Certificate #6613.01

FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	Waltero AB
Address:	Nytänkargatan 4

Manufacturer or Supplier:	Waltero AB
Address:	Nytänkargatan 4
Product:	W-Sensor
Brand Name:	Waltero
Model Name:	W-Sensor LTE
FCC ID:	2BNXWWS-001
Date of tests:	Dec. 27, 2024 ~ Mar. 04, 2025

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

☒ **ANSI C63.10-2020**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Xu Hanwen	Sun Peibo
Date: Mar. 04, 2025	Date: Mar. 04, 2025

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/ and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or CHaracteristics of the lot from whiCH a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that suCH notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise suCH issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSZ-QSU2412270112RF05	Original release	Mar. 04, 2025

1. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	TEST LAB*
15.207	AC Power Conducted Emission	Compliance	B
15.205 15.209	Radiated Emissions	Compliance	A
15.247(d)	Out of band Emission Measurement	Compliance	B
15.247(a)(2)	6dB bandwidth	Compliance	B
15.247(b)	Conducted Output power	Compliance	B
15.247(e)	Power Spectral Density	Compliance	B
15.203	Antenna Requirement	Compliance	B

Note：Except RSE and AC Power Conducted Emission, other data please refer to Appendix.

***Test Lab Information Reference**

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

The FCC Site Registration No. is 434559; The Designation No. is CN1325.

Lab B:

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

Lab Address:

Room B37, Warehouse A5, No.3 Chiwan 4th Road, Zhaoshang Street, Nanshan District Shenzhen, Guangdong, People's Republic of China

Accredited Test Lab Cert 3939.01

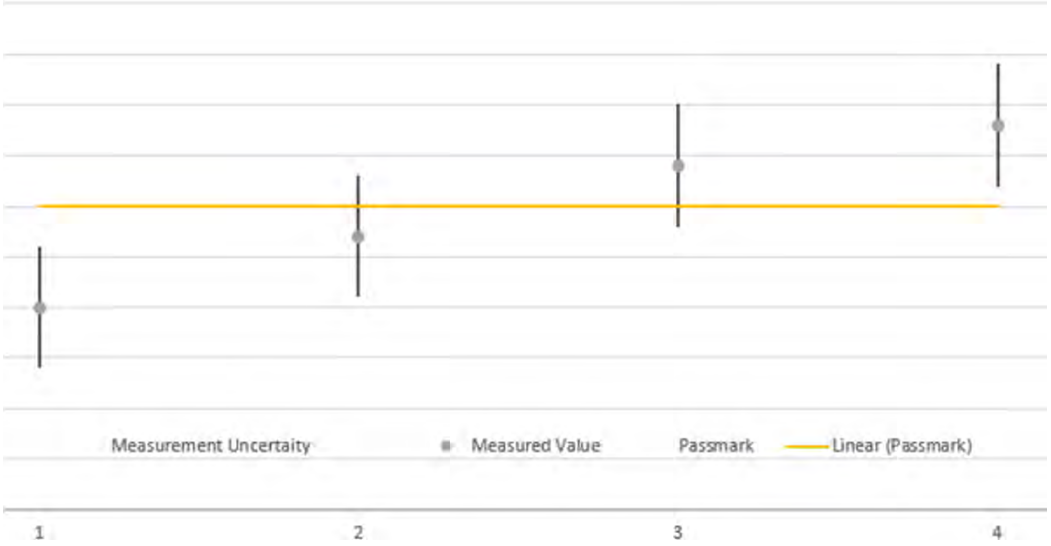
The FCC Site Registration No. is 525120; The Designation No. is CN1171.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	±2.70dB
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions (30MHz~1GHz)	±4.98dB
Radiated emissions (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Power Spectral Density	±0.85 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	W-Sensor	
BRAND NAME*	Waltero	
MODEL NAME*	W-Sensor LTE	
NOMINAL VOLTAGE*	5.0Vdc (Adapter) 3.0Vdc (battery)	
MODULATION *	2.4G WIFI	DSSS,OFDM
TRANSMISSION RATE*	802.11b: 11/5.5/2.0/1.0 Mbps	
	802.11g: 54/48/36/24/18/9/6 Mbps	
	802.11n(HT20): up to 72.2 Mbps	
	802.11n(HT40): up to 150 Mbps	
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20/40)	
MAX. OUTPUT POWER	307.61mW (Maximum)	
ANTENNA GAIN*	2.4G WIFI	2.99dBi
ANTENNA TYPE*	2.4G WIFI	PCB antenna on module
HW VERSION*	5	
SW VERSION*	1.4.021	
I/O PORTS*	Refer to user's manual	
CABLE SUPPLIED*	USB Cable: shielded cable, with ferrite core, 1 meter	

NOTE:

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n(HT20)	1TX/1RX
802.11n(HT40)	1TX/1RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

5. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.

6. List of Accessory:

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery 1	GP	Ningbo GP Energy Co., Ltd	GPCR123A	Capacity: 3.0Vdc, 1500mAh
Battery 2	PROCELL	PROCELL	CR123A	Capacity: 3.0Vdc, 1600mAh
Battery 3	Panasonic	Panasonic Corporation	CR123A	N/A
USB Cable	Waltero	Waltero	W-CABLE-01	Signal Line,1.0meter

2.2 DESCRIPTION OF TEST MODES

11 Channels are provided for 802.11b, 802.11g and 802.11n20 (HT20):

802.11b/802.11g/802.11n20 (HT20)			
CHANNEL	**FREQUENCY**	**CHANNEL**	**FREQUENCY**
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

802.11n40 (HT40)			
CHANNEL	**FREQUENCY**	**CHANNEL**	**FREQUENCY**
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 MHz		

2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 4 photographs of the test configuration for reference.

2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.
The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G:** Radiated Emission below 1GHz **RE≥1G:** Radiated Emission above 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (BELOW 1GHz):

☒ 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).
☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	6.0

RADIATED EMISSION TEST (ABOVE 1GHz):

☒ 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).

☒ The following Channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n20(HT20)	1 to 11	1, 6, 11	OFDM	MCS0
802.11n(HT40)	3 to 9	3,6,9	OFDM	MCS0

POWER LINE CONDUCTED EMISSION TEST

☒ 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).
☒ The following Channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	6.0

BANDEDGE MEASUREMENT:

☒ 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).
☒ The following Channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n20(HT20)	1 to 11	1, 6, 11	OFDM	MCS0
802.11n(HT40)	3 to 9	3,6,9	OFDM	MCS0

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of eaCH mode, but only includes spectrum plot of worst value of eaCH mode.
☒ 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).
☒ The following Channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n20(HT20)	1 to 11	1, 6, 11	OFDM	MCS0
802.11n(HT40)	3 to 9	3,6,9	OFDM	MCS0

TEST CONDITION			
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu
RE≥1G	23deg. C, 70%RH	DC 5.0V By Adapter	Hanwen Xu
PLC	25deg. C, 52%RH	DC 5.0V By Adapter	Carl xie
APCM	25deg. C, 60%RH	DC 3.0V By Battery	James Fu

2.3 DUTY CYCLE OF TEST SIGNAL

Please Refer to Appendix Of this test report.

2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

KDB 558074 D01 DTS Meas Guidance v05r02

ANSI C63.10-2020

Note：

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Cable: shielded cable, with ferrite core, 1 meter

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Lab B:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 13,24	Feb. 12,25
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 12,25	Feb. 11,27
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 12,25	Feb. 11,26
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Mar. 09,24	Mar. 08,25

NOTE:

1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

3.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were CHecked for maximum conducted interference.

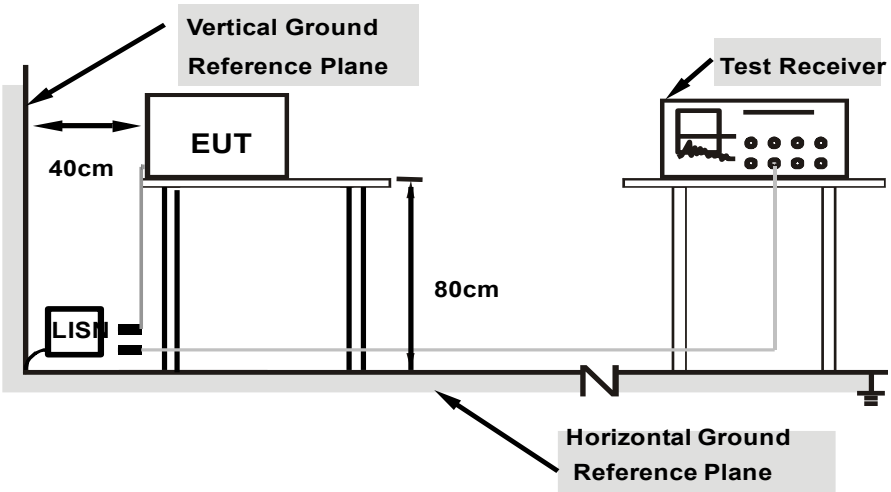
c. The frequency range from 150kHz to 30MHz was searCHed. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST SETUP



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

For the actual test configuration, please refer to the attaCHed file (Test Setup Photo).

3.1.6 EUT OPERATING CONDITIONS

a. Turned on the power and connected of all equipment.
b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

3.1.7 TEST RESULTS

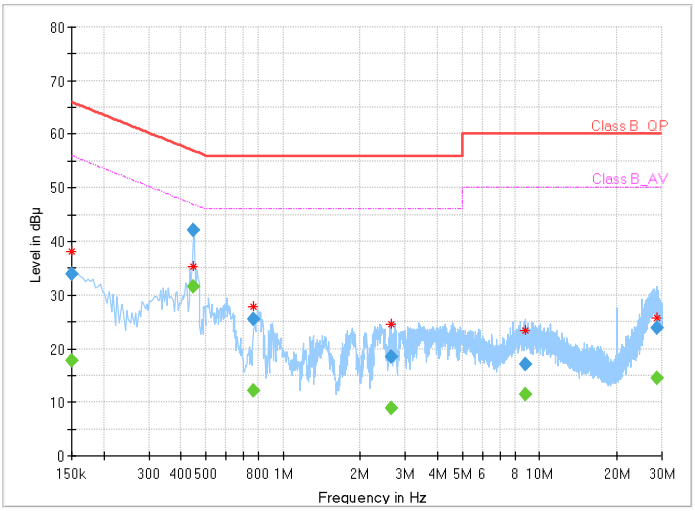
CONDUCTED WORST-CASE DATA			
Frequency Range	150KHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	26deg. C, 51%RH
Tested By	Carl xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	17.71	56.00	38.29	L1	ON	9.8
0.150000	34.04	---	66.00	31.96	L1	ON	9.8
0.447000	---	31.53	46.93	15.40	L1	ON	9.8
0.447000	42.20	---	56.93	14.73	L1	ON	9.8
0.767000	---	12.11	46.00	33.89	L1	ON	9.8
0.767000	25.40	---	56.00	30.60	L1	ON	9.8
2.635000	---	8.99	46.00	37.01	L1	ON	9.9
2.635000	18.47	---	56.00	37.53	L1	ON	9.9
8.771000	---	11.42	50.00	38.58	L1	ON	10.3
8.771000	17.19	---	60.00	42.81	L1	ON	10.3
28.783000	---	14.60	50.00	35.40	L1	ON	11.3
28.783000	23.86	---	60.00	36.14	L1	ON	11.3

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value -Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

Full Spectrum

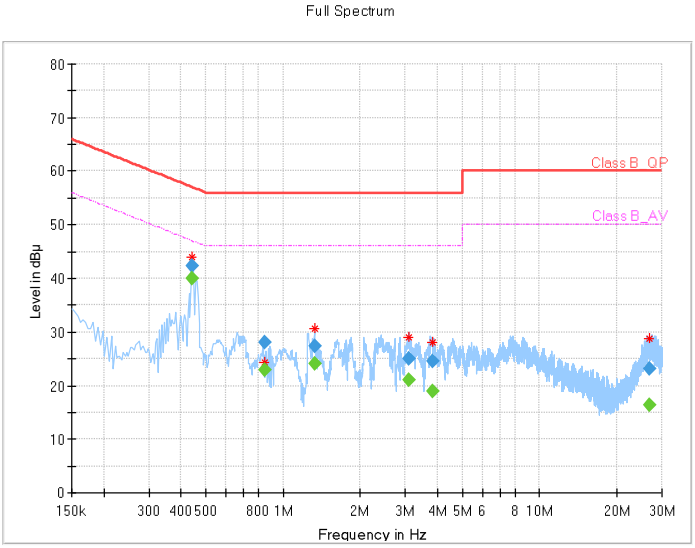


Frequency Range	150KHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	26deg. C, 51%RH
Tested By	Carl xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.442000	---	40.03	47.02	6.99	N	ON	9.6
0.442000	42.42	---	57.02	14.62	N	ON	9.6
0.846000	---	22.86	46.00	23.14	N	ON	9.7
0.846000	27.95	---	56.00	28.05	N	ON	9.7
1.326000	---	24.16	46.00	21.84	N	ON	9.7
1.326000	27.46	---	56.00	28.54	N	ON	9.7
3.090000	---	21.09	46.00	24.91	N	ON	9.8
3.090000	25.01	---	56.00	30.99	N	ON	9.8
3.810000	---	18.98	46.00	27.02	N	ON	9.7
3.810000	24.55	---	56.00	31.45	N	ON	9.7
26.766000	---	16.48	50.00	33.52	N	ON	11.4
26.766000	23.12	---	60.00	36.88	N	ON	11.4

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value -Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



3.1 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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).

FREQUENCIES (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
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.2.2 TEST INSTRUMENTS

Lab A

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,23	Aug.29,25
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,23	Aug.21,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.21,25	Aug.20,27
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,23	Aug.21,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,23	Feb.22,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,25	Feb.21,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Aug.31,23	Aug.30,25
Hygrothermograph	DELI	20210528	SZ014	Sep.06,23	Sep.05,25
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25

NOTE:

1. The calibration interval of the above test instruments is 12/ 24 / 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Chamber.
3. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

3.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter CHamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, whiCH was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For eaCH suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. During the test, eaCH emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

Note:

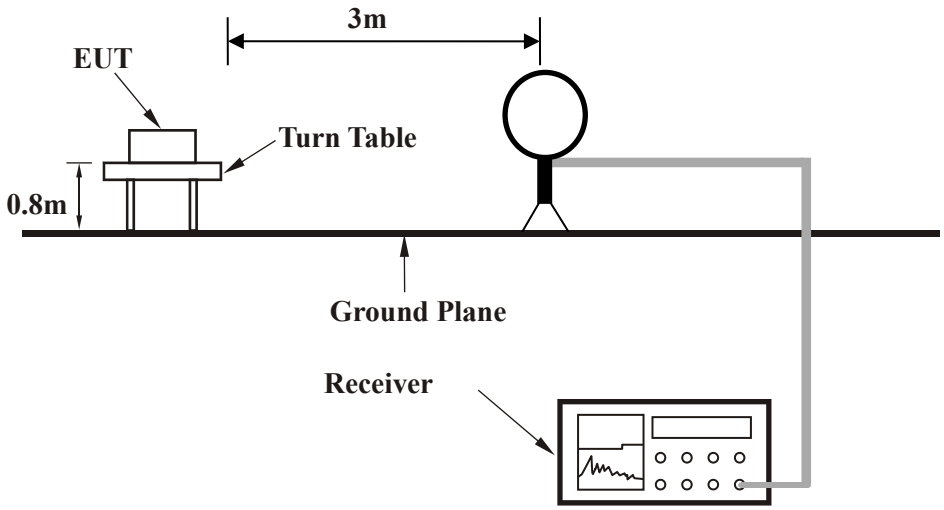
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 DEVIATION FROM TEST STANDARD

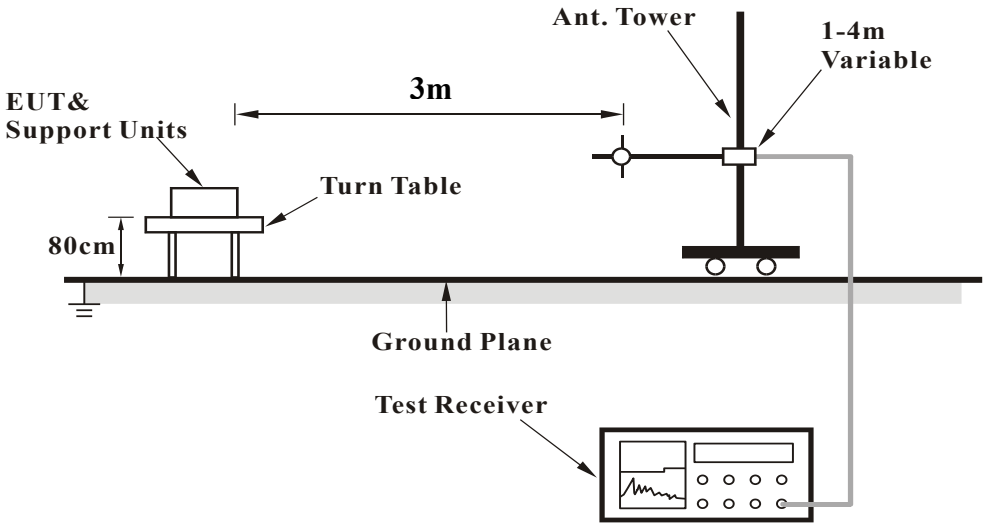
No deviation

3.2.5 TEST SETUP

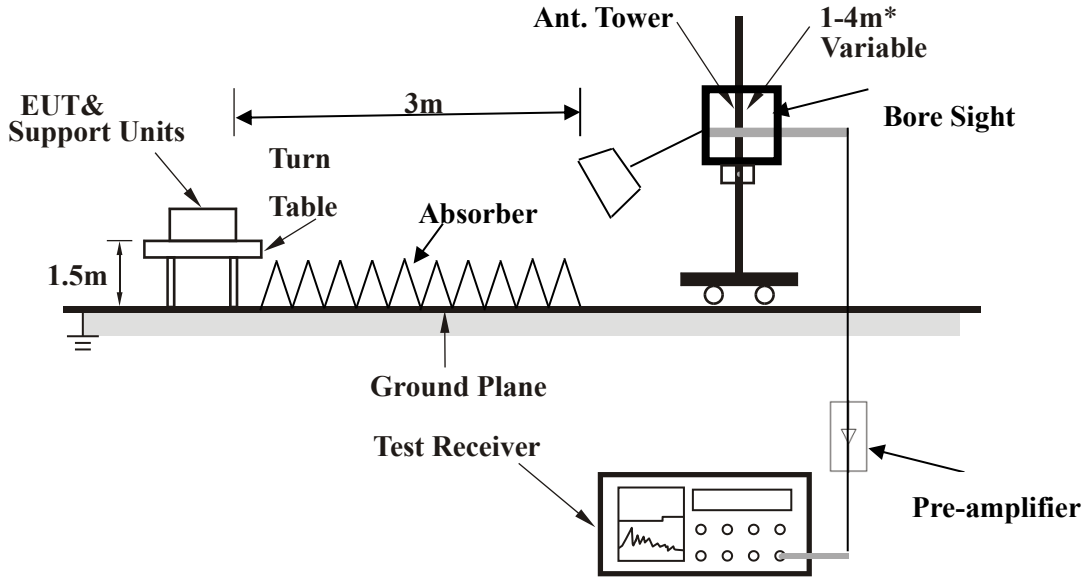
<Frequency Range 9KHz~30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attaCHed file (Test Setup Photo).

3.2.6 EUT OPERATING CONDITIONS

a. Set the EUT under full load condition and placed them on a testing table.
b. Set the transmitter part of EUT under transmission condition continuously at specific Channel frequency.
c. The necessary accessories enable the EUT in full functions.

