RADIO TEST REPORT

Product	:	Cable Gateway
Model Name	:	CBV390SL5-X57
Series Model	:	Infinity 601
FCC ID	:	RK9-INFINITY601
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.247)
Received Date	:	2023/2/23
Test Date	:	2023/2/23 ~ 2023/4/19
Issued Date	:	2023/6/6
Applicant	:	CastleNet Technology Inc. No. 14, Ln. 141, Sec. 3, Beishen Rd., Shenkeng Dist., New Taipei City 22244, Taiwan (R.O.C.)
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

REVISION HISTORY

Original Test Report No.: 4790688499-US-R0-V0

Revision	Test report No.	Date	Page revised	Contents
Original	4790688499-US-R0-V0	2023/6/6	-	Initial issue

Table of Contents

1. Attestation of Test Results

APPLICANT:	CastleNet Technology Inc. No. 14, Ln. 141, Sec. 3, Beishen Rd., Shenkeng Dist., New Taipei City 22244, Taiwan (R.O.C.)
MANUFACTURER:	CastleNet Technology Inc. No. 14, Ln. 141, Sec. 3, Beishen Rd., Shenkeng Dist., New Taipei City 22244, Taiwan (R.O.C.)
EUT DESCRIPTION:	Cable Gateway
MODEL:	CBV390SL5-X57
SERIES MODEL:	Infinity 601
SAMPLE STAGE:	Pilot-run Verification Test sample
DATE of TESTED:	2023/2/23 ~ 2023/4/19

APPLICABLE STANDARDS	
STANDARD	**Test Results**
FCC 47 CFR PART 15 Subpart C (Section 15.247)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu Date : 2023/6/6
Project Handler

Approved and Authorized By:

Eric Lee Date : 2023/6/6
Senior Laboratory Engineer

2. Summary of Test Results

Summary of Test Results		
FCC Clause	**Test Items**	**Result**
15.247(a)(2)	6dB Bandwidth	PASS
15.247(b)	Conducted Output Power	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Antenna Port Emission	PASS
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS
15.207	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB558074 D01 Meas Guidance v05r02, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013 and KDB 662911 D01 Multiple Transmitter Output v02r01.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Determining compliance based on the results of the compliance measurement, not considering measurement instrumentation uncertainty.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±2.9 dB
RF Conducted	9 kHz - 40GHz	±2.4 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.8 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.8 dB

6. Equipment under Test

6.1. Description of EUT

Product	Cable Gateway
Model Name	CBV390SL5-X57
Series Model	Infinity 601
Operating Frequency	2412MHz ~ 2462MHz
Modulation	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to MCS23 802.11ac: up to MCS9 802.11ax: up to MCS11
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20) 7 for 802.11n (HT20), 802.11ac (VHT40), 802.11ax (HE40)
Maximum Output Power	**Non-Beamforming mode:** 802.11b: 25.12 dBm 802.11g: 26.00 dBm 802.11ax (HE20): 25.42 dBm 802.11ax (HE40): 22.97 dBm **Beamforming mode:** 802.11ax (HE20): 25.39 dBm 802.11ax (HE40): 22.74 dBm
Normal Voltage	120Vac/ 60Hz From AC adapter
Sample ID	Conducted Test: 5666280 Radiated Test: 5666280

Note:

1. The models difference table as below:

Model	Wi-Fi	2.5G port	1G port	USB port	ON/OFF switch	Power adapter	Housing
CBV390SL5-X57	V	V	V	V	V	12Vdc/3.5A	black F61 housing
Infinity 601	V	V	V	X	X	12Vdc/3A	white/black F65 housing

Note: The EUT has two types of housing: black F61 housing and white/black F65 housing. Since the differences in housing are only the openings and color. These differences do not affect the test, so the test report only uses the black F61 housing as a representative.

2. The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and two receivers.

Modulation Mode	Tx,Rx Function
802.11b	1Tx Fixed Chain 0,3RX
802.11g	3TX,3RX
802.11n (HT20)	3TX,3RX
802.11n (HT40)	3TX,3RX
802.11ac (VHT20)	3TX,3RX
802.11ac (VHT40)	3TX,3RX
802.11ax (HE20)	3TX,3RX
802.11ax (HE40)	3TX,3RX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40 and 802.11ax mode for HE20 / HE40, therefore investigated worst case to representative mode in test report.

3. The EUT contains following accessory devices

Product	Brand	Model	Description
Lan Cable	EEK SONG ELEC	PF01-C112	YELLOW / 1M
AC Adapter	MOSO	MSS-V3500WR120-042A0-US	12Vdc/3.5A
AC Adapter	MOSO	MS-V3000R120-036I1-US	12Vdc/3A
AC Adapter	SUNNY	SYS1666-3612-W2	12Vdc/3A

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual, the laboratory shall not be held responsible.

6.2. Channel List

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

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	-	-

7 channels are provided for 802.11n (HT20), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437	-	-

6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	22~24°C/ 63~65%RH	120Vac/ 60Hz	2023/03/21~ 2023/04/19	WaterNil Guan
Radiated Spurious Emission	966-2	20~26°C/ 60~66%RH	120Vac/ 60Hz	2023/01/30~ 2023/04/19	WaterNil Guan
AC power Line Conducted Emission	SR1	22~24°C/ 63~65%RH	120Vac/ 60Hz	2023/03/21~ 2023/03/27	WaterNil Guan

FCC Test Firm Registration Number: 498077

Sample Calculation:

Antenna Port Conducted Measurement:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBm) = Reading Value (dBm) +Attenuator Factor (dB) + Cable Loss (dB).
  Example: Result Value (10dBm) = Reading Value (-2dBm) +Attenuator Factor (10dB) + Cable Loss(2dB).
  *Test plot only shown the “Result Value”.

Radiated Spurious Emission:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
  Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
  Example: Result Value (34.5dBuV/m) = Reading Value (40.1dBuV) + Antenna Factor (18.7dB/m) + Cable Loss (4.2dB) - Preamp Factor (28.5dB).

AC power Line Conducted Emission:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBuV) = Reading Value (dBuV) + Correction Factor (dB).
  Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).
  Example: Result Value (53.7dBuV) = Reading Value (35.1dBuV) + Insertion loss(18.1dB) + Cable loss(0.5dB).

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)	LYNWAVE TECH	2AN-C901WE00RFR	PCB	2.4GHz: 3.5 5GHz: 3.9
2	Chain (1)	LYNWAVE TECH	2AN-C901BK00RFR	PCB	2.4GHz: 3.5 5GHz: 4.6
3	Chain (2)	LYNWAVE TECH	2AN-C901BE00RFR	PCB	2.4GHz: 3.6 5GHz: 5.1
4	Chain (3)	LYNWAVE TECH	2AN-C901GY00RFR	PCB	5GHz: 3.2

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual, the laboratory shall not be held responsible.

6.5. Test Mode Applicability and Tested Channel Detail

- For AC power line conducted emissions, the pre-scan has been determined by AC power 120Vac/60Hz (worst case)
- The fundamental of the EUT was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that X-Y plane was worst-case. Therefore, all final radiated testing was performed with the EUT in X-Y plane.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- 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).

Non-Beamforming mode:

Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Radiated Emissions (Above 1GHz)	802.11b	DSSS	DBPSK	1 to 11	1,6,11	1 Mbps
	802.11g	OFDM	BPSK	1 to 11	1,2,6,10,11	6 Mbps
	802.11ax20	OFDMA	BPSK	1 to 11	1,2,6,10,11	MCS 0
	802.11ax40	OFDMA	BPSK	3 to 9	3,6,9	MCS 0
Radiated Emissions (Below 1GHz)	802.11g	OFDM	BPSK	1 to 11	6	6 Mbps
AC Power Line Conducted Emission	802.11g	OFDM	BPSK	1 to 11	6	6 Mbps
*Antenna Port Conducted Measurement	802.11b	DSSS	DBPSK	1 to 11	1,6,11	1 Mbps
	802.11g	OFDM	BPSK	1 to 11	1,2,6,10,11	6 Mbps
	802.11ax20	OFDMA	BPSK	1 to 11	1,2,6,10,11	MCS 0
	802.11ax40	OFDMA	BPSK	3 to 9	3,6,9	MCS 0

Beamforming mode:

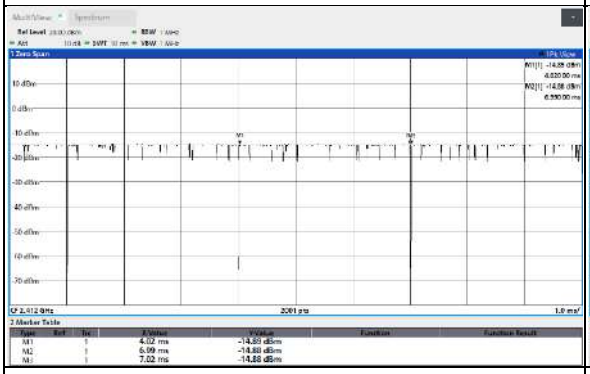
Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
*Antenna Port Conducted Measurement	802.11ax20	OFDMA	BPSK	1 to 11	1,6,11	MCS 0
	802.11ax40	OFDMA	BPSK	3 to 9	3,6,9	MCS 0

*Note: The worse spurious emissions test and maximum output power was found in Non-Beamforming mode. Therefore Beamforming mode only the test data of the RF output power were recorded in this report.

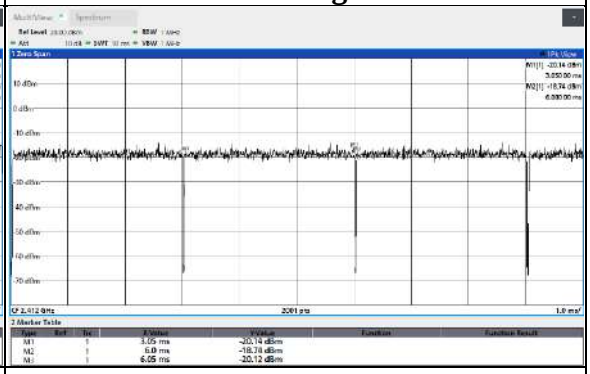
6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
802.11b	2.970	3.000	0.9900	N/A	10Hz
802.11g	2.950	3.000	0.9833	N/A	10Hz
802.11ax(HE20)	2.265	2.315	0.9784	0.09	510Hz
802.11ax(HE40)	2.320	2.395	0.9687	0.14	510Hz

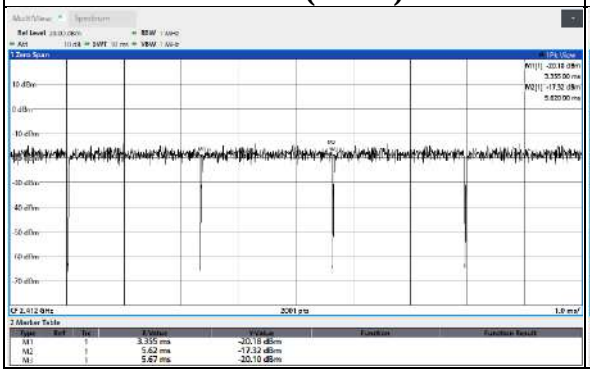
802.11b



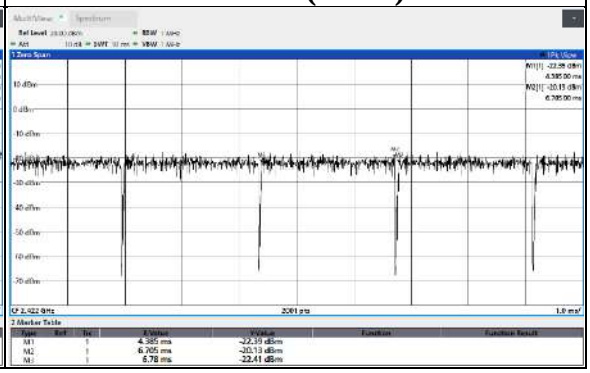
802.11g



802.11ax(HE20)



802.11ax(HE40)



7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2022/10/24	2023/10/23
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2022/12/13	2023/12/12
Loop Antenna	ETS lindgren	6502	00213440	2023/1/4	2024/1/3
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2023/2/13	2024/2/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2022/12/21	2023/12/20
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2022/12/30	2023/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2022/6/7	2023/6/6
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2023/2/17	2024/2/16
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2022/5/17	2023/5/16
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2022/12/1	2023/11/30
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2022/12/1	2023/11/30

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2022/9/12	2023/9/11
Attenuator	EMCI	EMC-40ATK2W10	17002	2022/12/9	2023/12/8
Pulse Power Sensor	Anritsu	MA2411B	1531202	2023/1/4	2024/1/3
Power Meter	Anritsu	ML2495A	1645002	2023/1/4	2024/1/3
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2022/11/10	2023/11/9
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2022/8/29	2023/8/28
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2022/8/30	2023/8/29
Cables	TITAN	CFD200	T0732ACFD200 20A300-2	2022/4/9	2023/4/8

UL Software		
Description	**Name**	**Version**
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF-Conducted-FCC 15247	ver 1.0
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2

8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	DELL	Latitude E5470	CXSKWF2	Provide by lab
B	Adapter	Moso	MSS-V3500WR120-042A0-US	N/A	Provide by Client
C	USB Flash	Transcend	JetFlash 700	N/A	Provide by lab
D	Hub	D-Link	DES-1005A	TES1005ALE1E	Provide by lab
E	Phone	SAMPO	HT-B1003L	993706277	Provide by lab
F	Phone	SAMPO	HT-B1003L	993706278	Provide by lab

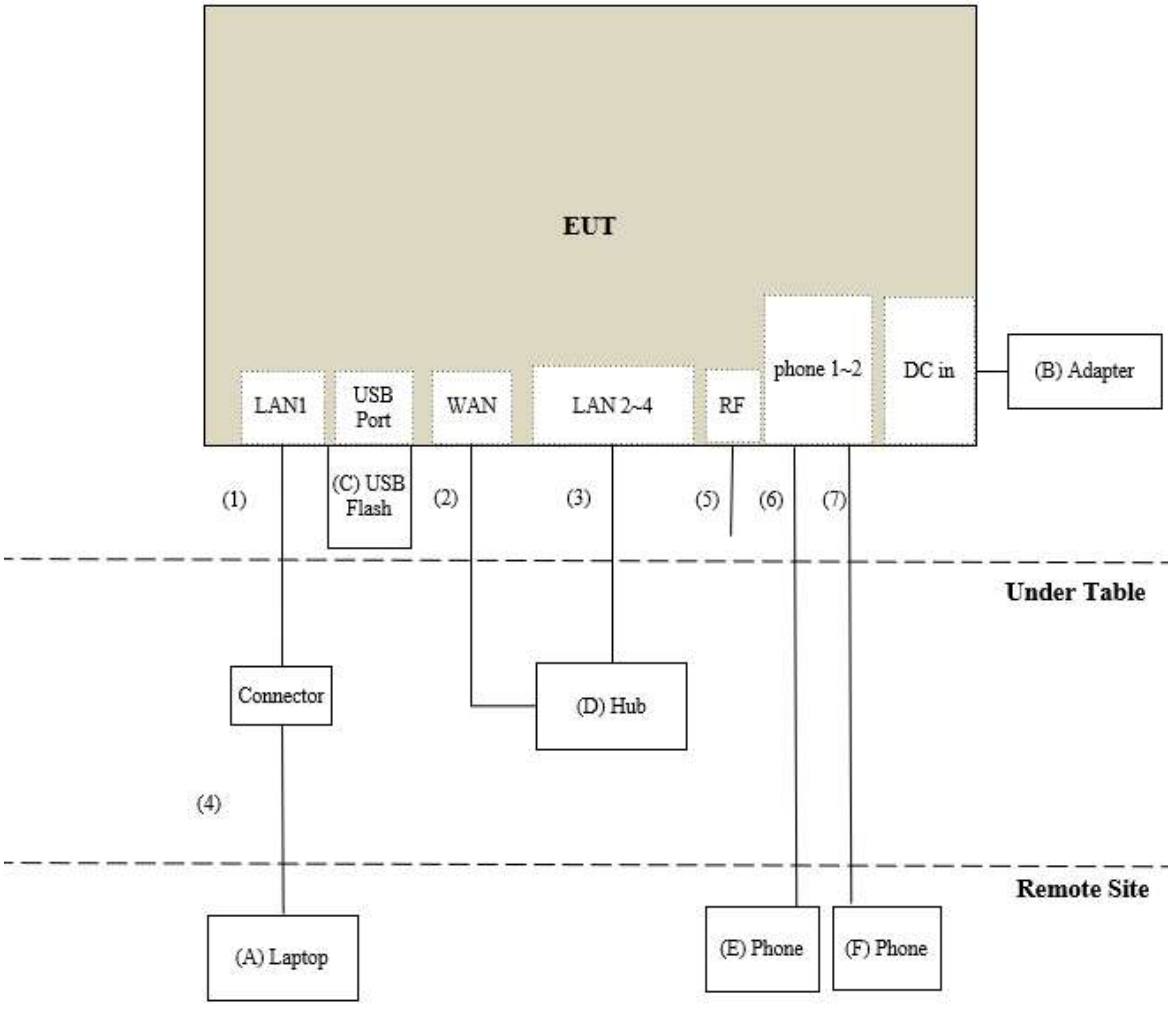
I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	Lan Cable	EEK SONG ELEC	PF01-C112	1	Provide by Client
2	RJ-45 Cable	OEM/AngNet	UTP	2	Provide by lab
3	RJ-45 Cable	OEM/AngNet	UTP	2	Number x 3 Provide by lab
4	RJ-45 Cable	Fastlink	FL-61STU-04	10	Provide by lab
5	Coaxial Cable	TBD	TBD	2.5	Provide by lab
6	RJ-11 Cable	Tupavco	PW01	10	Provide by lab
7	RJ-11 Cable	Tupavco	PW01	10	Provide by lab

Test Setup

Controlled using a bespoke application (Access Manual Tool_version 3.1.0.1) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Setup Diagram for Test



9. Test Results

9.1. 6dB Bandwidth

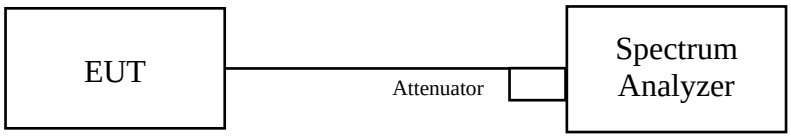
Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

a. Set resolution bandwidth (RBW) = 100kHz.
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Setup

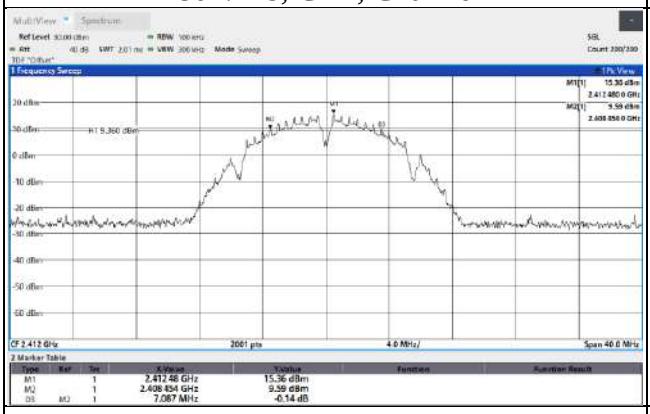


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

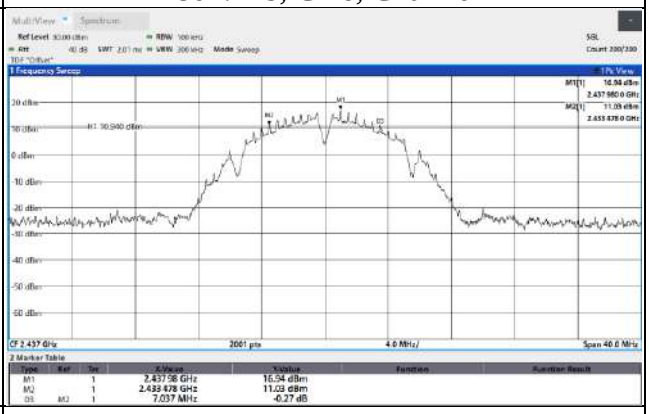
Test Data

Mode	CH	Freq (MHz)	6dB BW (MHz)	Limit (MHz)	Result
			Chain 0		
802.11b	1	2412	7.087	0.5	PASS
	6	2437	7.037	0.5	PASS
	11	2462	7.574	0.5	PASS

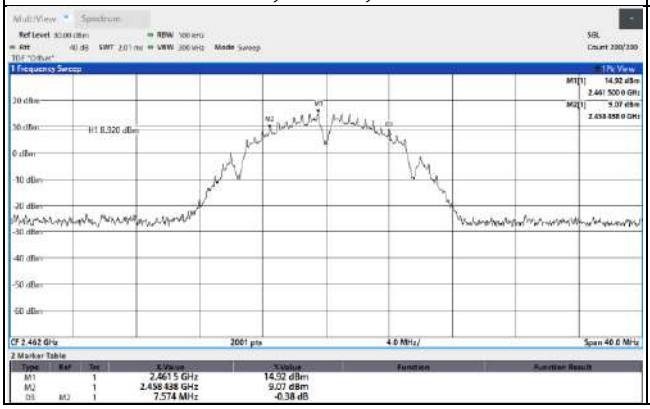
802.11b, CH1, Chain 0



802.11b, CH6, Chain 0

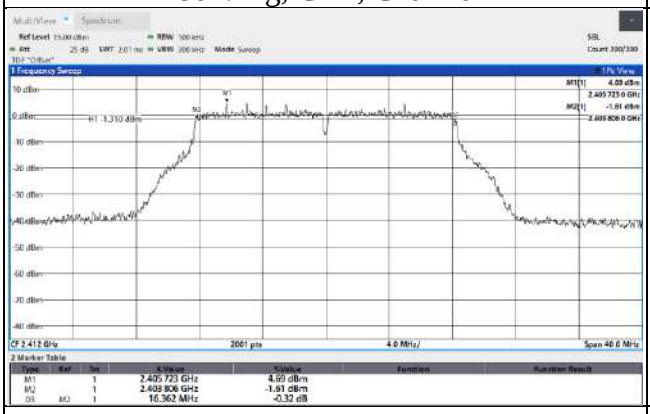


802.11b, CH11, Chain 0

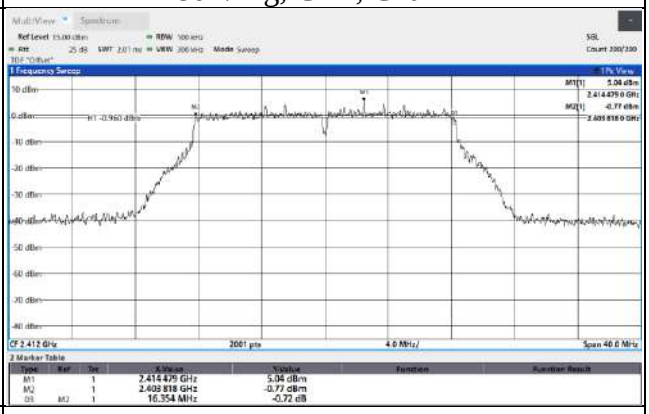


Mode	CH	Freq (MHz)	6dB BW (MHz)			Limit (MHz)	Result
			Chain 0	Chain 1	Chain 2		
802.11g	1	2412	16.362	16.354	16.383	0.5	PASS
	2	2417	16.370	16.347	16.369	0.5	PASS
	6	2437	16.358	16.358	16.358	0.5	PASS
	10	2457	16.369	16.375	16.381	0.5	PASS
	11	2462	16.373	16.363	16.364	0.5	PASS

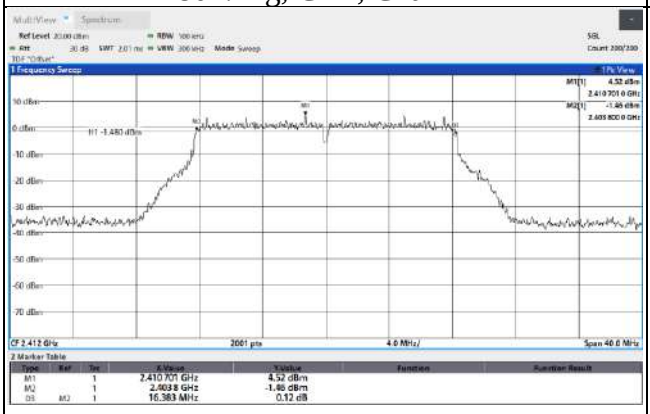
802.11g, CH1, Chain 0



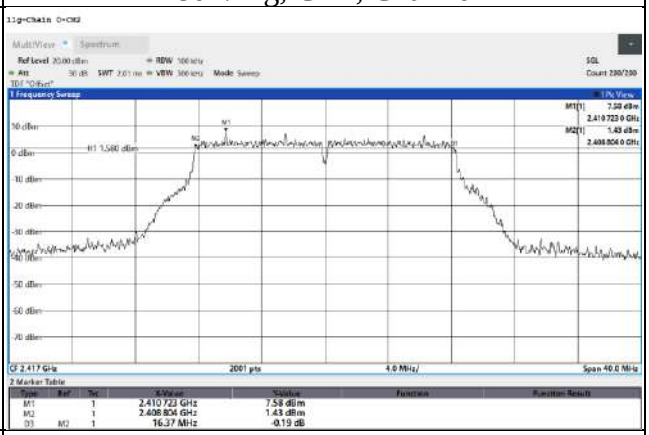
802.11g, CH1, Chain 1



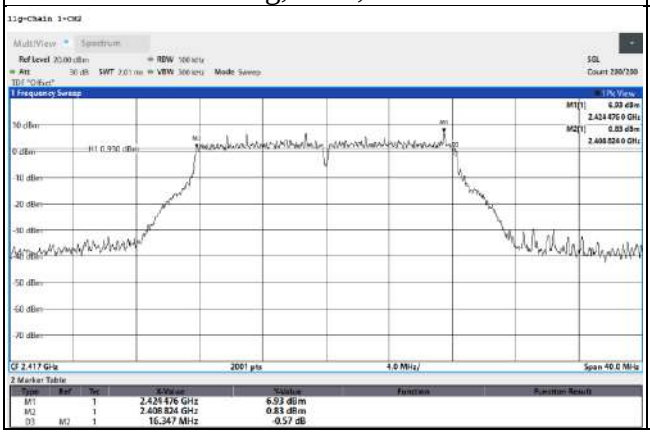
802.11g, CH1, Chain 2



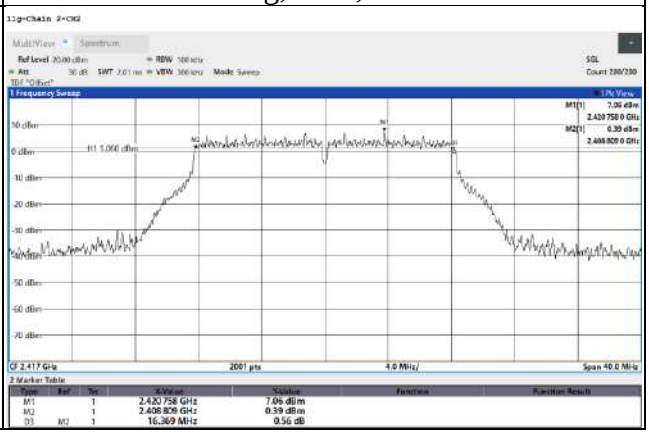
802.11g, CH2, Chain 0



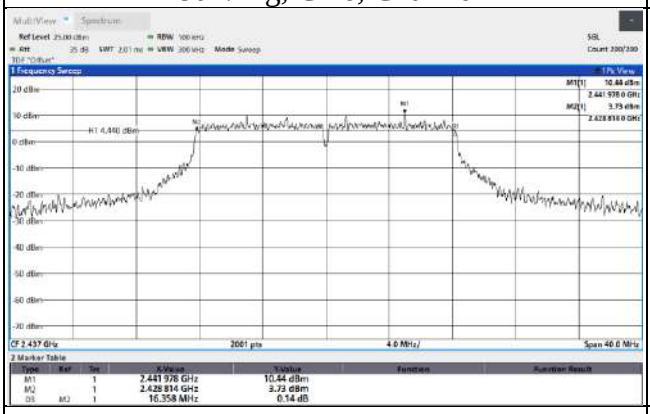
802.11g, CH2, Chain 1



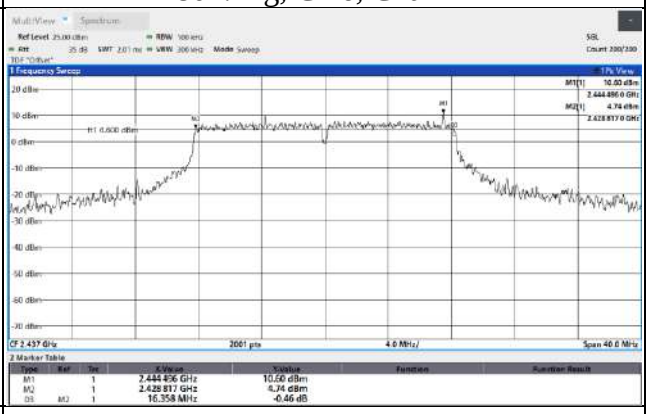
802.11g, CH2, Chain 2



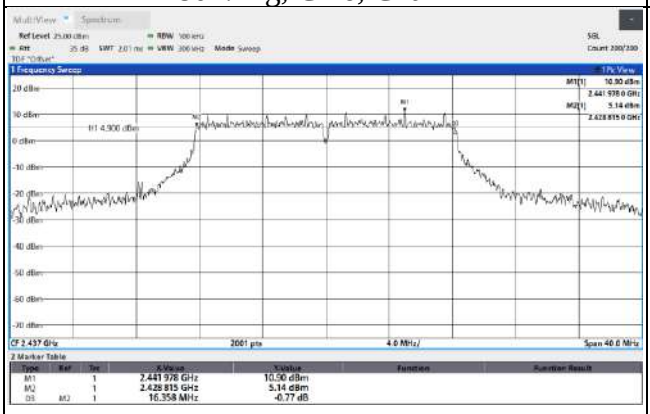
802.11g, CH6, Chain 0



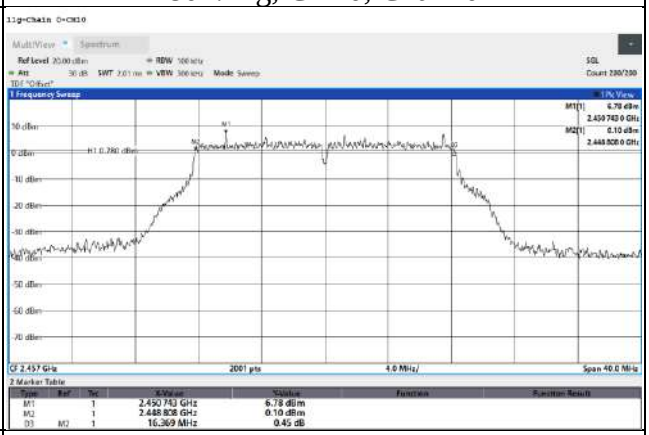
802.11g, CH6, Chain 1



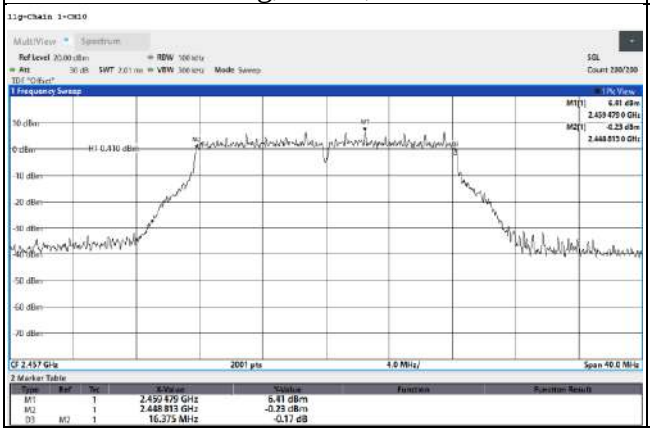
802.11g, CH6, Chain 2



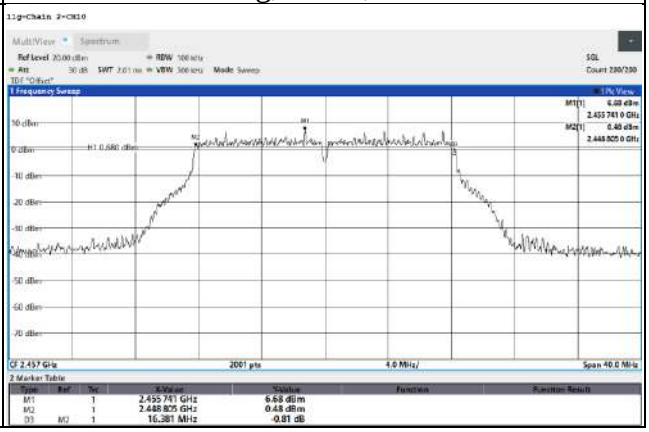
802.11g, CH10, Chain 0



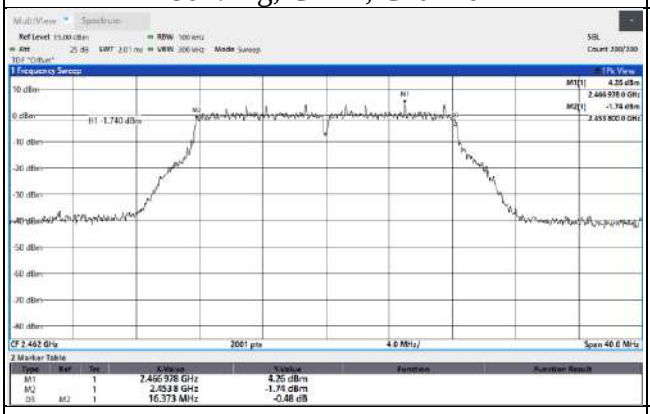
802.11g, CH10, Chain 1



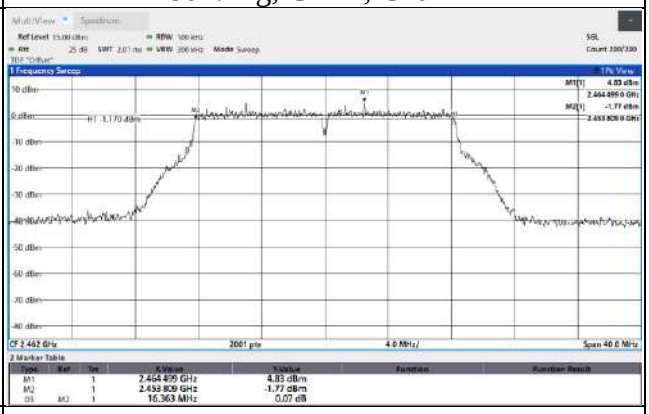
802.11g, CH10, Chain 2



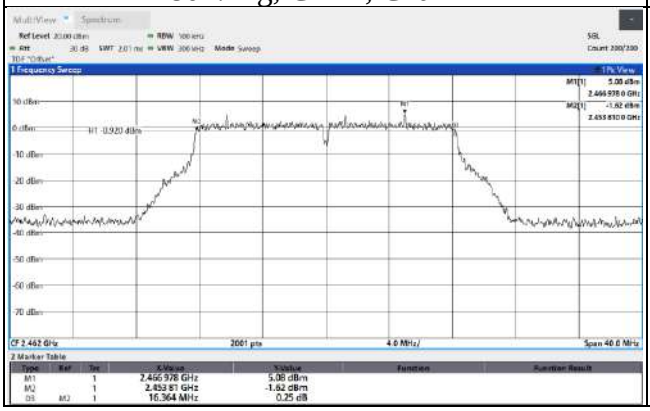
802.11g, CH11, Chain 0



802.11g, CH11, Chain 1

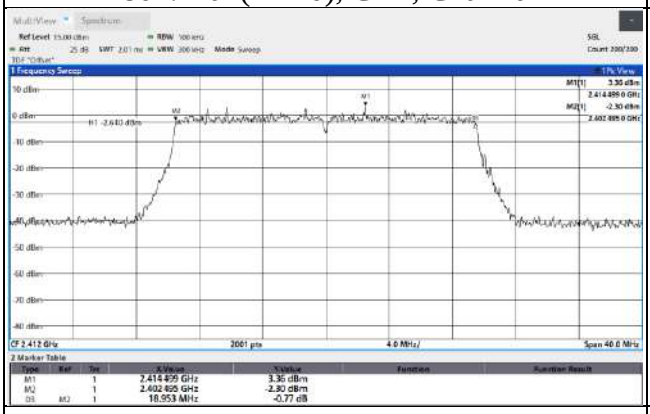


802.11g, CH11, Chain 2

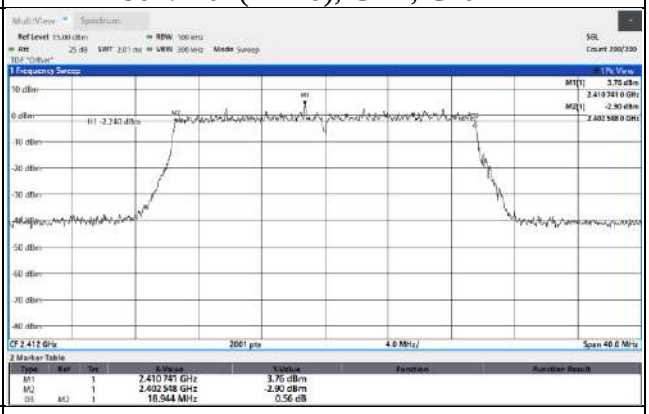


Mode	CH	Freq (MHz)	6dB BW (MHz)			Limit (MHz)	Result
			Chain 0	Chain 1	Chain 2		
802.11ax(HE20)	1	2412	18.953	18.944	18.968	0.5	PASS
	2	2417	19.006	18.955	18.927	0.5	PASS
	6	2437	18.876	18.971	18.920	0.5	PASS
	10	2457	19.018	18.949	18.986	0.5	PASS
	11	2462	18.905	19.005	18.974	0.5	PASS

