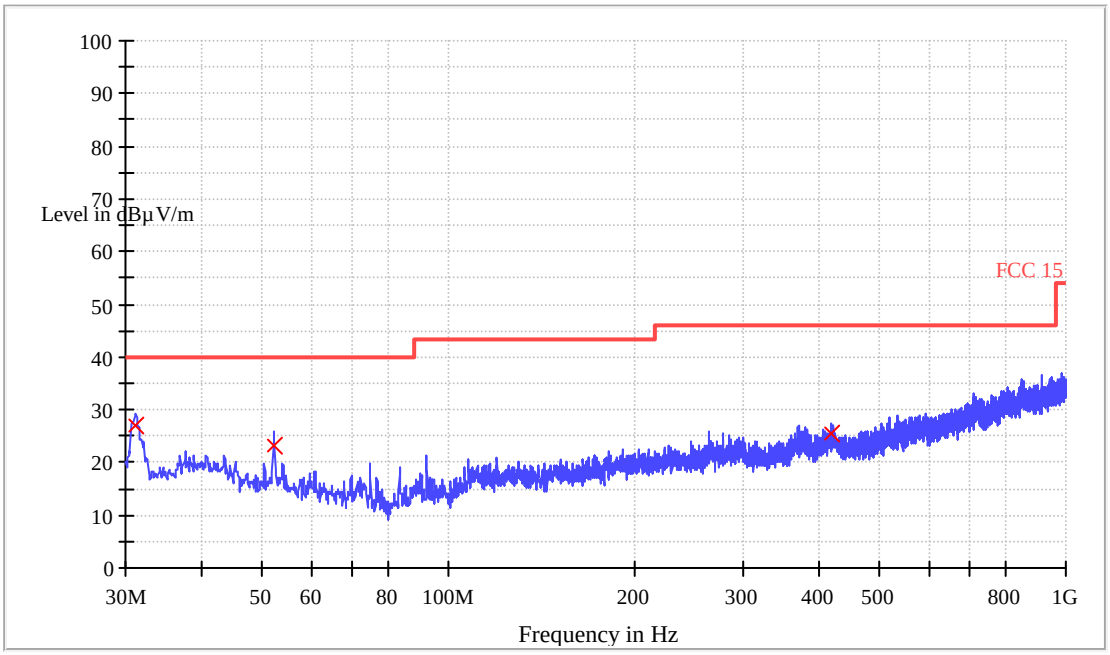
Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2389.000000	47.6	1000.0	1000.000	130.0	H	359.0	-2.3	54

Test at Channel 6 (2.437GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

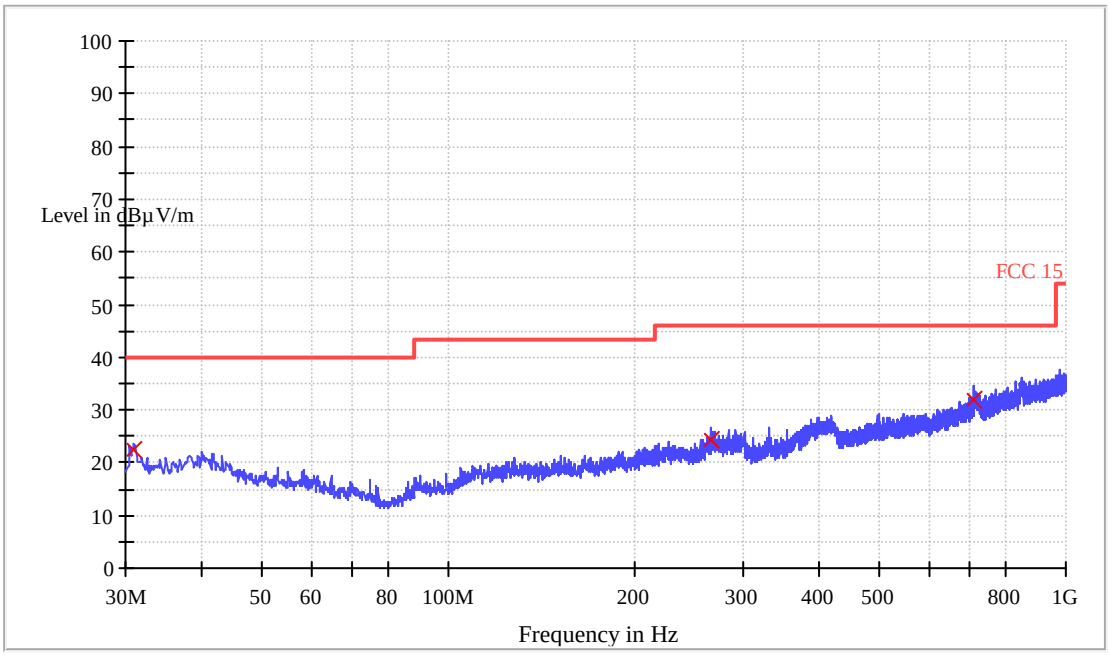
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.240000	27.2	120.000	V	13.3	12.8	40.0
52.120000	23.3	120.000	V	11.8	16.7	40.0
416.760000	25.4	120.000	V	19.0	20.6	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.000000	22.3	120.000	H	13.2	17.7	40.0
266.400000	24.3	120.000	H	15.9	21.7	46.0
709.680000	31.9	120.000	H	23.9	14.1	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	4631.200	43.0	/	-0.5	74.0	/	54.0	-11.0
Horizontal	7702.800	48.4	/	4.7	74.0	/	54.0	-5.6
Horizontal	9879.200	49.1	/	7.2	74.0	/	54.0	-4.9
Vertical	6054.400	45.6	/	2.4	74.0	/	54.0	-8.4
Vertical	7639.600	47.6	/	4.6	74.0	/	54.0	-6.4
Vertical	9960.000	49.1	/	7.4	74.0	/	54.0	-4.9

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

Final Test Level =Receiver Reading + Correction Factor

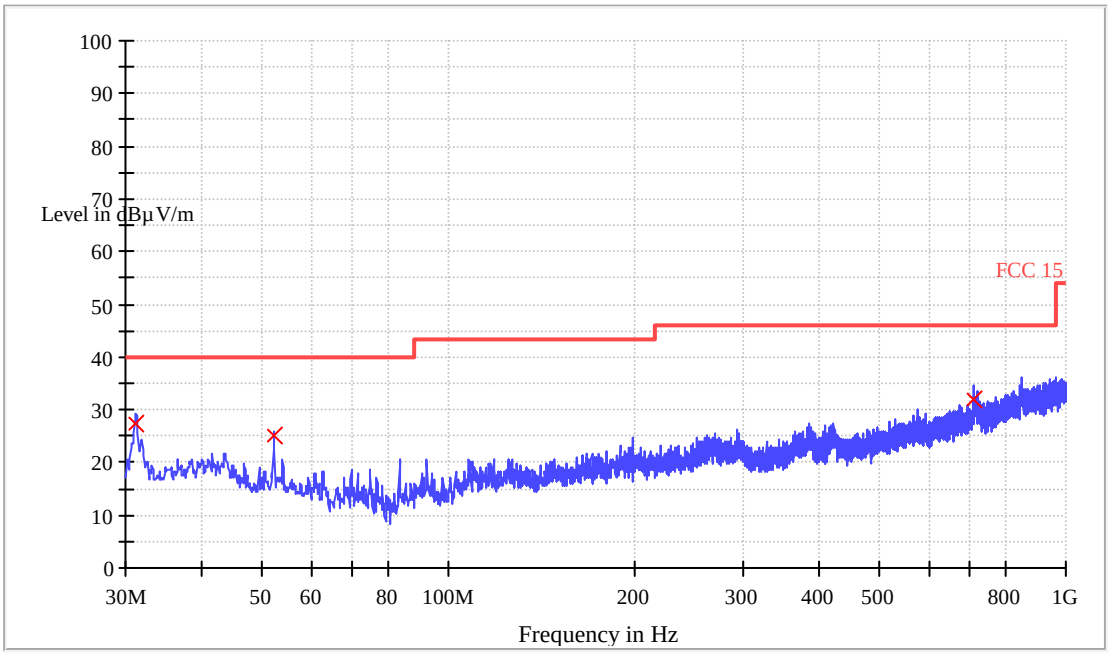
Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Test at Channel 11 (2.462 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

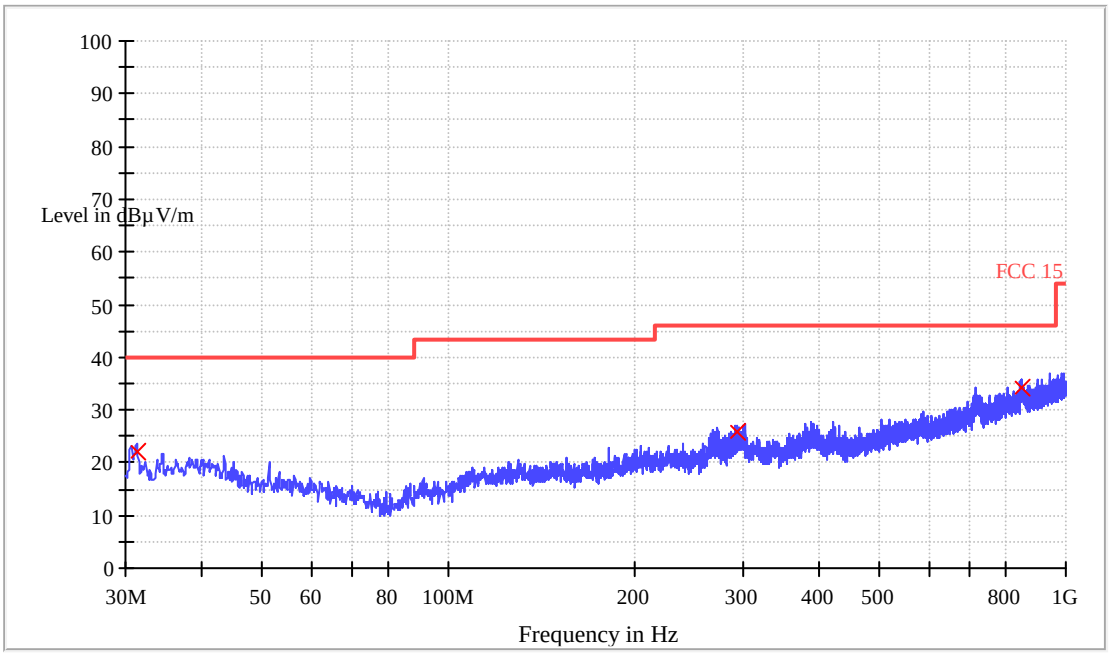
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.240000	27.3	120.000	V	13.3	12.8	40.0
52.200000	25.1	120.000	V	11.7	14.9	40.0
709.240000	31.9	120.000	V	23.9	14.1	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.360000	22.2	120.000	H	13.3	17.8	40.0
294.160000	25.8	120.000	H	17.2	20.2	46.0
849.080000	34.2	120.000	H	27.3	11.8	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	6313.200	45.1	/	2.4	74.0	/	54.0	-8.9
Horizontal	7602.800	47.6	/	4.6	74.0	/	54.0	-6.4
Horizontal	9848.000	50.9	/	7.1	74.0	/	54.0	-3.1
Vertical	4654.600	44.0	/	-0.5	74.0	/	54.0	-10.0
Vertical	7844.000	47.3	/	4.9	74.0	/	54.0	-6.7
Vertical	9848.000	51.2	/	7.1	74.0	/	54.0	-2.8