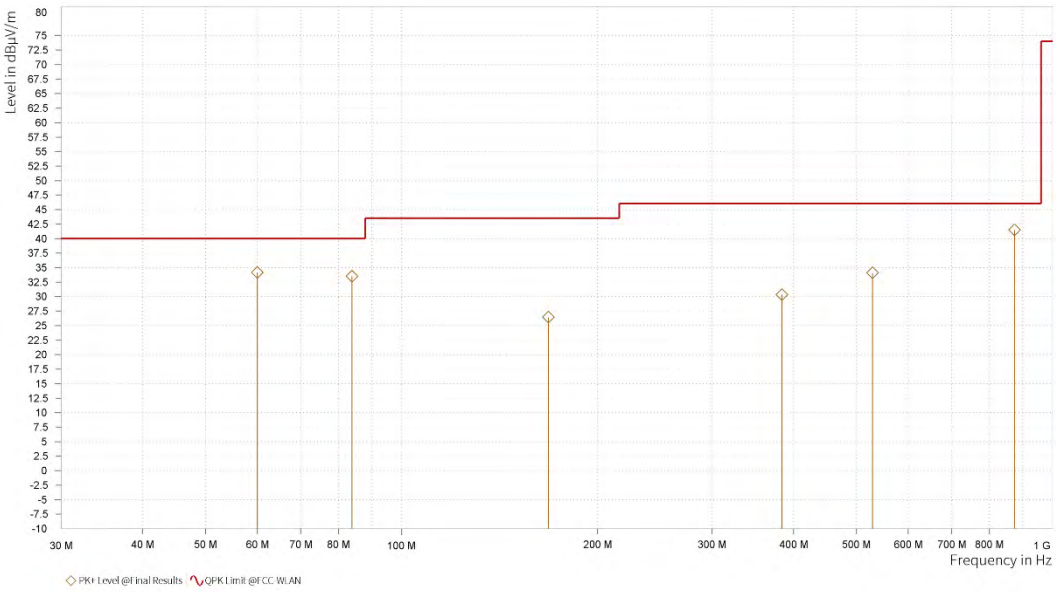
3.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA			
NOTE: The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.			
802.11G			
CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	60.022	34.16	40.00	5.84	-13.88	H	0.9	2.00
1	83.932	33.51	40.00	6.49	-17.06	H	1.6	2.00
1	168.031	26.43	43.50	17.07	-15.80	H	96.5	2.00
1	384.002	30.33	46.00	15.67	-9.45	H	358.4	1.00
1	528.774	34.08	46.00	11.92	-8.09	H	96.5	2.00
1	874.628	41.47	46.00	4.53	-2.13	H	1	1.00

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.



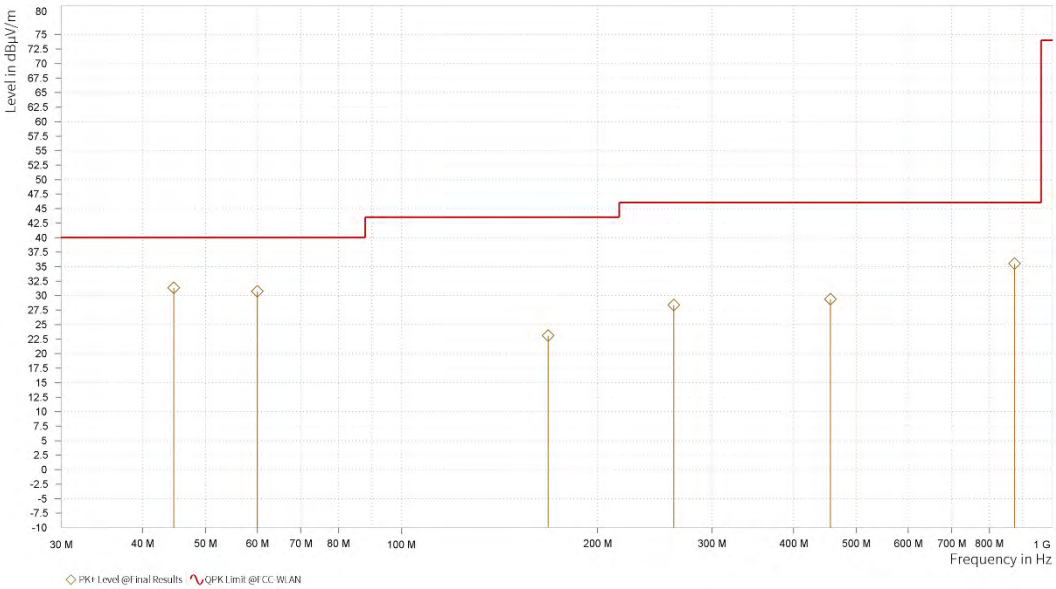
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	44.647	31.31	40.00	8.70	-11.96	V	128.6	1.00
1	60.022	30.73	40.00	9.27	-13.88	V	97.5	2.00
1	167.886	23.06	43.50	20.44	-15.81	V	1.8	2.00
1	261.782	28.34	46.00	17.66	-11.76	V	355.5	2.00
1	456.024	29.38	46.00	16.62	-9.06	V	128.6	1.00
1	874.628	35.49	46.00	10.51	-2.13	V	262.5	1.00

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.



ABOVE 1GHz WORST-CASE DATA

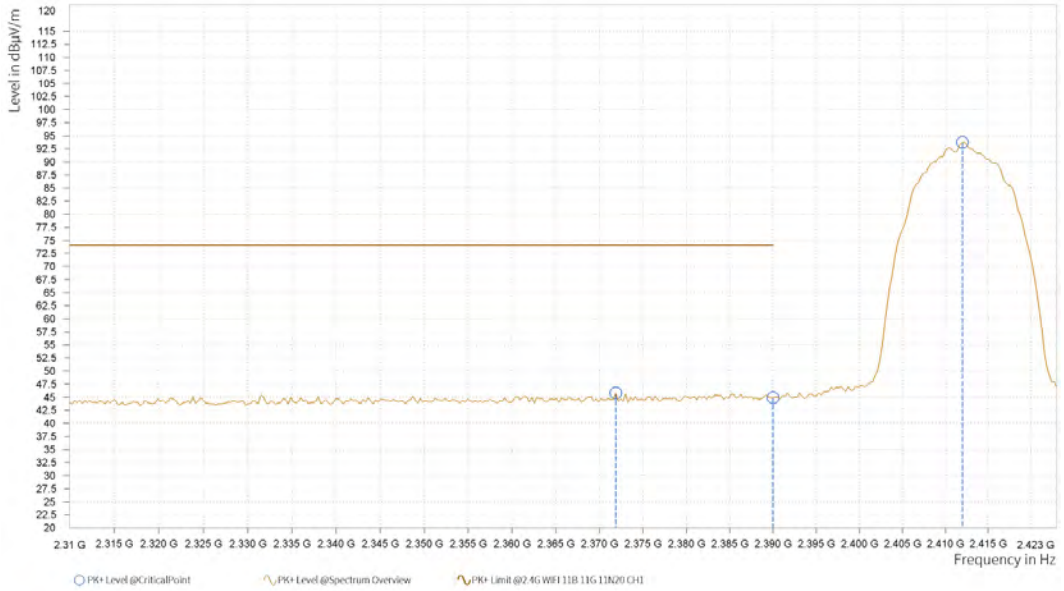
Note:

1. For radiated emissions testing，the full testing range of different modes have been scanned，only the worst case harmonic data is reported in the sheet.
2. All other emissions greater than 20dB below the limit were not recorded

802.11b			
CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,371.868	45.79	74.00	28.21	6.07	H	359.1	1.00
1	2,390.000	44.94	74.00	29.06	6.39	H	354.9	2.00
1	2,411.983	93.72			6.77	H	1.7	2.00

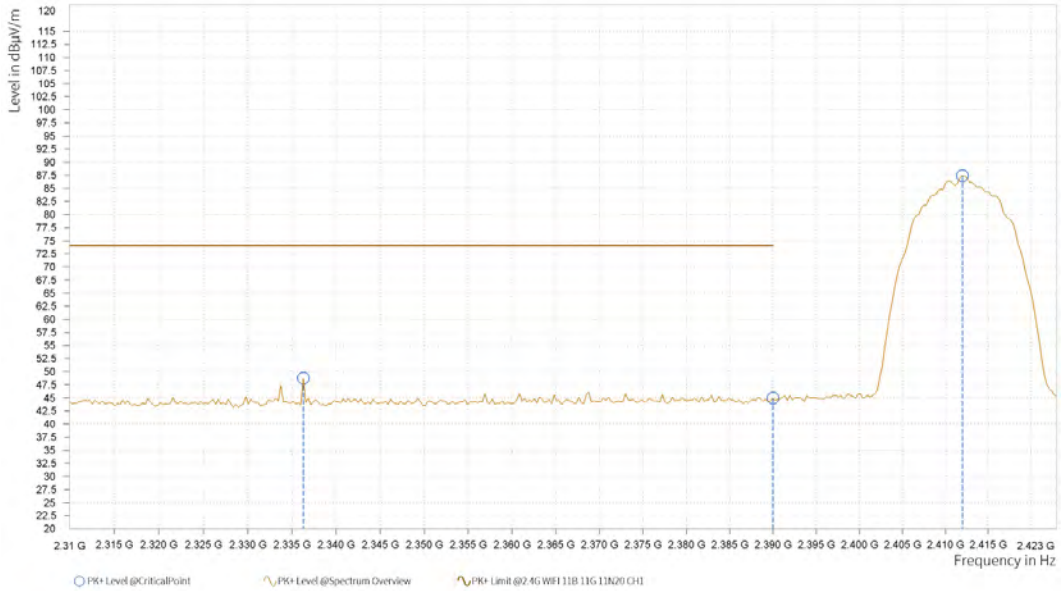


ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,383.168	31.04	54.00	22.96	6.27	H	1	1.00
1	2,390.000	31.05	54.00	22.95	6.39	H	359	2.00
1	2,411.135	84.50			6.75	H	359	2.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,336.273	48.77	74.00	25.23	5.84	V	1	1.00
1	2,390.000	44.99	74.00	29.01	6.39	V	4.5	1.00
1	2,411.983	87.39			6.77	V	108.3	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.383	30.75	54.00	23.25	6.38	V	276.8	1.00
1	2,390.000	30.79	54.00	23.21	6.39	V	176.5	1.00
1	2,412.830	78.53			6.78	V	33	1.00

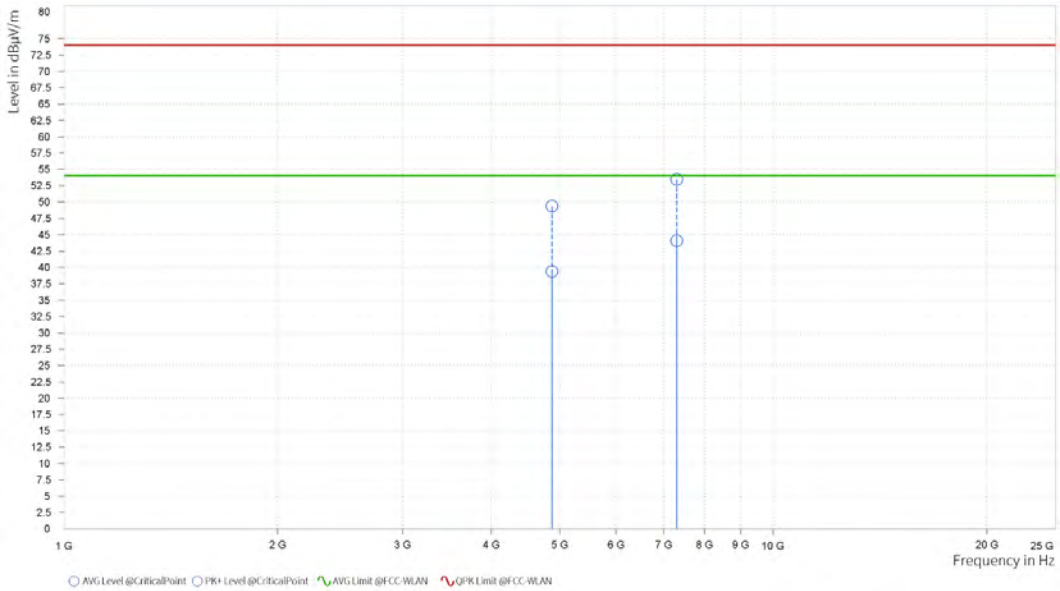
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

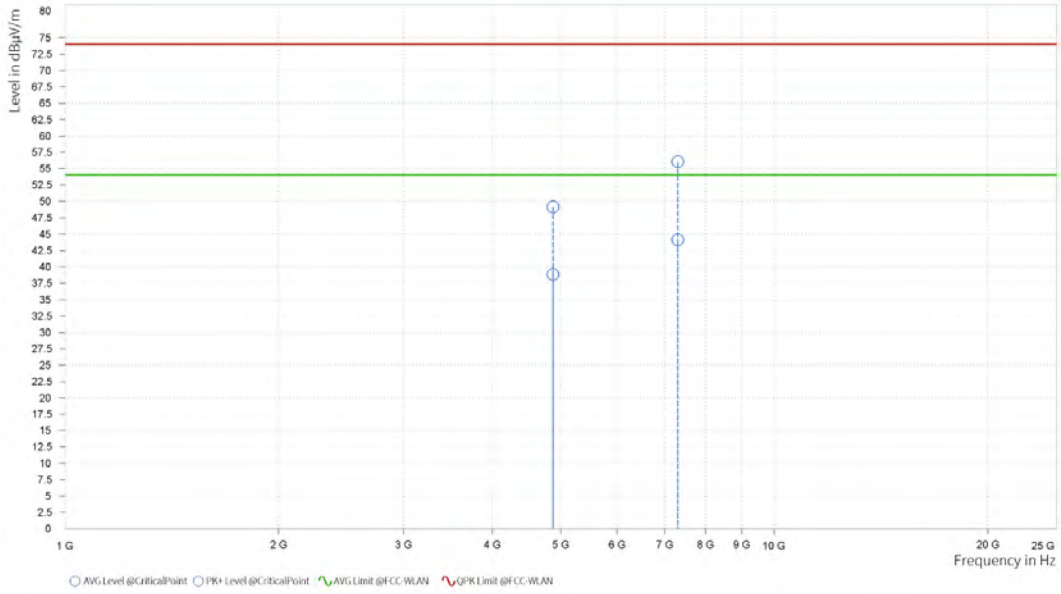
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	49.37	74.00	24.63	39.36	54.00	14.64	13.85	H	239.9	1.00
3	7,311.000	53.47	74.00	20.53	44.12	54.00	9.88	19.48	H	9.4	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	49.16	74.00	24.84	38.82	54.00	15.18	13.85	V	359	2.00
3	7,311.000	56.08	74.00	17.92	44.16	54.00	9.84	19.48	V	129.8	2.00



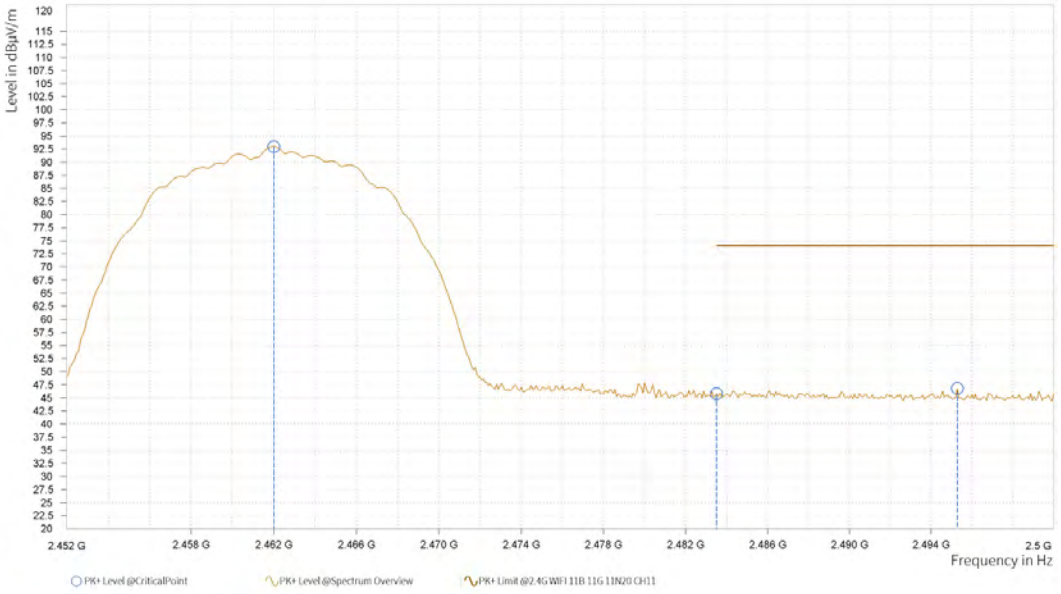
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

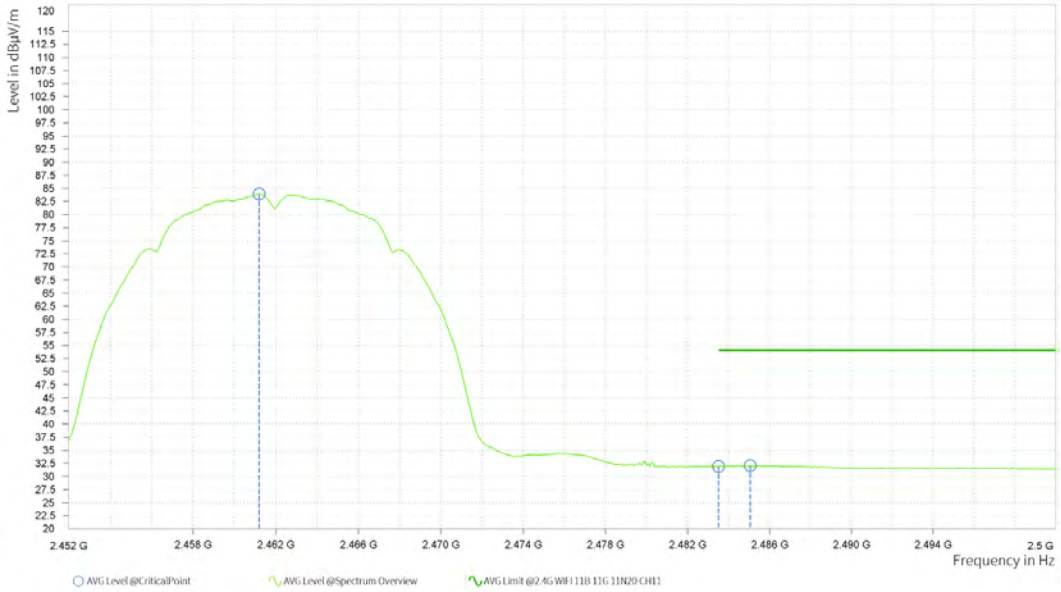
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,462.000	92.97			7.42	H	1	1.00
2	2,483.500	45.80	74.00	28.20	7.18	H	348	1.00
2	2,495.280	46.81	74.00	27.19	7.00	H	359	2.00



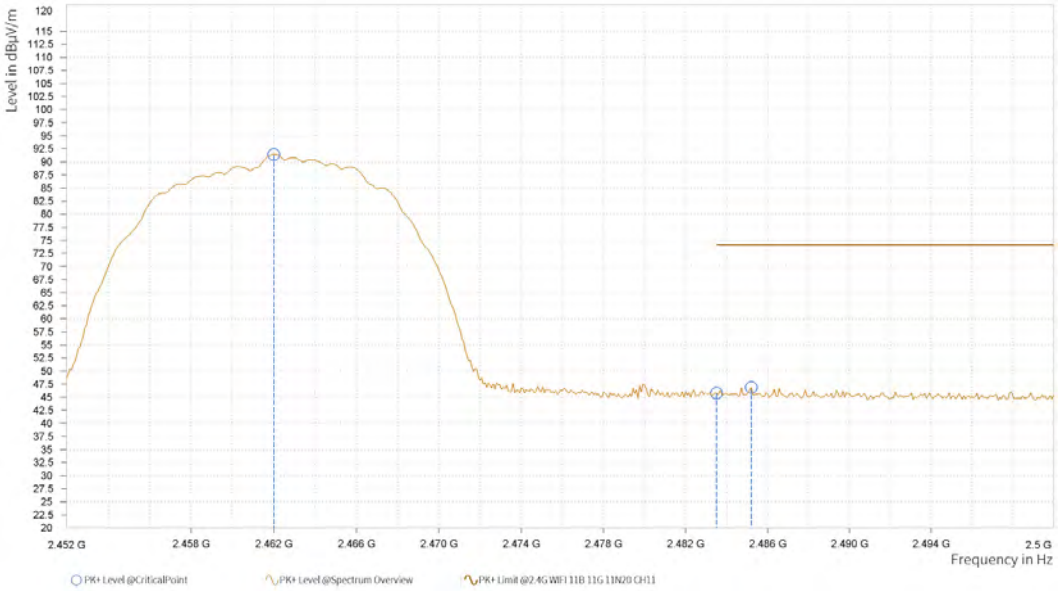
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,461.200	83.91			7.41	H	359.1	1.00
2	2,483.500	31.91	54.00	22.09	7.18	H	1.4	2.00
2	2,485.040	32.05	54.00	21.95	7.15	H	359.1	1.00

