

	  
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn. Bhd. Plot 2A Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia.	FCC / ISED TEST REPORT Report Revision : Rev.A
Date/s Tested : 02-May-2024 - 23-May-2024 Report Issue Date : 05-August-2024 Manufacturer/Location : Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900, Bayan Lepas, Penang, Malaysia Requestor : CADOGAN SEAN Product Type : Hand-held Product Marketing Name (PMN) : APX N70 Hardware Version Identification Number (HVIN) : H35KET9PW8AN & H35KET9PW8AN-H Frequency Band : 2.412-2.462 GHz Max RF Output Power : 802.11b - 199.53 mWatts 802.11g - 199.53 mWatts 802.11n(HT20) - 199.53 mWatts 802.11n(HT40) - 316.23 mWatts Applicant Name : Motorola Solutions Inc Applicant Address : Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia FCC Registrations : 461337 ISED Registrations : MY0001 Firmware Version Identification Number (FVIN) : D03.75.58 The equipment was tested accordance to the requirement listed below: (2.4GHz Wifi) 47CFR Part 15C ISED RSS 247 Issue 2 February 2017 PASS	
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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	05-August-2024	Alieya

1.0. General Information

EUT Description:

Technologies	2.4GHz Wi-Fi
TX Frequency range	2412MHz – 2462MHz
Modulation Type	DSSS, OFDM
Connector type	PROGRAMMING, TEST & ALIGNMENT CABLE
Antenna type	Stamped metal

1.1. Channel number and frequency information:

There are two bandwidth systems.

For 20MHz Bandwidth systems (802.11b, 802.11g, 802.11n), use channel 1 ~ channel 11

For 40MHz Bandwidth systems (802.11n), use channel 3 ~ channel 9

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

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
UL 3650mAH (using RN 2170 Li-Ion cell)	MOTOROLA	PMNN4818A
VHF ¼ wave antenna 136-174MHz	MOTOROLA	AN000414A01
CHARGER, CHGR DEKSTOP SINGLE UNIT IMPRES 2 EXT PS BASE ONLY	MOTOROLA	PMPN4590A
CHARGER DEKSTOP MULTI UNIT IMPRES 2 6 DISPLAY INT PS US	MOTOROLA	PMPN4591A

General Description of Applied Standards

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

FCC 47 CFR Part 15 Subpart C
KDB 558074 D01 15.247 Meas Guidance v05
ANSI C63.10-2013

Deviation from standard

Not applicable as no deviation from standard test method

Modifications to EUT

For RF conducted measurements a pigtail was soldered out of the board while for radiated measurements there were no modifications to the device

2.0. Summary of Test Results

FCC Clause	IC Clause	Test Item	Result	Remark	Serial number tested	Tested by
15.247 (a)(2)	RSS-247 5.2(a)	DTS & 99% Channel Bandwidth	Pass	Highest 99% OCB: 802.11b: 13.828MHz (13M8G1D) 802.11g: 16.695MHz (16M7D1D) 802.11n(HT20): 17.916MHz (17M9D1D) 802.11n(HT40): 36.290MHz (36M3D1D)	022TAD0665	Alieya
15.247 (b)(3)	RSS-247 5.4(d)	Conducted RF Output Power (Peak)	Pass	Highest output power: 802.11b: 22.975 dBm (198.38 mW) 802.11g: 21.865 dBm (153.64 mW) 802.11n(HT20): 22.105 dBm (162.37 mW) 802.11n(HT40): 24.275 dBm (267.61 mW)	022TAD0665	Alieya
15.247(e)	RSS-247 5.2(b)	Maximum Power Spectral Density	Pass	Meet the limit requirement.	022TAD0665	Alieya
15.247(d)	RSS-247 5.5	Conducted Spurious Emissions	Pass	Worst case emission: -39.60 dBm	022TAD0665	Alieya
15.247 (d)	RSS-247 5.5	Band edge Conducted Spurious Emission	Pass	Worst case emission: -24.64 dBm	022TAD0665	Alieya
15.205, 15.209, 15.247 (d)	RSS-247 5.5	Radiated Emission within Restricted Bands	Pass	Worst case emission: RBE: 50.7723 dBuV/m (margin: 3.2277 dB) RSE: 53.5053 dBuV/m (margin: 0.4947 dB), Noise floor	022TAF1508	Nazrin & Rezza
15.207	RSS-Gen 8.8	AC Power Line Conducted Emission	NA	Meet the limit requirement.	022TAF1508	Alif
15.203		Antenna requirement	NA	Internal antenna is not accessible to the end-user	NA	NA

NA → Not Available

3.0. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±dB)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.48
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	5.88
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.84
	18GHz ~ 40GHz	6.02
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82

4.0. Equipment List

Bluetooth ATE # 1 (SW Version: Ate Main_3.1.12_R1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
CHAMBER	SH-641	92005573	1-April-24	1-April-25
POWER SUPPLY	6652A	3541A02371	18-Jul-23	18-Jul-24
PULSE SENSOR	MA2411B	1726287	22-Aug-23	22-Aug-24
PULSE POWER METER	ML2495A	1845014	16-Aug-23	16-Aug-24
SPECTRUM ANALYZER	E4440A	MY46185415	5-Jan-24	5-Jan-25

Radiated Emission Station (SW Version: EMC FCC RE v1.6.5)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DRG HORN FREQ.	SAS-571	1143	8-Mar-23	8-Mar-25
DRG HORN FREQ.	SAS-571	720	18-Apr-23	18-Apr-25
DC Power Supply	NR973A	MY54180189	30-Aug-23	30-Aug-24
SIGNAL GENERATOR	SMB 100A	182511	4-Jun-21	4-Jun-24
EMI TEST RECEIVER	ESW44	101731	11-Aug-23	11-Aug-24
BILOG ANTENNA	CBL6112B	2950	14-Dec-23	14-Dec-24
BILOG ANTENNA	CBL6112B	2964	25-Sep-23	25-Sep-24
DATA LOGGER THERMOHYGROMETER	SDL500	A.016800	21-Jun-23	21-Jun-24
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	28-Aug-23	28-Aug-24
PREAMPLIFIER	PAM-0118P	269	28-Jun-23	28-Jun-24
LOOP ANTENNA	6502	00208416	26-Oct-23	26-Oct-24
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	Not required	Not required
SYSTEM CONTROLLER	SC104V	050806-1	Not required	Not required
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	Not required	Not required
ANTENNA POSITIONING TOWER	TLT2	NA	Not required	Not required
PREAMPLIFIER 18-40GHz	Miteq Hi Gain Sucoflex	002	Not required	Not required

AC Powerline Station (SW Version: EMC32 Ver.10.60.10)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DATA LOGGER	DSB	16344143	21-Jun-23	21-Jun-24
V-NETWORK 2-LINE	ENV216V	101039	13-Dec-23	13-Dec-24
EMI TEST RECEIVER	ESIB26	100017	4-Dec-23	4-Dec-24
PROGRAMMABLE AC SOURCE	61604	ABR000000926	25-Jul-23	25-Jul-24

5.0. Test Mode Applicability and Test Channel Detail

The device employs MIMO technology. Below are the possible configurations.

WLAN Configurations		Mode					
		SISO		Spatial Diversity Multiplexing (MIMO)		Cyclic Delay Diversity (MIMO)	
	Antenna	Primary	Secondary	Primary	Secondary	Primary	Secondary
2.4GHz	802.11b	√	√	x	x	x	x
	802.11g	√	√	x	x	x	x
	802.11n (HT20)	√	√	x	x	x	x
	802.11n (HT40)	x	x	x	x	x	x

√ = Support;
 x = NOT Support

Note: This Device supports simultaneous transmission operation, which allows for two SISO or two MIMO channels to operate independent of one another in the 2.4GHz band on each antenna. 802.11n mode is capable of transmitting simultaneously on two antennas using Cyclic Delay Diversity and Spatial Diversity Multiplexing (2x2 MIMO).

The following tables show the worst case configurations determined during testing. The data for these configurations is contained in this test report.

Radiated Emission Test (Above 1GHz)

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

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

EUT Configure Mode	Modulation	Available Channel	Tested Channel	Modulation Technology	Data Modulation Type	Date Rate (Mbps)	Mode	Environmental Conditions
Test Mode	802.11b	1 to 11	1,6,11	DSSS	QPSK	2	SISO	23.3°C, 68.7%RH
Test Mode	802.11g	1 to 11	1,6,11	OFDM	BPSK	6	SISO	23.3°C, 68.7%RH
Test Mode	802.11n (HT20)	1 to 11	1,6,11	OFDM	BPSK	6.5	SISO CDD (MIMO)	23.3°C, 68.7%RH
Test Mode	802.11n (HT40)	3 to 9	3,6,9	OFDM	BPSK	6.5	SISO CDD (MIMO)	NA

Radiated Emission Test (Below 1GHz)

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

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

EUT Configure Mode	Modulation	Available Channel	Tested Channel	Modulation Technology	Data Modulation Type	Date Rate (Mbps)	Mode	Environmental Conditions
Test Mode	802.11b	1 to 11	1,6,11	DSSS	QPSK	2	SISO	23.3°C, 68.7%RH
Test Mode	802.11g	1 to 11	1,6,11	OFDM	BPSK	6	SISO	23.3°C, 68.7%RH
Test Mode	802.11n (HT20)	1 to 11	1,6,11	OFDM	BPSK	6.5	SISO CDD (MIMO)	23.3°C, 68.7%RH
Test Mode	802.11n (HT40)	3 to 9	3,6,9	OFDM	BPSK	6.5	SISO CDD (MIMO)	NA

Power Line Conducted Emission Test

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☐ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Modulation	Available Channel	Tested Channel	Modulation Technology	Data Modulation Type	Date Rate (Mbps)	Environmental Conditions
Application Mode	802.11bgn mixed	1 to 11	AUTO	DSSS, OFDM	AUTO	AUTO	NA

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

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

EUT Configure Mode	Modulation	Available Channel	Tested Channel	Modulation Technology	Data Modulation Type	Data Rate (Mbps)	Mode	Environmental Conditions
Test Mode	802.11b	1 to 11	1,6,11	DSSS	QPSK	2	SISO	25°C, 54.8%RH
Test Mode	802.11g	1 to 11	1,6,11	OFDM	BPSK	6	SISO	25°C, 54.8%RH
Test Mode	802.11n (HT20)	1 to 11	1,6,11	OFDM	BPSK	6.5	SISO CDD (MIMO)	25°C, 54.8%RH
Test Mode	802.11n (HT40)	1 to 11	3,6,9	OFDM	BPSK	6.5	SISO CDD (MIMO)	NA

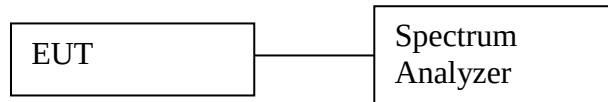
Duty Cycle of Test Signal

802.11b, 802.11g and 802.11n : Duty cycle of test signal is $\geq 98\%$. (Refer to Clause 6.3 for duty cycle test signal)

6.0. Transmitter Test Parameters

6.1. 6dB Channel Bandwidth

6.1.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max hold
 - e. Sweep = auto
- e) Measure the freq different of two frequencies that were attenuated 6dB from peak of the emission & record the frequency difference as the emission bandwidth.
- f) Measure every antenna port by repeat the step above for MIMO measurement.

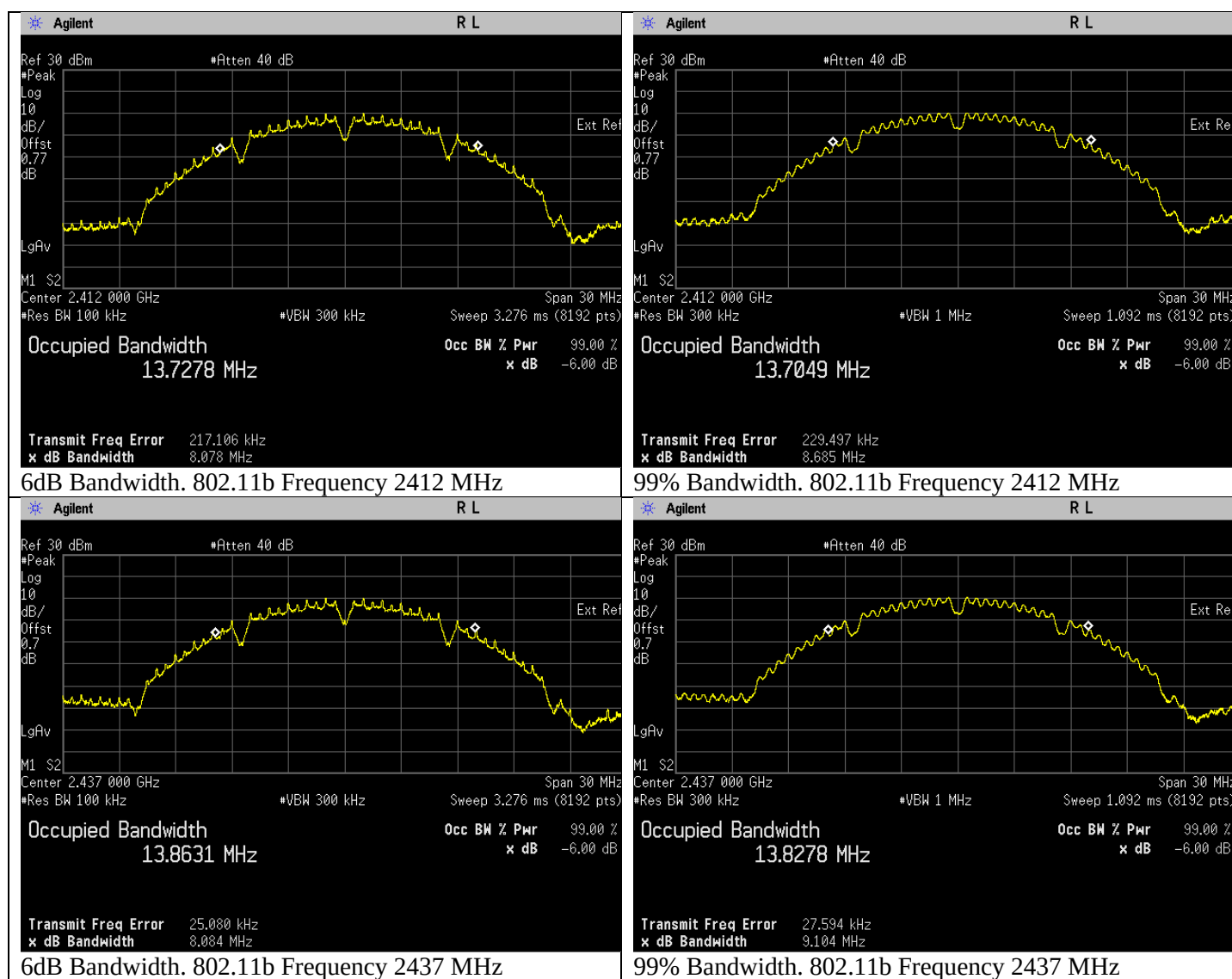
6.1.2. Test Limits:

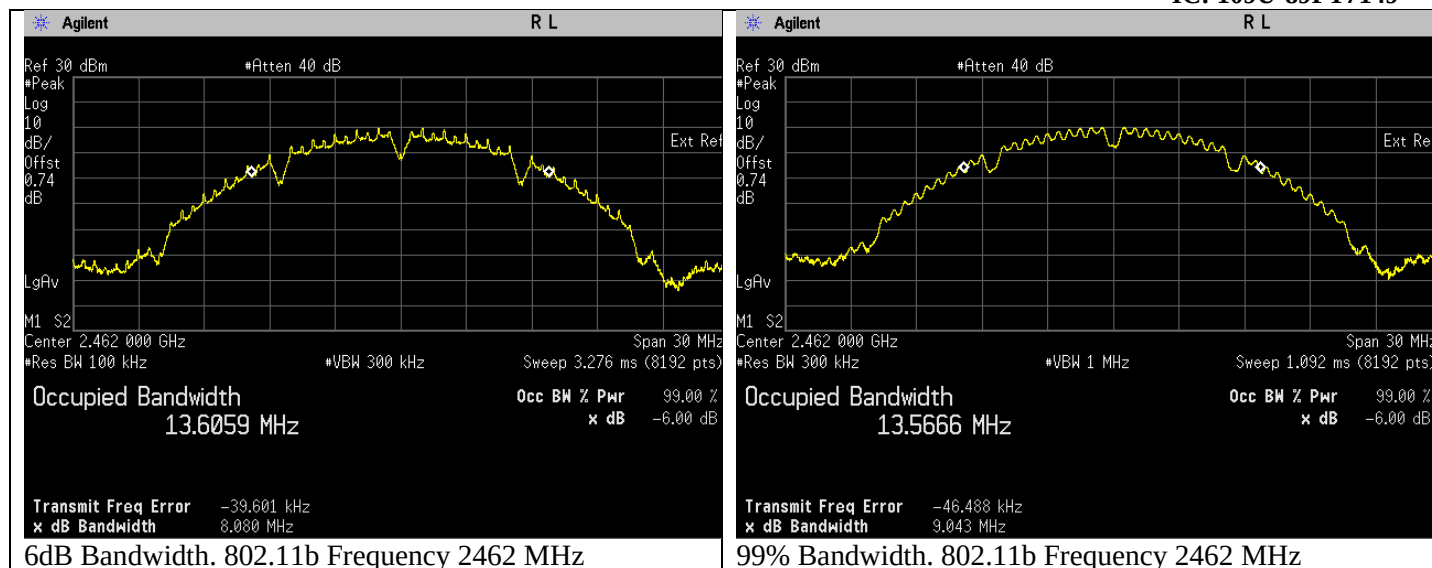
Normal Condition (25 ° C)
≥500 kHz

6.1.3. Test Data:

802.11 b

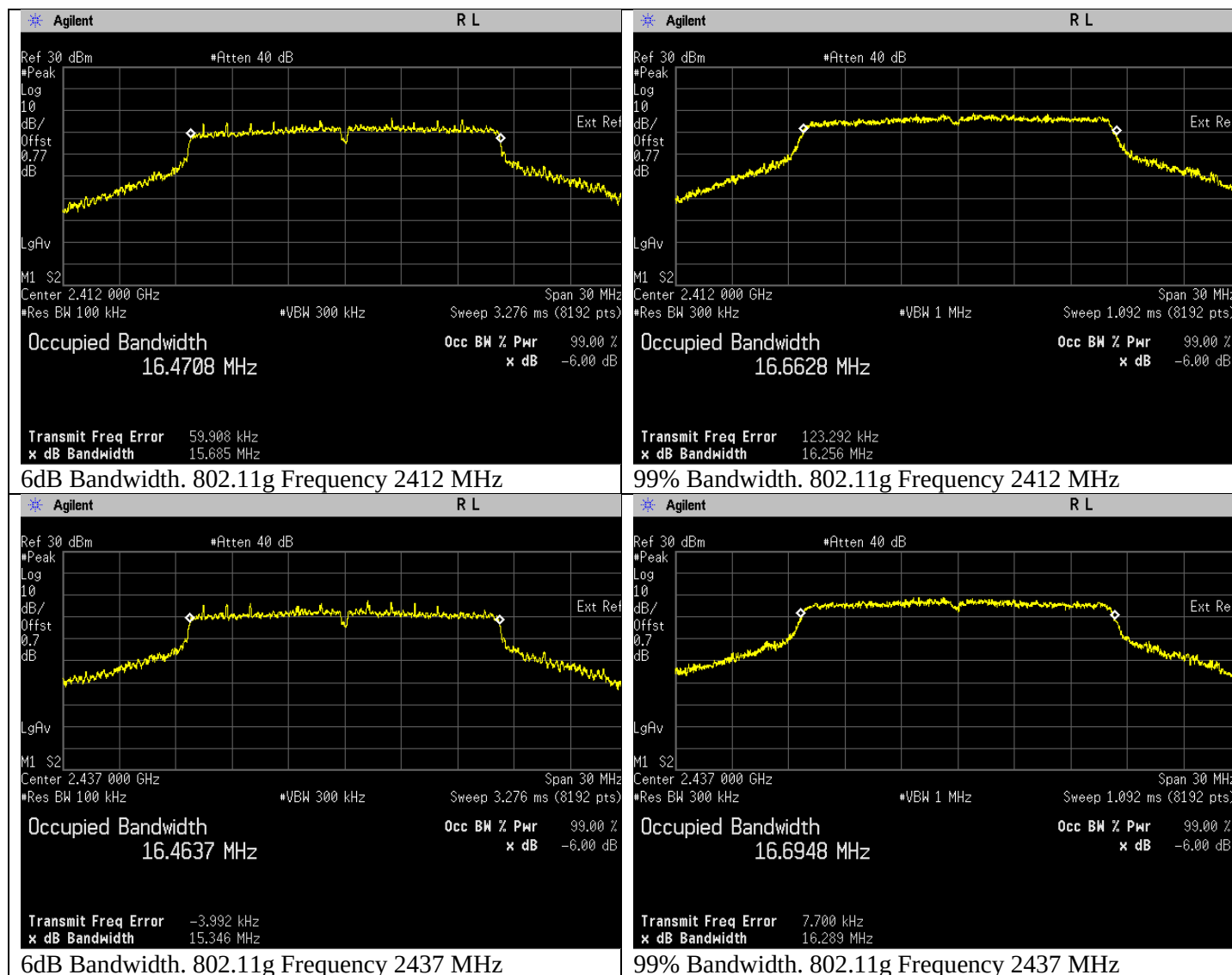
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Status
802.11b	DSSS	QPSK	1	2412	8.078	13.705	Pass
802.11b	DSSS	QPSK	1	2437	8.084	13.828	Pass
802.11b	DSSS	QPSK	1	2462	8.080	13.567	Pass

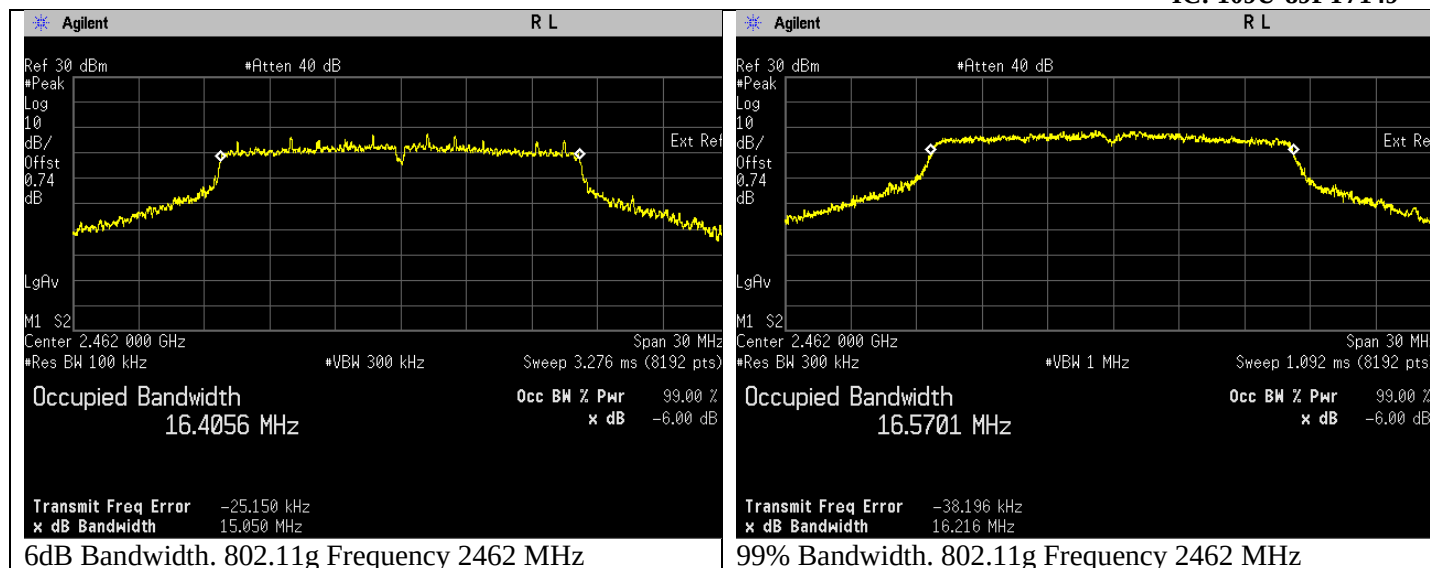




802.11 g

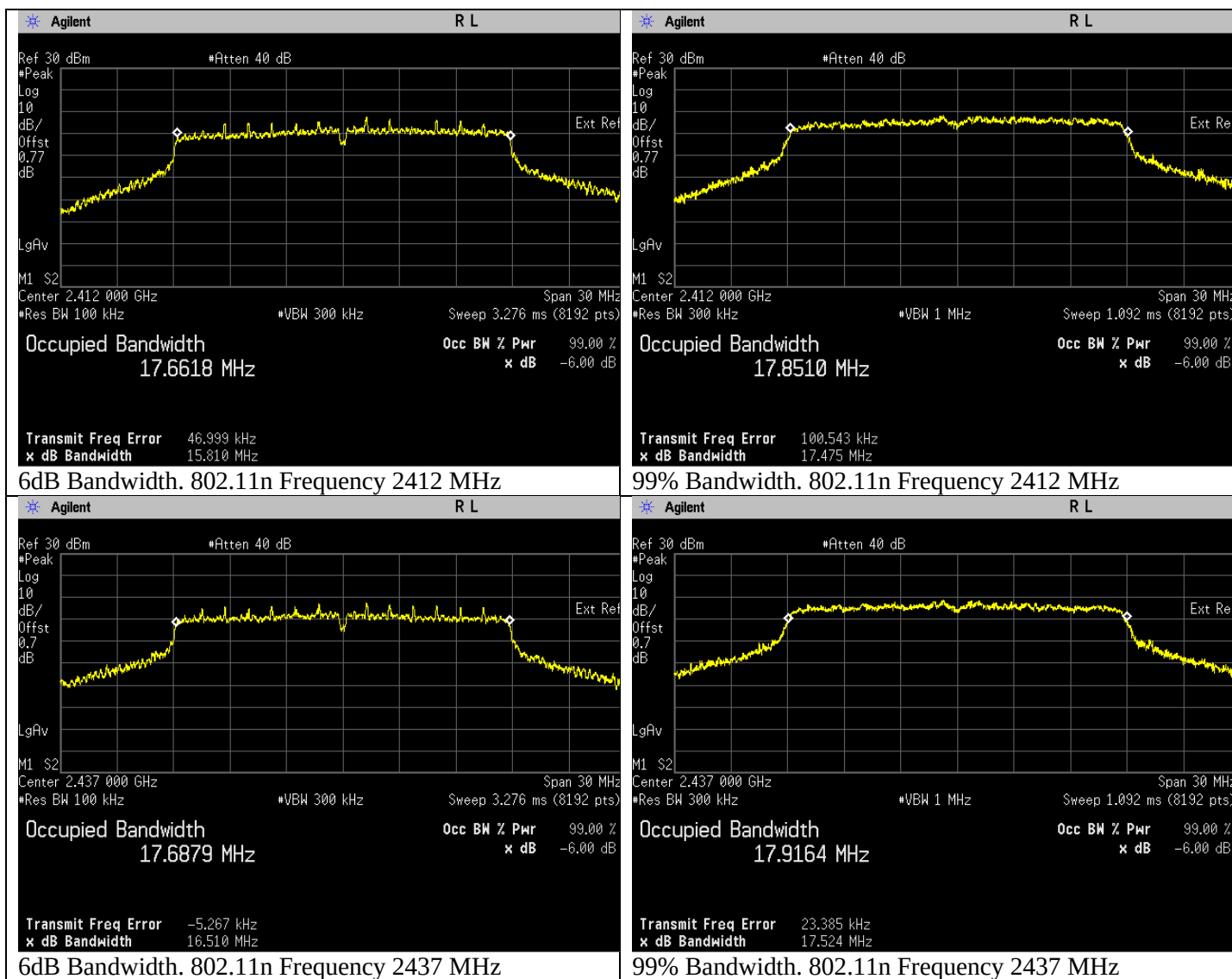
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Status
802.11g	OFDM	BPSK	6	2412	15.685	16.663	Pass
802.11g	OFDM	BPSK	6	2437	15.346	16.695	Pass
802.11g	OFDM	BPSK	6	2462	15.050	16.570	Pass

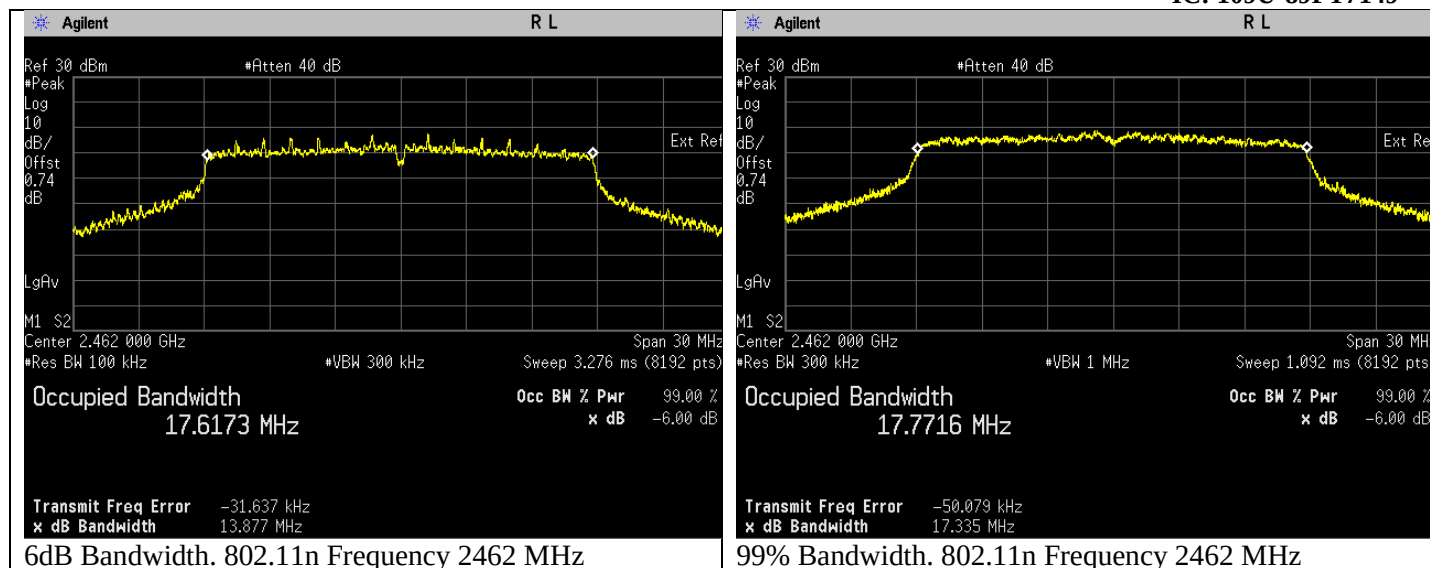




802.11n (HT20)

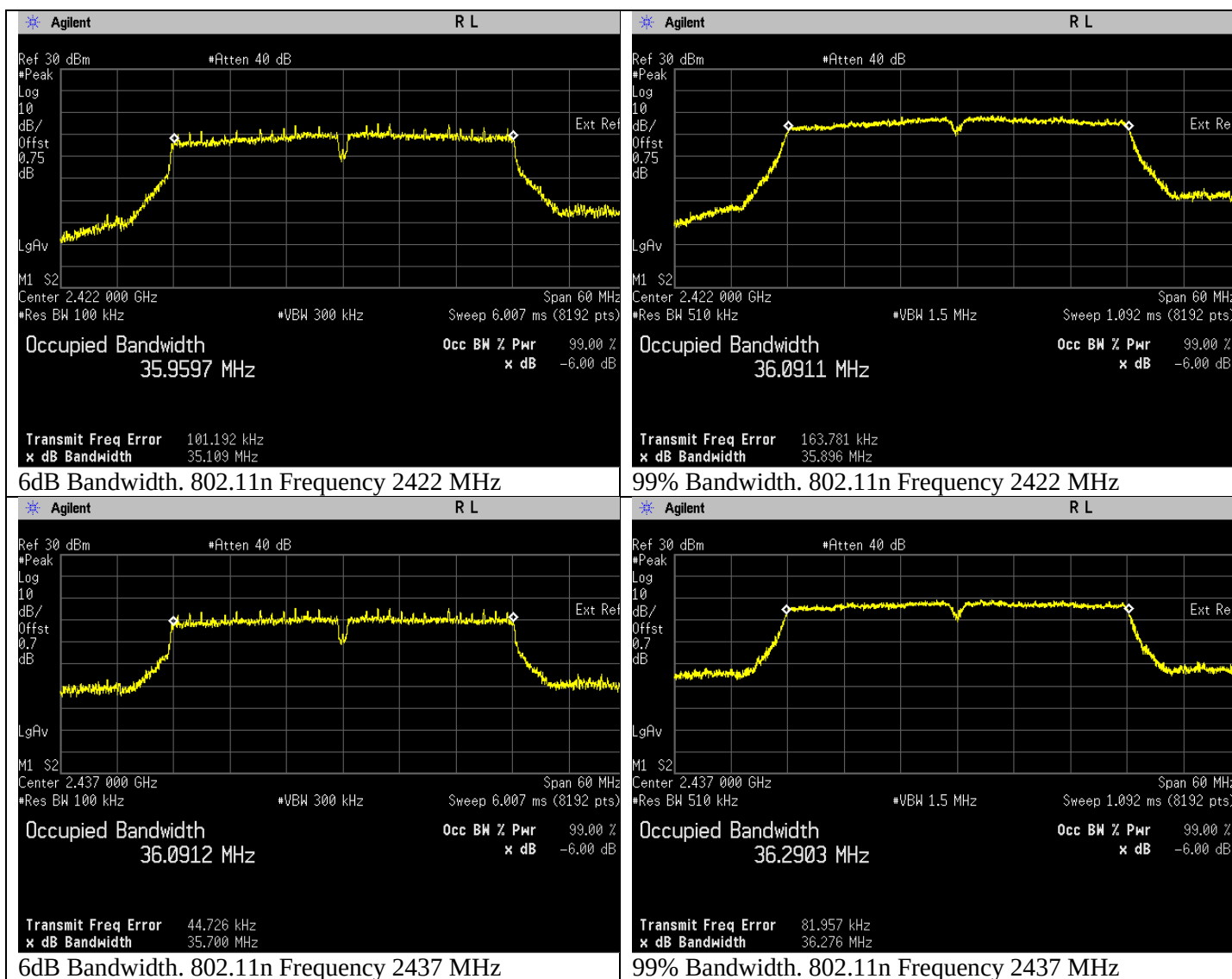
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Status
802.11n	OFDM	BPSK	6.5	2412	15.810	17.851	Pass
802.11n	OFDM	BPSK	6.5	2437	16.510	17.916	Pass
802.11n	OFDM	BPSK	6.5	2462	13.877	17.772	Pass