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

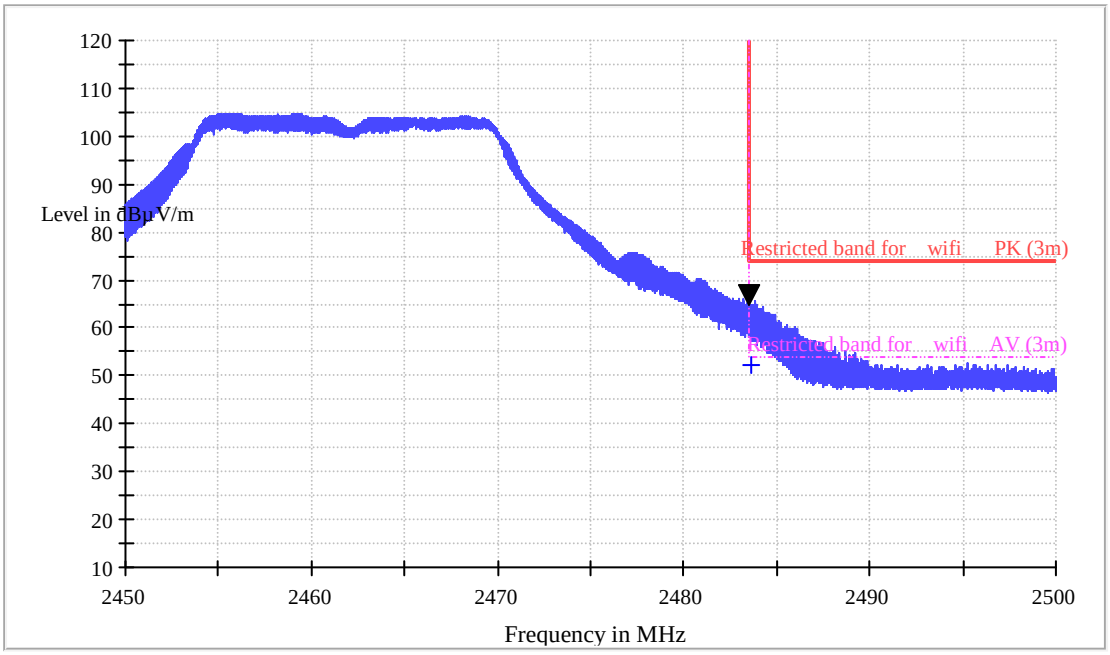
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

Horizontal



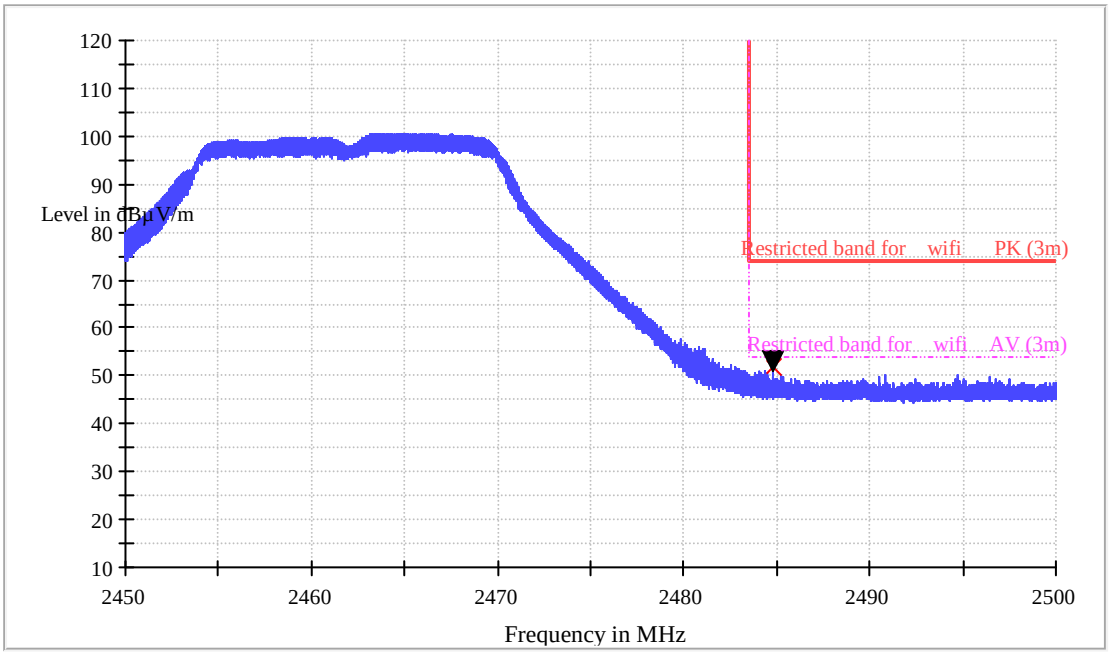
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2483.600000	65.1	1000.0	1000.000	130.0	H	138.0	-2.1	74

Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2483.600000	52.2	1000.0	1000.000	130.0	H	138.0	-2.1	54

Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2484.800000	51.9	1000.0	1000.000	130.0	V	359.0	-2.1	54

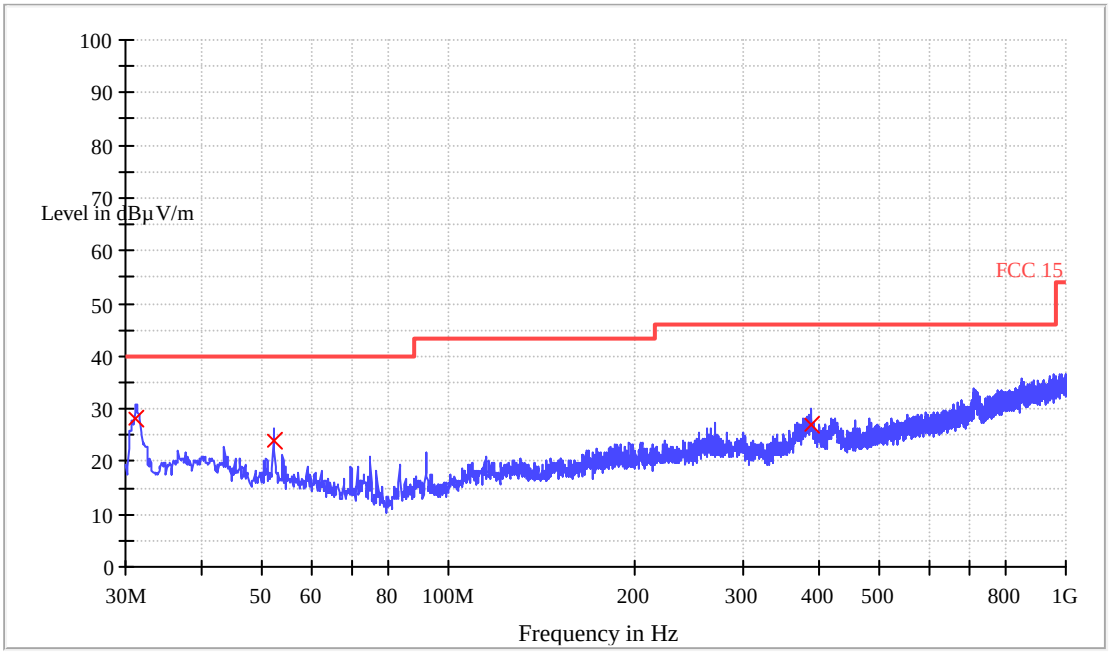
802.11n (HT20) mode with 6.5Mbps data rate

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

Test at Channel 1 (2.412 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

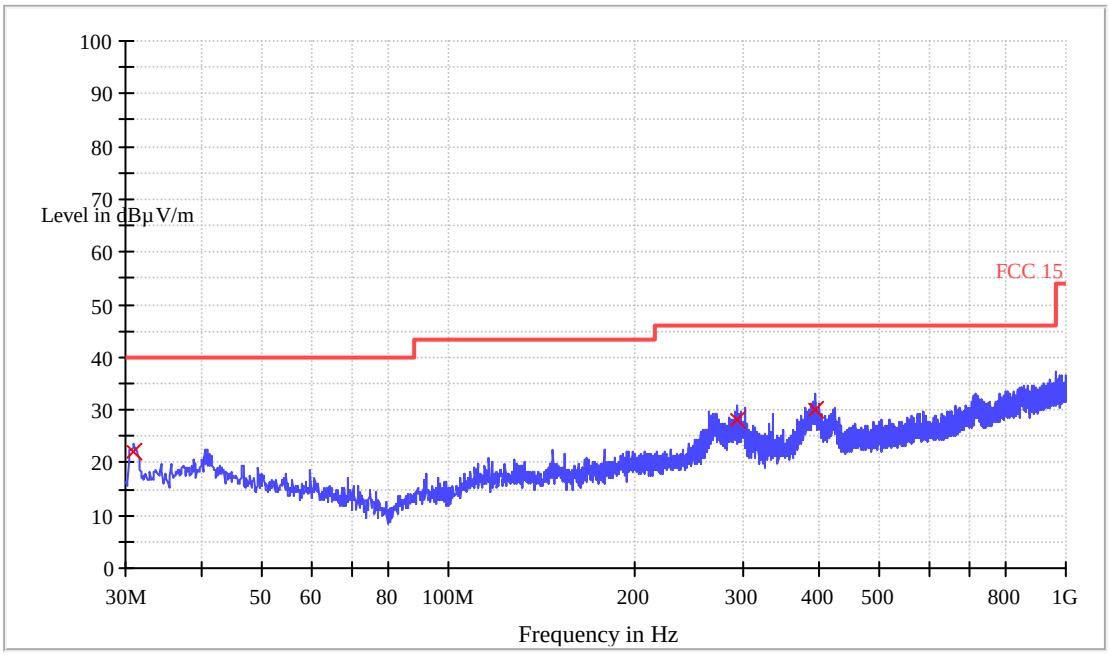
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.240000	28.0	120.000	V	13.3	12.0	40.0
52.200000	24.1	120.000	V	11.7	15.9	40.0
386.200000	27.0	120.000	V	18.7	19.0	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.000000	21.9	120.000	H	13.2	18.1	40.0
292.480000	28.1	120.000	H	17.1	17.9	46.0
393.400000	30.0	120.000	H	18.8	16.0	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	4814.800	44.6	/	-0.5	74.0	/	54.0	-9.4
Horizontal	7214.200	51.5	/	3.5	74.0	/	54.0	-2.5
Horizontal	10002.400	49.3	/	7.5	74.0	/	54.0	-4.7
Vertical	4823.600	44.4	/	-0.5	74.0	/	54.0	-9.6
Vertical	7236.400	47.6	/	3.5	74.0	/	54.0	-6.4
Vertical	9856.400	49.4	/	7.1	74.0	/	54.0	-4.6

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

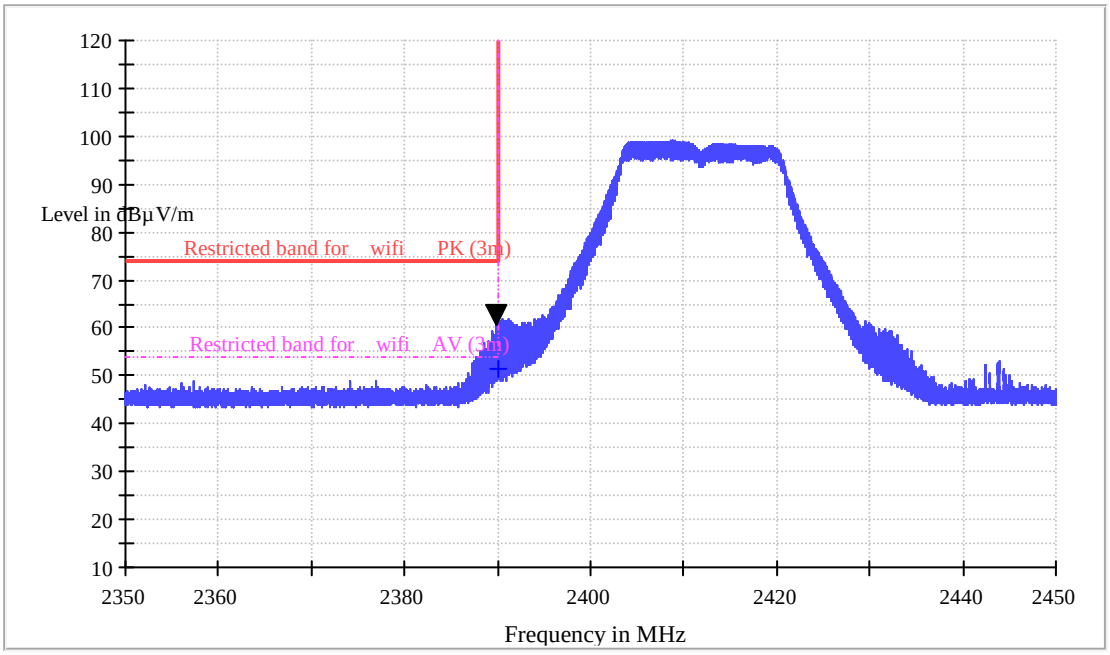
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