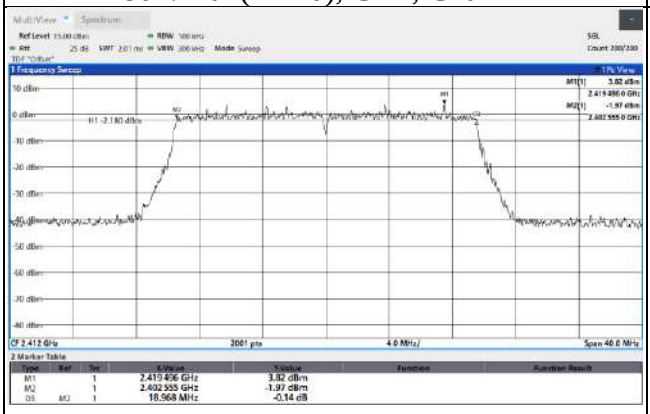
802.11ax(HE20), CH1, Chain 0



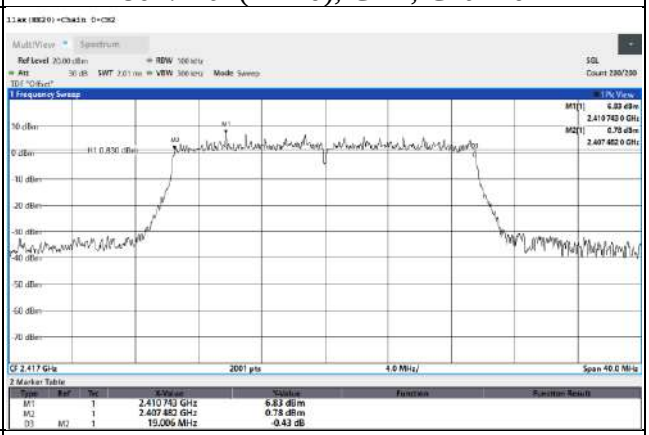
802.11ax(HE20), CH1, Chain 1



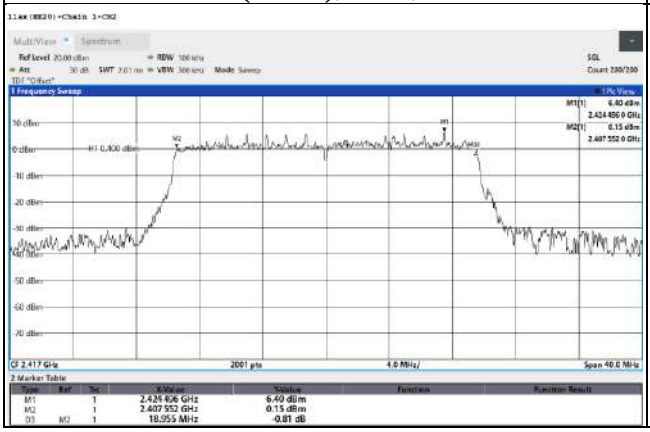
802.11ax(HE20), CH1, Chain 2



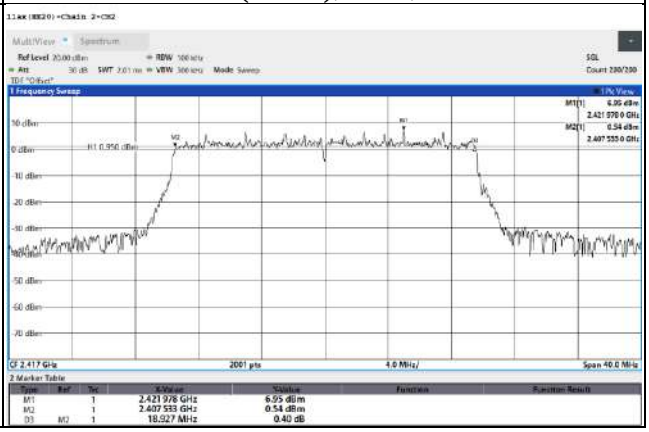
802.11ax(HE20), CH2, Chain 0

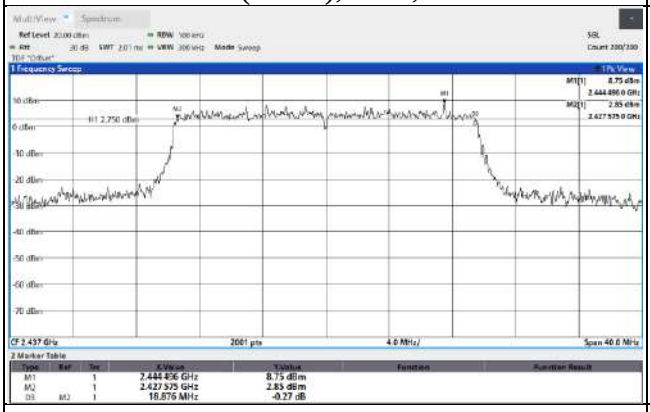
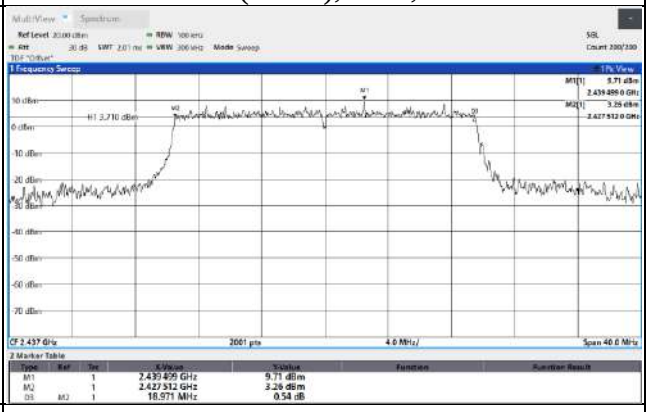
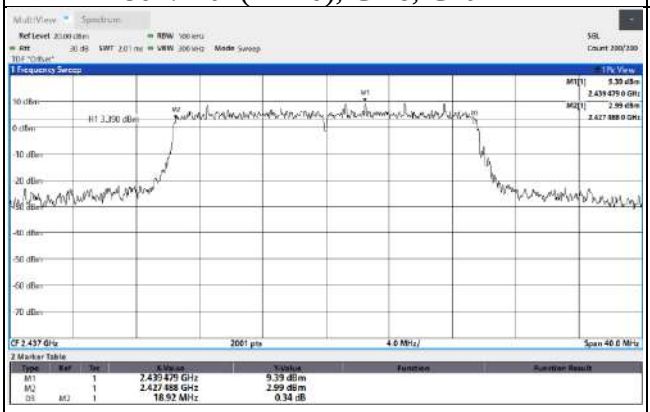
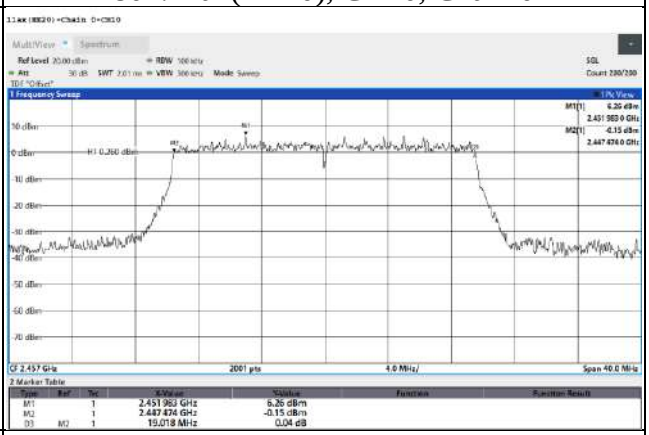
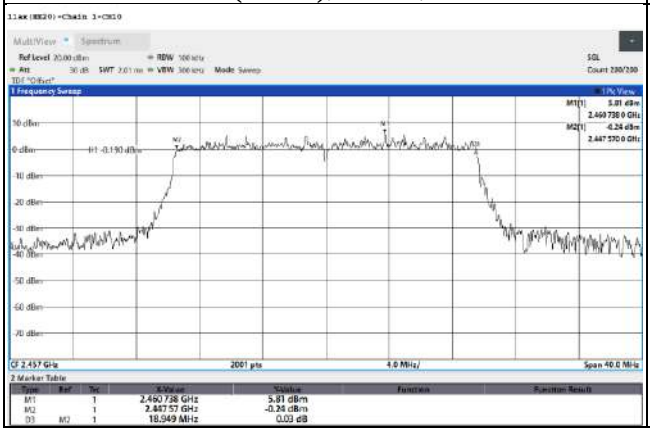
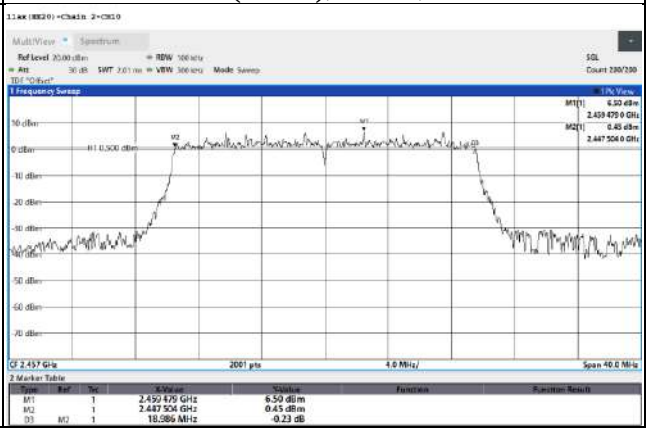


802.11ax(HE20), CH2, Chain 1

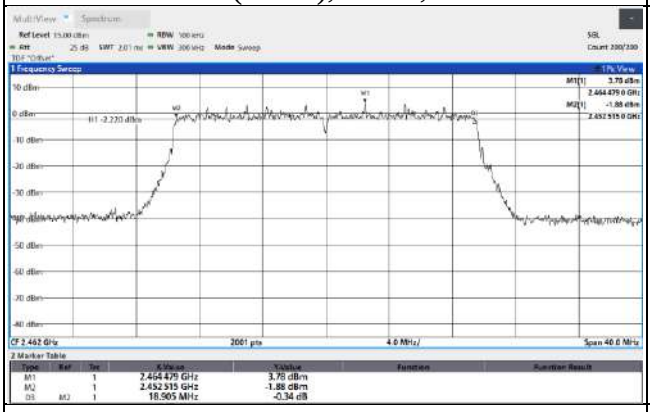


802.11ax(HE20), CH2, Chain 2

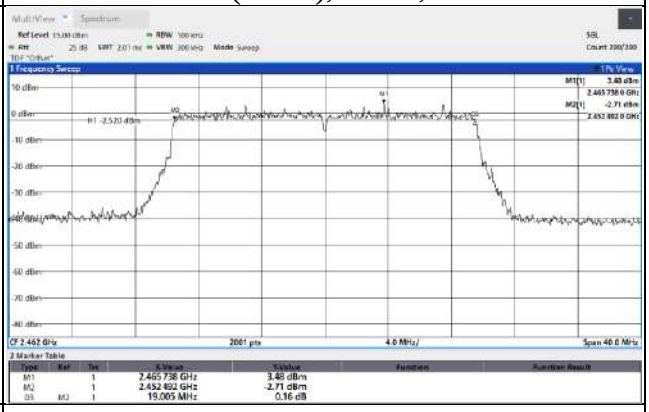


802.11ax(HE20), CH6, Chain 0	802.11ax(HE20), CH6, Chain 1
	
802.11ax(HE20), CH6, Chain 2	**802.11ax(HE20), CH10, Chain 0**
	
802.11ax(HE20), CH10, Chain 1	**802.11ax(HE20), CH10, Chain 2**
	

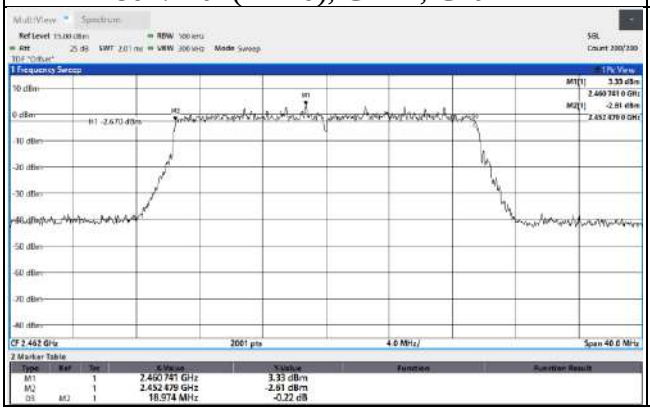
802.11ax(HE20), CH11, Chain 0



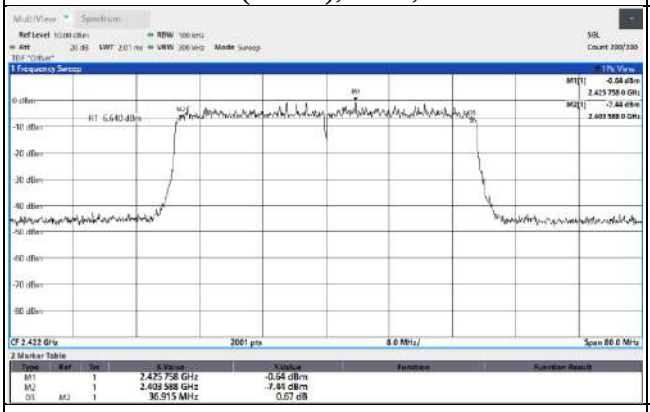
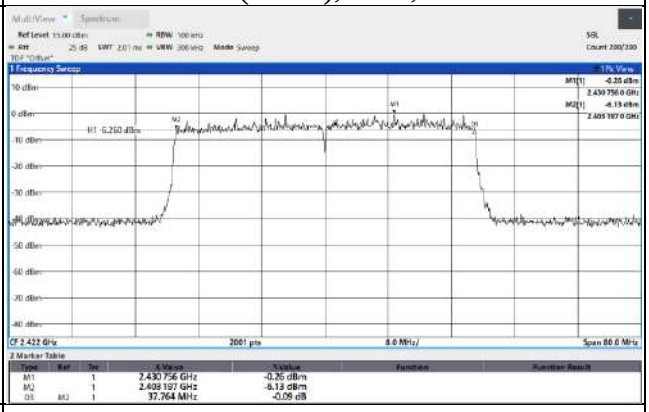
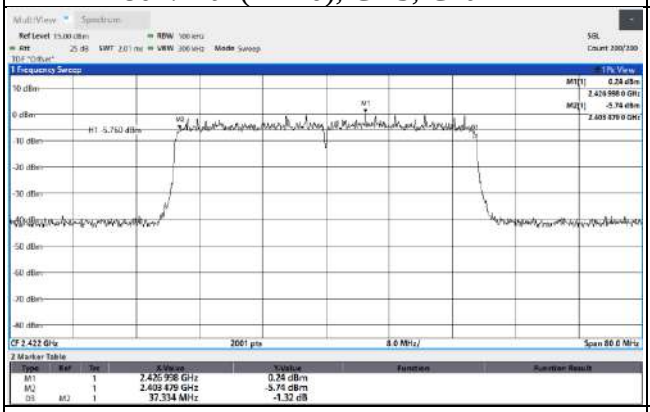
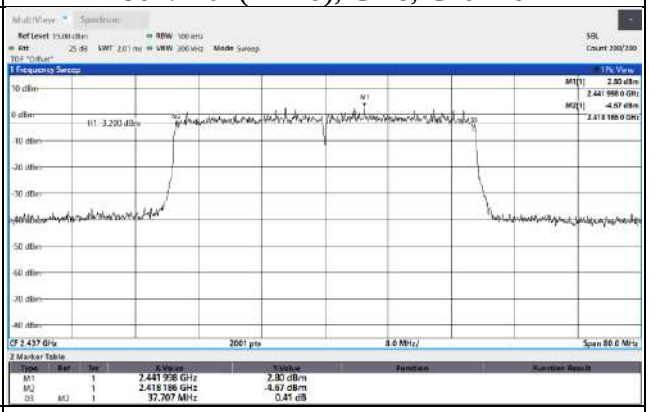
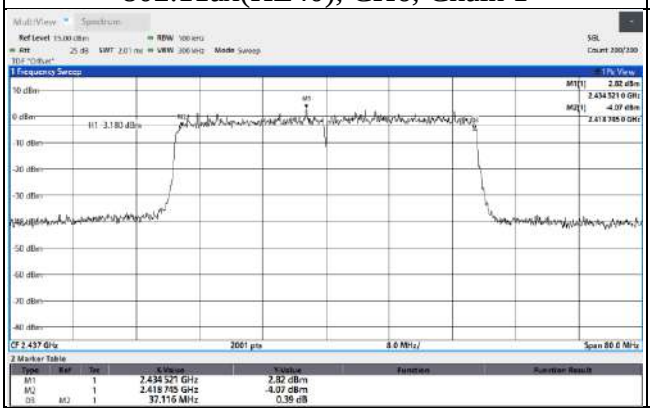
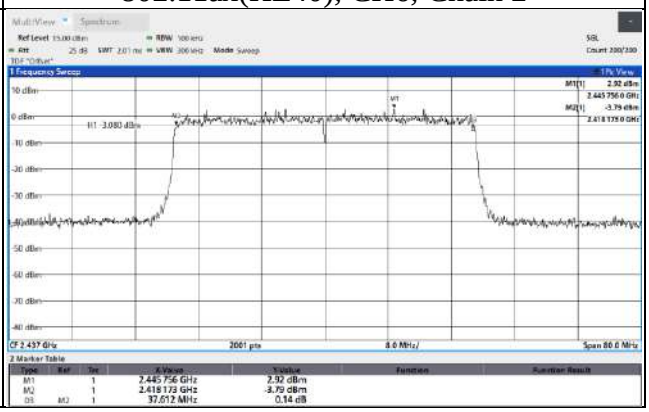
802.11ax(HE20), CH11, Chain 1



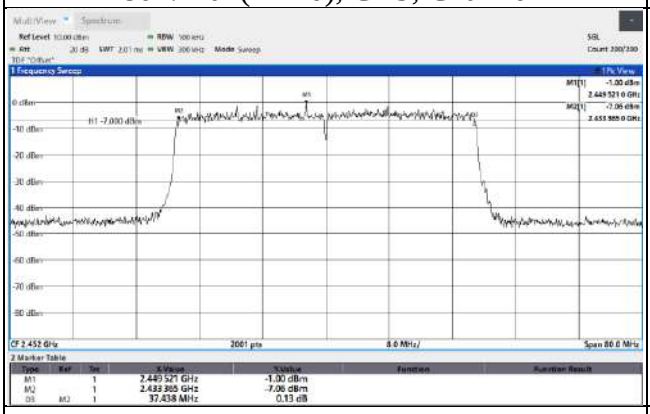
802.11ax(HE20), CH11, Chain 2



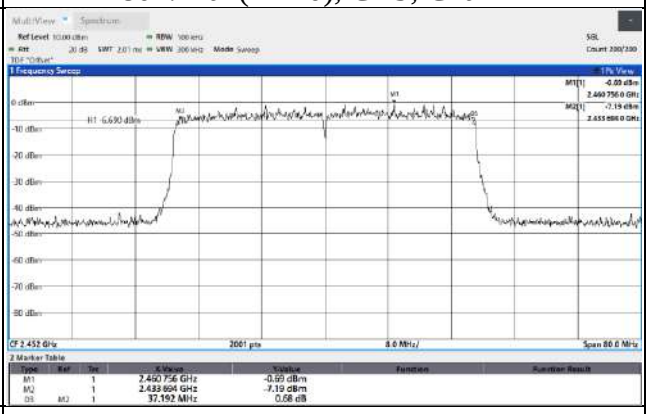
Mode	CH	Freq (MHz)	6dB BW (MHz)			Limit (MHz)	Result
			Chain 0	Chain 1	Chain 2		
802.11ax(HE40)	3	2422	36.915	37.764	37.334	0.5	PASS
	6	2437	37.707	37.116	37.612	0.5	PASS
	9	2452	37.438	37.192	37.178	0.5	PASS

802.11ax(HE40), CH3, Chain 0	802.11ax(HE40), CH3, Chain 1
	
802.11ax(HE40), CH3, Chain 2	**802.11ax(HE40), CH6, Chain 0**
	
802.11ax(HE40), CH6, Chain 1	**802.11ax(HE40), CH6, Chain 2**
	

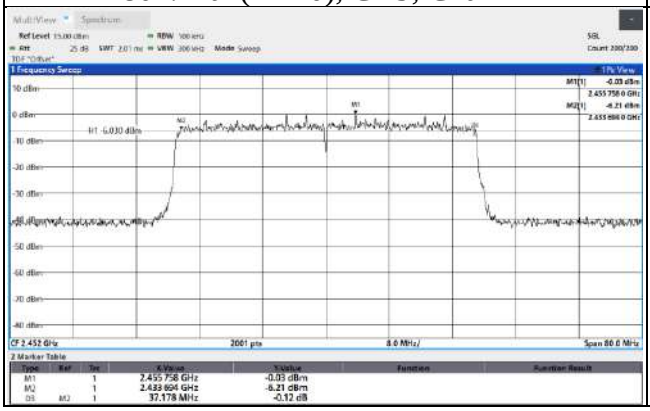
802.11ax(HE40), CH9, Chain 0



802.11ax(HE40), CH9, Chain 1



802.11ax(HE40), CH9, Chain 2



9.2. Conducted Output Power

Requirements

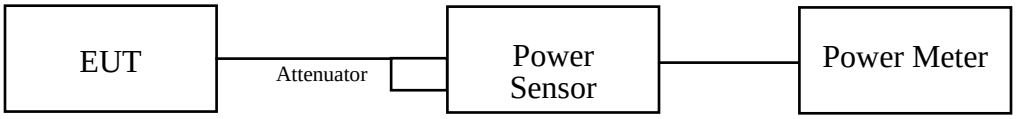
For systems using digital modulation in the 2400-2483.5 MHz bands: 1 Watt.

Note:
1. P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi, B is the 26 dB emission bandwidth in megahertz
2. Directional Gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{Gn/20})^2$ / Nant] dBi.
   Nant: Number of Transmit Antennas
   G1, G2,..., Gn: Gain of Individual Antennas
   Example: three antennas and gain 3.5 dBi / 3.5 dBi / 3.6 dBi, so if it was used for TxBF power measurement
   Directional Gain = 10 log[$(10^{3.5/20} + 10^{3.5/20} + 10^{3.6/20})^2$ / 3] dBi = 8.3 dBi
3. Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices, CDD
   Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
   Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.
   Example: Maximum antenna gain = 3.6 dBi and $N_{ANT} \leq 4$, so if it was used for CDD power measurement
   Directional Gain = 3.6 dBi + Array Gain = 3.6 dBi + 0 dB = 3.6 dBi
4. For power measurement of KDB 662911 is used with multiple transmitter output. Total conducted power is the sum of the conducted power levels measured at the various output ports.

Test Procedure

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

Test Setup



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

Average Power

Non-Beamforming mode

802.11b
FOR 1TX USE

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Power Limit (dBm)
1	2412	263.027	24.20	30
6	2437	325.087	25.12	30
11	2462	264.85	24.23	30

802.11g
FOR 3TX USE

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
		Chain 0	Chain 1	Chain 2			
1	2412	17.12	17.21	17.03	154.525	21.89	30
2	2417	18.89	18.76	18.78	228.034	23.58	30
6	2437	21.23	21.25	21.22	398.107	26.00	30
10	2457	18.31	18.12	18.45	202.768	23.07	30
11	2462	16.67	16.69	16.66	139.316	21.44	30

802.11ax (HE20)
FOR 3TX USE

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
		Chain 0	Chain 1	Chain 2			
1	2412	16.45	16.32	16.27	129.42	21.12	30
2	2417	17.84	17.75	17.68	179.061	22.53	30
6	2437	20.66	20.53	20.74	348.337	25.42	30
10	2457	17.66	17.55	17.75	174.985	22.43	30
11	2462	16.52	16.41	16.35	131.826	21.20	30

802.11ax (HE40)
FOR 3TX USE

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
		Chain 0	Chain 1	Chain 2			
3	2422	15.32	15.25	15.34	101.625	20.07	30
6	2437	18.21	18.24	18.15	198.153	22.97	30
9	2452	15.35	15.38	15.44	103.753	20.16	30

Beamforming mode

802.11ax (HE20)
FOR 3TX USE

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
		Chain 0	Chain 1	Chain 2			
1	2412	16.25	16.28	16.01	124.451	20.95	27.7
2	2417	17.65	17.73	17.62	175.388	22.44	27.7
6	2437	20.62	20.51	20.73	345.939	25.39	27.7
10	2457	17.60	17.65	17.66	174.181	22.41	27.7
11	2462	16.29	16.25	16.28	127.057	21.04	27.7

802.11ax (HE40)
FOR 3TX USE

Channel	Frequency (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)
		Chain 0	Chain 1	Chain 2			
3	2422	15.08	15.11	15.14	97.275	19.88	27.7
6	2437	17.97	17.95	17.99	187.932	22.74	27.7
9	2452	15.10	15.37	15.16	99.541	19.98	27.7

9.3. Power Spectral Density

Requirements

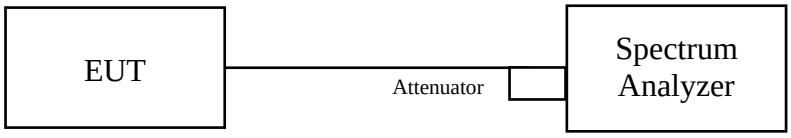
The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz (If G_{TX} > 6 dBi, then PSD = 8 – (G_{TX} – 6)).

Note:
1. PSD = power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz
2. G_{TX} = the maximum transmitting antenna directional gain in dBi.
3. Directional Gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ +...+$10^{Gn/20}$)^2 / Nant] dBi.
   N*a*nt: Number of Transmit Antennas
   G1, G2,..., Gn: Gain of Individual Antennas
   Example: three antenna and gain 3.5 dBi / 3.5 dBi / 3.6 dBi, so if it was used for power density measurement, Directional Gain = 10 log[($10^{3.5/20}$ + $10^{3.5/20}$+ $10^{3.6/20}$)^2 / 3] dBi = 8.3 dBi
4. "PSD per chain" of the report shown is maximum value for each chain, at the "Total PSD" is summing entire spectra across corresponding frequency bins on the various outputs by computer, refer KDB 662911 Method a) for calculating total power density.
5. Method a) of power density measurement of KDB 662911 is used for calculating total power density with multiple transmitter output. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

Test procedure

For AVG. power (duty cycle ≥ 98%)
a. Set instrument center frequency to DTS channel center frequency.
b. Set span to at least 1.5 times the OBW.
c. Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set VBW ≥3 x RBW.
e. Detector = power averaging (RMS) or sample detector (when RMS not available).
f. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g. Sweep time = auto couple.
h. Employ trace averaging (RMS) mode over a minimum of 100 traces.
i. Use the peak marker function to determine the maximum amplitude level.

Test Setup



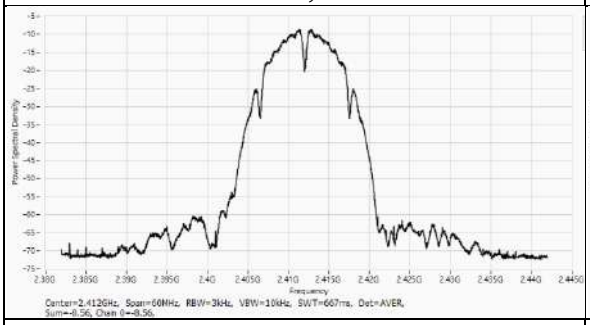
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

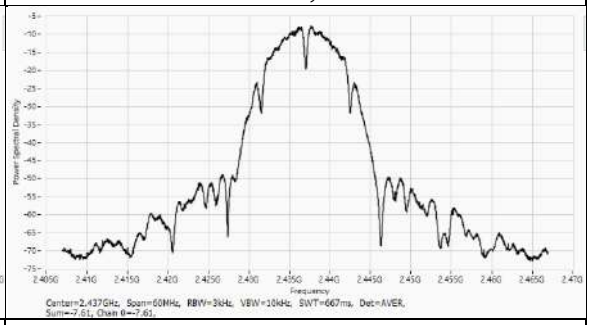
Mode	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11b	1	2412	8.3	-8.56	5.7	PASS
	6	2437	8.3	-7.61	5.7	PASS
	11	2462	8.3	-8.81	5.7	PASS

Mode	CH	Freq (MHz)	PSD per Chain (dBm/3kHz)
			Chain 0
802.11b	1	2412	-8.558
	6	2437	-7.611
	11	2462	-8.809

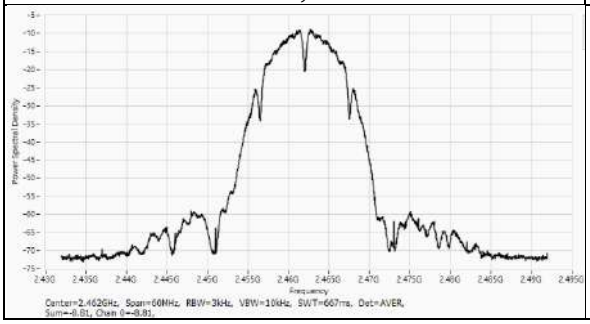
802.11b, CH1



802.11b, CH6

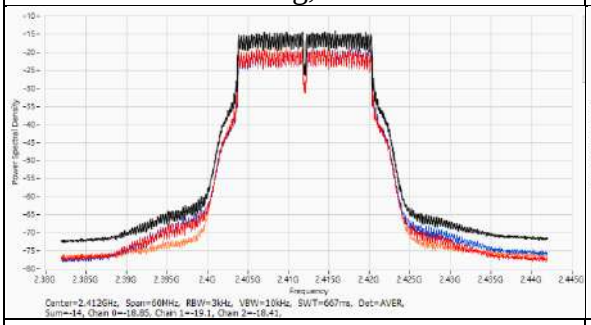
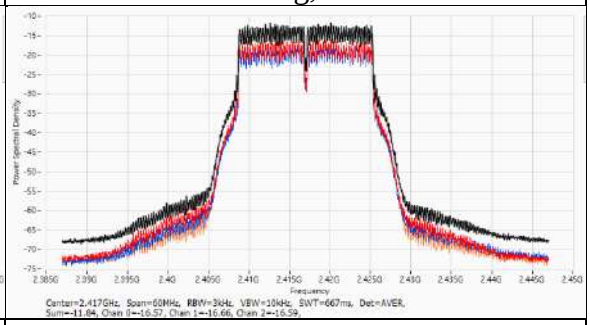
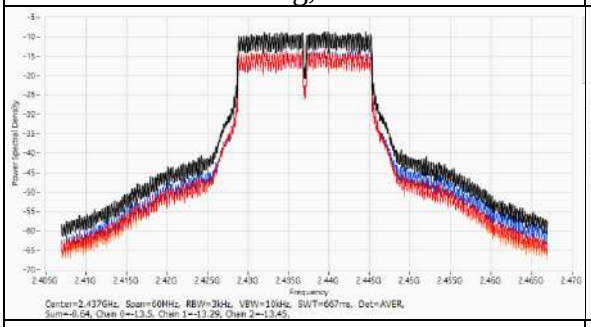
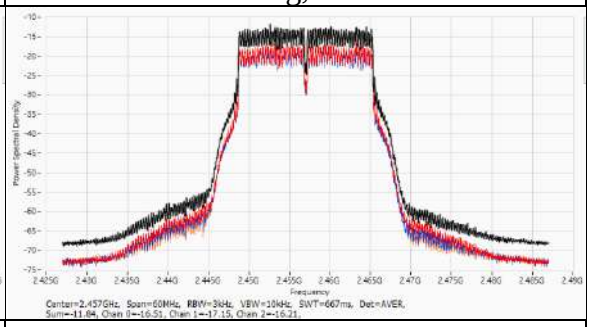
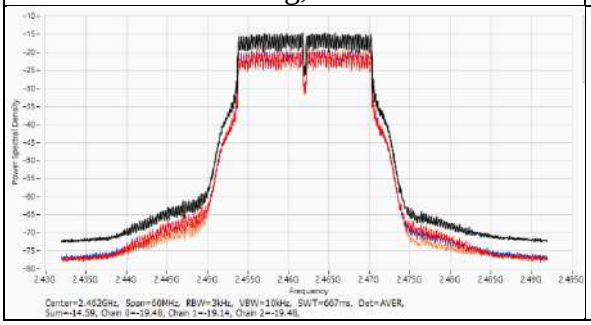


802.11b, CH11



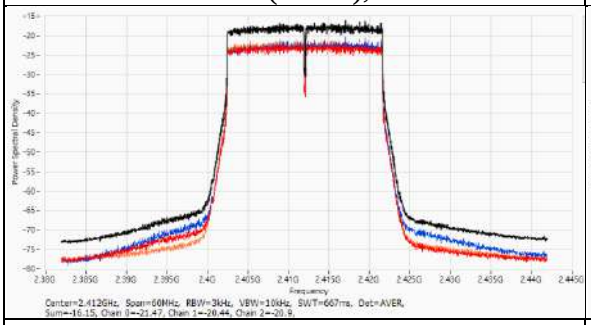
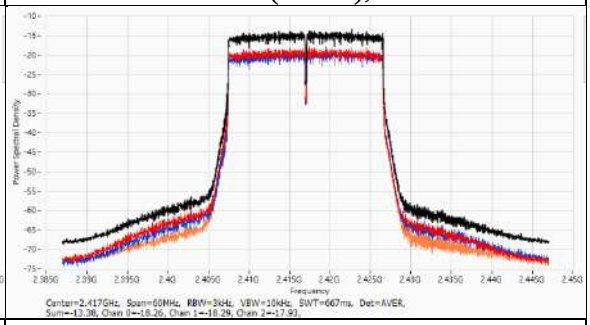
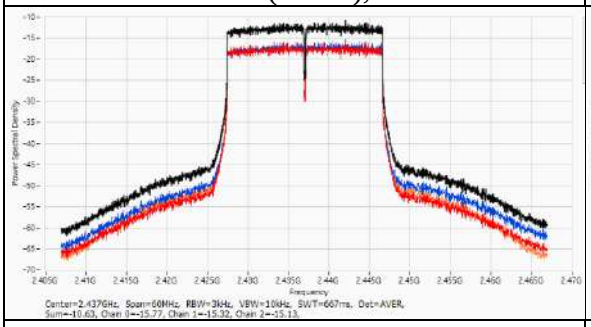
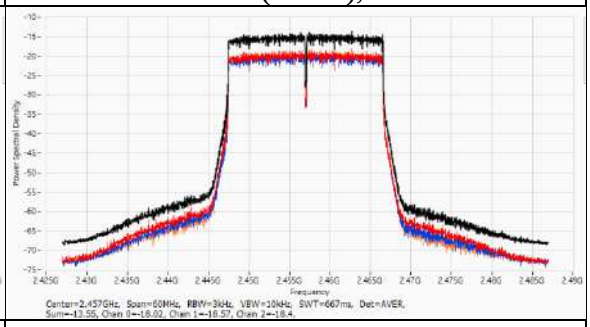
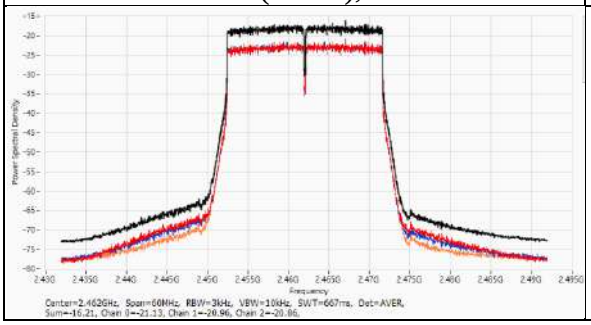
Mode	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11g	1	2412	8.3	-14	5.7	PASS
	2	2417	8.3	-11.84	5.7	PASS
	6	2437	8.3	-8.64	5.7	PASS
	10	2457	8.3	-11.84	5.7	PASS
	11	2462	8.3	-14.59	5.7	PASS

Mode	CH	Freq (MHz)	PSD per Chain (dBm/3kHz)		
			Chain 0	Chain 1	Chain 2
802.11g	1	2412	-18.849	-19.099	-18.408
	2	2417	-16.12	-16.662	-16.364
	6	2437	-13.505	-13.29	-13.418
	10	2457	-16.48	-17.153	-16.211
	11	2462	-19.475	-19.135	-18.474

802.11g, CH1	802.11g, CH2
	
802.11g, CH6	**802.11g, CH10**
	
802.11g, CH11	
	

Mode	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11ax(HE20)	1	2412	8.3	-16.15	5.7	PASS
	2	2417	8.3	-13.38	5.7	PASS
	6	2437	8.3	-10.63	5.7	PASS
	10	2457	8.3	-13.55	5.7	PASS
	11	2462	8.3	-16.21	5.7	PASS

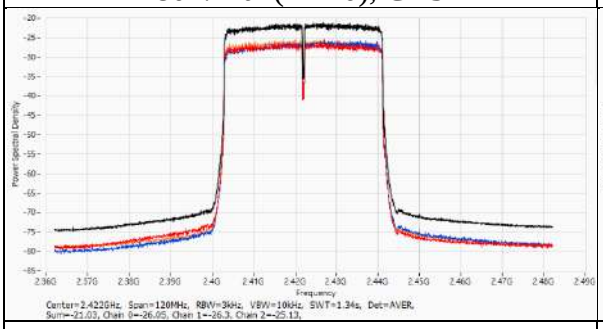
Mode	CH	Freq (MHz)	PSD per Chain (dBm/3kHz)		
			Chain 0	Chain 1	Chain 2
802.11ax(HE20)	1	2412	-21.21	-20.441	-20.847
	2	2417	-17.866	-18.294	-17.927
	6	2437	-15.766	-15.324	-15.132
	10	2457	-18.022	-18.566	-18.164
	11	2462	-21.129	-20.96	-20.858

802.11ax(HE20), CH1	802.11ax(HE20), CH2
	
802.11ax(HE20), CH6	**802.11ax(HE20), CH10**
	
802.11ax(HE20), CH11	
	

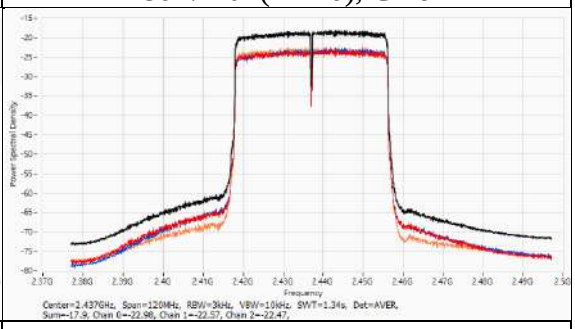
Mode	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11ax(HE40)	3	2422	8.3	-21.03	5.7	PASS
	6	2437	8.3	-17.9	5.7	PASS
	9	2452	8.3	-21.12	5.7	PASS

Mode	CH	Freq (MHz)	PSD per Chain (dBm/3kHz)		
			Chain 0	Chain 1	Chain 2
802.11ax(HE40)	3	2422	-26.052	-25.651	-25.126
	6	2437	-22.981	-22.573	-22.156
	9	2452	-25.981	-25.594	-25.963

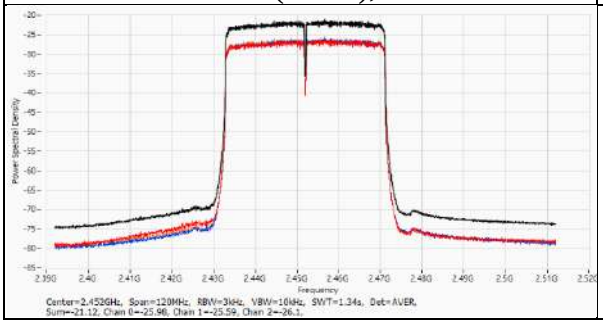
802.11ax(HE40), CH3



802.11ax(HE40), CH6



802.11ax(HE40), CH9



9.4. Conducted Out of Band Emission

Requirements

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b) (3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209 (a) is not required.