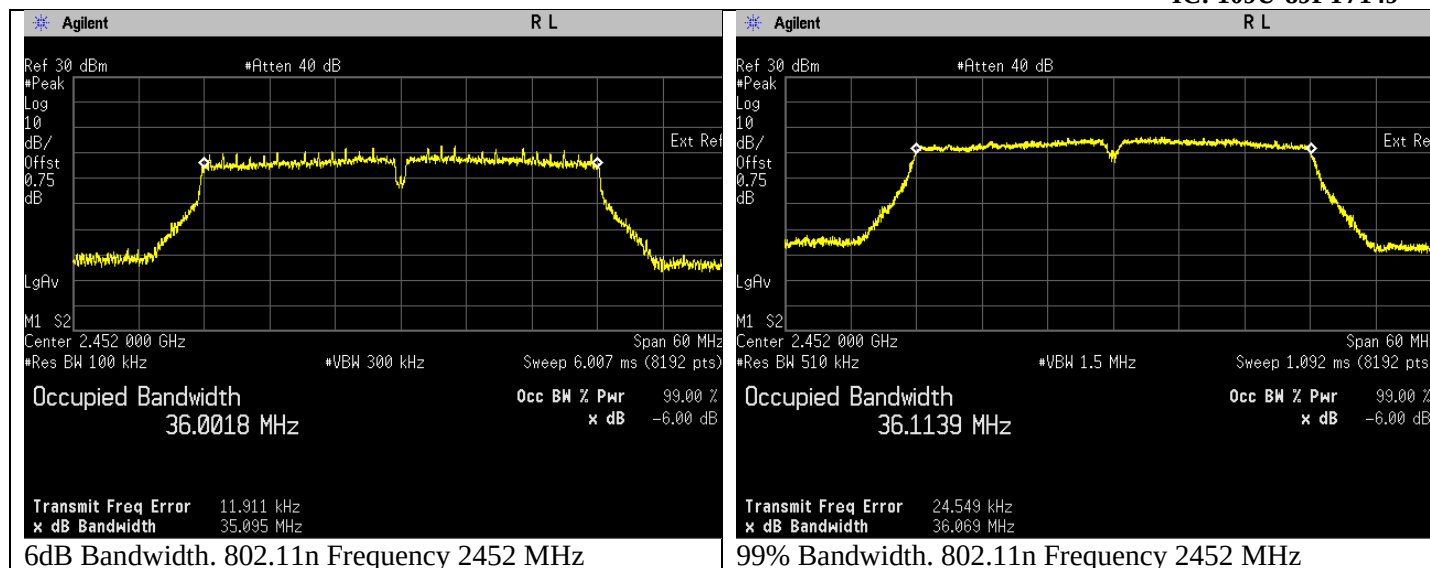




802.11n (HT40)

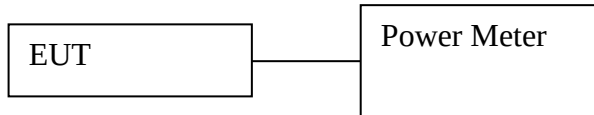
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Status
802.11n	OFDM	BPSK	6.5	2422	35.109	36.091	Pass
802.11n	OFDM	BPSK	6.5	2437	35.700	36.290	Pass
802.11n	OFDM	BPSK	6.5	2452	35.095	36.114	Pass





6.2. Conducted RF Output Power

6.2.1. Test Setup



Peak

- a) Set the following settings on the power meter:
 - a. Preset -> reset
 - b. Cal/Zero -> Zero & Cal
 - c. Preset -> 802.11g
 - d. Sensor -> Cal Factor -> Enter freq
 - e. Channel -> Trigger -> Trigger Source -> Internal, Rising Edge
 - f. Channel -> Trigger -> More -> Arming -> Automatic
 - g. Channel -> Averaging -> Averaging
 - h. Sensor -> offset -> fixed to couple for losses from ancillaries
 - i. Record peak data
- b) Key up DUT
- c) Restart averaging and read data once the numbers stabilize.
- d) Record power by reading peak data
- e) Repeat the steps in (1) (omit first 3 steps if done previously) by setting DUT to transmit at mid frequency and high frequency.

6.2.2. Test Limits:

Normal Condition (25 ° C)
≤1 Watt(30 dBm)

6.2.3. Test Data:

Test was conducted peak power.

802.11b

Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Output Power (dBm)	Status
802.11b	DSSS	QPSK	1	2412	22.320	Pass
802.11b	DSSS	QPSK	1	2437	22.975	Pass
802.11b	DSSS	QPSK	1	2462	22.535	Pass

802.11g

Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Output Power (dBm)	Status
802.11g	OFDM	BPSK	6	2412	21.440	Pass
802.11g	OFDM	BPSK	6	2437	21.865	Pass
802.11g	OFDM	BPSK	6	2462	21.625	Pass

802.11n (HT20)

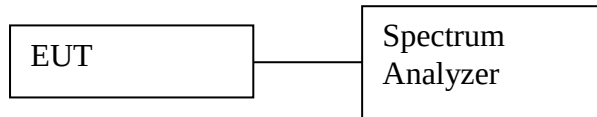
Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Output Power (dBm)	Status
802.11n	OFDM	BPSK	6.5	2412	21.600	Pass
802.11n	OFDM	BPSK	6.5	2437	22.105	Pass
802.11n	OFDM	BPSK	6.5	2462	21.795	Pass

802.11n (HT40)

Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Output Power (dBm)	Status
802.11n	OFDM	BPSK	6.5	2422	23.395	Pass
802.11n	OFDM	BPSK	6.5	2437	24.275	Pass
802.11n	OFDM	BPSK	6.5	2452	21.940	Pass

6.3.Duty Cycle of the test signal

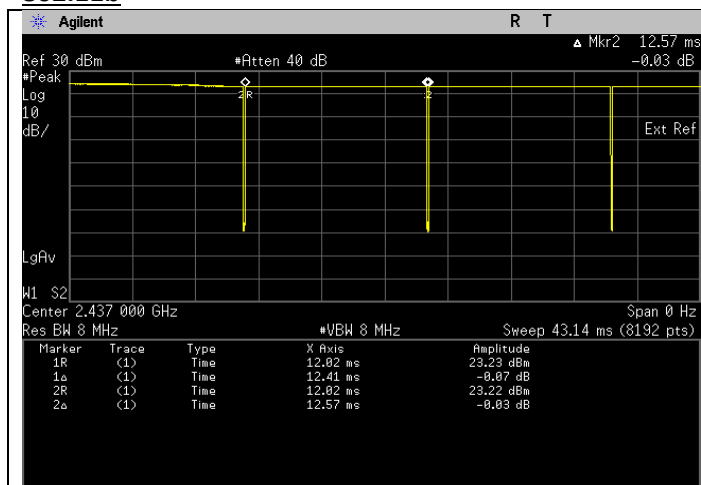
6.3.1. Test Setup



- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. Set the RBW = 10 MHz or the highest RBW available on spectrum analyzer.
 - b. Set the VBW $\geq$ RBW.
 - c. Set the span $\geq [1.5 \times \text{DTS bandwidth}]$.
 - d. Detector = Peak.
 - e. Sweep time = 10ms or others that allow to measure accurate duty cycle.
 - f. Trace mode = max hold.
 - g. Allow trace to fully stabilize.
- 5) Record the duty cycle as X and save the plot.
- 6) Measure every antenna port by repeat the step above for MIMO measurement.

6.3.2. Test Data

802.11b



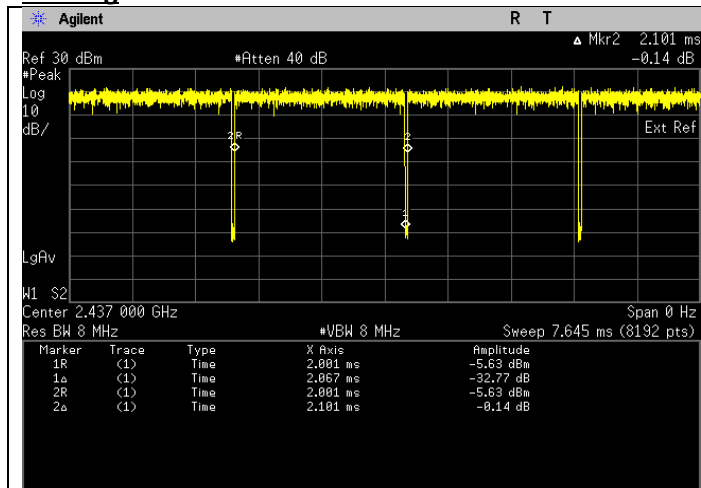
Duty Cycle

On time (ms)	12.41
On + Off Time (ms)	12.57
Duty cycle	0.9873
Duty Cycle factor	0.056

*Duty cycle = On time/ On +off time

*Duty Cycle factor = $10 \cdot \log(1/\text{Duty Cycle})$

802.11g



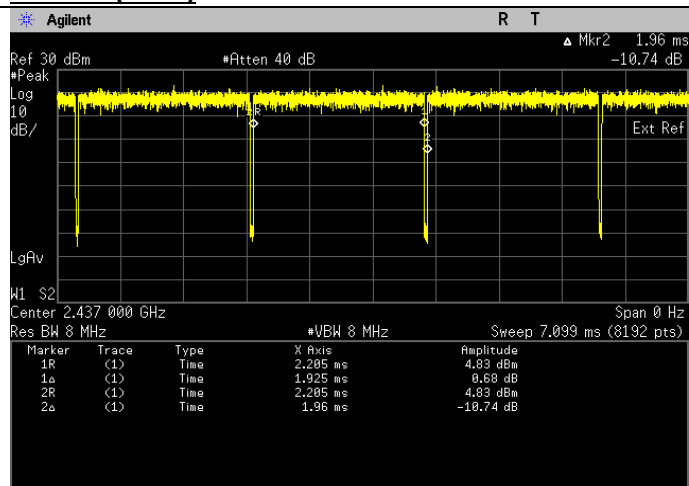
Duty Cycle

On time (ms)	2.067
On + Off Time (ms)	2.101
Duty cycle	0.9838
Duty Cycle factor	0.071

*Duty cycle = On time/ On +off time

*Duty Cycle factor = $10 \cdot \log(1/\text{Duty Cycle})$

802.11n (HT20)



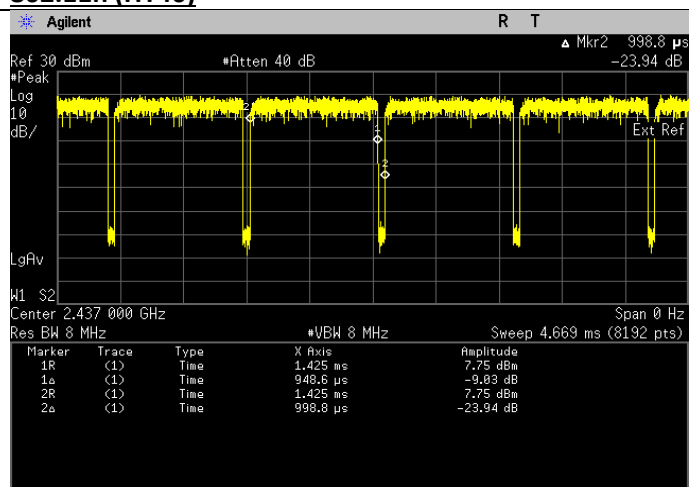
Duty Cycle

On time (ms)	1.925
On + Off Time (ms)	1.960
Duty cycle	0.9821
Duty Cycle factor	0.078

*Duty cycle = On time/ On +off time

*Duty Cycle factor = 10*log(1/Duty Cycle)

802.11n (HT40)



Duty Cycle

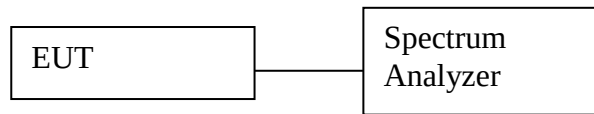
On time (ms)	0.9486
On + Off Time (ms)	0.9988
Duty cycle	0.9497
Duty Cycle factor	0.224

*Duty cycle = On time/ On +off time

*Duty Cycle factor = 10*log(1/Duty Cycle)

6.4. Maximum Peak Power Spectral Density

6.4.1. Test Setup



Maximum Peak

- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. Set analyzer center frequency to DTS channel center frequency.
 - b. Set the span to 1.5 times the DTS bandwidth.
 - c. Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
 - d. Set the VBW $\geq [3 \times \text{RBW}]$.
 - e. Detector = peak.
 - f. Sweep time = auto couple.
 - g. Trace mode = max hold.
 - h. Allow trace to fully stabilize.
 - i. Use the peak marker function to determine the maximum amplitude level within the RBW.
 - j. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
- e) Measure every antenna port by repeat the step above for MIMO measurement.

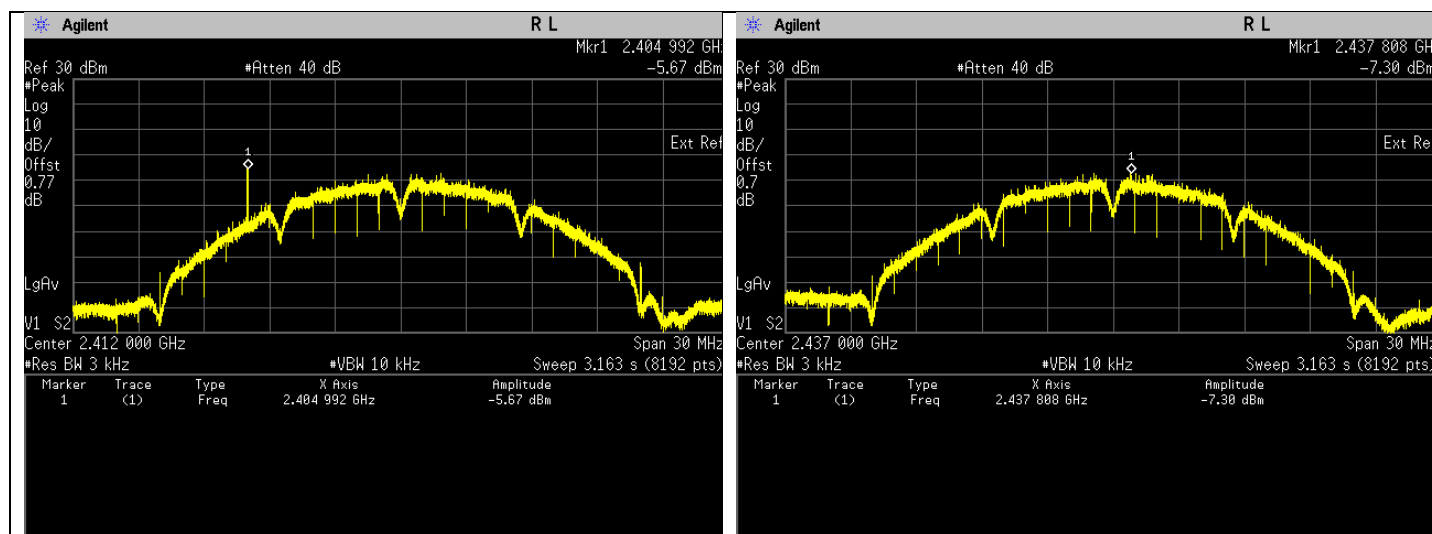
6.4.2. Test Limits

Normal Condition (25 ° C)
$\leq 8 \text{ dBm/3kHz}$

6.4.3. Test Result

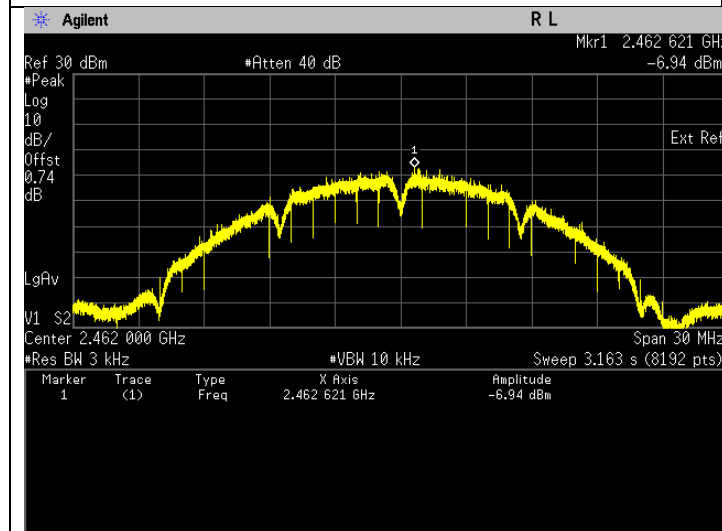
802.11b

Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Power (dBm/3kHz)	Status
802.11b	DSSS	QPSK	1	2412	-5.67	Pass
802.11b	DSSS	QPSK	1	2437	-7.30	Pass
802.11b	DSSS	QPSK	1	2462	-6.94	Pass



Maximum Power Spectral Density. 802.11b Frequency 2412 MHz

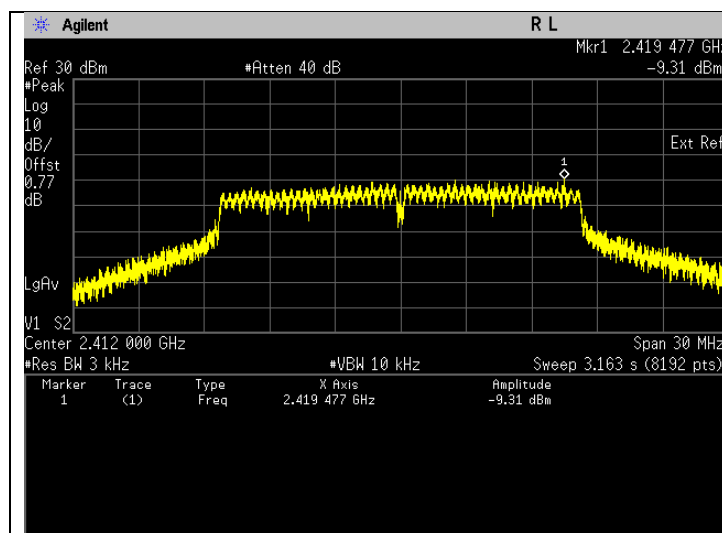
Maximum Power Spectral Density. 802.11b Frequency 2437 MHz



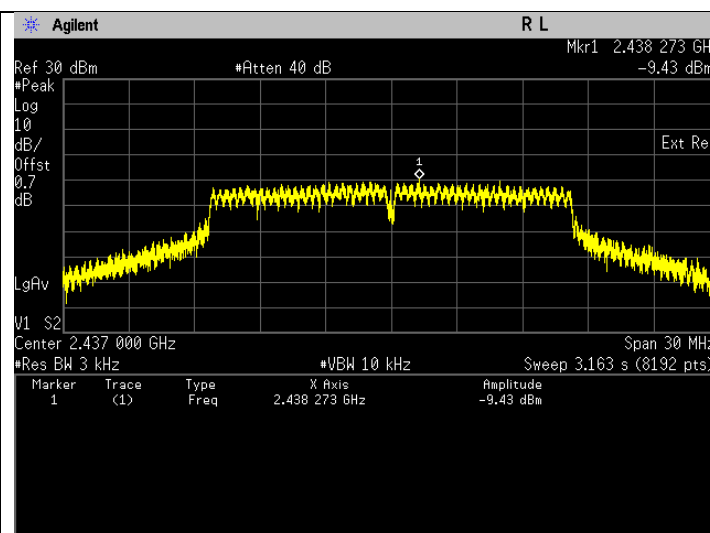
Maximum Power Spectral Density. 802.11b Frequency 2462 MHz

802.11g

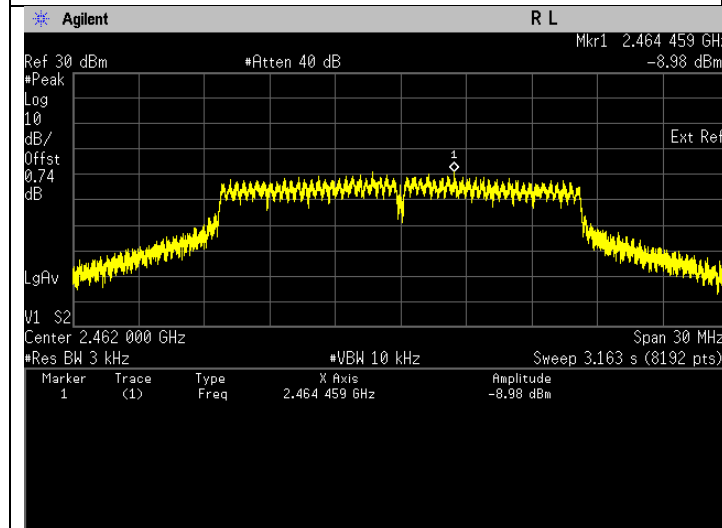
Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Power (dBm/3kHz)	Status
802.11g	OFDM	BPSK	6	2412	-9.31	Pass
802.11g	OFDM	BPSK	6	2437	-9.43	Pass
802.11g	OFDM	BPSK	6	2462	-8.98	Pass



Maximum Power Spectral Density. 802.11g Frequency 2412 MHz



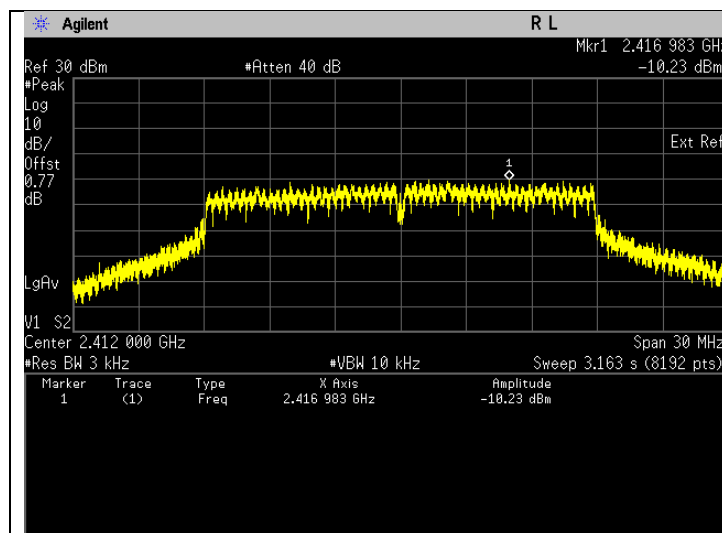
Maximum Power Spectral Density. 802.11g Frequency 2437 MHz



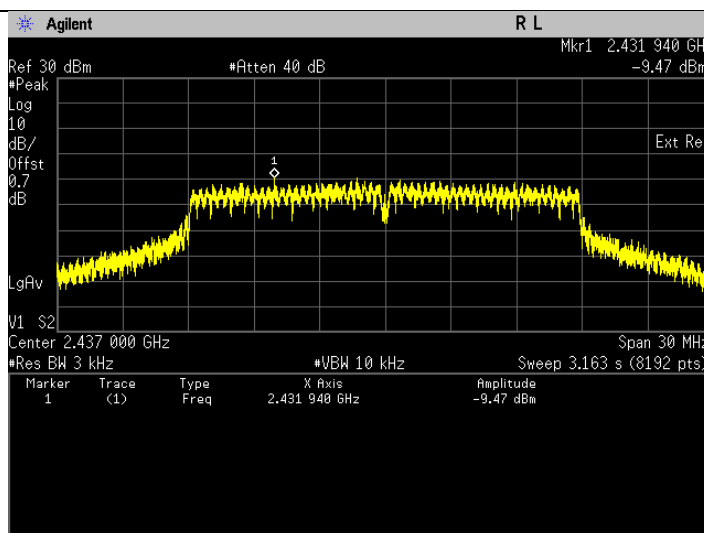
Maximum Power Spectral Density. 802.11g Frequency 2462 MHz

802.11n (HT20)

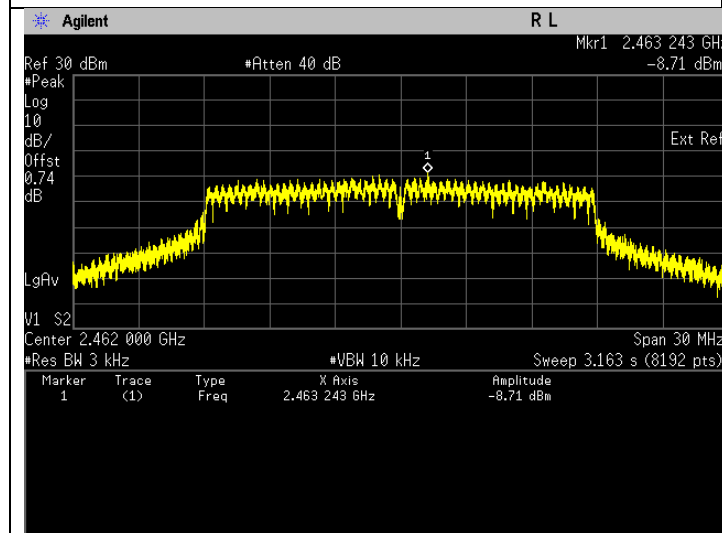
Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Power (dBm/3kHz)	Status
802.11n	OFDM	BPSK	6.5	2412	-10.23	Pass
802.11n	OFDM	BPSK	6.5	2437	-9.47	Pass
802.11n	OFDM	BPSK	6.5	2462	-8.71	Pass



Maximum Power Spectral Density. 802.11n Frequency 2412 MHz



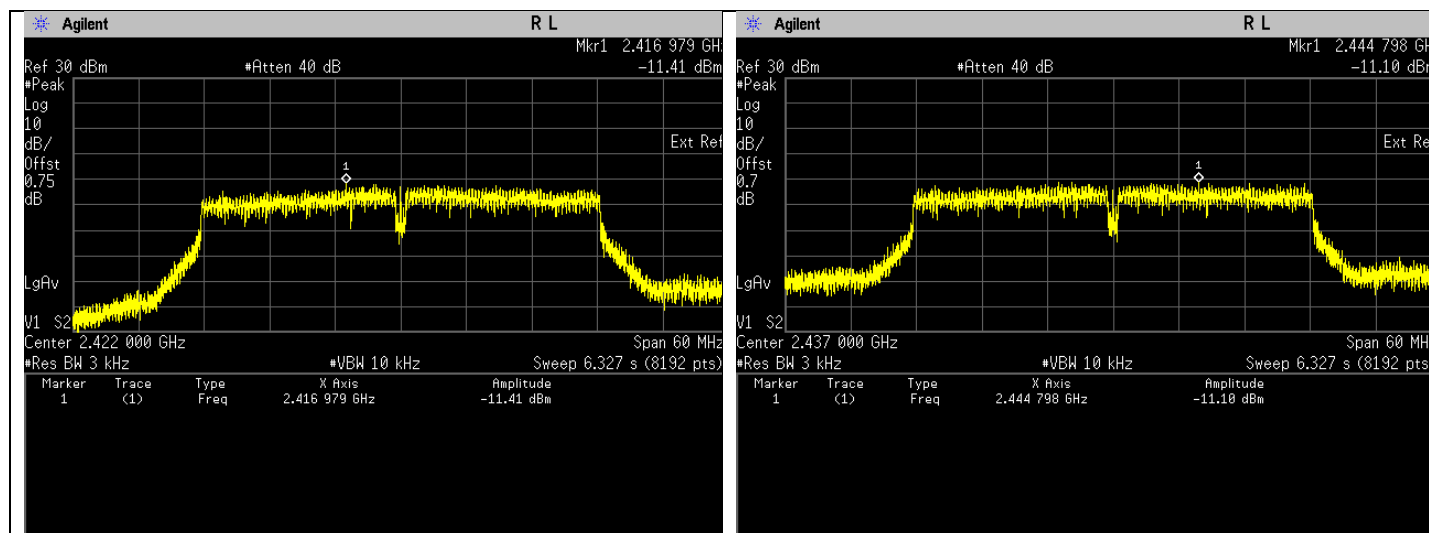
Maximum Power Spectral Density. 802.11n Frequency 2437 MHz



Maximum Power Spectral Density. 802.11n Frequency 2462 MHz

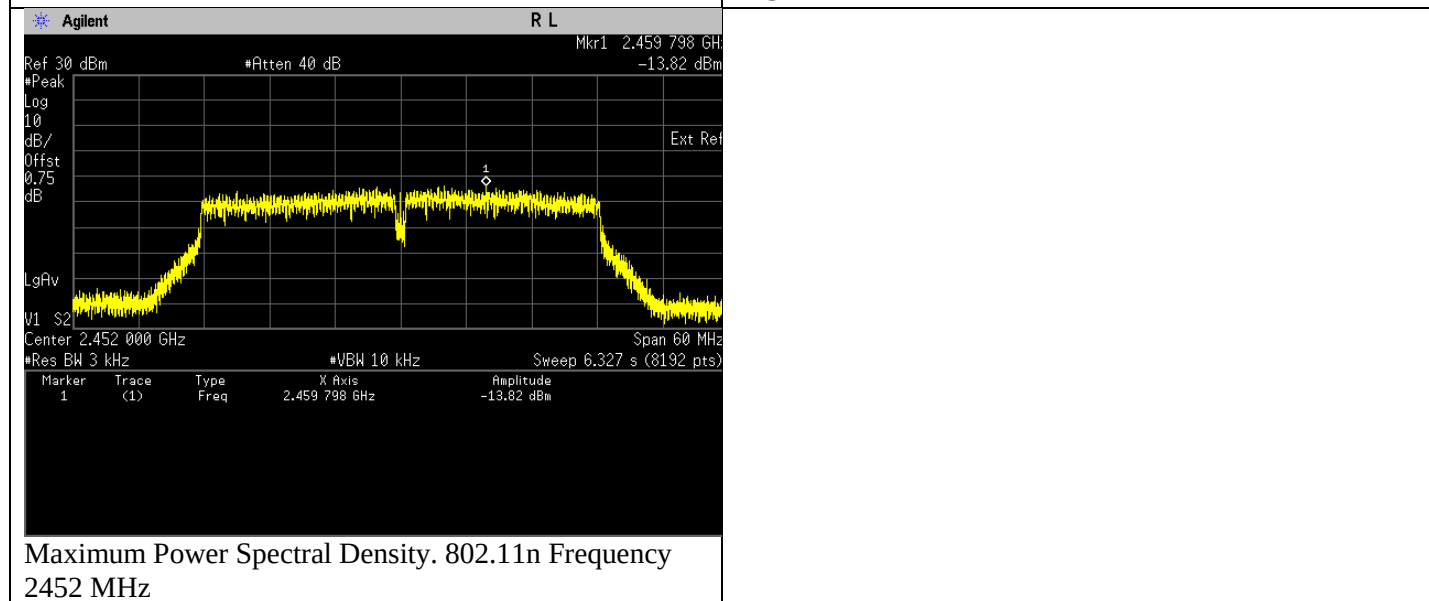
802.11n (HT40)

Test Conditions				Test Frequency	Results	
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Power (dBm/3kHz)	Status
802.11n	OFDM	BPSK	6.5	2422	-11.41	Pass
802.11n	OFDM	BPSK	6.5	2437	-11.10	Pass
802.11n	OFDM	BPSK	6.5	2452	-13.82	Pass



Maximum Power Spectral Density. 802.11n Frequency 2422 MHz

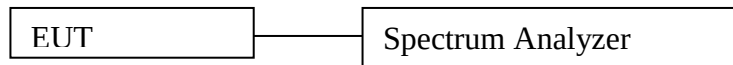
Maximum Power Spectral Density. 802.11n Frequency 2437 MHz



Maximum Power Spectral Density. 802.11n Frequency 2452 MHz

6.5. Conducted Spurious Emission

6.5.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max Hold
 - e. Sweep = auto
- e) Use the peak marker function to measure highest emission and scan up to 10th harmonic.
- f) Measure every antenna port by repeat the step above for MIMO measurement.