Horizontal



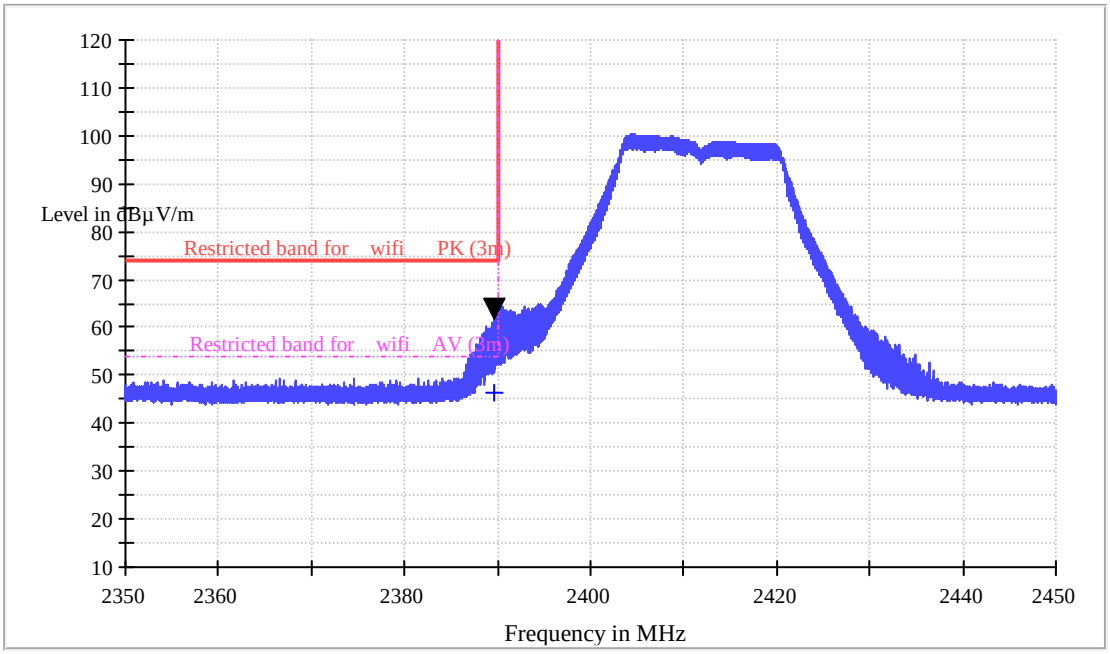
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2390.000000	60.9	1000.0	1000.000	130.0	H	359.0	-2.3	74

Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2390.000000	51.4	1000.0	1000.000	130.0	H	359.0	-2.3	54

Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2389.600000	62.4	1000.0	1000.000	130.0	V	359.0	-2.3	74

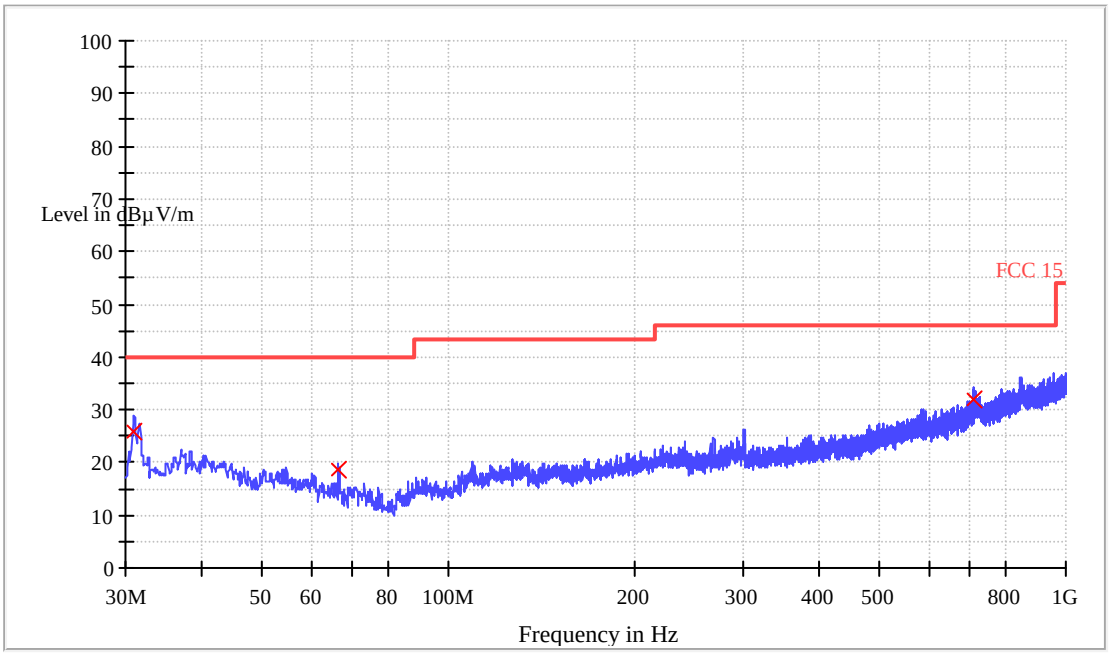
Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2389.600000	46.6	1000.0	1000.000	130.0	V	359.0	-2.3	54

Test at Channel 6 (2.437 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

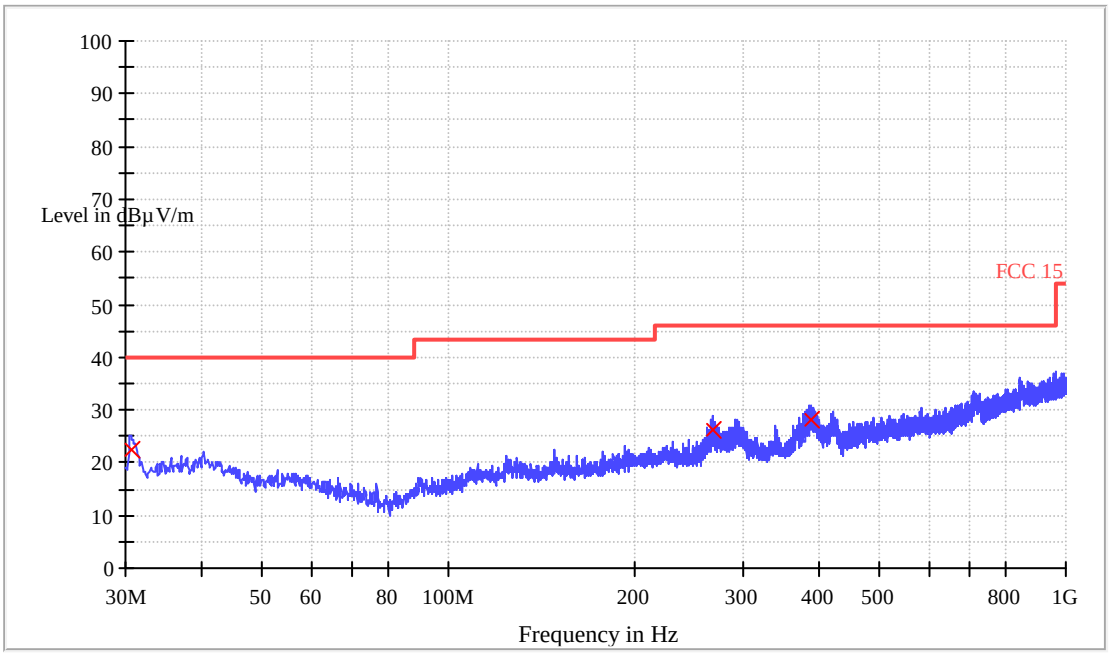
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.000000	25.9	120.000	V	13.2	14.1	40.0
66.320000	18.6	120.000	V	9.7	21.4	40.0
709.120000	31.9	120.000	V	23.9	14.1	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.680000	22.6	120.000	H	13.1	17.4	40.0
268.000000	26.2	120.000	H	16.0	19.8	46.0
386.640000	28.2	120.000	H	18.7	17.8	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBμV/m)	AV Net at 3m (dBμV/m)	Correction Factor (dB)	PK Limit at 3m (dBμV/m)	PK Margin (dB)	AV Limit at 3m (dBμV/m)	AV Margin (dB)
Horizontal	4845.200	44.0	/	-0.5	74.0	/	54.0	-10.0
Horizontal	7751.600	48.3	/	4.8	74.0	/	54.0	-5.7
Horizontal	10275.600	49.5	/	7.7	74.0	/	54.0	-4.5
Vertical	4958.000	44.1	/	-0.5	74.0	/	54.0	-9.9
Vertical	7687.200	47.7	/	4.7	74.0	/	54.0	-6.3
Vertical	10283.200	49.7	/	7.7	74.0	/	54.0	-4.3

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

Final Test Level =Receiver Reading + Correction Factor

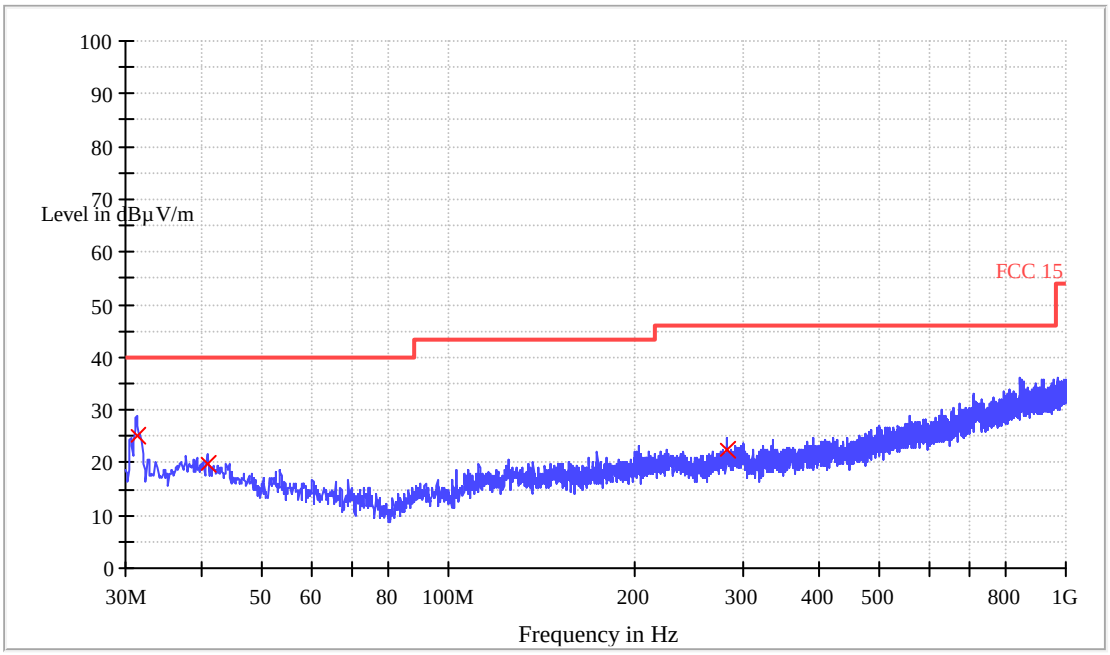
Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Test at Channel 11 (2.462 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