Test procedure

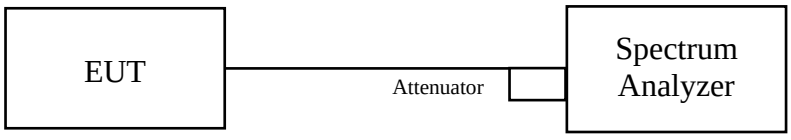
Measurement Procedure REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Measurement Procedure OOBE

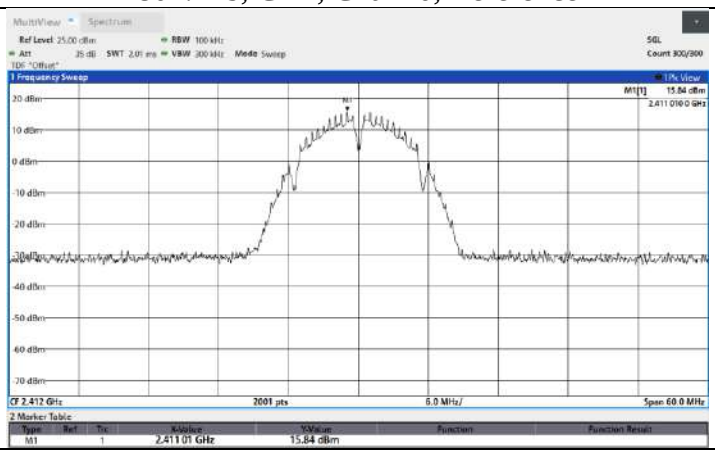
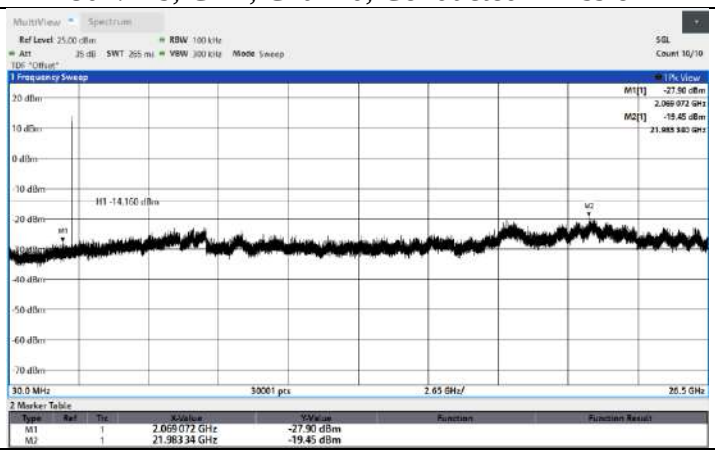
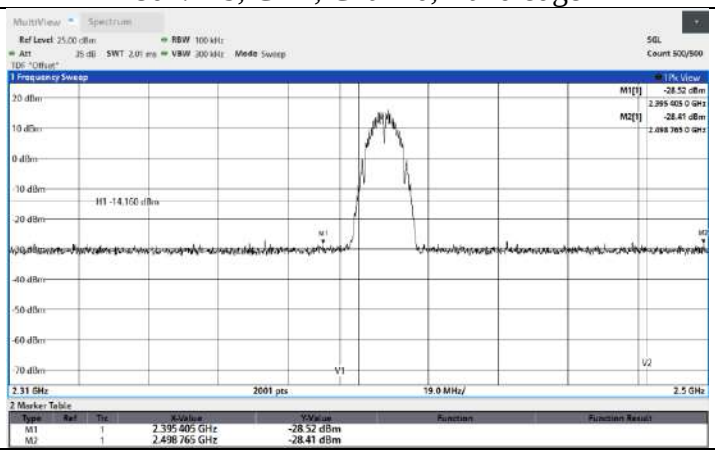
1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

Test Setup

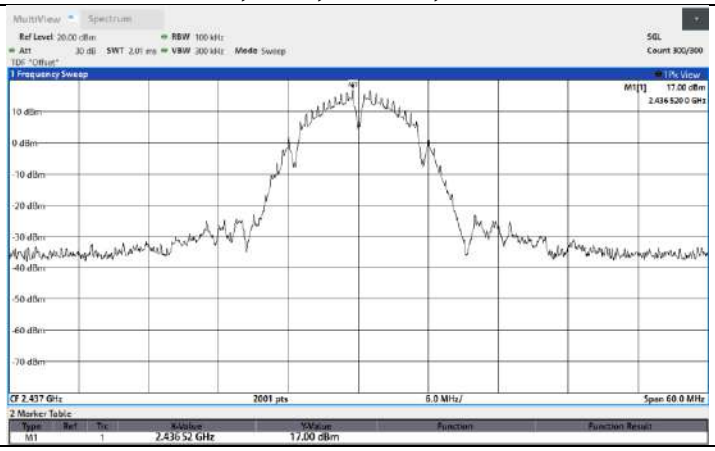


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

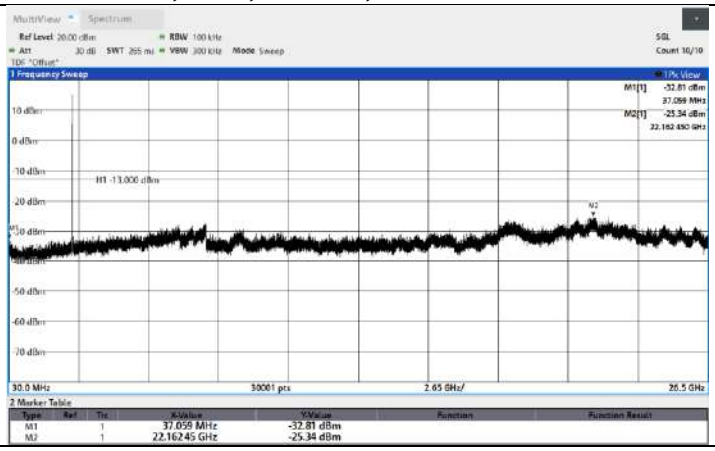
Test Data

802.11b, CH1, Chain 0, Reference

802.11b, CH1, Chain 0, Conducted Emission

802.11b, CH1, Chain 0, Band edge


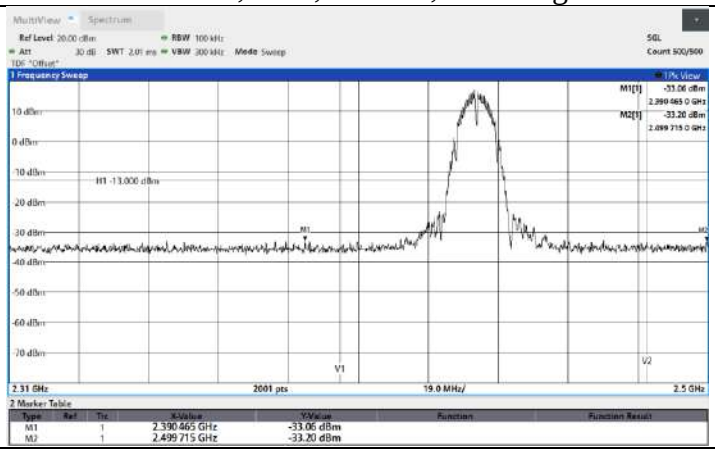
802.11b, CH6, Chain 0, Reference



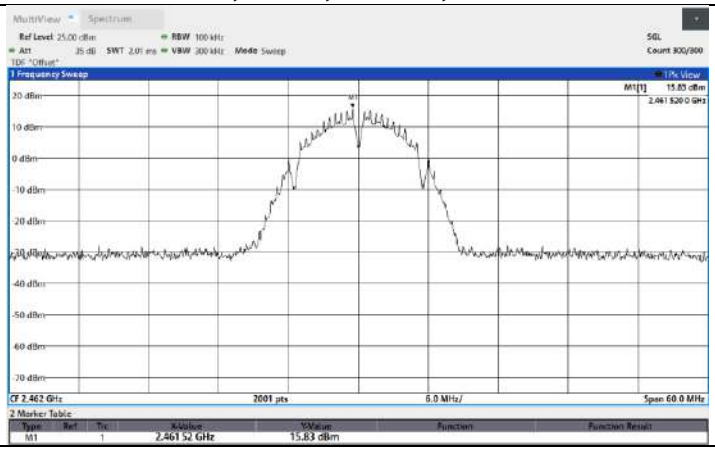
802.11b, CH6, Chain 0, Conducted Emission



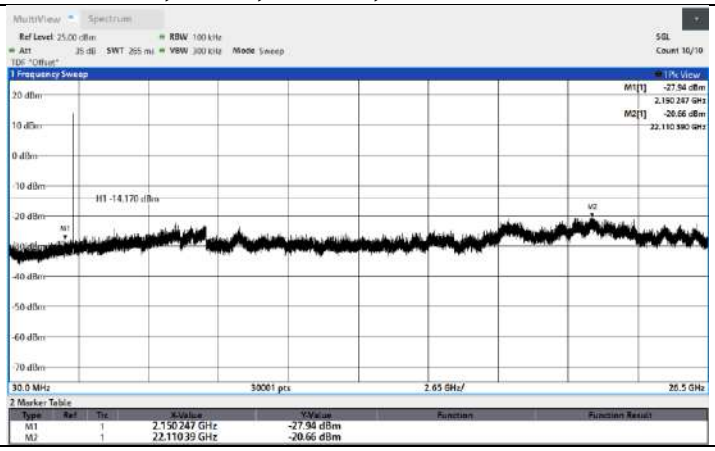
802.11b, CH6, Chain 0, Band edge



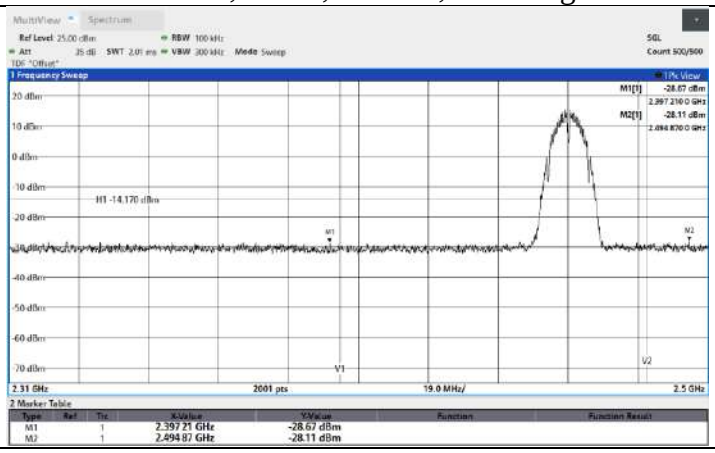
802.11b, CH11, Chain 0, Reference



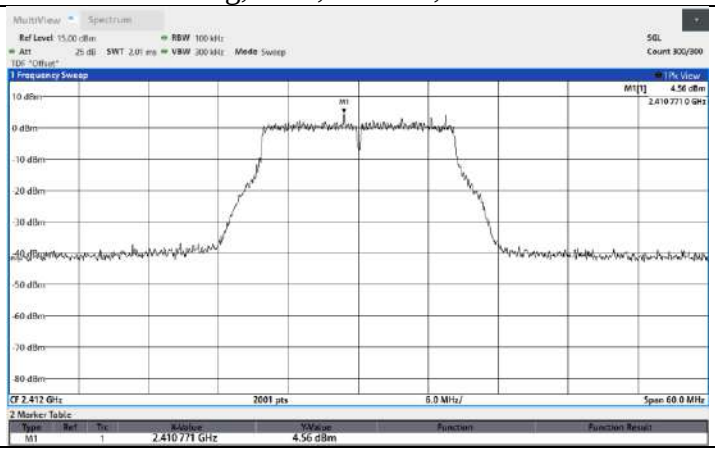
802.11b, CH11, Chain 0, Conducted Emission



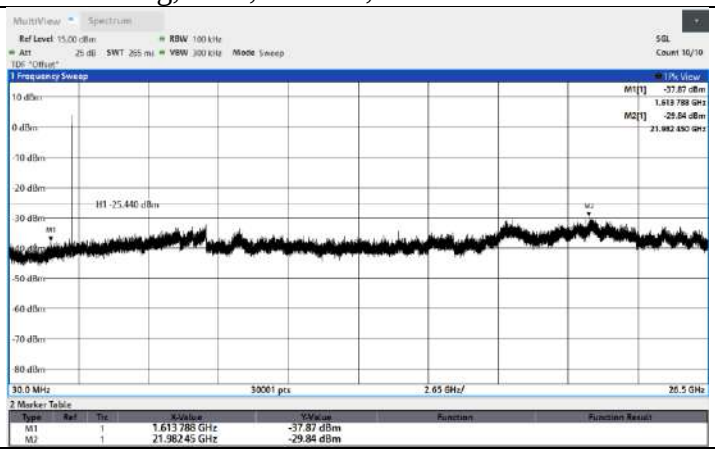
802.11b, CH11, Chain 0, Band edge



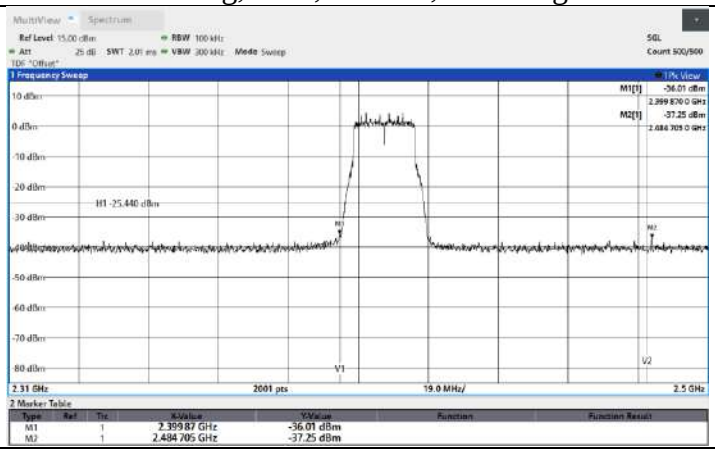
802.11g, CH1, Chain 0, Reference



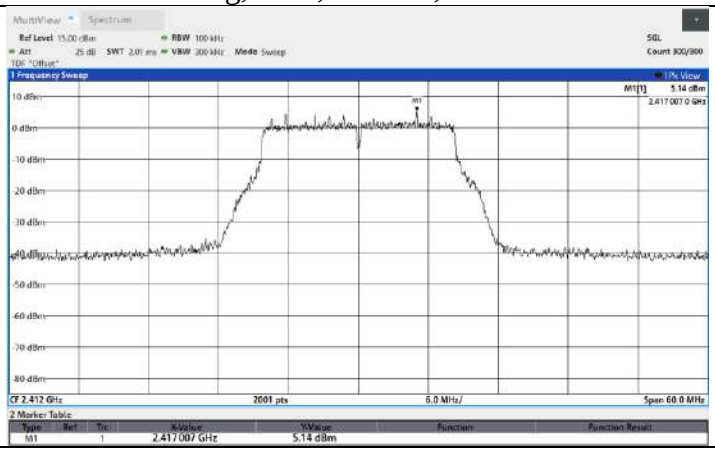
802.11g, CH1, Chain 0, Conducted Emission



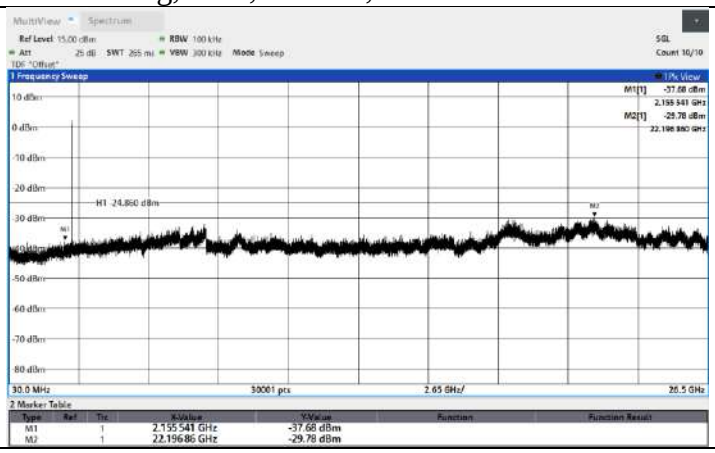
802.11g, CH1, Chain 0, Band edge



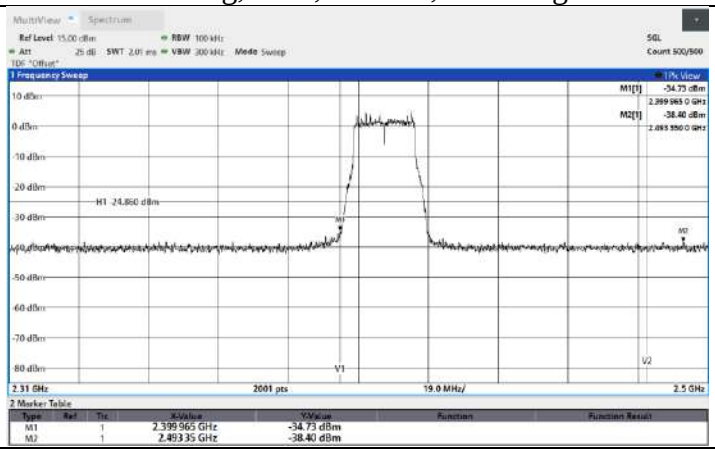
802.11g, CH1, Chain 1, Reference



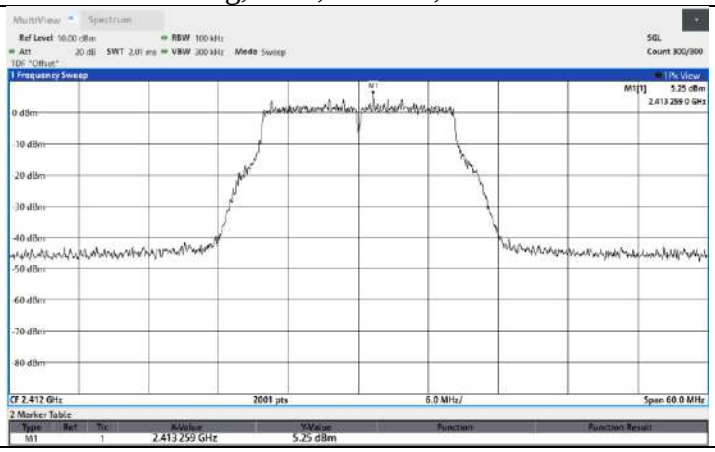
802.11g, CH1, Chain 1, Conducted Emission



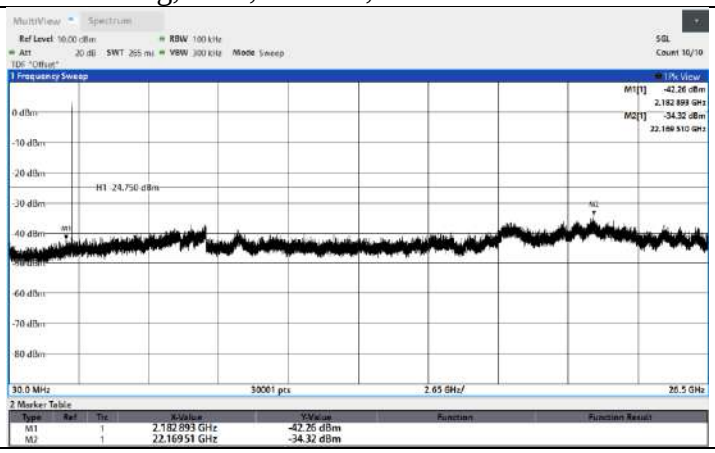
802.11g, CH1, Chain 1, Band edge



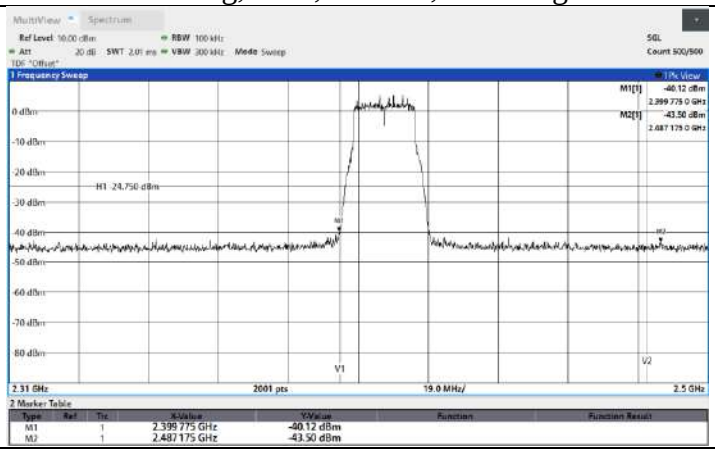
802.11g, CH1, Chain 2, Reference



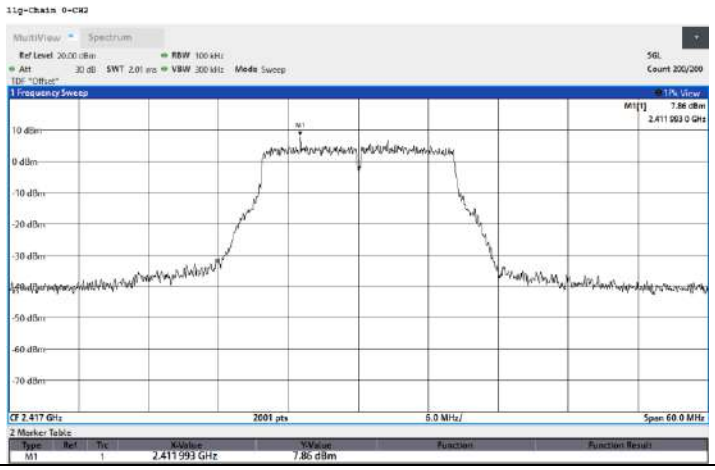
802.11g, CH1, Chain 2, Conducted Emission



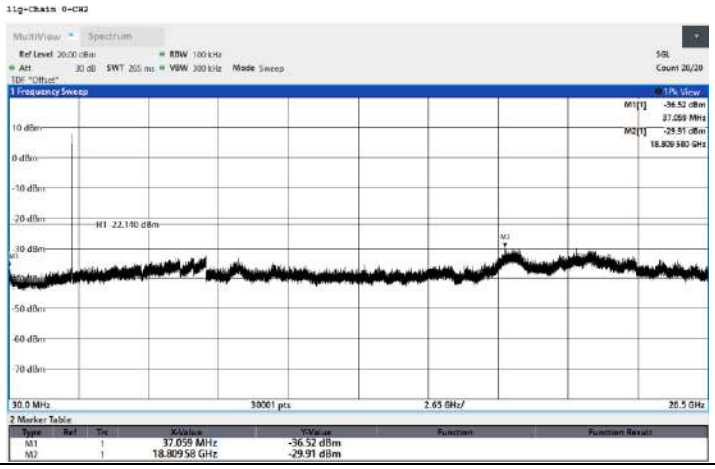
802.11g, CH1, Chain 2, Band edge



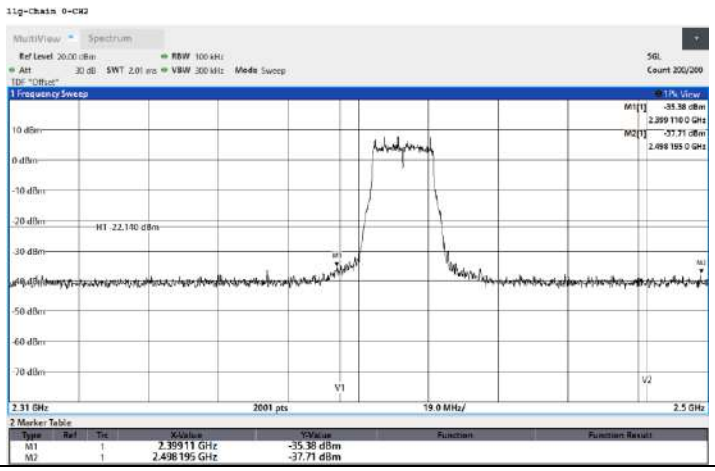
802.11g, CH2, Chain 0, Reference



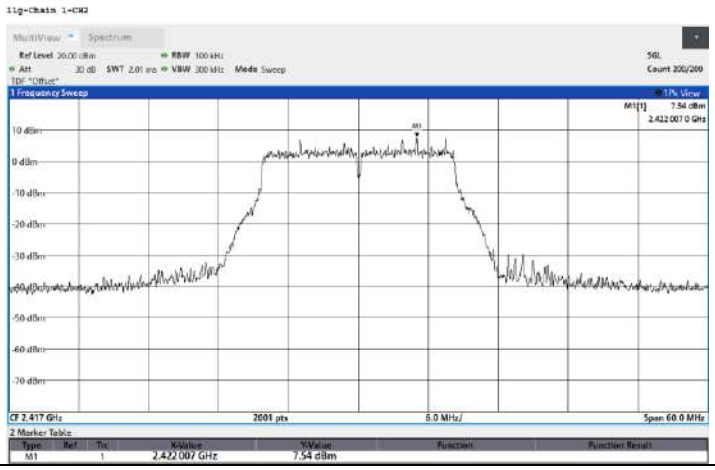
802.11g, CH2, Chain 0, Conducted Emission



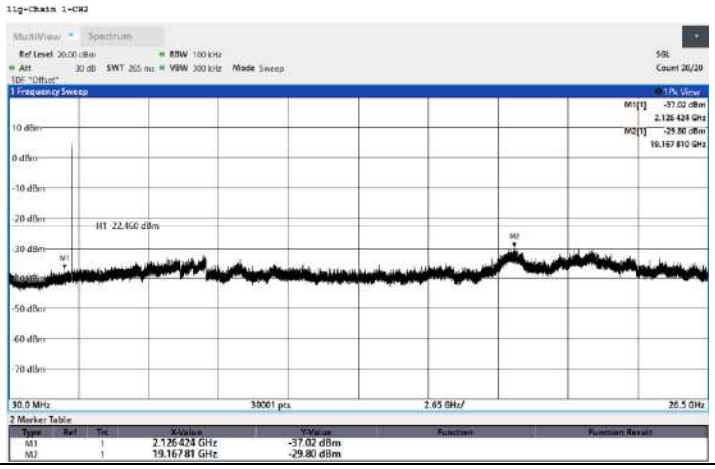
802.11g, CH2, Chain 0, Band edge



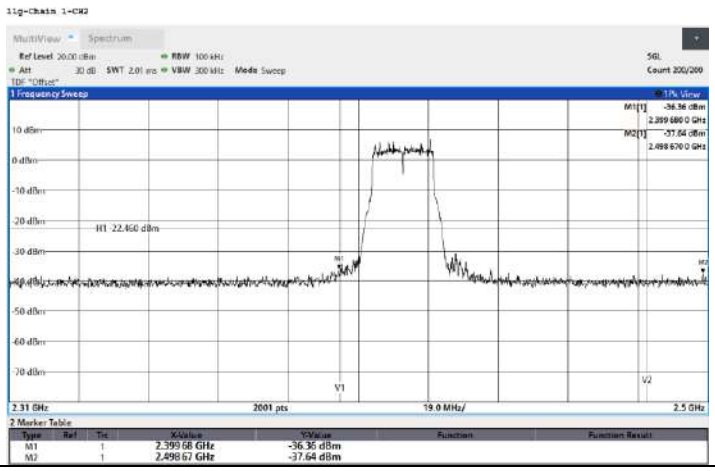
802.11g, CH2, Chain 1, Reference



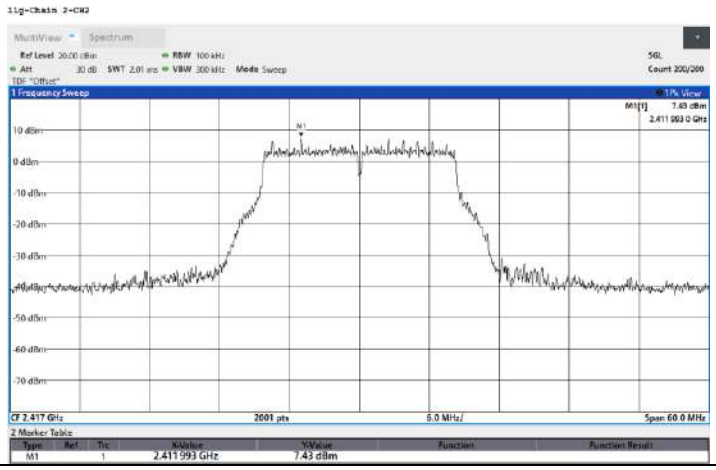
802.11g, CH2, Chain 1, Conducted Emission



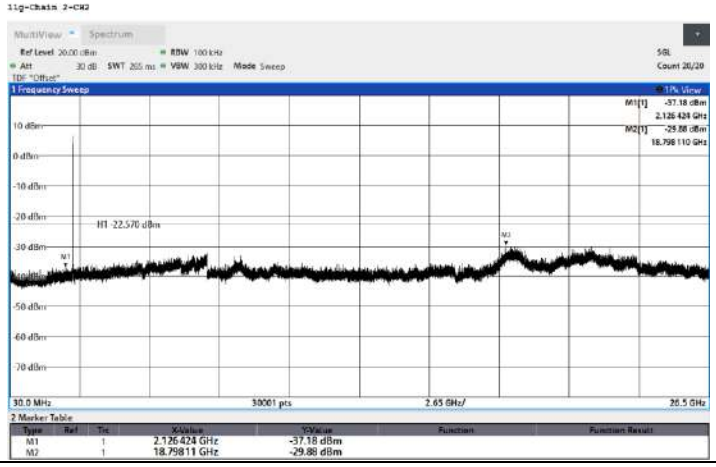
802.11g, CH2, Chain 1, Band edge



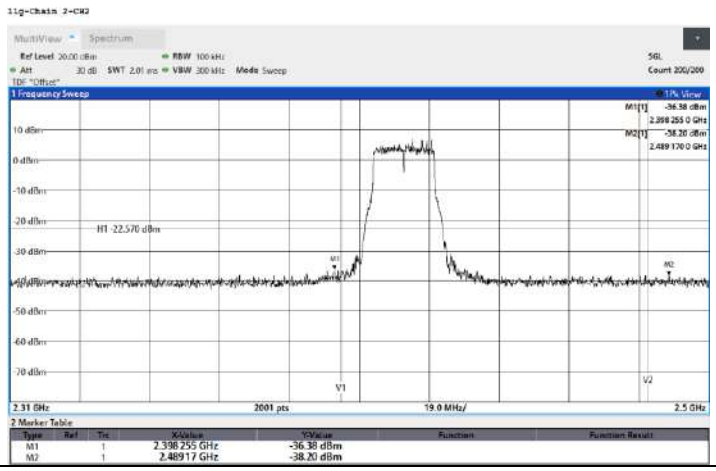
802.11g, CH2, Chain 2, Reference



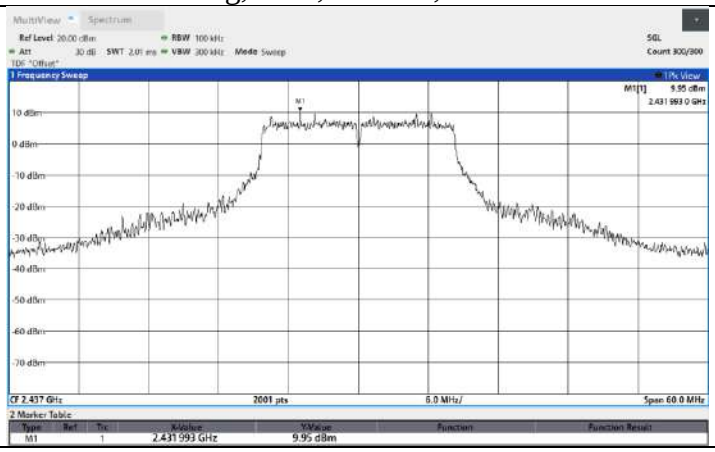
802.11g, CH2, Chain 2, Conducted Emission



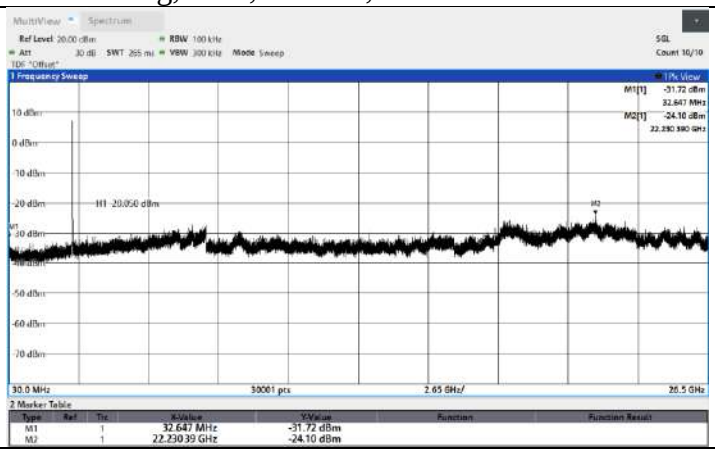
802.11g, CH2, Chain 2, Band edge



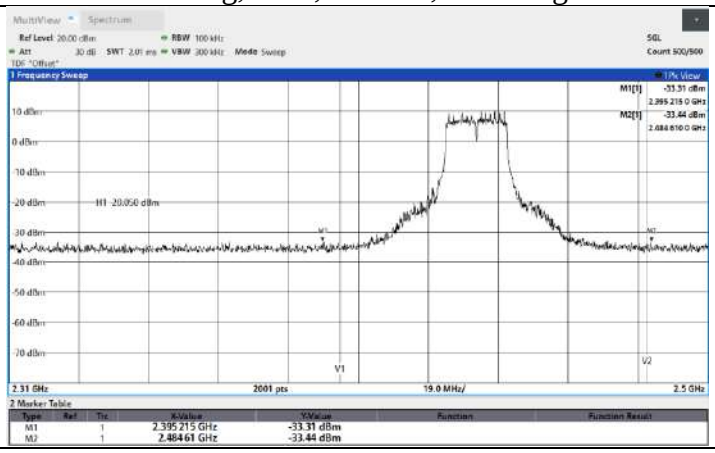
802.11g, CH6, Chain 0, Reference



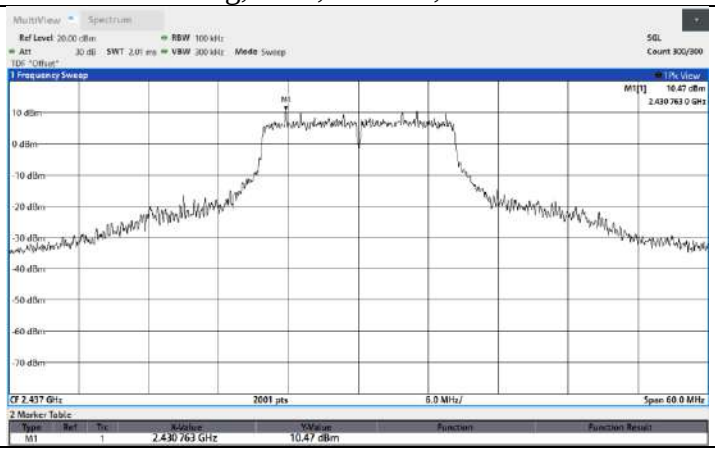
802.11g, CH6, Chain 0, Conducted Emission



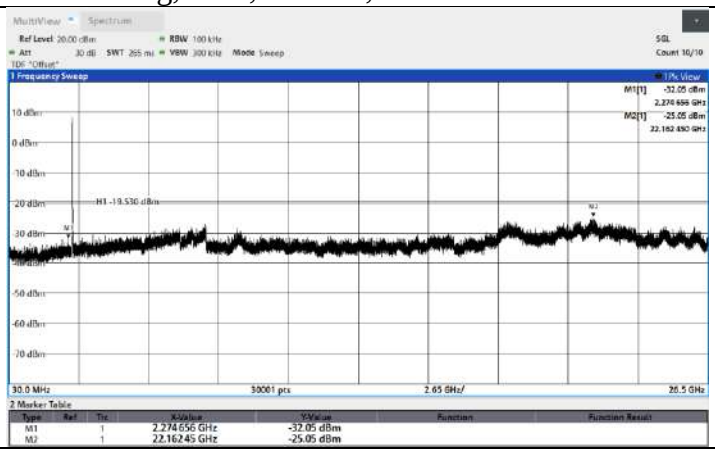
802.11g, CH6, Chain 0, Band edge



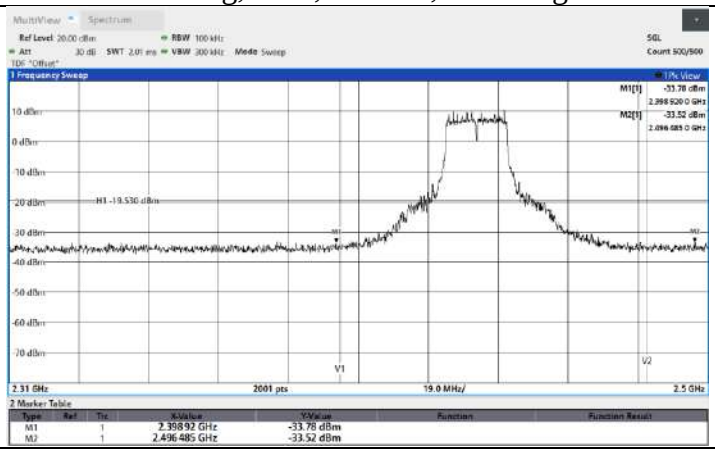
802.11g, CH6, Chain 1, Reference



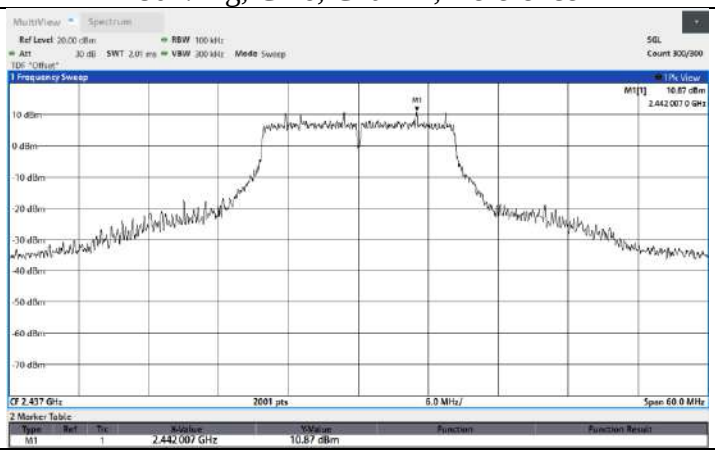
802.11g, CH6, Chain 1, Conducted Emission



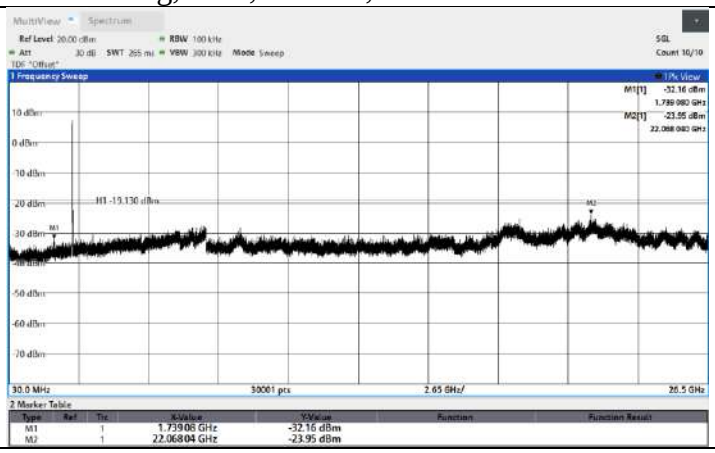
802.11g, CH6, Chain 1, Band edge



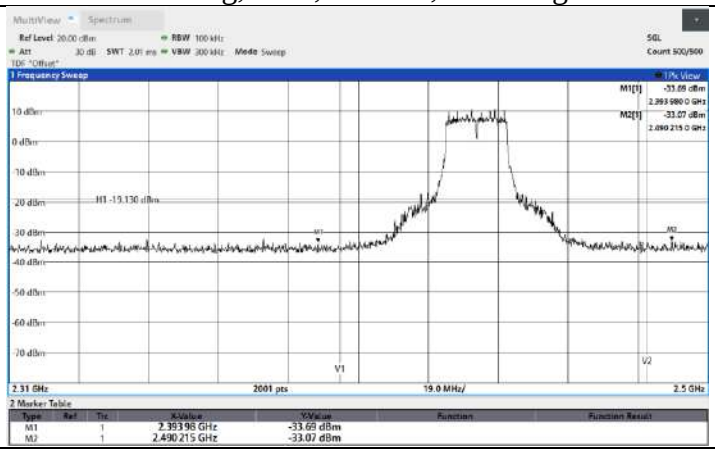
802.11g, CH6, Chain 2, Reference



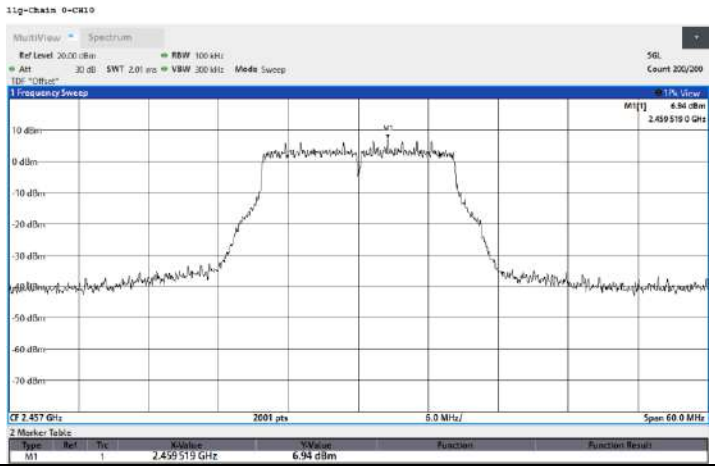
802.11g, CH6, Chain 2, Conducted Emission