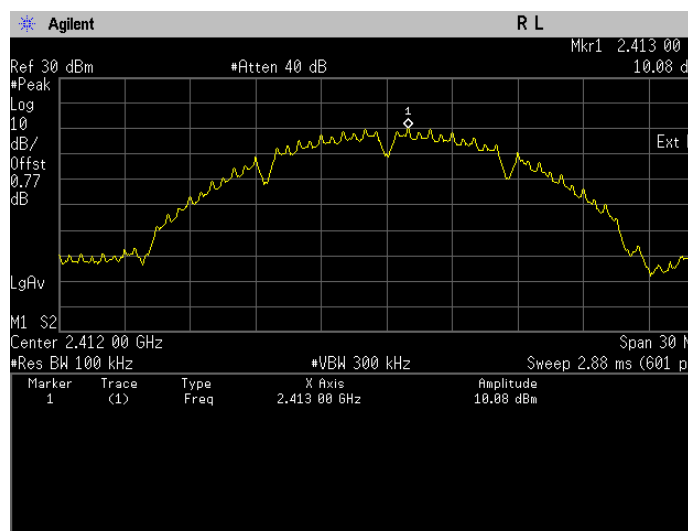
6.5.2. Test Limits:

Normal Condition (25 ° C)
Shall be at least 20 dB below max power. (Peak detector)

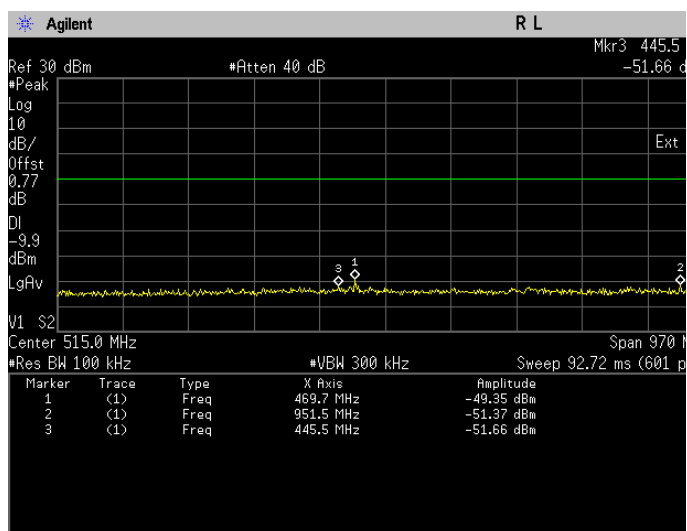
6.5.3. Test Result

802.11b

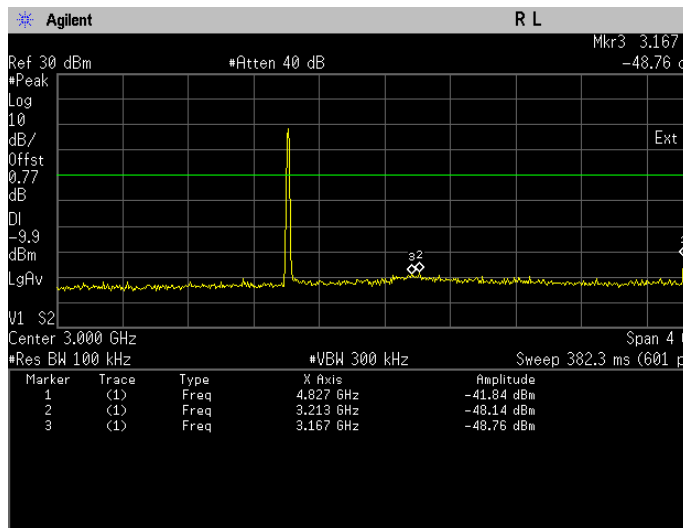
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
802.11b	DSSS	QPSK	1	2412	24958.000	-41.08	Pass
					24500.000	-41.10	Pass
					24892.000	-41.22	Pass
802.11b	DSSS	QPSK	1	2437	24908.000	-41.36	Pass
					24408.000	-41.43	Pass
					24942.000	-41.47	Pass
802.11b	DSSS	QPSK	1	2462	24525.000	-40.89	Pass
					24817.000	-41.01	Pass
					24575.000	-41.31	Pass



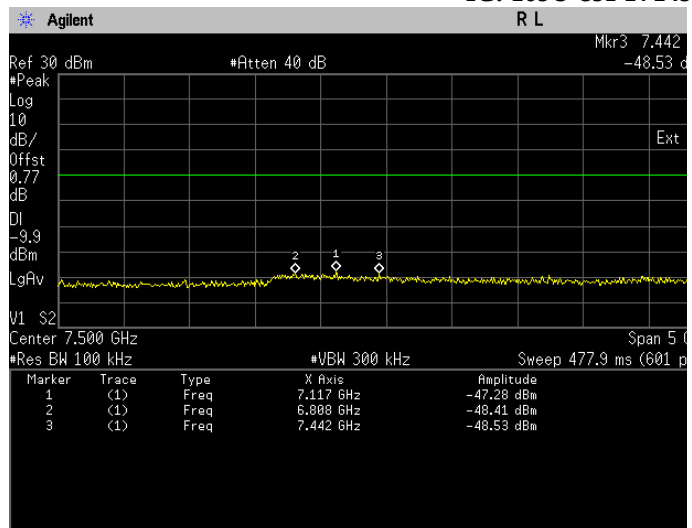
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Reference Level



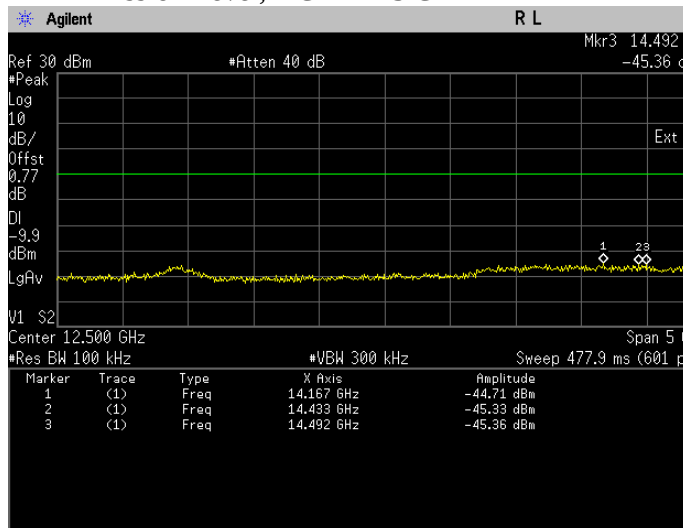
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Emission Level, 30 MHz -> 1 GHz



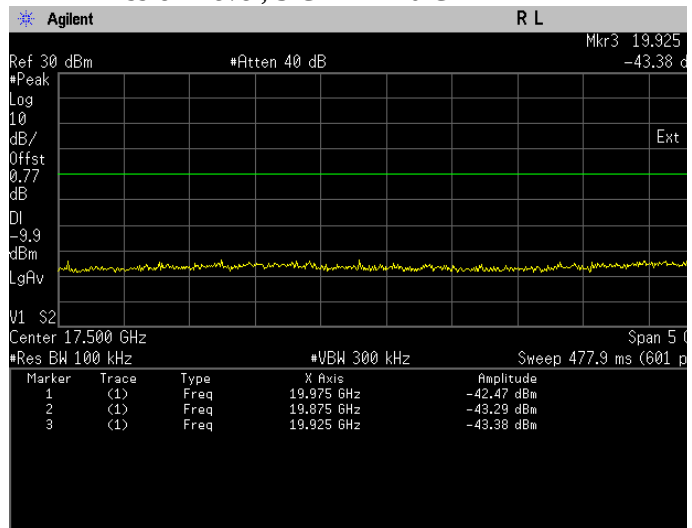
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Emission Level, 1 GHz -> 5 GHz



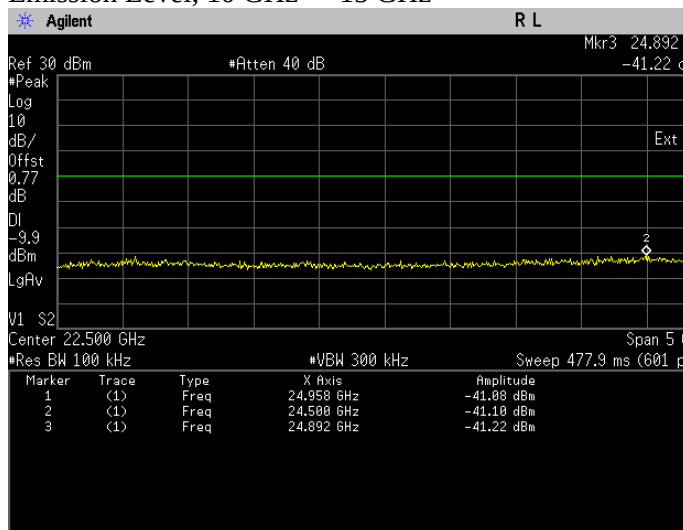
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Emission Level, 5 GHz -> 10 GHz



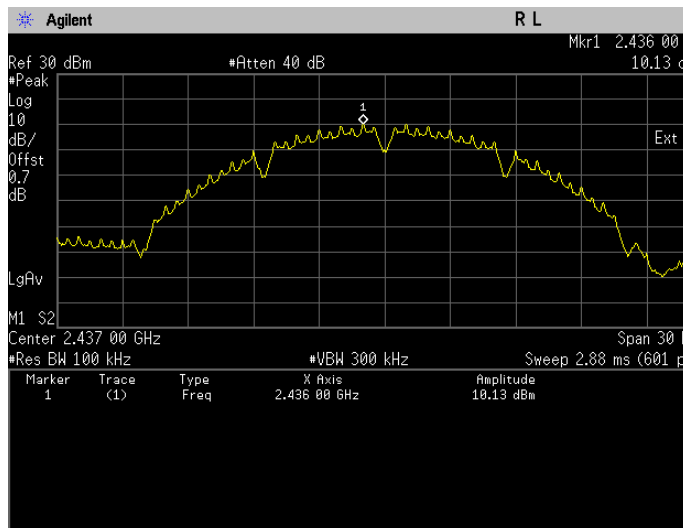
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Emission Level, 10 GHz -> 15 GHz



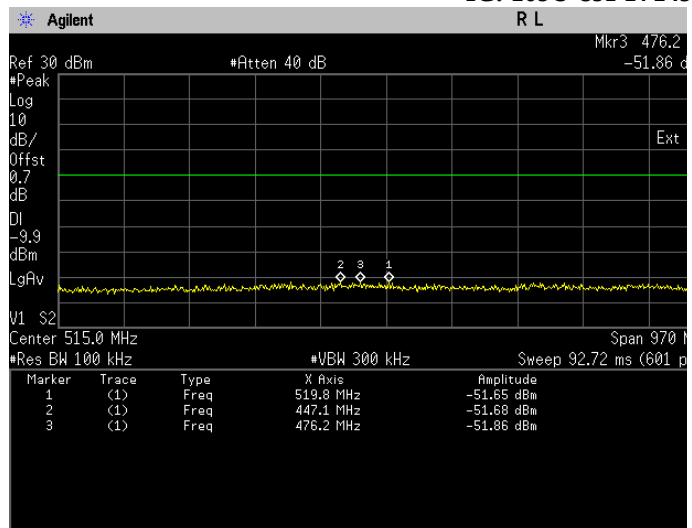
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Emission Level, 15 GHz -> 20 GHz



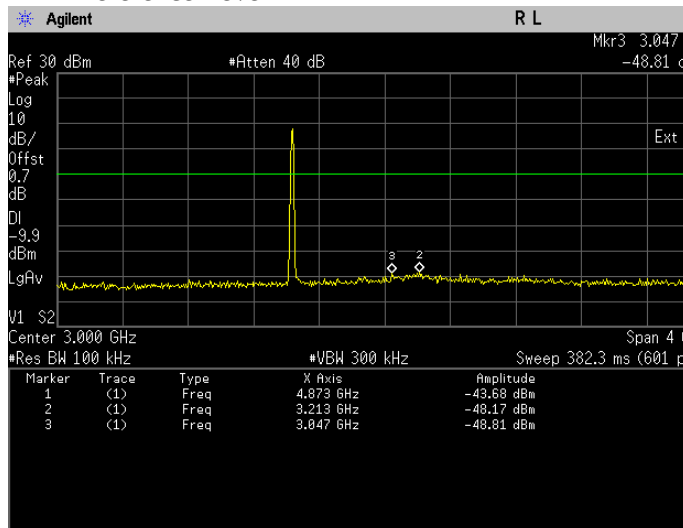
Conducted Emissions(Peak). 802.11b, Frequency 2412 MHz Emission Level, 20 GHz -> 25 GHz



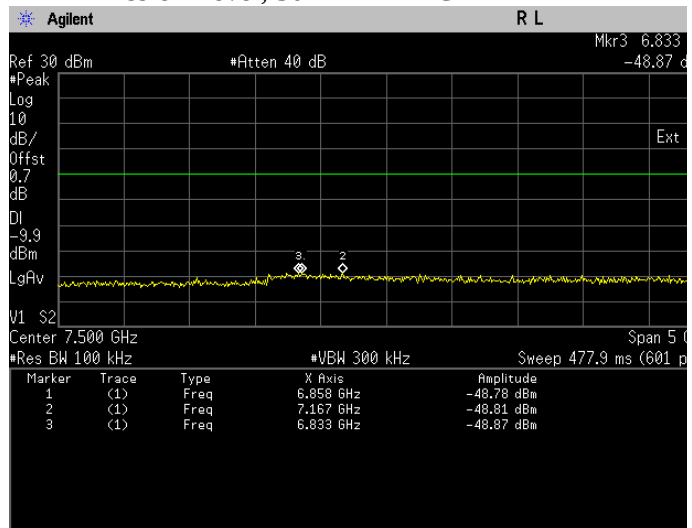
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Reference Level



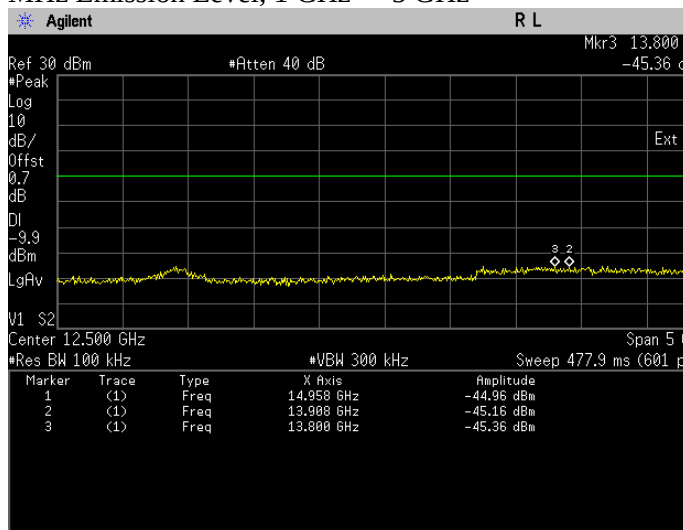
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



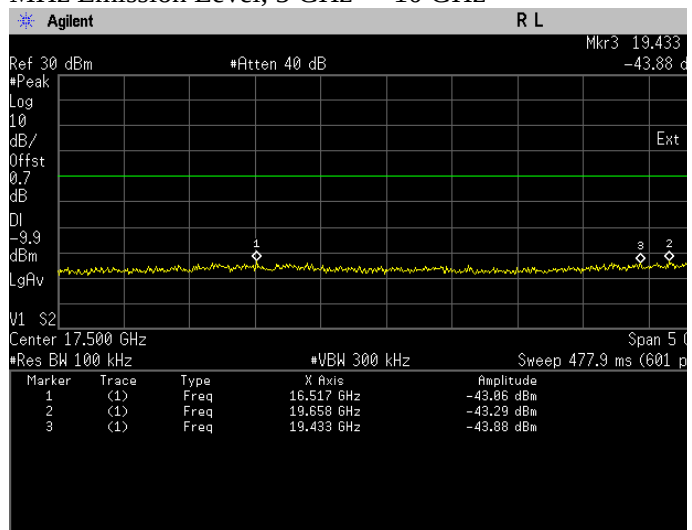
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz



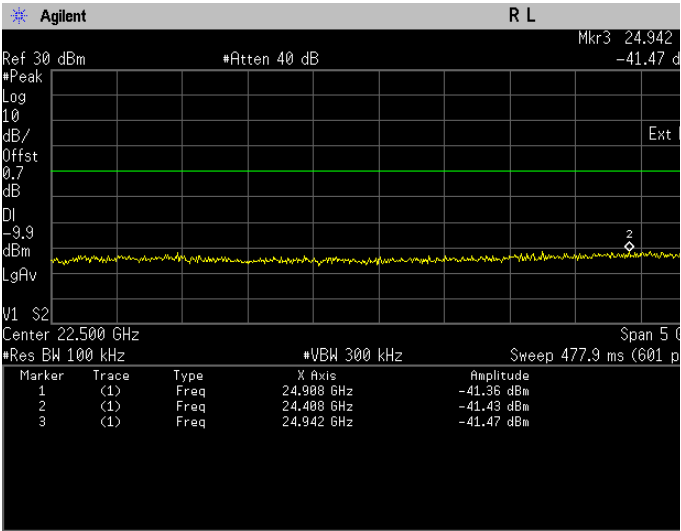
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz



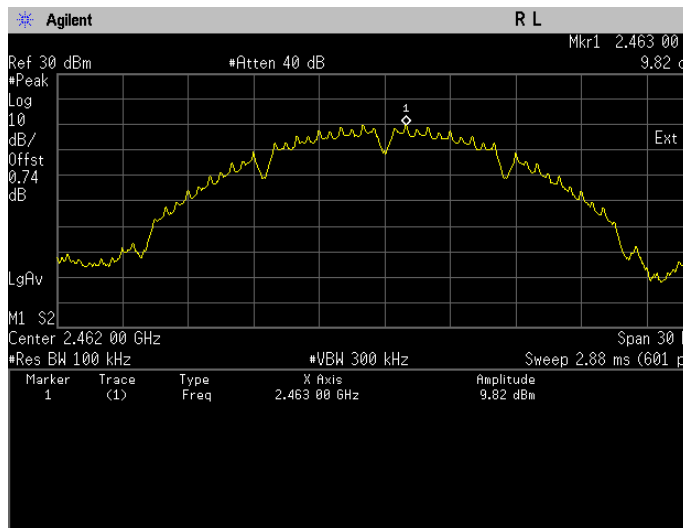
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Emission Level, 10 GHz -> 15 GHz



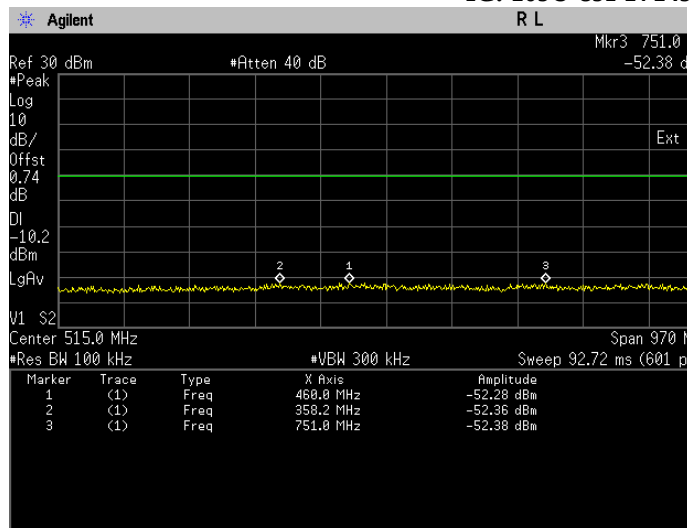
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



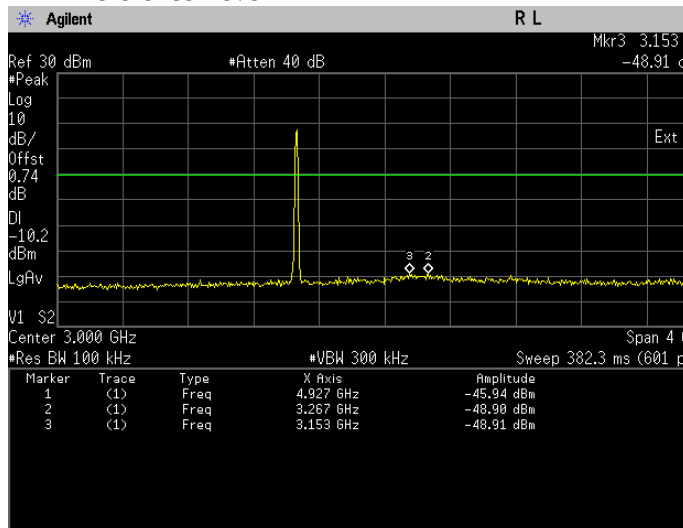
Conducted Emissions(Peak). 802.11b, Frequency 2437 MHz Emission Level, 20 GHz -> 25 GHz



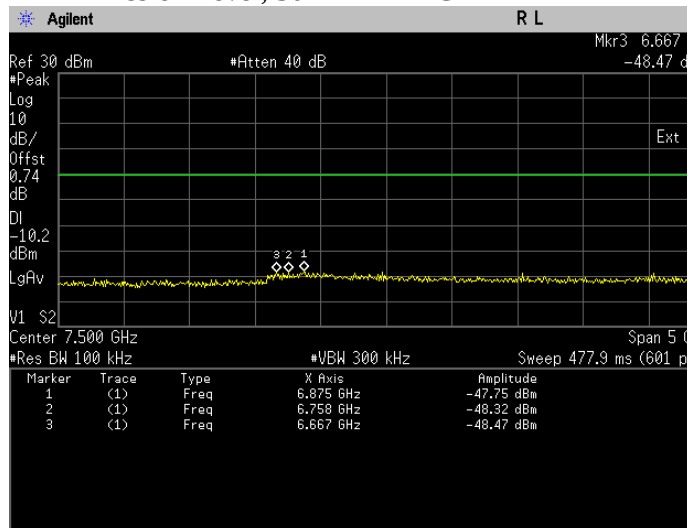
Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Reference Level



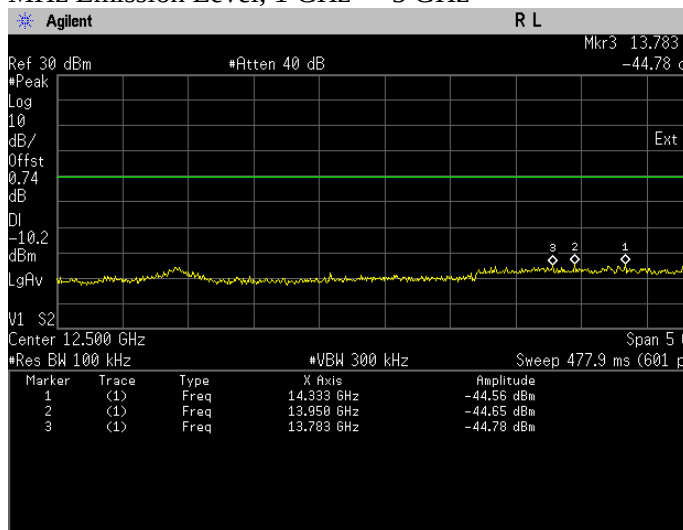
Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Emission Level, 30 MHz -> 1 GHz



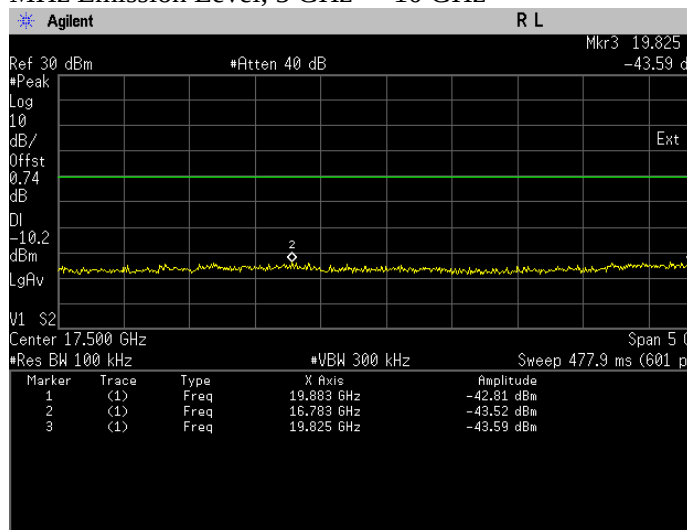
Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Emission Level, 1 GHz -> 5 GHz



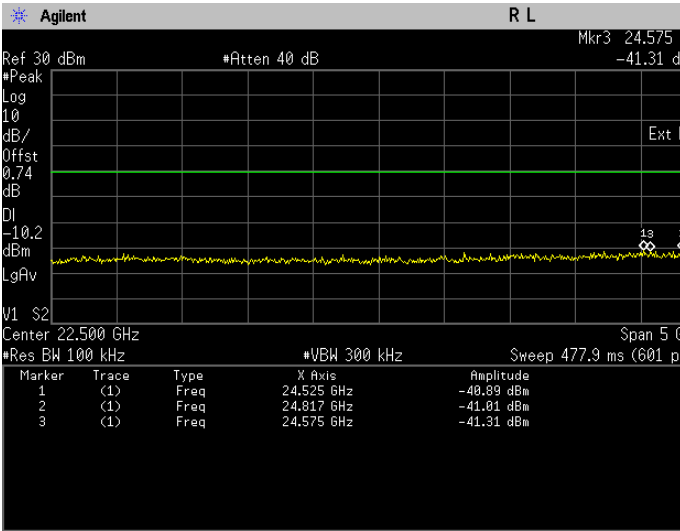
Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Emission Level, 10 GHz -> 15 GHz



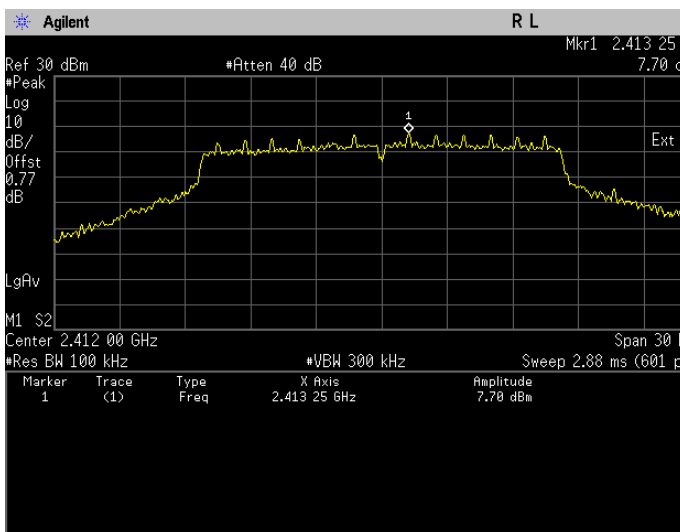
Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Emission Level, 15 GHz -> 20 GHz



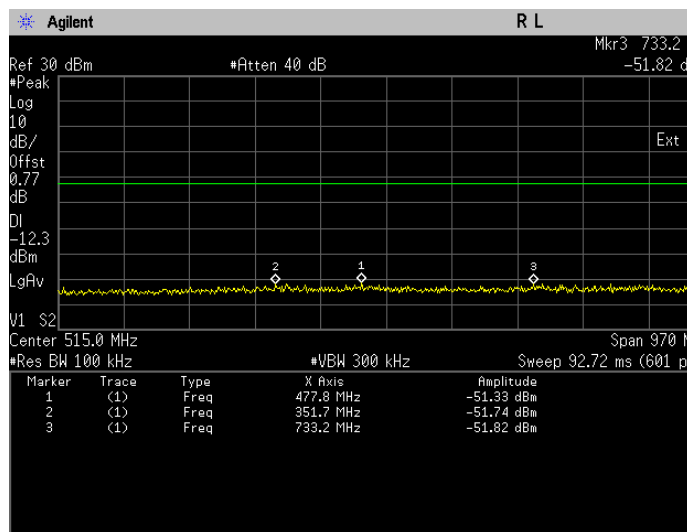
Conducted Emissions(Peak). 802.11b, Frequency 2462 MHz Emission Level, 20 GHz -> 25 GHz

802.11g

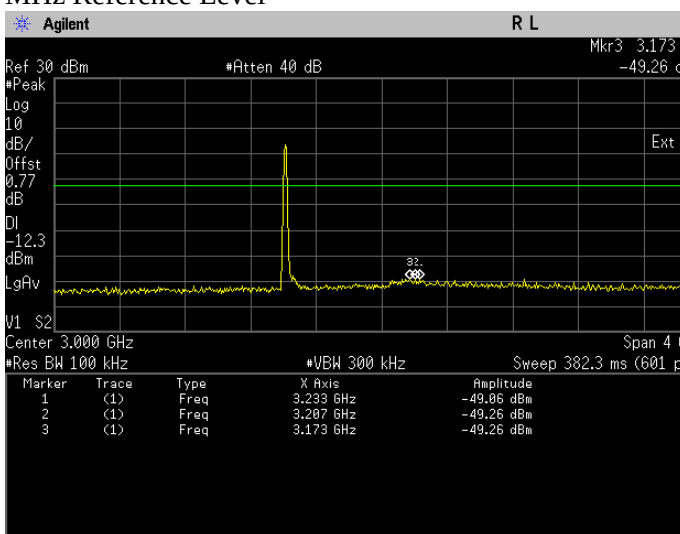
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
802.11g	OFDM	BPSK	6	2412	24500.000	-40.76	Pass
					24850.000	-41.04	Pass
					23650.000	-41.42	Pass
802.11g	OFDM	BPSK	6	2437	25000.000	-39.60	Pass
					24925.000	-40.49	Pass
					24842.000	-40.61	Pass
802.11g	OFDM	BPSK	6	2462	24900.000	-40.25	Pass
					24542.000	-40.95	Pass
					24658.000	-41.28	Pass



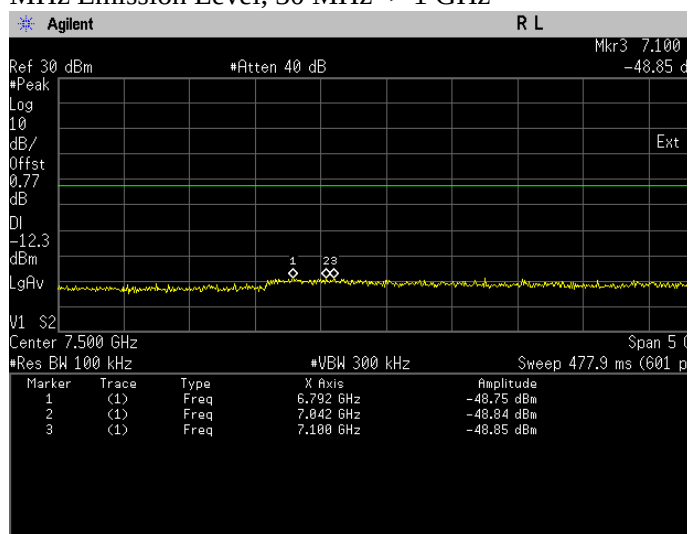
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Reference Level



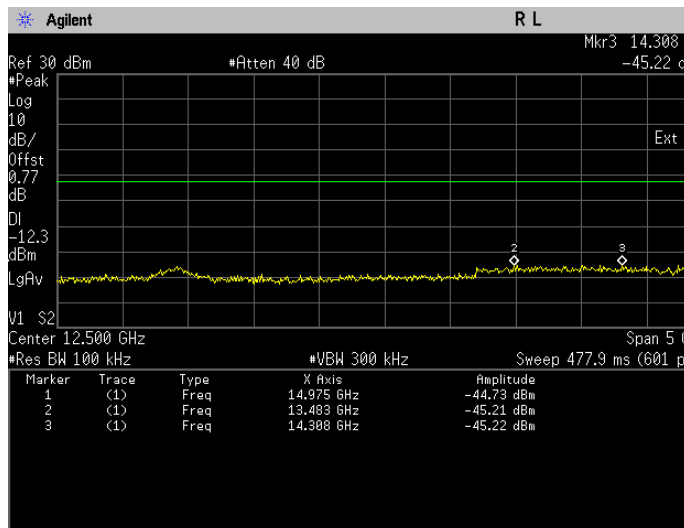
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Emission Level, 30 MHz -> 1 GHz