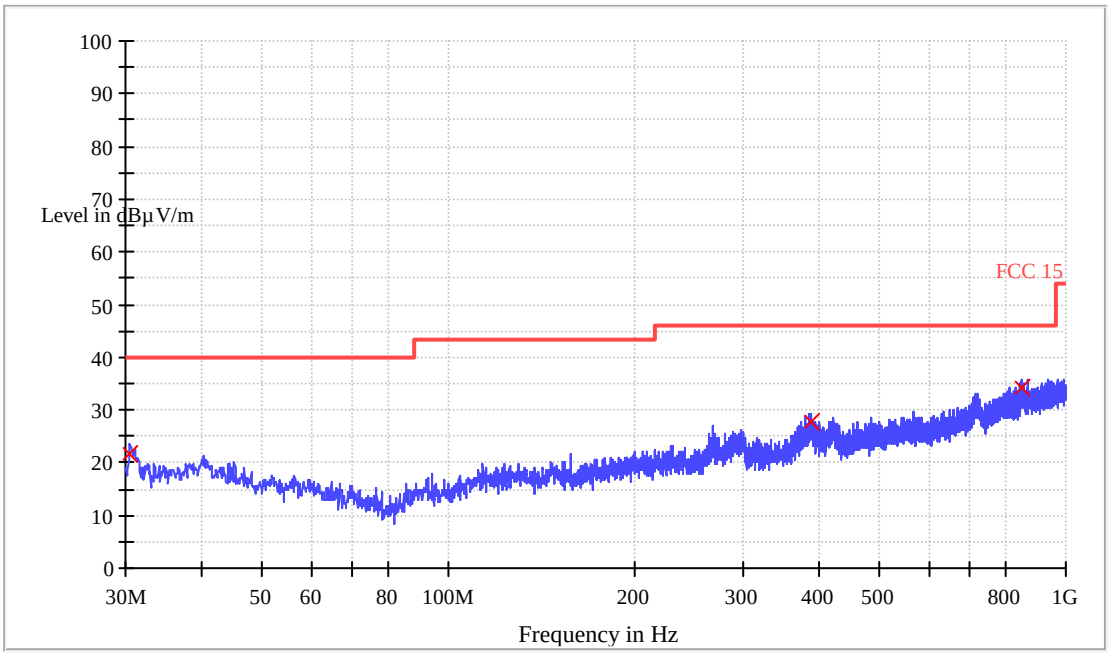
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.360000	25.3	120.000	V	13.3	14.7	40.0
40.720000	19.8	120.000	V	15.7	20.2	40.0
282.640000	22.3	120.000	V	16.5	23.7	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.560000	21.6	120.000	H	13.0	18.4	40.0
386.520000	27.8	120.000	H	18.7	18.2	46.0
849.080000	34.1	120.000	H	27.3	11.9	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	4764.800	43.4	/	-0.5	74.0	/	54.0	-10.6
Horizontal	7635.200	47.8	/	4.6	74.0	/	54.0	-6.2
Horizontal	10408.000	49.4	/	7.8	74.0	/	54.0	-4.6
Vertical	5894.800	45.0	/	2.0	74.0	/	54.0	-9.0
Vertical	7726.800	48.6	/	4.7	74.0	/	54.0	-5.4
Vertical	9848.000	51.5	/	7.1	74.0	/	54.0	-2.5

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

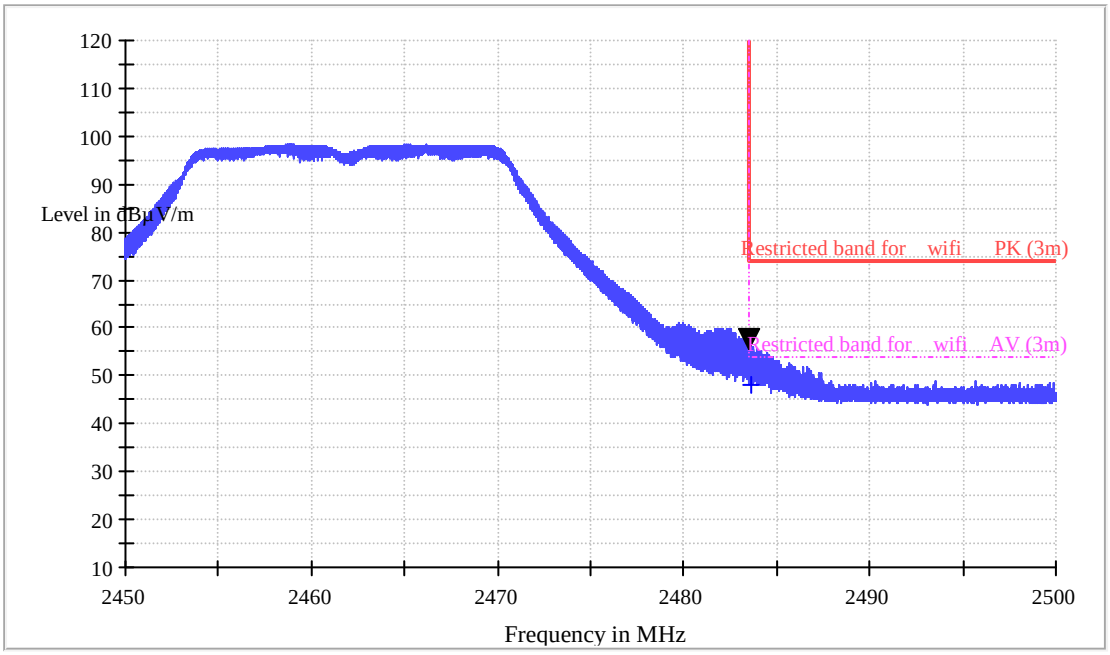
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

Horizontal



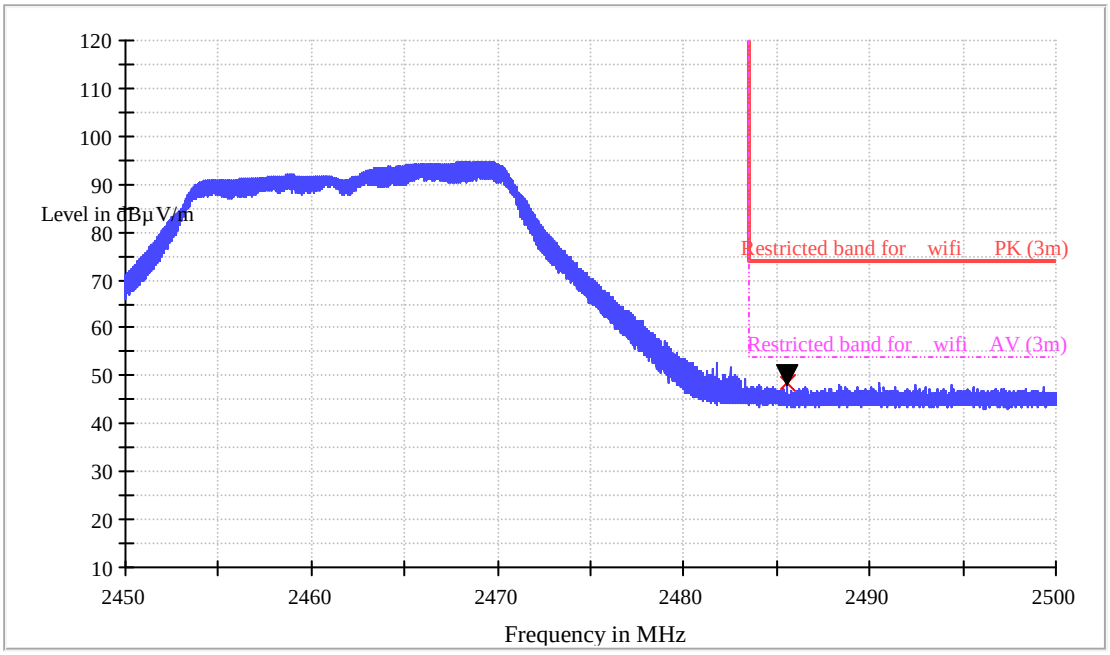
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2483.600000	56.0.2	1000.0	1000.000	130.0	H	1.0	-2.1	74

Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2483.600000	48.2	1000.0	1000.000	130.0	H	1.0	-2.1	54

Vertical



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2485.600000	48.4	1000.0	1000.000	130.0	V	359.0	-2.1	74

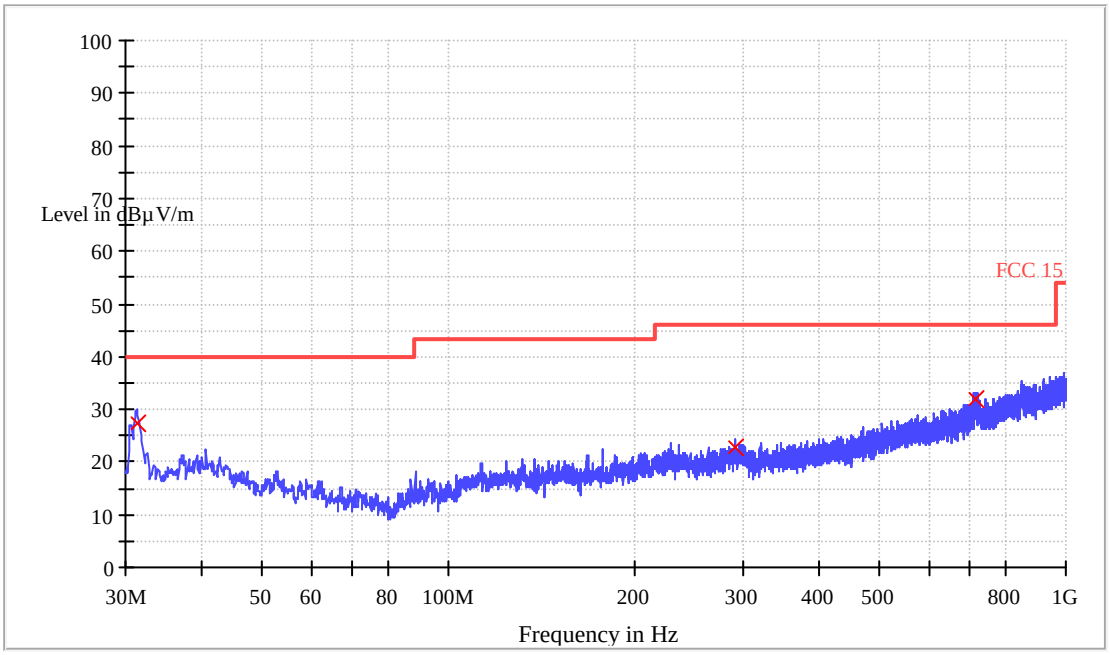
802.11n (HT40) mode with 130Mbps data rate

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

Test at Channel 3 (2.422 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

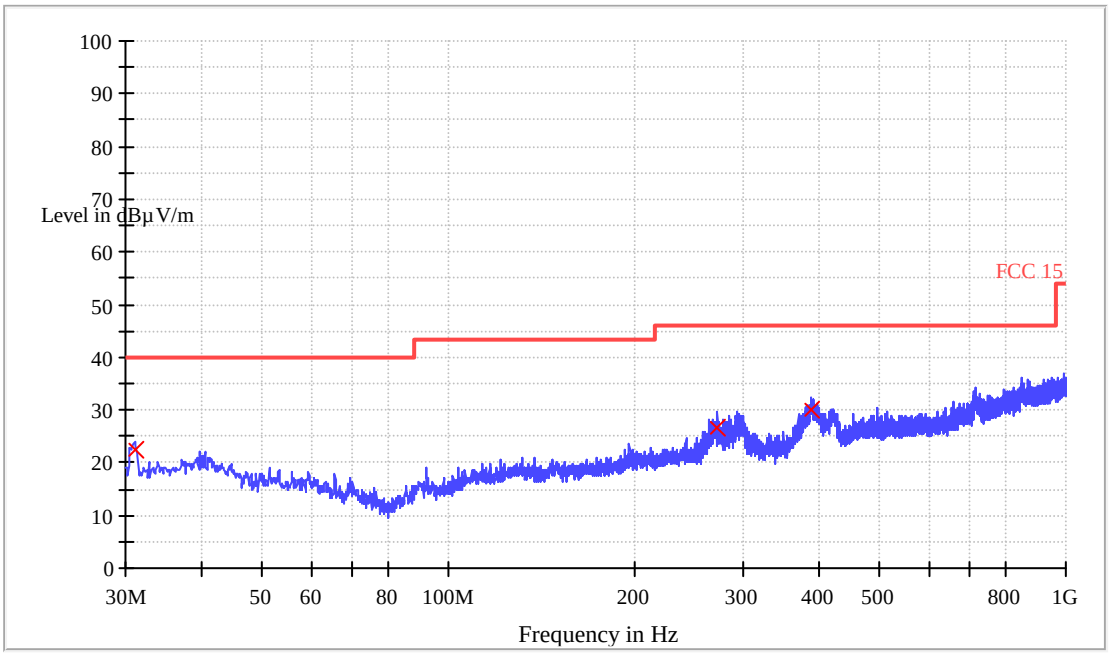
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.360000	27.4	120.000	V	13.3	12.6	40.0
290.320000	22.7	120.000	V	17.0	23.3	46.0
714.520000	32.1	120.000	V	24.1	14.0	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.120000	22.4	120.000	H	13.2	17.6	40.0
273.280000	26.7	120.000	H	16.1	19.3	46.0
386.520000	29.9	120.000	H	18.7	16.1	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBμV/m)	AV Net at 3m (dBμV/m)	Correction Factor (dB)	PK Limit at 3m (dBμV/m)	PK Margin (dB)	AV Limit at 3m (dBμV/m)	AV Margin (dB)
Horizontal	6116.800	44.8	/	2.4	74.0	/	54.0	-9.2
Horizontal	7848.000	47.2	/	4.9	74.0	/	54.0	-6.8
Horizontal	10247.000	50.2	/	7.7	74.0	/	54.0	-3.8
Vertical	5882.800	45.2	/	1.9	74.0	/	54.0	-8.8
Vertical	7736.400	48.9	/	4.7	74.0	/	54.0	-5.1
Vertical	10290.000	49.9	/	7.7	74.0	/	54.0	-4.1