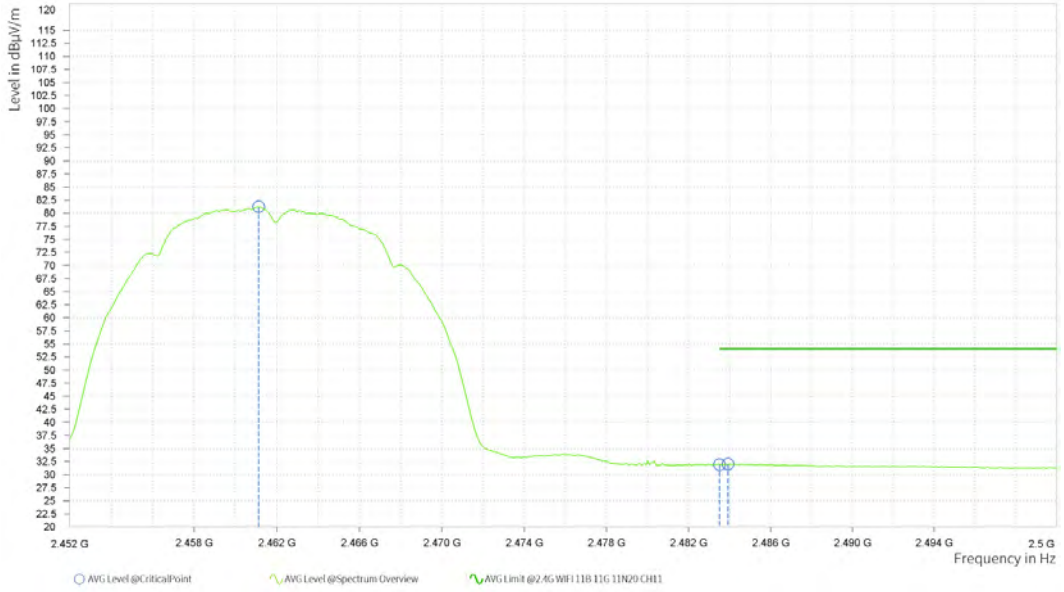


ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,462.000	91.42			7.42	V	47.3	1.00
2	2,483.500	45.74	74.00	28.26	7.18	V	354.9	2.00
2	2,485.200	46.89	74.00	27.11	7.15	V	359	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,461.120	81.21			7.41	V	1	1.00
2	2,483.500	31.92	54.00	22.08	7.18	V	359	1.00
2	2,483.920	32.02	54.00	21.98	7.17	V	345.8	1.00



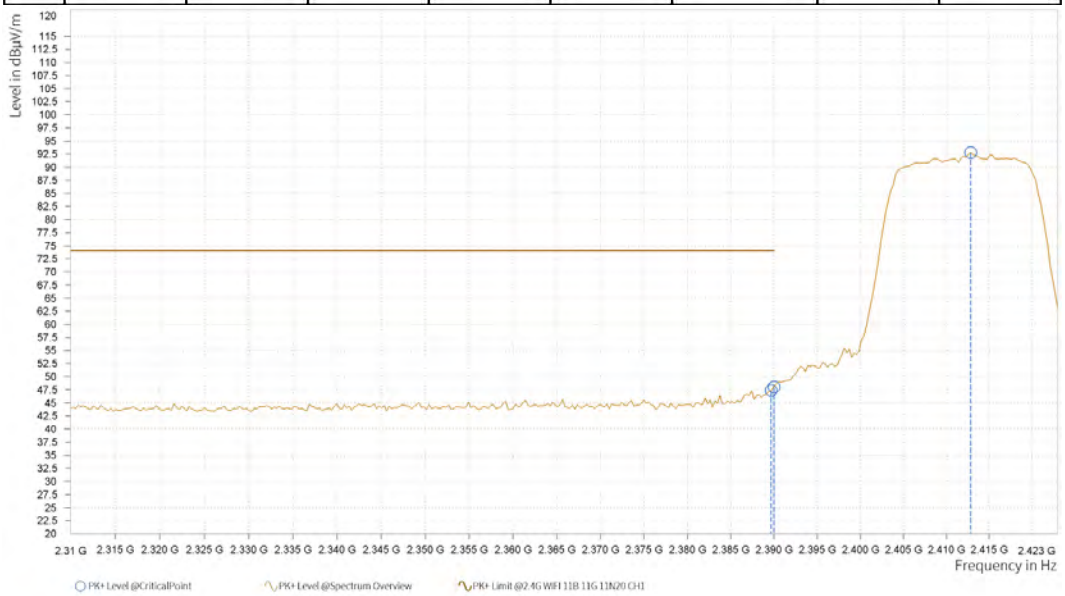
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2462MHz: Fundamental frequency.

802.11g			
CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

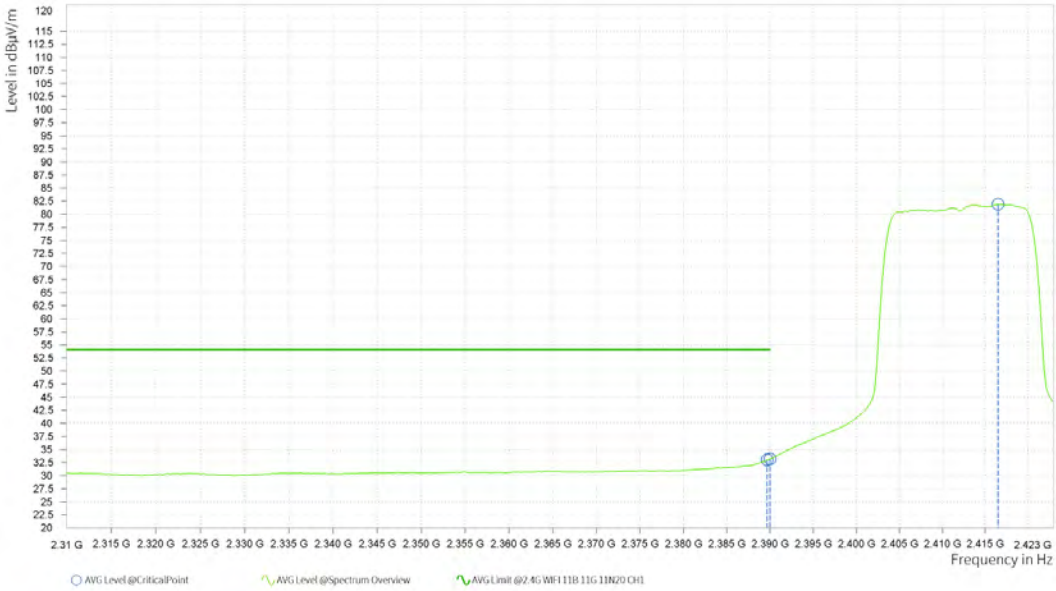
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.665	47.35	74.00	26.65	6.38	H	1	1.00
1	2,390.000	48.04	74.00	25.96	6.39	H	348.7	1.00
1	2,412.830	92.78			6.78	H	1	2.00



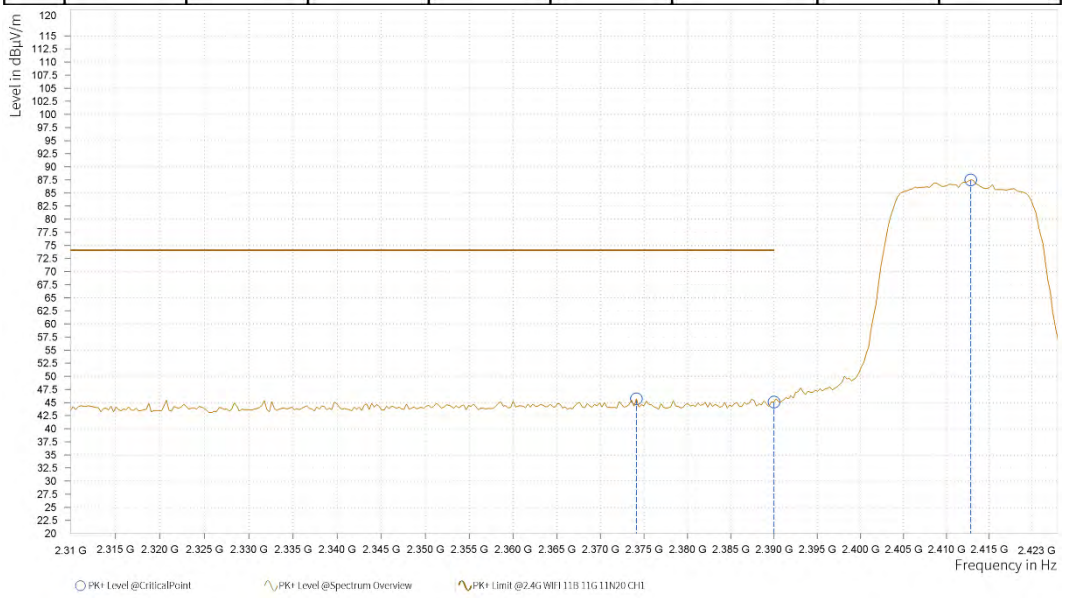
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.665	33.00	54.00	21.00	6.38	H	346.6	1.00
1	2,390.000	33.17	54.00	20.83	6.39	H	346.6	1.00
1	2,416.503	81.90			6.84	H	359	1.00



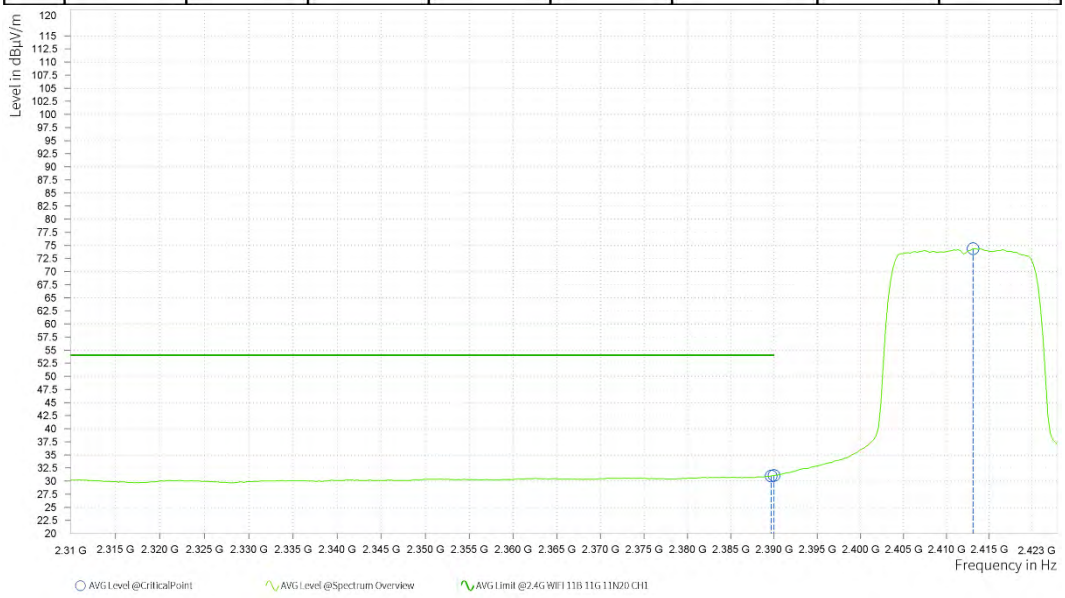
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,374.128	45.71	74.00	28.29	6.11	V	281.7	1.00
1	2,390.000	45.06	74.00	28.94	6.39	V	1	1.00
1	2,412.830	87.51			6.78	V	334.2	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.665	30.98	54.00	23.02	6.38	V	147.8	1.00
1	2,390.000	31.06	54.00	22.94	6.39	V	359	2.00
1	2,413.113	74.37			6.79	V	347.3	1.00



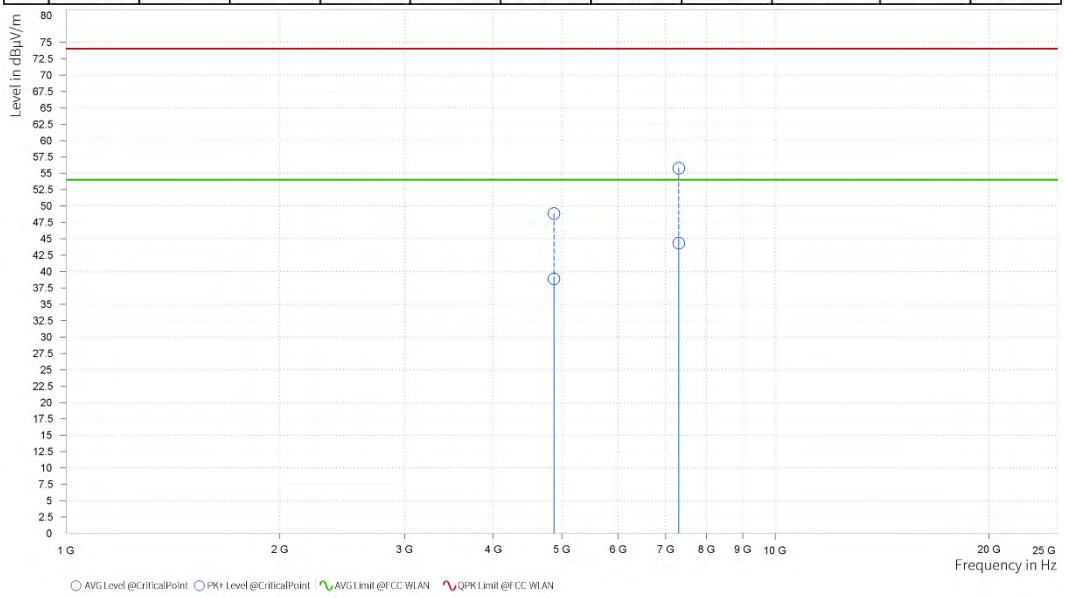
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

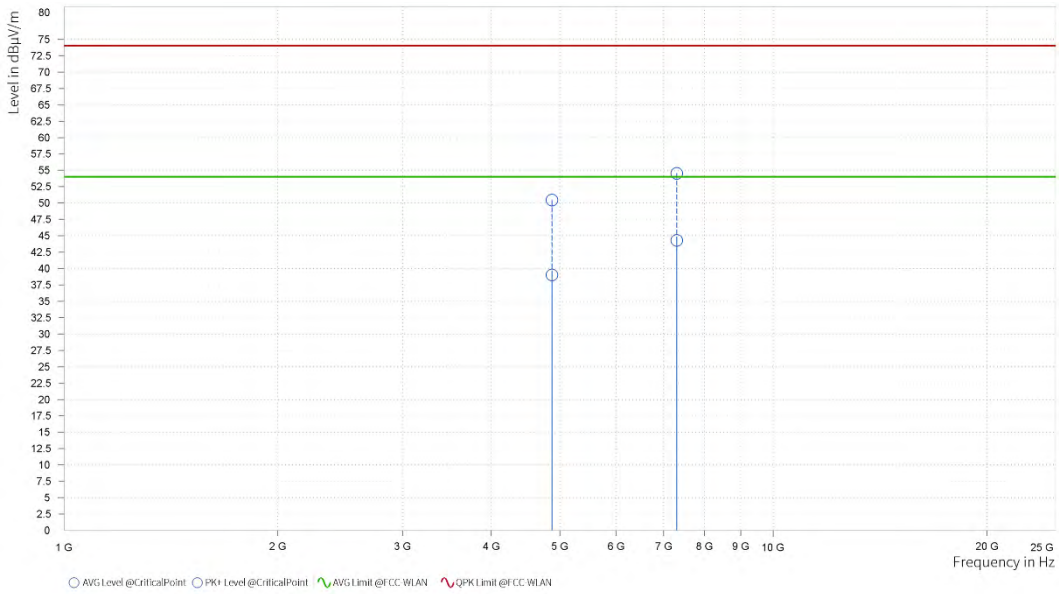
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	48.85	74.00	25.15	38.90	54.00	15.10	13.85	H	1	1.00
3	7,311.000	55.80	74.00	18.20	44.34	54.00	9.66	19.48	H	359	2.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	50.45	74.00	23.55	39.04	54.00	14.96	13.85	V	236.3	1.00
3	7,311.000	54.53	74.00	19.47	44.30	54.00	9.70	19.48	V	121.4	2.00



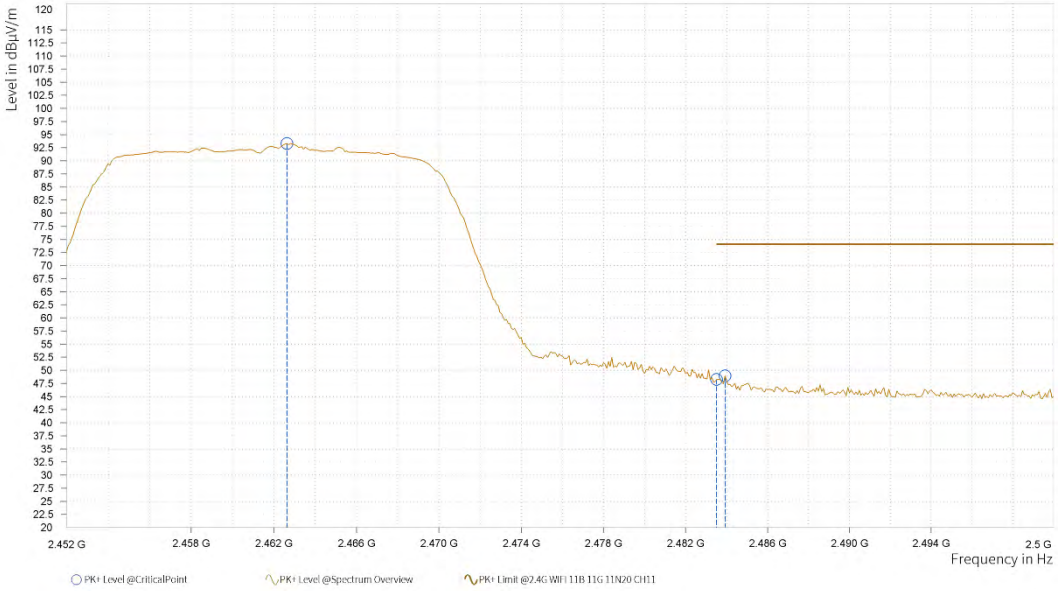
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor Margin value = Limit value- Emission level.
2. 2437MHz: Fundamental frequency.