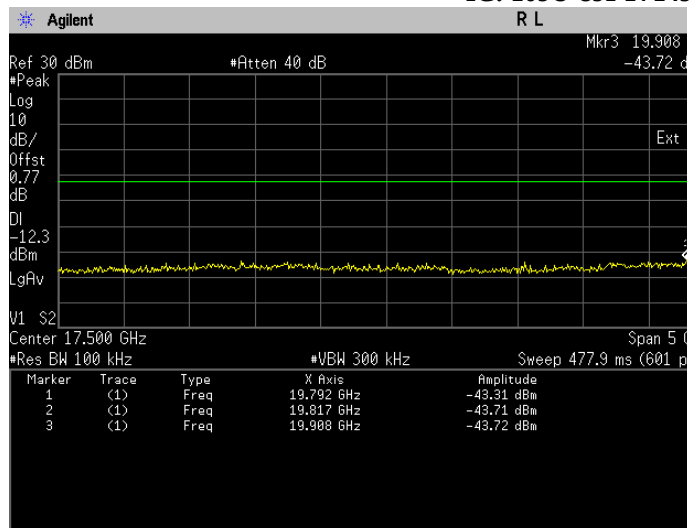
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Emission Level, 1 GHz -> 5 GHz



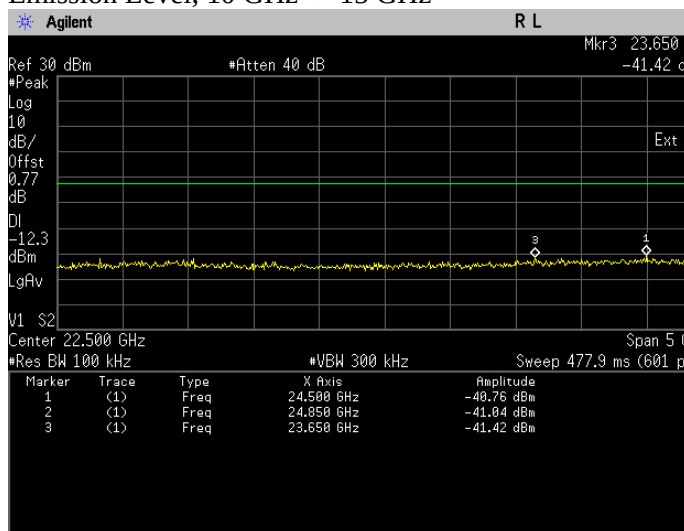
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Emission Level, 5 GHz -> 10 GHz



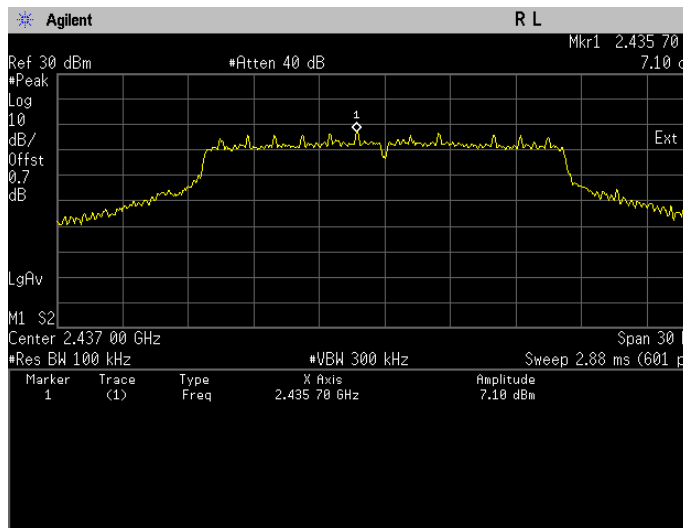
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Emission Level, 10 GHz -> 15 GHz



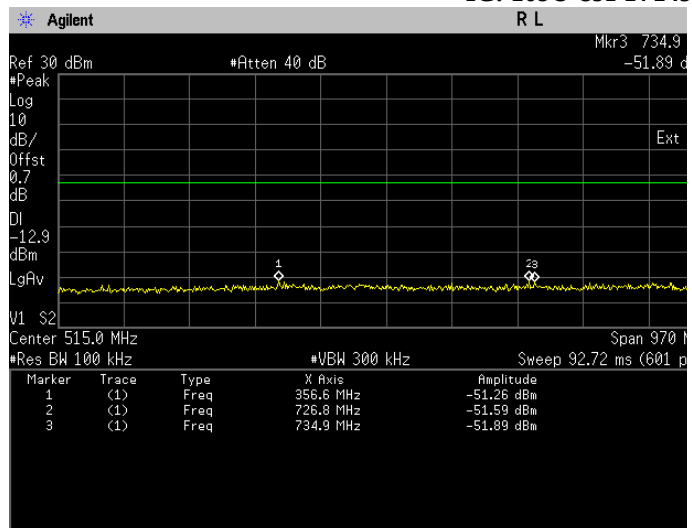
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Emission Level, 15 GHz -> 20 GHz



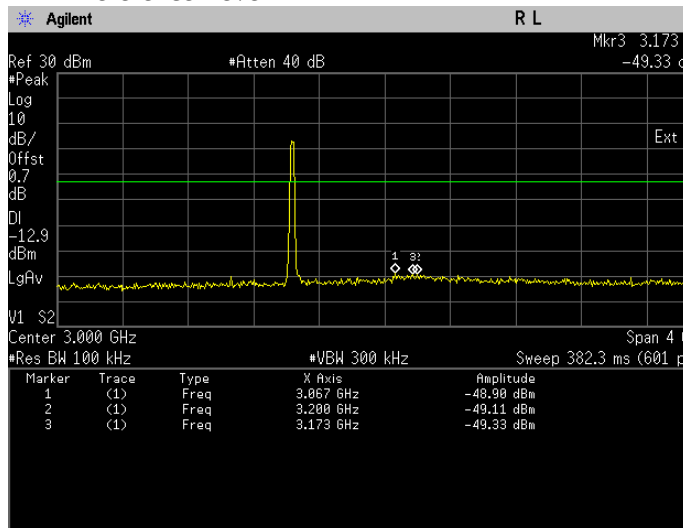
Conducted Emissions(Peak). 802.11g, Frequency 2412 MHz Emission Level, 20 GHz -> 25 GHz



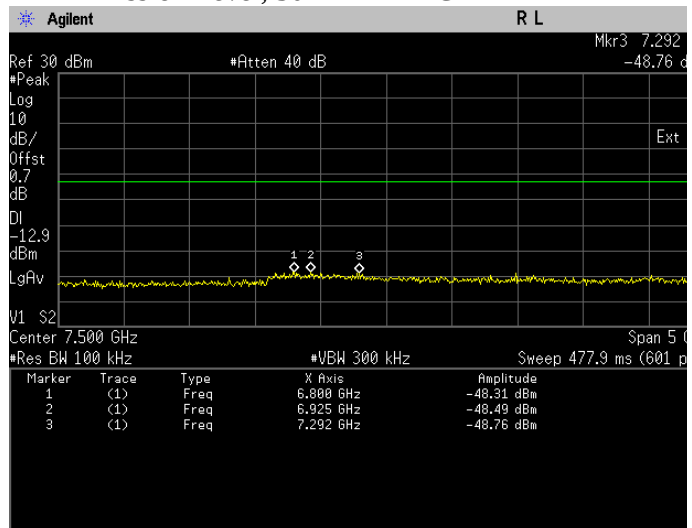
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Reference Level



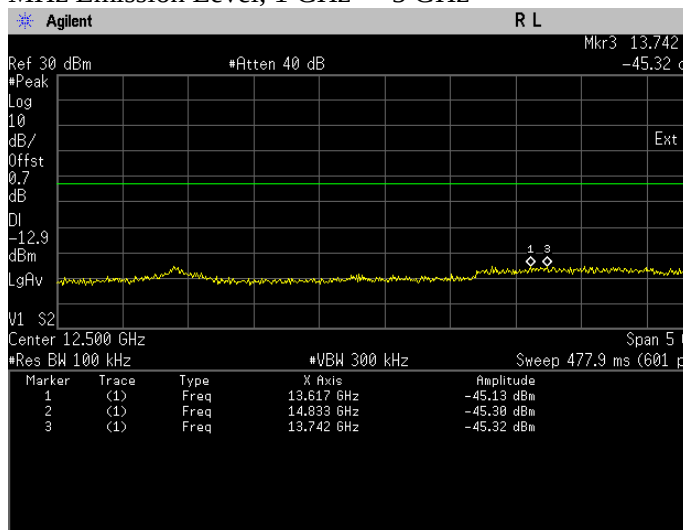
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



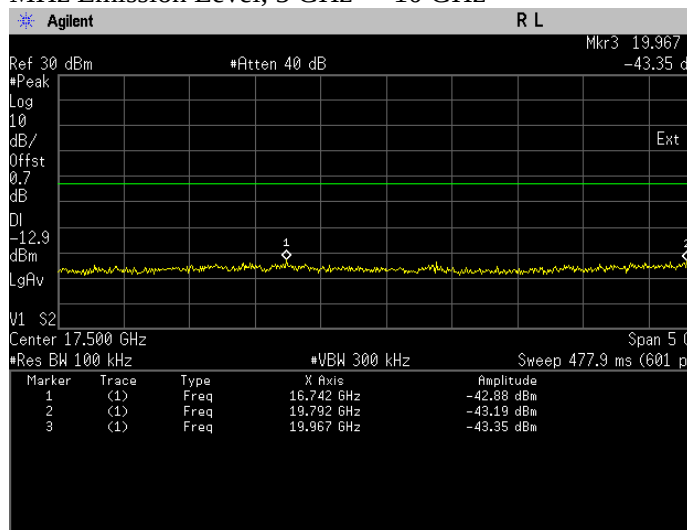
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz



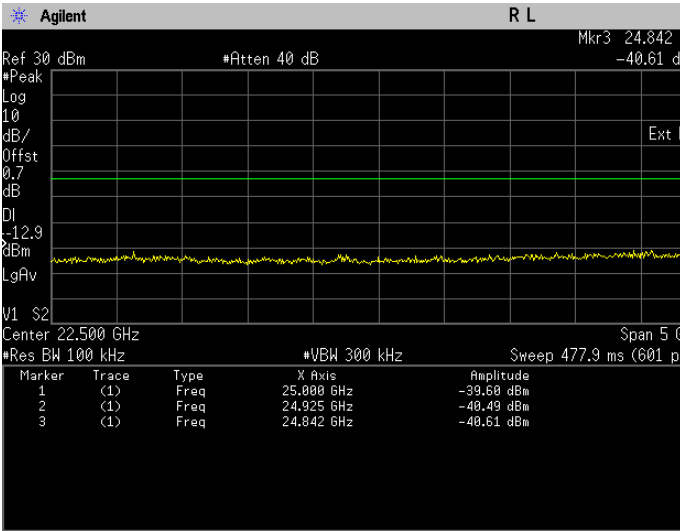
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz



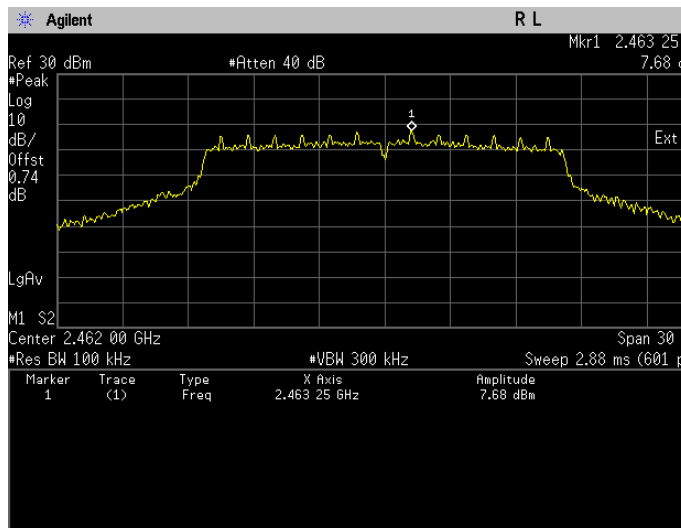
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Emission Level, 10 GHz -> 15 GHz



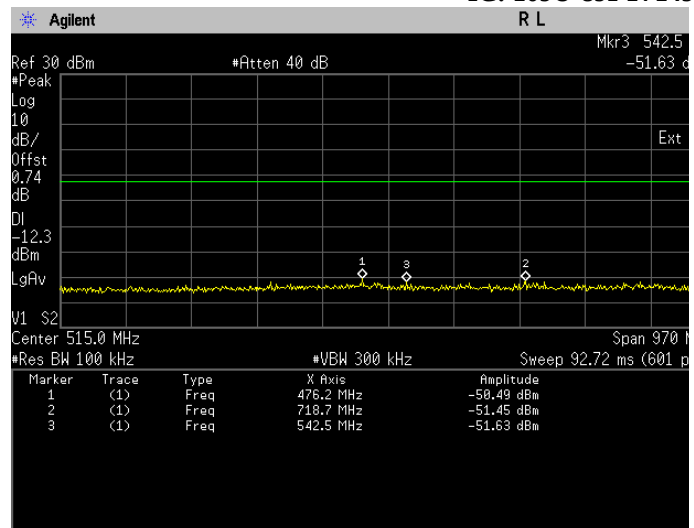
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



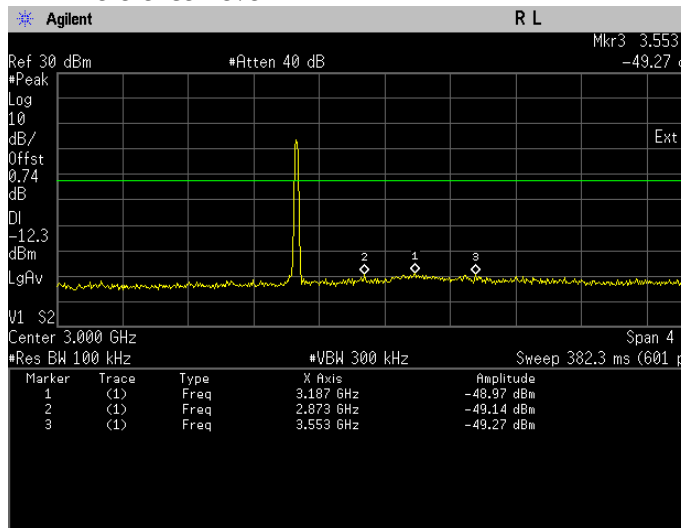
Conducted Emissions(Peak). 802.11g, Frequency 2437 MHz Emission Level, 20 GHz -> 25 GHz



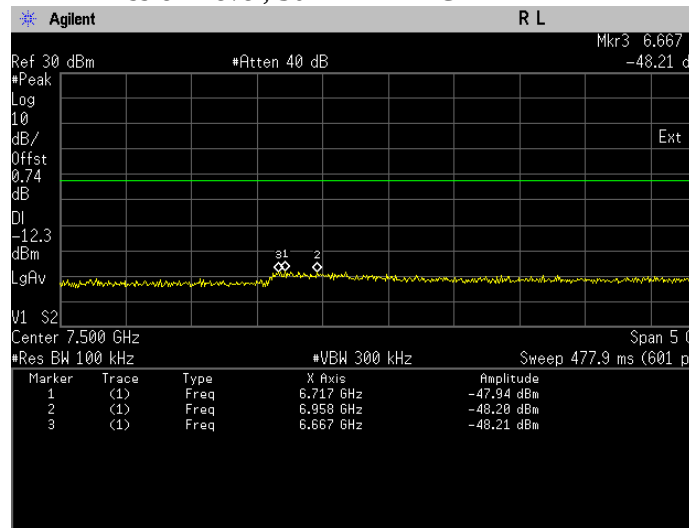
Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Reference Level



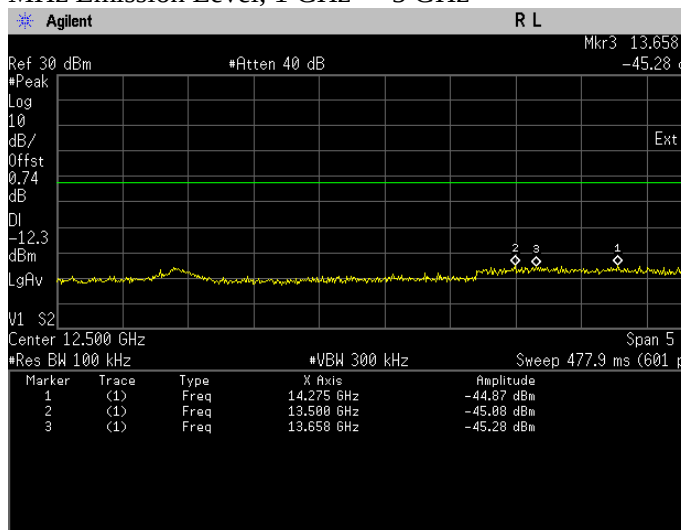
Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Emission Level, 30 MHz -> 1 GHz



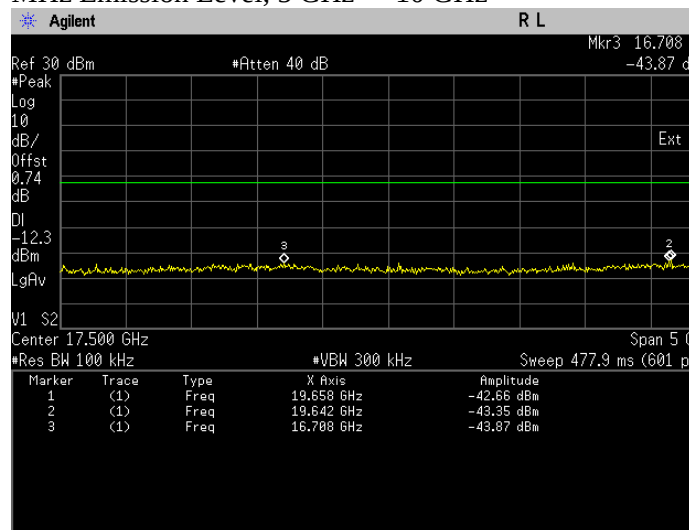
Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Emission Level, 1 GHz -> 5 GHz



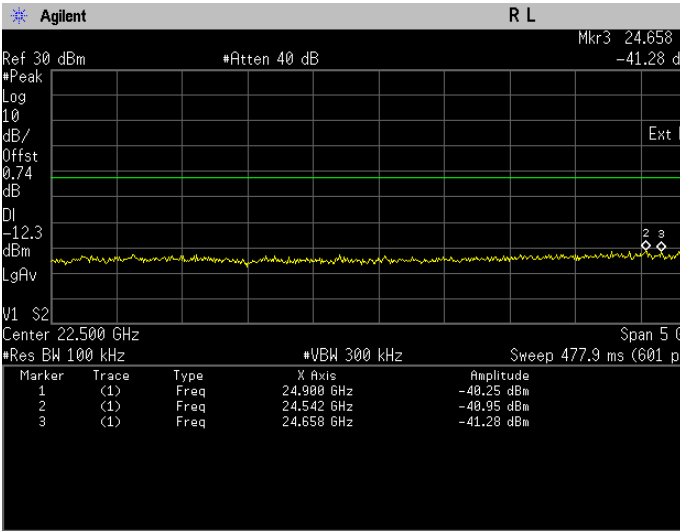
Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Emission Level, 10 GHz -> 15 GHz



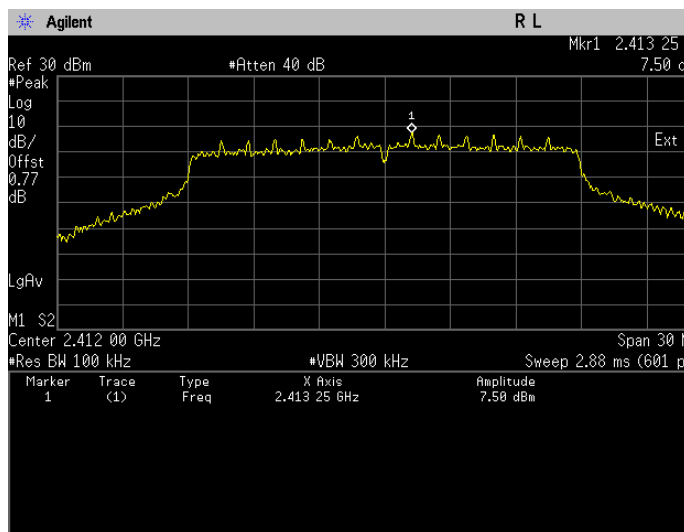
Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Emission Level, 15 GHz -> 20 GHz



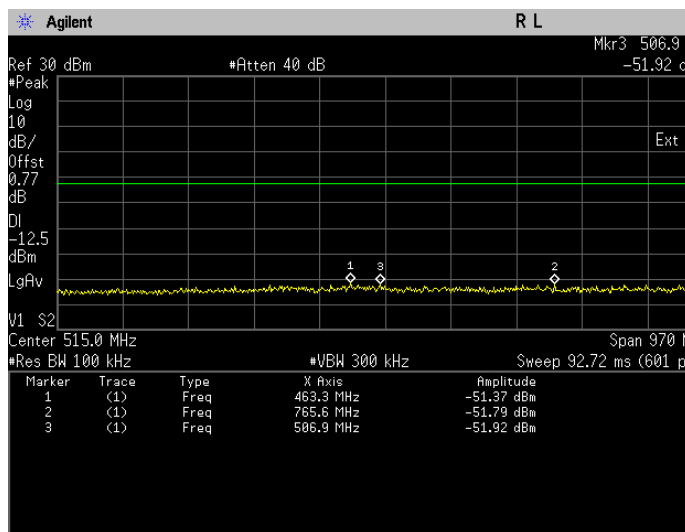
Conducted Emissions(Peak). 802.11g, Frequency 2462 MHz Emission Level, 20 GHz -> 25 GHz

802.11n (HT20)

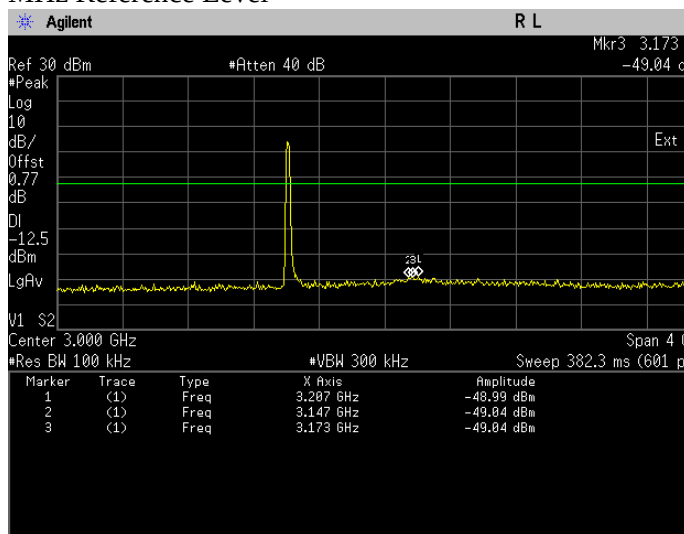
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
802.11n	OFDM	BPSK	6.5	2412	24792.000	-39.84	Pass
					24875.000	-40.65	Pass
					24908.000	-40.80	Pass
802.11n	OFDM	BPSK	6.5	2437	24125.000	-40.78	Pass
					23633.000	-41.33	Pass
					24458.000	-41.35	Pass
802.11n	OFDM	BPSK	6.5	2462	24642.000	-40.55	Pass
					24083.000	-41.19	Pass
					24167.000	-41.35	Pass



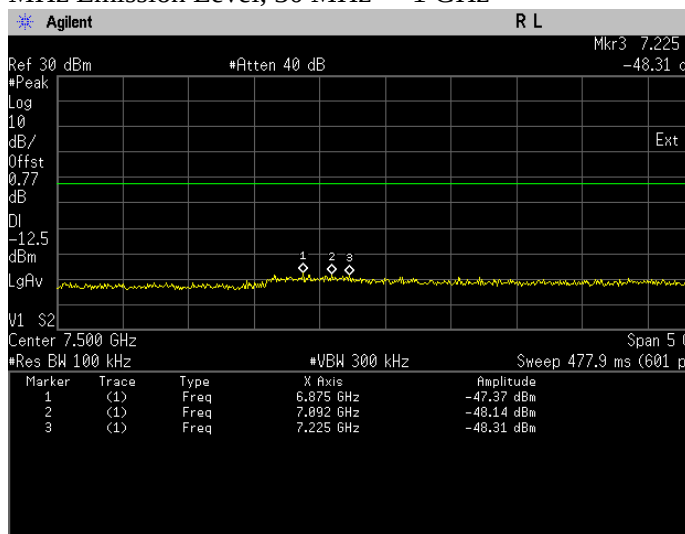
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Reference Level



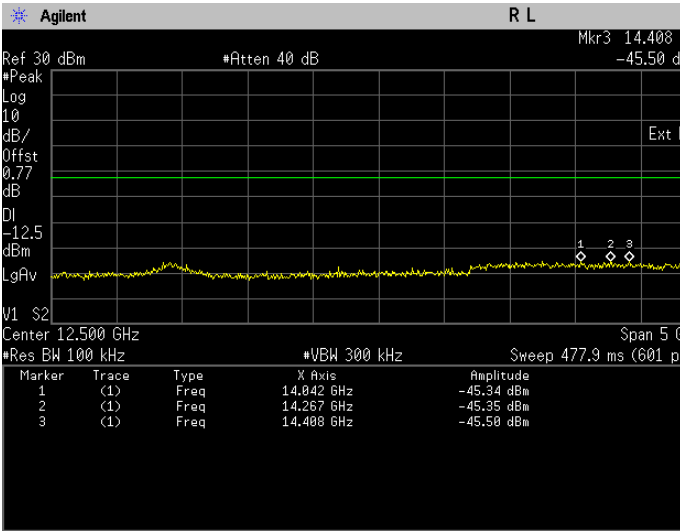
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Emission Level, 30 MHz -> 1 GHz



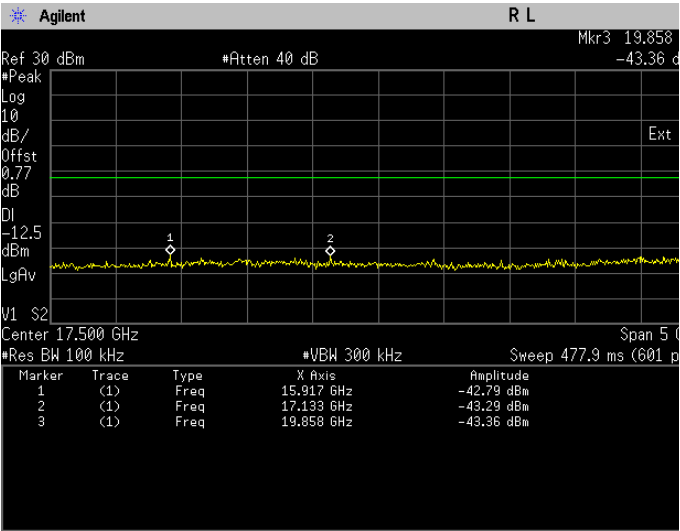
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Emission Level, 1 GHz -> 5 GHz



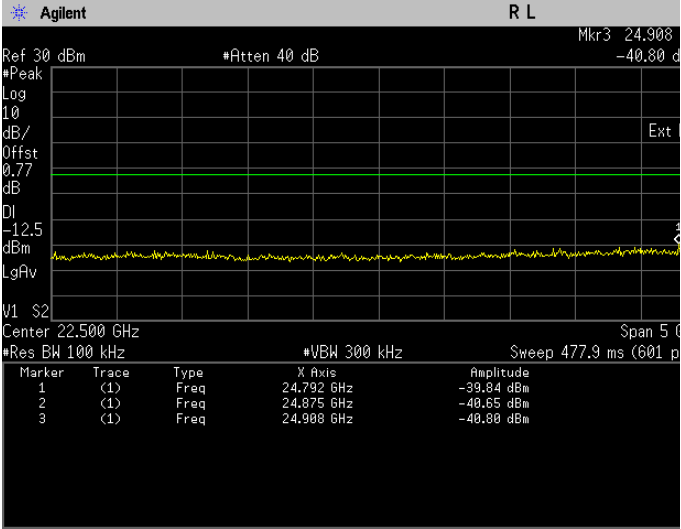
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Emission Level, 5 GHz -> 10 GHz



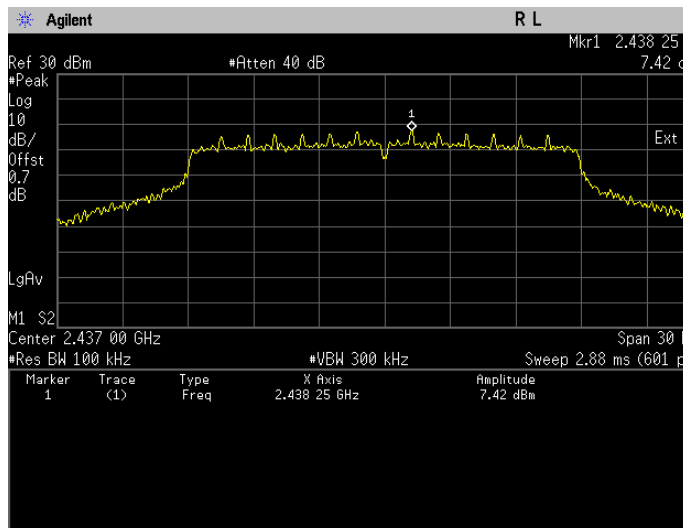
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Emission Level, 10 GHz -> 15 GHz



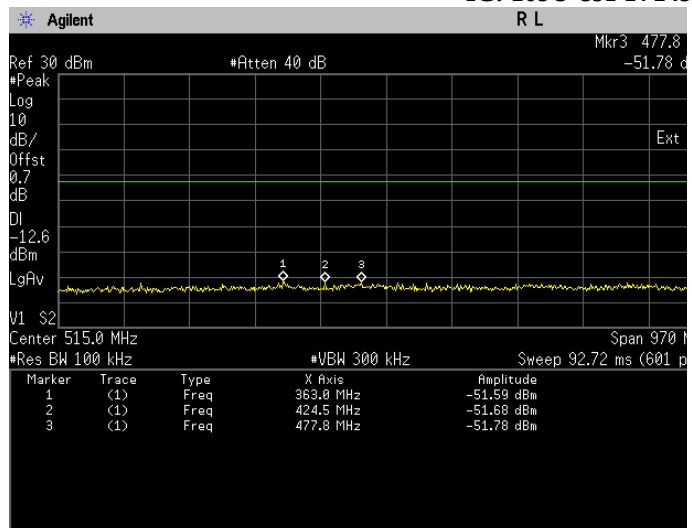
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Emission Level, 15 GHz -> 20 GHz



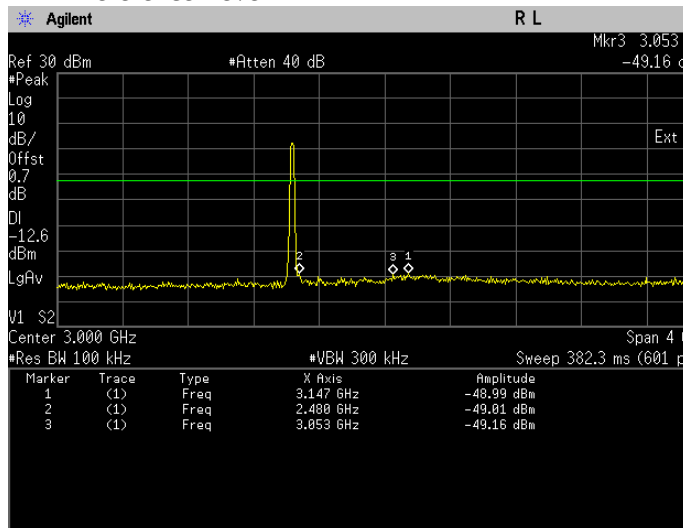
Conducted Emissions(Peak). 802.11n, Frequency 2412 MHz Emission Level, 20 GHz -> 25 GHz



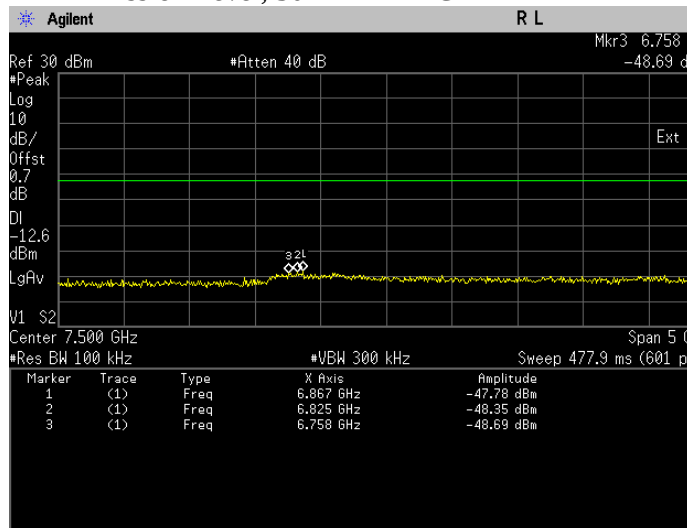
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Reference Level