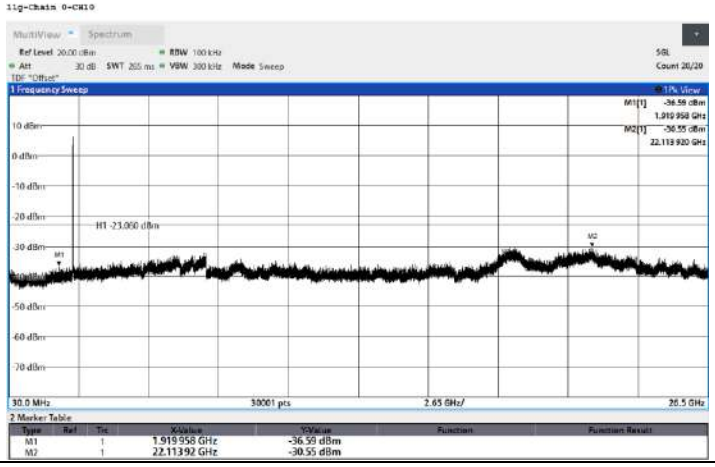
802.11g, CH6, Chain 2, Band edge



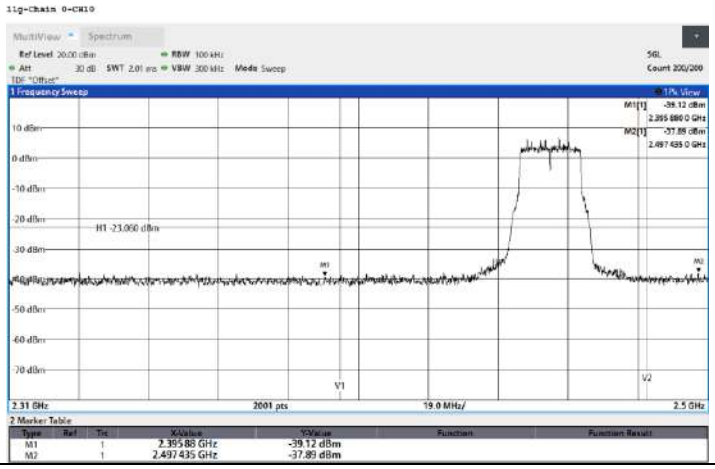
802.11g, CH10, Chain 0, Reference



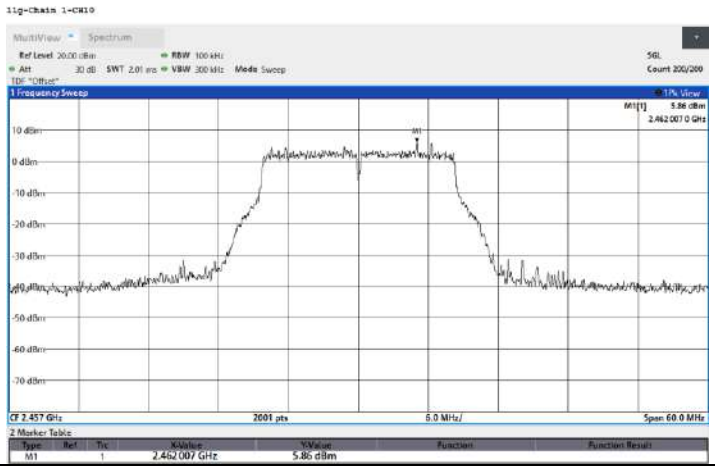
802.11g, CH10, Chain 0, Conducted Emission



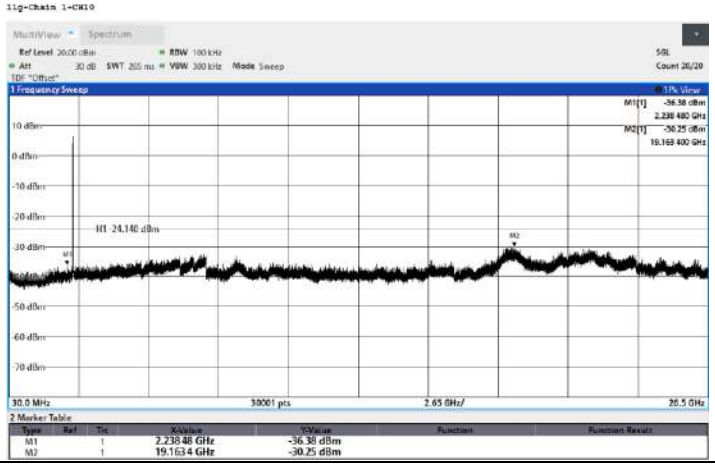
802.11g, CH10, Chain 0, Band edge



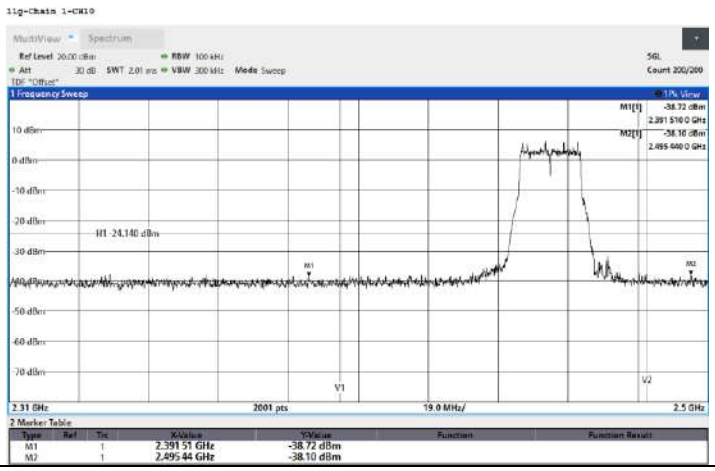
802.11g, CH10, Chain 1, Reference



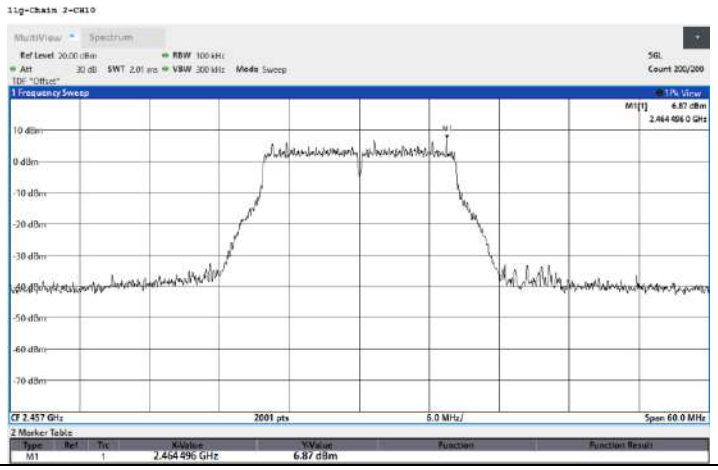
802.11g, CH10, Chain 1, Conducted Emission



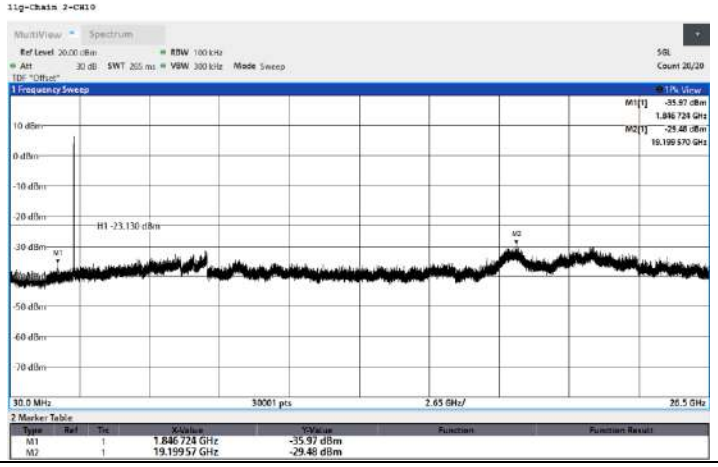
802.11g, CH10, Chain 1, Band edge



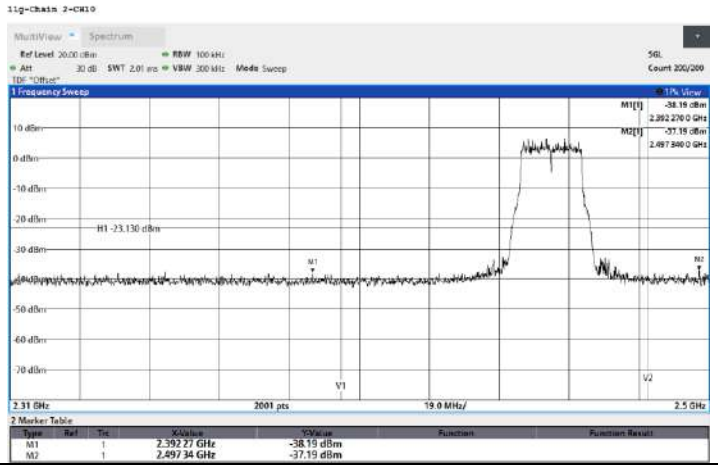
802.11g, CH10, Chain 2, Reference



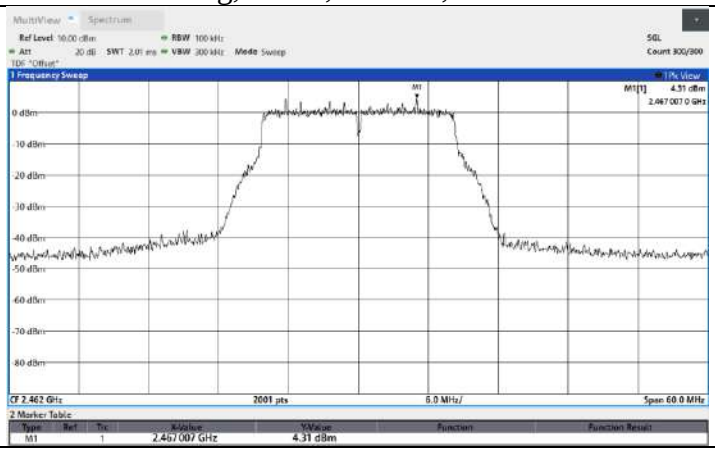
802.11g, CH10, Chain 2, Conducted Emission



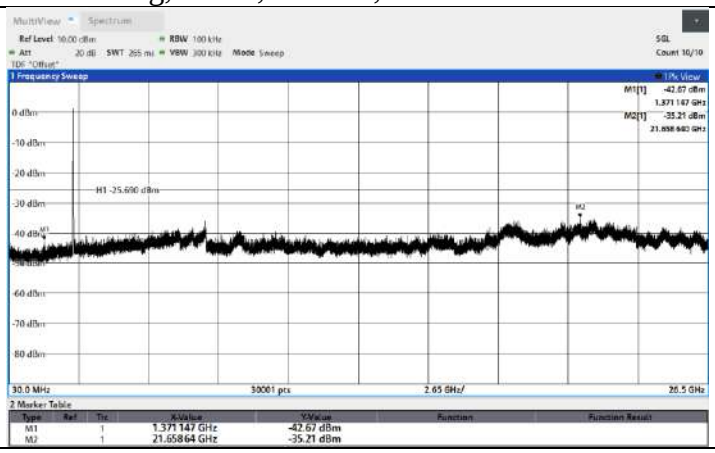
802.11g, CH10, Chain 2, Band edge



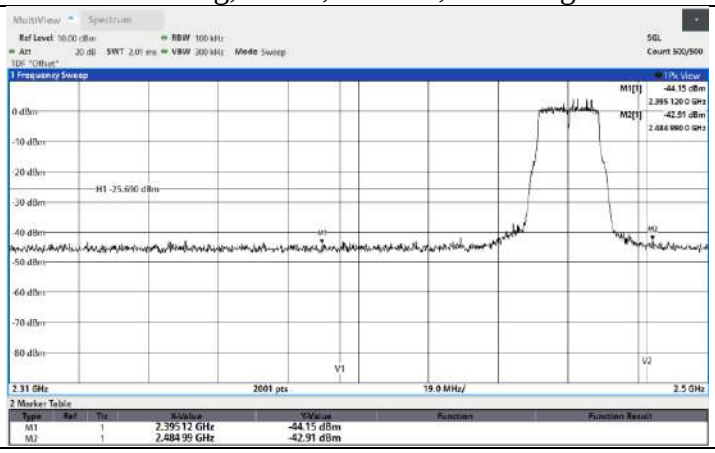
802.11g, CH11, Chain 0, Reference



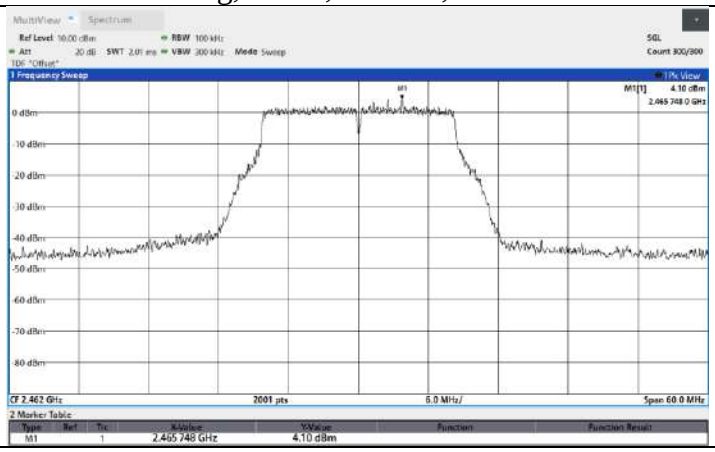
802.11g, CH11, Chain 0, Conducted Emission



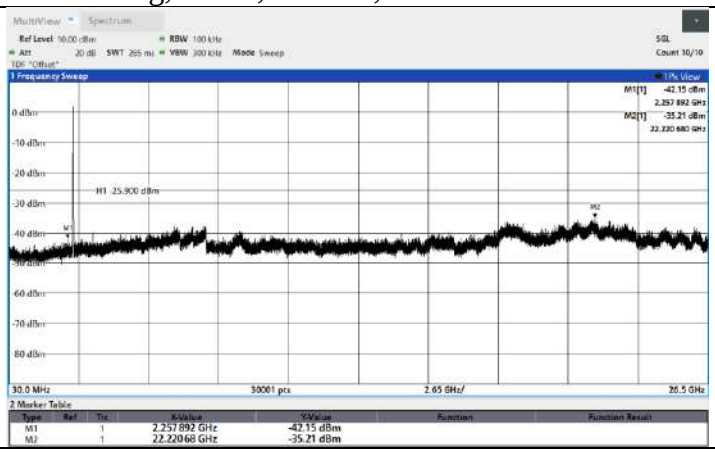
802.11g, CH11, Chain 0, Band edge



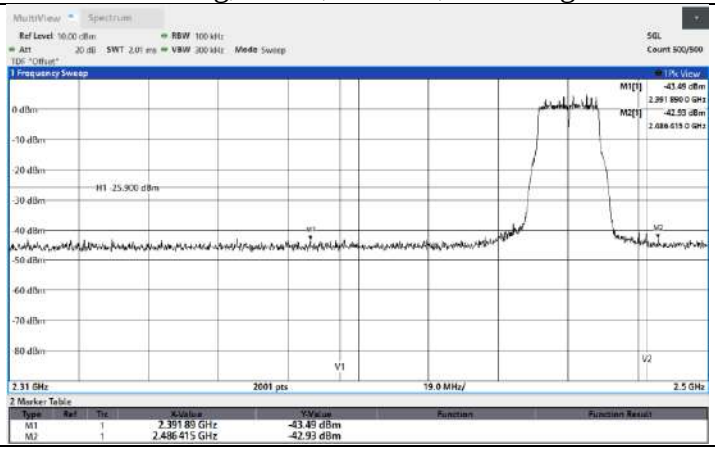
802.11g, CH11, Chain 1, Reference



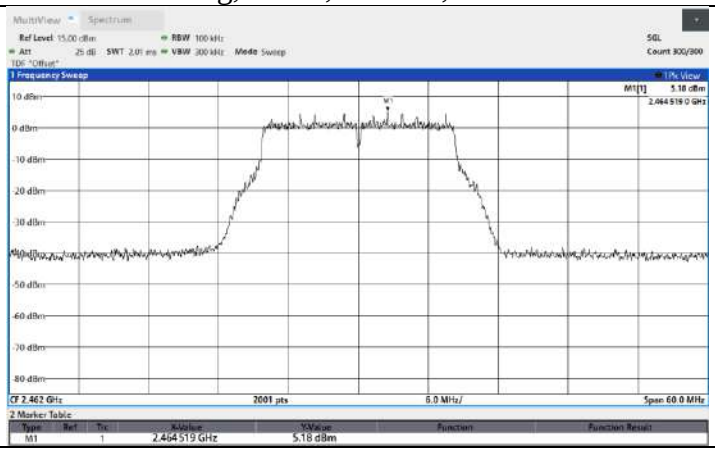
802.11g, CH11, Chain 1, Conducted Emission



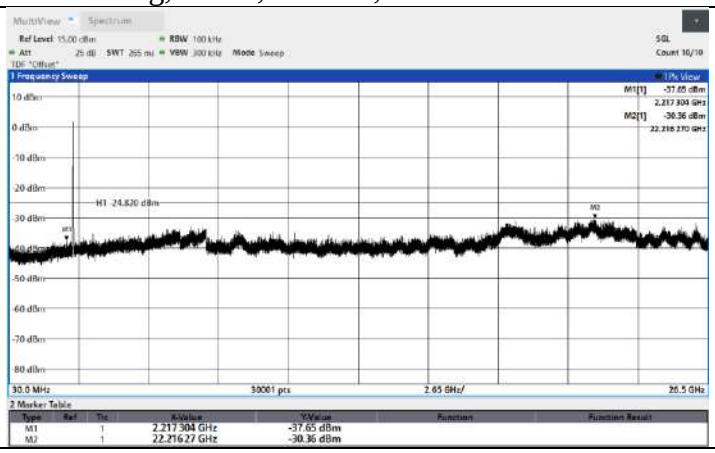
802.11g, CH11, Chain 1, Band edge



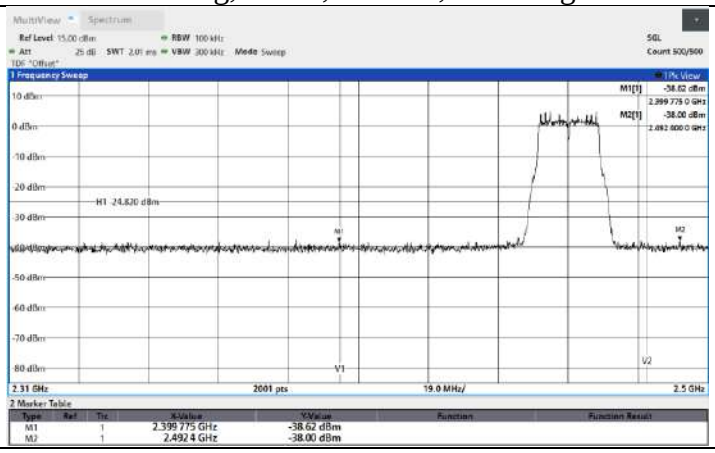
802.11g, CH11, Chain 2, Reference



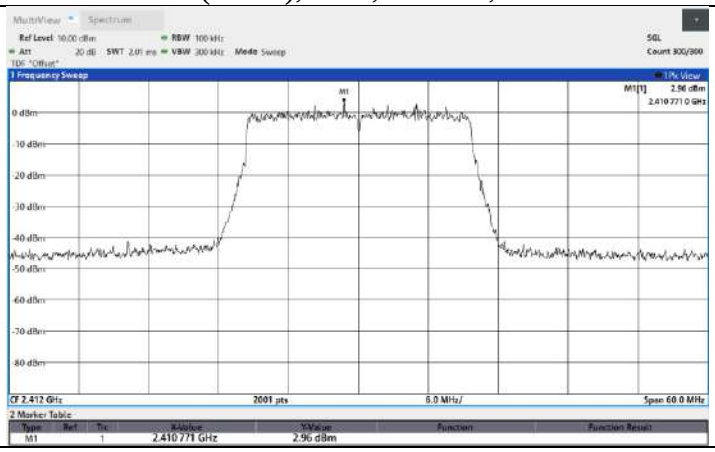
802.11g, CH11, Chain 2, Conducted Emission



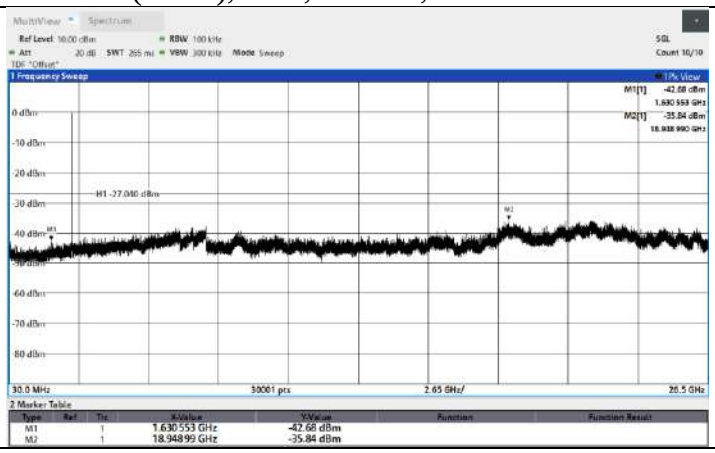
802.11g, CH11, Chain 2, Band edge



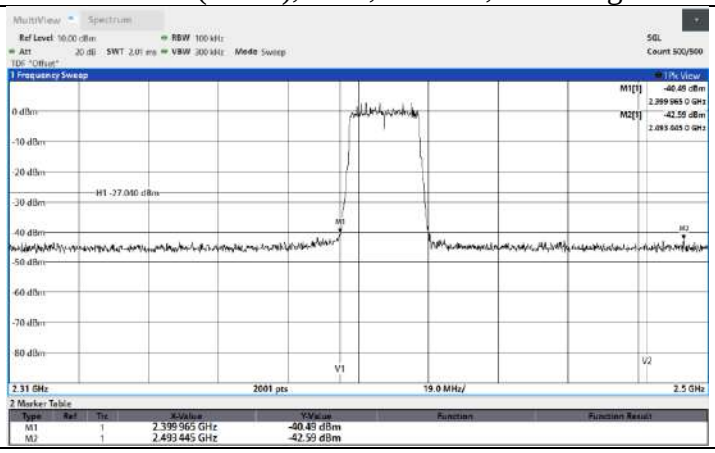
802.11ax(HE20), CH1, Chain 0, Reference



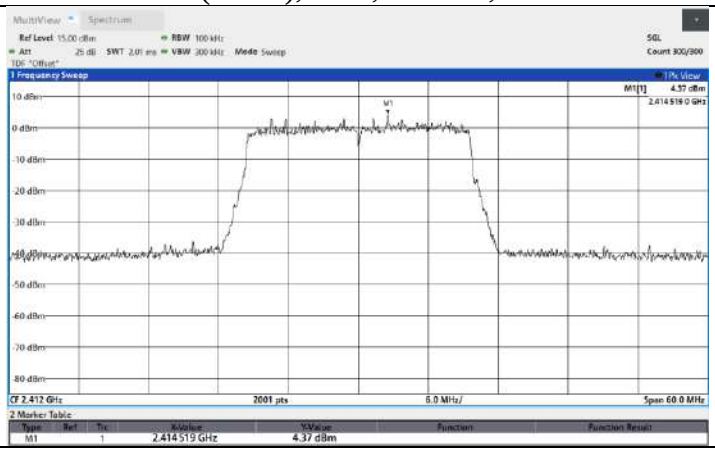
802.11ax(HE20), CH1, Chain 0, Conducted Emission



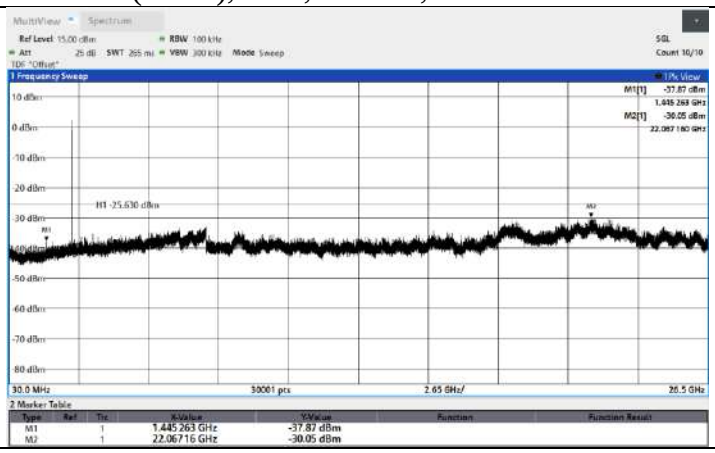
802.11ax(HE20), CH1, Chain 0, Band edge



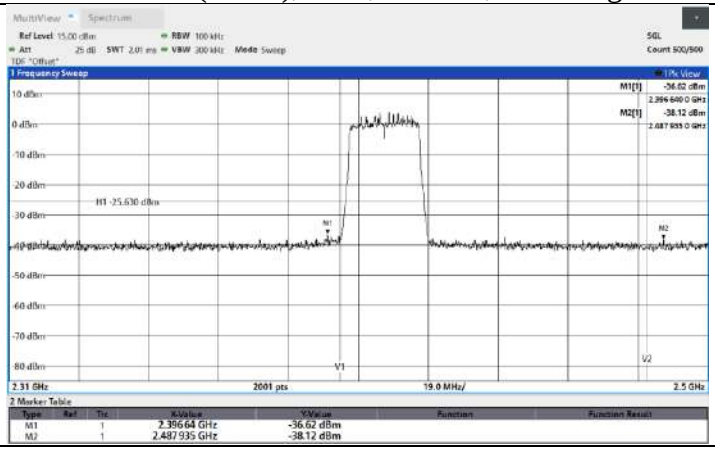
802.11ax(HE20), CH1, Chain 1, Reference



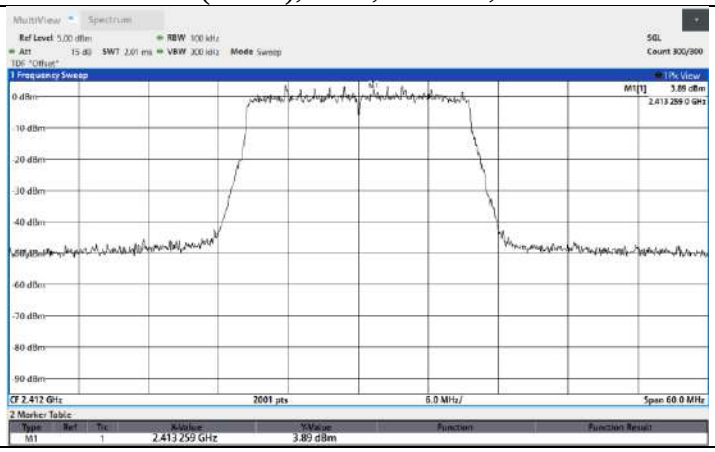
802.11ax(HE20), CH1, Chain 1, Conducted Emission



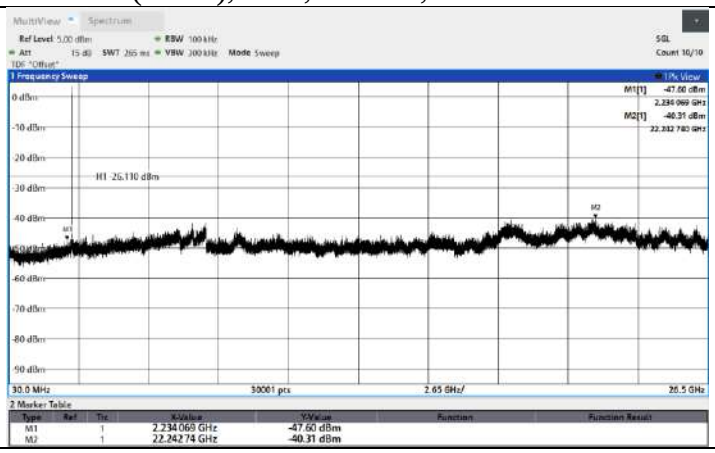
802.11ax(HE20), CH1, Chain 1, Band edge



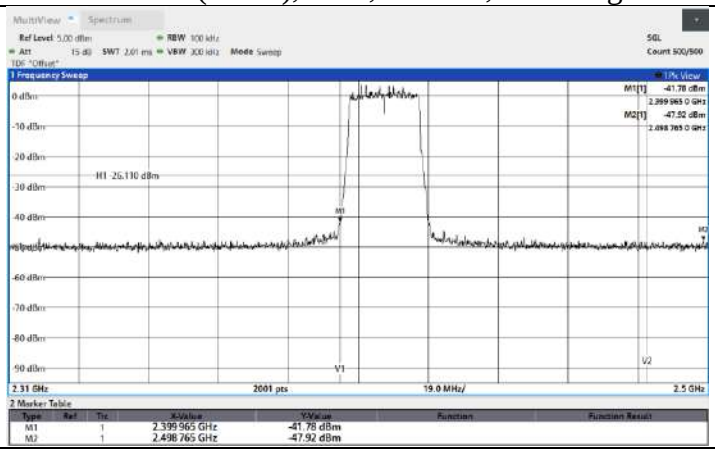
802.11ax(HE20), CH1, Chain 2, Reference



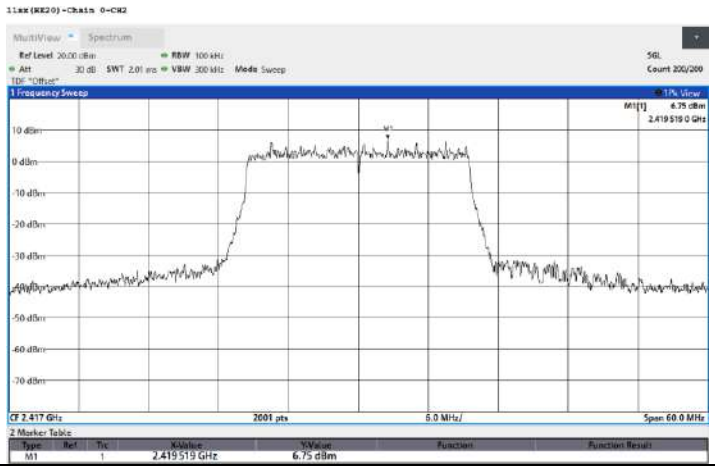
802.11ax(HE20), CH1, Chain 2, Conducted Emission



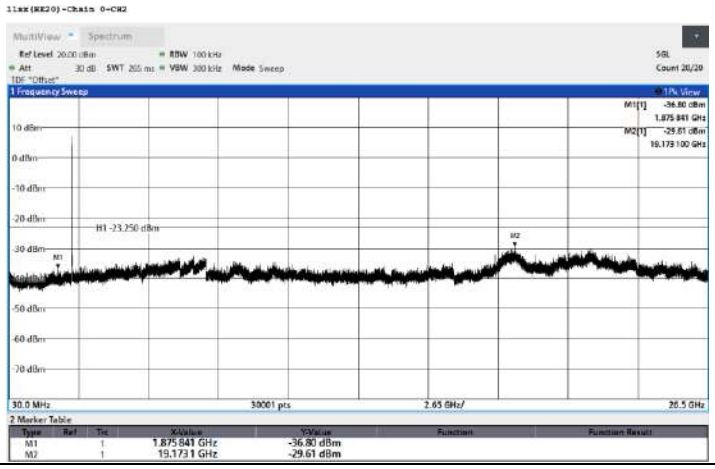
802.11ax(HE20), CH1, Chain 2, Band edge



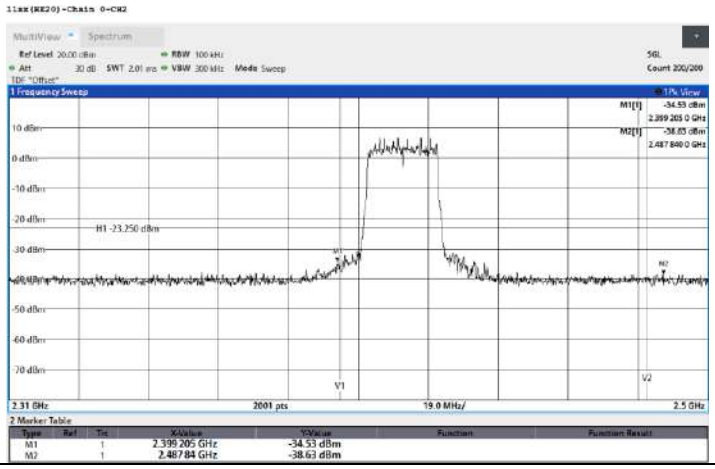
802.11ax(HE20), CH2, Chain 0, Reference



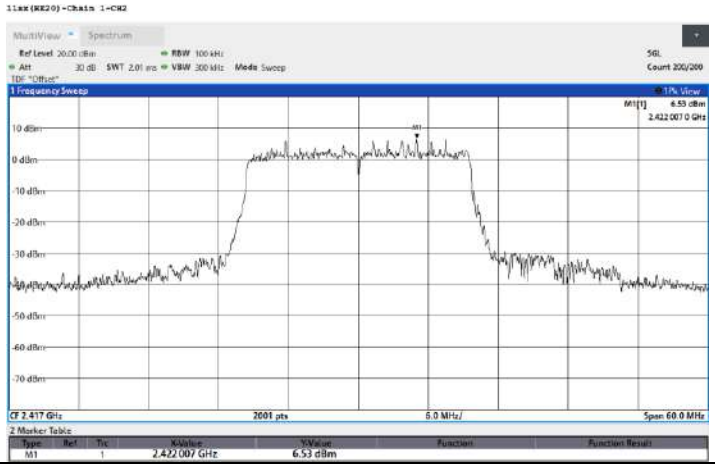
802.11ax(HE20), CH2, Chain 0, Conducted Emission



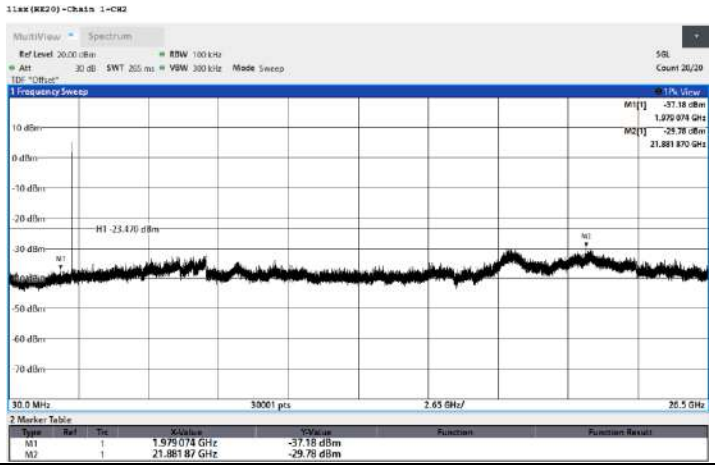
802.11ax(HE20), CH2, Chain 0, Band edge



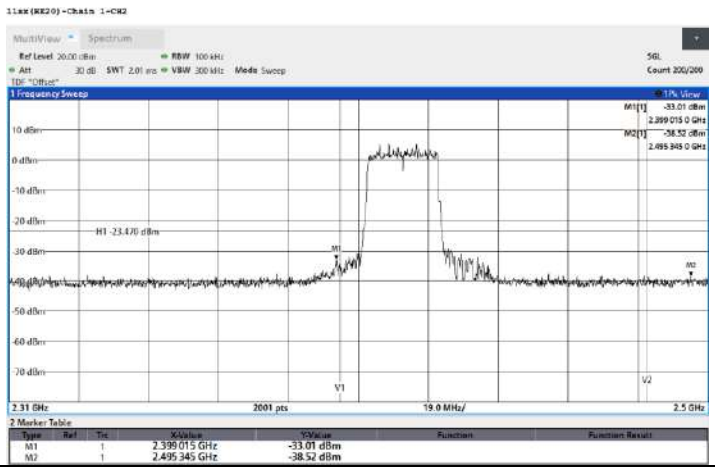
802.11ax(HE20), CH2, Chain 1, Reference



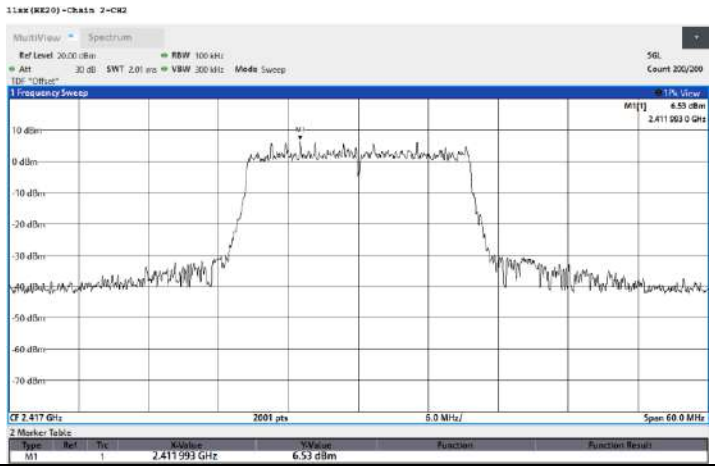
802.11ax(HE20), CH2, Chain 1, Conducted Emission



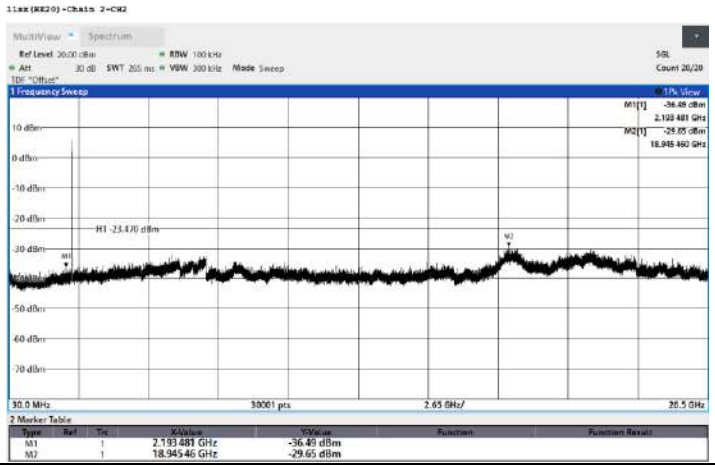
802.11ax(HE20), CH2, Chain 1, Band edge



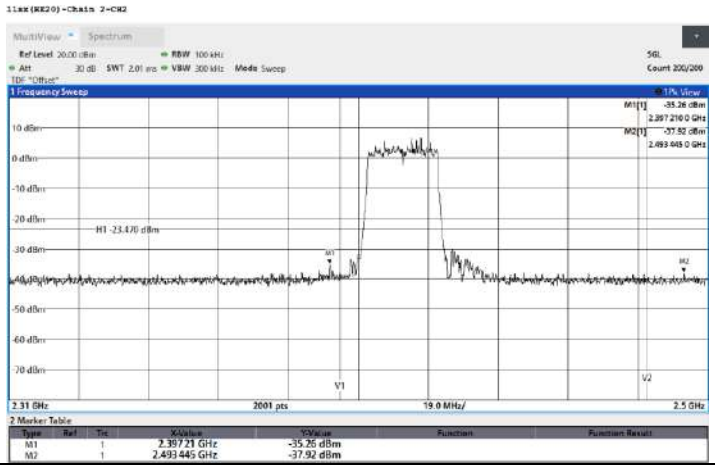
802.11ax(HE20), CH2, Chain 2, Reference



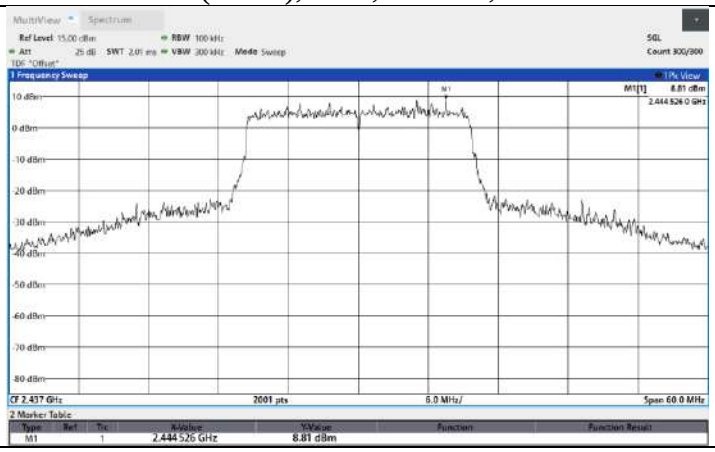
802.11ax(HE20), CH2, Chain 2, Conducted Emission