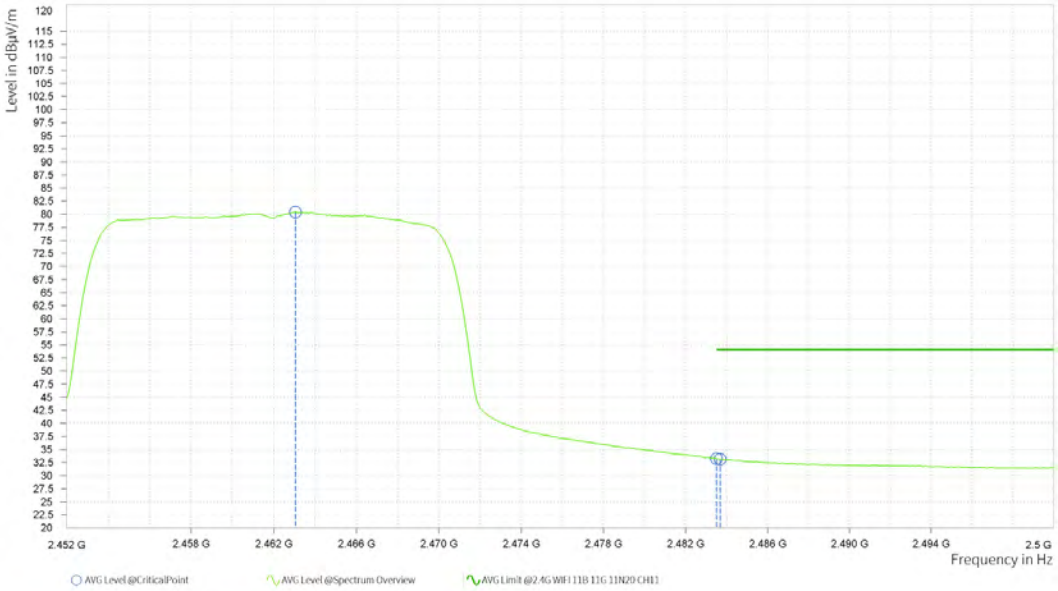
CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

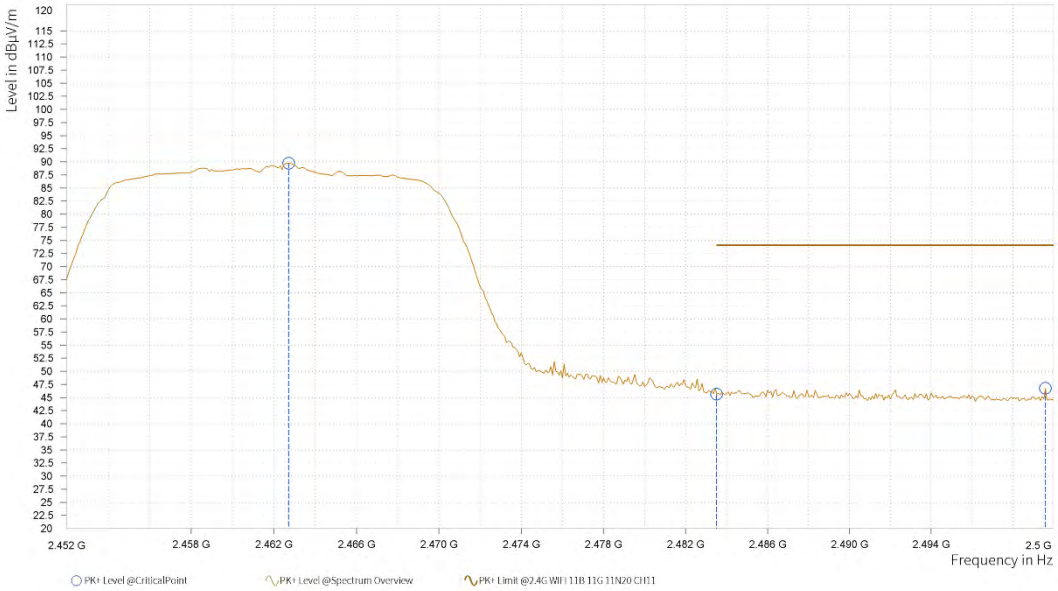
Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,462.640	93.29			7.43	H	1	1.00
2	2,483.500	48.29	74.00	25.71	7.18	H	0.9	2.00
2	2,483.920	48.95	74.00	25.05	7.17	H	52.1	2.00



ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,463.040	80.39			7.43	H	1	1.00
2	2,483.500	33.22	54.00	20.78	7.18	H	2.2	2.00
2	2,483.680	33.12	54.00	20.88	7.17	H	2.2	2.00

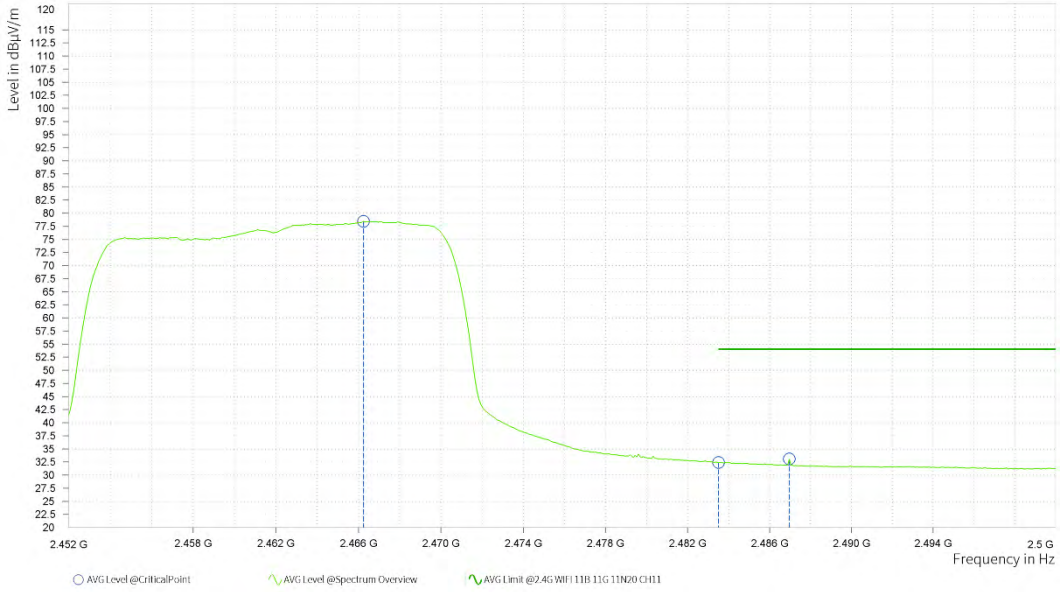


ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,462.720	89.75			7.43	V	60.4	1.00
2	2,483.500	45.64	74.00	28.36	7.18	V	359.1	1.00
2	2,499.600	46.74	74.00	27.26	6.93	V	113	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,466.240	78.46			7.44	V	49.7	1.00
2	2,483.500	32.42	54.00	21.58	7.18	V	357.6	1.00
2	2,486.960	33.06	54.00	20.94	7.12	V	311.6	2.00



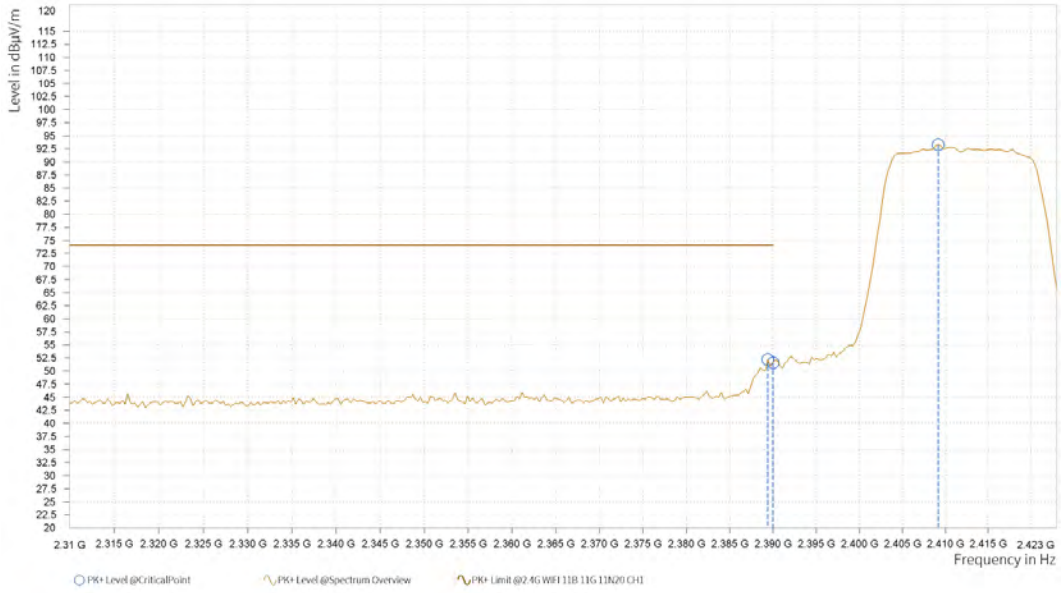
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2462MHz: Fundamental frequency.

802.11n (20MHz)			
CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.383	52.18	74.00	21.82	6.38	H	357.9	1.00
1	2,390.000	51.57	74.00	22.43	6.39	H	359.1	1.00
1	2,409.158	93.31			6.72	H	357.9	1.00

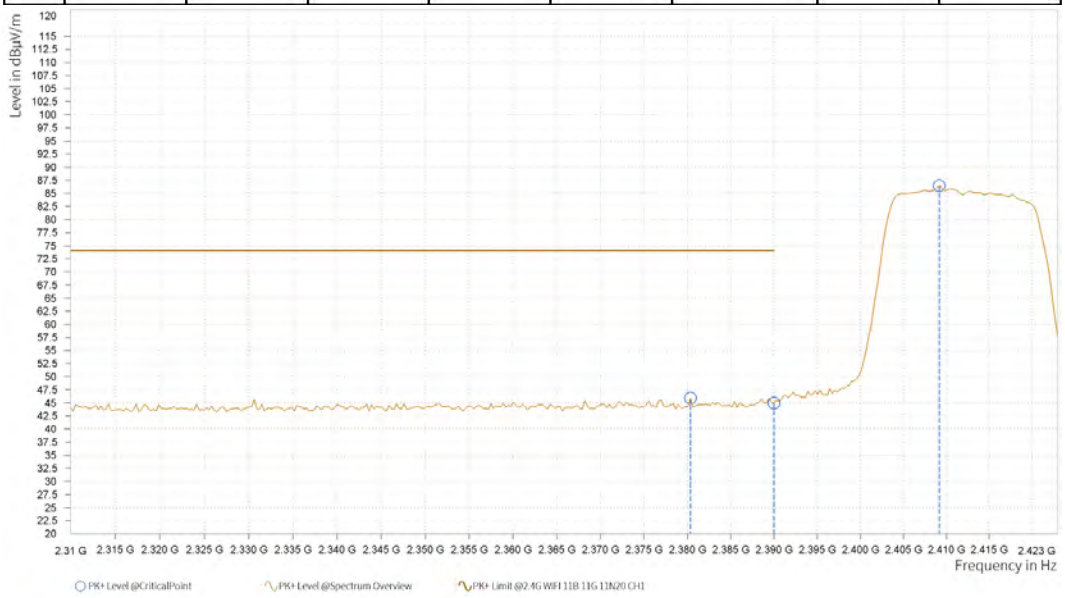


ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

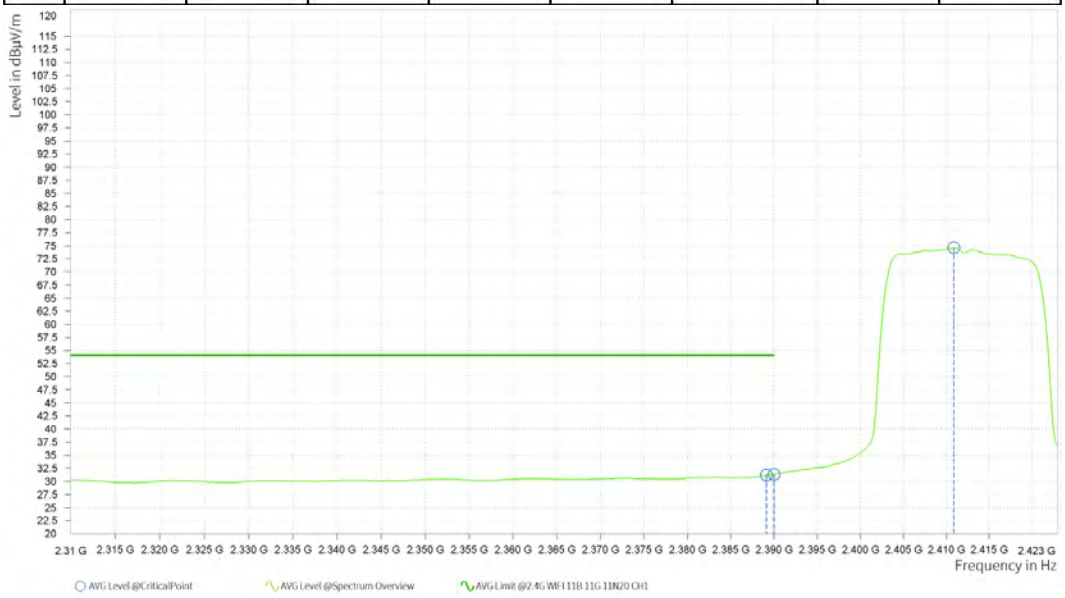
Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.665	33.41	54.00	20.59	6.38	H	5.8	1.00
1	2,390.000	33.56	54.00	20.44	6.39	H	5.8	1.00
1	2,413.113	81.20			6.79	H	1	1.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,380.343	45.95	74.00	28.05	6.22	V	250.6	1.00
1	2,390.000	44.95	74.00	29.05	6.39	V	358.8	1.00
1	2,409.158	86.40			6.72	V	347.9	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	2,389.100	31.23	54.00	22.77	6.37	V	359	2.00
1	2,390.000	31.34	54.00	22.66	6.39	V	359	2.00
1	2,410.853	74.62			6.75	V	349.4	1.00



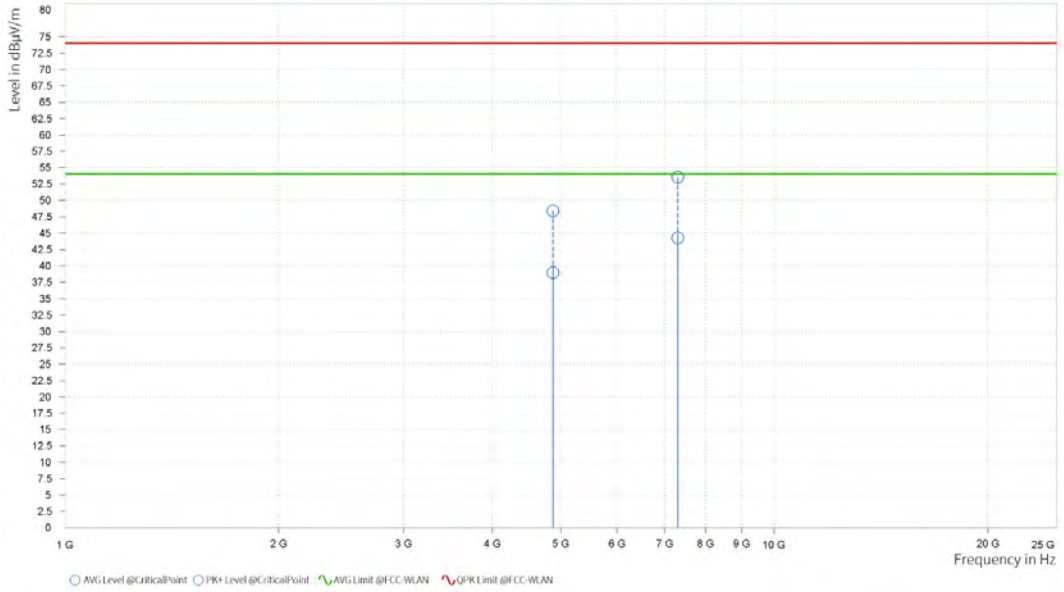
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

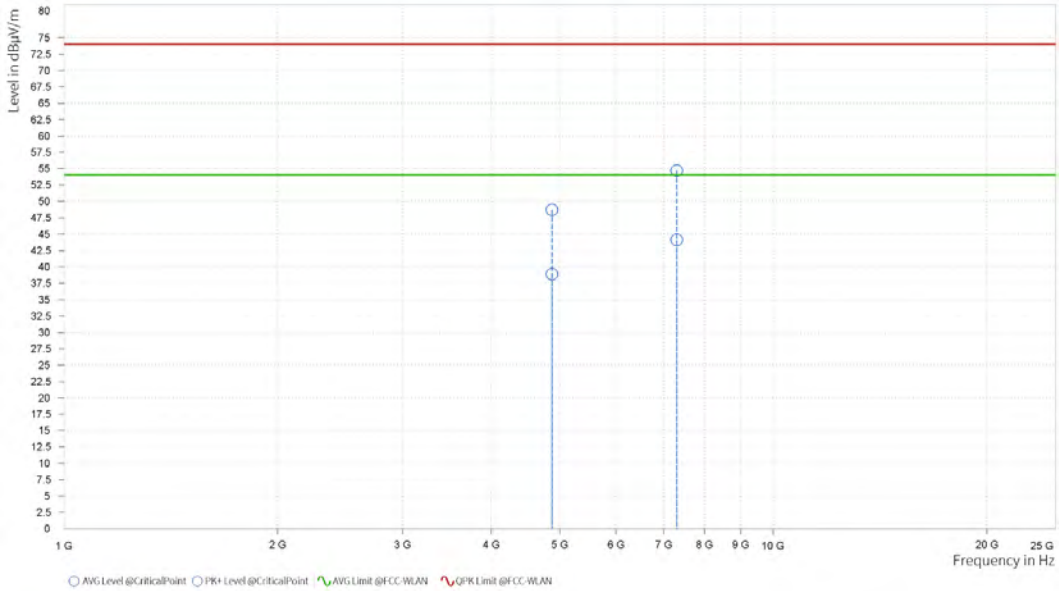
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	48.39	74.00	25.61	38.98	54.00	15.02	13.85	H	0.9	2.00
3	7,311.000	53.53	74.00	20.47	44.30	54.00	9.70	19.48	H	255.4	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	48.72	74.00	25.28	38.89	54.00	15.11	13.85	V	359	2.00
3	7,311.000	54.71	74.00	19.29	44.15	54.00	9.85	19.48	V	116.6	2.00



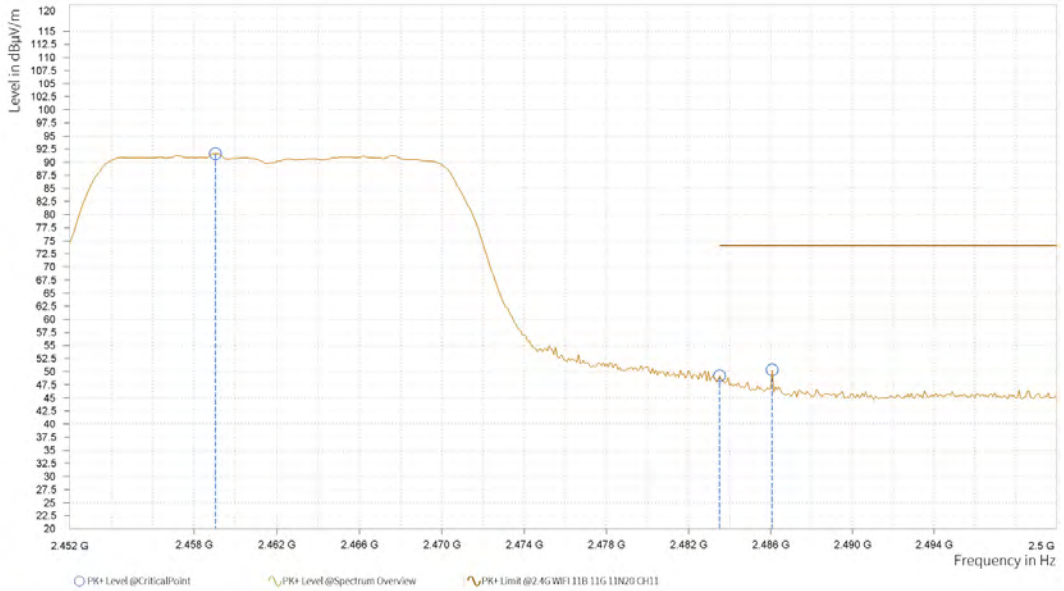
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

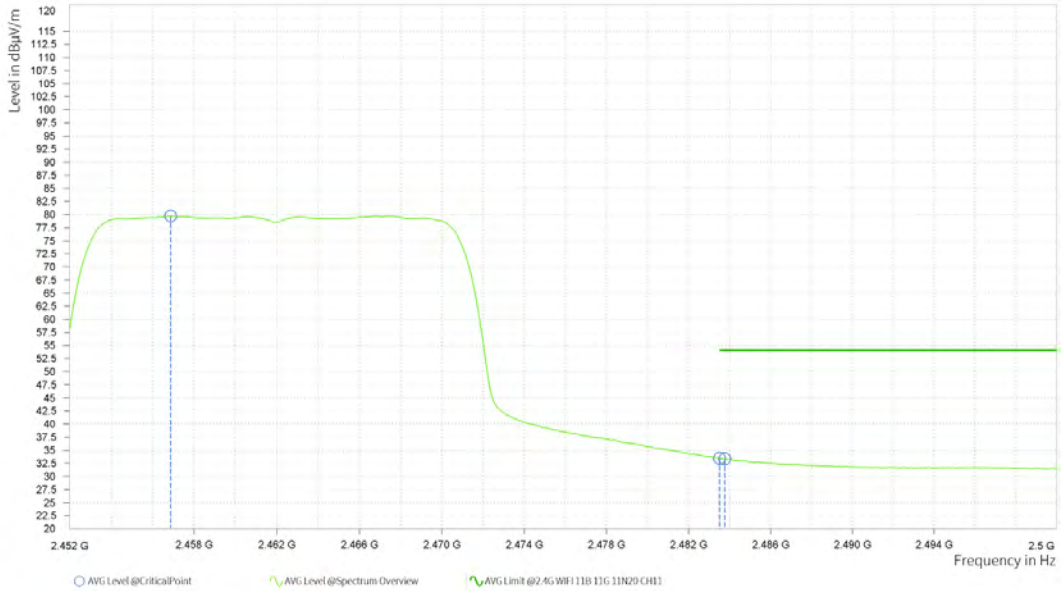
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,459.040	91.65			7.39	H	1	1.00
2	2,483.500	49.20	74.00	24.80	7.18	H	336.4	1.00
2	2,486.080	50.31	74.00	23.69	7.14	H	141.7	1.00