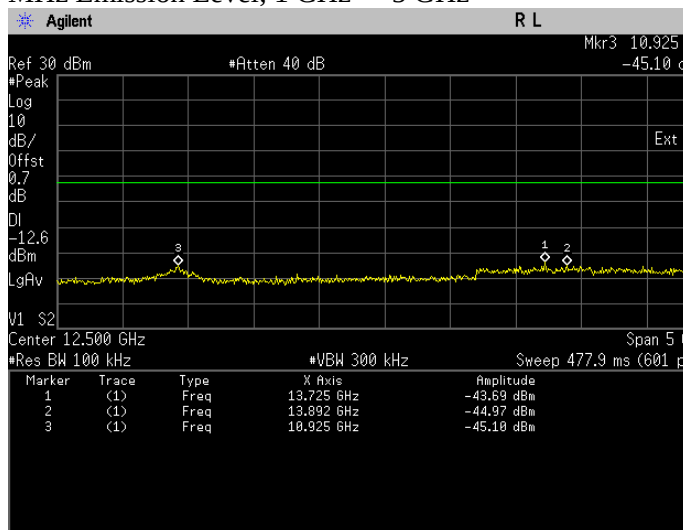
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



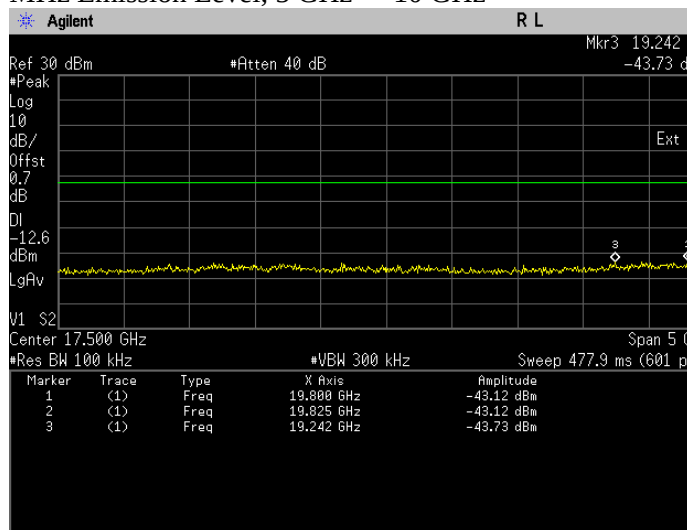
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz



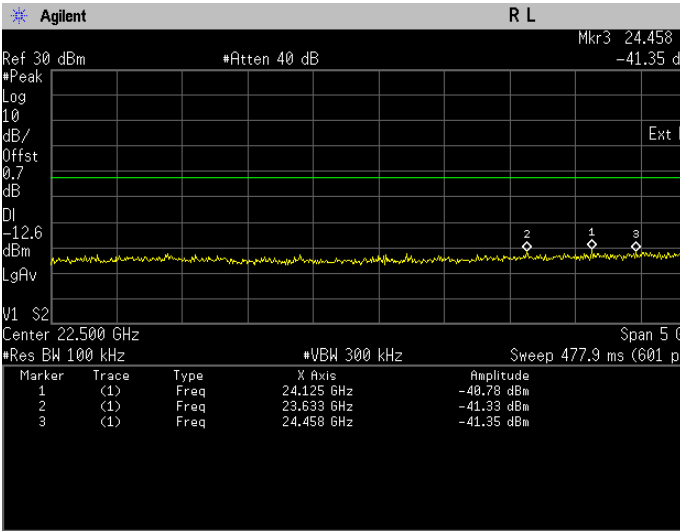
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz



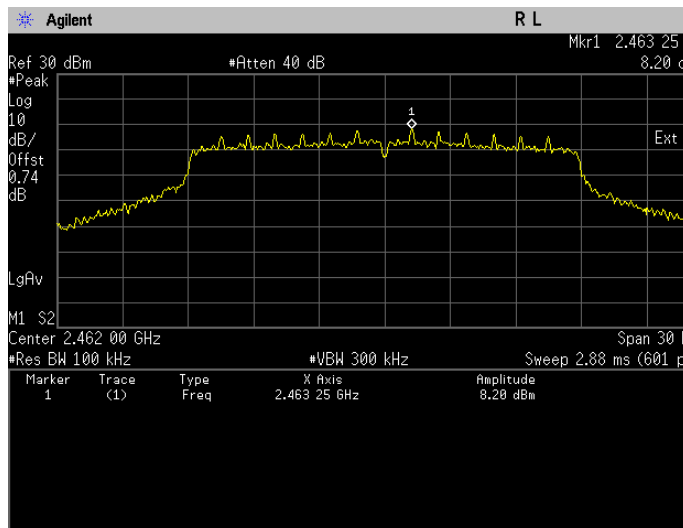
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 10 GHz -> 15 GHz



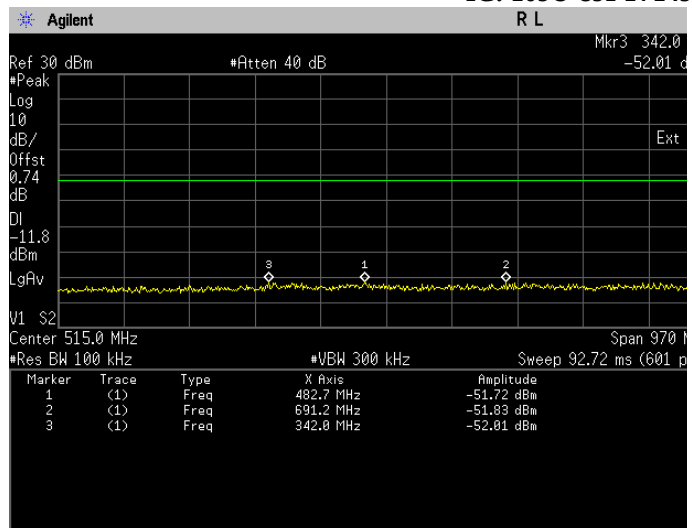
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



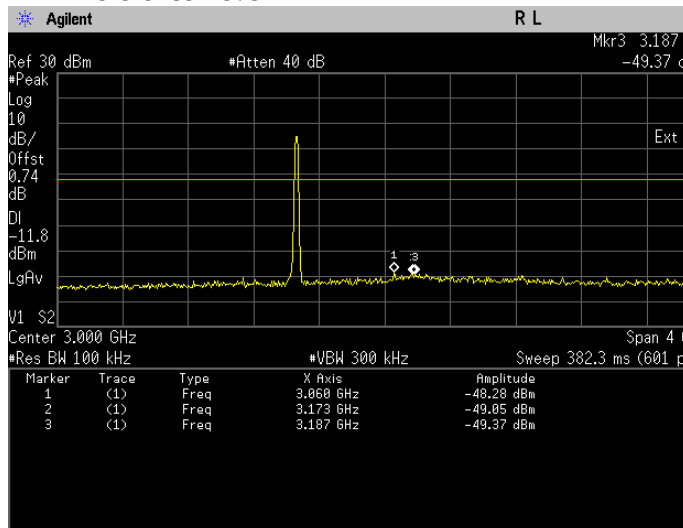
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 20 GHz -> 25 GHz



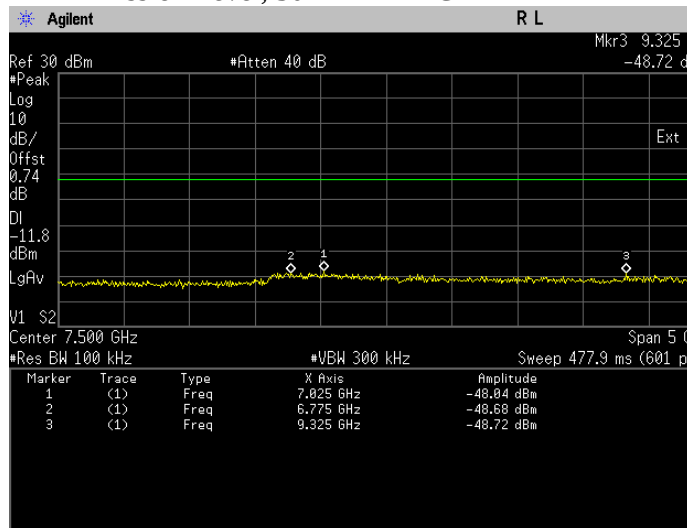
Conducted Emissions(Peak). 802.11n, Frequency 2462 MHz Reference Level



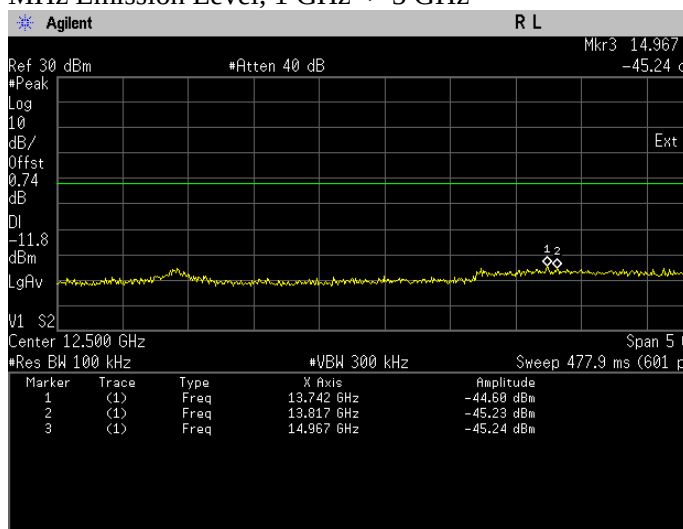
Conducted Emissions(Peak). 802.11n, Frequency 2462 MHz Emission Level, 30 MHz -> 1 GHz



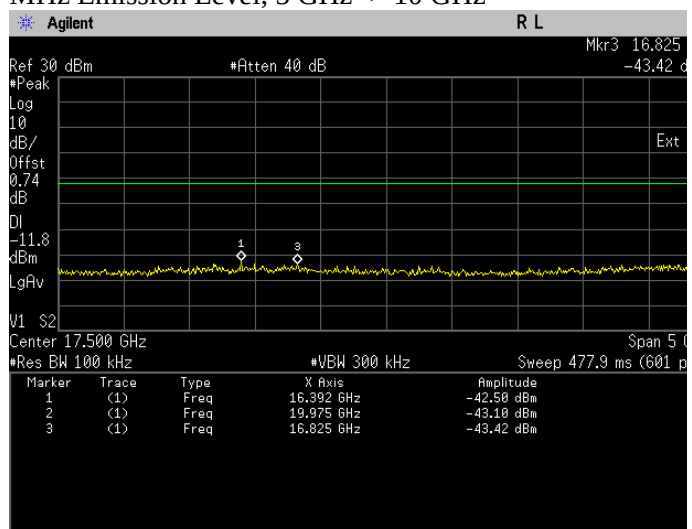
Conducted Emissions(Peak). 802.11n, Frequency 2462 MHz Emission Level, 1 GHz -> 5 GHz



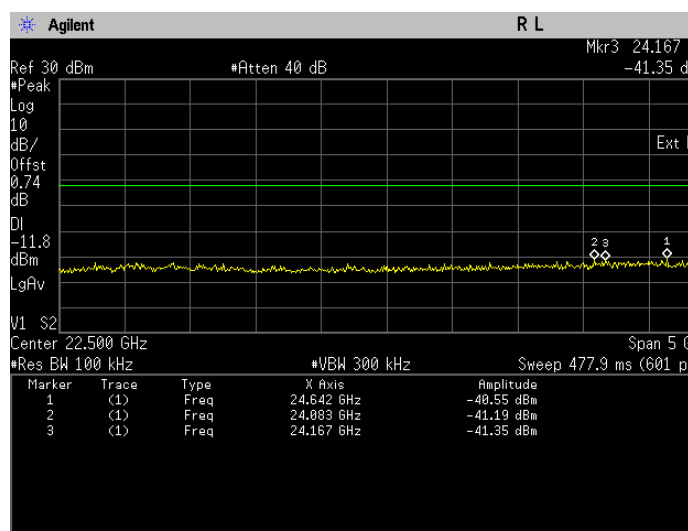
Conducted Emissions(Peak). 802.11n, Frequency 2462 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Peak). 802.11n, Frequency 2462 MHz Emission Level, 10 GHz -> 15 GHz



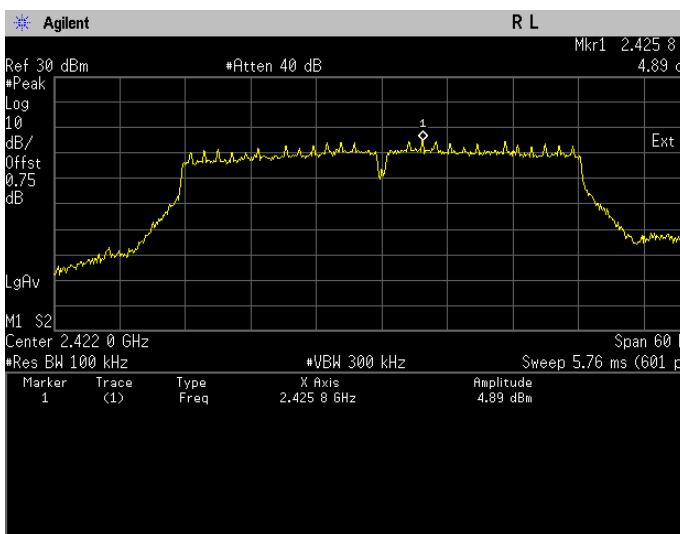
Conducted Emissions(Peak). 802.11n, Frequency 2462 MHz Emission Level, 15 GHz -> 20 GHz



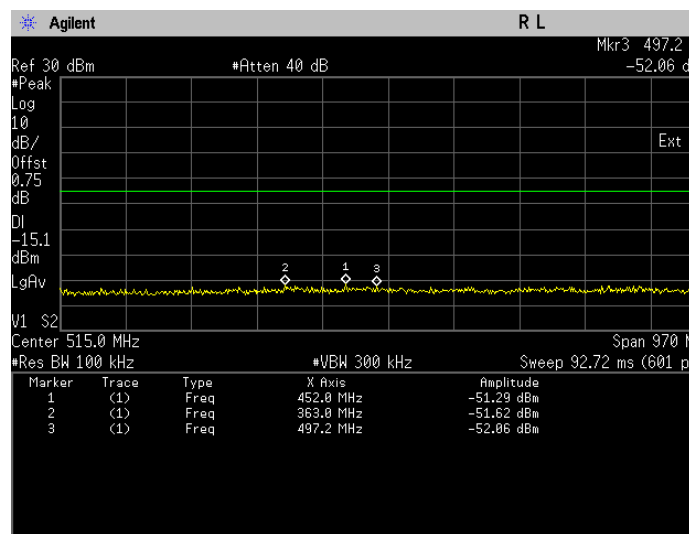
Conducted Emissions(Peak). 802.11n, Frequency 2462
 MHz Emission Level, 20 GHz -> 25 GHz

802.11n (HT40)

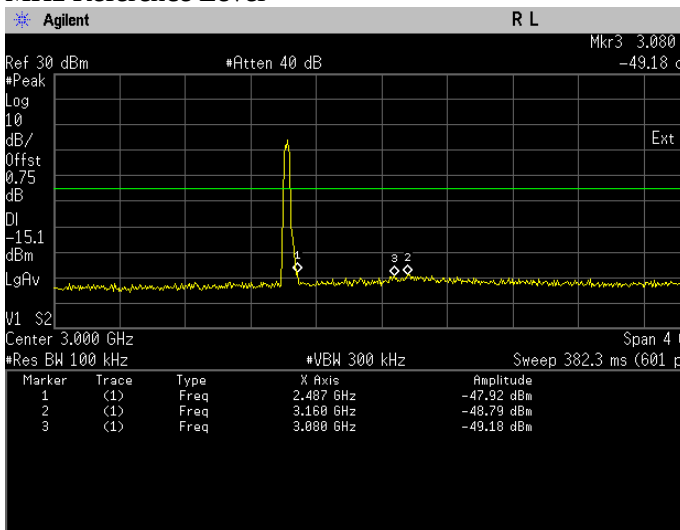
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
802.11n	OFDM	BPSK	6.5	2422	24925.000	-40.17	Pass
					24442.000	-40.64	Pass
					24842.000	-40.77	Pass
802.11n	OFDM	BPSK	6.5	2437	24900.000	-41.22	Pass
					24192.000	-41.26	Pass
					24967.000	-41.42	Pass
802.11n	OFDM	BPSK	6.5	2452	24575.000	-40.10	Pass
					24917.000	-40.62	Pass
					24392.000	-41.06	Pass



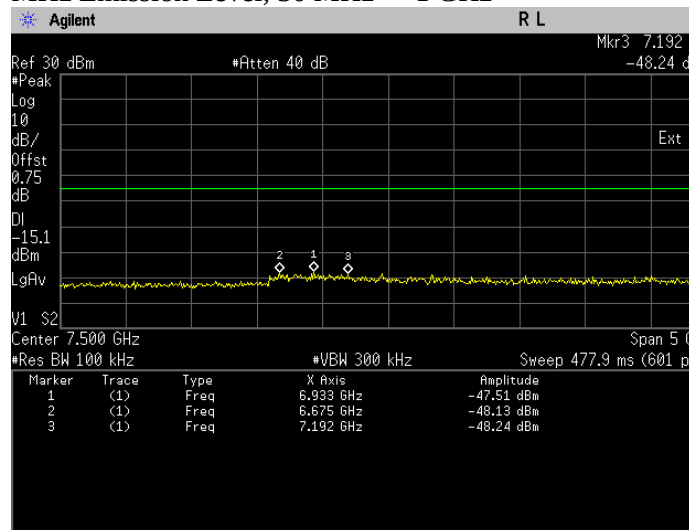
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Reference Level



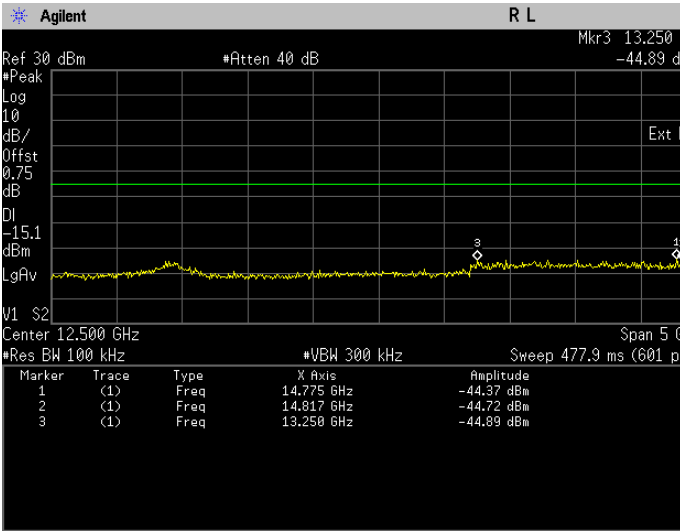
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Emission Level, 30 MHz -> 1 GHz



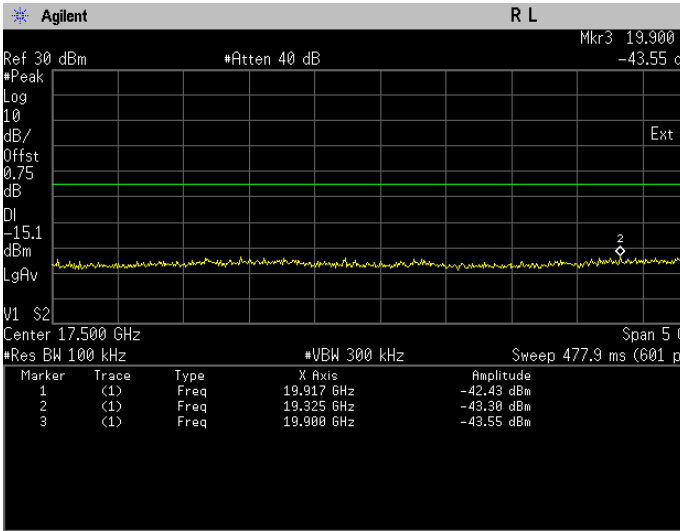
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Emission Level, 1 GHz -> 5 GHz



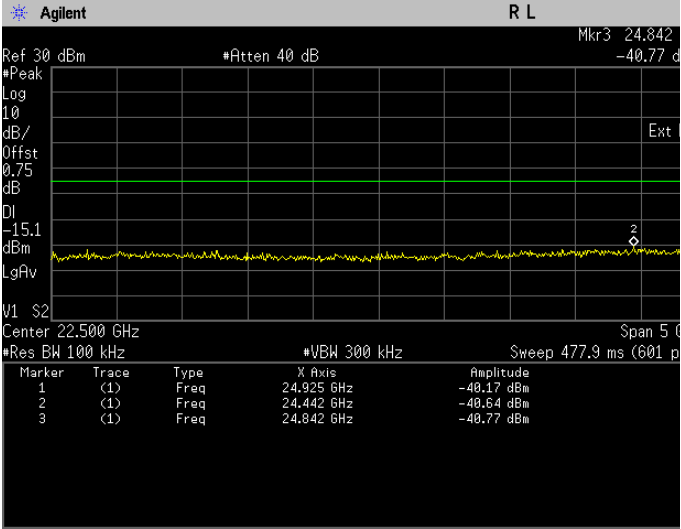
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Emission Level, 5 GHz -> 10 GHz



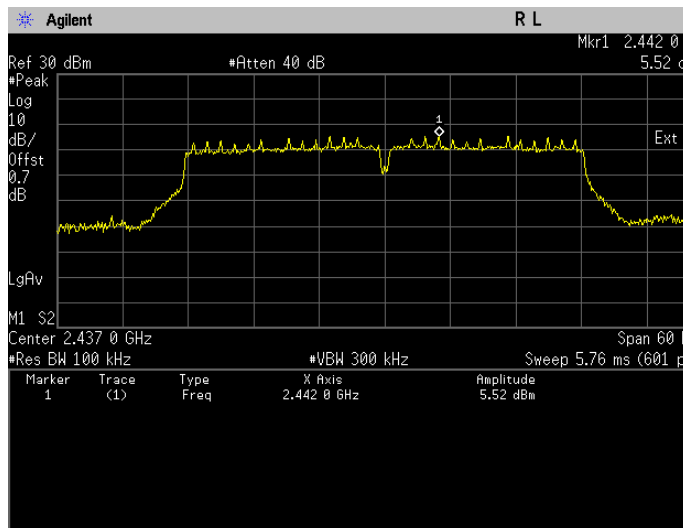
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Emission Level, 10 GHz -> 15 GHz



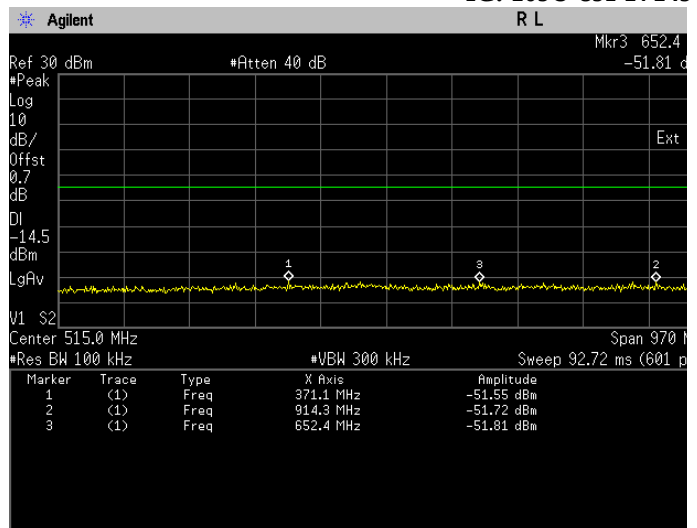
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Emission Level, 15 GHz -> 20 GHz



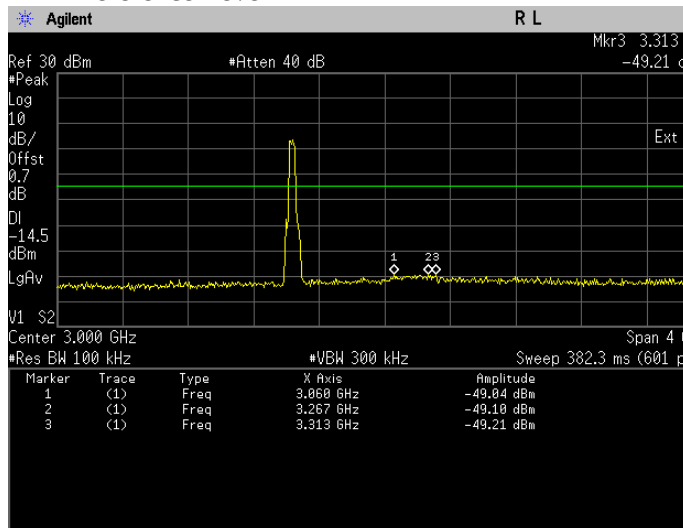
Conducted Emissions(Peak). 802.11n, Frequency 2422 MHz Emission Level, 20 GHz -> 25 GHz



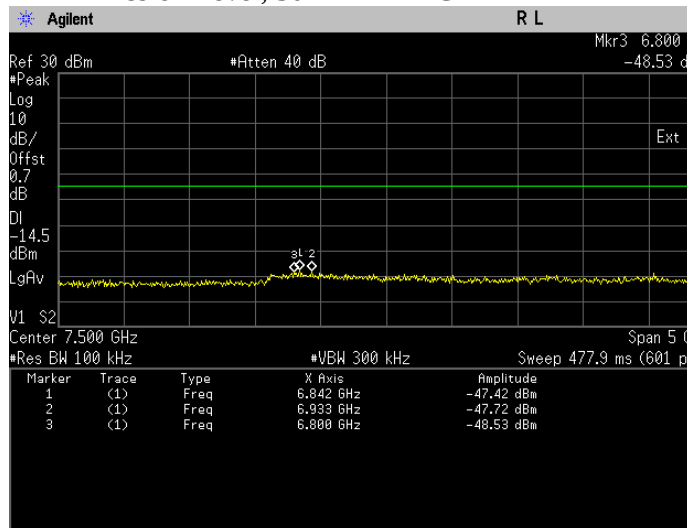
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Reference Level



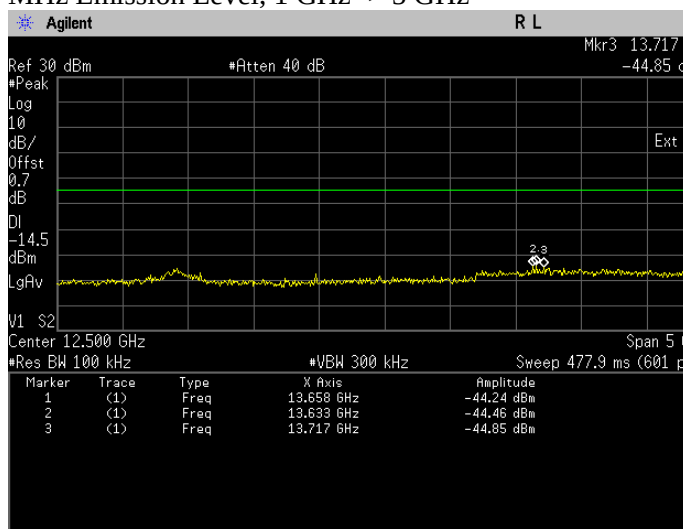
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 30 MHz -> 1 GHz



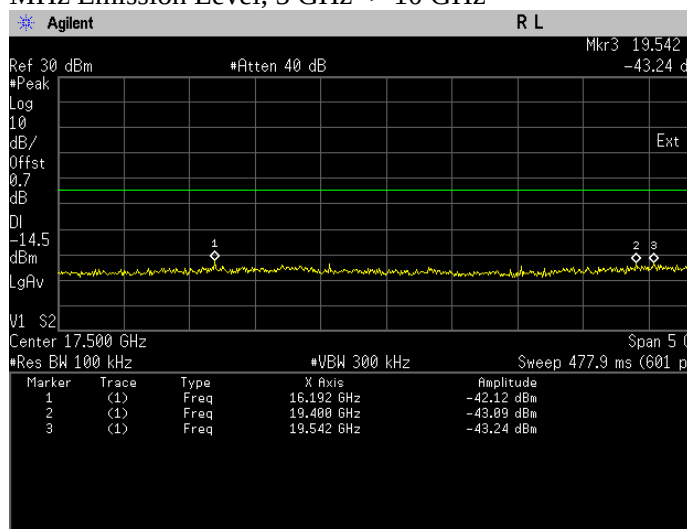
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 1 GHz -> 5 GHz



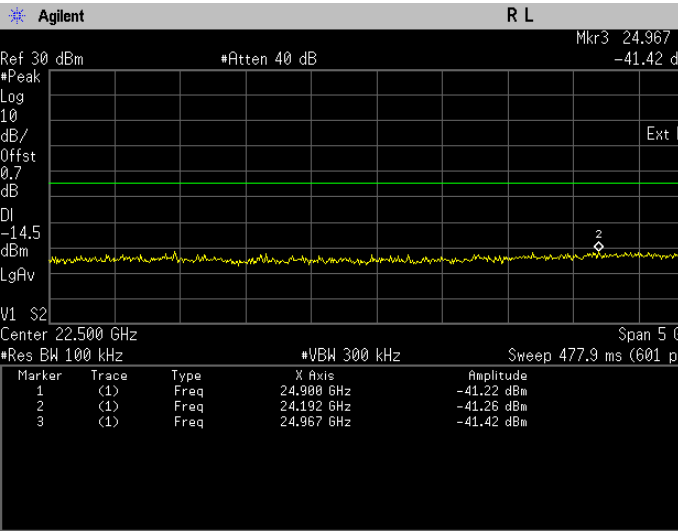
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 5 GHz -> 10 GHz



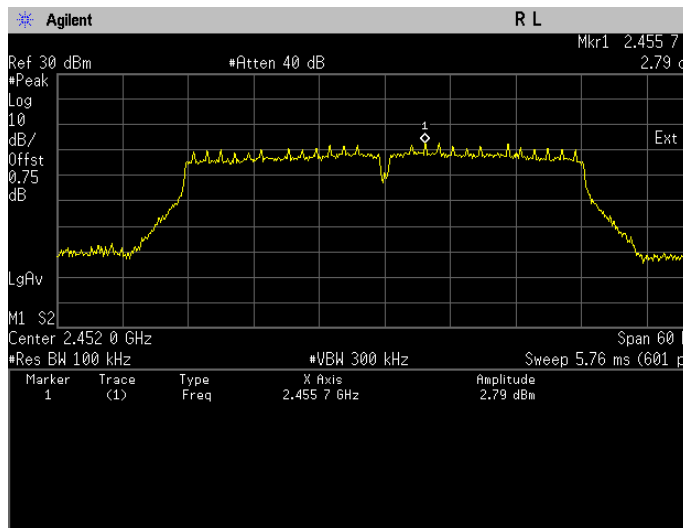
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 10 GHz -> 15 GHz



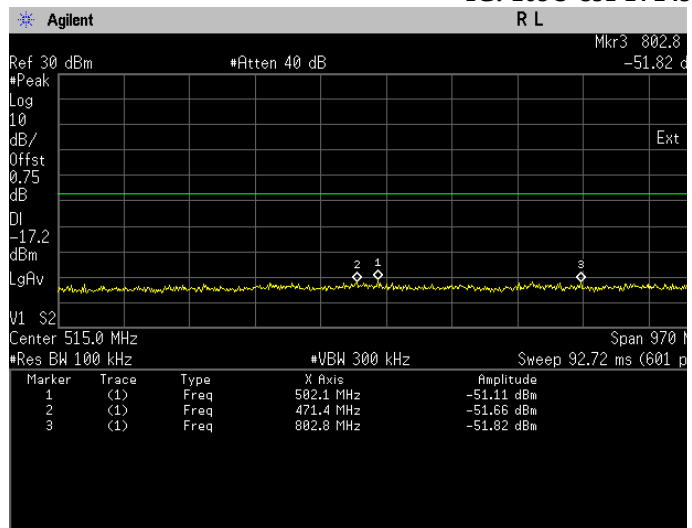
Conducted Emissions(Peak). 802.11n, Frequency 2437 MHz Emission Level, 15 GHz -> 20 GHz



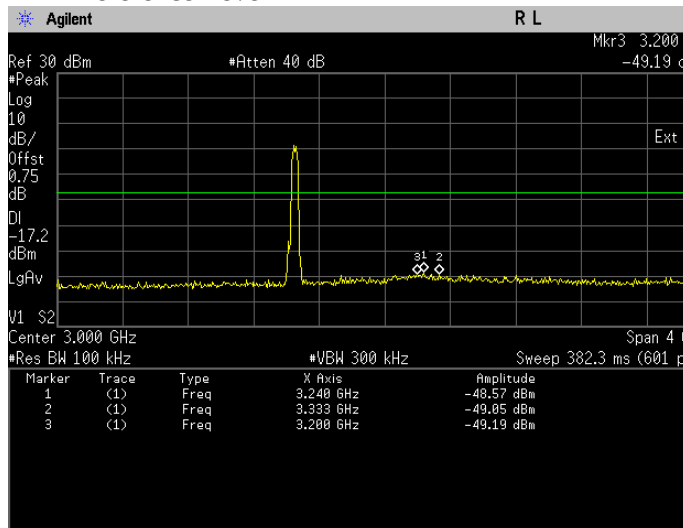
Conducted Emissions(Peak). 802.11n, Frequency 2437
MHz Emission Level, 20 GHz -> 25 GHz