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

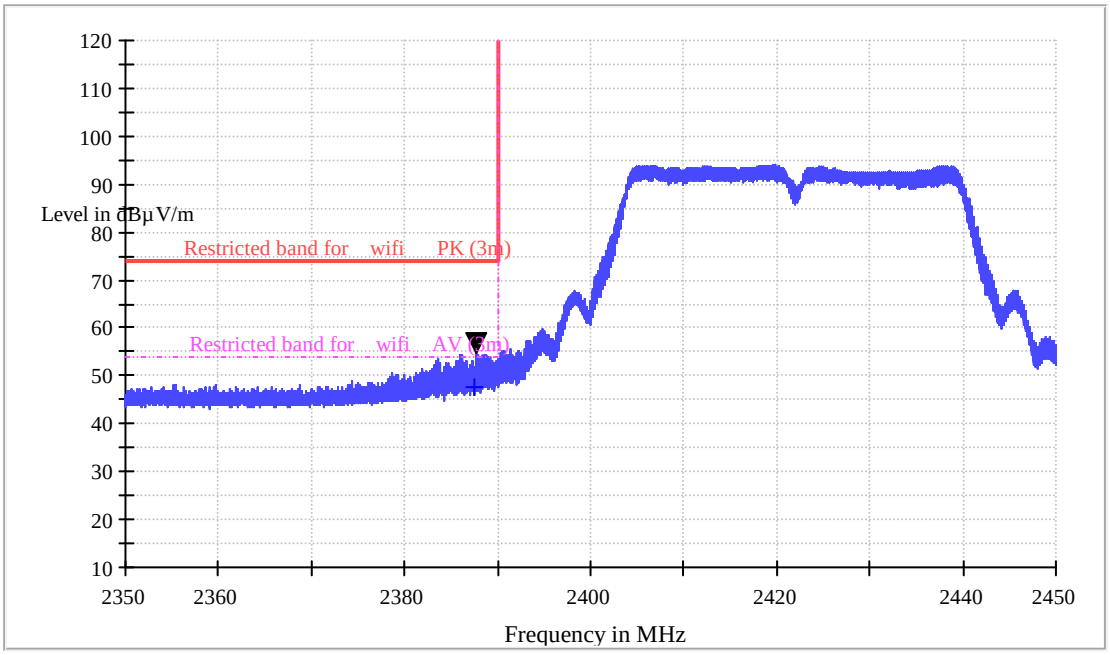
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

Horizontal



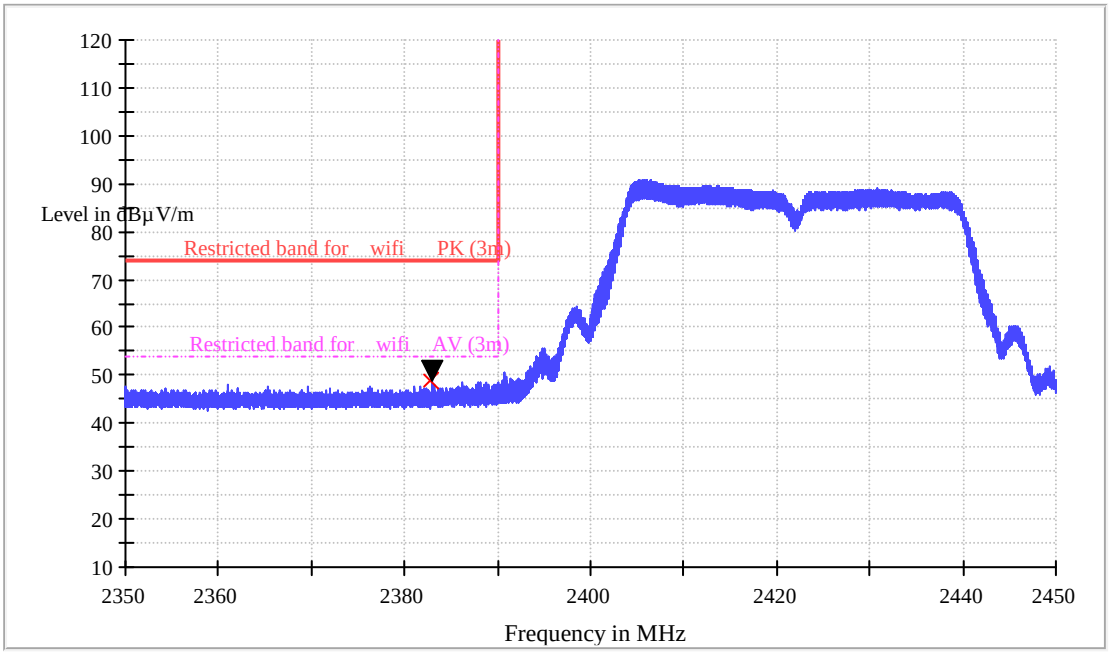
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2387.600000	55.2	1000.0	1000.000	130.0	H	359.0	-2.3	74

Result Table_Single

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2387.600000	47.7	1000.0	1000.000	130.0	H	359.0	-2.3	54

Vertical



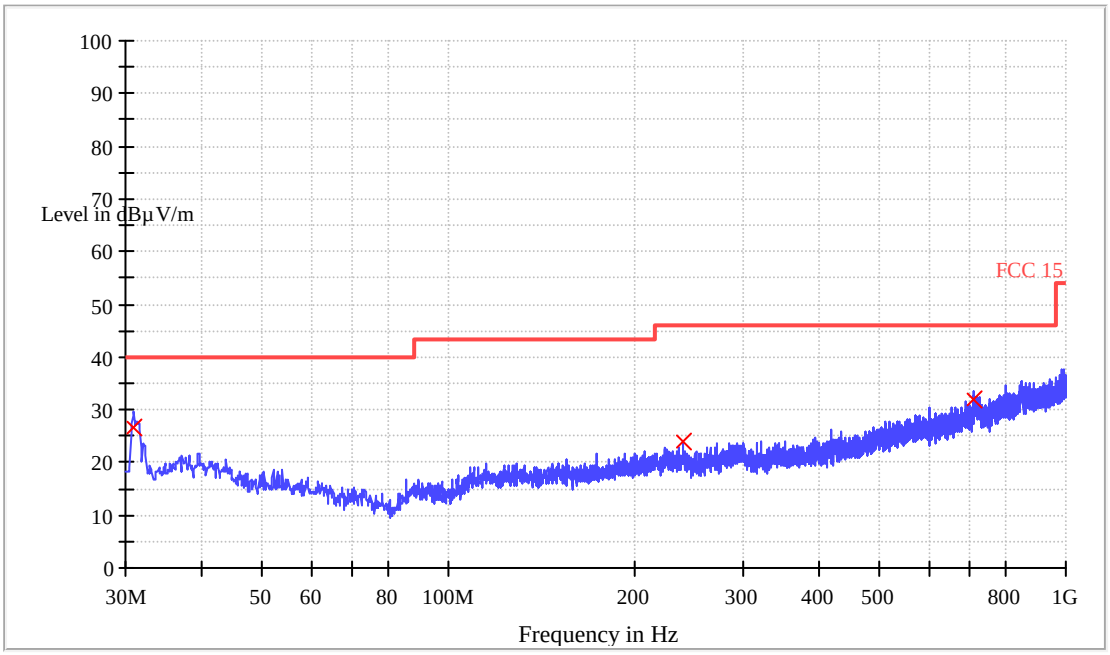
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2382.800000	49.1	1000.0	1000.000	130.0	V	1.0	-2.3	74

Test at Channel 6 (2.437 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

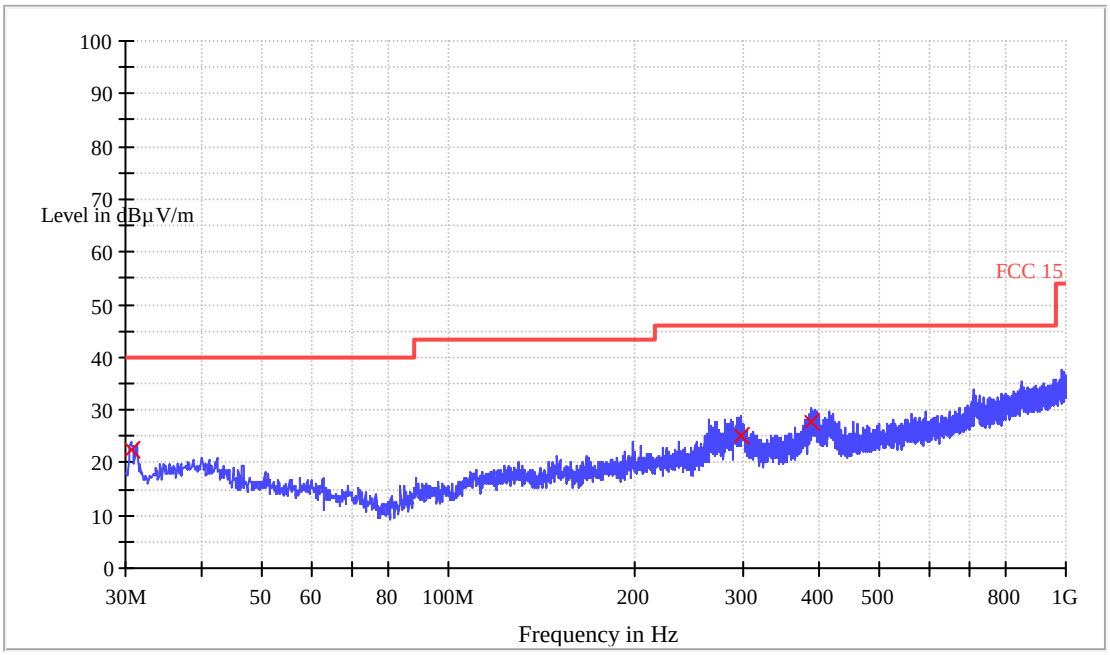
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.000000	26.8	120.000	V	13.2	13.2	40.0
240.120000	24.1	120.000	V	15.4	21.9	46.0
711.040000	31.9	120.000	V	24.0	14.1	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.680000	22.5	120.000	H	13.1	17.5	40.0
297.640000	25.0	120.000	H	17.5	21.0	46.0
388.320000	27.6	120.000	H	18.7	18.4	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	6376.800	45.7	/	2.4	74.0	/	54.0	-8.3
Horizontal	7636.000	47.9	/	4.6	74.0	/	54.0	-6.1
Horizontal	10233.200	49.7	/	6.4	74.0	/	54.0	-4.3
Vertical	5984.800	48.4	/	2.4	74.0	/	54.0	-5.6
Vertical	7748.400	48.3	/	4.8	74.0	/	54.0	-5.7
Vertical	10468.400	49.6	/	7.8	74.0	/	54.0	-4.4