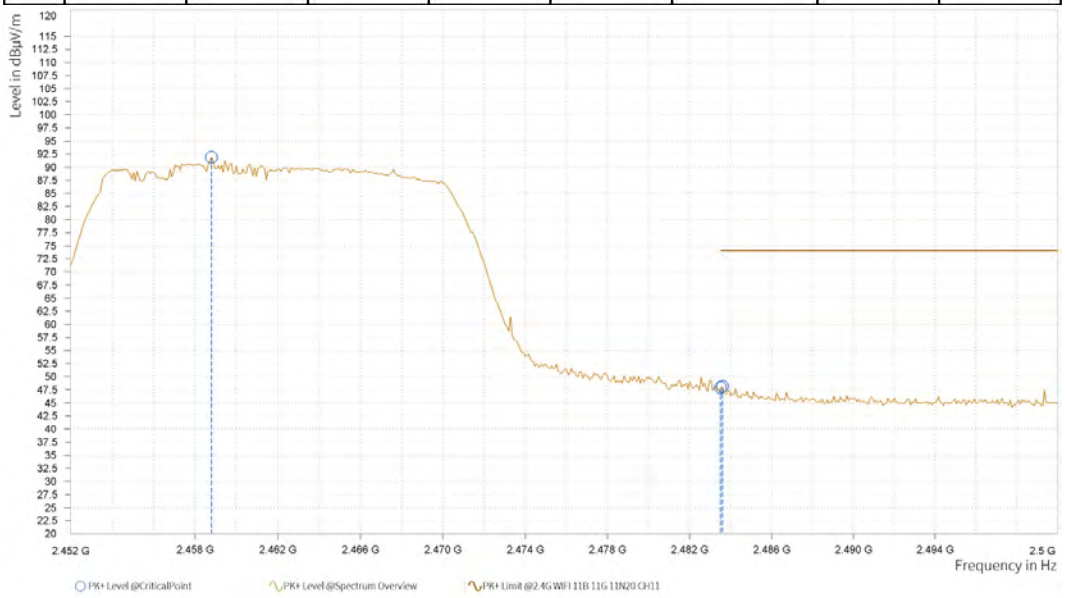


ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,456.880	79.74			7.37	H	1	1.00
2	2,483.500	33.49	54.00	20.51	7.18	H	1	1.00
2	2,483.760	33.37	54.00	20.63	7.17	H	1	1.00

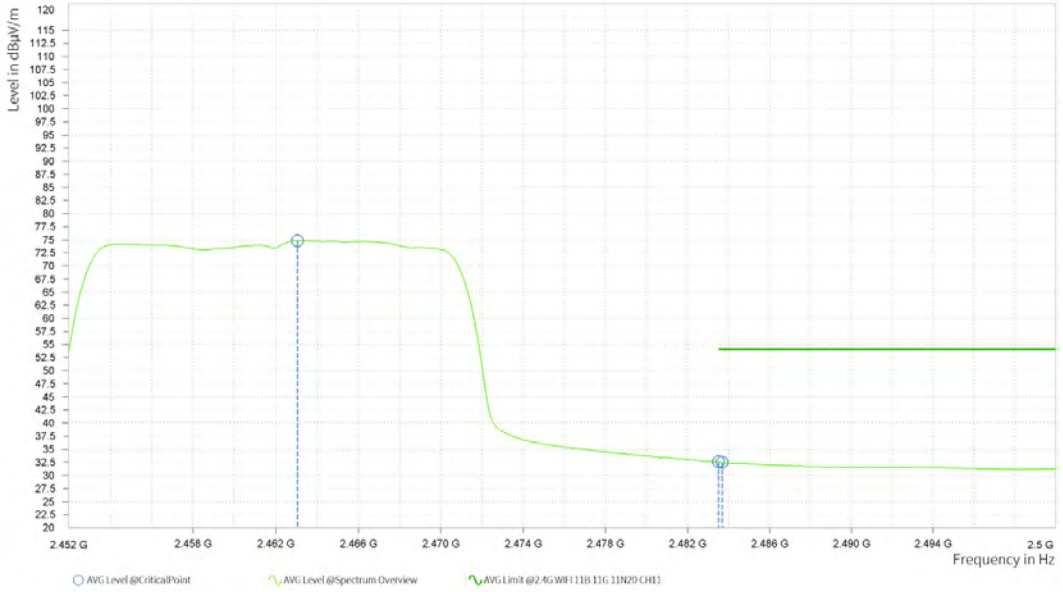


ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,458.800	91.89			7.39	V	1	1.00
2	2,483.500	47.94	74.00	26.06	7.18	V	359.1	1.00
2	2,483.600	48.15	74.00	25.85	7.18	V	358.1	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	2,463.040	74.83			7.43	V	355	2.00
2	2,483.500	32.63	54.00	21.37	7.18	V	46.1	1.00
2	2,483.680	32.52	54.00	21.48	7.17	V	46.1	1.00



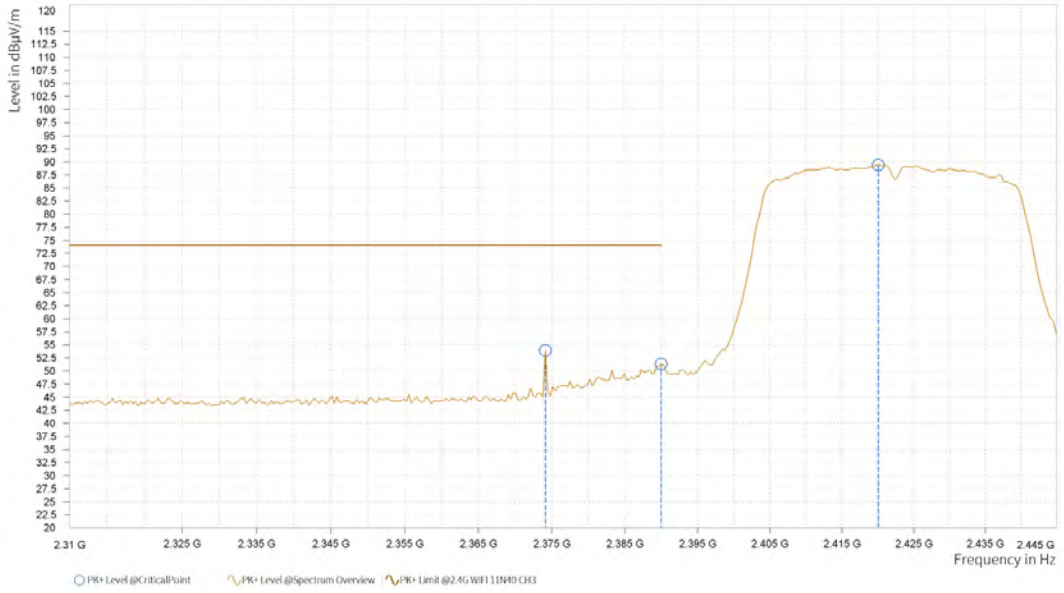
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2462MHz: Fundamental frequency.

802.11n (40MHz)			
CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

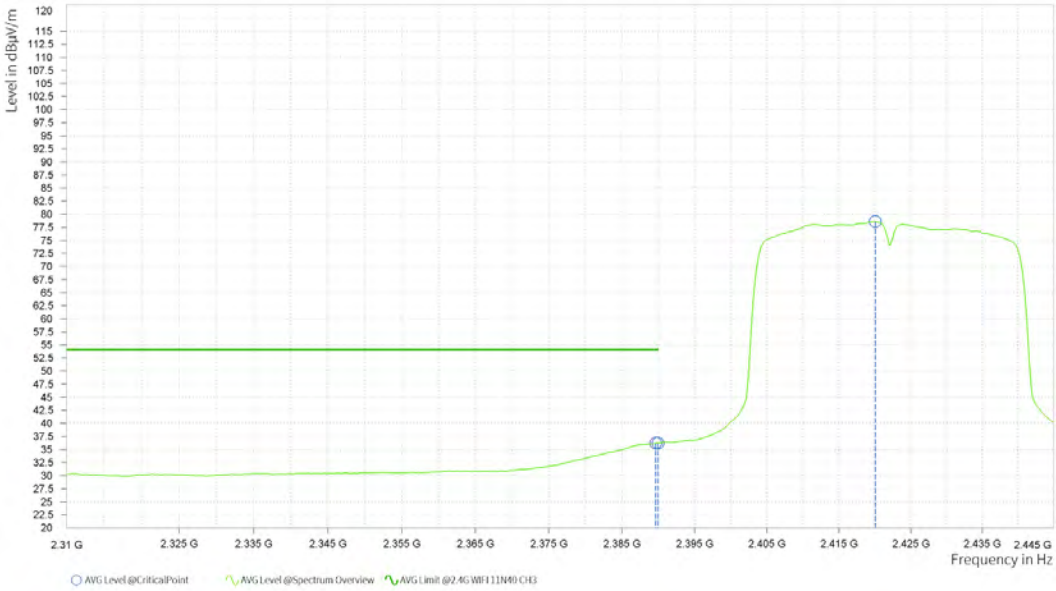
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	2,374.130	53.93	74.00	20.07	6.11	H	1	1.00
3	2,390.000	51.35	74.00	22.65	6.39	H	358.2	1.00
3	2,420.025	89.39			6.90	H	359.1	1.00



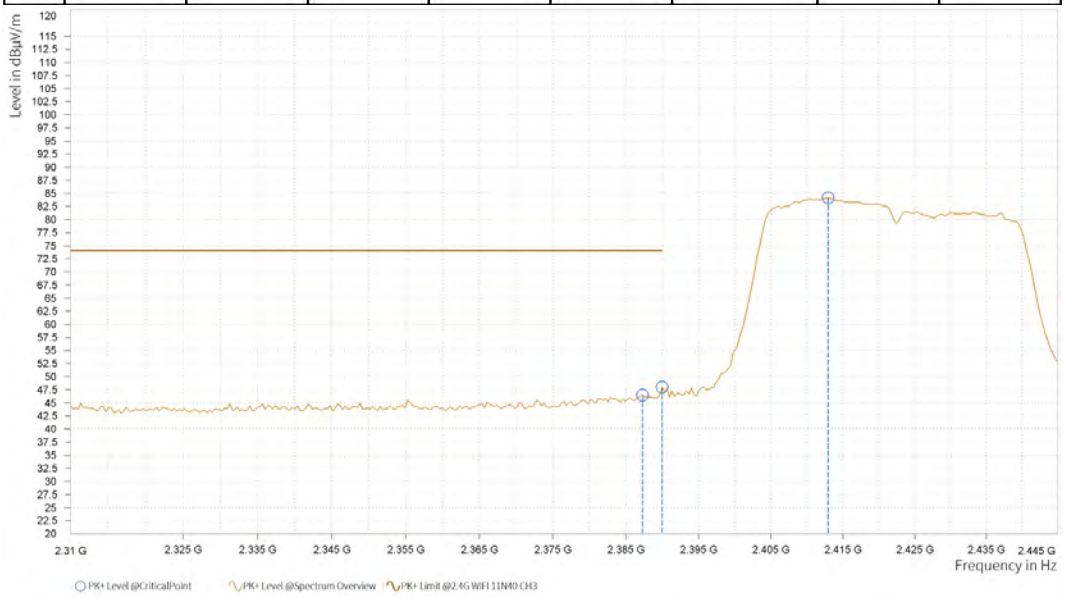
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	2,389.650	36.18	54.00	17.82	6.38	H	359	1.00
3	2,390.000	36.19	54.00	17.81	6.39	H	359	1.00
3	2,420.025	78.59			6.90	H	1	2.00



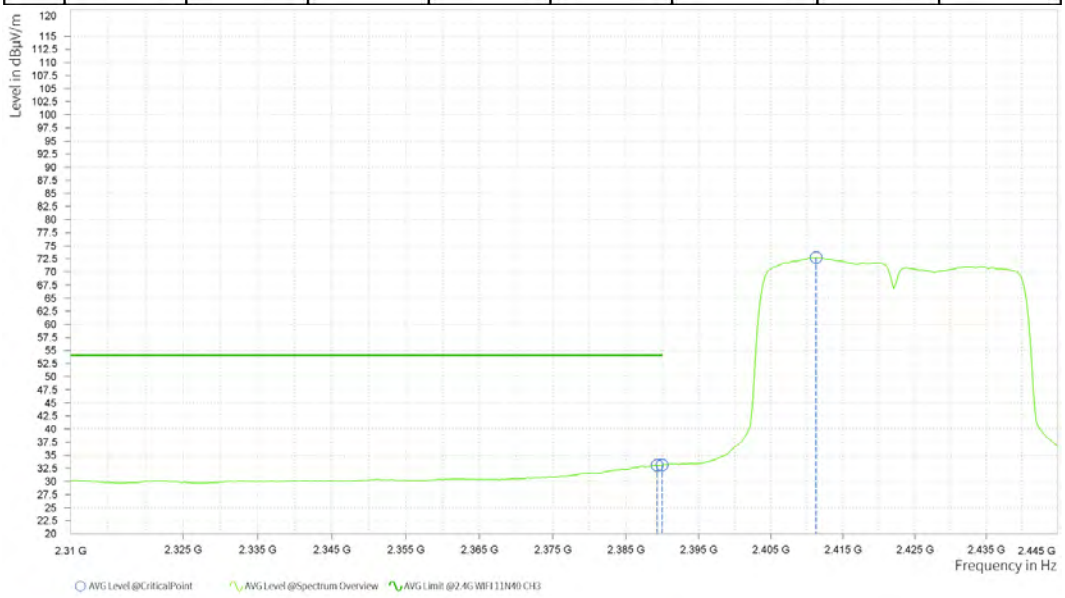
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	2,387.288	46.51	74.00	27.49	6.34	V	1.9	2.00
3	2,390.000	47.99	74.00	26.01	6.39	V	42.6	1.00
3	2,412.938	84.11			6.78	V	42.6	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	2,389.313	33.06	54.00	20.94	6.38	V	47.4	1.00
3	2,390.000	33.11	54.00	20.89	6.39	V	47.4	1.00
3	2,411.250	72.77			6.75	V	347.3	1.00



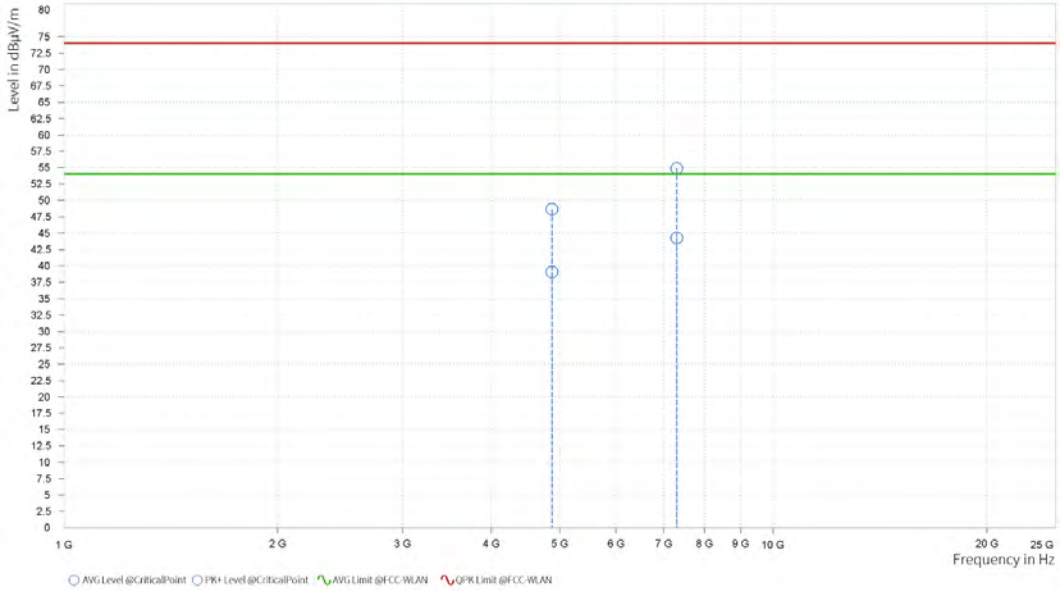
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2412MHz: Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

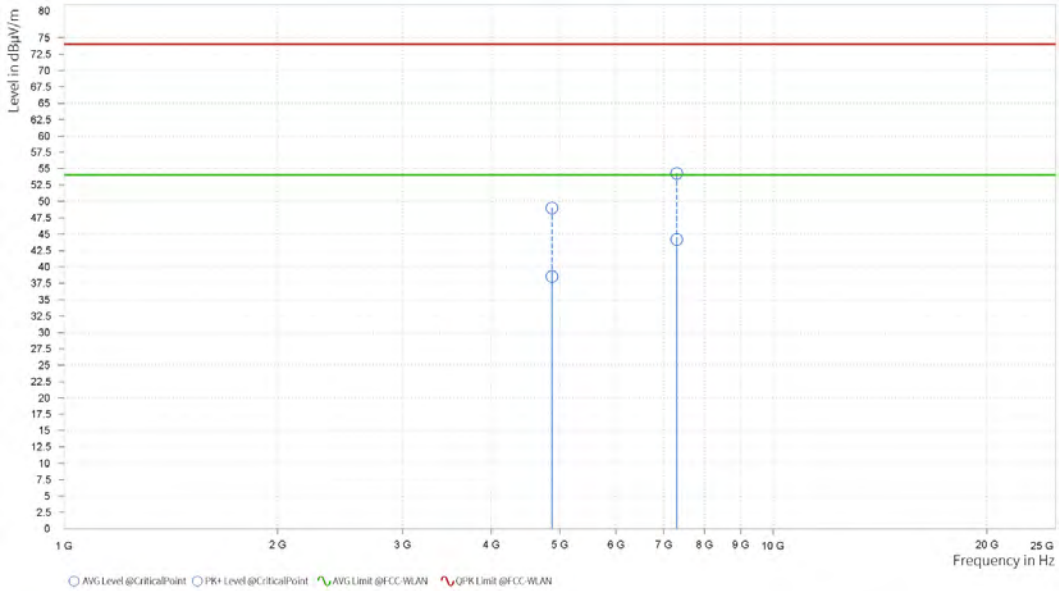
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+: QPK Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	48.65	74.00	25.35	39.05	54.00	14.95	13.85	H	359	2.00
3	7,311.000	54.89	74.00	19.11	44.29	54.00	9.71	19.48	H	1	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+: QPK Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	4,874.000	48.99	74.00	25.01	38.54	54.00	15.46	13.85	V	0.9	2.00
3	7,311.000	54.26	74.00	19.74	44.18	54.00	9.82	19.48	V	0.9	2.00



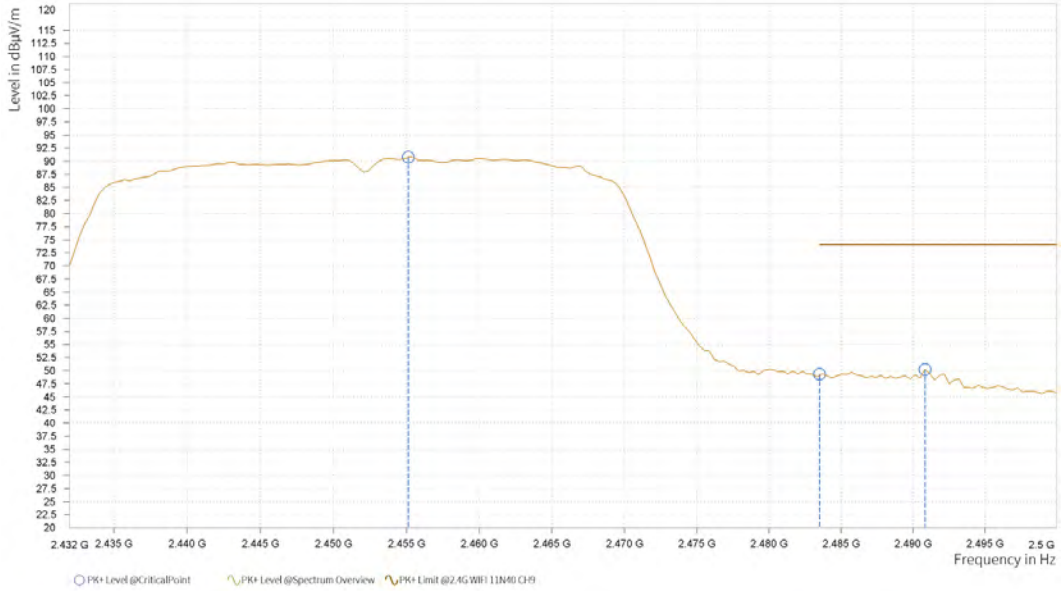
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2437MHz: Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