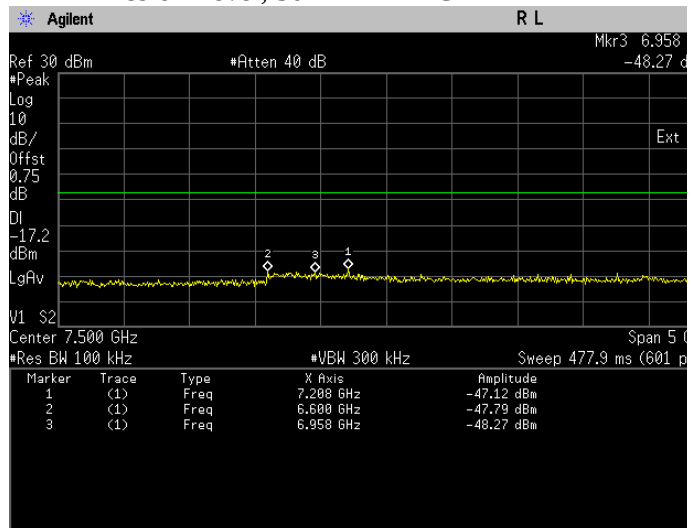
Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Reference Level



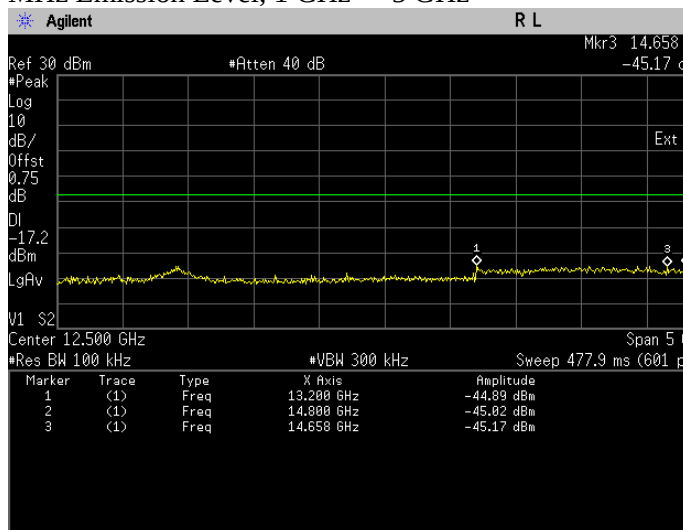
Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Emission Level, 30 MHz -> 1 GHz



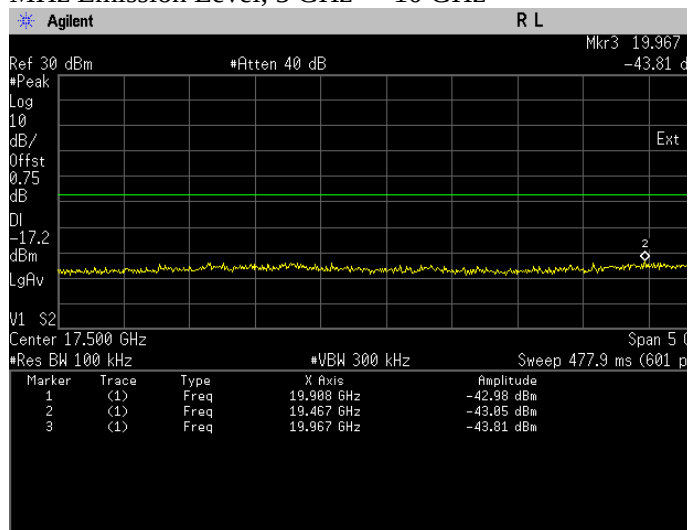
Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Emission Level, 1 GHz -> 5 GHz



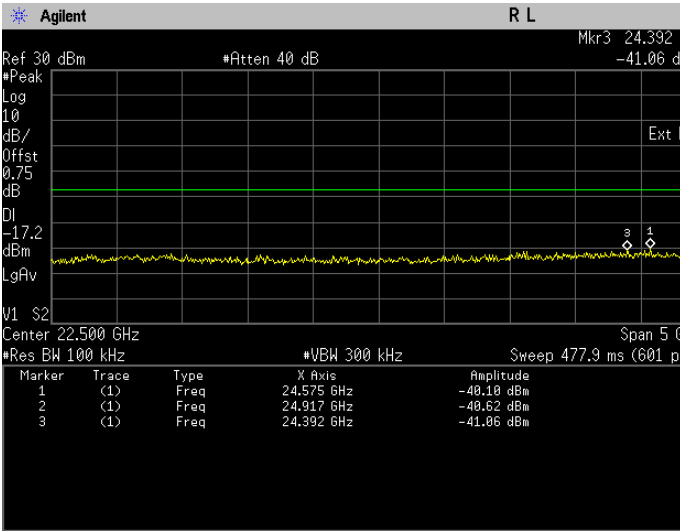
Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Emission Level, 5 GHz -> 10 GHz



Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Emission Level, 10 GHz -> 15 GHz



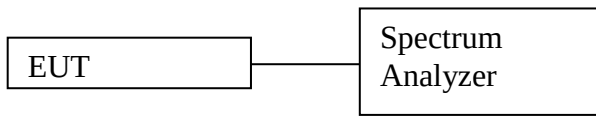
Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Emission Level, 15 GHz -> 20 GHz



Conducted Emissions(Peak). 802.11n, Frequency 2452 MHz Emission Level, 20 GHz -> 25 GHz

6.6. Band edge Conducted Spurious Emission

6.6.1. Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max Hold
 - e. Sweep = auto
- e) Use the peak marker function to measure highest emission.
- f) Measure every antenna port by repeat the step above for MIMO measurement.

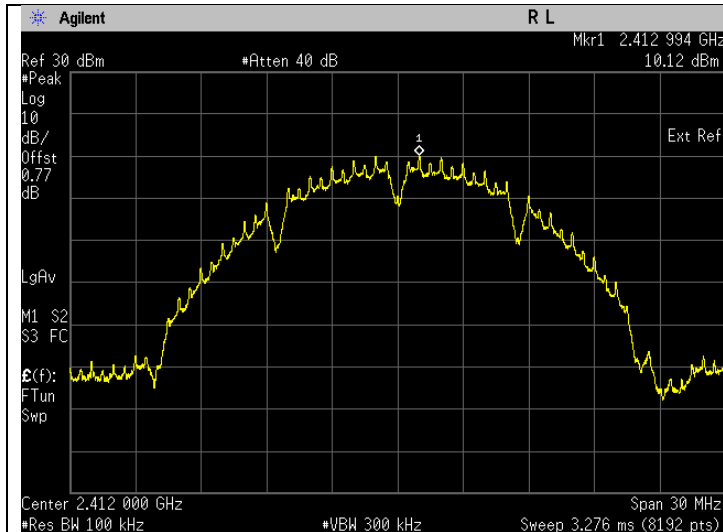
6.6.2. Test Limits:

Normal Condition (25 ° C)
Shall be at least 20 dB below max power. (Peak detector)

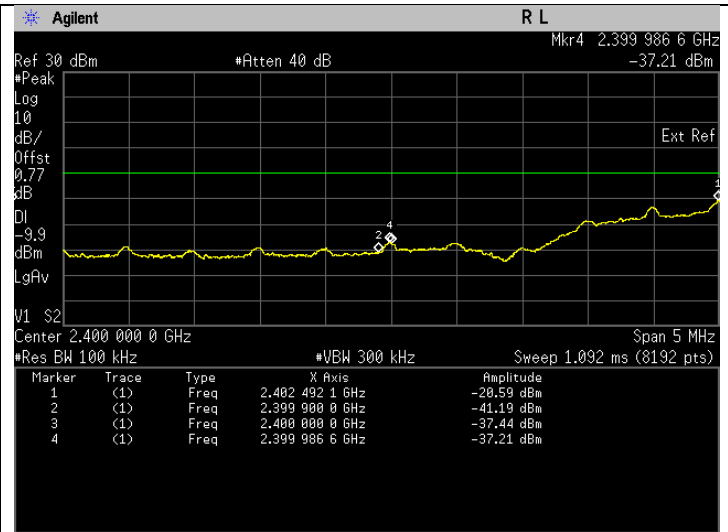
6.6.3. Test Result

802.11b

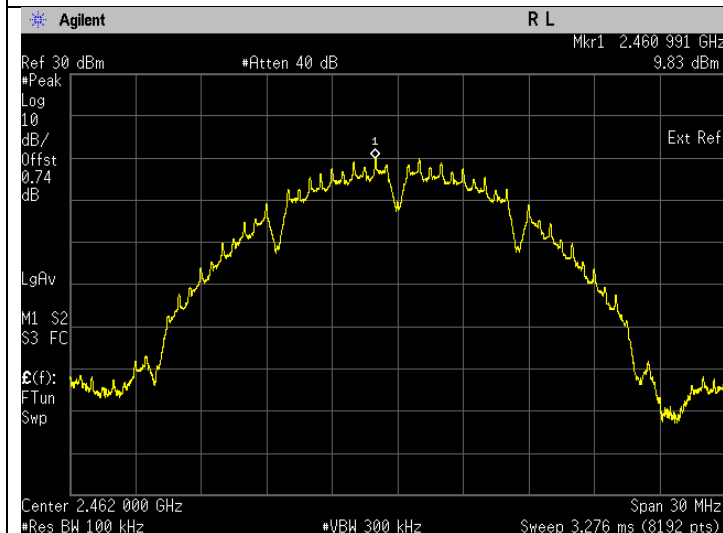
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
802.11b	DSSS	QPSK	1	2412	2399.99	-37.21	Pass
802.11b	DSSS	QPSK	1	2462	2483.60	-50.11	Pass



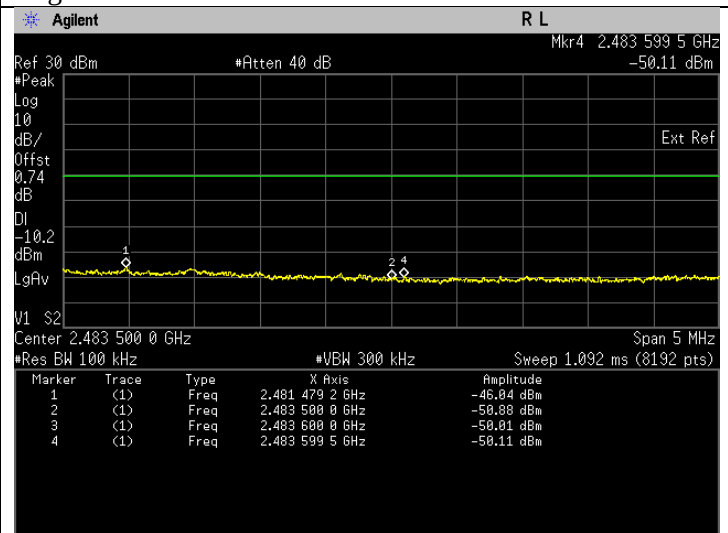
Band Edge(Peak). 802.11b Frequency 2412 MHz
Reference Level



Band Edge(Peak). 802.11b Frequency 2412 MHz Band
Edge



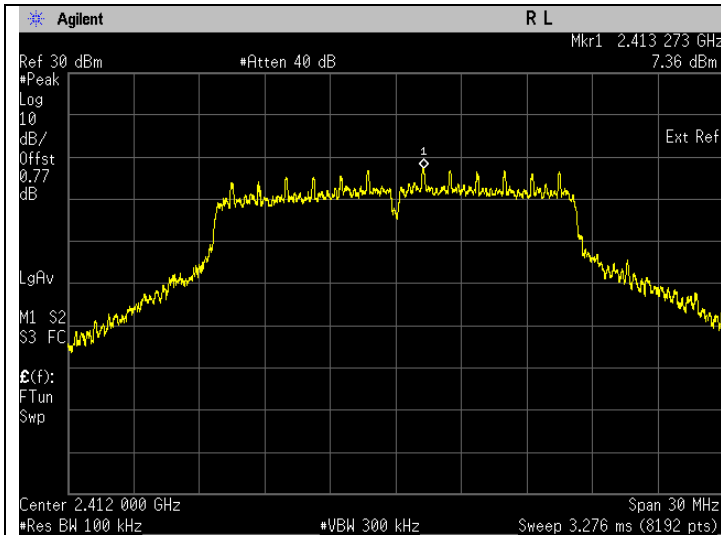
Band Edge(Peak). 802.11b Frequency 2462 MHz
Reference Level



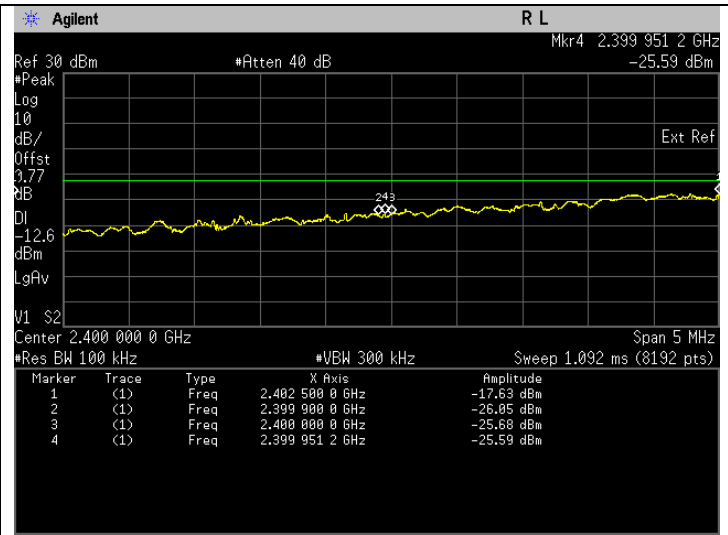
Band Edge(Peak). 802.11b Frequency 2462 MHz Band
Edge

802.11g

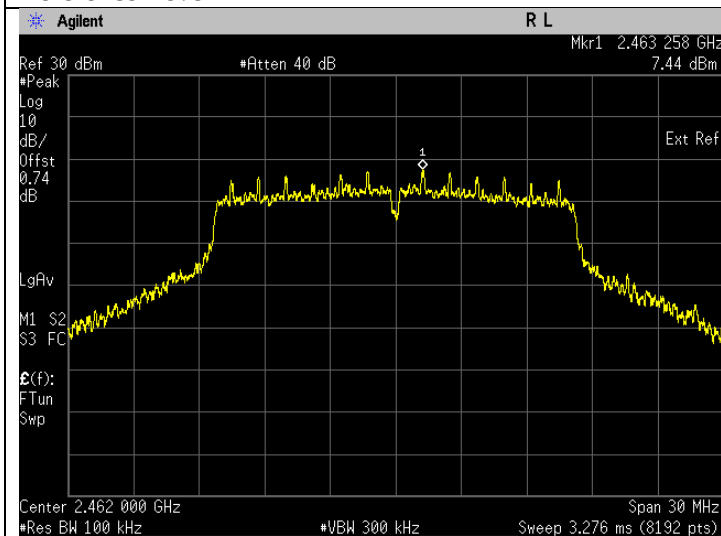
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
802.11g	OFDM	BPSK	6	2412	2399.95	-25.59	Pass
802.11g	OFDM	BPSK	6	2462	2483.55	-42.78	Pass



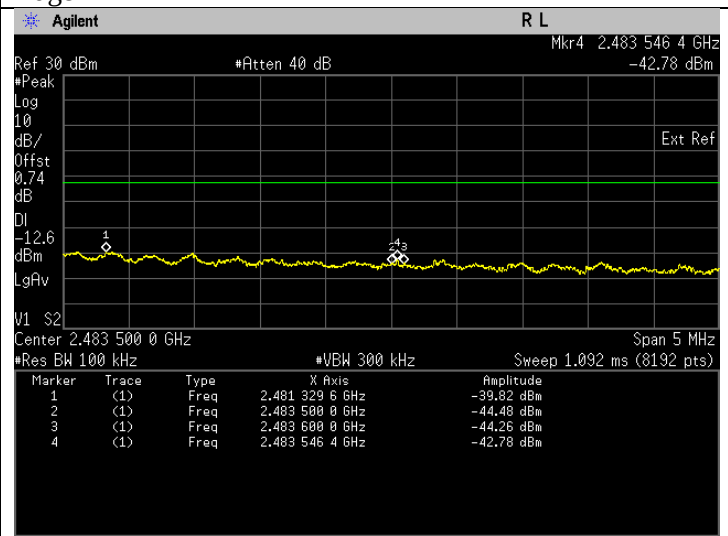
Band Edge(Peak). 802.11g Frequency 2412 MHz
Reference Level



Band Edge(Peak). 802.11g Frequency 2412 MHz Band
Edge



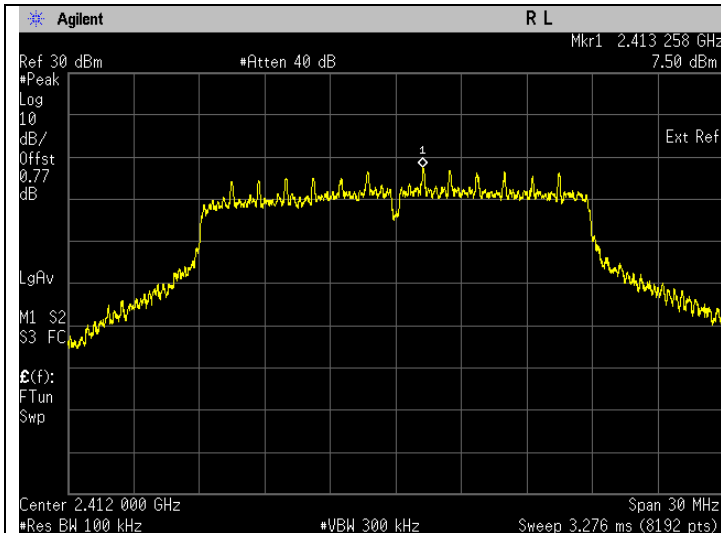
Band Edge(Peak). 802.11g Frequency 2462 MHz
Reference Level



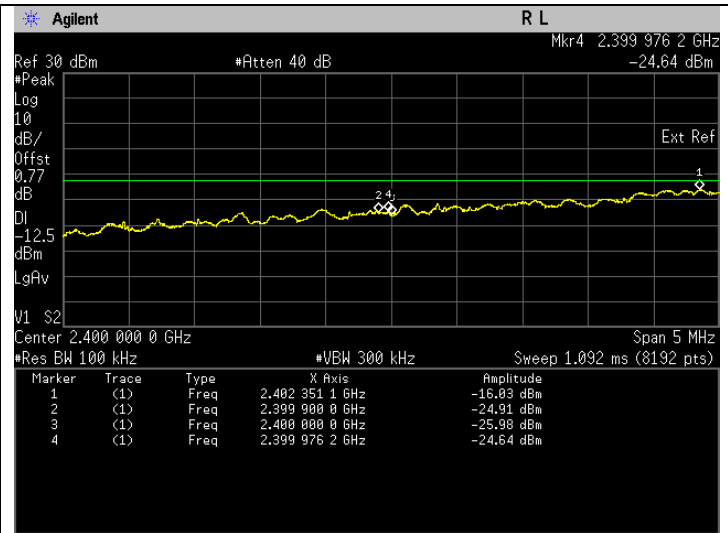
Band Edge(Peak). 802.11g Frequency 2462 MHz Band
Edge

802.11n (HT20)

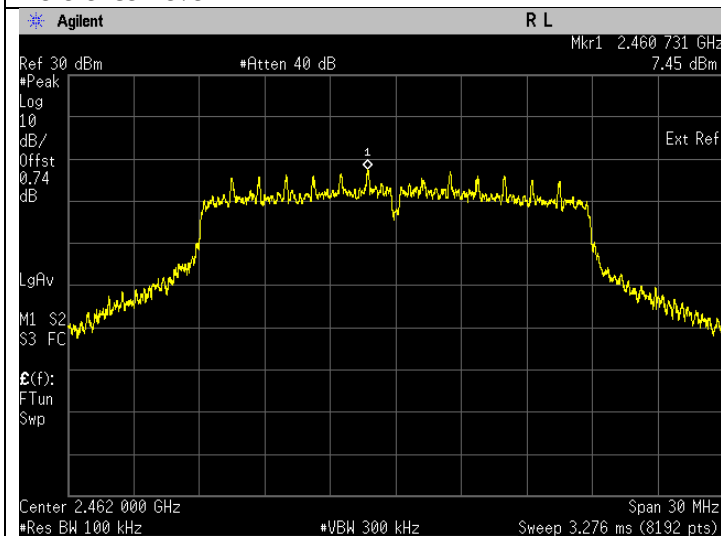
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
802.11n	OFDM	BPSK	6.5	2412	2399.98	-24.64	Pass
802.11n	OFDM	BPSK	6.5	2462	2483.52	-42.26	Pass



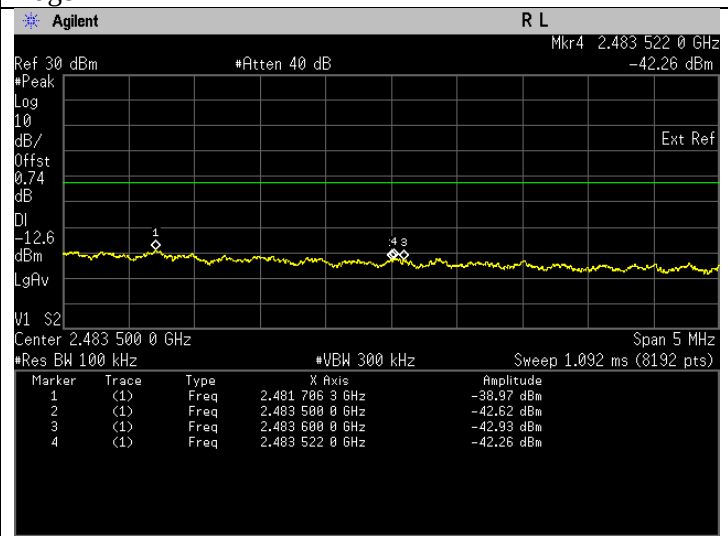
Band Edge(Peak). 802.11n Frequency 2412 MHz
Reference Level



Band Edge(Peak). 802.11n Frequency 2412 MHz Band
Edge



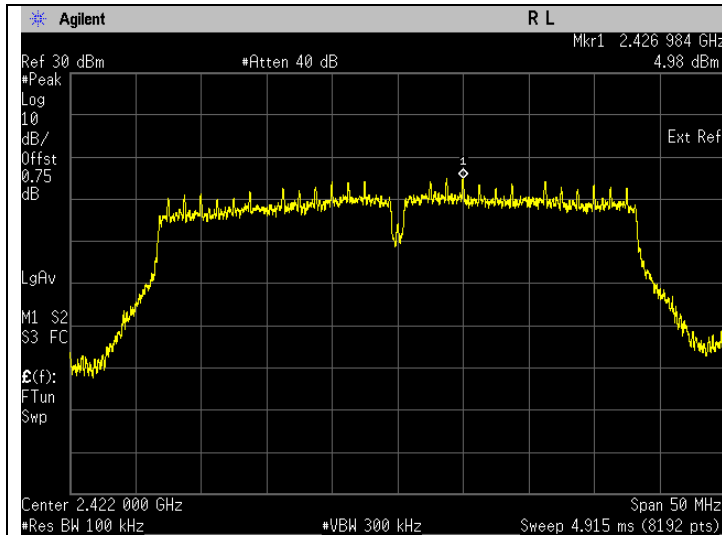
Band Edge(Peak). 802.11n Frequency 2462 MHz
Reference Level



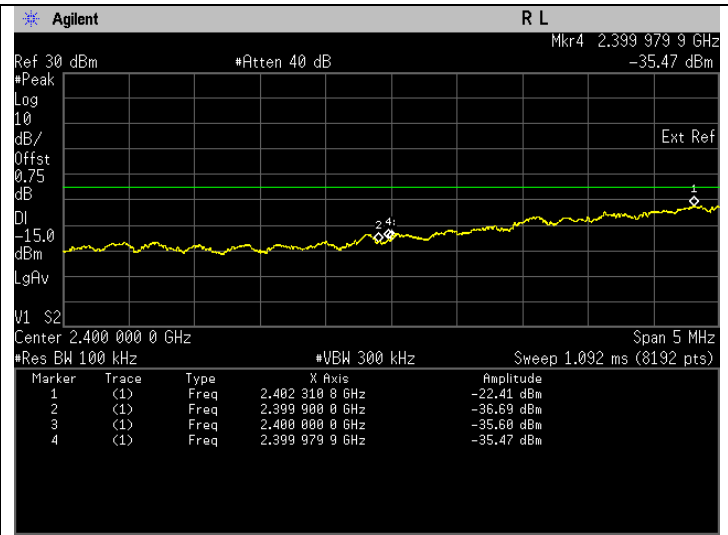
Band Edge(Peak). 802.11n Frequency 2462 MHz Band
Edge

802.11n (HT40)

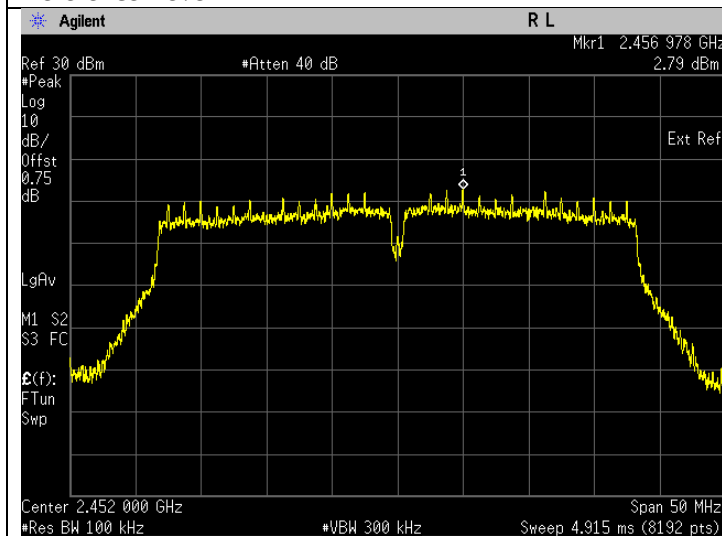
Test Conditions				Test Frequency	Results		
Standard	Modulation Type	Modulation Technology	Data Rate (mbps)	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
802.11n	OFDM	BPSK	6.5	2422	2399.98	-35.47	Pass
802.11n	OFDM	BPSK	6.5	2452	2483.60	-41.60	Pass



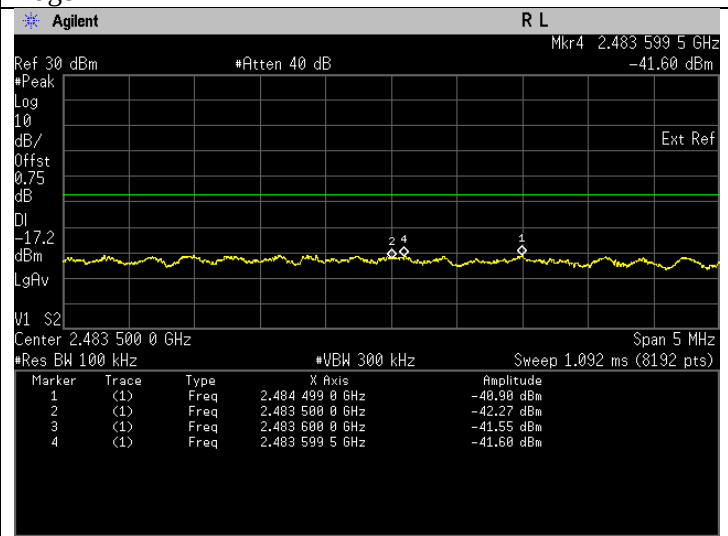
Band Edge(Peak). 802.11n Frequency 2422 MHz
Reference Level



Band Edge(Peak). 802.11n Frequency 2422 MHz Band
Edge



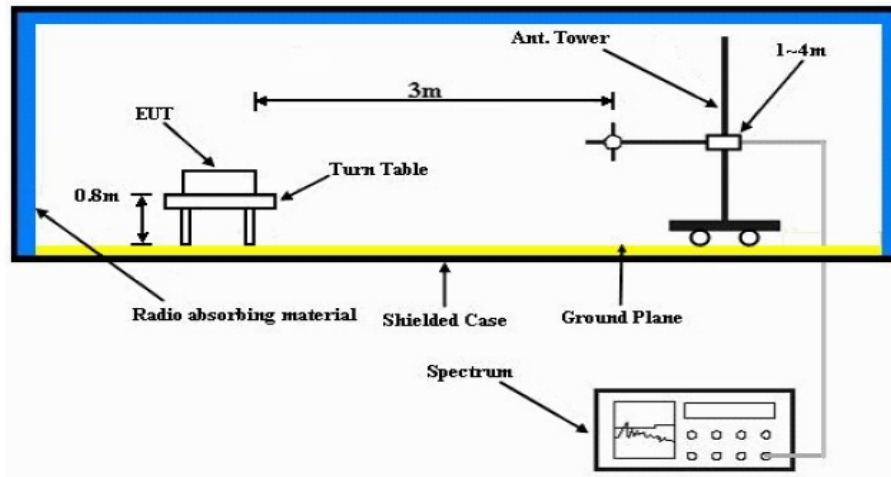
Band Edge(Peak). 802.11n Frequency 2452 MHz
Reference Level



Band Edge(Peak). 802.11n Frequency 2452 MHz Band
Edge

6.7. Radiated Emission within restricted Bands

6.7.1. Test Setup



- The EUT is placed on the top of a rotating table 0.8m above the ground (<1GHz) and 1.5m above the ground (>1GHz) at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
- The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
- The antenna is Bilog/Horn antenna depend on which frequency range uses, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

6.7.2. Test Limits:

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 20dB below the highest level of the desired power.

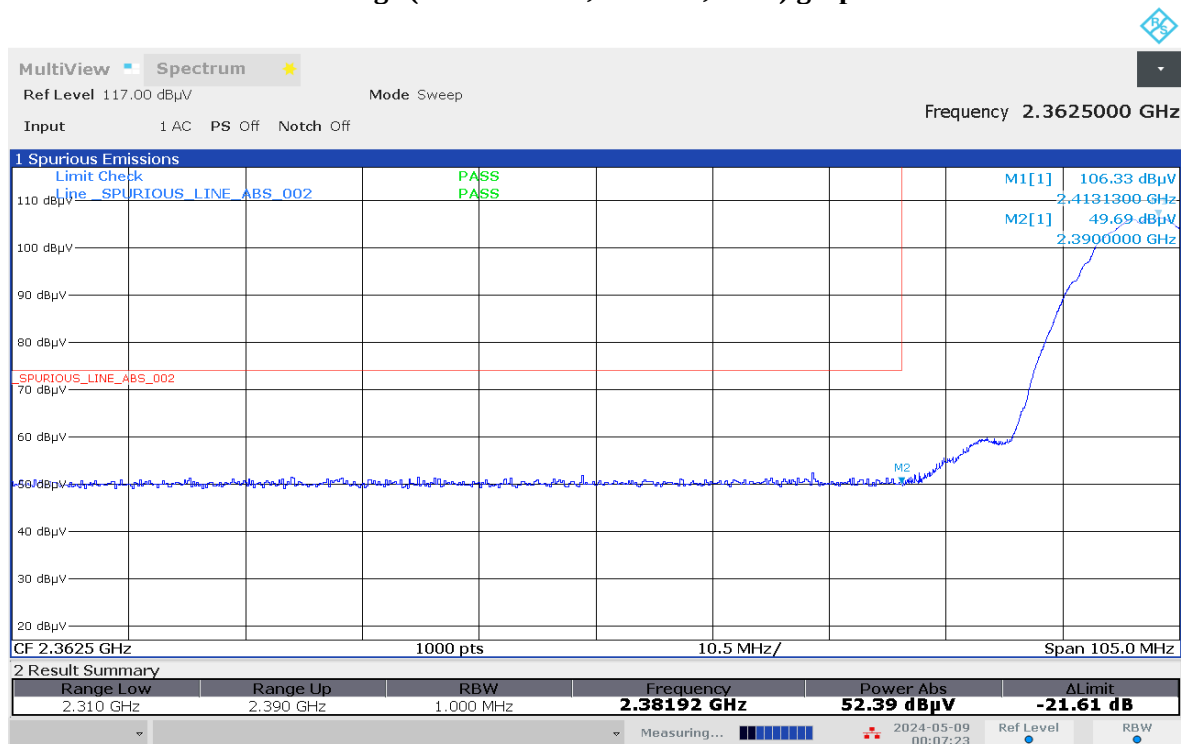
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, 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.