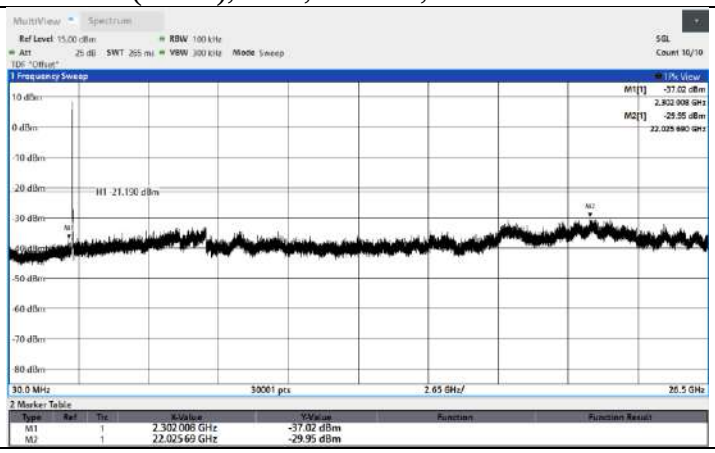
802.11ax(HE20), CH2, Chain 2, Band edge



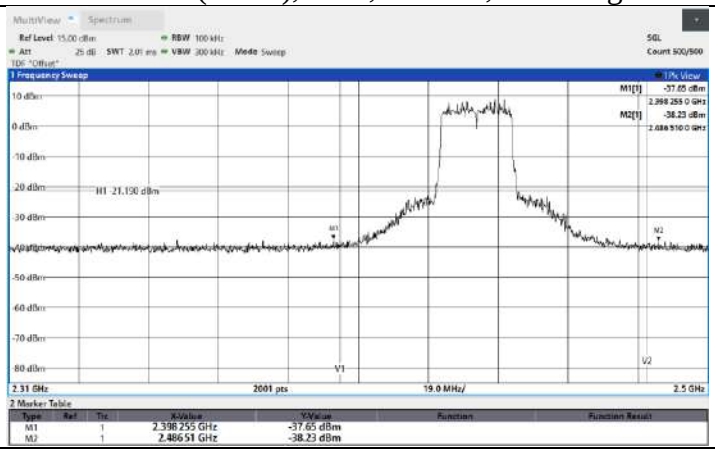
802.11ax(HE20), CH6, Chain 0, Reference



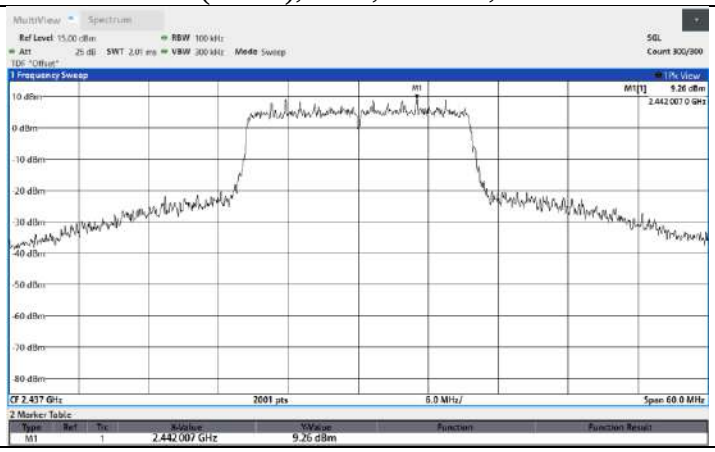
802.11ax(HE20), CH6, Chain 0, Conducted Emission



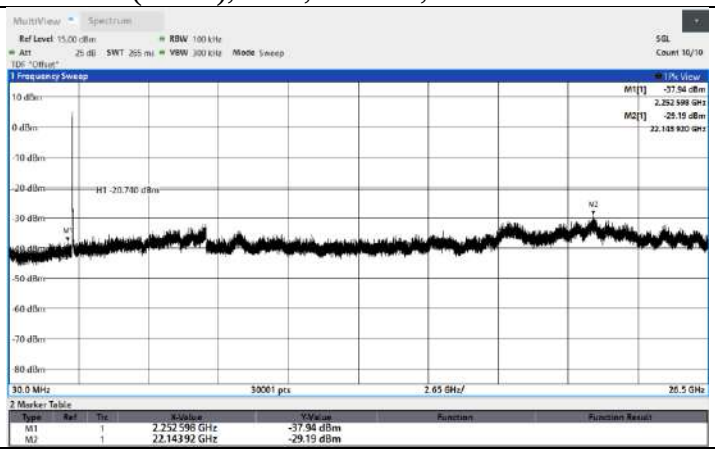
802.11ax(HE20), CH6, Chain 0, Band edge



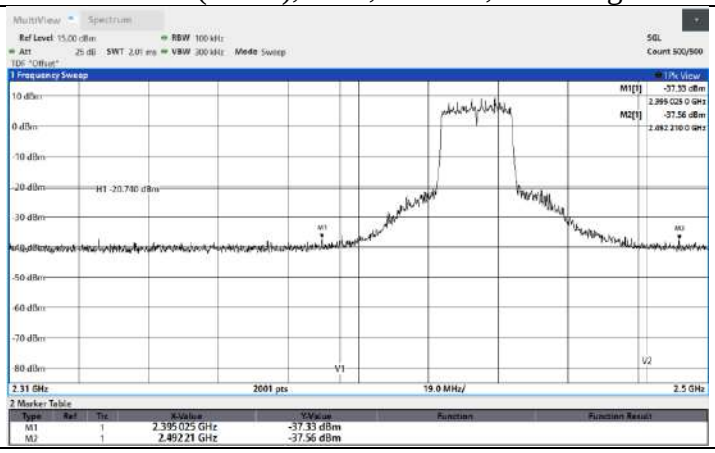
802.11ax(HE20), CH6, Chain 1, Reference



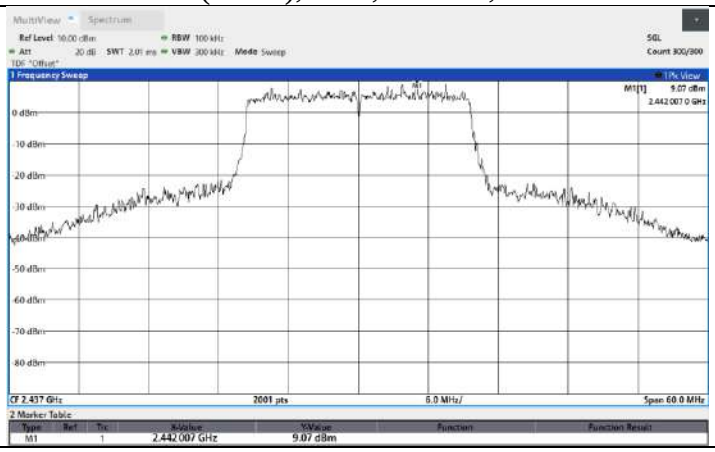
802.11ax(HE20), CH6, Chain 1, Conducted Emission



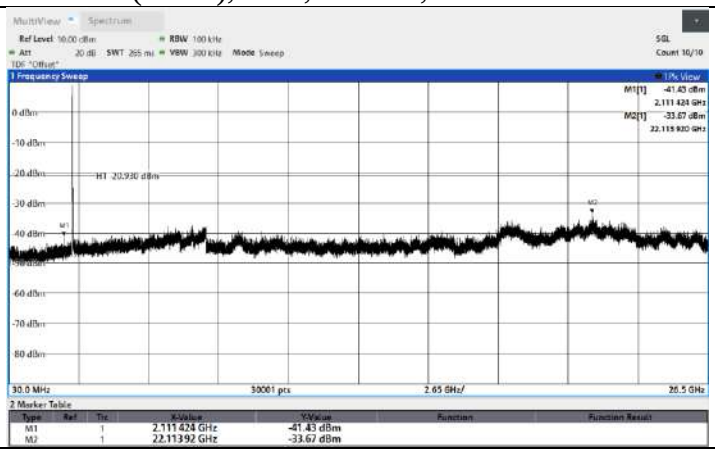
802.11ax(HE20), CH6, Chain 1, Band edge



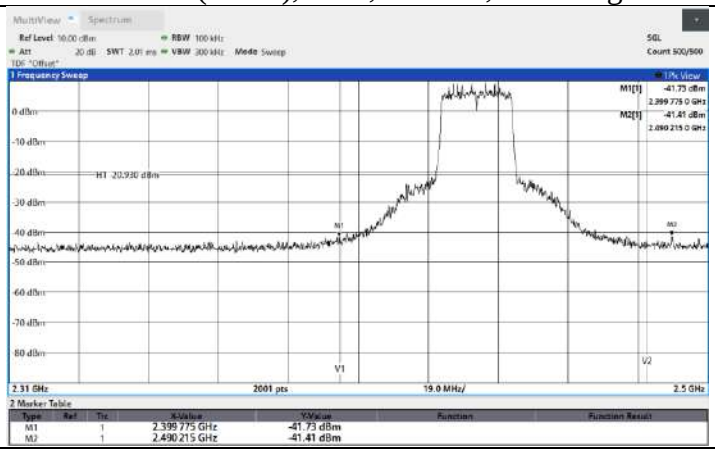
802.11ax(HE20), CH6, Chain 2, Reference



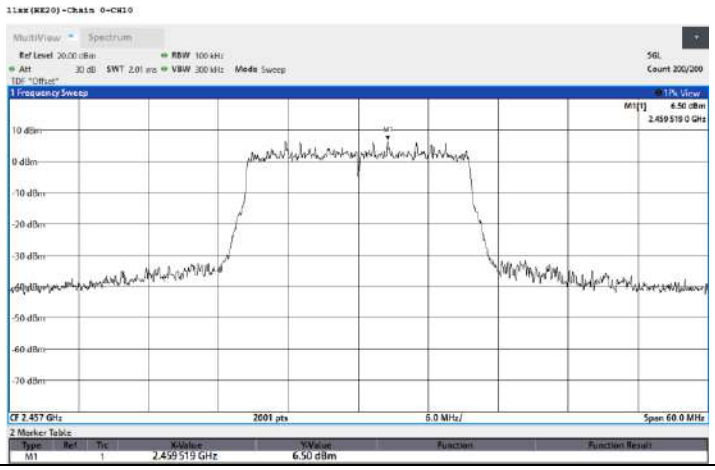
802.11ax(HE20), CH6, Chain 2, Conducted Emission



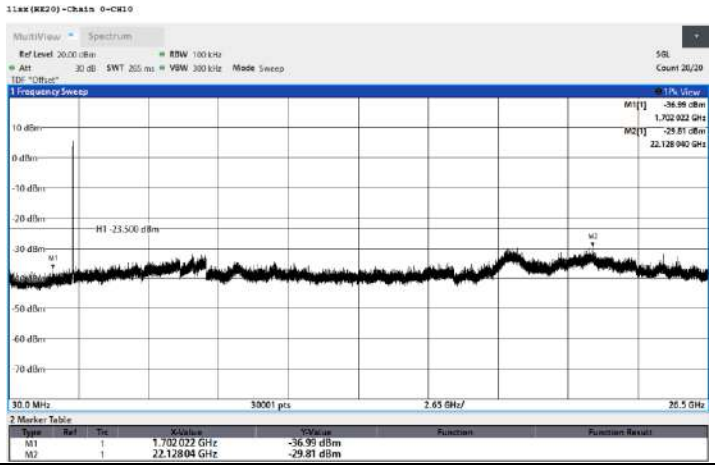
802.11ax(HE20), CH6, Chain 2, Band edge



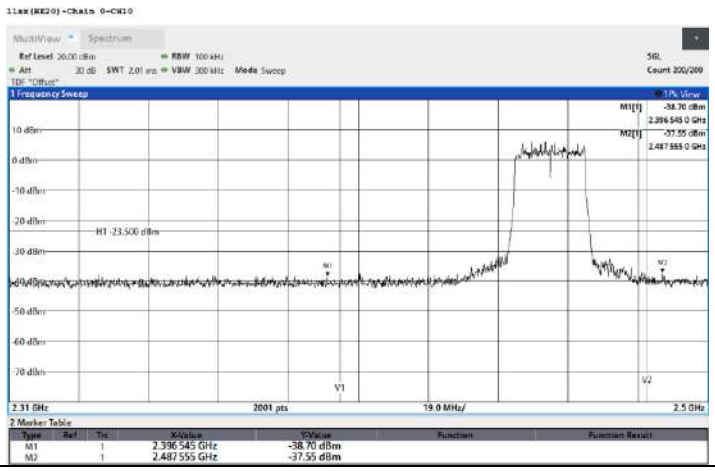
802.11ax(HE20), CH10, Chain 0, Reference



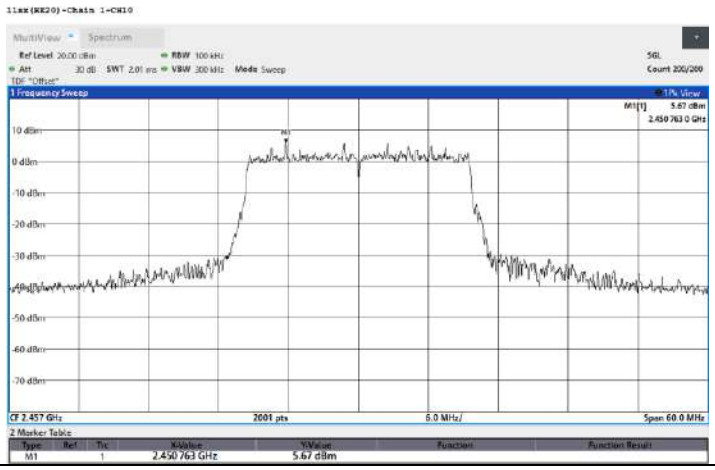
802.11ax(HE20), CH10, Chain 0, Conducted Emission



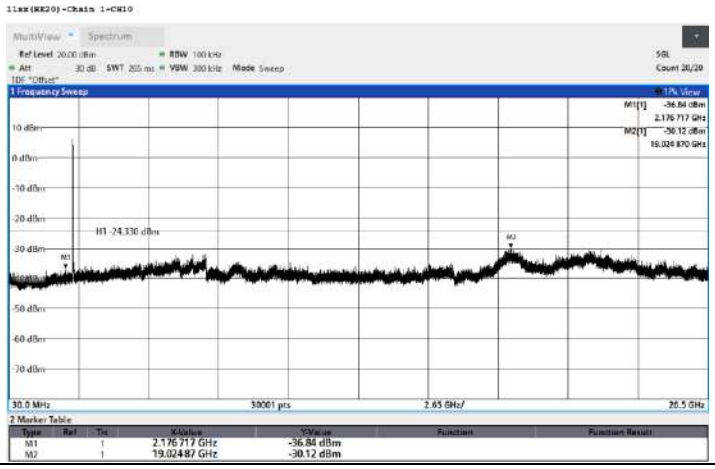
802.11ax(HE20), CH10, Chain 0, Band edge



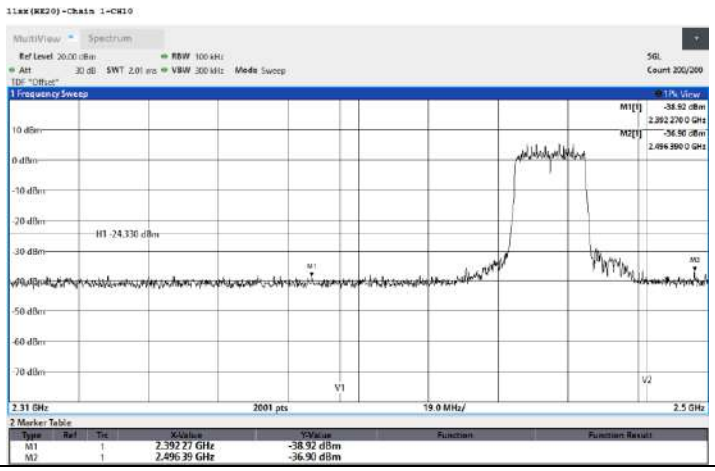
802.11ax(HE20), CH10, Chain 1, Reference



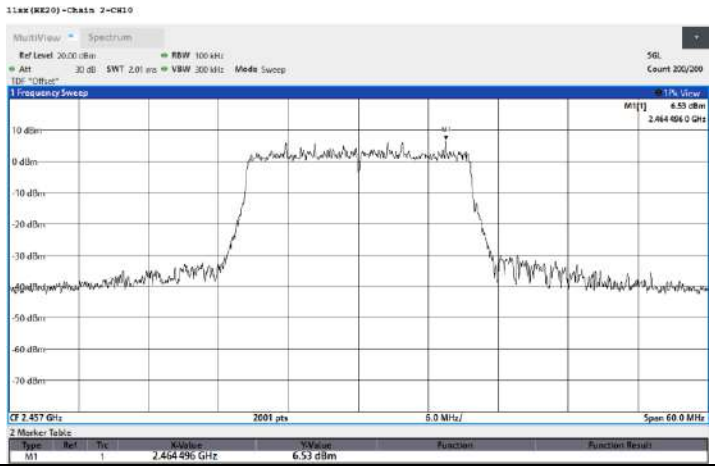
802.11ax(HE20), CH10, Chain 1, Conducted Emission



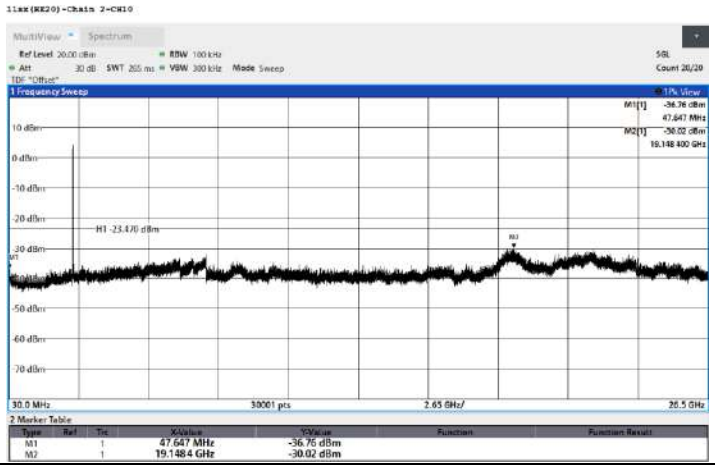
802.11ax(HE20), CH10, Chain 1, Band edge



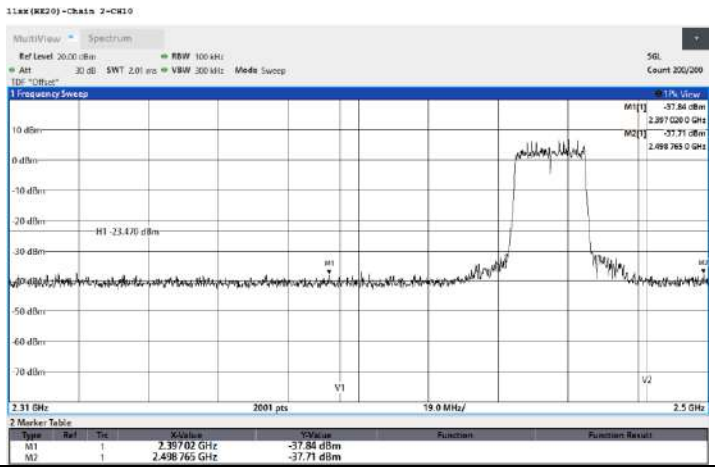
802.11ax(HE20), CH10, Chain 2, Reference



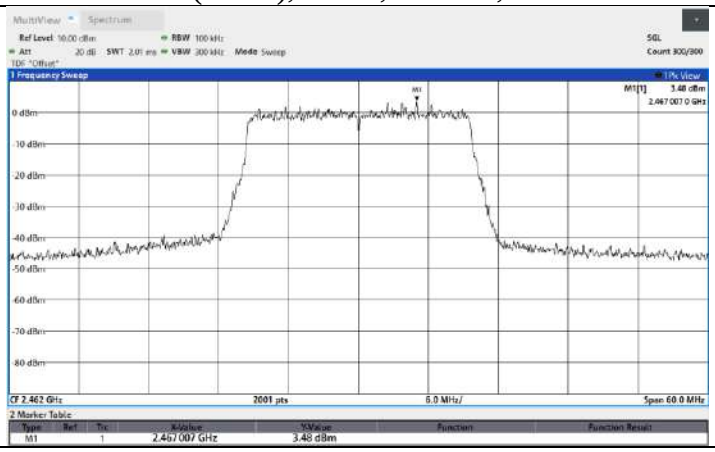
802.11ax(HE20), CH10, Chain 2, Conducted Emission



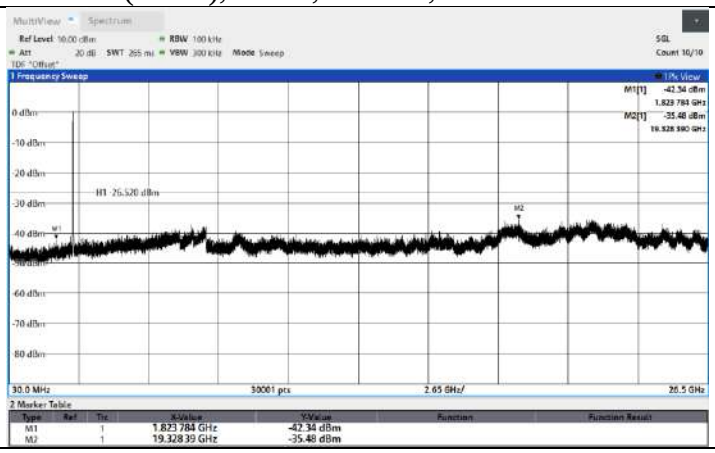
802.11ax(HE20), CH10, Chain 2, Band edge



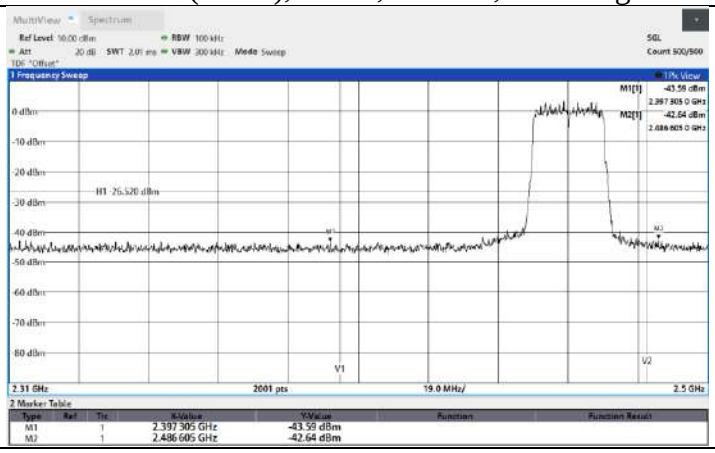
802.11ax(HE20), CH11, Chain 0, Reference



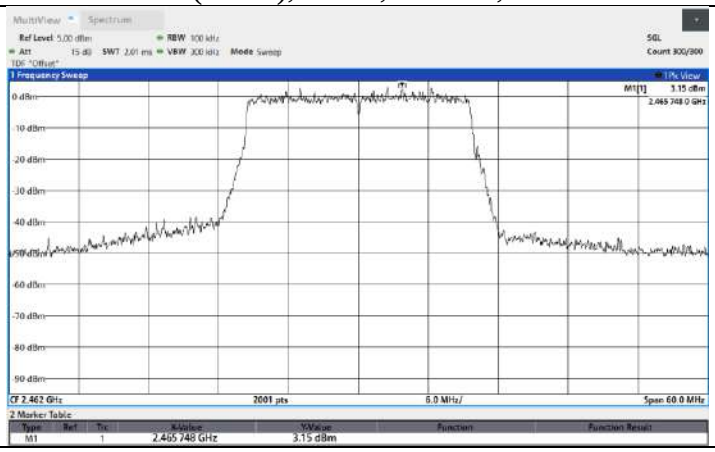
802.11ax(HE20), CH11, Chain 0, Conducted Emission



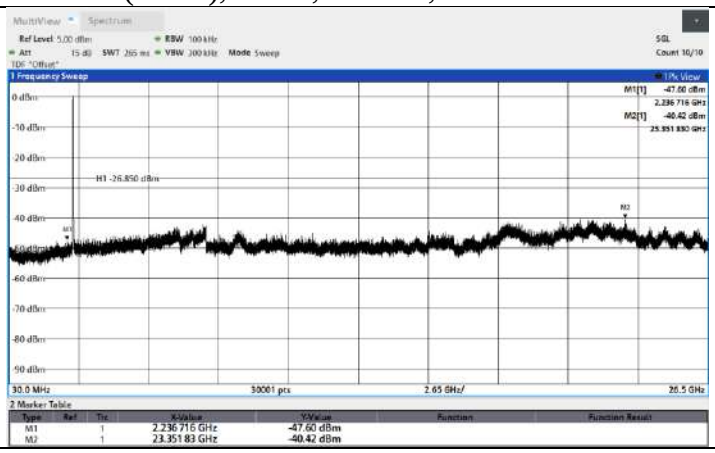
802.11ax(HE20), CH11, Chain 0, Band edge



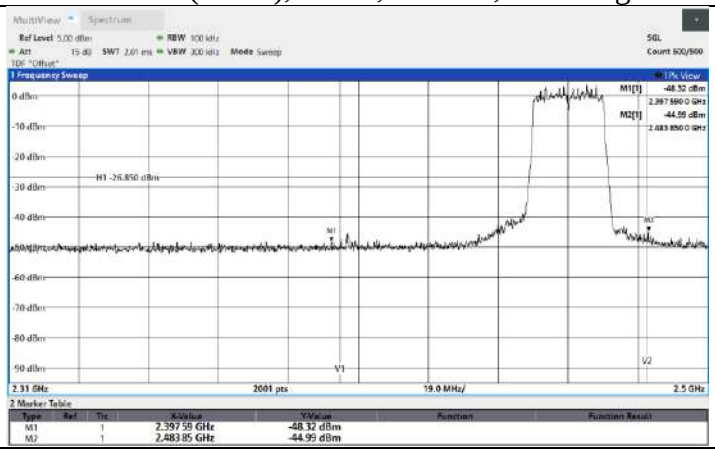
802.11ax(HE20), CH11, Chain 1, Reference



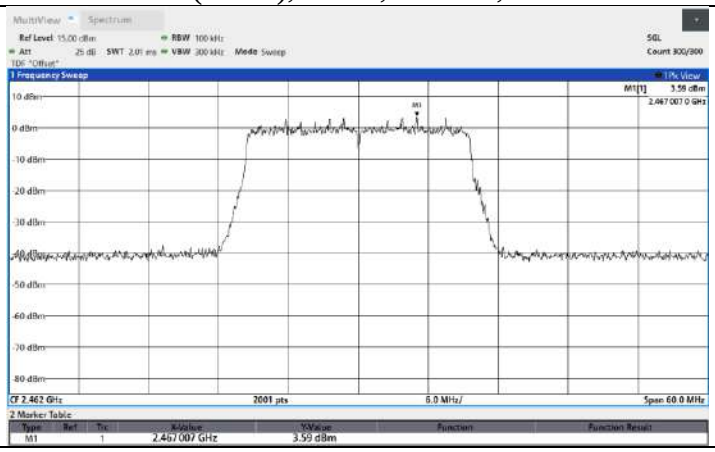
802.11ax(HE20), CH11, Chain 1, Conducted Emission



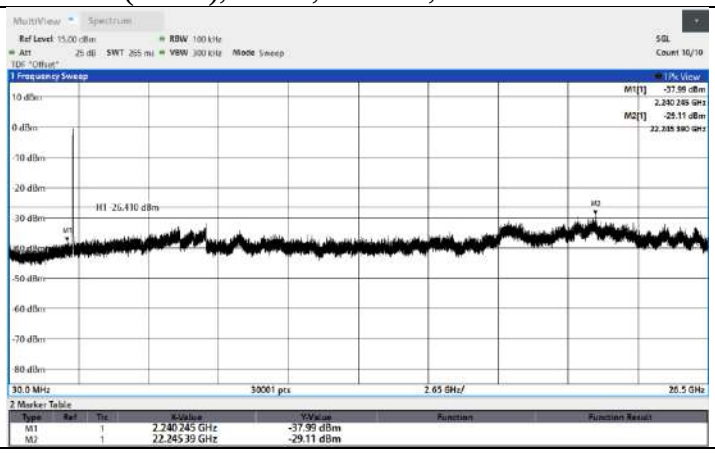
802.11ax(HE20), CH11, Chain 1, Band edge



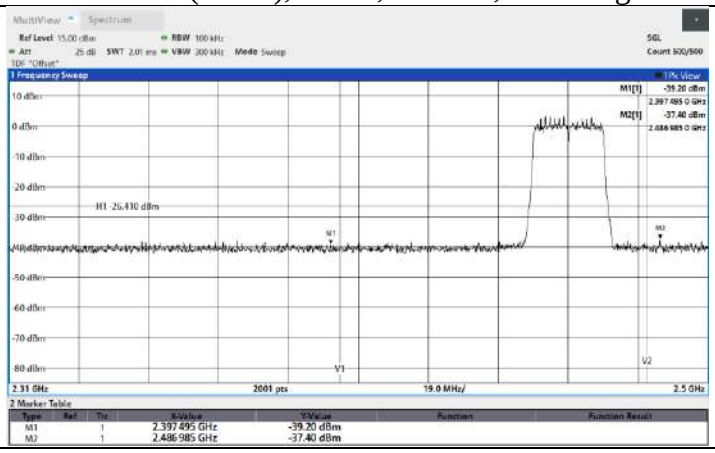
802.11ax(HE20), CH11, Chain 2, Reference



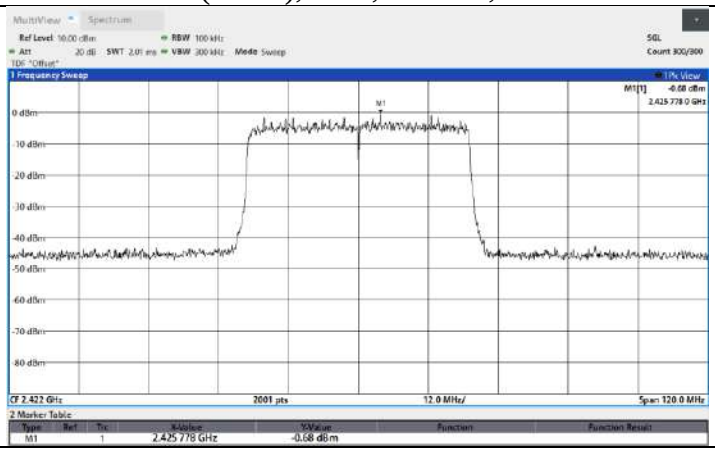
802.11ax(HE20), CH11, Chain 2, Conducted Emission



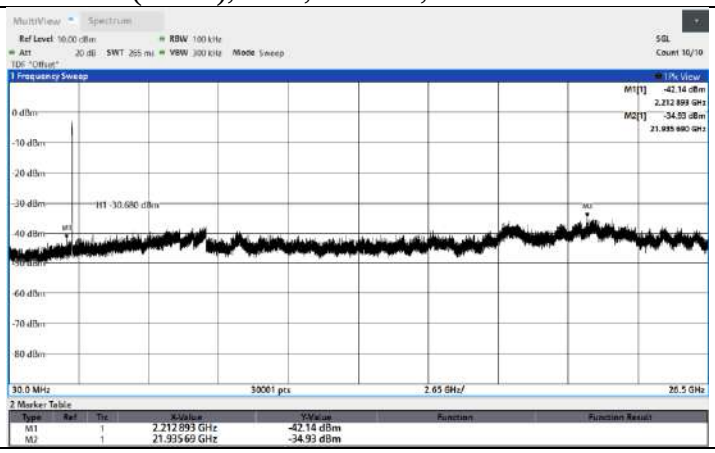
802.11ax(HE20), CH11, Chain 2, Band edge



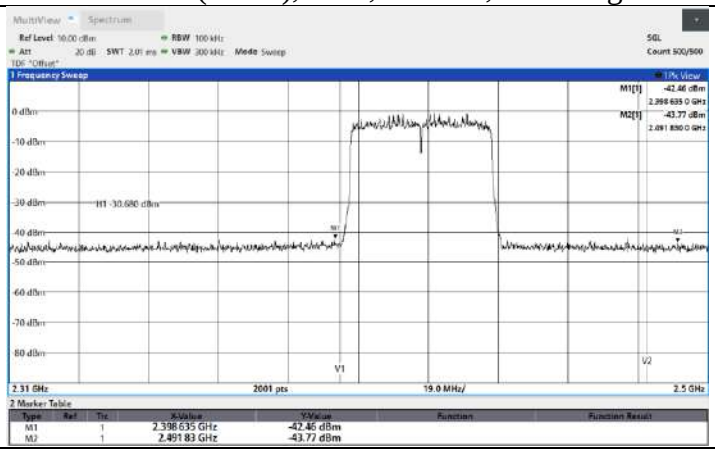
802.11ax(HE40), CH3, Chain 0, Reference



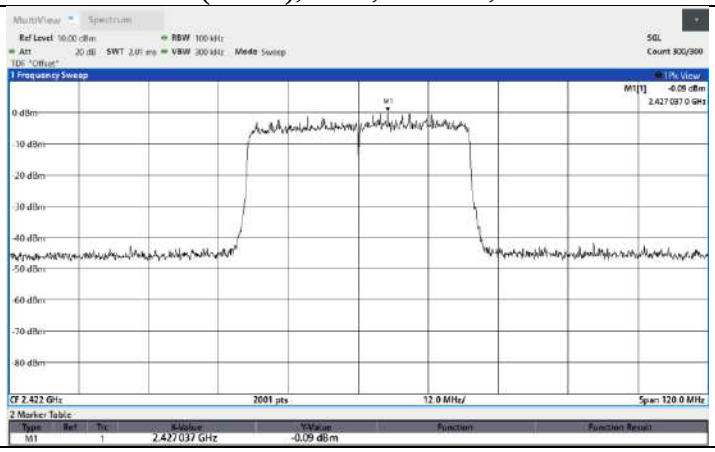
802.11ax(HE40), CH3, Chain 0, Conducted Emission



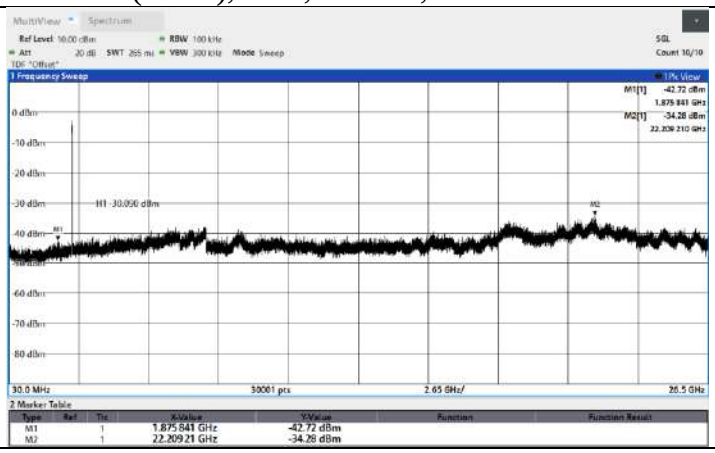
802.11ax(HE40), CH3, Chain 0, Band edge



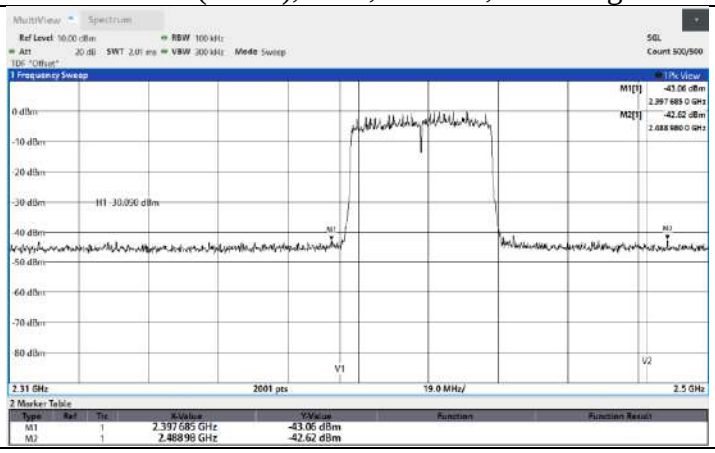
802.11ax(HE40), CH3, Chain 1, Reference



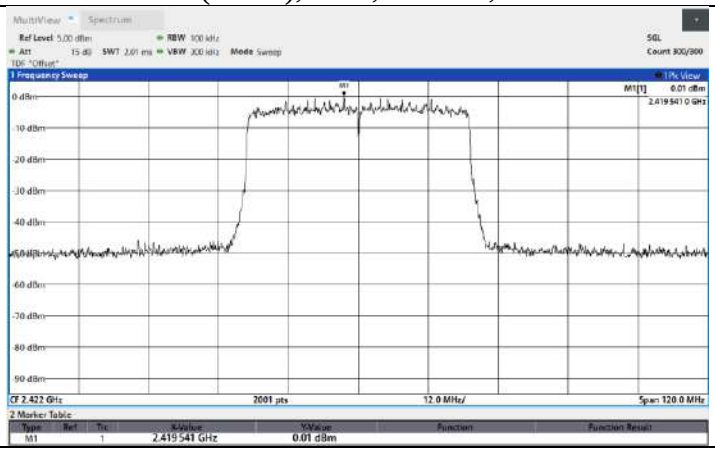
802.11ax(HE40), CH3, Chain 1, Conducted Emission