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

Final Test Level =Receiver Reading + Correction Factor

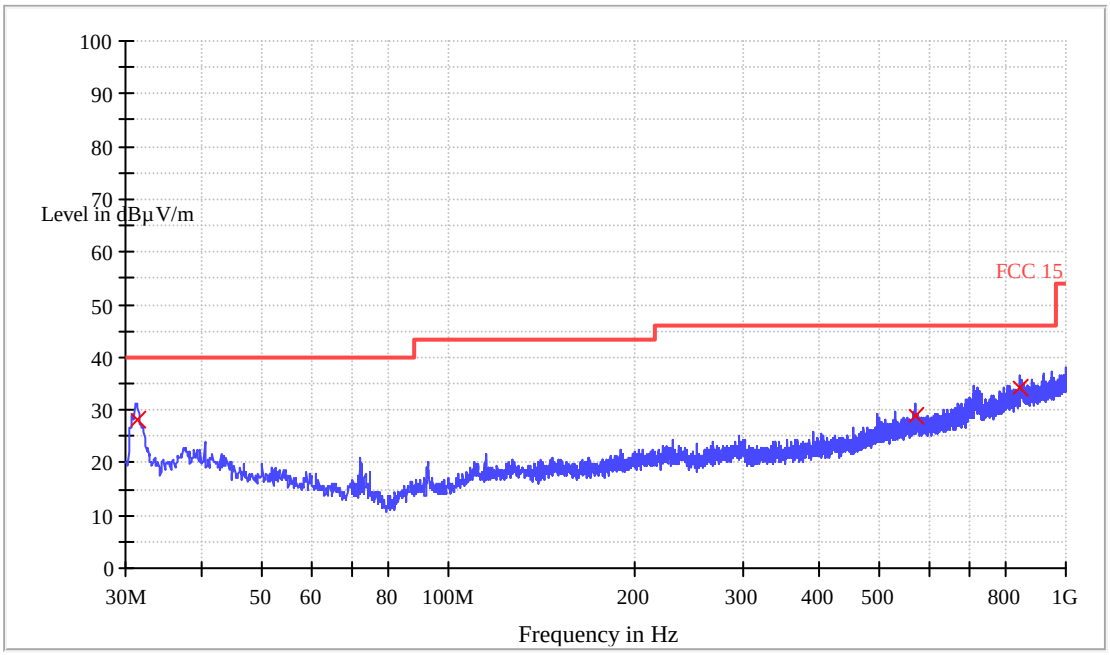
Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Test at Channel 11 (2.452 GHz) in transmitting status

30 MHz~1 GHz Radiated Emissions .Quasi-Peak Measurement

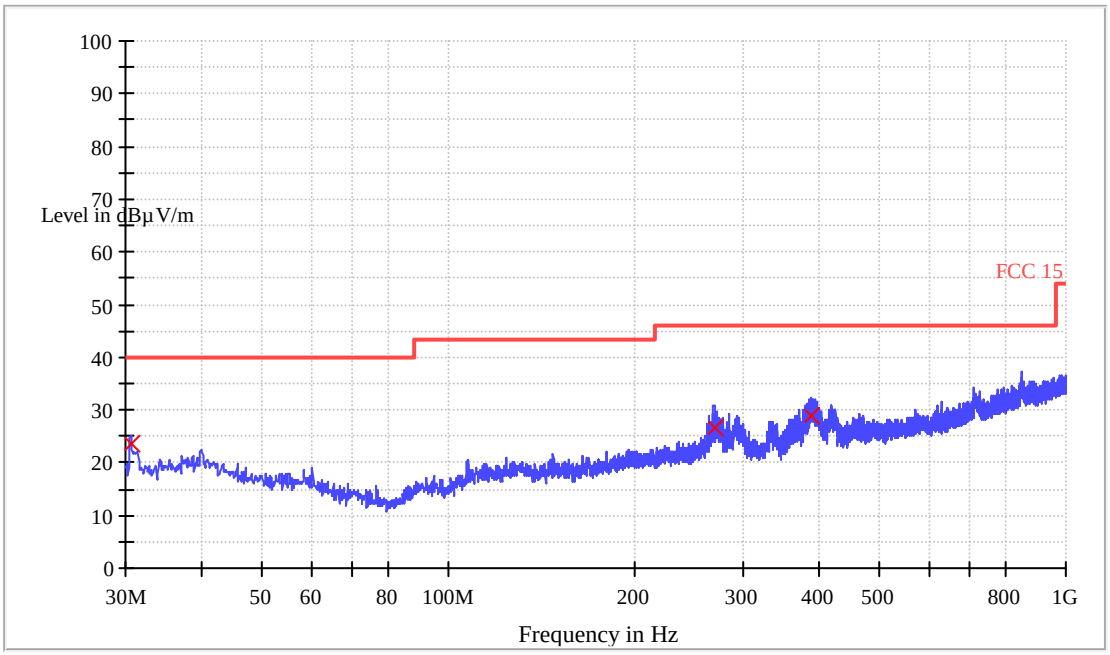
Vertical:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.360000	28.0	120.000	V	13.3	12.0	40.0
572.200000	28.8	120.000	V	21.7	17.2	46.0
844.920000	34.1	120.000	V	27.3	11.9	46.0

Horizontal:



QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.680000	23.5	120.000	H	13.1	16.5	40.0
269.240000	26.7	120.000	H	16.0	19.3	46.0
388.240000	29.0	120.000	H	18.7	17.0	46.0

1~25 GHz Radiated Emissions. Peak & Average Measurement

Polarization	Frequency (MHz)	PK Net at 3m (dBµV/m)	AV Net at 3m (dBµV/m)	Correction Factor (dB)	PK Limit at 3m (dBµV/m)	PK Margin (dB)	AV Limit at 3m (dBµV/m)	AV Margin (dB)
Horizontal	4610.000	42.9	/	-0.5	74.0	/	54.0	-11.1
Horizontal	8007.200	46.3	/	5.1	74.0	/	54.0	-7.7
Horizontal	10285.200	49.0	/	7.7	74.0	/	54.0	-5.0
Vertical	4484.000	44.1	/	-0.5	74.0	/	54.0	-9.9
Vertical	8222.800	47.3	/	5.0	74.0	/	54.0	-6.7
Vertical	9808.000	51.0	/	6.9	74.0	/	54.0	-3.0

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

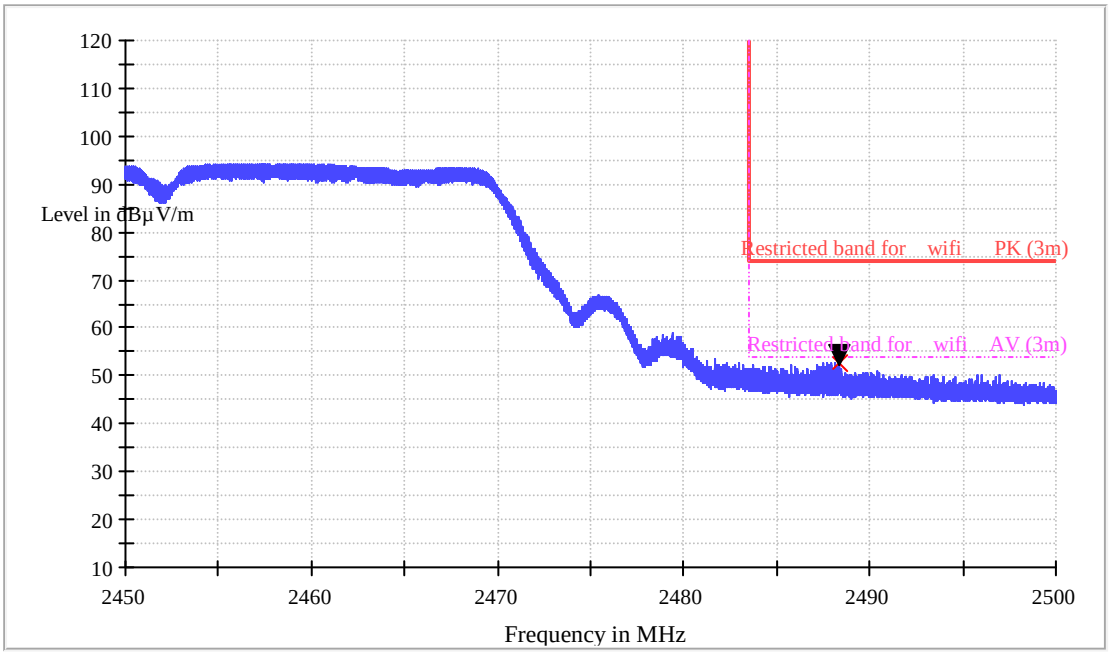
Final Test Level =Receiver Reading + Correction Factor

Correction Factor = Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Band Edge test Restricted Bands

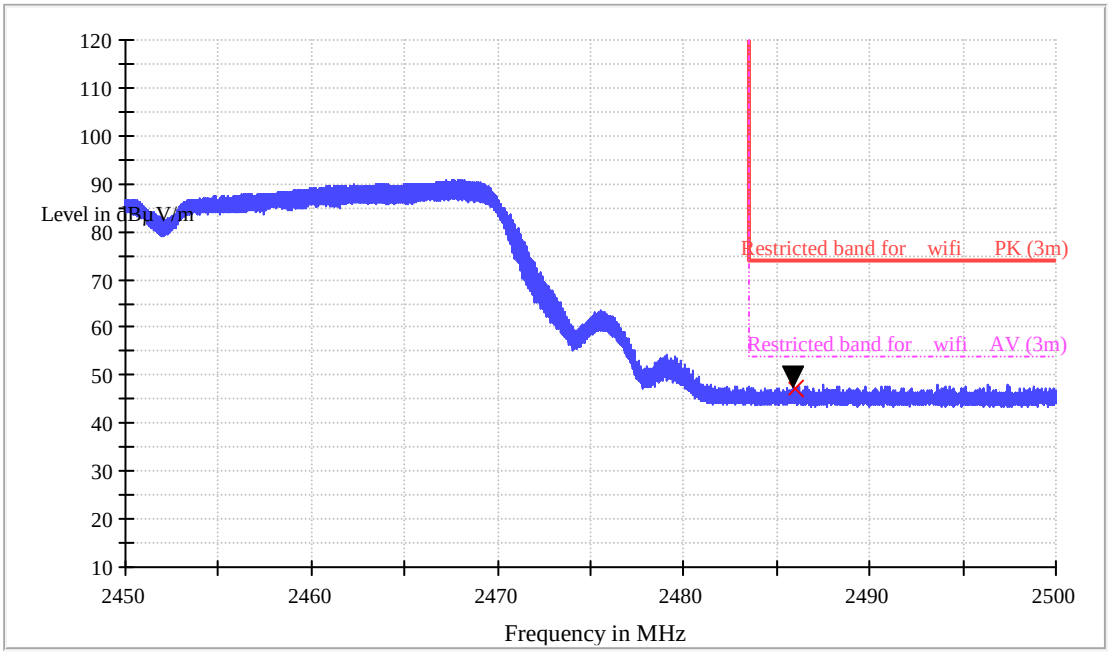
Horizontal



Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2488.400000	52.8	1000.0	1000.000	130.0	H	359.0	-2.1	74

Vertical

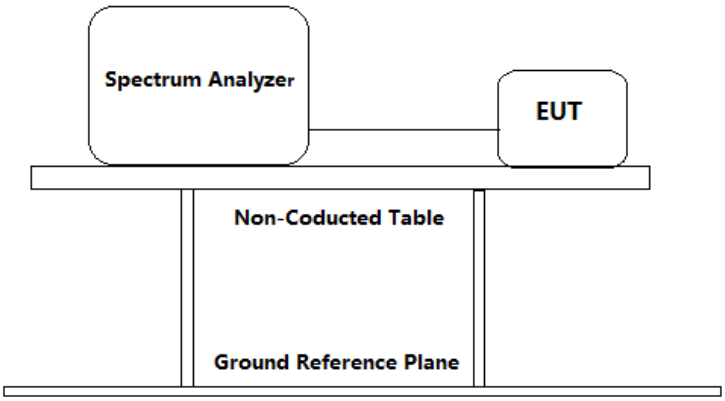


Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Limit (dBµV/m)
2486.000000	47.1	1000.0	1000.000	130.0	V	1.0	-2.1	74

4.8 Band Edges Requirement

Test Requirement:	FCC Part 15 C section 15.247
	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Based on either an RF conducted or a radiated measurement. Provided the transmitter demonstrates compliance with the peak conducted power limits.
Frequency Band:	2400 MHz to 2483.5 MHz
Test Method:	ANSI C63.10: Clause 11.11 and 11.13
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test Configuration:	For Band Edges Emission in Radiated mode, Please refer to clause 4.7



Test Procedure:	For Band Edges Emission in Radiated mode, Please refer to clause 4.7

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.

   a) Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).
   b) Set the center frequency and span to encompass frequency range to be measured.
   c) RBW = 100 kHz.
   d) VBW ⩾ [3 × RBW].

e) Detector = peak.
f) Sweep time = auto.
g) Trace mode = max hold.
h) Allow sweep to continue until the trace stabilizes (required measurement time may increase for low-duty-cycle applications).
i) For radiated Band-edge emissions within a restricted band and within 2 MHz of an authorized band edge, integration method is considered.