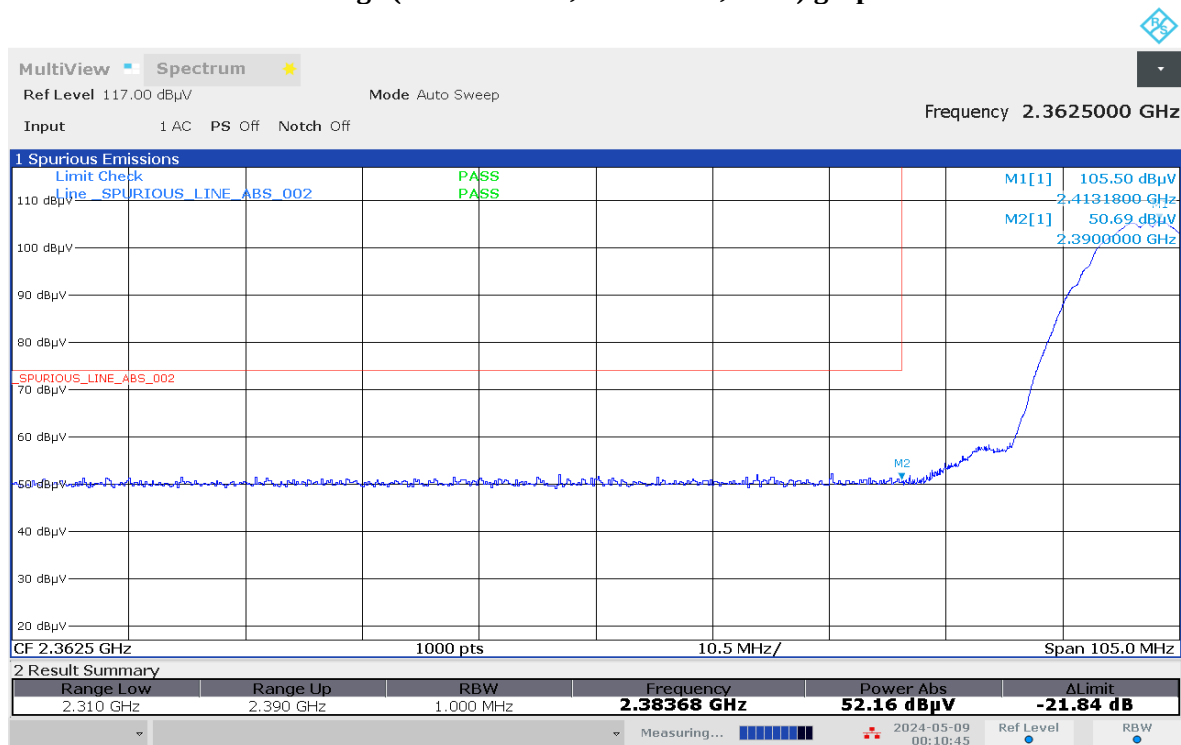
Test Channel: Low **Test Frequency: 2412.0000 MHz** **Test Standard: ANSI C63.10-2013**
Worst Case Plane: Z-Plane (802.11b)

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



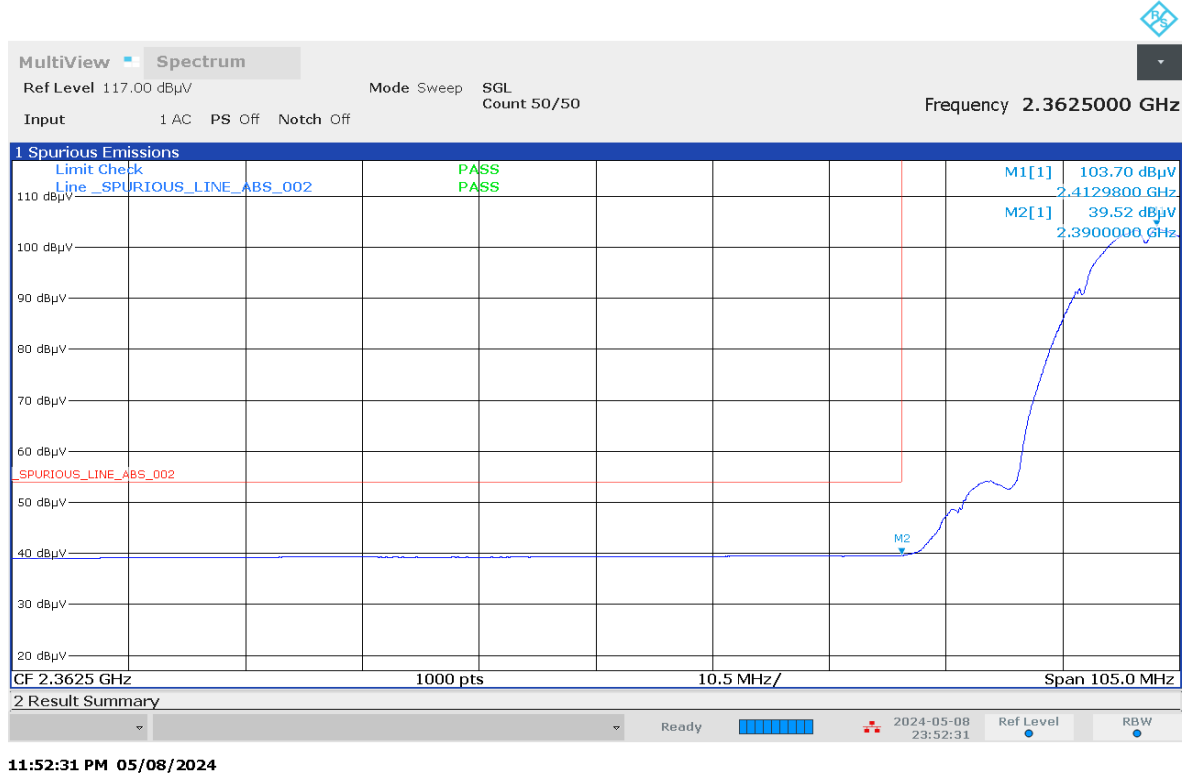
12:07:24 AM 05/09/2024

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot

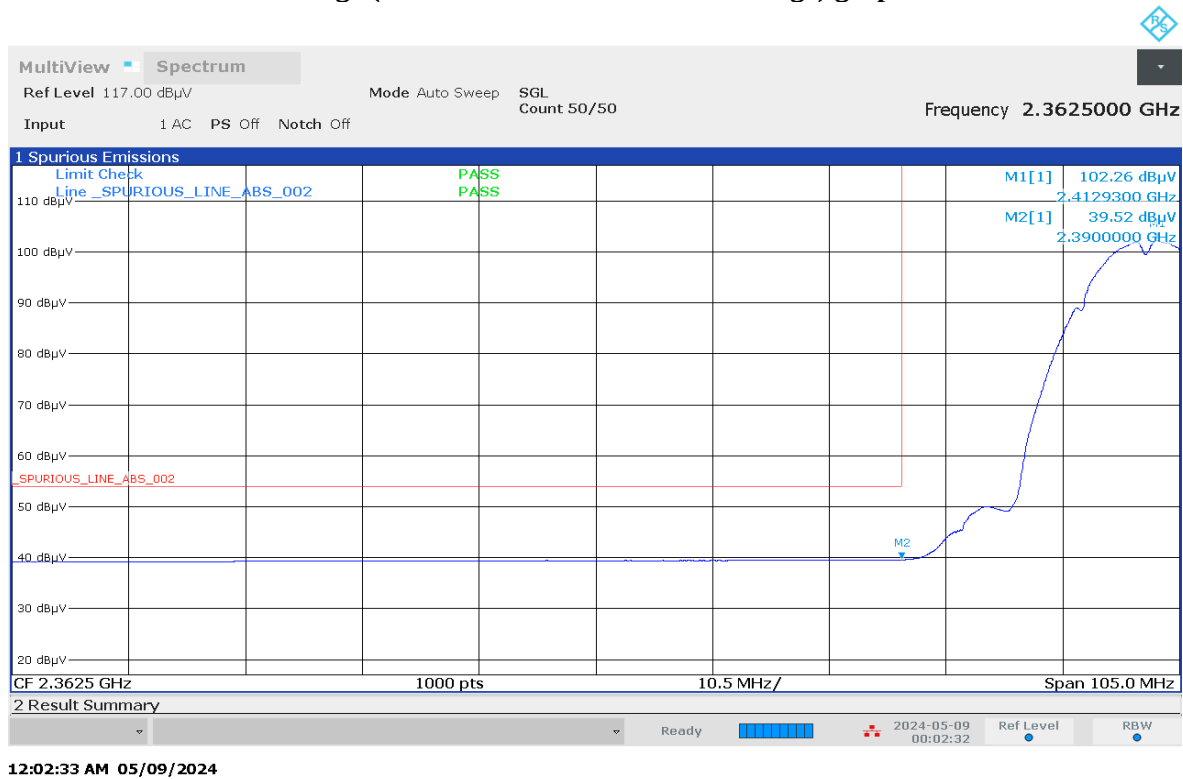


12:10:45 AM 05/09/2024

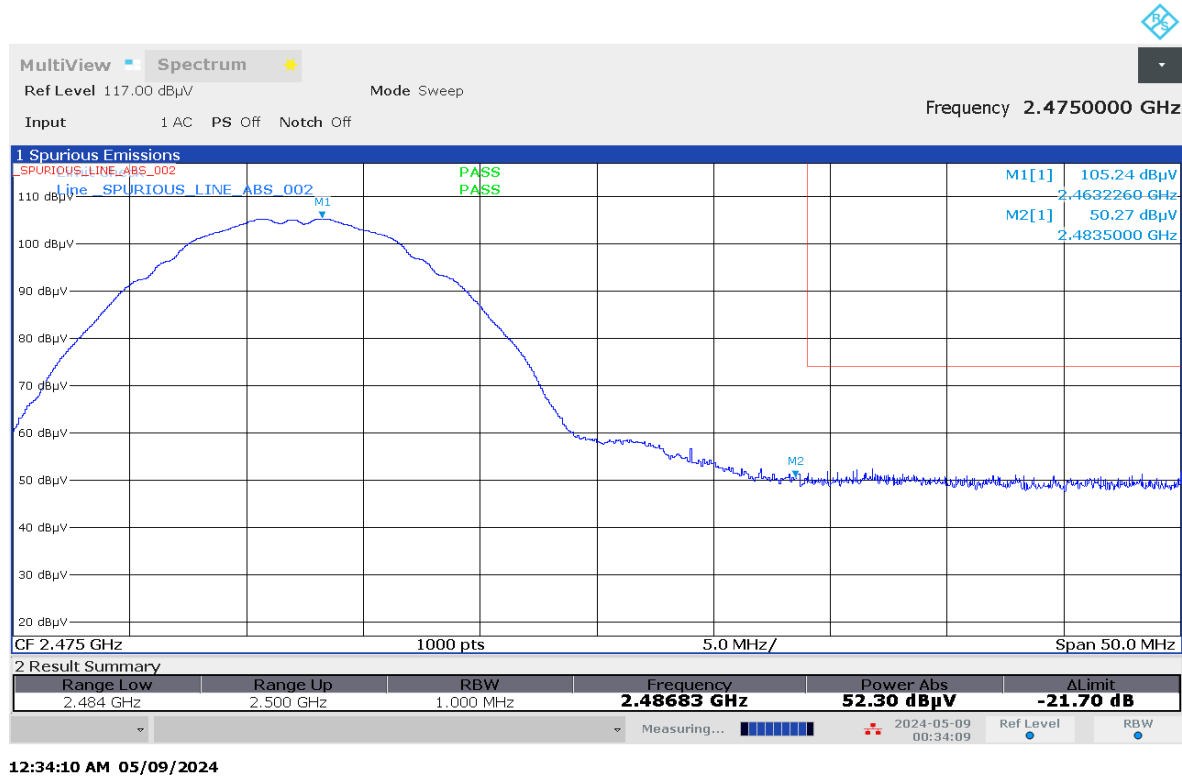
Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



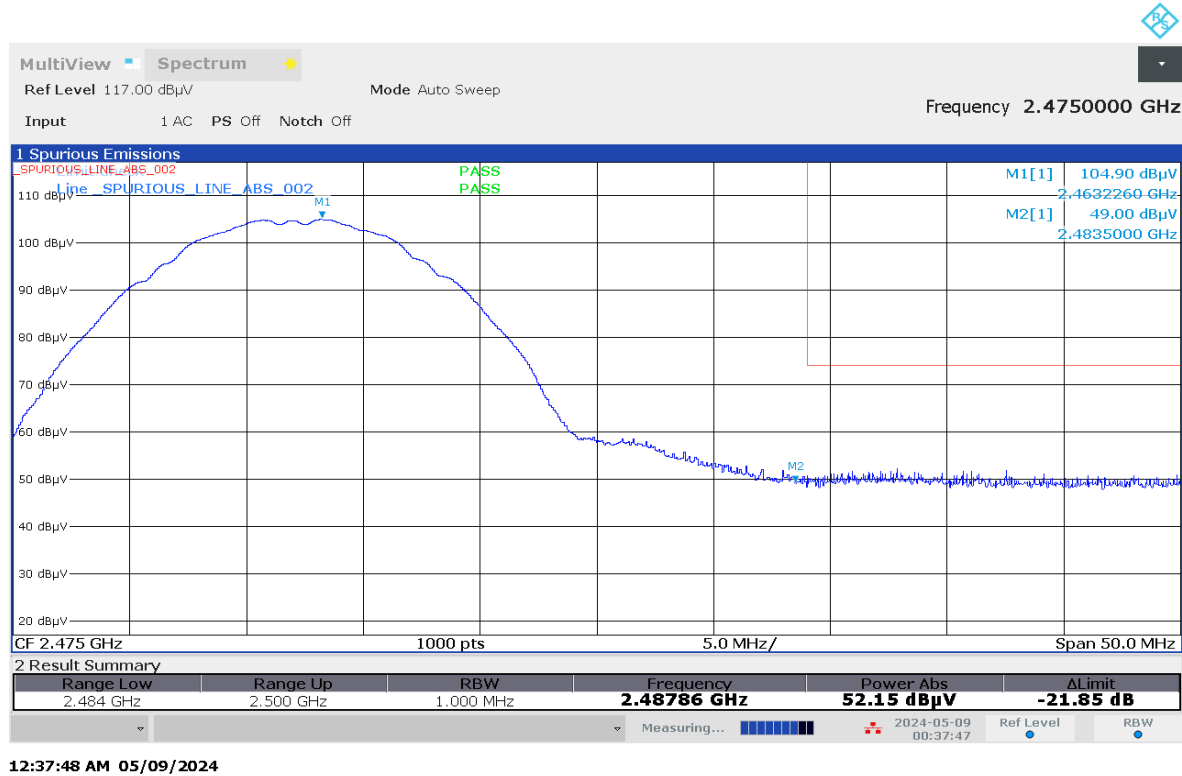
Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



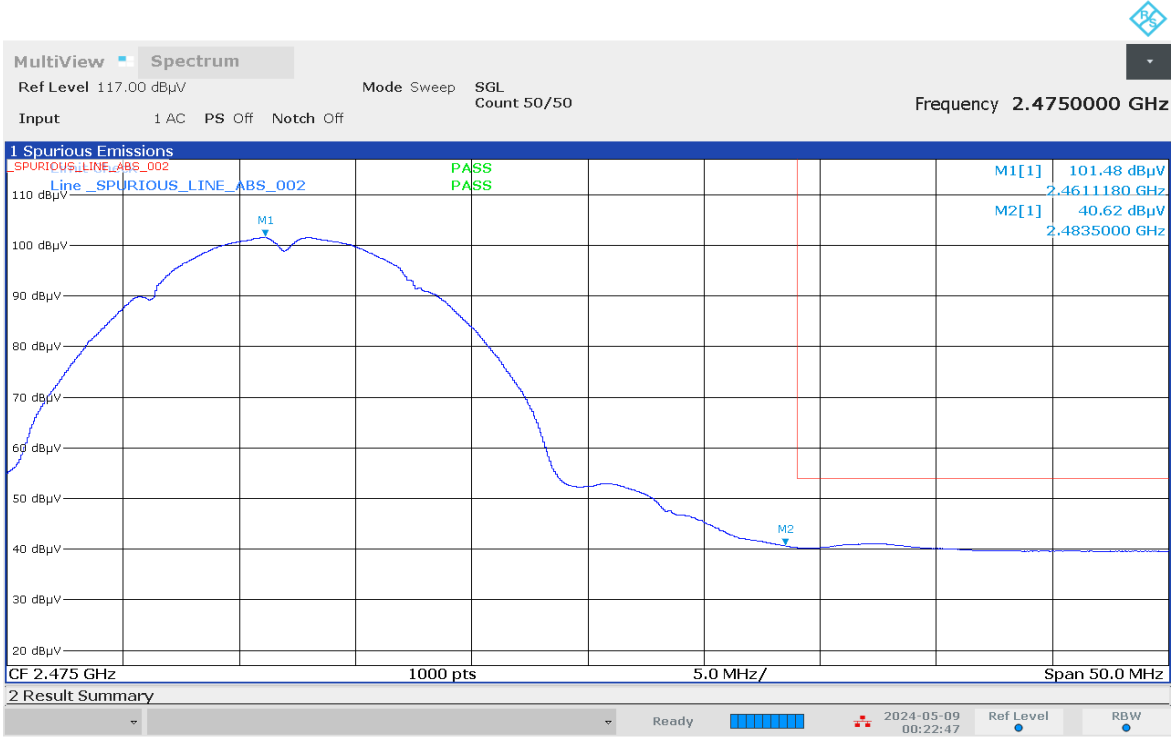
Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot

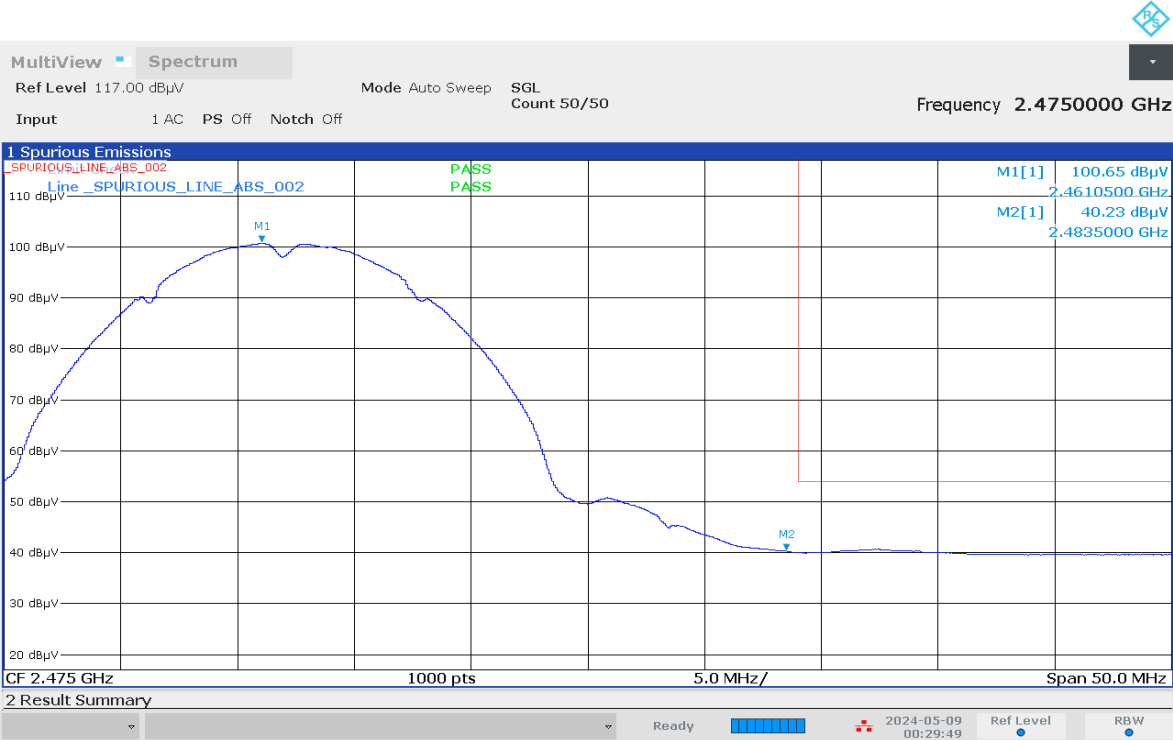


Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



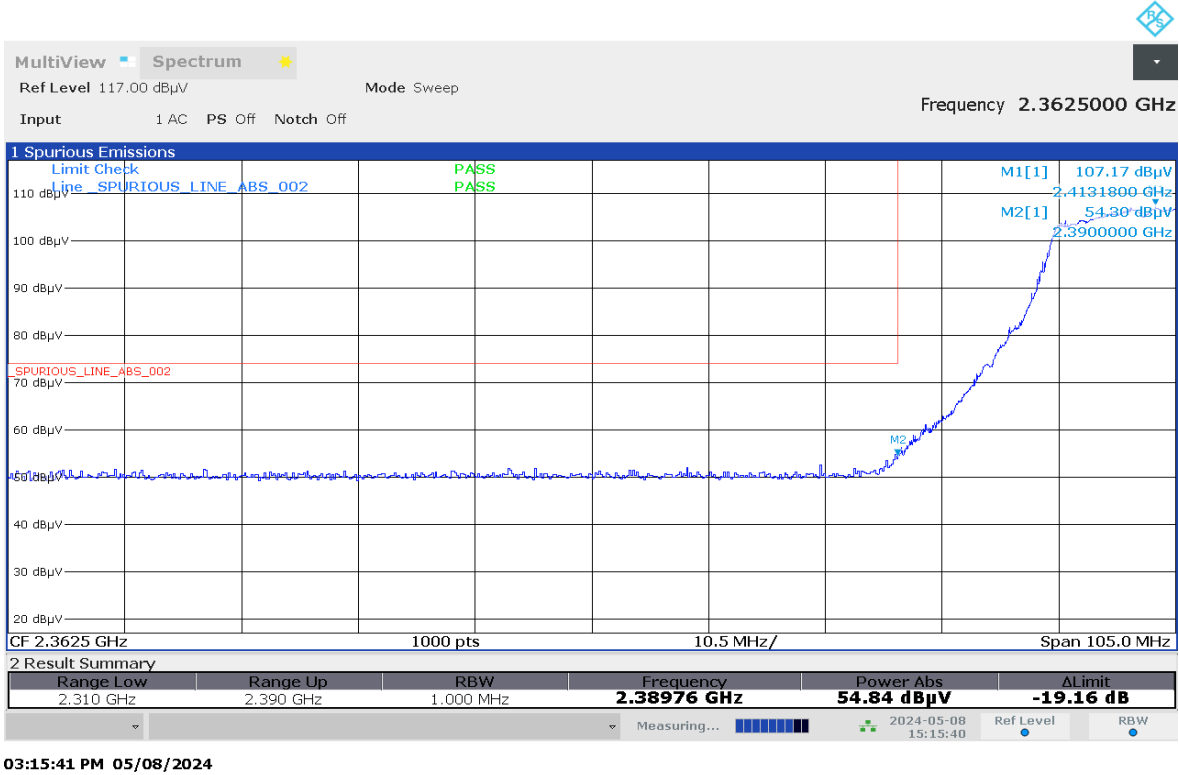
12:22:48 AM 05/09/2024

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot

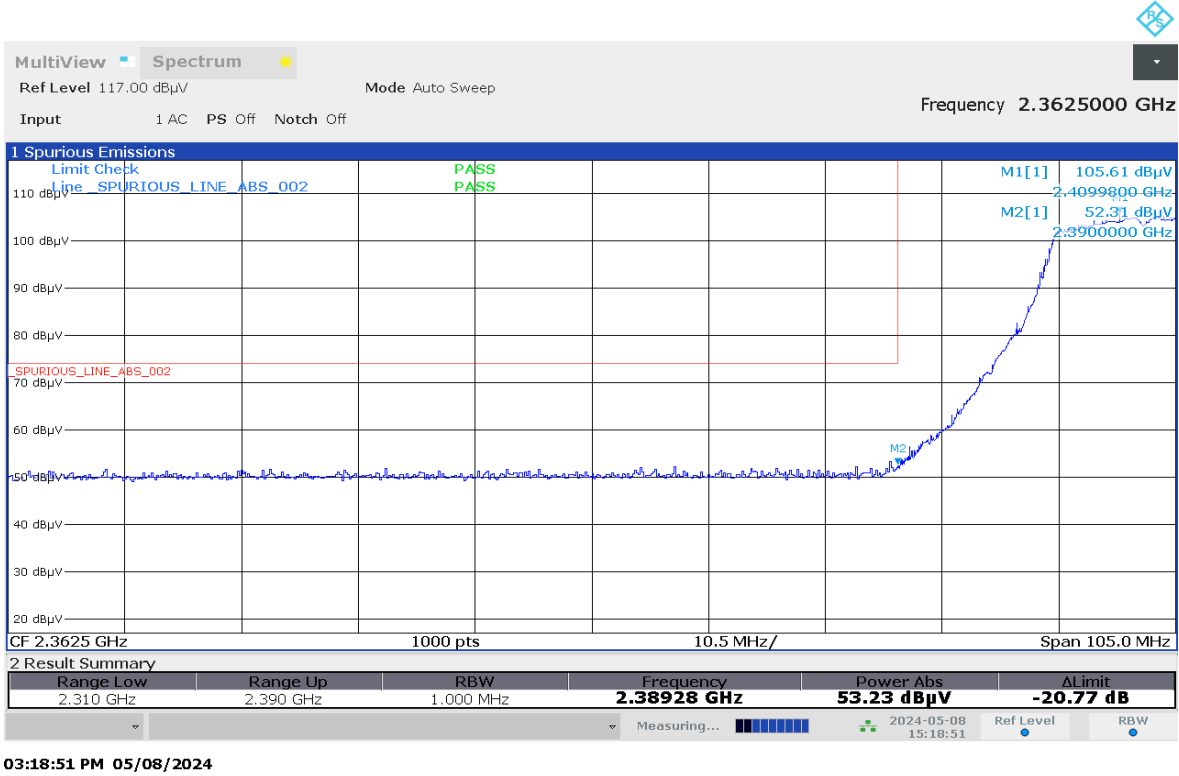


12:29:50 AM 05/09/2024

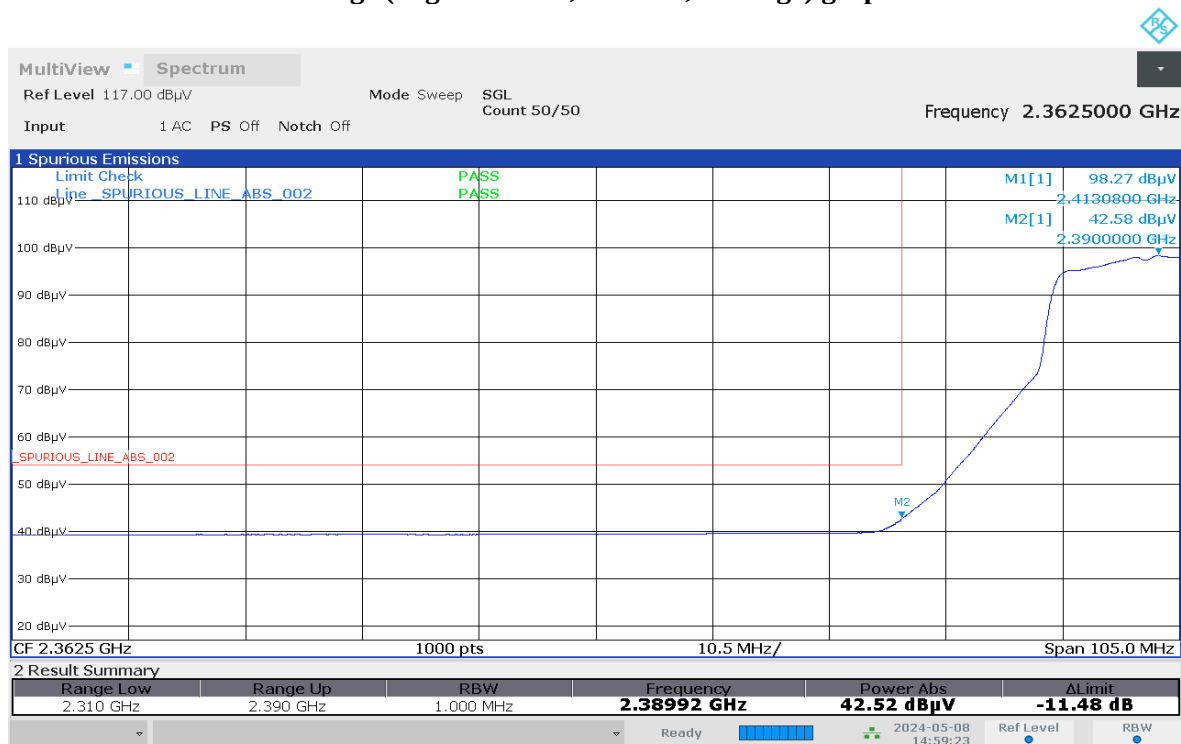
Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot