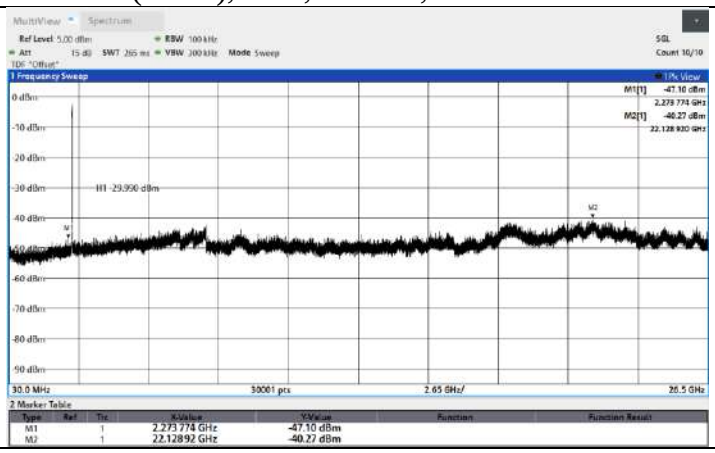
802.11ax(HE40), CH3, Chain 1, Band edge



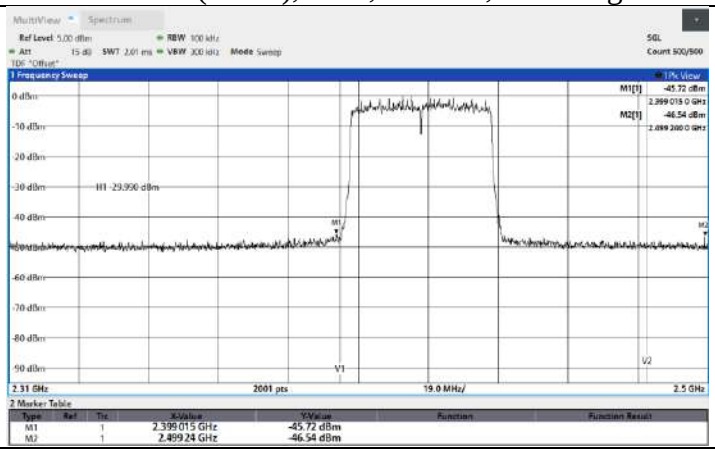
802.11ax(HE40), CH3, Chain 2, Reference



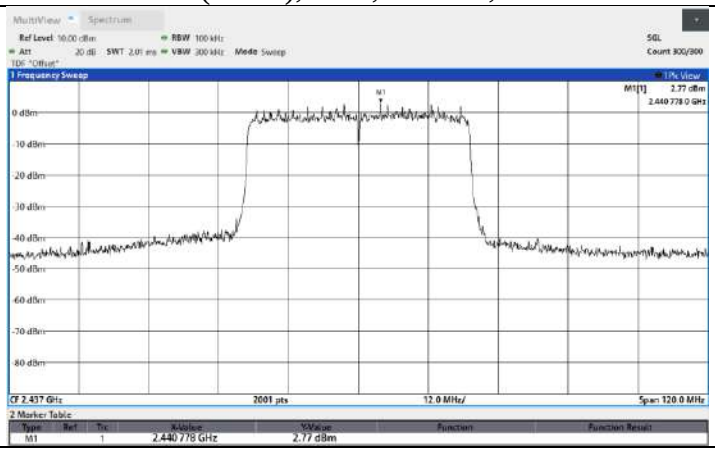
802.11ax(HE40), CH3, Chain 2, Conducted Emission



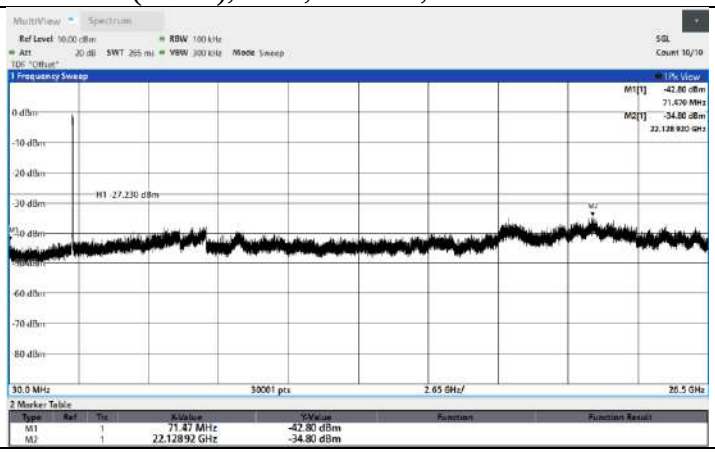
802.11ax(HE40), CH3, Chain 2, Band edge



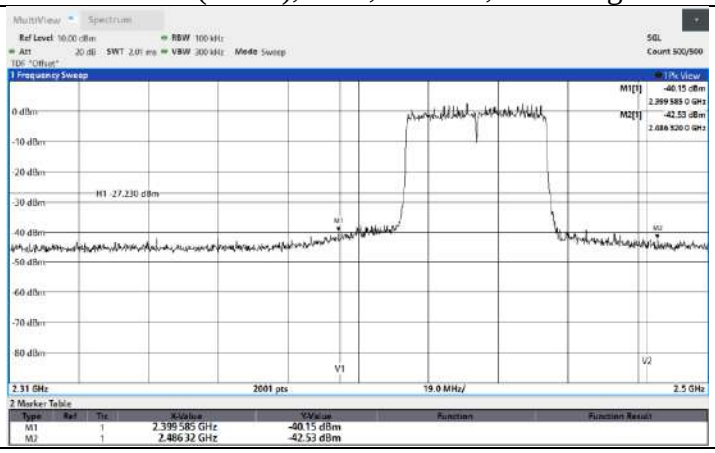
802.11ax(HE40), CH6, Chain 0, Reference



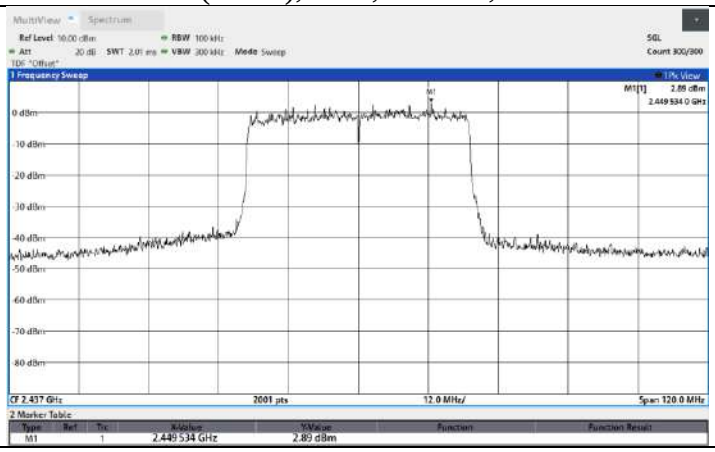
802.11ax(HE40), CH6, Chain 0, Conducted Emission



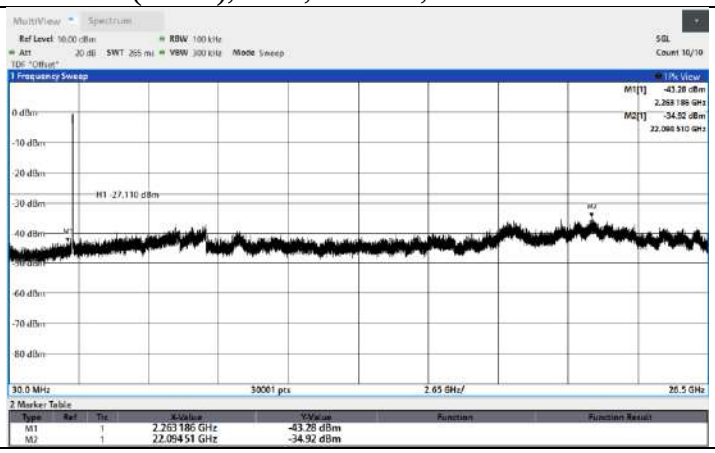
802.11ax(HE40), CH6, Chain 0, Band edge



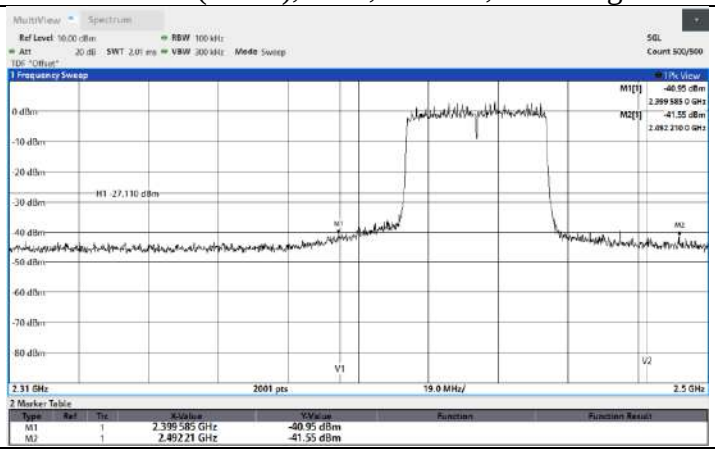
802.11ax(HE40), CH6, Chain 1, Reference



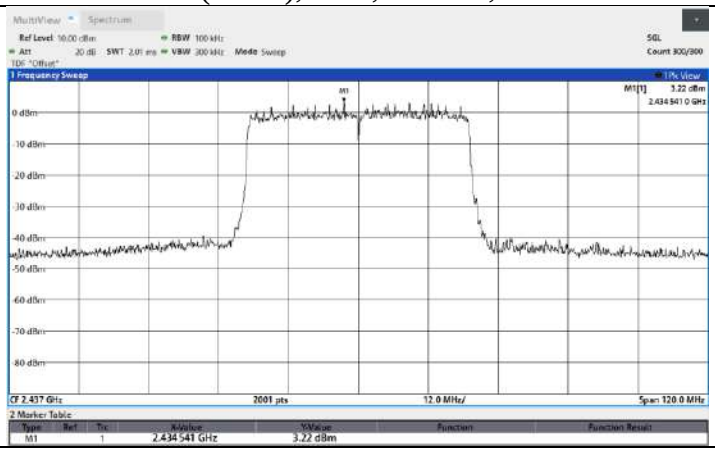
802.11ax(HE40), CH6, Chain 1, Conducted Emission



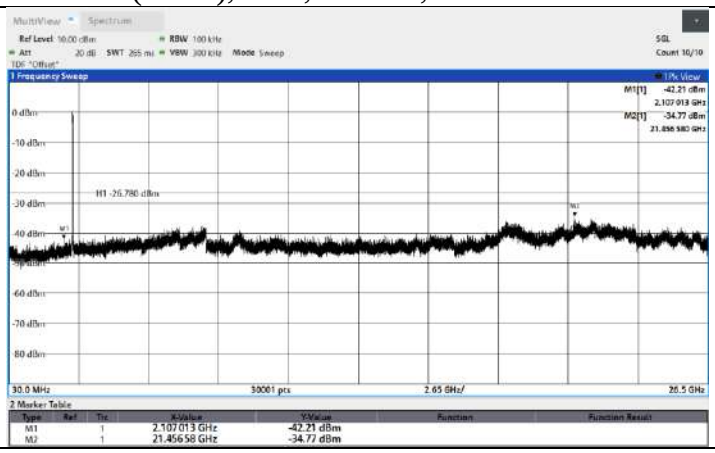
802.11ax(HE40), CH6, Chain 1, Band edge



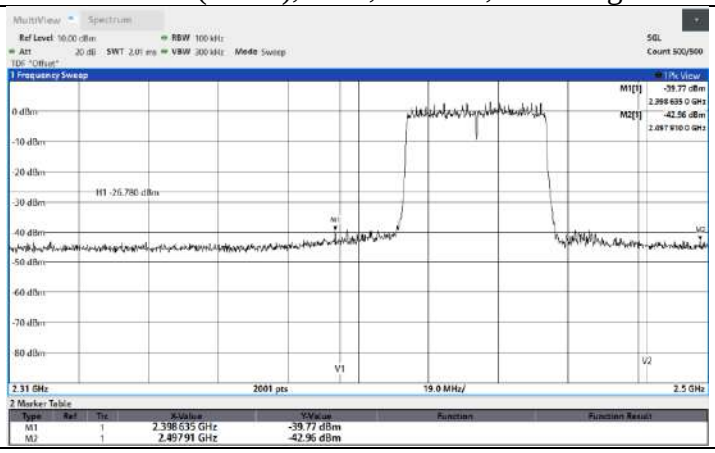
802.11ax(HE40), CH6, Chain 2, Reference



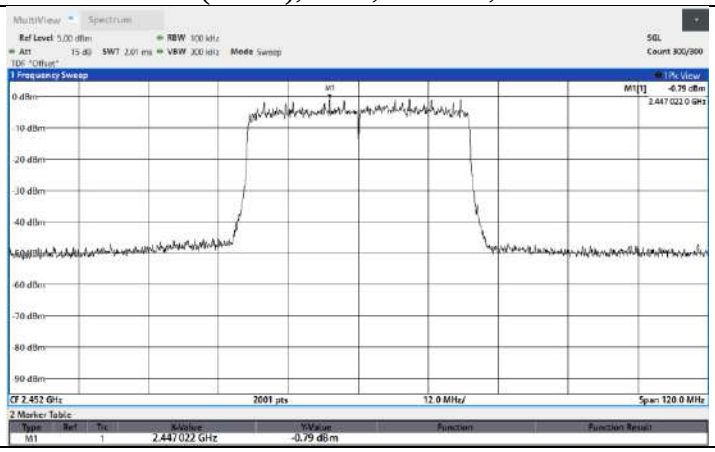
802.11ax(HE40), CH6, Chain 2, Conducted Emission



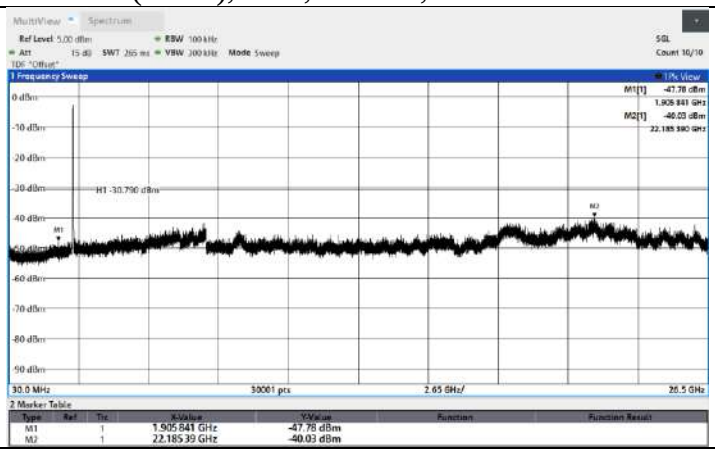
802.11ax(HE40), CH6, Chain 2, Band edge



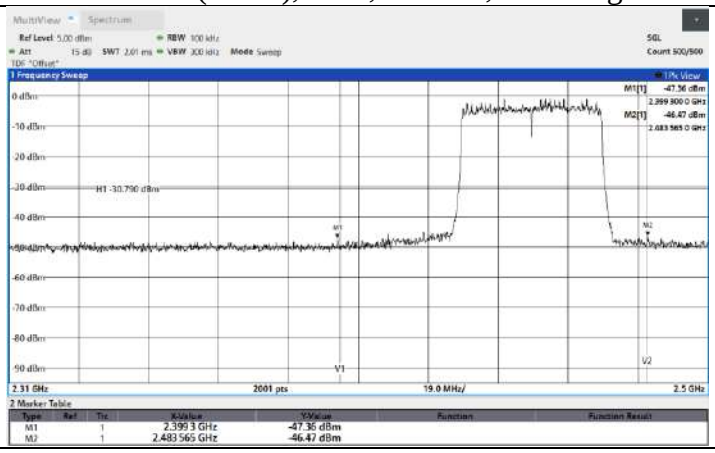
802.11ax(HE40), CH9, Chain 0, Reference



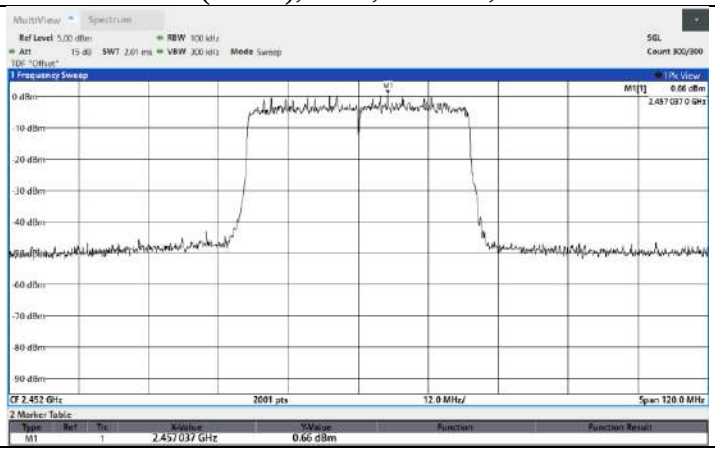
802.11ax(HE40), CH9, Chain 0, Conducted Emission



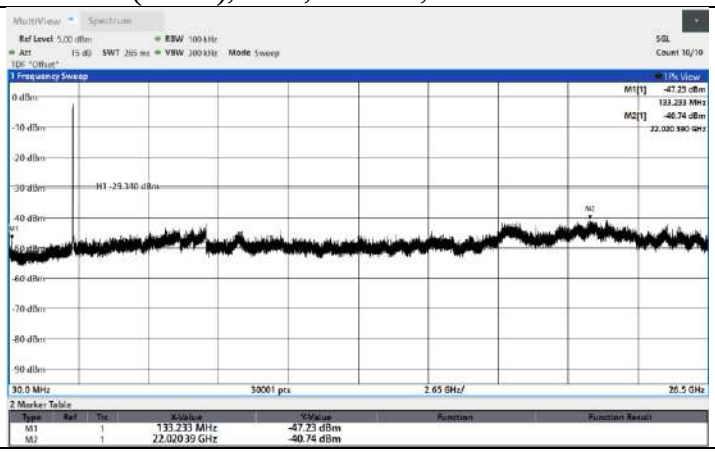
802.11ax(HE40), CH9, Chain 0, Band edge



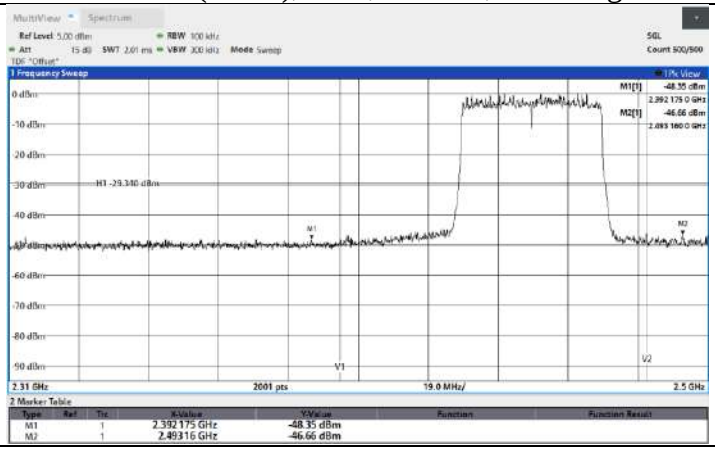
802.11ax(HE40), CH9, Chain 1, Reference



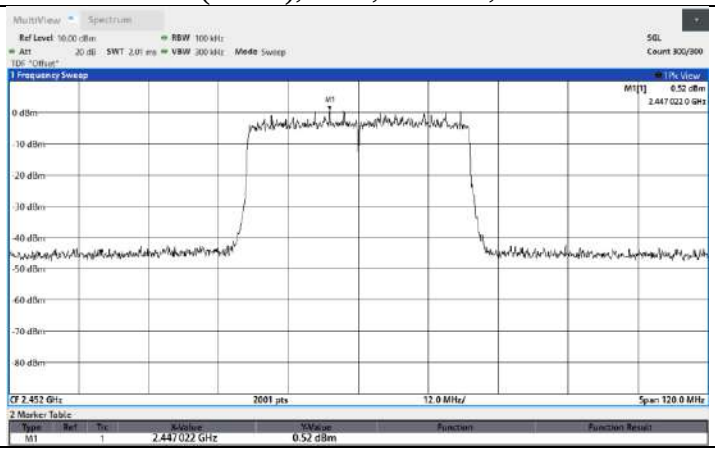
802.11ax(HE40), CH9, Chain 1, Conducted Emission



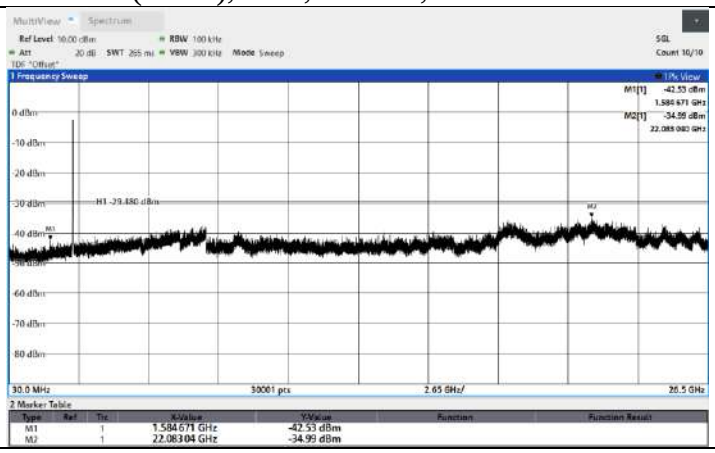
802.11ax(HE40), CH9, Chain 1, Band edge



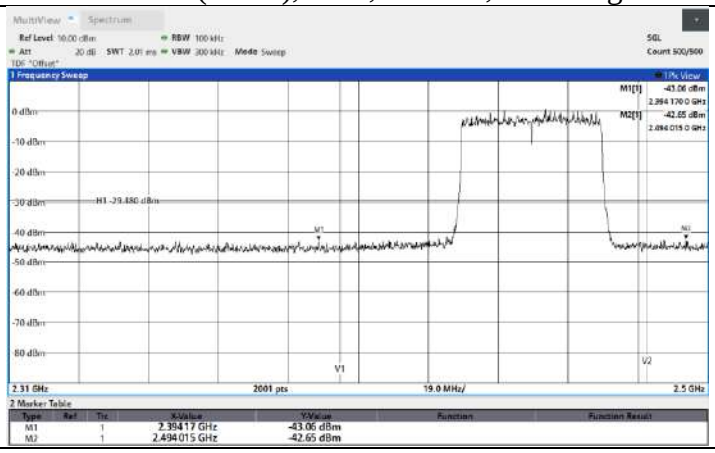
802.11ax(HE40), CH9, Chain 2, Reference



802.11ax(HE40), CH9, Chain 2, Conducted Emission



802.11ax(HE40), CH9, Chain 2, Band edge



9.5. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
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. 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.

Test Procedures

[For 9 kHz ~ 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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 height of antenna 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. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

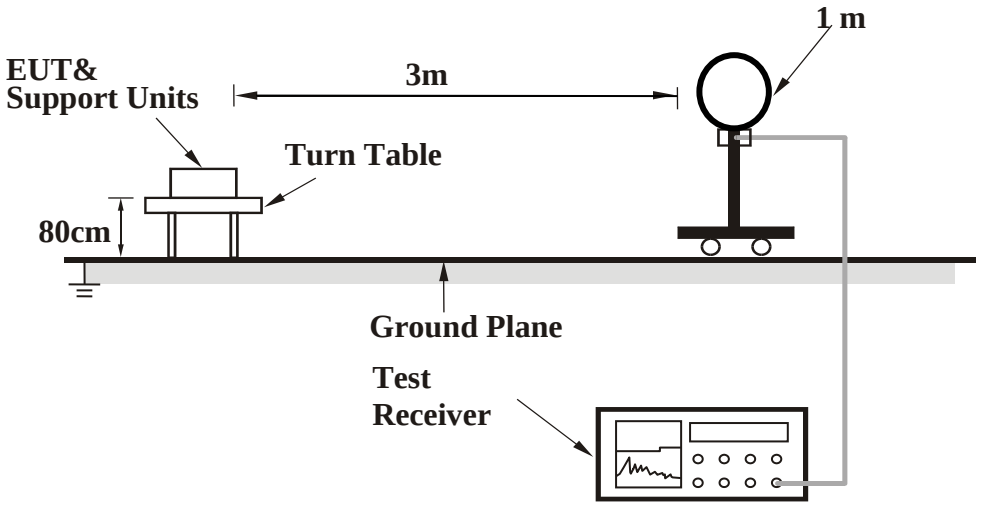
a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
802.11b	1MHz	Refer to section 6.6 for duty cycle.
802.11g		
802.11n (HT20)		
802.11n (HT40)		
802.11ac (VHT20)		
802.11ac (VHT40)		

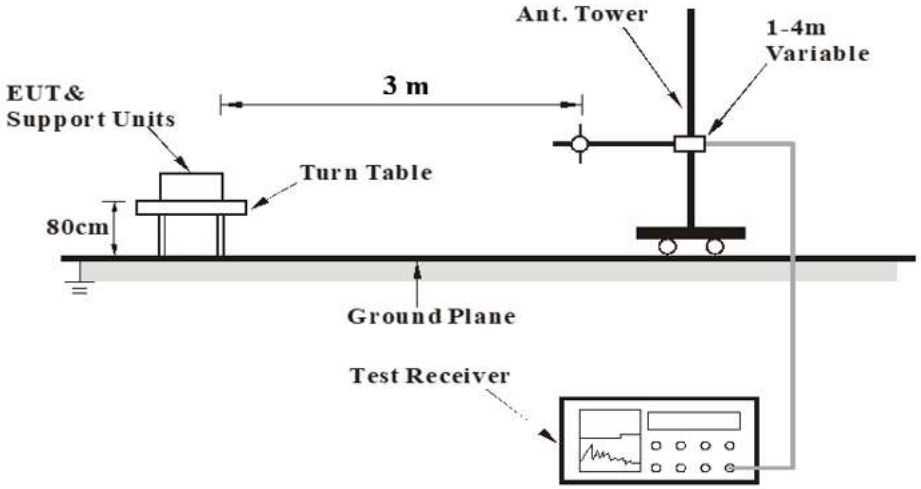
d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
e. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
f. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
g. Test data of Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
h. Test data of Notation "@" = Fundamental Frequency
i. Test data of Notation " * " = The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

Test Setup

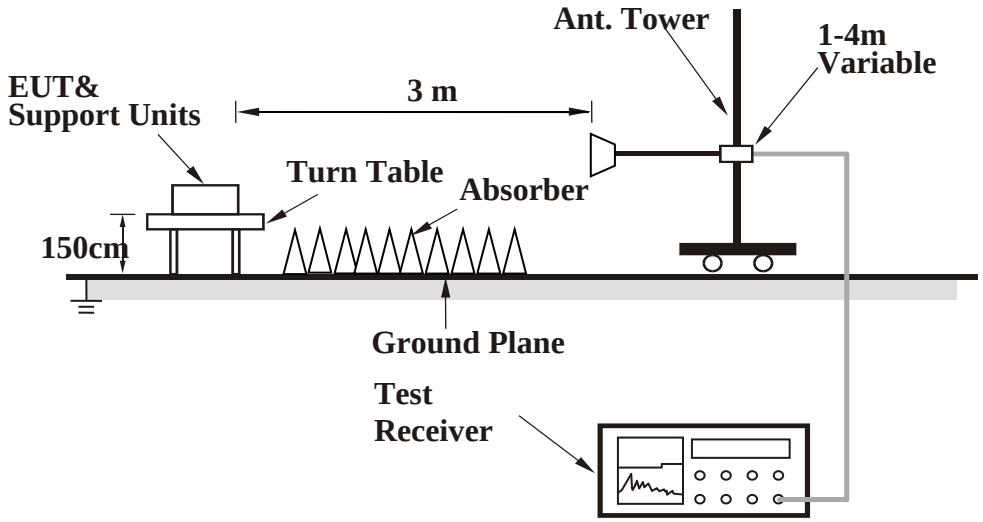
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



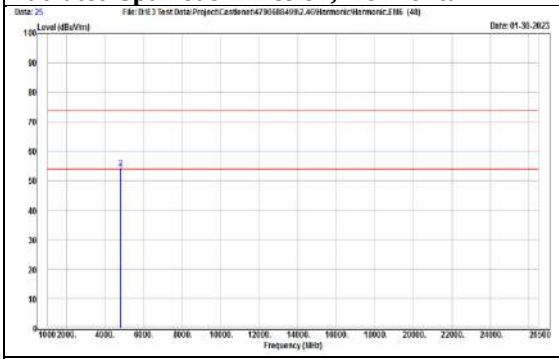
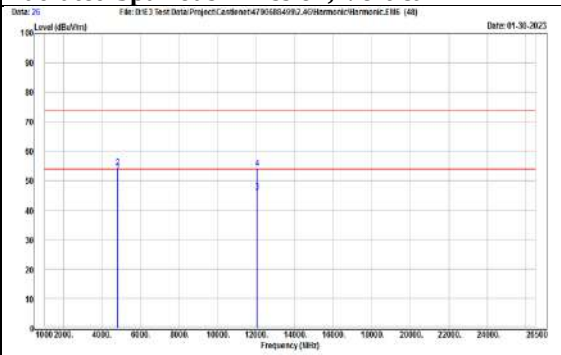
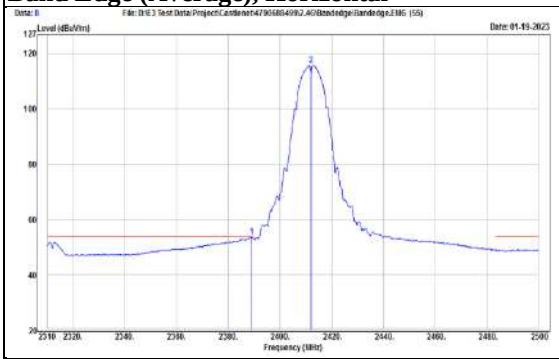
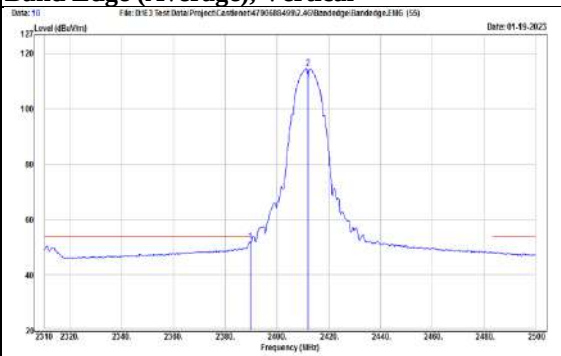
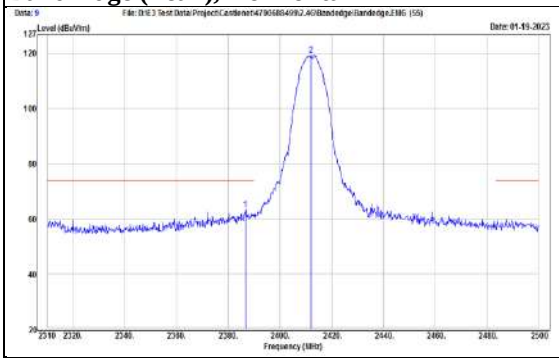
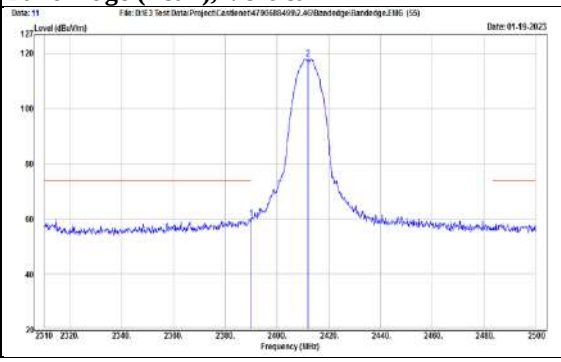
For the actual test configuration, please refer to the Setup Configurations.

Test Data

Above 1 GHz

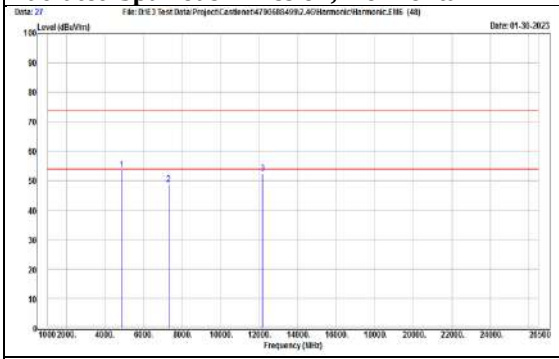
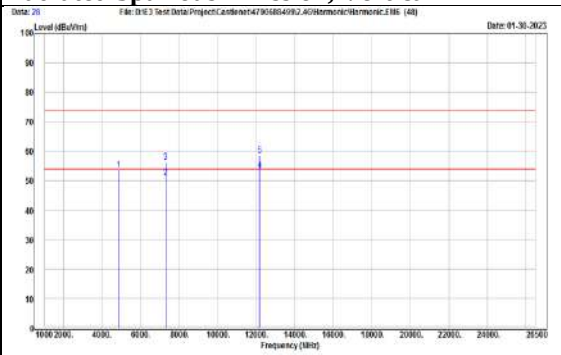
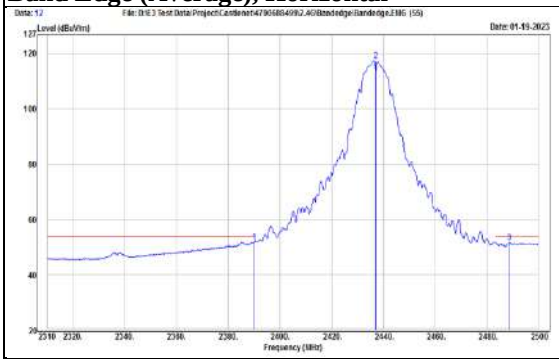
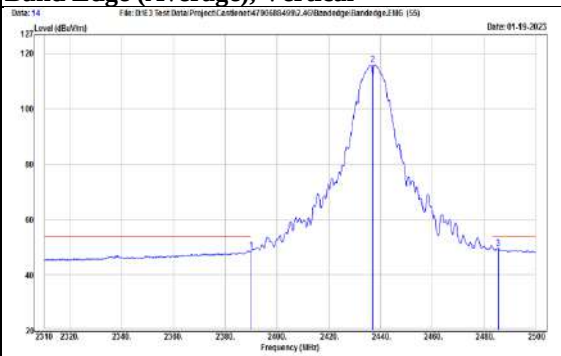
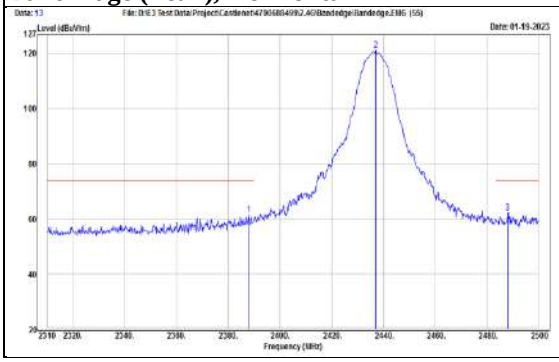
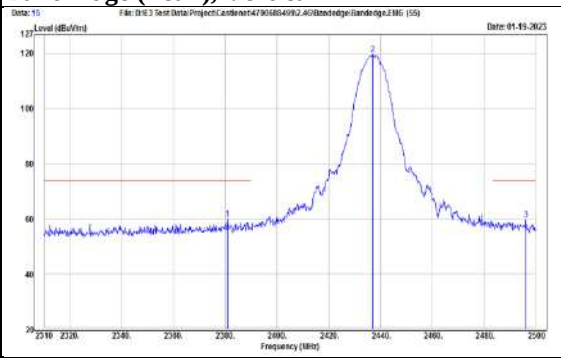
Mode	802.11b	Channel	1

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2386.57	47.3	16.01	63.31	74	-10.69	PK
		2389.04	37.67	16	53.67	54	-0.33	AVG
	@	2412	103.37	16.01	119.38	N/A	N/A	PK
	@	2412	99.84	16.01	115.85	N/A	N/A	AVG
		4824	51.84	2.39	54.23	74	-19.77	PK
		4824	50.72	2.39	53.11	54	-0.89	AVG
Vertical		2389.61	35.98	16	51.98	54	-2.02	AVG
		2389.99	44.11	16	60.11	74	-13.89	PK
	@	2412	102.19	16.01	118.2	N/A	N/A	PK
	@	2412	98.75	16.01	114.76	N/A	N/A	AVG
		4824	52.06	2.39	54.45	74	-19.55	PK
		4824	50.86	2.39	53.25	54	-0.75	AVG
		12060	35.28	18.88	54.16	74	-19.84	PK
		12060	27.15	18.88	46.03	54	-7.97	AVG

TX, 802.11b (Ch 1) **Radiated Spurious Emission, Horizontal**	**TX, 802.11b (Ch 1)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11b (Ch 1) **Band Edge (Average), Horizontal**	**TX, 802.11b (Ch 1)** **Band Edge (Average), Vertical**
	
TX, 802.11b (Ch 1) **Band Edge (Peak), Horizontal**	**TX, 802.11b (Ch 1)** **Band Edge (Peak), Vertical**
	

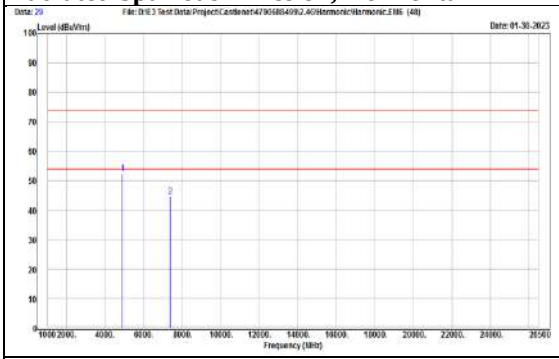
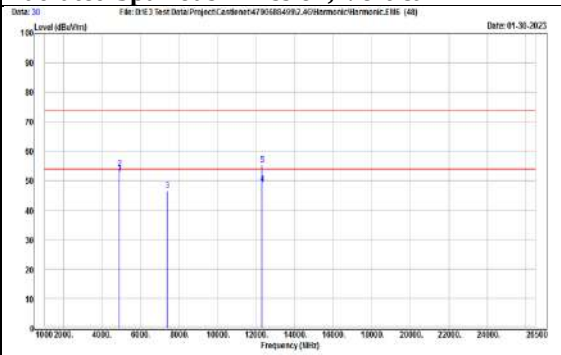
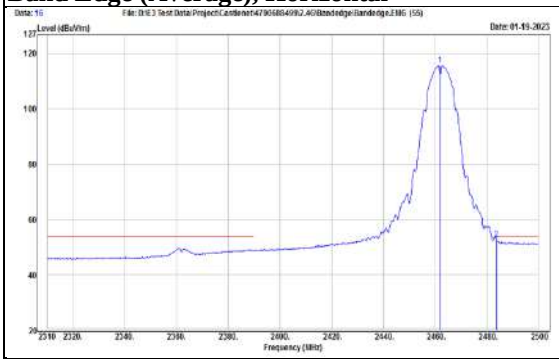
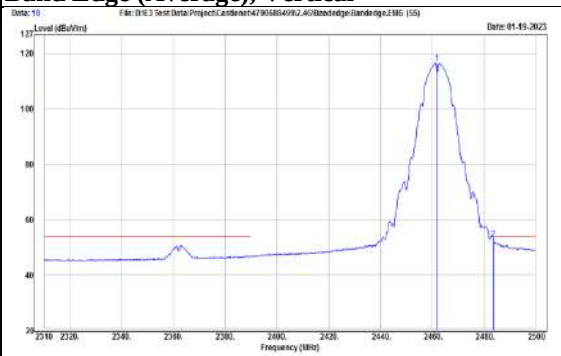
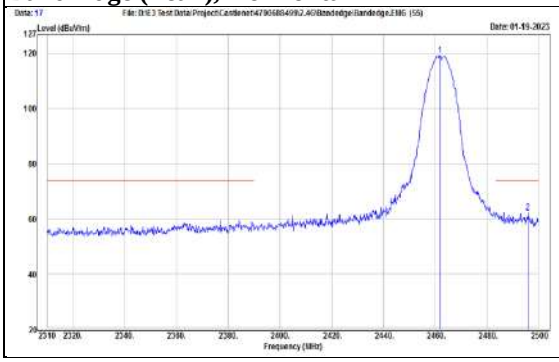
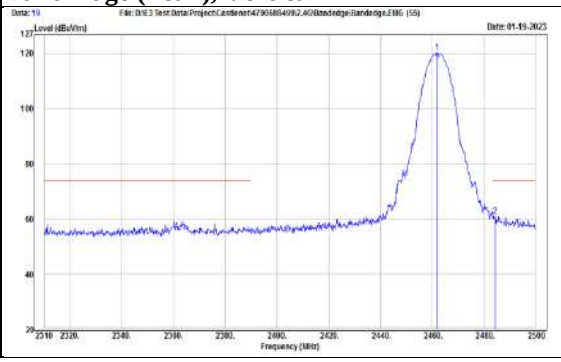
Mode	802.11b	Channel	6