2. Repeat until all the test status is investigated.
3. Report the worst case.

Test result with plots as follows:

For conduct mode:

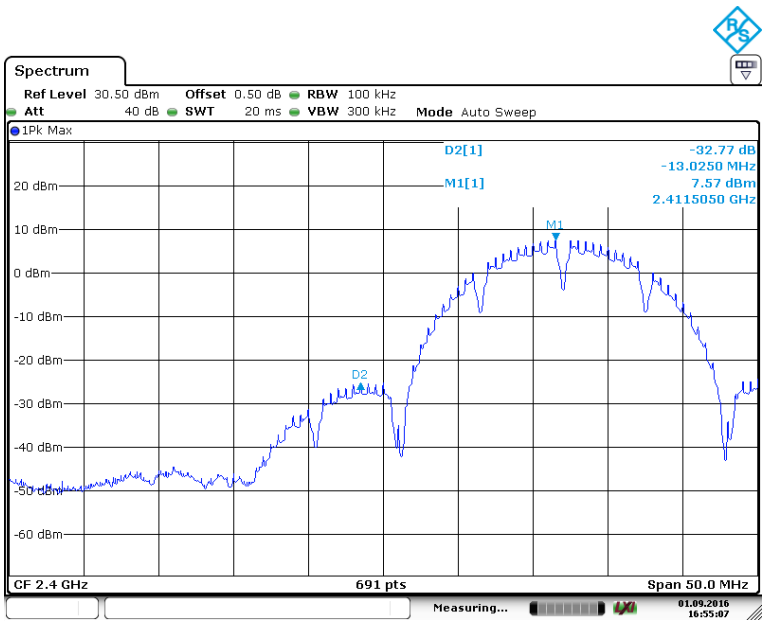
The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB.

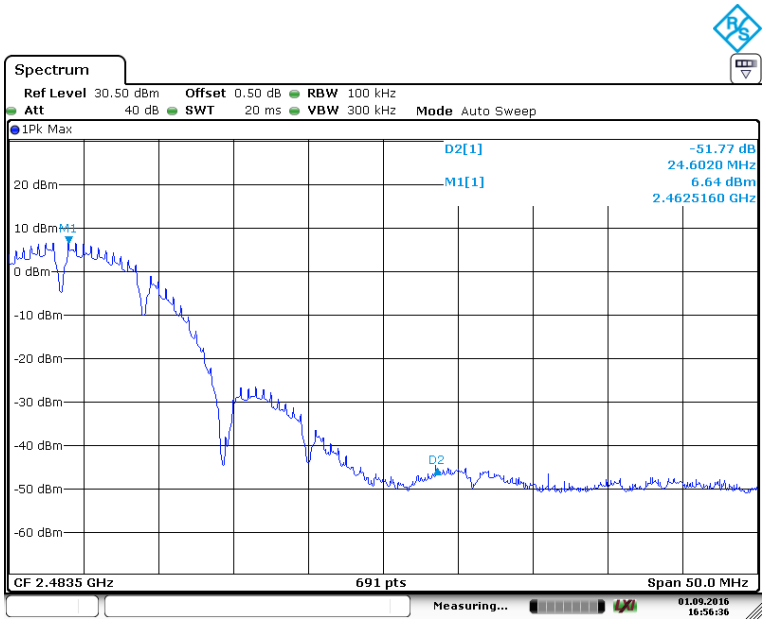
The Upper Edges attenuated more than 20dB.