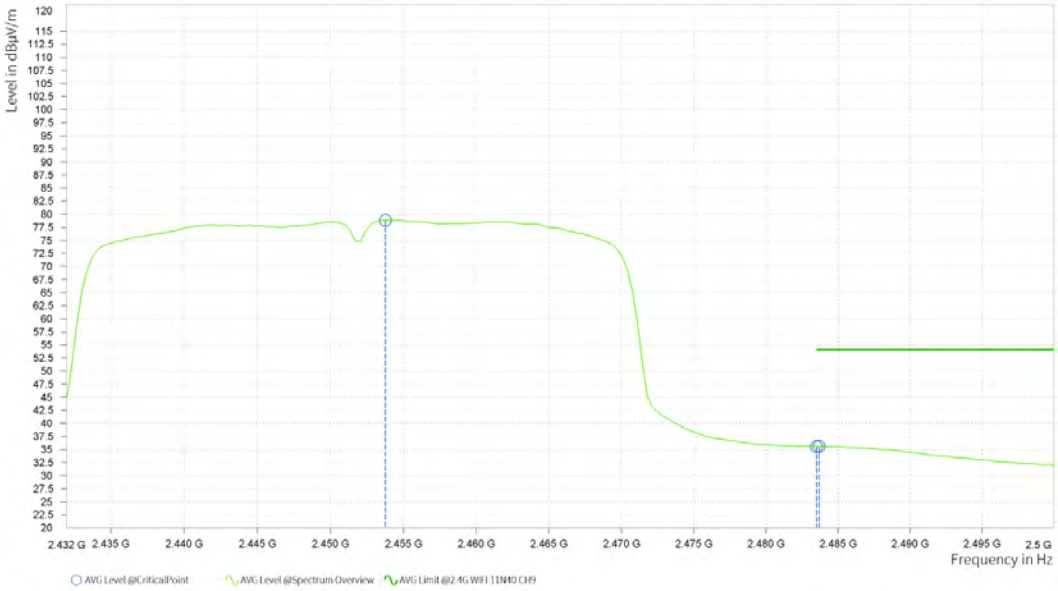
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	2,455.120	90.78			7.36	H	1	1.00
4	2,483.500	49.35	74.00	24.65	7.17	H	5	1.00
4	2,490.820	50.25	74.00	23.75	7.06	H	1	1.00



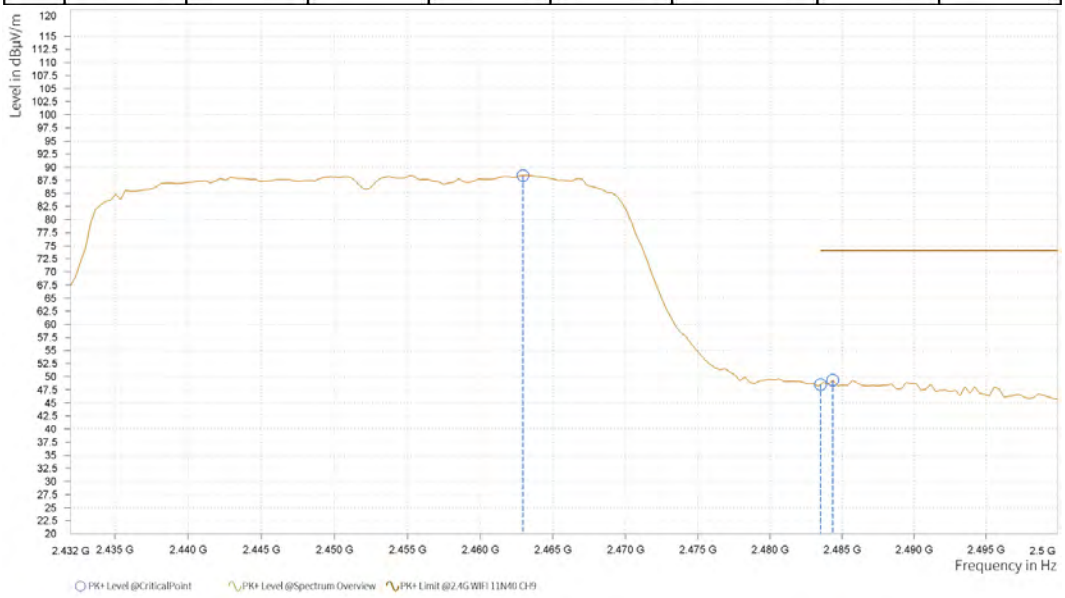
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	2,453.760	78.85			7.34	H	1	1.00
4	2,483.500	35.50	54.00	18.50	7.16	H	5.1	1.00
4	2,483.680	35.61	54.00	18.39	7.17	H	5.1	1.00



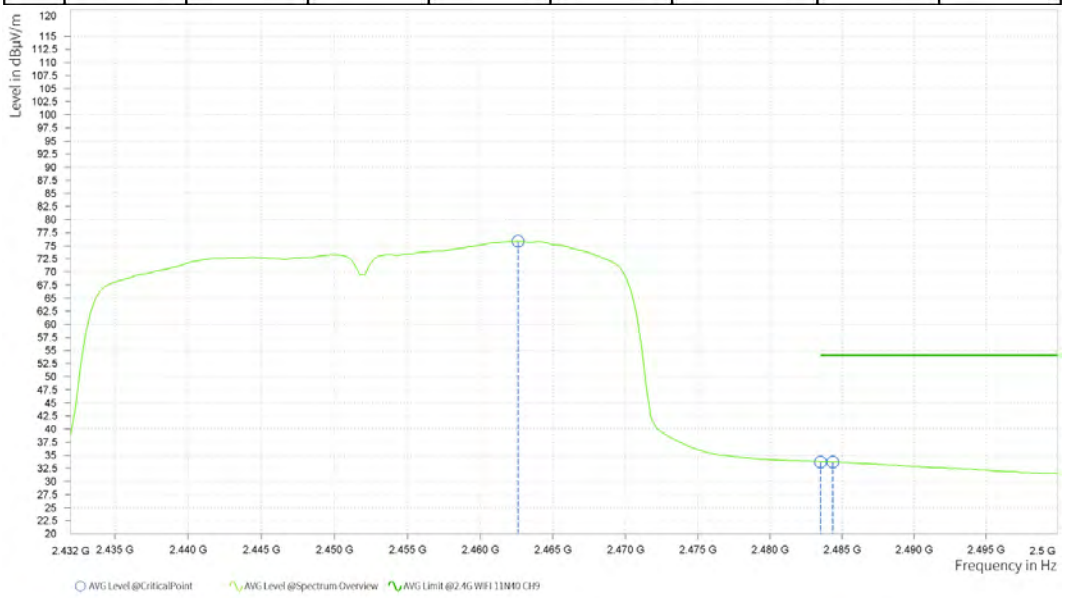
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	2,462.940	88.39			7.43	V	46.2	1.00
4	2,483.500	48.50	74.00	25.50	7.17	V	1	1.00
4	2,484.360	49.34	74.00	24.66	7.16	V	359.1	1.00



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	2,462.600	75.84			7.43	V	47.3	1.00
4	2,483.500	33.69	54.00	20.31	7.16	V	1	1.00
4	2,484.360	33.68	54.00	20.32	7.16	V	1	1.00



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
2. Margin value = Limit value- Emission level.
3. 2452MHz: Fundamental frequency.

3.2 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Lab B:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 13,24	Feb. 12,25
Power Meter	ANRITSU	ML2495A	1506002	Feb. 12,25	Feb. 11,26
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510523	Feb. 13,24	Feb. 12,25
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510523	Feb. 12,25	Feb. 11,26
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.09,24	May.08,25
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 13,24	Feb. 12,25
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 13,24	Feb. 12,25

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

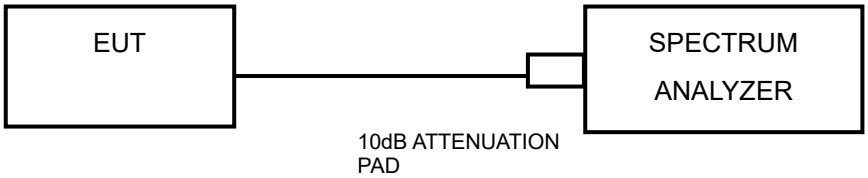
3.3.3 TEST PROCEDURE

1. Set RBW = shall be in the·range·of 1%·to·5%of the·0BW·but not less than·100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. 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.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest Channel frequencies individually.

3.3.7 TEST RESULTS

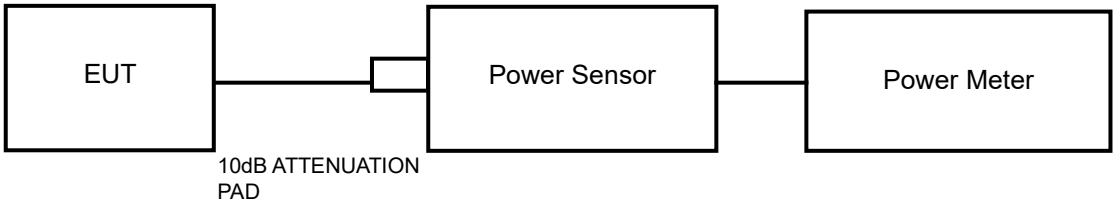
Please Refer to Appendix Of this test report.

3.3 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest Channel frequencies individually.

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix Of this test report.

3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

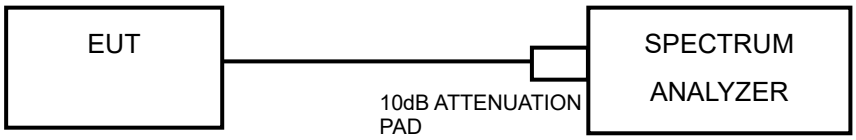
Please Refer to Appendix Of this test report.

3.4 POWER SPECTRAL DENSITY MEASUREMENT

3.4.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW ≥ 3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest Channel frequencies individually.

3.4.7 TEST RESULTS

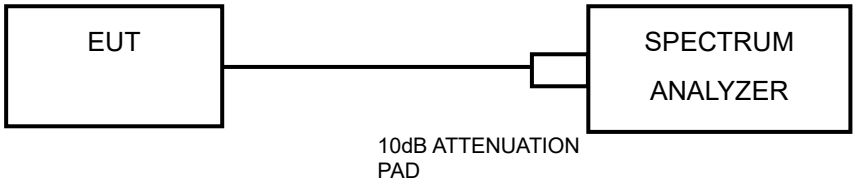
Please Refer to Appendix Of this test report.

3.5 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest Channel frequencies individually.

3.6.7 TEST RESULTS

The spectrum plots are attaCHed on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix Of this test report.

3.6 ANTENNA REQUIREMENTS

3.6.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.6.3 ANTENNA GAIN

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit and PSD limit.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

6 APPENDIX: WLAN

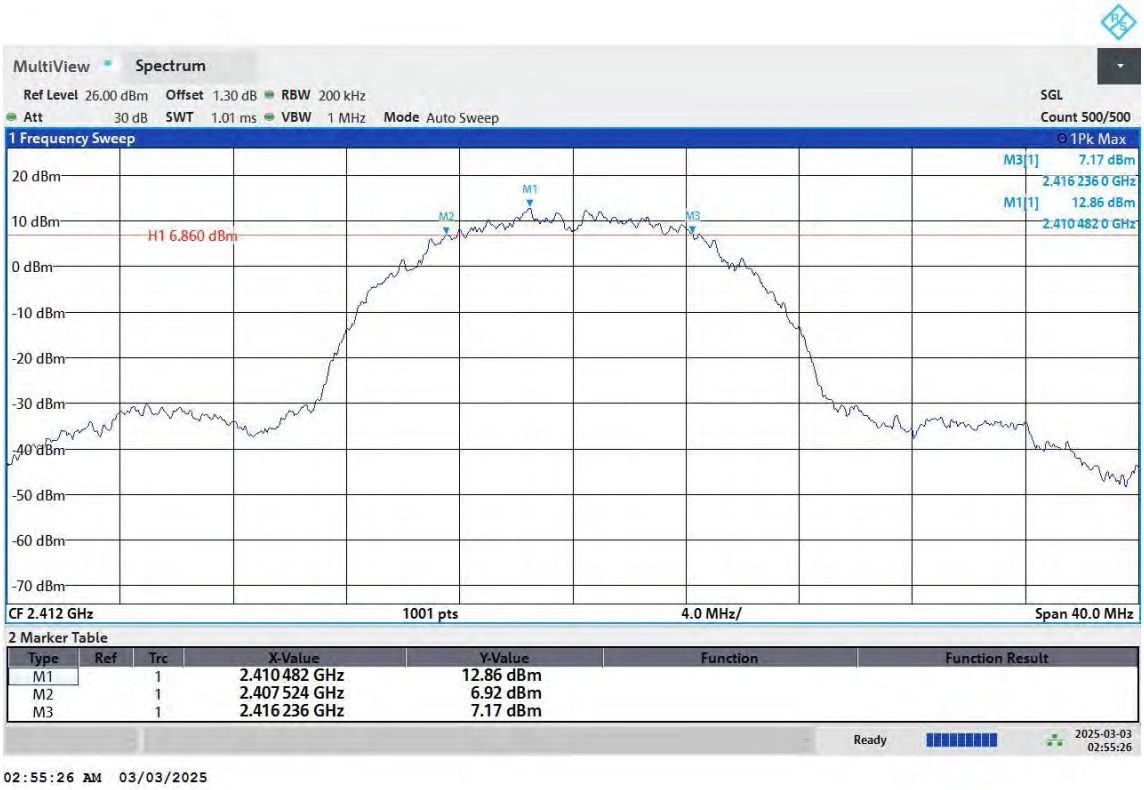
DTS BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.712	2407.524	2416.236	0.5	PASS
	Ant1	2437	8.751	2437.445	2446.196	0.5	PASS
	Ant1	2462	9.031	2467.445	2476.476	0.5	PASS
11G	Ant1	2412	16.384	2403.768	2420.152	0.5	PASS
	Ant1	2437	16.344	2433.768	2450.112	0.5	PASS
	Ant1	2462	16.344	2463.808	2480.152	0.5	PASS
11N20	Ant1	2412	17.262	2403.329	2420.591	0.5	PASS
	Ant1	2437	17.262	2433.329	2450.591	0.5	PASS
	Ant1	2462	17.262	2463.329	2480.591	0.5	PASS
11N40	Ant1	2422	34.845	2404.498	2439.343	0.5	PASS
	Ant1	2437	34.985	2424.358	2459.343	0.5	PASS
	Ant1	2452	36.684	2443.618	2480.302	0.5	PASS