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2387.9	45.45	16.01	61.46	74	-12.54	PK
		2389.99	35.87	16	51.87	54	-2.13	AVG
	@	2437	105.14	16.11	121.25	N/A	N/A	PK
	@	2437	101.27	16.11	117.38	N/A	N/A	AVG
		2488.03	46.55	15.85	62.4	74	-11.6	PK
		2488.6	35.81	15.84	51.65	54	-2.35	AVG
	*	4874	51.23	2.43	53.66	74	-20.34	PK
	*	7311	38.22	10.48	48.7	74	-25.3	PK
	*	12185	33.26	19.29	52.55	74	-21.45	PK
Vertical		2380.87	44.02	16.02	60.04	74	-13.96	PK
		2389.99	32.73	16	48.73	54	-5.27	AVG
	@	2437	103.61	16.11	119.72	N/A	N/A	PK
	@	2437	99.94	16.11	116.05	N/A	N/A	AVG
		2485.56	33.69	15.86	49.55	54	-4.45	AVG
		2496.2	43.86	15.78	59.64	74	-14.36	PK
	*	4874	51.35	2.43	53.78	74	-20.22	PK
		7311	45.74	10.48	56.22	74	-17.78	PK
		7311	40.61	10.48	51.09	54	-2.91	AVG
		12185	39.37	19.29	58.66	74	-15.34	PK
		12185	34.22	19.29	53.51	54	-0.49	AVG

TX, 802.11b (Ch 6) **Radiated Spurious Emission, Horizontal**	**TX, 802.11b (Ch 6)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11b (Ch 6) **Band Edge (Average), Horizontal**	**TX, 802.11b (Ch 6)** **Band Edge (Average), Vertical**
	
TX, 802.11b (Ch 6) **Band Edge (Peak), Horizontal**	**TX, 802.11b (Ch 6)** **Band Edge (Peak), Vertical**
	

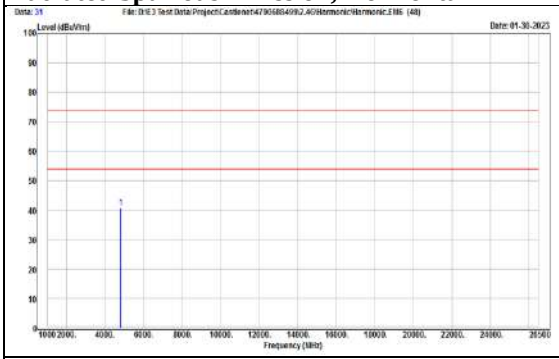
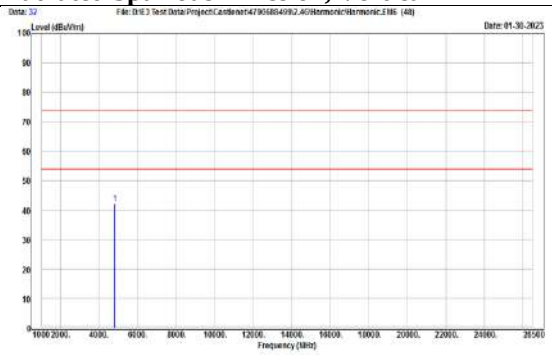
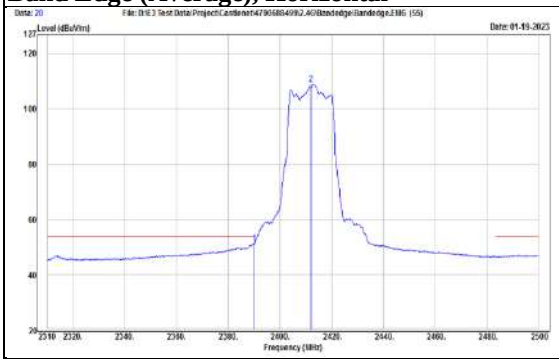
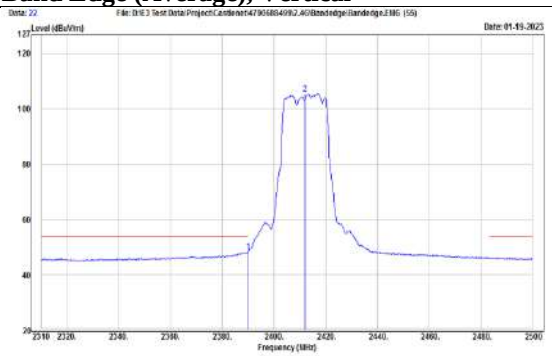
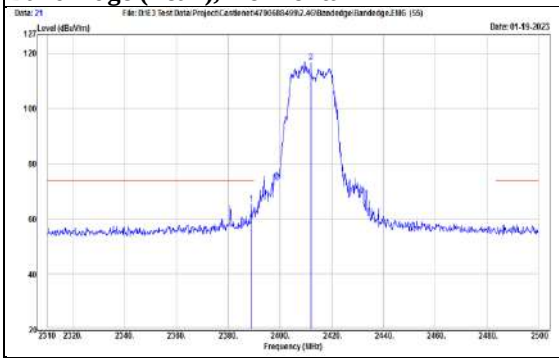
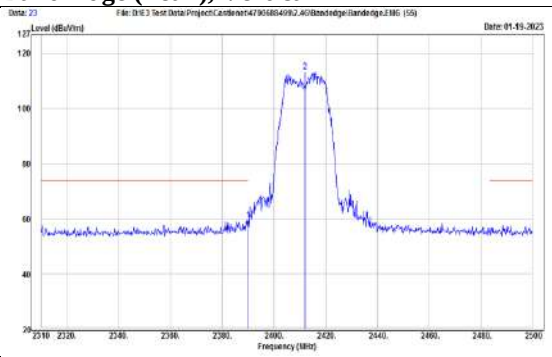
Mode	802.11b	Channel	11

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2462	103.38	16.07	119.45	N/A	N/A	PK
	@	2462	99.61	16.07	115.68	N/A	N/A	AVG
		2483.66	36.87	15.88	52.75	54	-1.25	AVG
		2495.82	46.56	15.78	62.34	74	-11.66	PK
	*	4924	50.04	2.43	52.47	74	-21.53	PK
	*	7386	33.94	10.64	44.58	74	-29.42	PK
Vertical	@	2462	104.36	16.07	120.43	N/A	N/A	PK
	@	2462	100.52	16.07	116.59	N/A	N/A	AVG
		2483.66	36.95	15.88	52.83	54	-1.17	AVG
		2484.42	45.19	15.88	61.07	74	-12.93	PK
		4924	51.84	2.43	54.27	74	-19.73	PK
		4924	49.98	2.43	52.41	54	-1.59	AVG
	*	7386	35.92	10.64	46.56	74	-27.44	PK
		12310	36.07	19.3	55.37	74	-18.63	PK
		12310	29.46	19.3	48.76	54	-5.24	AVG

TX, 802.11b (Ch 11) **Radiated Spurious Emission, Horizontal**	**TX, 802.11b (Ch 11)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11b (Ch 11) **Band Edge (Average), Horizontal**	**TX, 802.11b (Ch 11)** **Band Edge (Average), Vertical**
	
TX, 802.11b (Ch 11) **Band Edge (Peak), Horizontal**	**TX, 802.11b (Ch 11)** **Band Edge (Peak), Vertical**
	

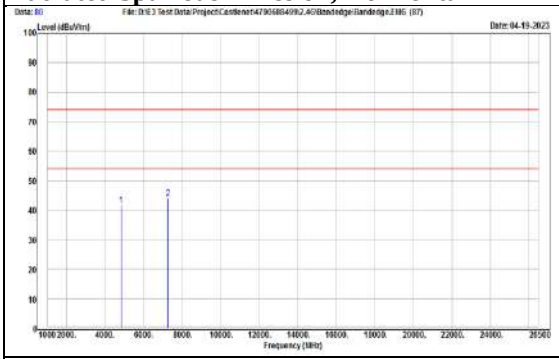
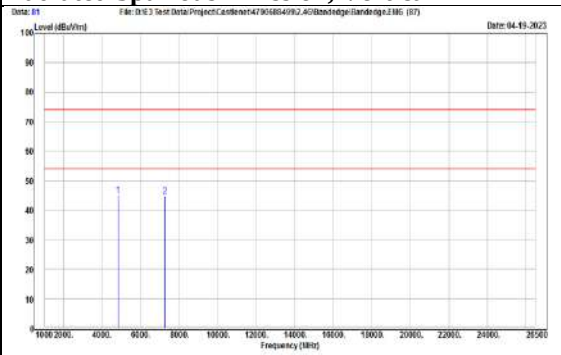
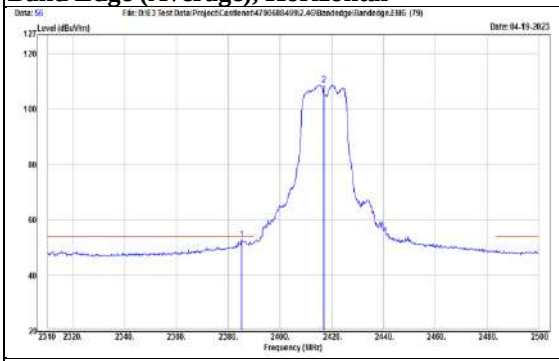
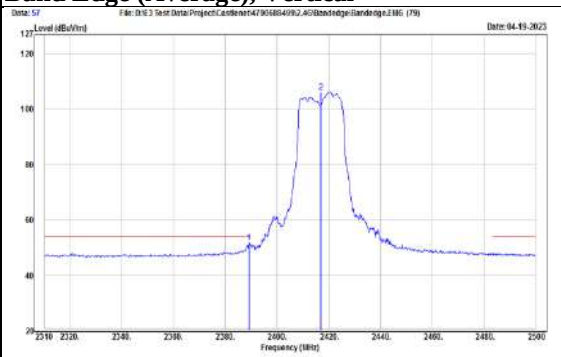
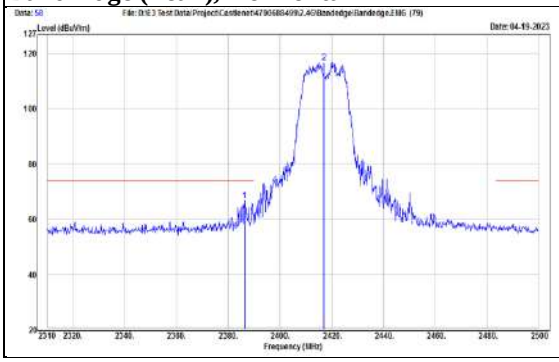
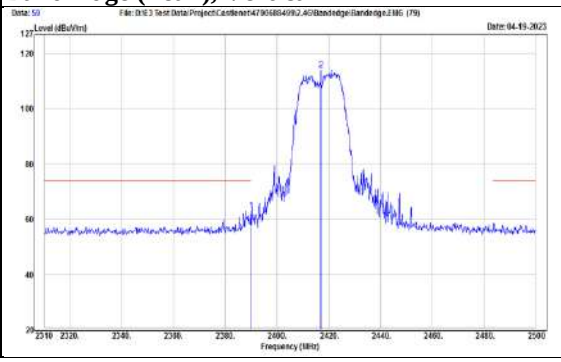
Mode	802.11g	Channel	1

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2388.85	49.33	16	65.33	74	-8.67	PK
		2389.99	35.3	16	51.3	54	-2.7	AVG
	@	2412	100.74	16.01	116.75	N/A	N/A	PK
	@	2412	93.02	16.01	109.03	N/A	N/A	AVG
	*	4824	38.3	2.39	40.69	74	-33.31	PK
Vertical		2389.99	43.56	16	59.56	74	-14.44	PK
		2389.99	32.2	16	48.2	54	-5.8	AVG
	@	2412	97.45	16.01	113.46	N/A	N/A	PK
	@	2412	89.35	16.01	105.36	N/A	N/A	AVG
	*	4824	39.69	2.39	42.08	74	-31.92	PK

TX, 802.11g (Ch 1) **Radiated Spurious Emission, Horizontal**	**TX, 802.11g (Ch 1)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11g (Ch 1) **Band Edge (Average), Horizontal**	**TX, 802.11g (Ch 1)** **Band Edge (Average), Vertical**
	
TX, 802.11g (Ch 1) **Band Edge (Peak), Horizontal**	**TX, 802.11g (Ch 1)** **Band Edge (Peak), Vertical**
	

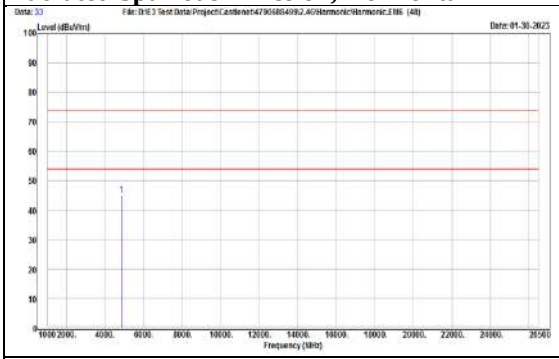
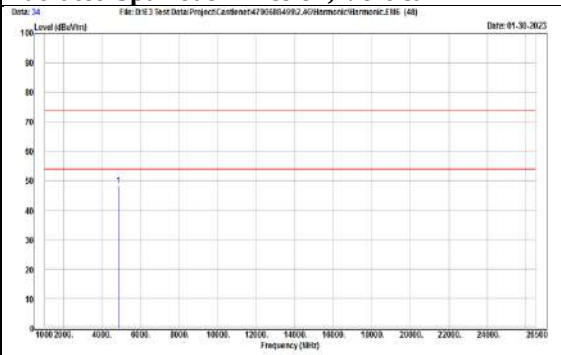
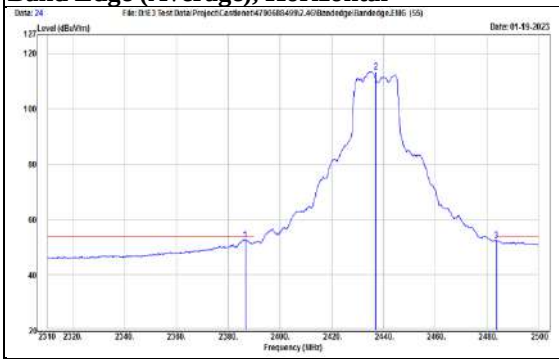
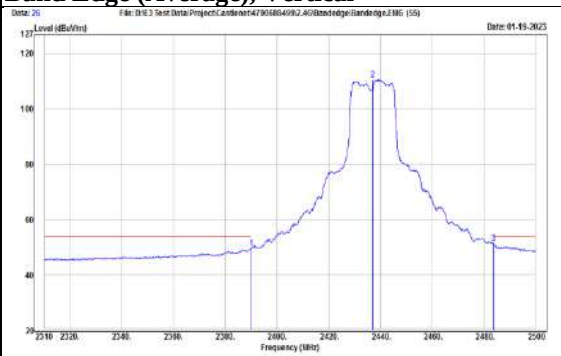
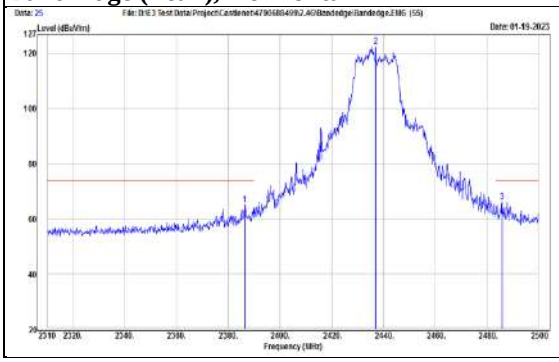
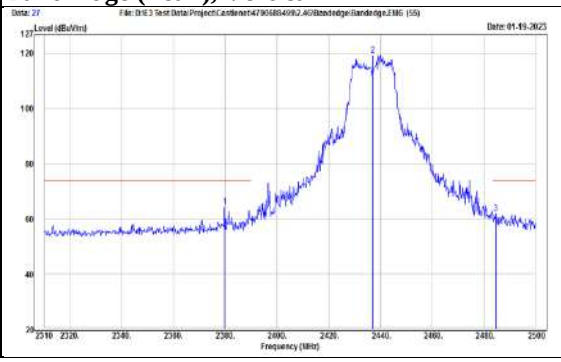
Mode	802.11g	Channel	2

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2385.24	37	15.87	52.87	54	-1.13	AVG
		2386.38	50.71	15.87	66.58	74	-7.42	PK
	@	2417	100.83	15.89	116.72	N/A	N/A	PK
	@	2417	92.83	15.89	108.72	N/A	N/A	AVG
	*	4834	39.39	2.17	41.56	74	-32.44	PK
	*	7251	33.78	10.38	44.16	74	-29.84	PK
Vertical		2389.23	35.68	15.86	51.54	54	-2.46	AVG
		2389.99	47.26	15.86	63.12	74	-10.88	PK
	@	2417	98.13	15.89	114.02	N/A	N/A	PK
	@	2417	90.03	15.89	105.92	N/A	N/A	AVG
	*	4834	42.85	2.17	45.02	74	-28.98	PK
	*	7251	34.52	10.38	44.9	74	-29.1	PK

TX, 802.11g (Ch 2) **Radiated Spurious Emission, Horizontal**	**TX, 802.11g (Ch 2)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11g (Ch 2) **Band Edge (Average), Horizontal**	**TX, 802.11g (Ch 2)** **Band Edge (Average), Vertical**
	
TX, 802.11g (Ch 2) **Band Edge (Peak), Horizontal**	**TX, 802.11g (Ch 2)** **Band Edge (Peak), Vertical**
	

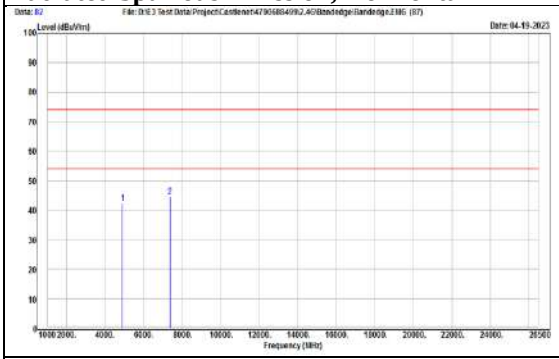
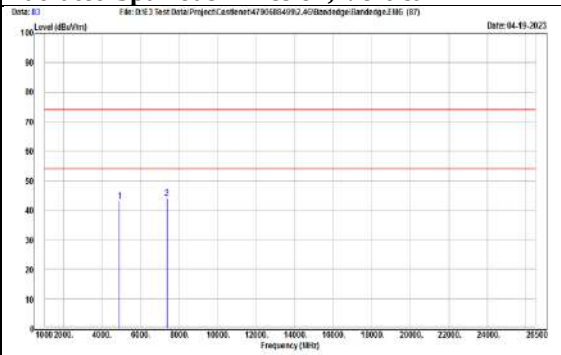
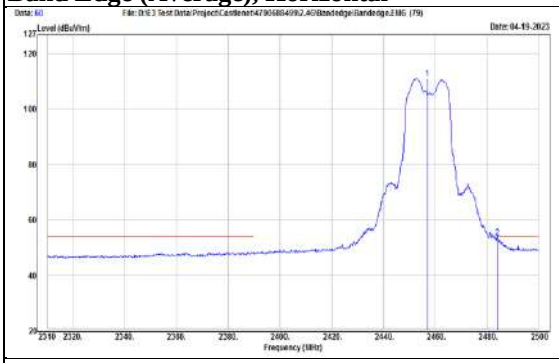
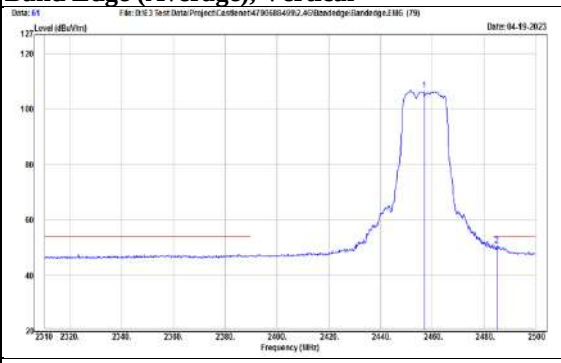
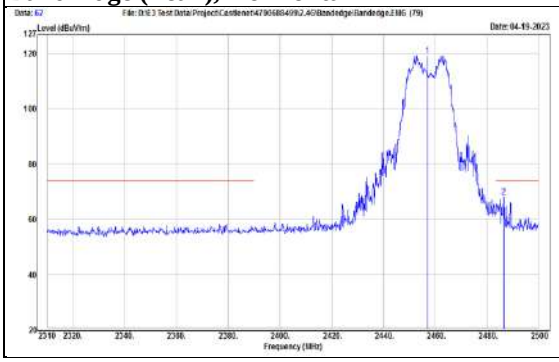
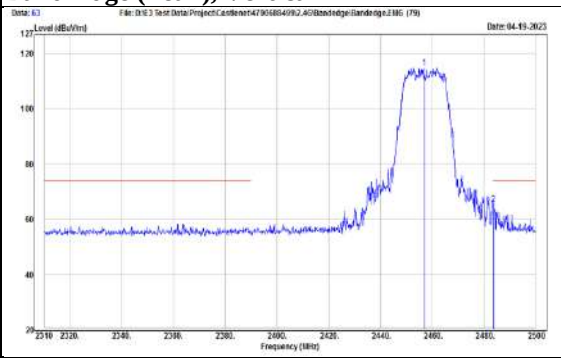
Mode	802.11g	Channel	6

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2386.38	49.13	16.01	65.14	74	-8.86	PK
		2386.57	36.67	16.01	52.68	54	-1.32	AVG
	@	2437	106.4	16.11	122.51	N/A	N/A	PK
	@	2437	97.31	16.11	113.42	N/A	N/A	AVG
		2483.66	36.48	15.88	52.36	54	-1.64	AVG
		2485.94	50.31	15.86	66.17	74	-7.83	PK
	*	4874	42.76	2.43	45.19	74	-28.81	PK
Vertical		2379.73	48.29	16.02	64.31	74	-9.69	PK
		2389.99	33.53	16	49.53	54	-4.47	AVG
	@	2437	103.23	16.11	119.34	N/A	N/A	PK
	@	2437	94.4	16.11	110.51	N/A	N/A	AVG
		2483.85	35.41	15.88	51.29	54	-2.71	AVG
		2484.61	46.18	15.87	62.05	74	-11.95	PK
	*	4874	45.75	2.43	48.18	74	-25.82	PK

TX, 802.11g (Ch 6) **Radiated Spurious Emission, Horizontal**	**TX, 802.11g (Ch 6)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11g (Ch 6) **Band Edge (Average), Horizontal**	**TX, 802.11g (Ch 6)** **Band Edge (Average), Vertical**
	
TX, 802.11g (Ch 6) **Band Edge (Peak), Horizontal**	**TX, 802.11g (Ch 6)** **Band Edge (Peak), Vertical**
	

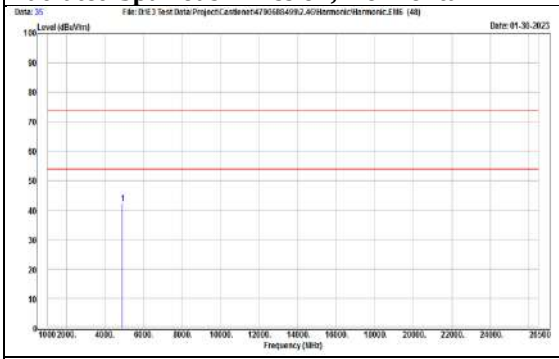
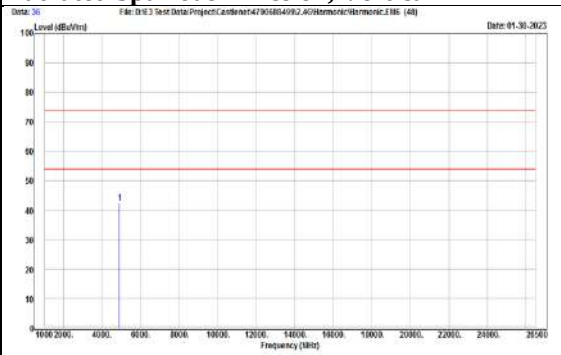
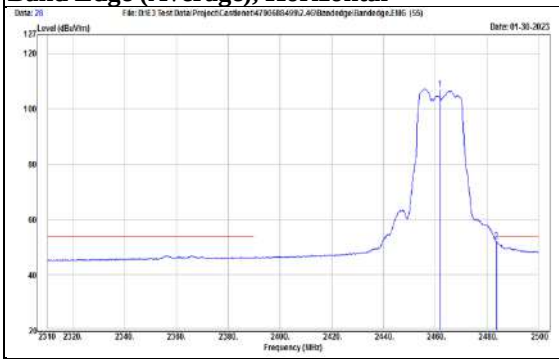
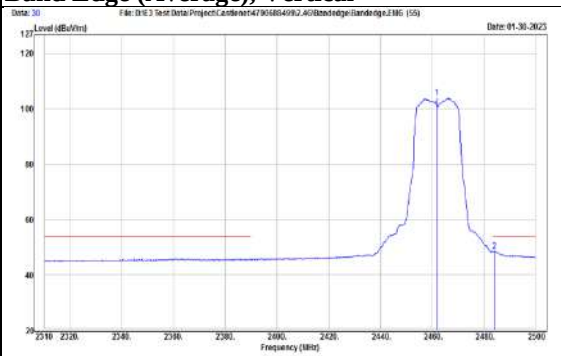
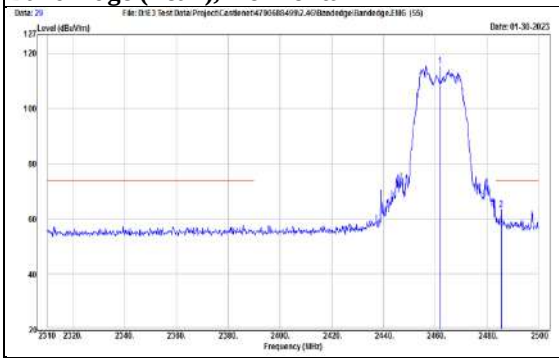
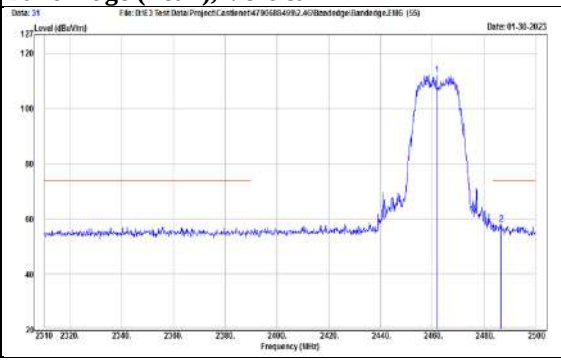
Mode	802.11g	Channel	10

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2457	103.28	15.98	119.26	N/A	N/A	PK
	@	2457	94.96	15.98	110.94	N/A	N/A	AVG
		2484.23	37.62	15.81	53.43	54	-0.57	AVG
		2486.51	52.21	15.8	68.01	74	-5.99	PK
	*	4914	40.15	2.24	42.39	74	-31.61	PK
	*	7371	34.06	10.47	44.53	74	-29.47	PK
Vertical	@	2457	98.94	15.98	114.92	N/A	N/A	PK
	@	2457	90.73	15.98	106.71	N/A	N/A	AVG
		2483.66	49.56	15.81	65.37	74	-8.63	PK
		2485.18	34.87	15.8	50.67	54	-3.33	AVG
	*	4914	40.82	2.24	43.06	74	-30.94	PK
	*	7371	33.7	10.47	44.17	74	-29.83	PK

TX, 802.11g (Ch 10) **Radiated Spurious Emission, Horizontal**	**TX, 802.11g (Ch 10)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11g (Ch 10) **Band Edge (Average), Horizontal**	**TX, 802.11g (Ch 10)** **Band Edge (Average), Vertical**
	
TX, 802.11g (Ch 10) **Band Edge (Peak), Horizontal**	**TX, 802.11g (Ch 10)** **Band Edge (Peak), Vertical**
	

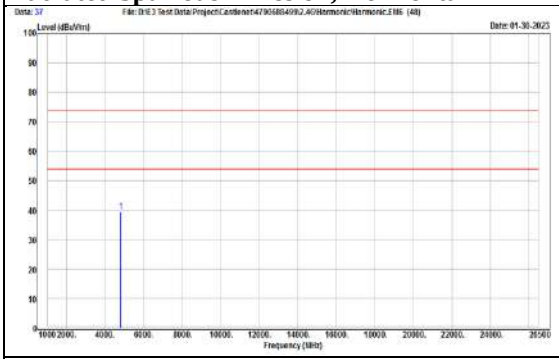
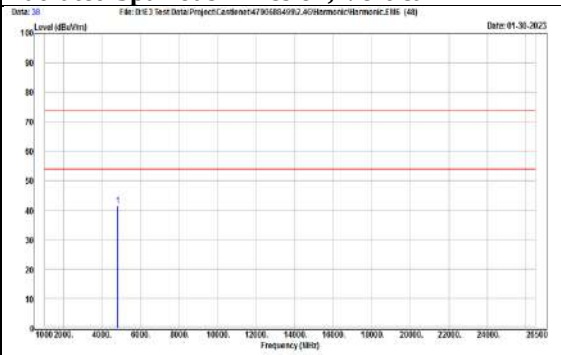
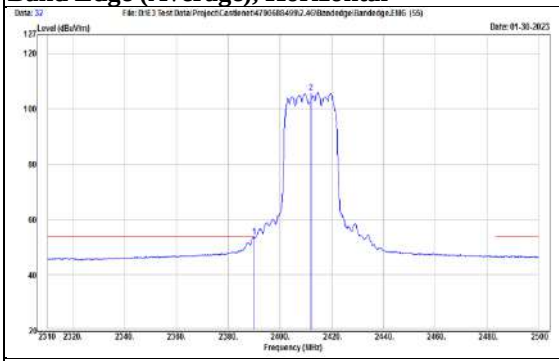
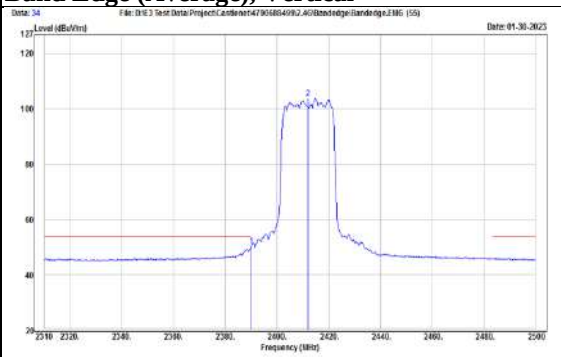
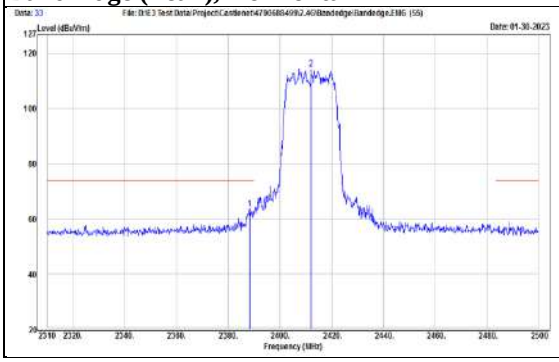
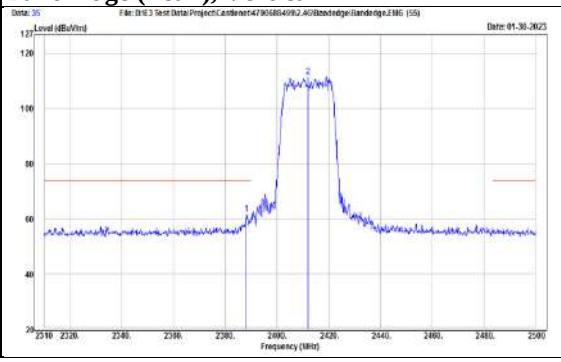
Mode	802.11g	Channel	11

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2462	99.32	16.07	115.39	N/A	N/A	PK
	@	2462	91.15	16.07	107.22	N/A	N/A	AVG
		2483.66	36.22	15.88	52.1	54	-1.9	AVG
		2485.56	47.44	15.86	63.3	74	-10.7	PK
	*	4924	39.83	2.43	42.26	74	-31.74	PK
Vertical	@	2462	96.23	16.07	112.3	N/A	N/A	PK
	@	2462	87.9	16.07	103.97	N/A	N/A	AVG
		2484.23	32.62	15.88	48.5	54	-5.5	AVG
		2486.7	42.24	15.86	58.1	74	-15.9	PK
	*	4924	40.03	2.43	42.46	74	-31.54	PK

TX, 802.11g (Ch 11) **Radiated Spurious Emission, Horizontal**	**TX, 802.11g (Ch 11)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11g (Ch 11) **Band Edge (Average), Horizontal**	**TX, 802.11g (Ch 11)** **Band Edge (Average), Vertical**
	
TX, 802.11g (Ch 11) **Band Edge (Peak), Horizontal**	**TX, 802.11g (Ch 11)** **Band Edge (Peak), Vertical**
	

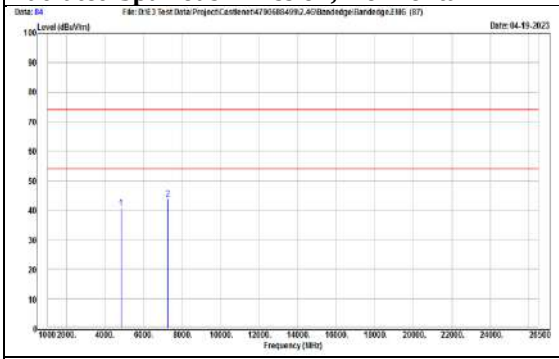
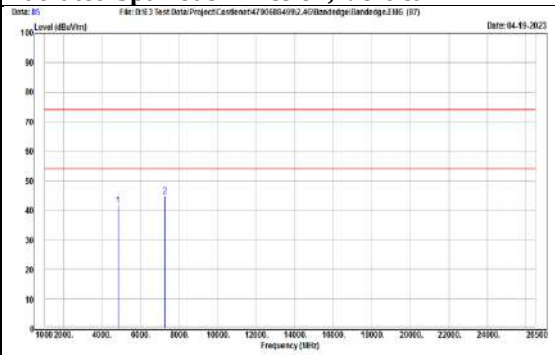
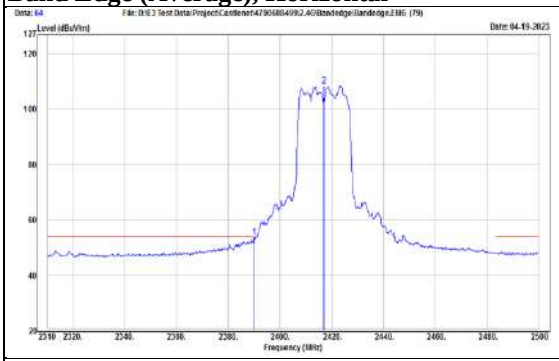
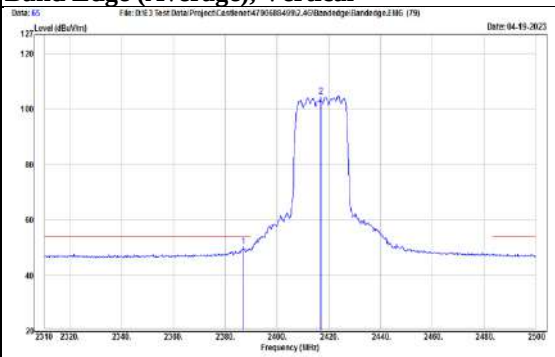
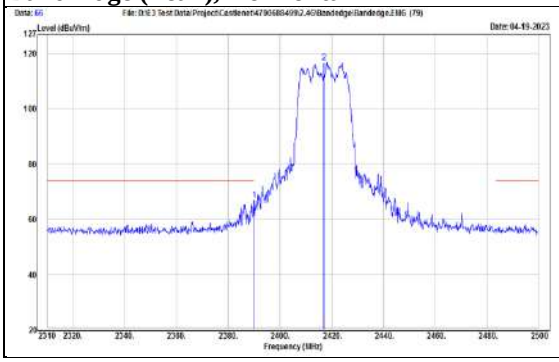
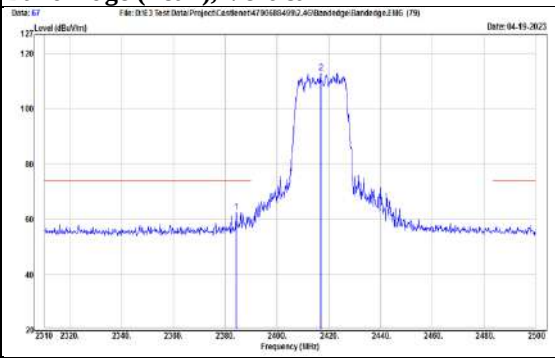
Mode	802.11ax(HE20)	Channel	1

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2388.28	47.55	16.01	63.56	74	-10.44	PK
		2389.99	37.62	16	53.62	54	-0.38	AVG
	@	2412	98.37	16.01	114.38	N/A	N/A	PK
	@	2412	89.83	16.01	105.84	N/A	N/A	AVG
	*	4824	37.19	2.39	39.58	74	-34.42	PK
Vertical		2388.09	45.86	16.01	61.87	74	-12.13	PK
		2389.99	34.24	16	50.24	54	-3.76	AVG
	@	2412	95.61	16.01	111.62	N/A	N/A	PK
	@	2412	87.72	16.01	103.73	N/A	N/A	AVG
	*	4824	39.14	2.39	41.53	74	-32.47	PK

TX, 802.11ax(HE20) (Ch 1) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE20) (Ch 1)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE20) (Ch 1) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE20) (Ch 1)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE20) (Ch 1) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE20) (Ch 1)** **Band Edge (Peak), Vertical**
	

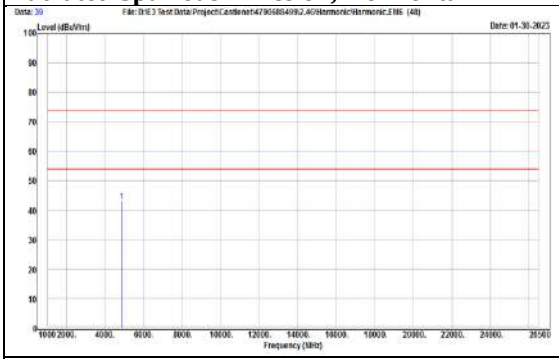
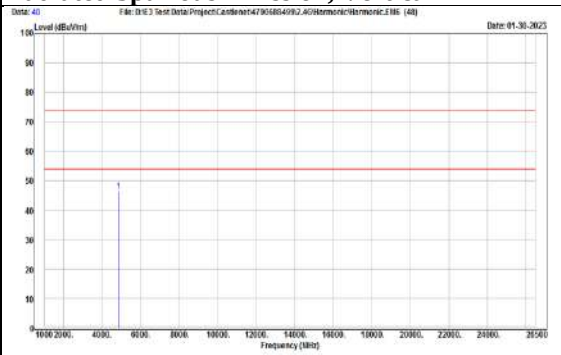
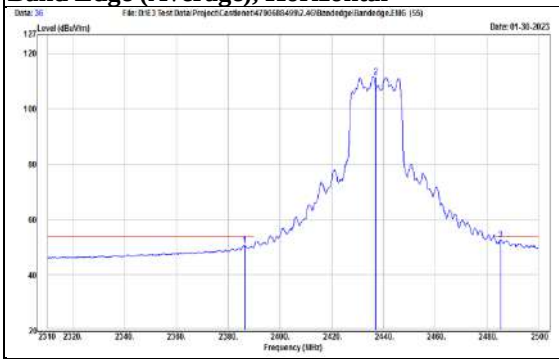
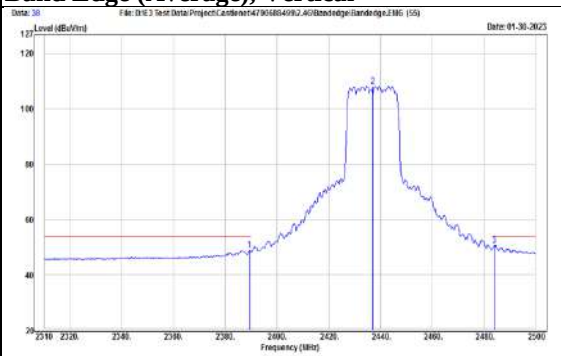
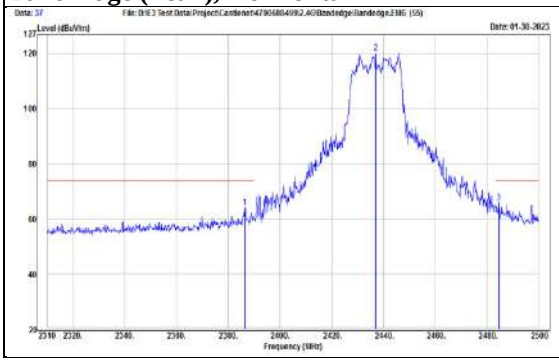
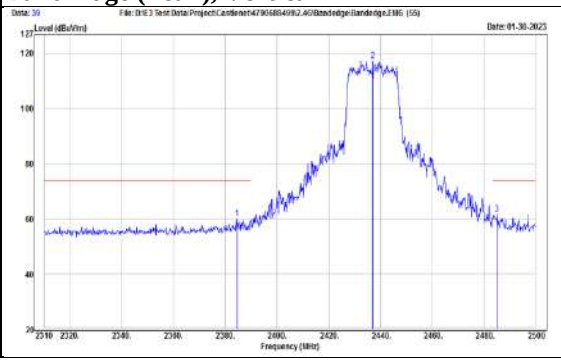
Mode	802.11ax(HE20)	Channel	2