802.11b mode with 11 Mbps data rate

Channel1: 2.412 GHz

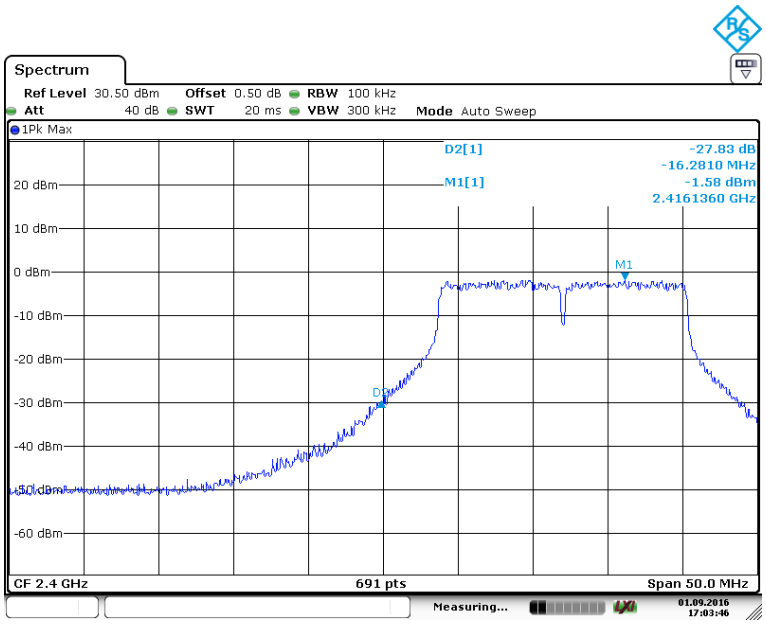


Channel 11: 2.462 GHz

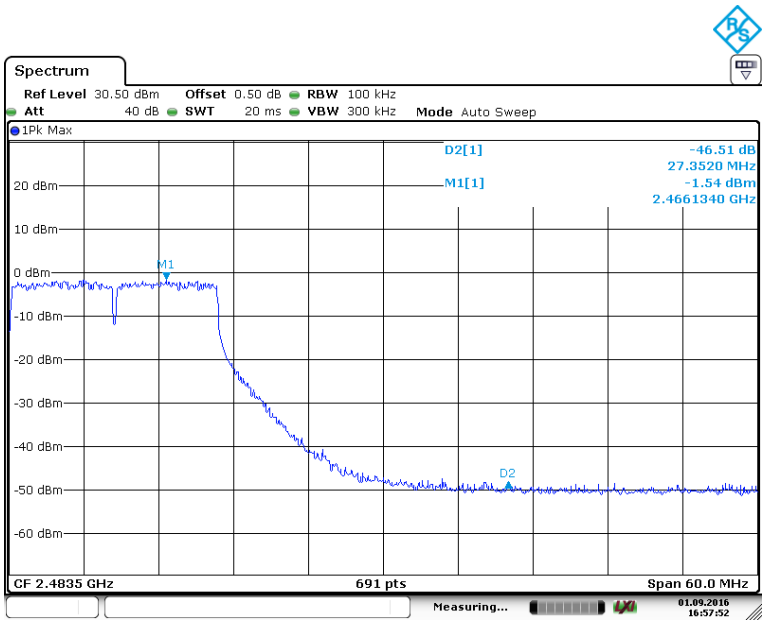


802.11g mode with 9 Mbps data rate

Channel1: 2.412 GHz

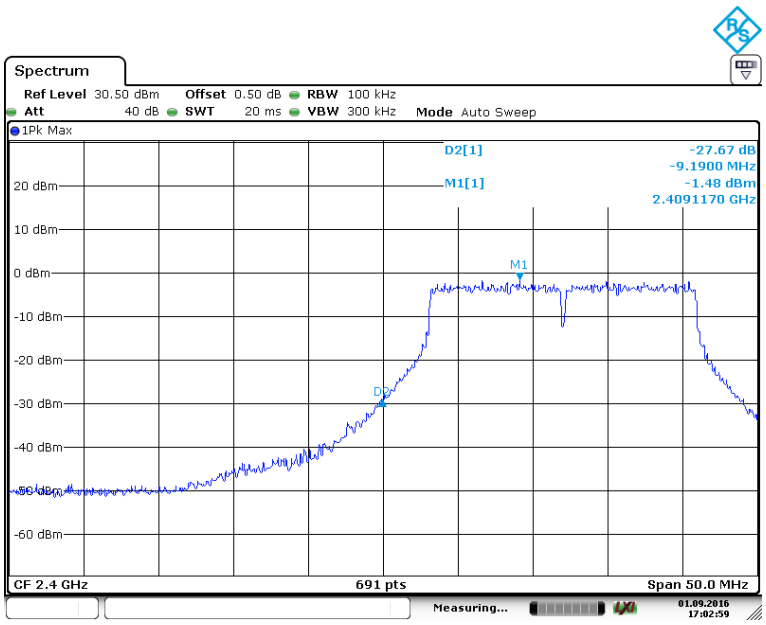


Channel 11: 2.462 GHz

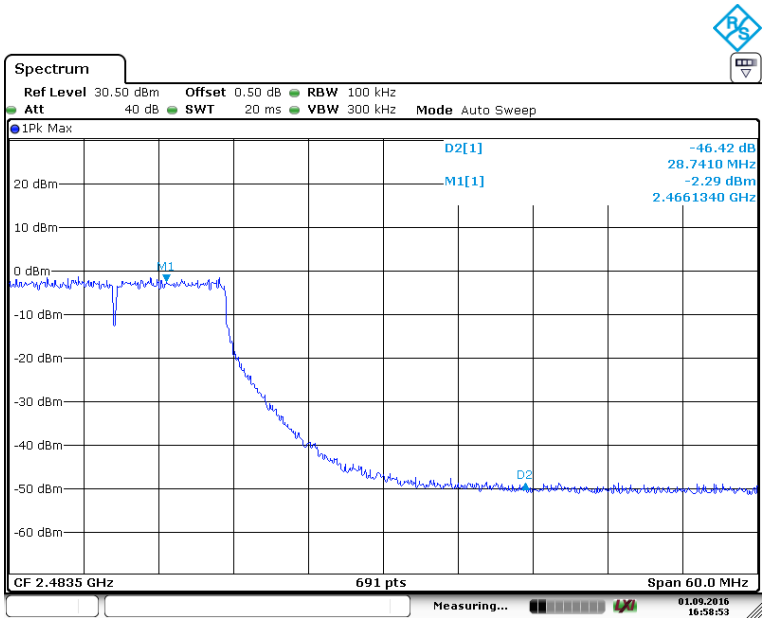


802.11n(HT20) mode with 6.5Mbps data rate

Channel1: 2.412 GHz

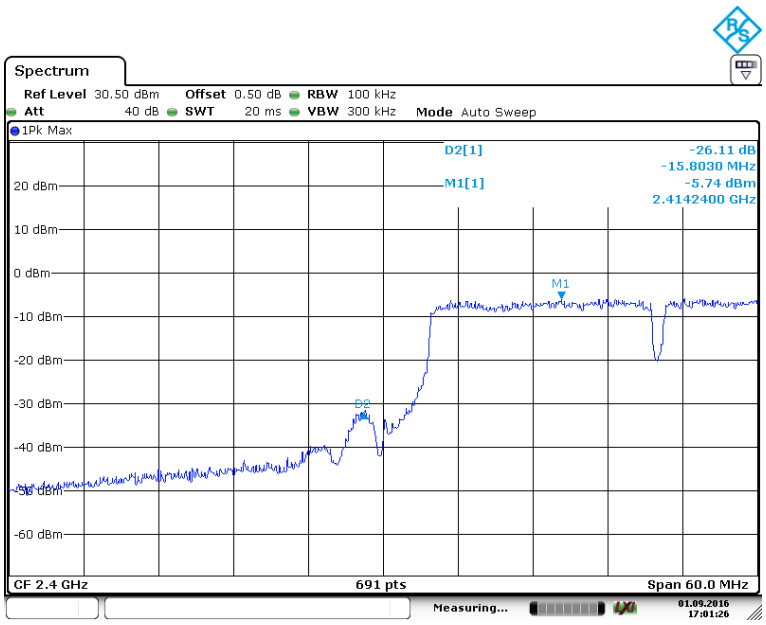


Channel 11: 2.462 GHz

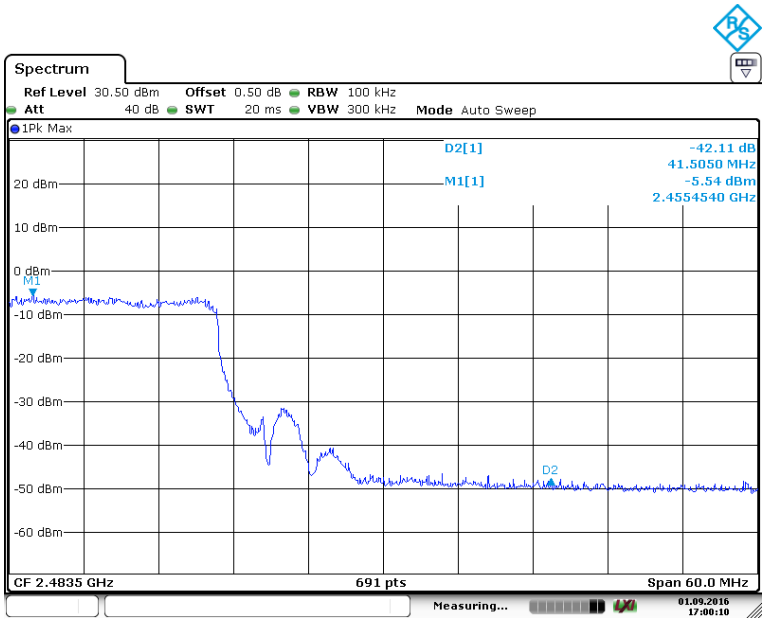


802.11n(HT40) mode with 135Mbps data rate

Channel 3: 2.422 GHz

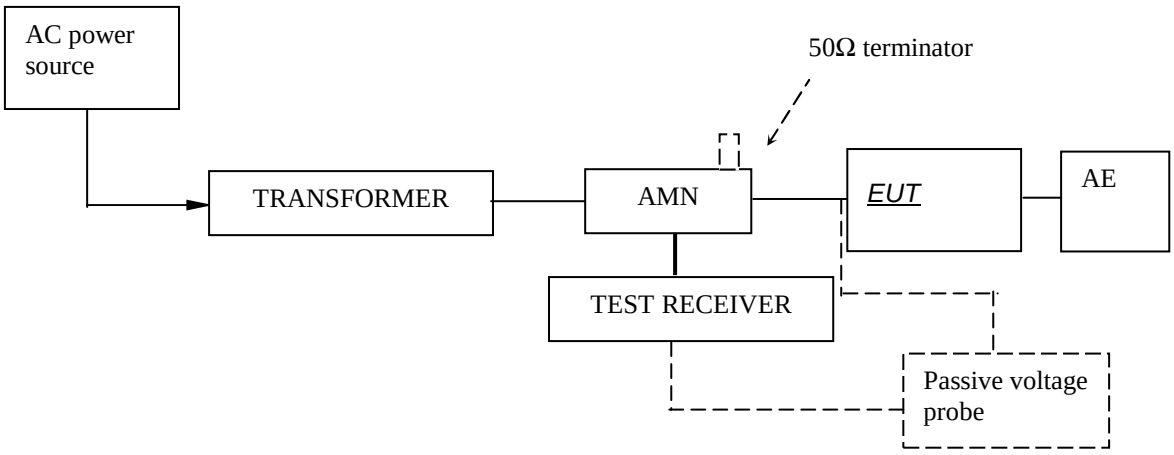


Channel 9: 2.452 GHz



4.9 Conducted Emission Test

Test Configuration:



Test Setup and Procedure

Test was performed according to ANSI C63.10 Clause 6.2. The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provides a 50Ω linear impedance Artificial hand is used if appropriate (for handheld apparatus). The load/control terminal disturbance voltage was measured with passive voltage probe if appropriate.

The table-top EUT was placed on a 0.8m high non-metallic table above earthed ground plane (Ground Reference Plane).And for floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP. The EUT keeps a distance of at least 0.8m from any other of the metallic surface. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

The bandwidth of test receiver was set at 9 kHz. The frequency range from 150 kHz to 30MHz was checked.

Pre-test on all modes and only the worst case data had been report.

Worst Case Test Data

At main terminal: Pass

Tested Wire: Live Operation Mode: transmitting B mode at 2437MHz

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC15QP				
Trace2:	FCC15AV				
Trace3:	---				
	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	154 kHz	61.95	L1	-3.82
2	Average	166 kHz	40.20	L1	-14.95
1	Quasi Peak	386 kHz	35.91	L1	-22.23
1	Quasi Peak	4.39 MHz	36.40	L1	-19.59
1	Quasi Peak	12.09 MHz	42.12	L1	-17.87
1	Quasi Peak	15.63 MHz	37.46	L1	-22.53

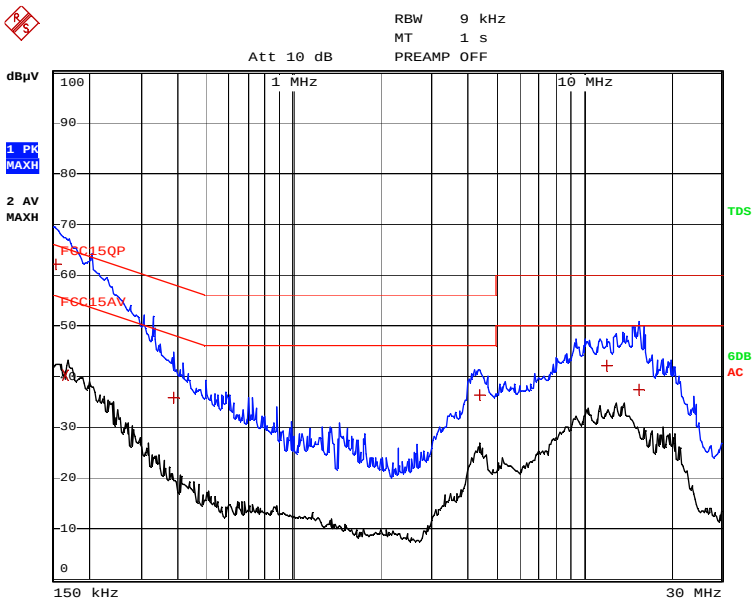
Tested Wire: Neutral Operation Mode: transmitting B mode at 2437MHz

EDIT PEAK LIST (Final Measurement Results)

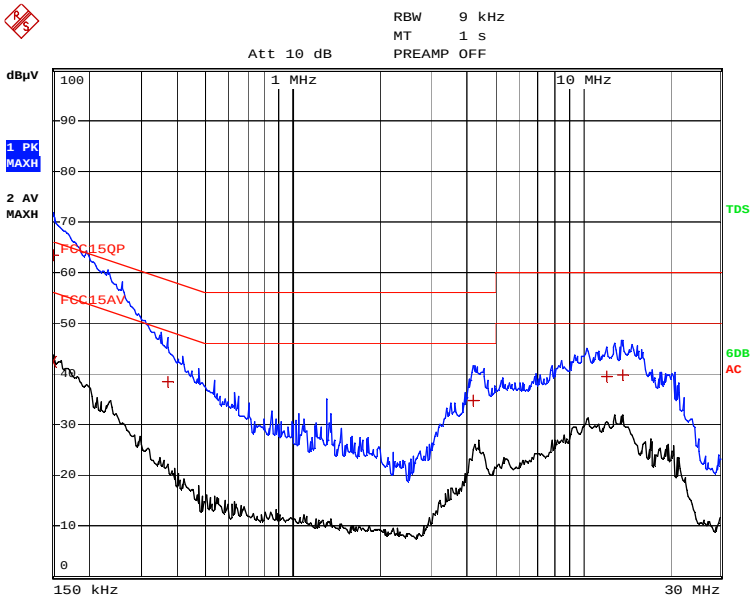
Trace1:	FCC15QP				
Trace2:	FCC15AV				
Trace3:	---				
	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	150 kHz	63.50	L1	-2.49
2	Average	150 kHz	42.30	L1	-13.69
1	Quasi Peak	370 kHz	38.48	L1	-20.01
1	Quasi Peak	4.214 MHz	34.80	L1	-21.19
1	Quasi Peak	12.182 MHz	39.51	L1	-20.48
1	Quasi Peak	13.786 MHz	39.69	L1	-20.30

Emission Curve

Tested Wire: Live



Tested Wire: Neutral



5.0 Test Equipment List

Radiated Emission

Equipment No.	Equipment	Model	Manufacturer	Cal. Due date (YYYY-MM-DD)	Calibration Interval
EM030-04	3m Semi-Anechoic Chamber	9×6×6 m^3	ETS·LINDGREN	2017/5/9	1Y
EM031-02	EMI Test Receiver (9 kHz~7 GHz)	R&S ESR7	R&S	2017/6/7	1Y
EM031-03	Signal and Spectrum Analyzer (10 Hz~40 GHz)	R&S FSV40	R&S	2017/6/3	1Y
EM011-04	Loop antenna (9 kHz-30 MHz)	HFH2-Z2	R&S	2017/6/6	1Y
EM061-03	TRILOG Super Broadband test Antenna (30 MHz-1.5 GHz）(TX)	VULB 9161	SCHWARZBECK	2017/6/6	1Y
EM033-01	TRILOG Super Broadband test Antenna(30 MHz-3 GHz）(RX)	VULB 9163	SCHWARZBECK	2017/9/8	1Y
EM033-02	Bouble-Ridged Waveguide Horn Antenna (800 MHz-18 GHz)(RX)	R&S HF907	R&S	2017/6/6	1Y
EM033-03	High Frequency Antenna & preamplifier(18 GHz~26.5 GHz) (RX)	R&S SCU-26	R&S	2017/4/1	1Y
EM033-04	High Frequency Antenna & preamplifier (26 GHz-40 GHz)	R&S SCU-40	R&S	2017/4/1	1Y
EM031-02-01	Coaxial cable(9 kHz-1 GHz)	N/A	R&S	2017/5/30	1Y
EM033-02-02	Coaxial cable(1 GHz-18 GHz)	N/A	R&S	2017/5/30	1Y
EM033-04-02	Coaxial cable(18 GHz~40 GHz)	N/A	R&S	2017/4/1	1Y
EM031-01	Signal Generator (9 kHz~6 GHz)	SMB100A	R&S	2017/6/11	1Y
SZ180-10	Signal Generator (10MHz-40GHz)	68369B	Wiltron	2017/5/23	1Y
EM040-01	Band Reject/Notch Filter	WRHFV	Wainwright	N/A	1Y
EM040-02	Band Reject/Notch Filter	WRCGV	Wainwright	N/A	1Y
EM040-03	Band Reject/Notch Filter	WRCGV	Wainwright	N/A	1Y
EM022-03	2.45 GHz Filter	BRM50702	Micro-Tronics	2017/5/9	1Y
SA016-16	Programmable Temperature & Humidity Test Chamber	MHU-800LJ	TERCHY	2017/10/21	1Y
SA012-74	Digital Multimeter	FLUKE175	FLUKE	2017/10/13	1Y
EM010-01	Regulated DC Power supply	PAB-3003A	GUANHUA	N/A	1Y
SA040-22	Regulated DC Power supply	IT6721	ITECH	2017/9/18	1Y
EM084-06	Audio Analyzer	8903B	HP	2017/3/29	1Y
EM084-07	Modulation Analyzer	8901B	HP	2017/6/5	1Y

Conducted emission at the mains terminals

Equipment No.	Equipment	Model	Manufacturer	Cal. Due date (YYYY-MM-DD)	Calibration Interval
EM080-05	EMI receiver	ESCI	R&S	2017/7/26	1Y
EM006-05	LISN	ENV216	R&S	2017/9/18	1Y
EM006-06	LISN	ENV216	R&S	2017/9/18	1Y
EM006-06-01	Coaxial cable	/	R&S	2017/4/11	1Y
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu	2017/1/25	1Y