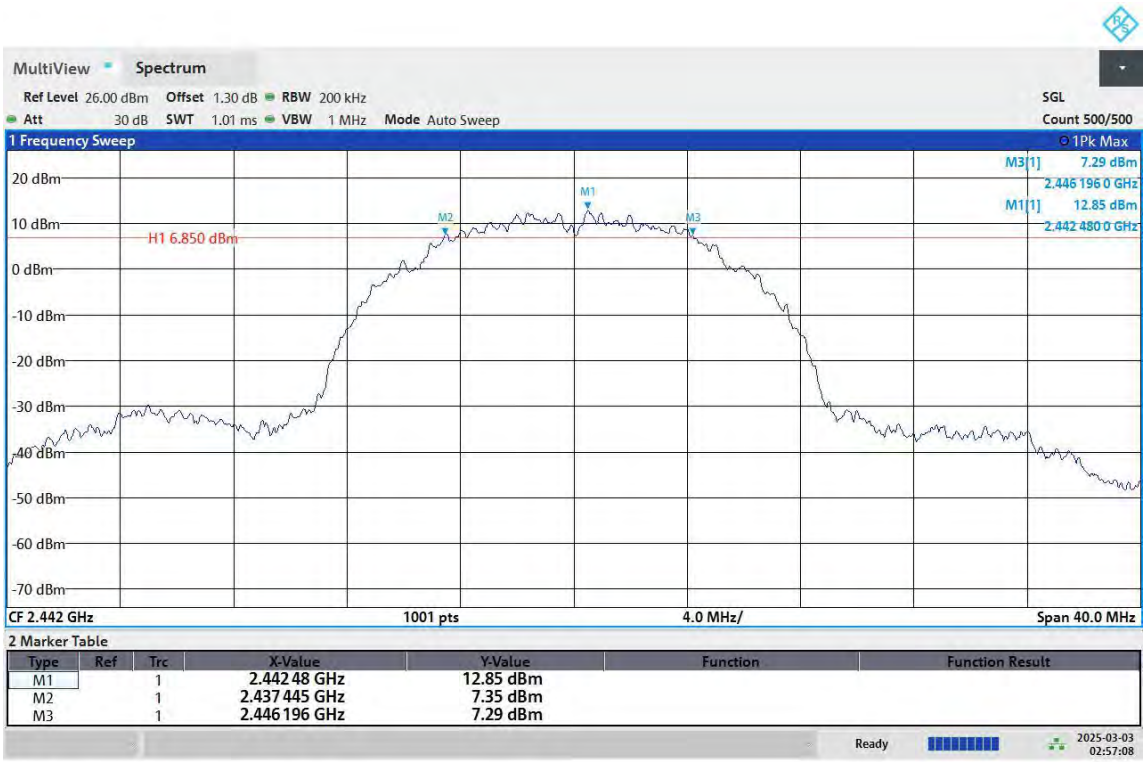
TEST GRAPHS

11B_ANT1_2412



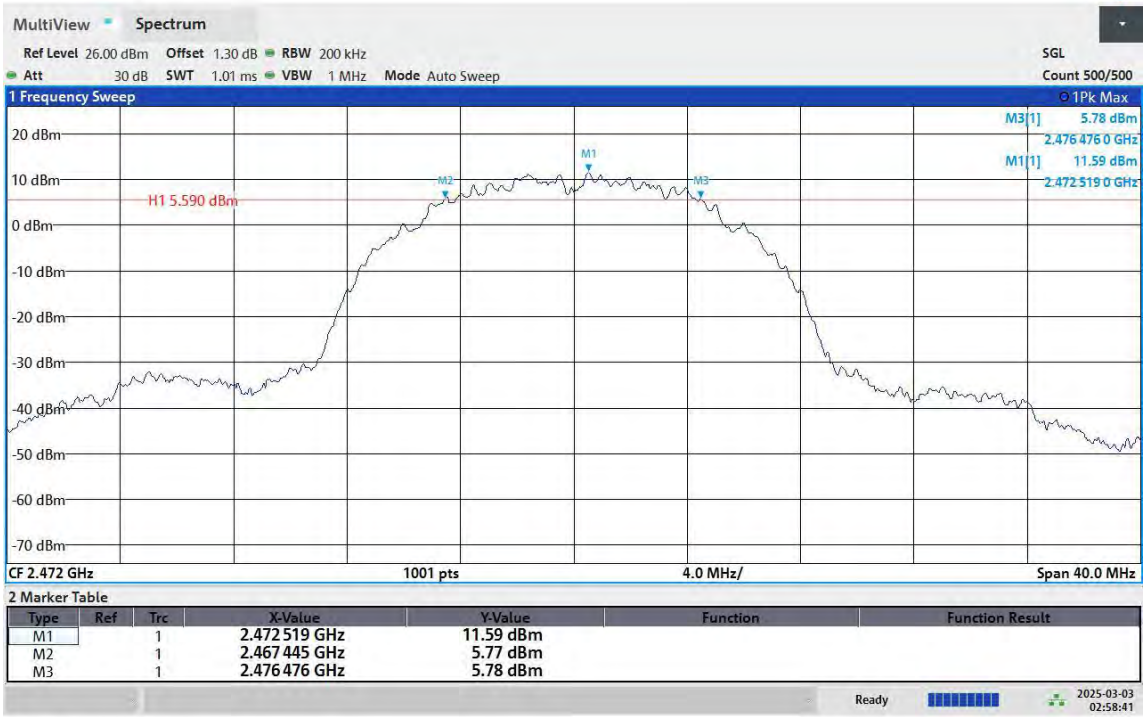
02:55:26 AM 03/03/2025

11B_ANT1_2437



02:57:08 AM 03/03/2025

11B_ANT1_2462



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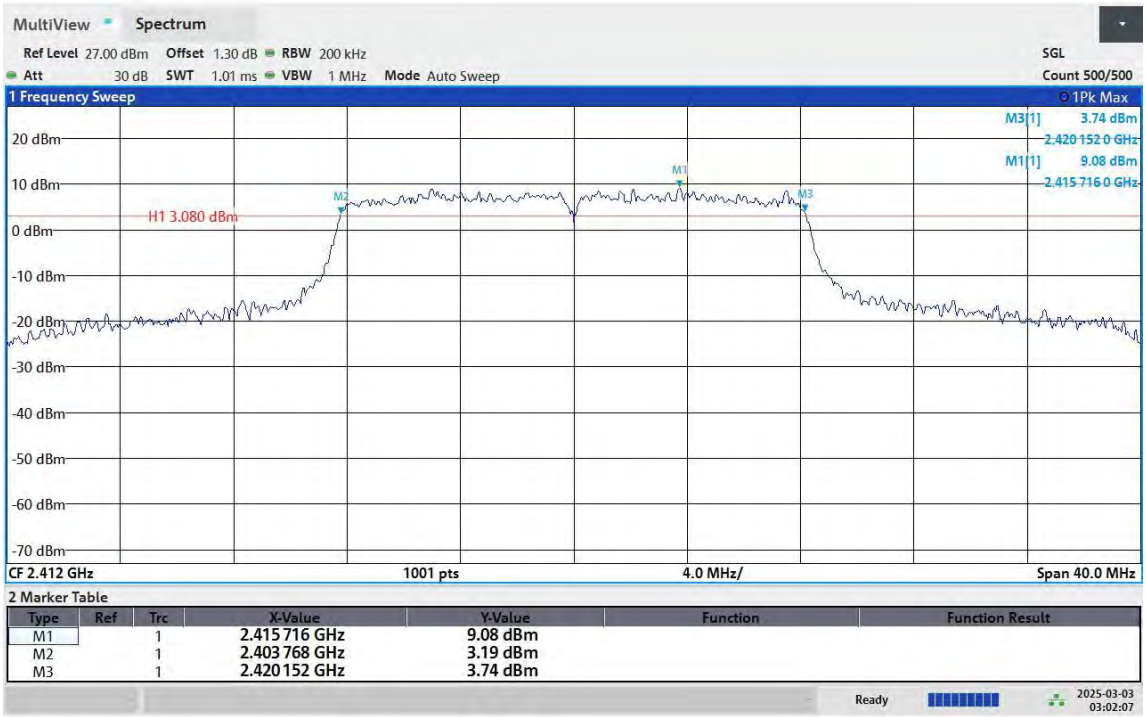
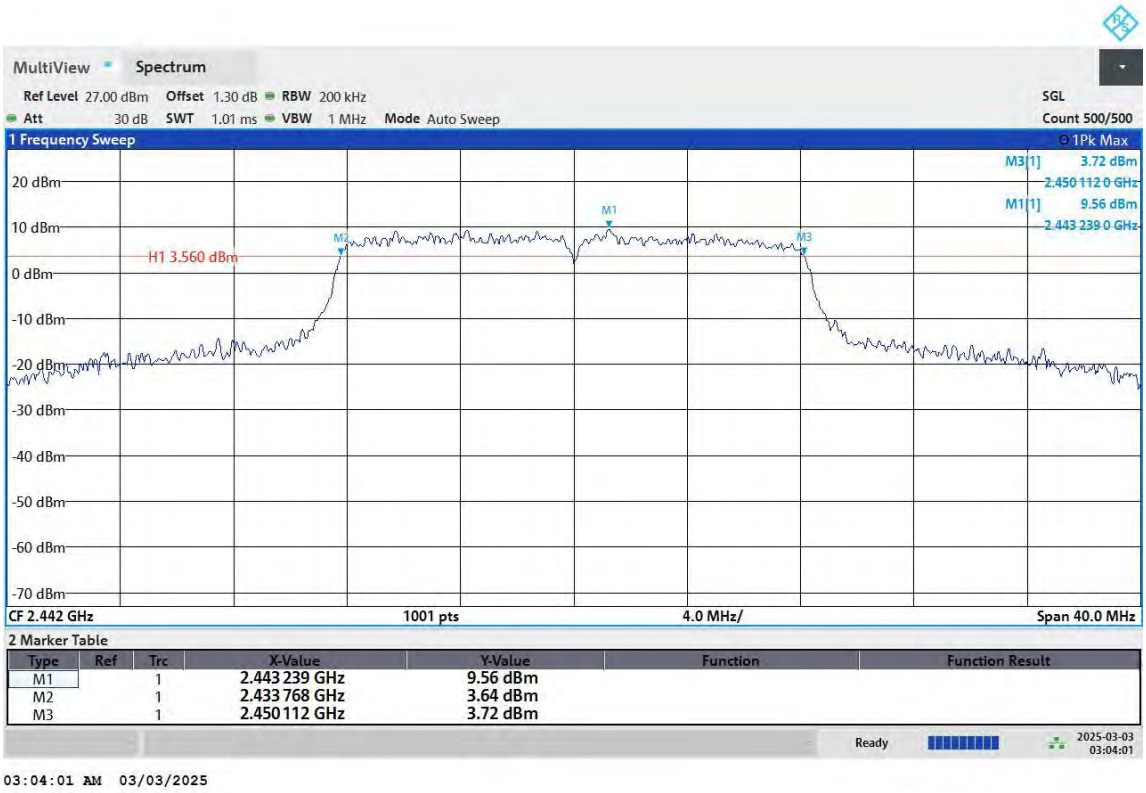
11G_ANT1_2412