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2389.99	50.99	15.86	66.85	74	-7.15	PK
		2389.99	37.69	15.86	53.55	54	-0.45	AVG
	@	2417	100.62	15.89	116.51	N/A	N/A	PK
	@	2417	92.34	15.89	108.23	N/A	N/A	AVG
	*	4834	38.5	2.17	40.67	74	-33.33	PK
	*	7251	33.4	10.38	43.78	74	-30.22	PK
Vertical		2384.29	46.64	15.87	62.51	74	-11.49	PK
		2386.95	34.49	15.87	50.36	54	-3.64	AVG
	@	2417	97.09	15.89	112.98	N/A	N/A	PK
	@	2417	88.65	15.89	104.54	N/A	N/A	AVG
	*	4834	39.47	2.17	41.64	74	-32.36	PK
	*	7251	34.32	10.38	44.7	74	-29.3	PK

TX, 802.11ax(HE20) (Ch 2) Radiated Spurious Emission, Horizontal	TX, 802.11ax(HE20) (Ch 2) Radiated Spurious Emission, Vertical
	
TX, 802.11ax(HE20) (Ch 2) Band Edge (Average), Horizontal	**TX, 802.11ax(HE20) (Ch 2) Band Edge (Average), Vertical**
	
TX, 802.11ax(HE20) (Ch 2) Band Edge (Peak), Horizontal	**TX, 802.11ax(HE20) (Ch 2) Band Edge (Peak), Vertical**
	

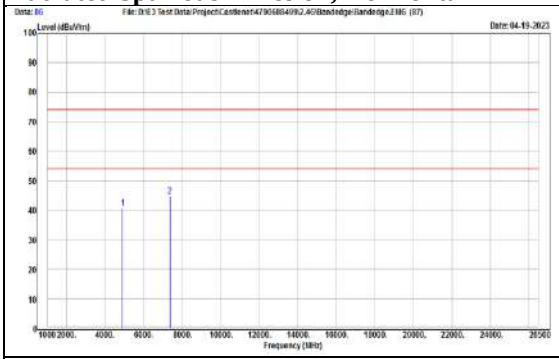
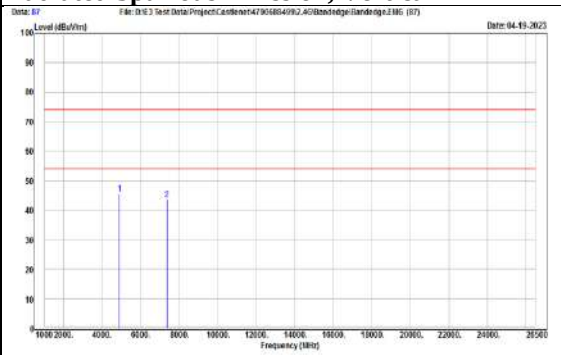
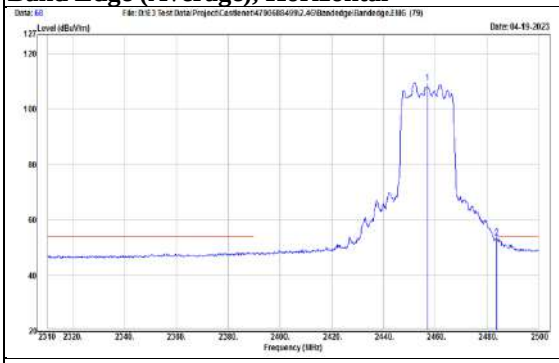
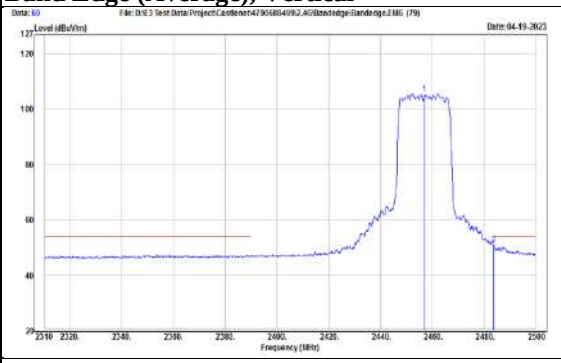
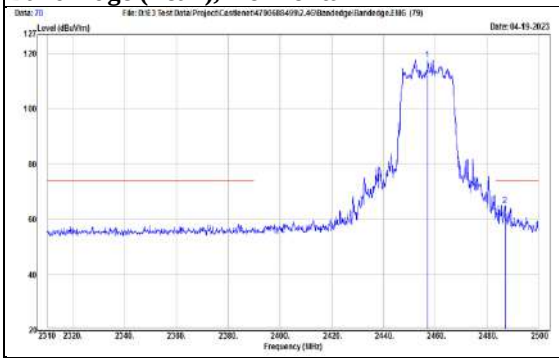
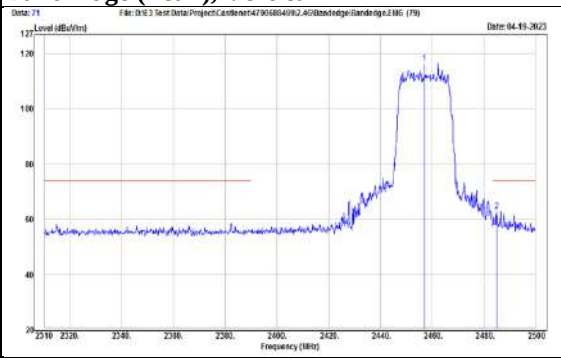
Mode	802.11ax(HE20)	Channel	6

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2386.38	48.1	16.01	64.11	74	-9.89	PK
		2386.38	34.52	16.01	50.53	54	-3.47	AVG
	@	2437	104.01	16.11	120.12	N/A	N/A	PK
	@	2437	95.39	16.11	111.5	N/A	N/A	AVG
		2484.61	49.97	15.87	65.84	74	-8.16	PK
		2485.37	36.62	15.87	52.49	54	-1.51	AVG
	*	4874	40.47	2.43	42.9	74	-31.1	PK
Vertical		2384.67	44.22	16.01	60.23	74	-13.77	PK
		2389.42	32.88	16	48.88	54	-5.12	AVG
	@	2437	101.29	16.11	117.4	N/A	N/A	PK
	@	2437	92.17	16.11	108.28	N/A	N/A	AVG
		2484.23	34.75	15.88	50.63	54	-3.37	AVG
		2485.18	45.83	15.87	61.7	74	-12.3	PK
	*	4874	43.93	2.43	46.36	74	-27.64	PK

TX, 802.11ax(HE20) (Ch 6) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE20) (Ch 6)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE20) (Ch 6) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE20) (Ch 6)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE20) (Ch 6) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE20) (Ch 6)** **Band Edge (Peak), Vertical**
	

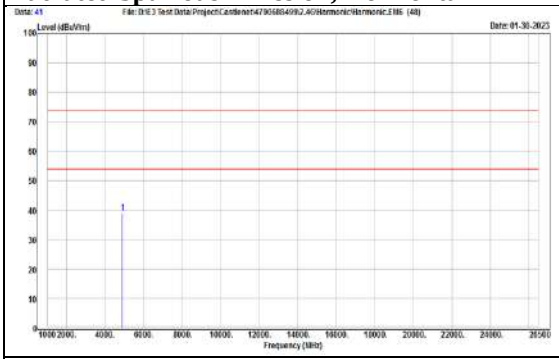
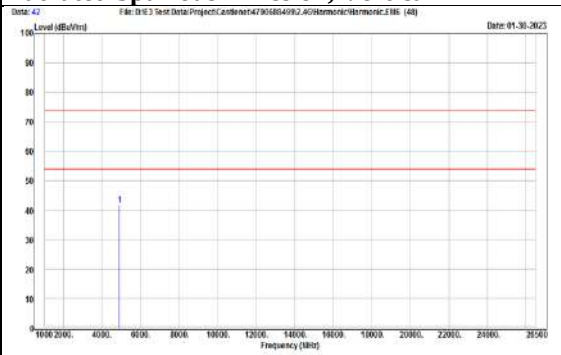
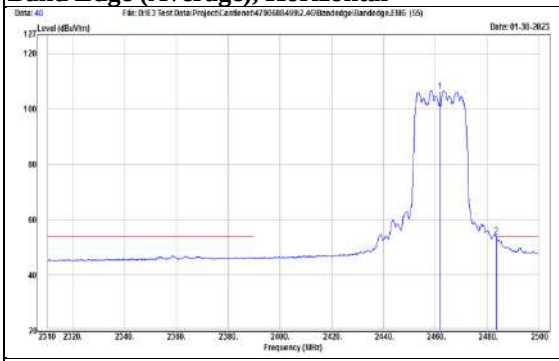
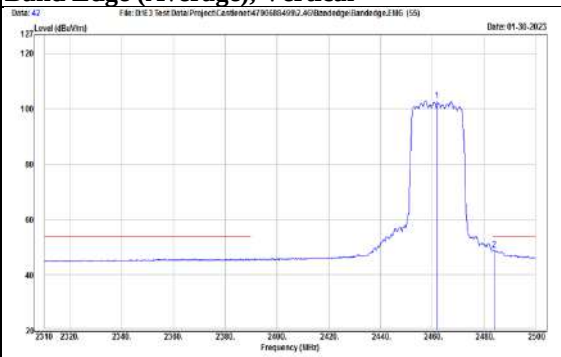
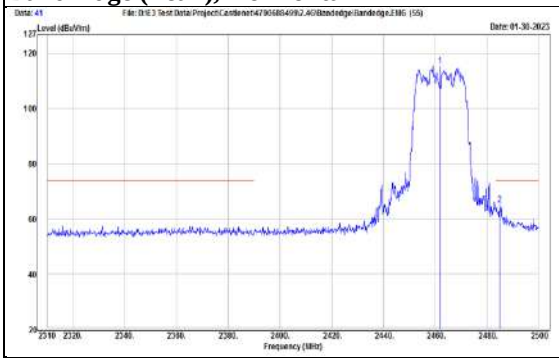
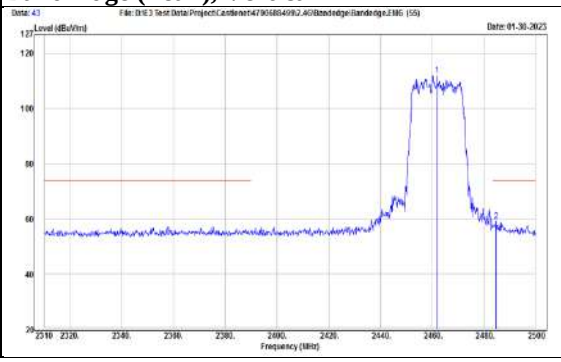
Mode	802.11ax(HE20)	Channel	10

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2457	101.8	15.98	117.78	N/A	N/A	PK
	@	2457	93.48	15.98	109.46	N/A	N/A	AVG
		2483.85	37.73	15.81	53.54	54	-0.46	AVG
		2487.08	49.08	15.79	64.87	74	-9.13	PK
	*	4914	38.33	2.24	40.57	74	-33.43	PK
	*	7371	34.32	10.47	44.79	74	-29.21	PK
Vertical	@	2457	100.31	15.98	116.29	N/A	N/A	PK
	@	2457	89.64	15.98	105.62	N/A	N/A	AVG
		2483.85	34.93	15.81	50.74	54	-3.26	AVG
		2484.99	46.94	15.8	62.74	74	-11.26	PK
	*	4914	43.31	2.24	45.55	74	-28.45	PK
	*	7371	33.1	10.47	43.57	74	-30.43	PK

TX, 802.11ax(HE20) (Ch 10) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE20) (Ch 10)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE20) (Ch 10) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE20) (Ch 10)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE20) (Ch 10) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE20) (Ch 10)** **Band Edge (Peak), Vertical**
	

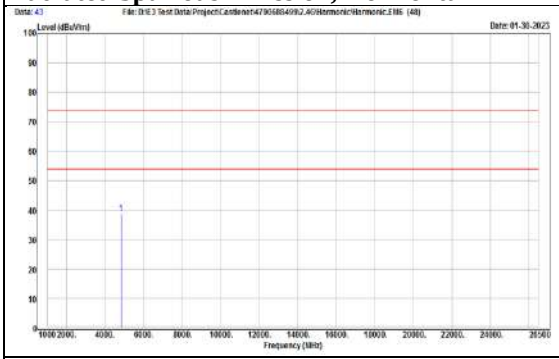
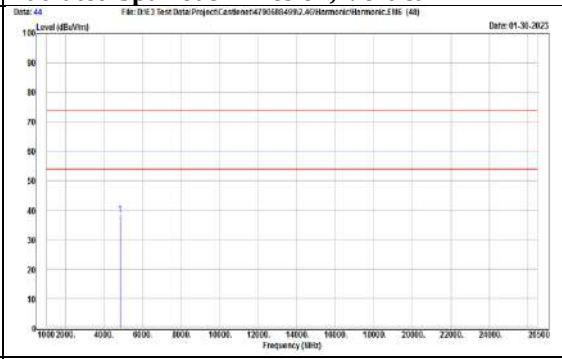
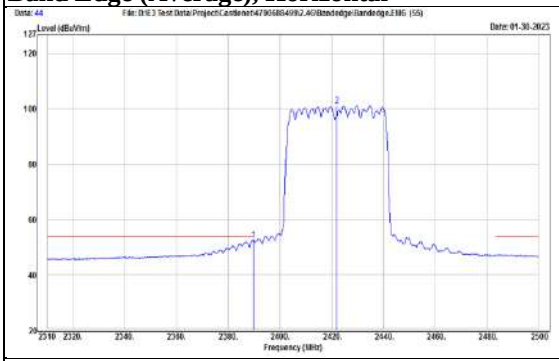
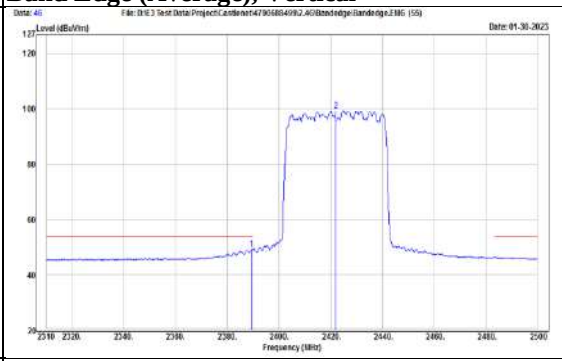
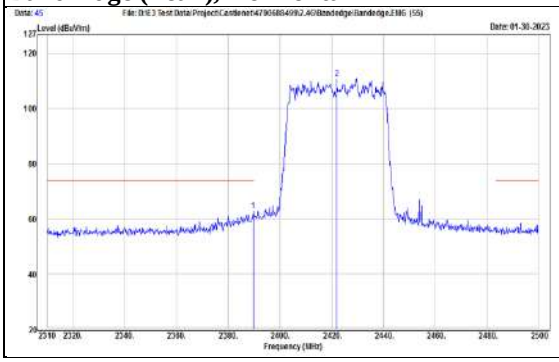
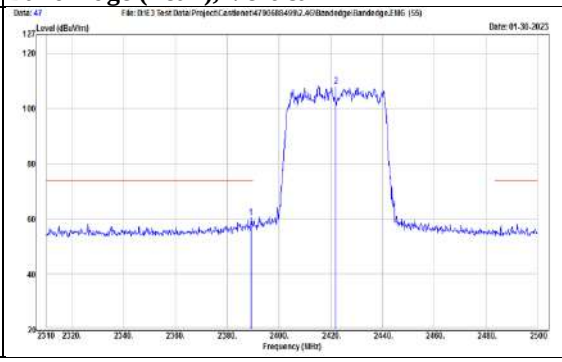
Mode	802.11ax(HE20)	Channel	11

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2462	99.44	16.07	115.51	N/A	N/A	PK
	@	2462	90.37	16.07	106.44	N/A	N/A	AVG
		2483.66	38.07	15.88	53.95	54	-0.05	AVG
		2484.99	49.3	15.87	65.17	74	-8.83	PK
	*	4924	36.55	2.43	38.98	74	-35.02	PK
Vertical	@	2462	96.01	16.07	112.08	N/A	N/A	PK
	@	2462	86.83	16.07	102.9	N/A	N/A	AVG
		2484.04	33.08	15.88	48.96	54	-5.04	AVG
		2484.8	43.3	15.87	59.17	74	-14.83	PK
	*	4924	39.39	2.43	41.82	74	-32.18	PK

TX, 802.11ax(HE20) (Ch 11) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE20) (Ch 11)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE20) (Ch 11) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE20) (Ch 11)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE20) (Ch 11) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE20) (Ch 11)** **Band Edge (Peak), Vertical**
	

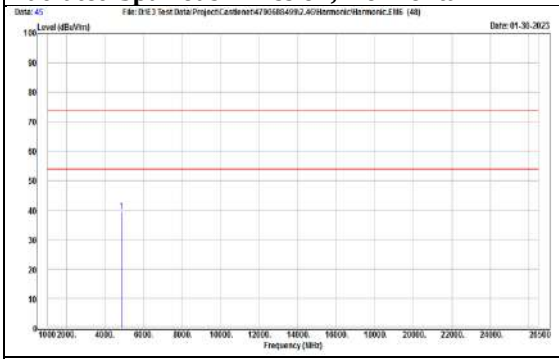
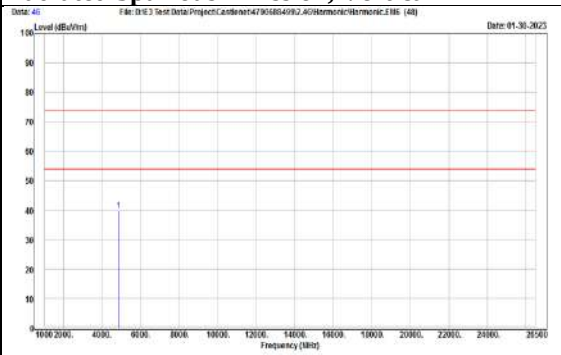
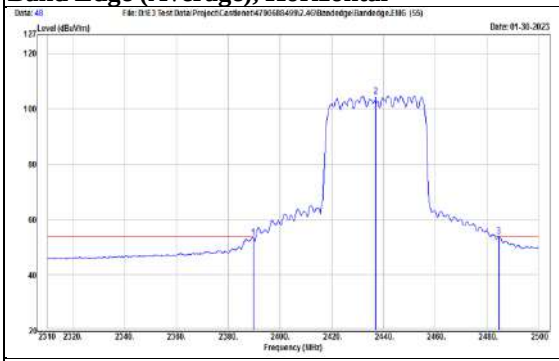
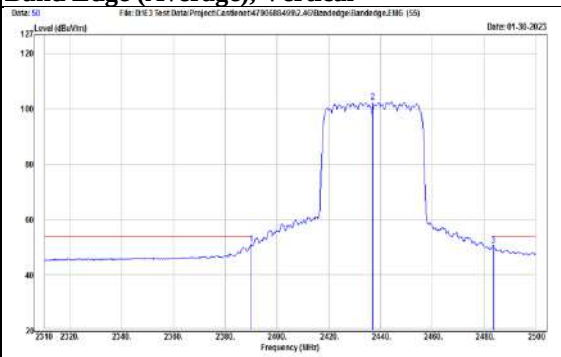
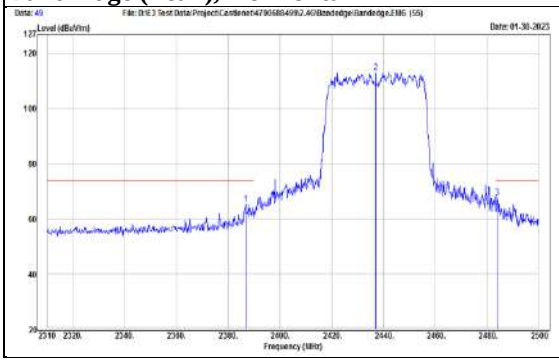
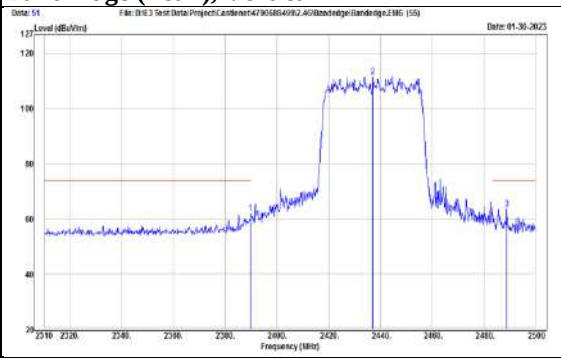
Mode	802.11ax(HE40)	Channel	3

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2389.61	46.9	16	62.9	74	-11.1	PK
		2389.8	36.66	16	52.66	54	-1.34	AVG
	@	2422	94.85	16.05	110.9	N/A	N/A	PK
	@	2422	85.21	16.05	101.26	N/A	N/A	AVG
	*	4844	36.38	2.41	38.79	74	-35.21	PK
Vertical		2389.23	44.53	16	60.53	74	-13.47	PK
		2389.42	33.2	16	49.2	54	-4.8	AVG
	@	2422	92.08	16.05	108.13	N/A	N/A	PK
	@	2422	83.2	16.05	99.25	N/A	N/A	AVG
	*	4844	36.24	2.41	38.65	74	-35.35	PK

TX, 802.11ax(HE40) (Ch 3) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE40) (Ch 3)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE40) (Ch 3) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE40) (Ch 3)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE40) (Ch 3) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE40) (Ch 3)** **Band Edge (Peak), Vertical**
	

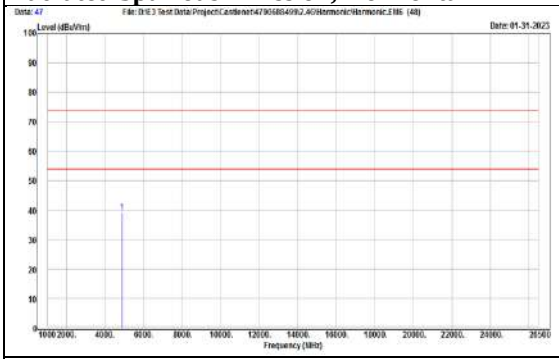
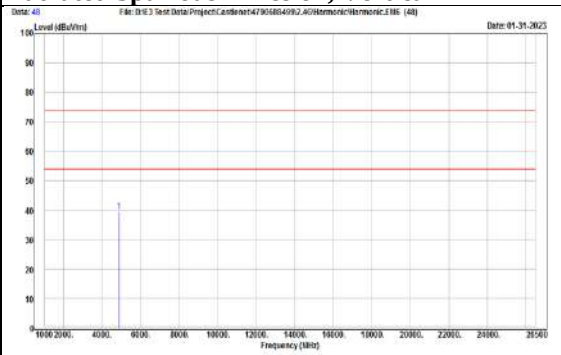
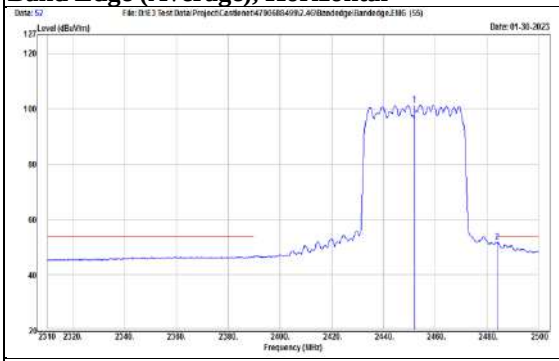
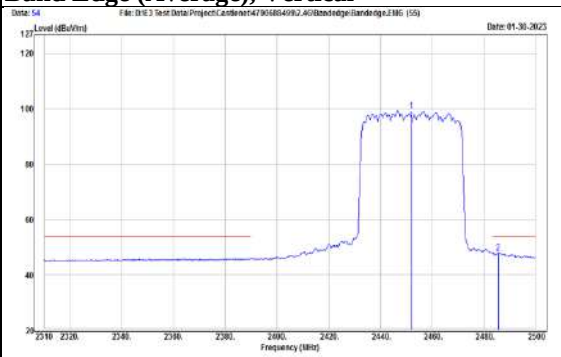
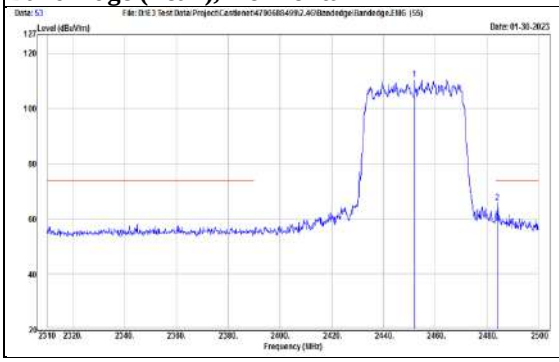
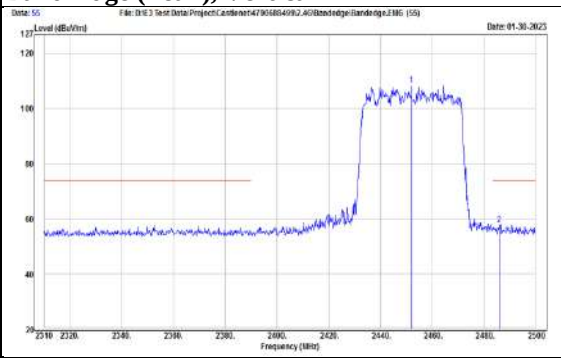
Mode	802.11ax(HE40)	Channel	6

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		2386.76	49.41	16.01	65.42	74	-8.58	PK
		2389.61	37.44	16	53.44	54	-0.56	AVG
	@	2437	97.11	16.11	113.22	N/A	N/A	PK
	@	2437	88.48	16.11	104.59	N/A	N/A	AVG
		2484.04	51.79	15.88	67.67	74	-6.33	PK
		2484.61	38.01	15.87	53.88	54	-0.12	AVG
	*	4874	36.97	2.43	39.4	74	-34.6	PK
Vertical		2389.8	45.9	16	61.9	74	-12.1	PK
		2389.99	34.94	16	50.94	54	-3.06	AVG
	@	2437	95.57	16.11	111.68	N/A	N/A	PK
	@	2437	86.38	16.11	102.49	N/A	N/A	AVG
		2483.66	34.52	15.88	50.4	54	-3.6	AVG
		2488.79	47.83	15.84	63.67	74	-10.33	PK
	*	4874	37.43	2.43	39.86	74	-34.14	PK

TX, 802.11ax(HE40) (Ch 6) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE40) (Ch 6)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE40) (Ch 6) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE40) (Ch 6)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE40) (Ch 6) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE40) (Ch 6)** **Band Edge (Peak), Vertical**
	

Mode	802.11ax(HE40)	Channel	9

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	2452	94.44	16.15	110.59	N/A	N/A	PK
	@	2452	85.37	16.15	101.52	N/A	N/A	AVG
		2484.04	35.97	15.88	51.85	54	-2.15	AVG
		2484.23	50.13	15.88	66.01	74	-7.99	PK
	*	4904	36.91	2.45	39.36	74	-34.64	PK
Vertical	@	2452	92.32	16.15	108.47	N/A	N/A	PK
	@	2452	83.08	16.15	99.23	N/A	N/A	AVG
		2485.56	32.19	15.86	48.05	54	-5.95	AVG
		2486.13	41.95	15.86	57.81	74	-16.19	PK
	*	4904	37	2.45	39.45	74	-34.55	PK

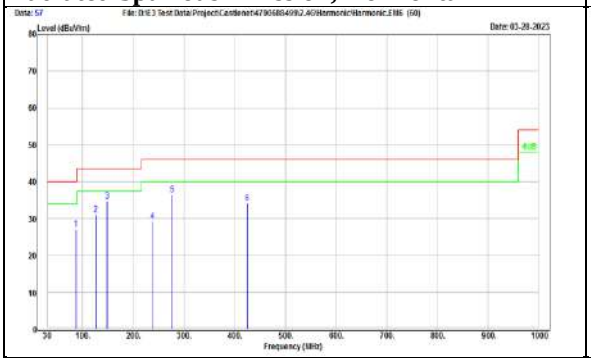
TX, 802.11ax(HE40) (Ch 9) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ax(HE40) (Ch 9)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ax(HE40) (Ch 9) **Band Edge (Average), Horizontal**	**TX, 802.11ax(HE40) (Ch 9)** **Band Edge (Average), Vertical**
	
TX, 802.11ax(HE40) (Ch 9) **Band Edge (Peak), Horizontal**	**TX, 802.11ax(HE40) (Ch 9)** **Band Edge (Peak), Vertical**
	

Below 1 GHz

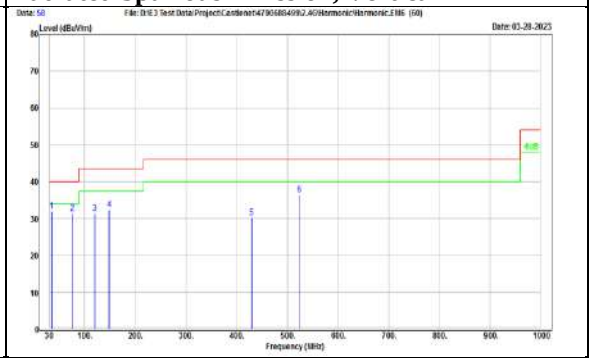
Mode	802.11b	Channel	6

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		87.23	44.85	-17.75	27.1	40	-12.9	PK
		126.03	44.62	-13.57	31.05	43.5	-12.45	PK
		148.34	46.66	-11.95	34.71	43.5	-8.79	PK
		237.58	41.97	-12.77	29.2	46	-16.8	PK
		276.38	47.96	-11.38	36.58	46	-9.42	PK
		424.79	41.32	-7.25	34.07	46	-11.93	PK
Vertical		34.85	45.12	-13.11	32.01	40	-7.99	PK
		75.59	46.3	-14.97	31.33	40	-8.67	PK
		120.21	45.45	-14.02	31.43	43.5	-12.07	PK
		148.34	44.41	-11.95	32.46	43.5	-11.04	PK
		429.64	37.24	-7.03	30.21	46	-15.79	PK
		523.73	41.31	-4.79	36.52	46	-9.48	PK

TX, 802.11b (Ch 6)
Radiated Spurious Emission, Horizontal



TX, 802.11b (Ch 6)
Radiated Spurious Emission, Vertical



Below 30MHz

9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

KDB 414788 D01 OATS and Chamber Correlation Justification

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

9.6. AC Power Line Conducted Emission

Requirements

Frequency (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

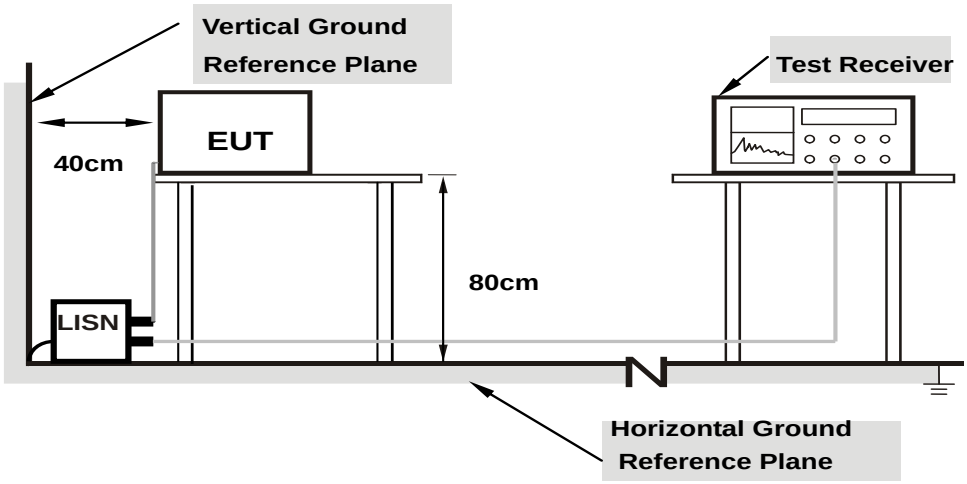
Note:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

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:
1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.
2. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
3. Test data of Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB).
4. Test data of Margin(dB) = Result value (dBuV) - Limit value (dBuV).
5. Test data of Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).

Test Setup



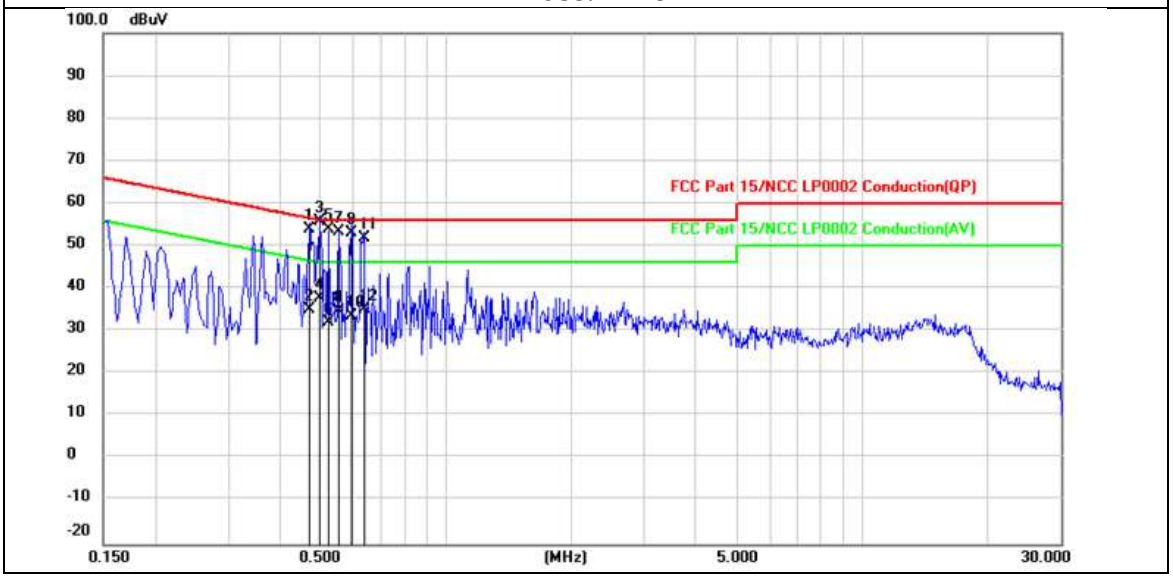
Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the Setup Configurations.

Test Data

Mode	G_TX2437	Channel	6

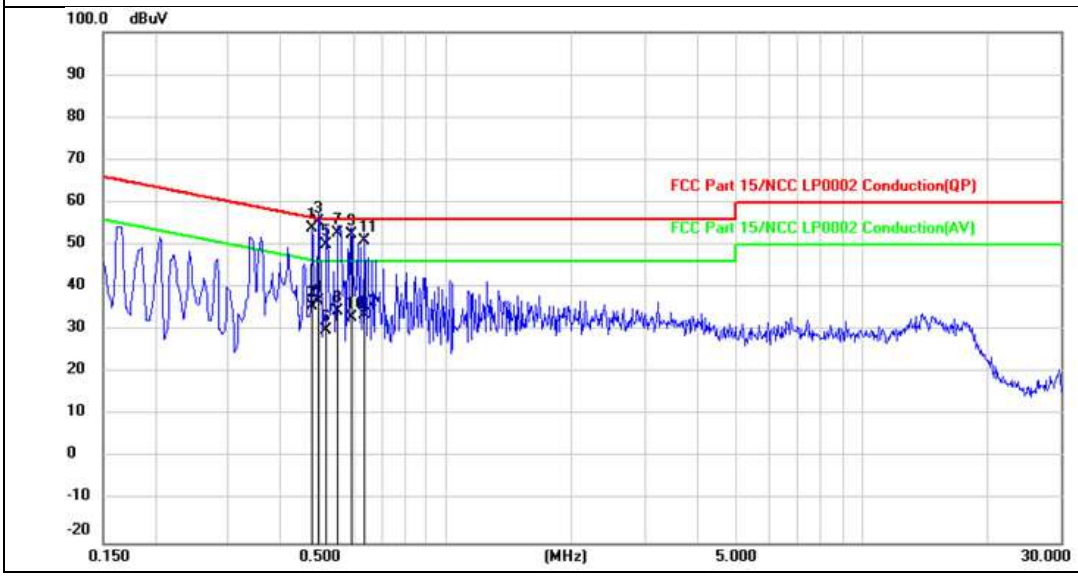
Phase: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4700	43.96	10.01	53.97	56.51	-2.54	QP
2	0.4700	25.13	10.01	35.14	46.51	-11.37	AVG
3	0.4980	45.78	10.01	55.79	56.03	-0.24	QP
4	0.4980	27.61	10.01	37.62	46.03	-8.41	AVG
5	0.5220	44.01	10.01	54.02	56.00	-1.98	QP
6	0.5220	21.92	10.01	31.93	46.00	-14.07	AVG
7	0.5540	43.29	10.01	53.30	56.00	-2.70	QP
8	0.5540	24.60	10.01	34.61	46.00	-11.39	AVG
9	0.5940	42.93	10.01	52.94	56.00	-3.06	QP
10	0.5940	23.57	10.01	33.58	46.00	-12.42	AVG
11	0.6340	41.92	10.01	51.93	56.00	-4.07	QP
12	0.6340	24.91	10.01	34.92	46.00	-11.08	AVG

Mode	G_TX2437	Channel	6

Phase: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4780	43.89	10.01	53.90	56.37	-2.47	QP
2	0.4780	25.60	10.01	35.61	46.37	-10.76	AVG
3	0.4940	45.31	10.01	55.32	56.10	-0.78	QP
4	0.4940	26.98	10.01	36.99	46.10	-9.11	AVG
5	0.5180	40.04	10.01	50.05	56.00	-5.95	QP
6	0.5180	19.90	10.01	29.91	46.00	-16.09	AVG
7	0.5500	42.67	10.01	52.68	56.00	-3.32	QP
8	0.5500	24.36	10.01	34.37	46.00	-11.63	AVG
9	0.5940	42.40	10.01	52.41	56.00	-3.59	QP
10	0.5940	23.01	10.01	33.02	46.00	-12.98	AVG
11	0.6380	41.06	10.01	51.07	56.00	-4.93	QP
12	0.6380	23.61	10.01	33.62	46.00	-12.38	AVG

END OF REPORT