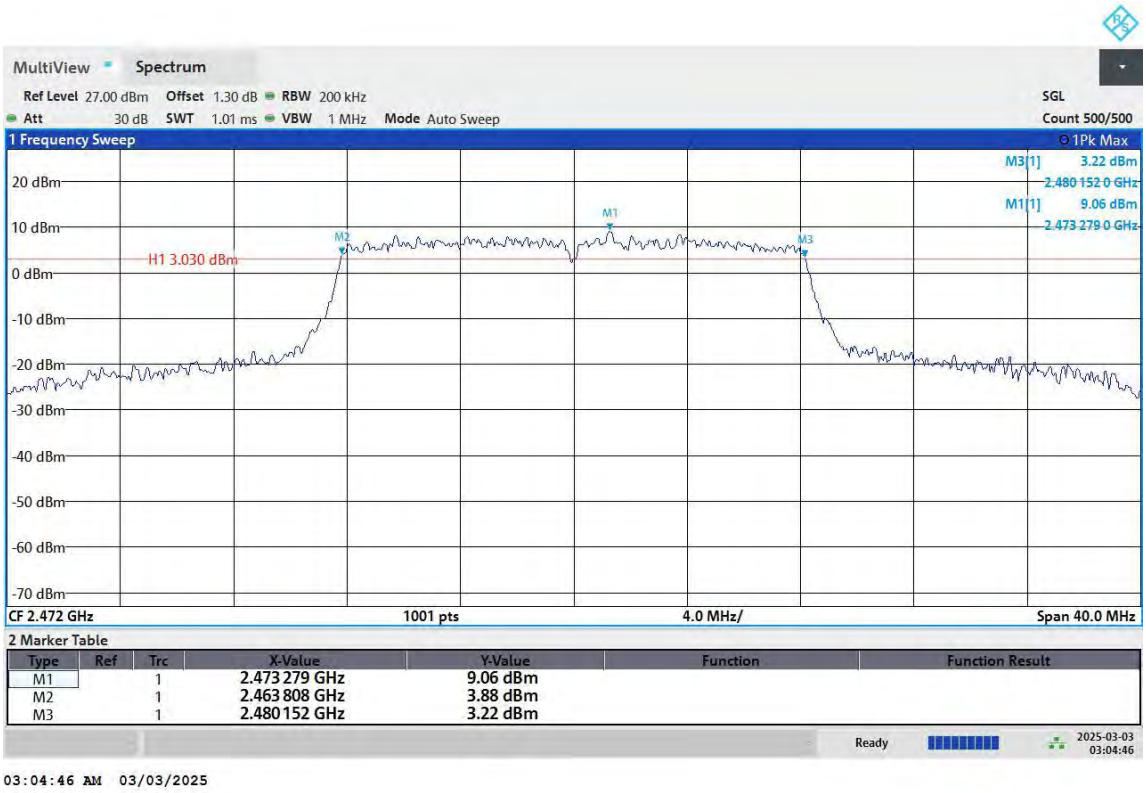


03:02:07 AM 03/03/2025

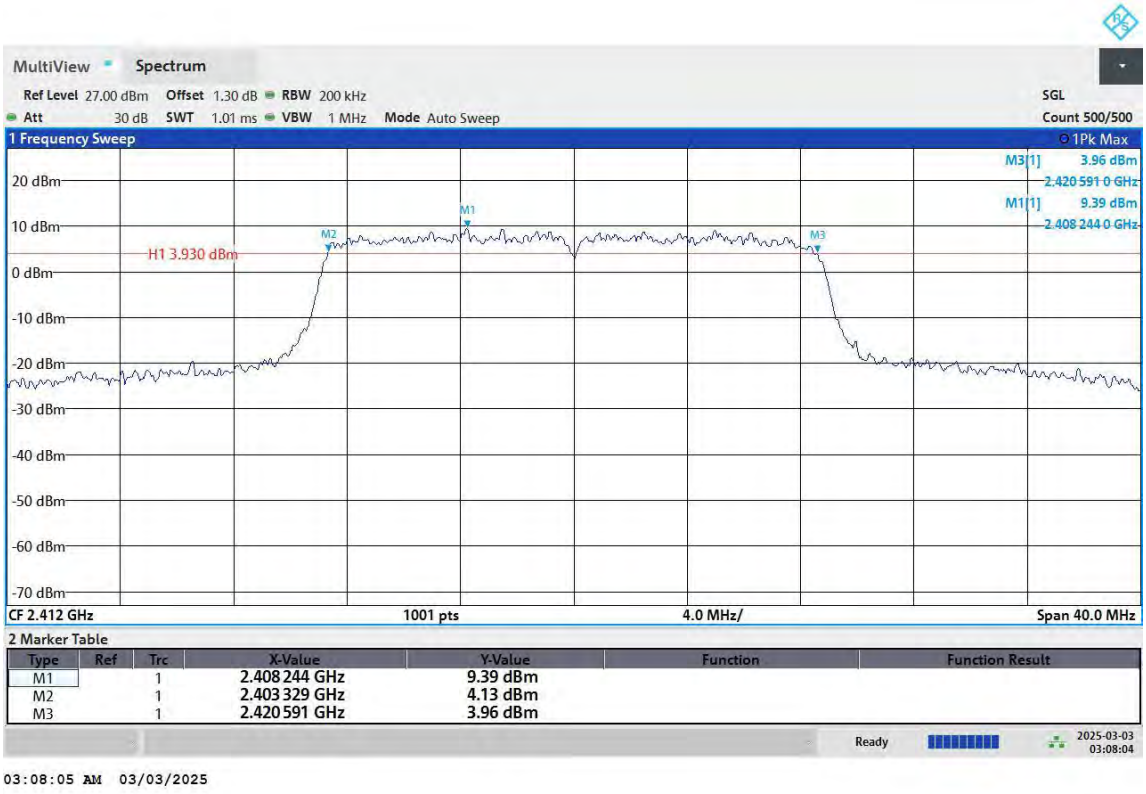
11G_ANT1_2437



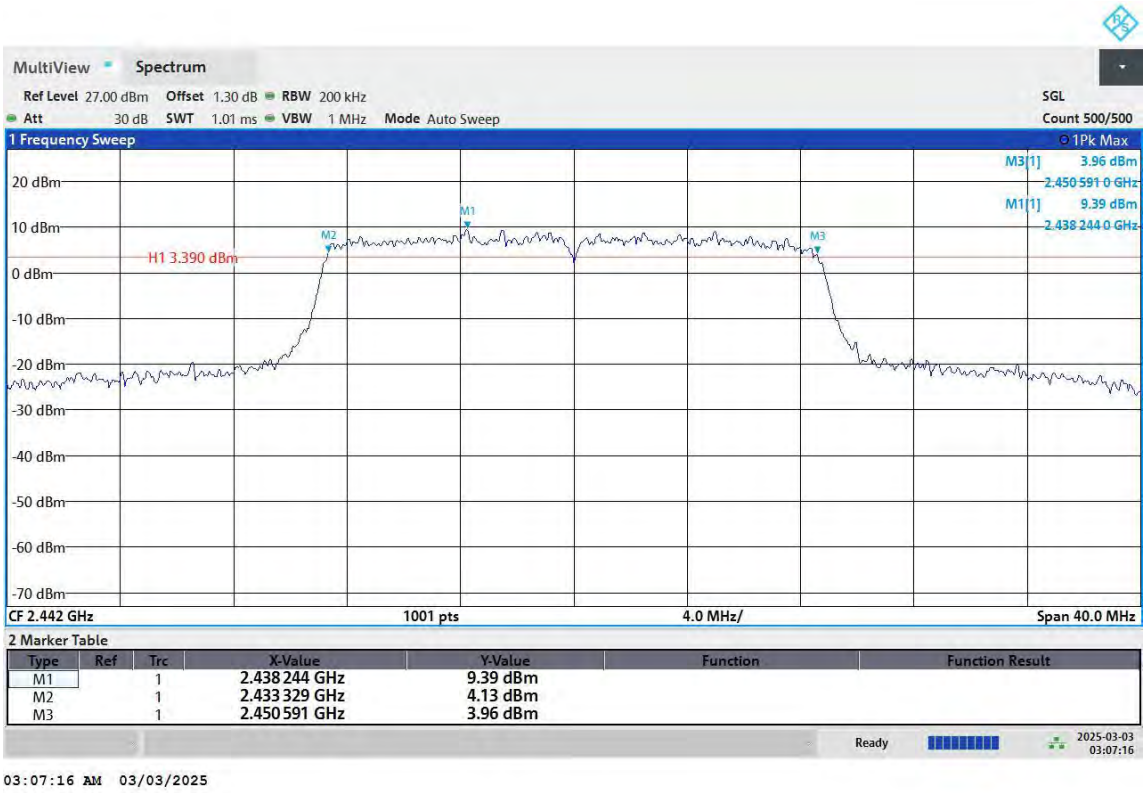
11G_ANT1_2462



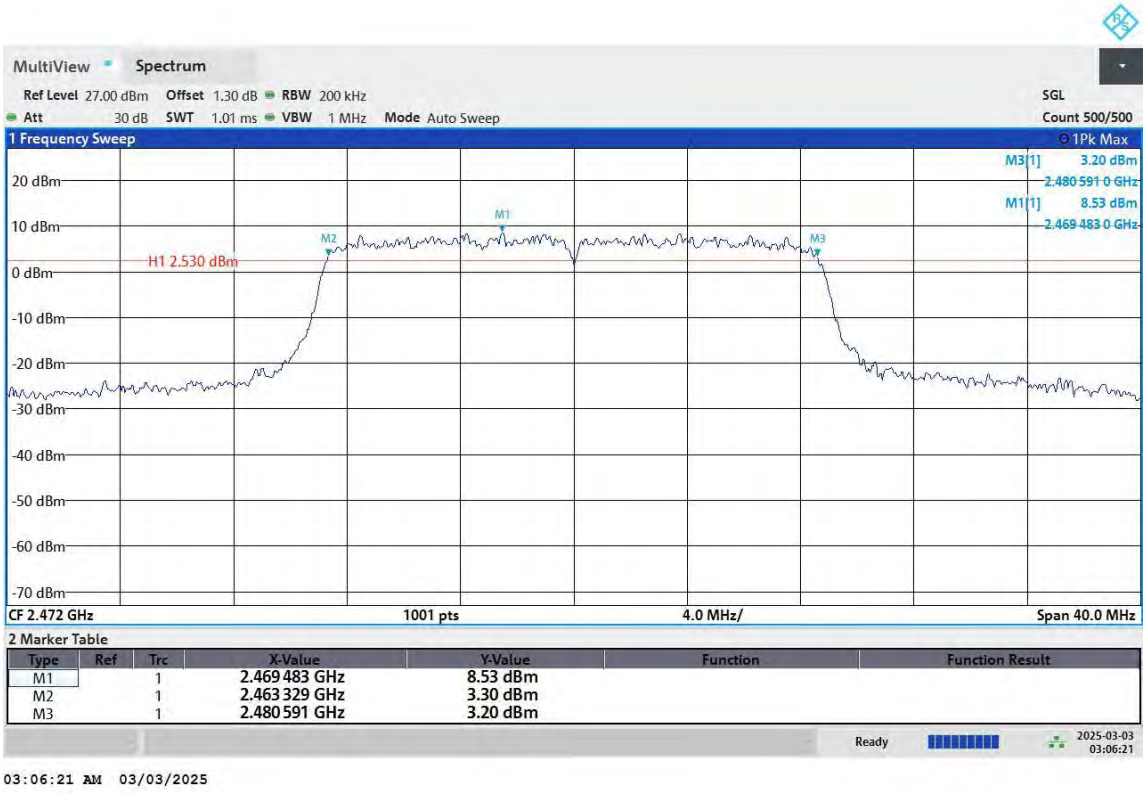
11N20_ANT1_2412



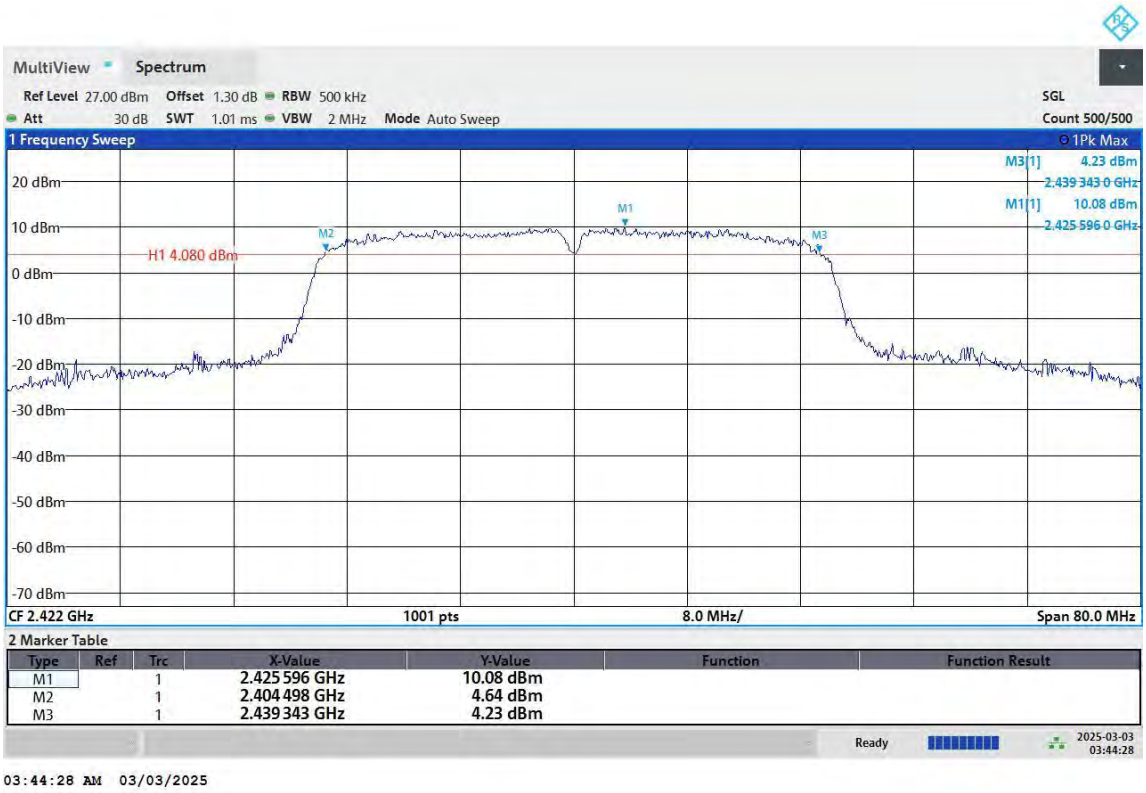
11N20_ANT1_2437



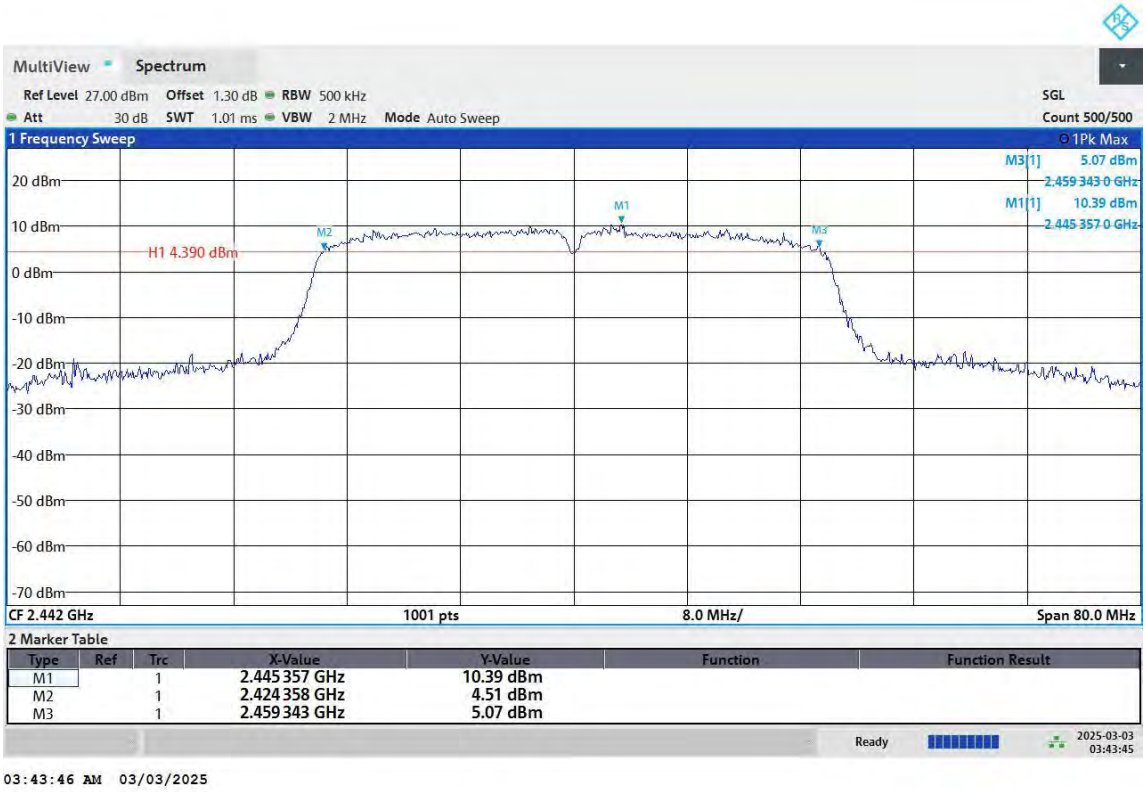
11N20_ANT1_2462



11N40_ANT1_2422



11N40_ANT1_2437



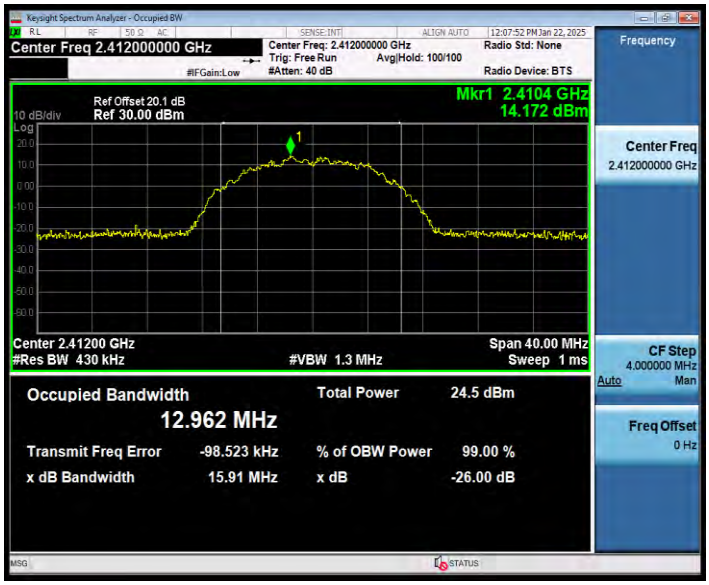
11N40_ANT1_2452

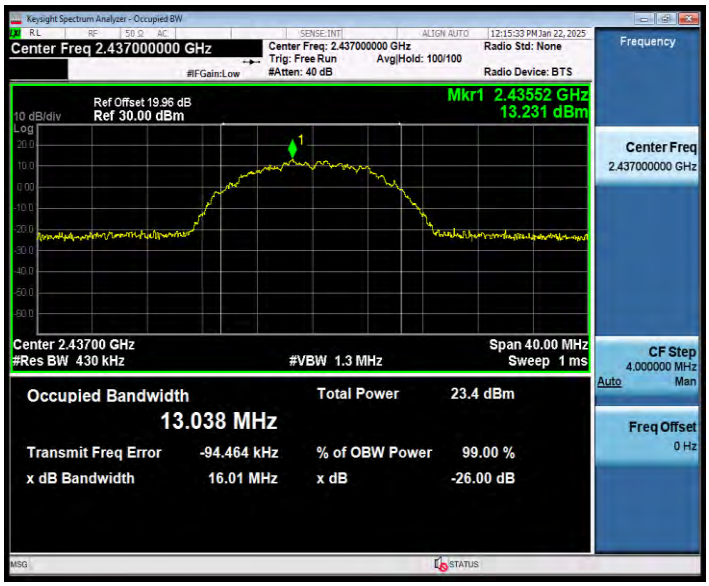
OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.962	2405.4205	2418.3825	---	---
		2437	13.038	2430.3865	2443.4245	---	---
		2462	12.960	2455.4649	2468.4249	---	---
11G	Ant1	2412	17.006	2403.4533	2420.4593	---	---
		2437	17.068	2428.4672	2445.5352	---	---
		2462	16.926	2453.5635	2470.4895	---	---
11N20SISO	Ant1	2412	17.628	2403.1419	2420.7699	---	---
		2437	17.690	2428.1346	2445.8246	---	---
		2462	17.588	2453.2003	2470.7883	---	---
11N40SISO	Ant1	2422	35.990	2403.9471	2439.9371	---	---
		2437	36.038	2418.9740	2455.0120	---	---
		2452	35.925	2434.0772	2470.0022	---	---

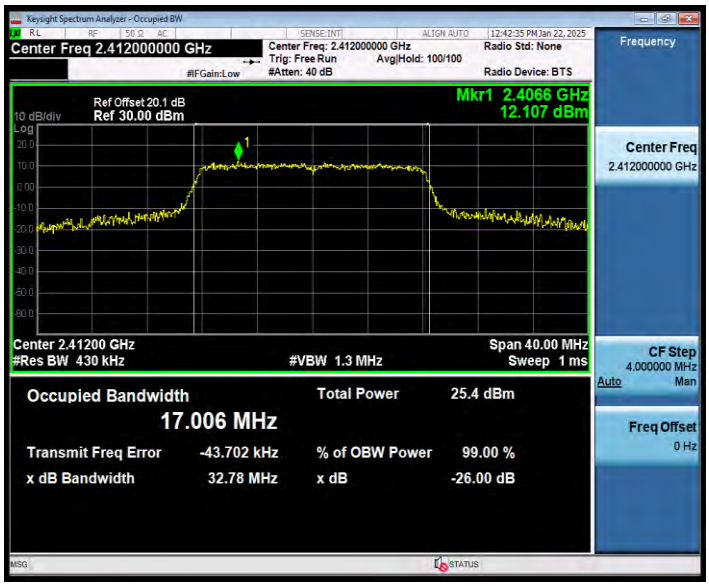
TEST GRAPHS

11B_Ant1_2412


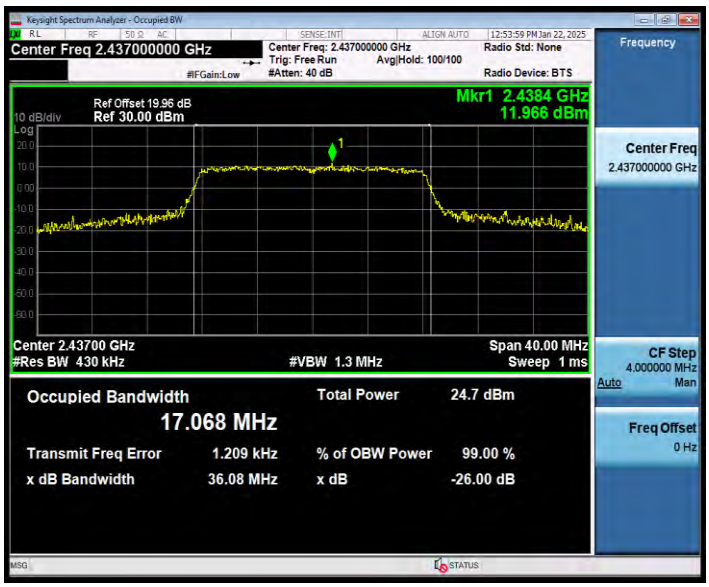
11B_Ant1_2437


11B_Ant1_2462

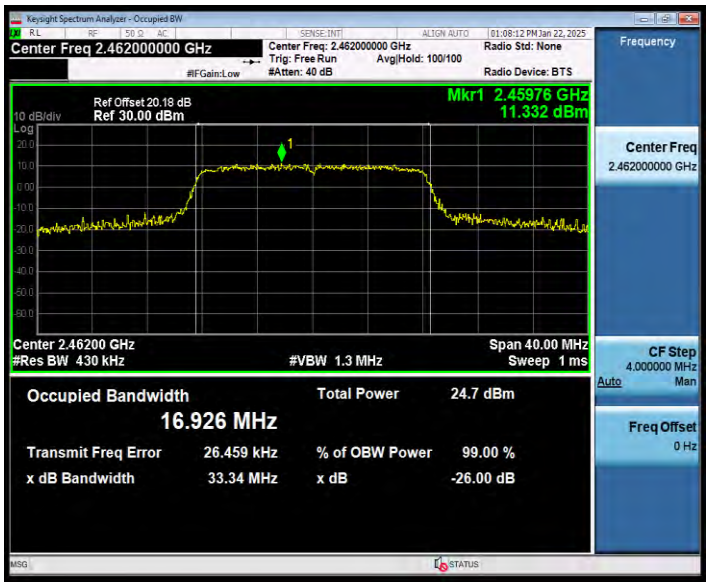
11G_Ant1_2412



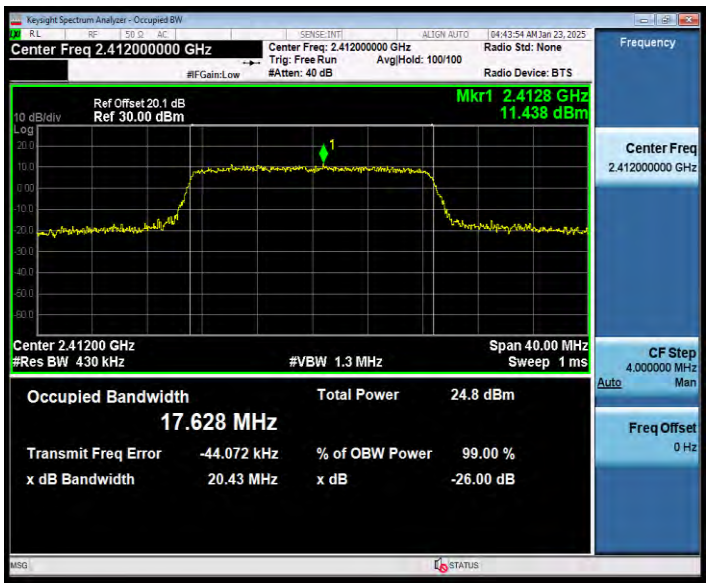
11G_Ant1_2437



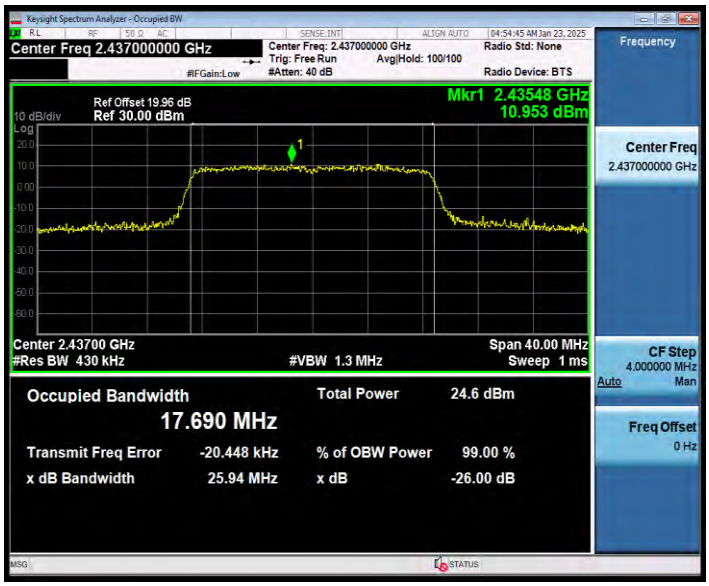
11G_Ant1_2462



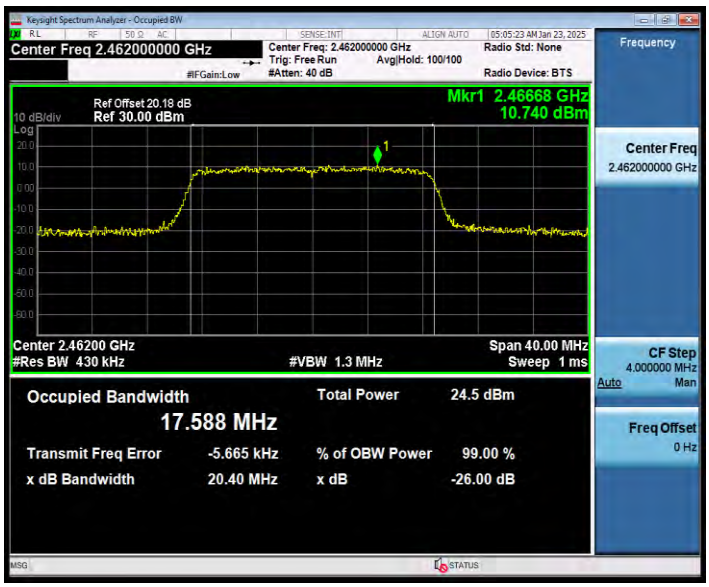
11N20SISO_Ant1_2412



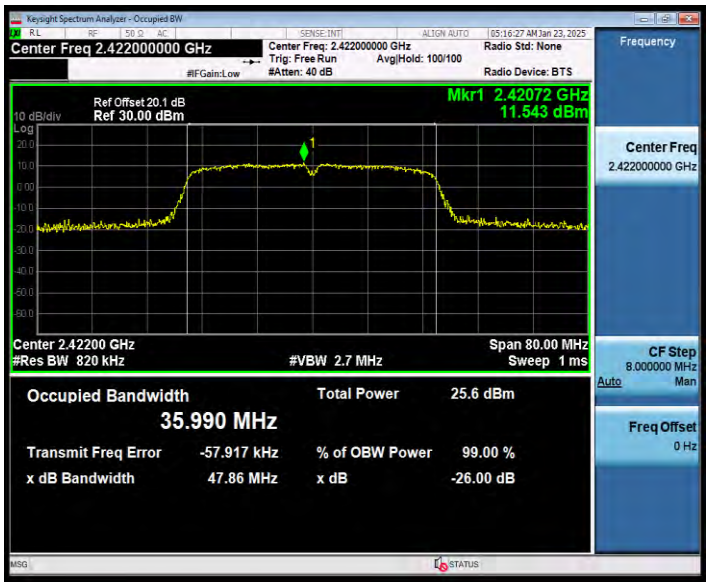
11N20SISO_Ant1_2437



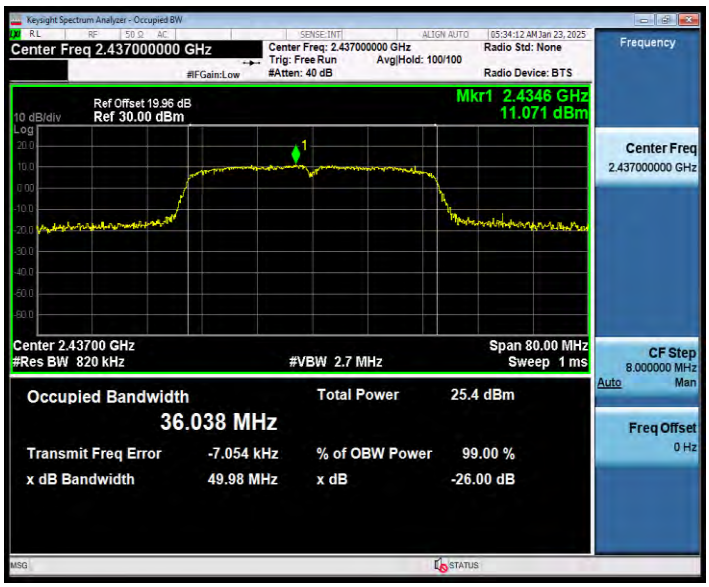
11N20SISO_Ant1_2462



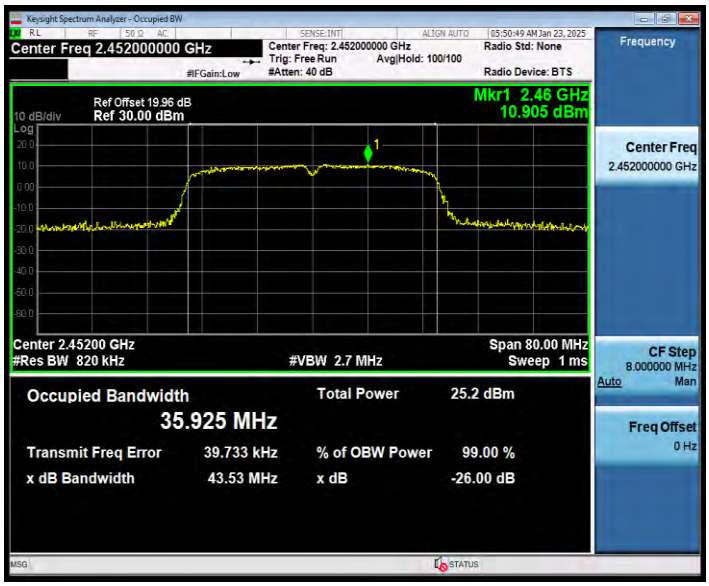
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT PEAK

TestMode	TX Mod.	Frequency [MHz]	Peak power [dBm] Ant1	MAX Peak power [mw]	Limit [dBm]	Verdict	Power Setting
11B	SISO	2412	21.23	132.74	≤30.00	PASS	---
		2437	20.56	113.76	≤30.00	PASS	---
		2462	20.39	109.40	≤30.00	PASS	---
11g	SISO	2412	24.62	289.73	≤30.00	PASS	---
		2437	24.52	283.14	≤30.00	PASS	---
		2462	24.24	265.46	≤30.00	PASS	---
11N20	SISO	2412	24.00	251.19	≤30.00	PASS	---
		2437	24.12	258.23	≤30.00	PASS	---
		2462	23.56	226.99	≤30.00	PASS	---
11N40	SISO	2422	24.53	283.79	≤30.00	PASS	---
		2437	24.88	307.61	≤30.00	PASS	---
		2452	24.48	280.54	≤30.00	PASS	---

TEST RESULT AVERAGE

TestMode	TX Mod.	Freq. [MHz]	Avg.power [dBm]	Power Setting
			Ant1	
11B	SISO	2412	17.80	---
		2437	17.47	---
		2462	16.94	---
11g	SISO	2412	18.22	---
		2437	18.64	---
		2462	17.43	---
11N20	SISO	2412	17.86	---
		2437	18.61	---
		2462	17.24	---
11N40	SISO	2422	17.87	---
		2437	18.53	---
		2452	17.98	---

MAXIMUM POWER SPECTRAL DENSITY

TEST RESULT

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-3.01	≤8.00	PASS
		2437	-2.96	≤8.00	PASS
		2462	-3.45	≤8.00	PASS
11G	Ant1	2412	-5.72	≤8.00	PASS
		2437	-6.25	≤8.00	PASS
		2462	-6.60	≤8.00	PASS
11N20SISO	Ant1	2412	-5.66	≤8.00	PASS
		2437	-5.85	≤8.00	PASS
		2462	-5.94	≤8.00	PASS
11N40SISO	Ant1	2422	-8.08	≤8.00	PASS
		2437	-8.39	≤8.00	PASS
		2452	-8.48	≤8.00	PASS

TEST GRAPHS

11B_Ant1_2412

11B_Ant1_2437

11B_Ant1_2462