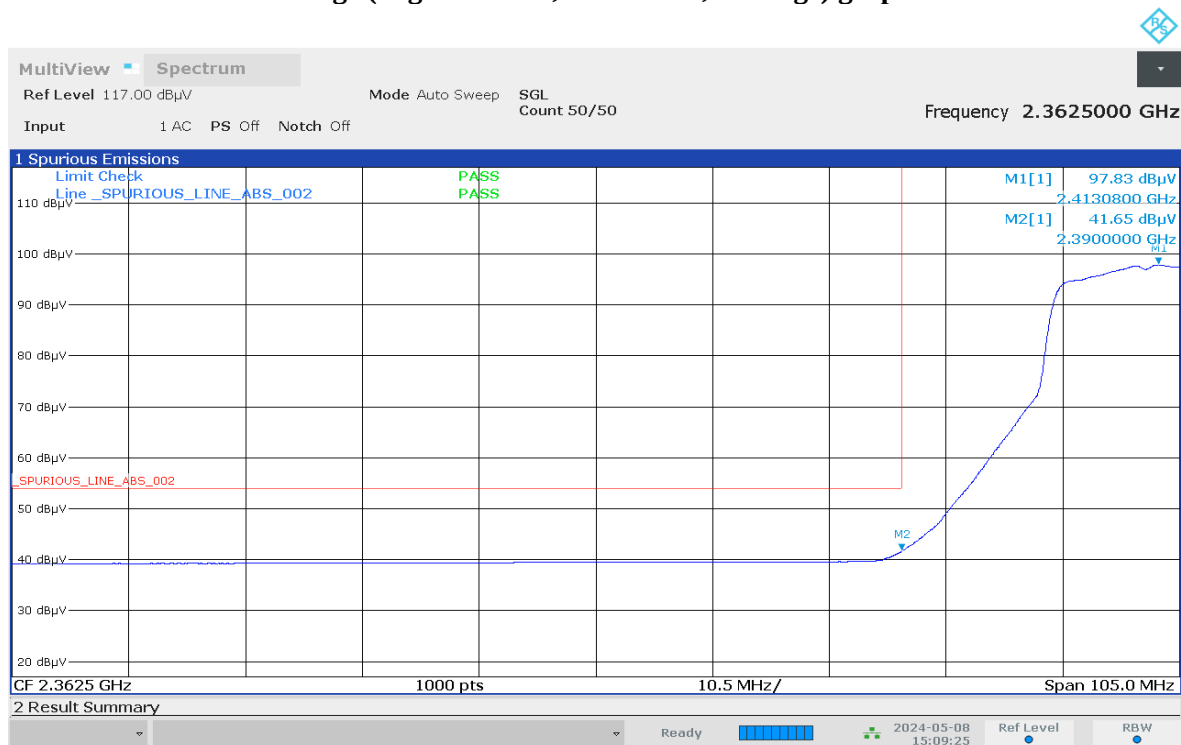


Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



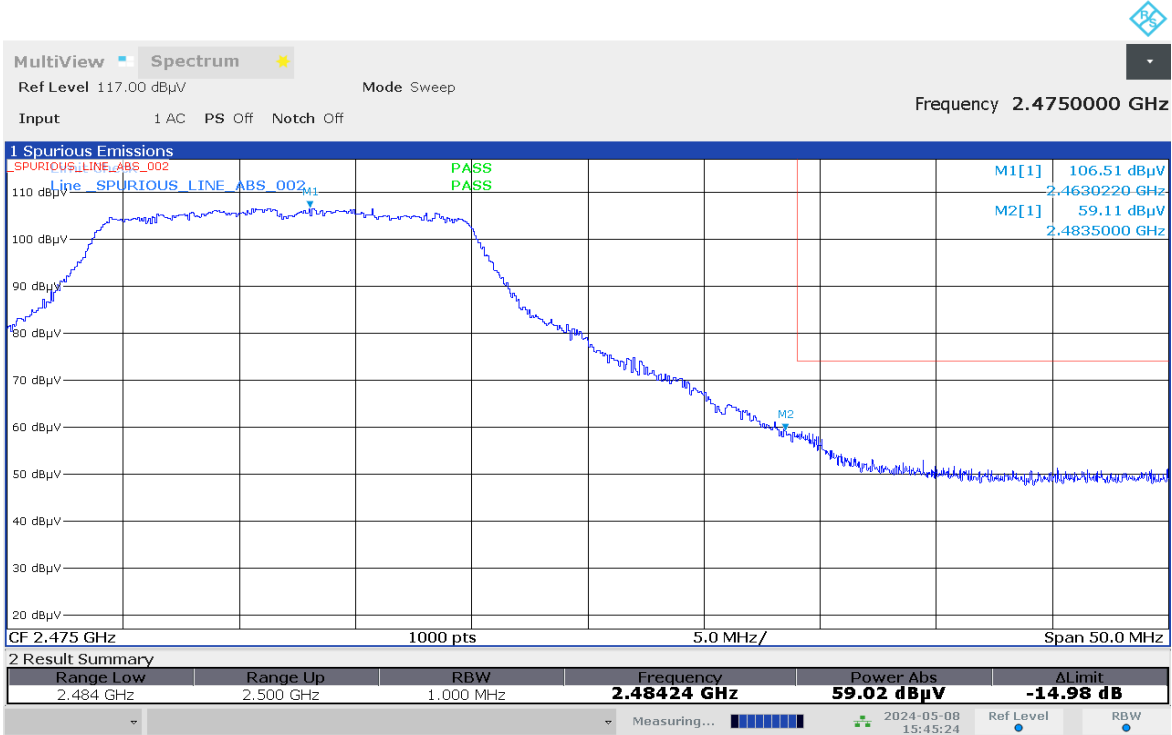
02:59:24 PM 05/08/2024

Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



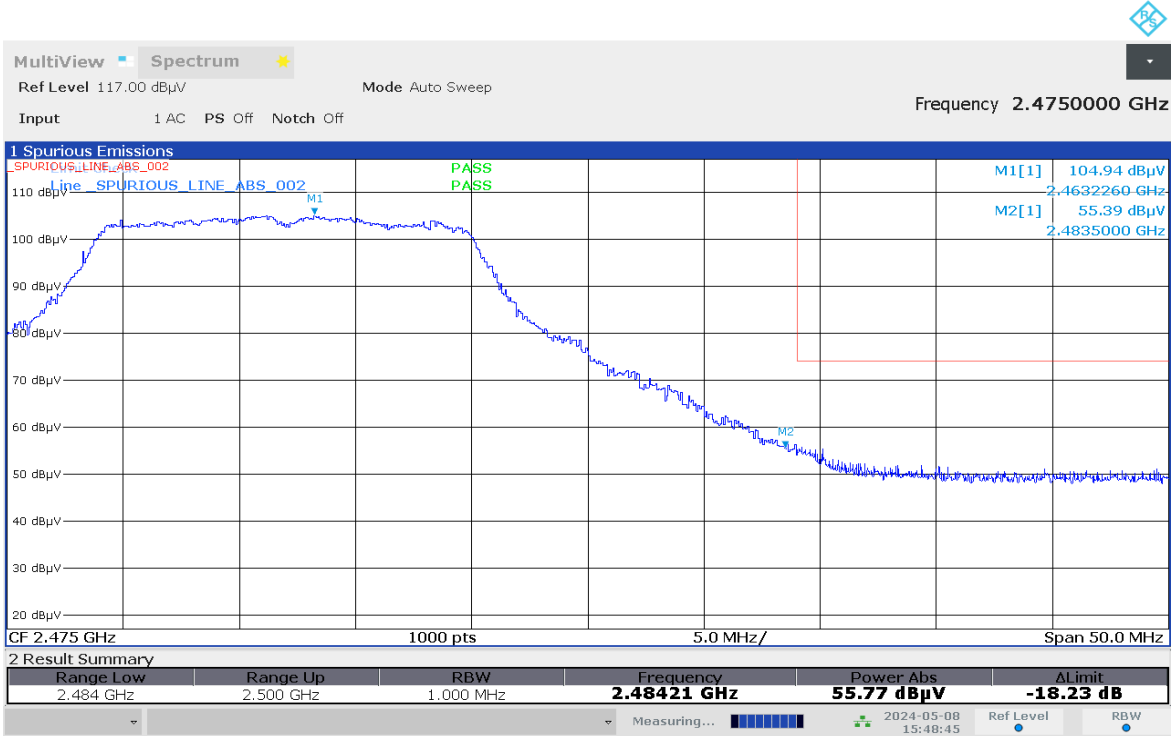
03:09:25 PM 05/08/2024

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



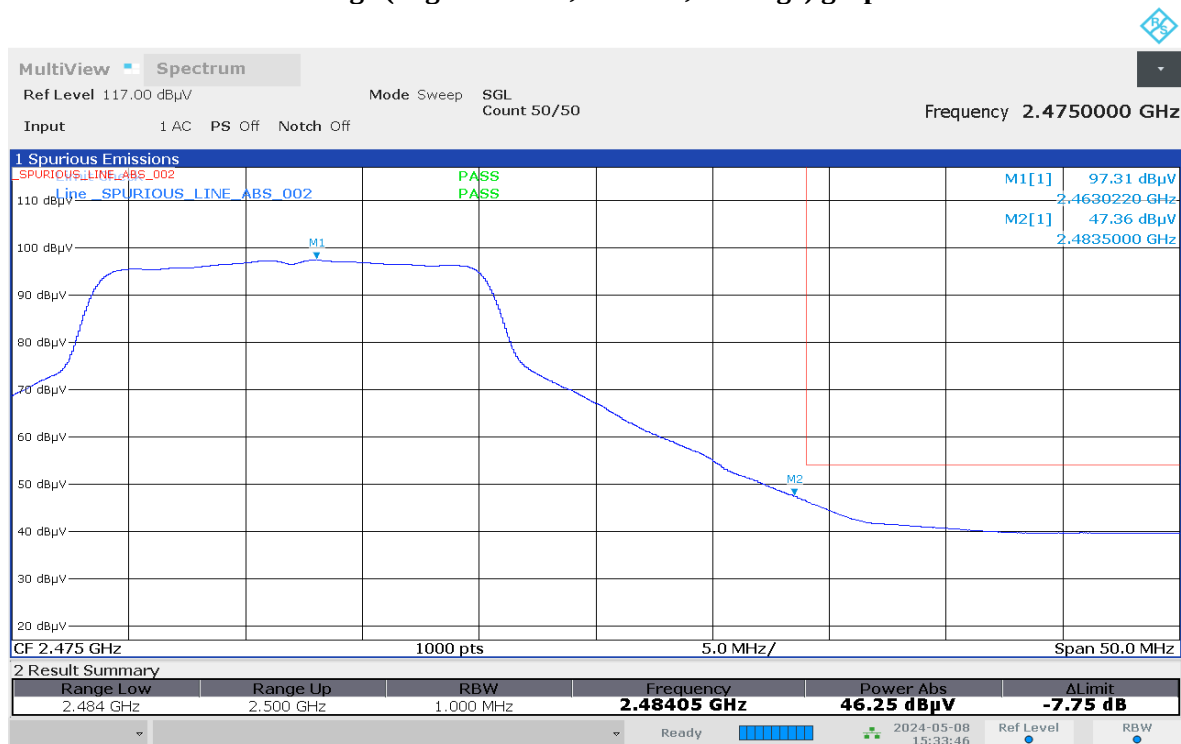
03:45:25 PM 05/08/2024

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



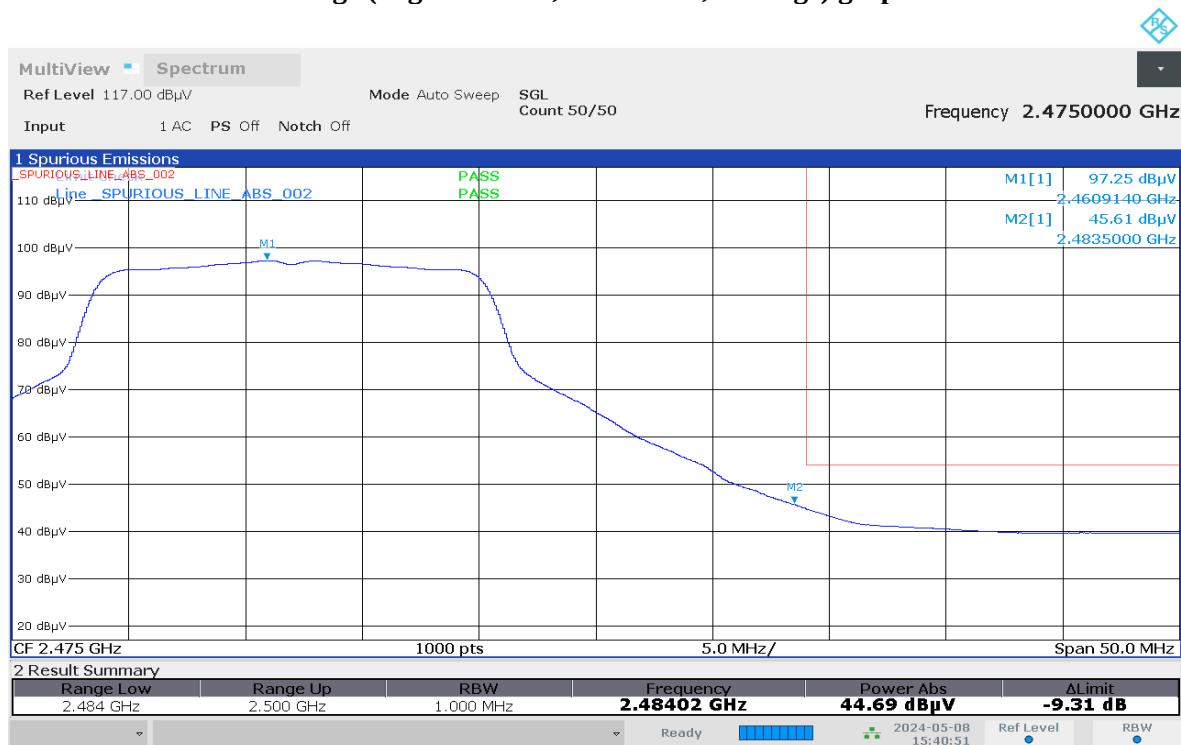
03:48:46 PM 05/08/2024

Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



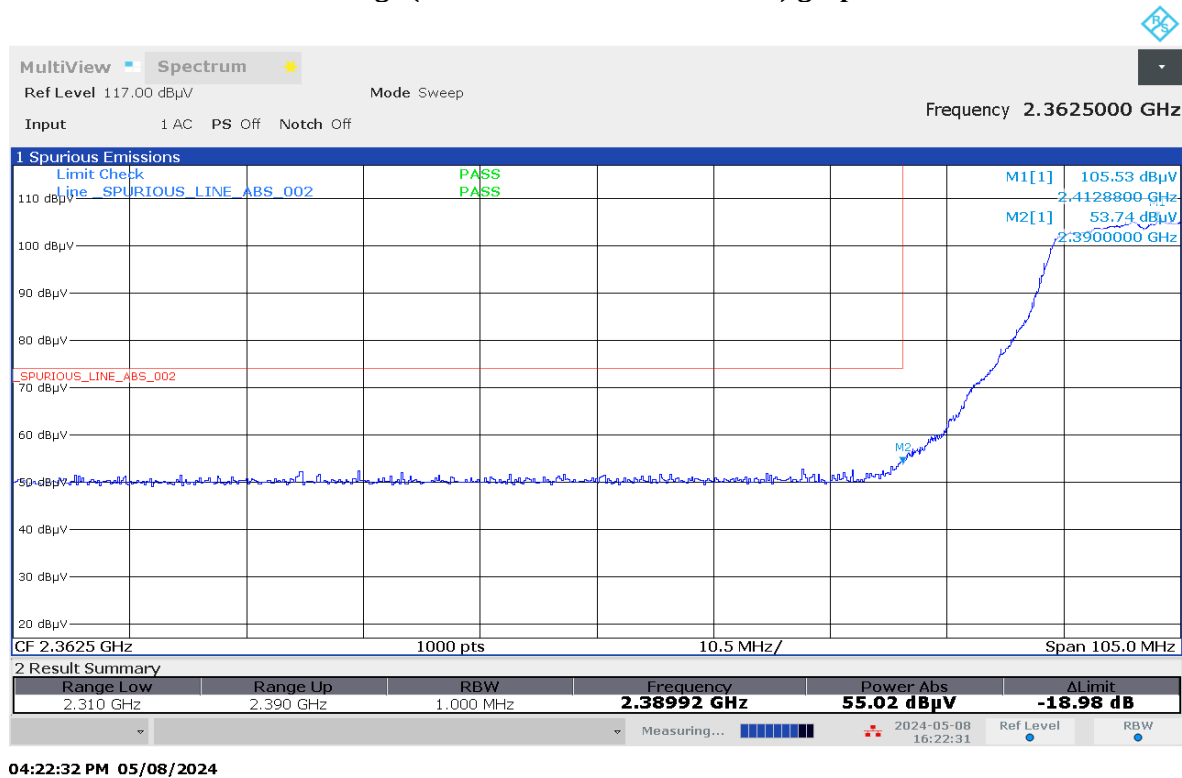
03:33:47 PM 05/08/2024

Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot

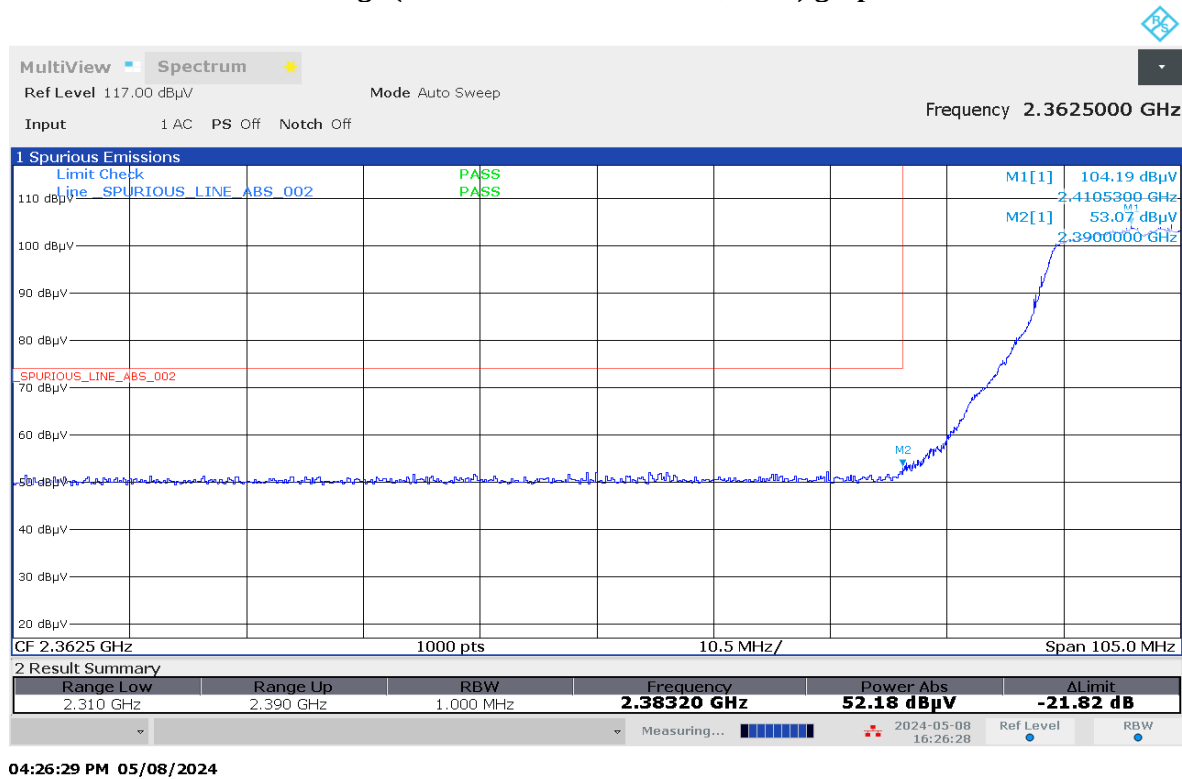


03:40:51 PM 05/08/2024

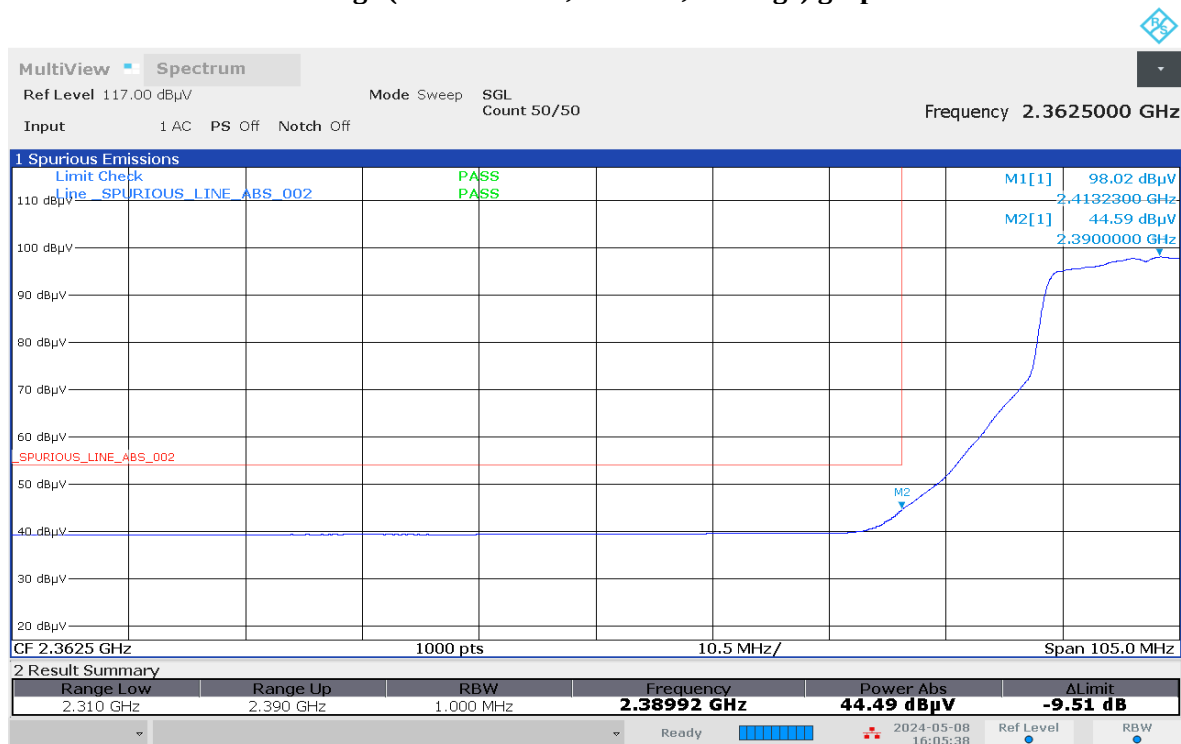
Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot

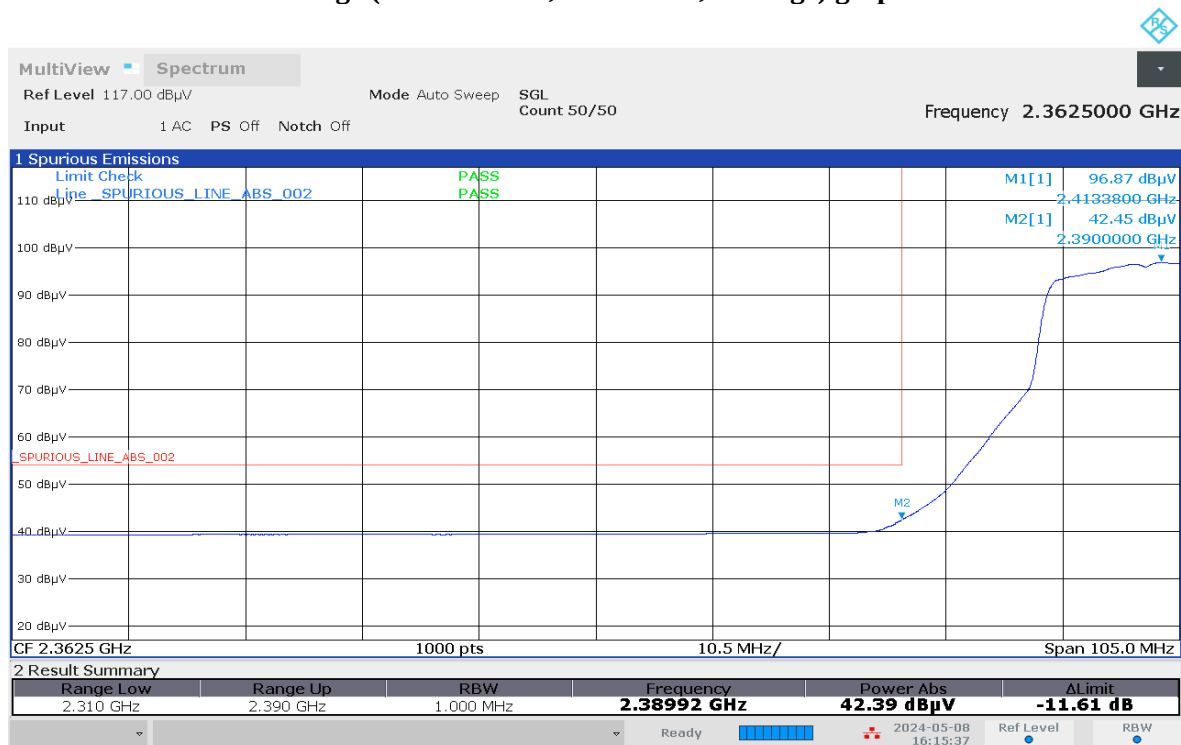


Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



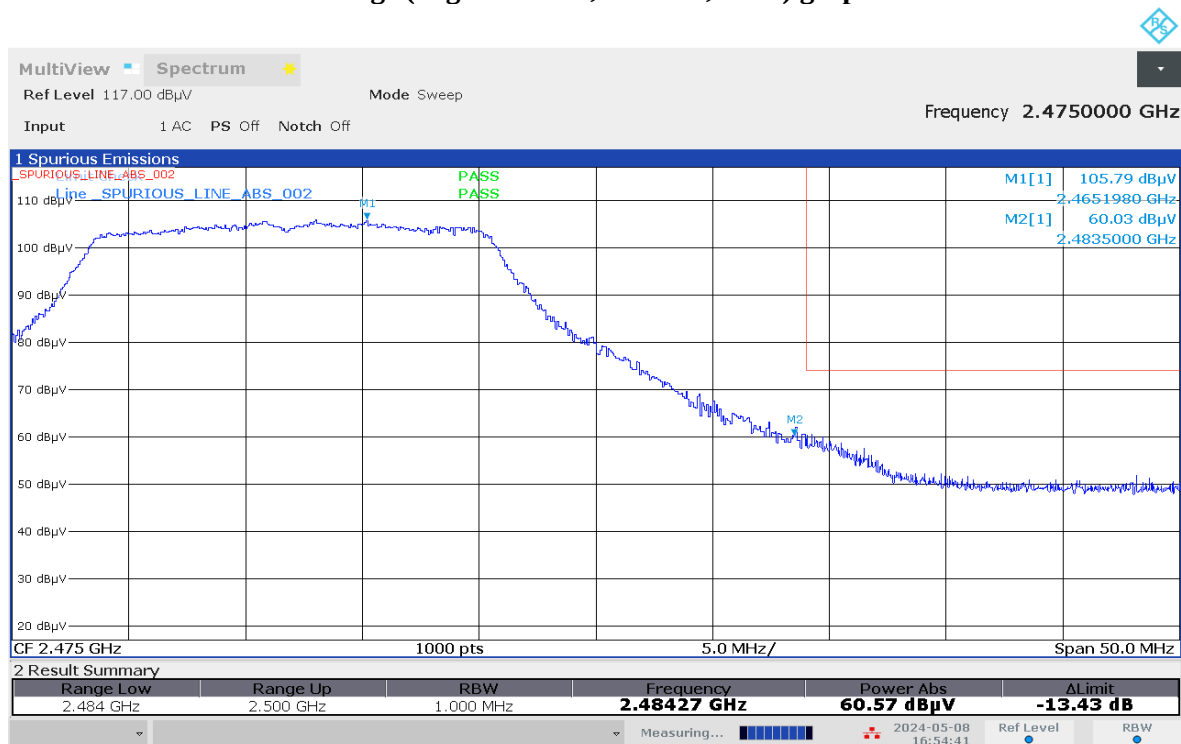
04:05:38 PM 05/08/2024

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



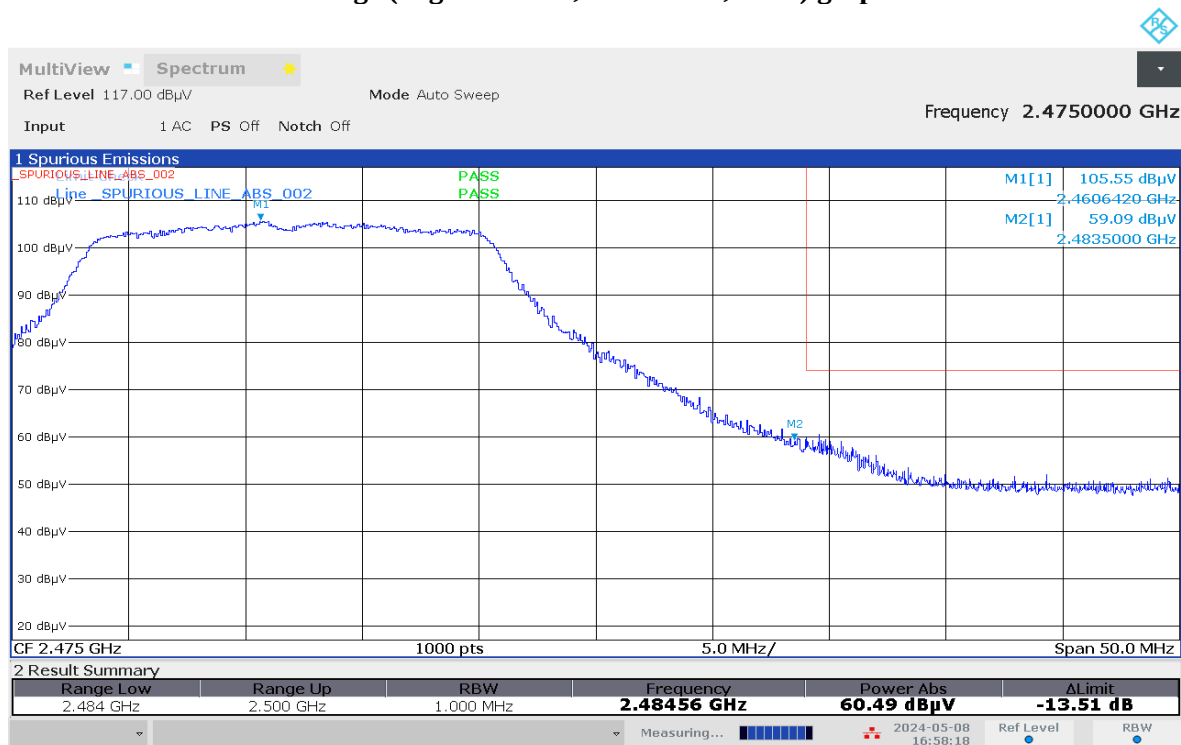
04:15:38 PM 05/08/2024

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



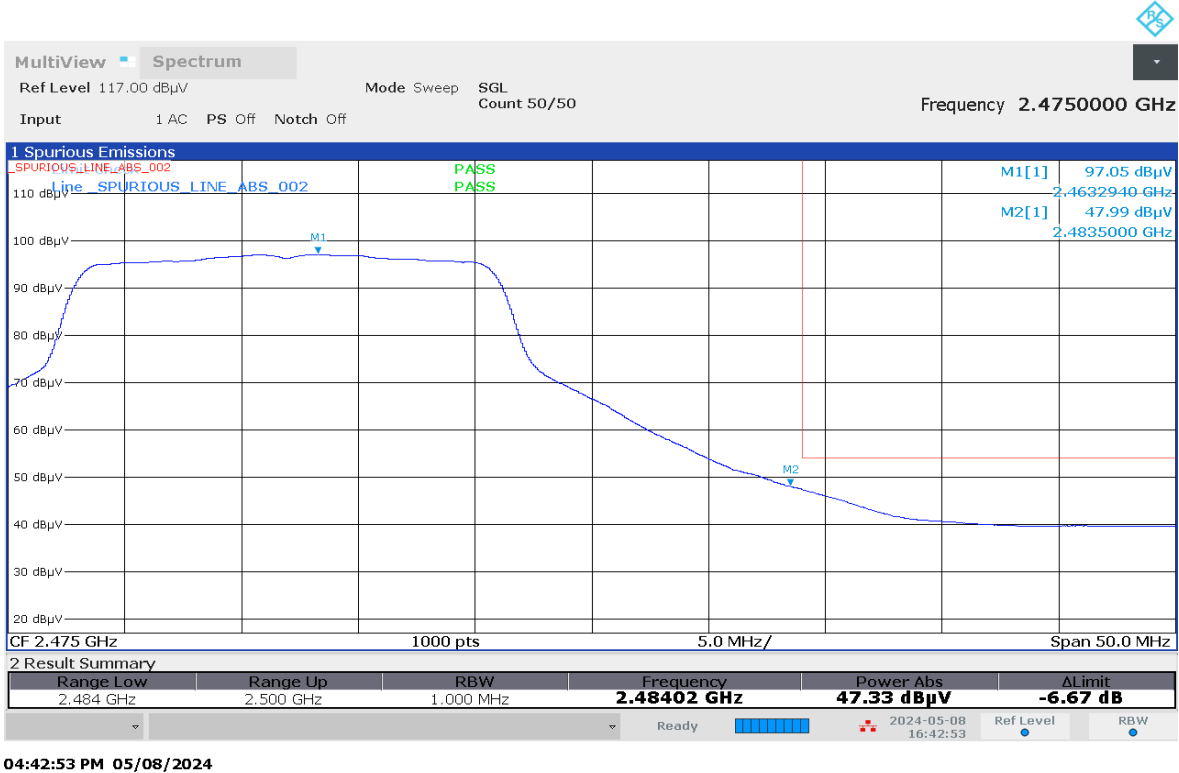
04:54:41 PM 05/08/2024

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot

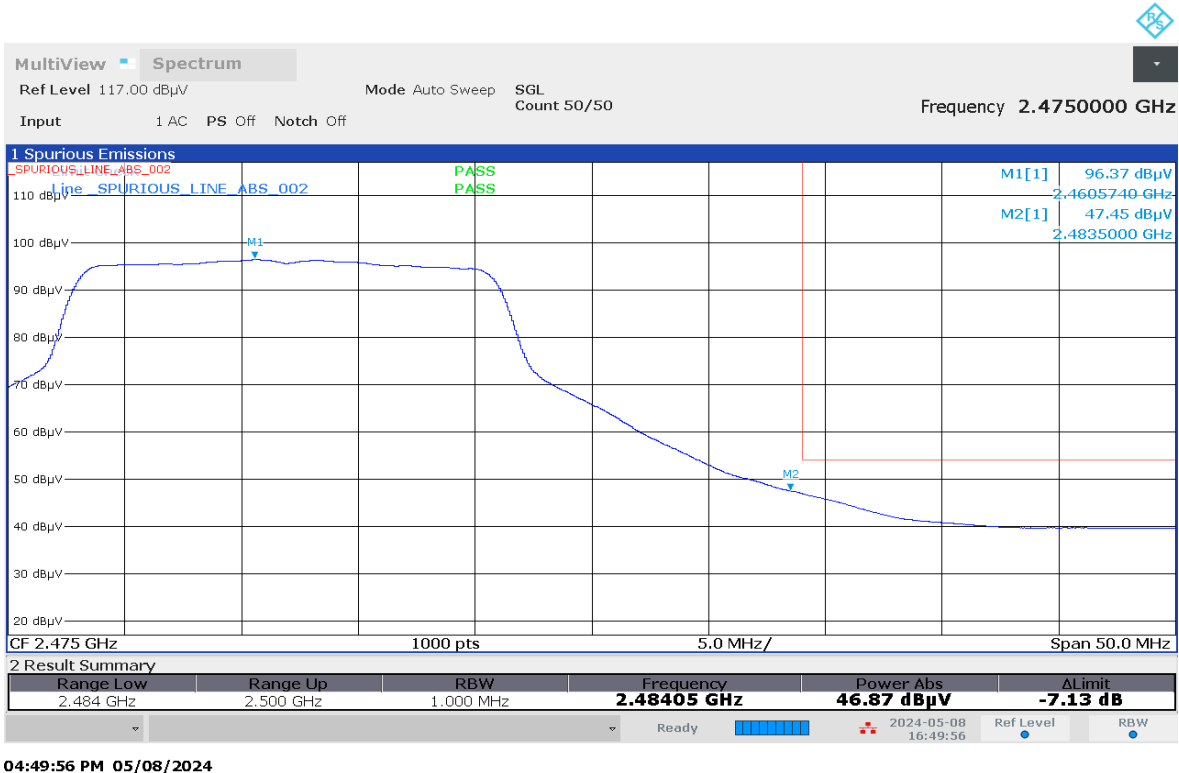


04:58:19 PM 05/08/2024

Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



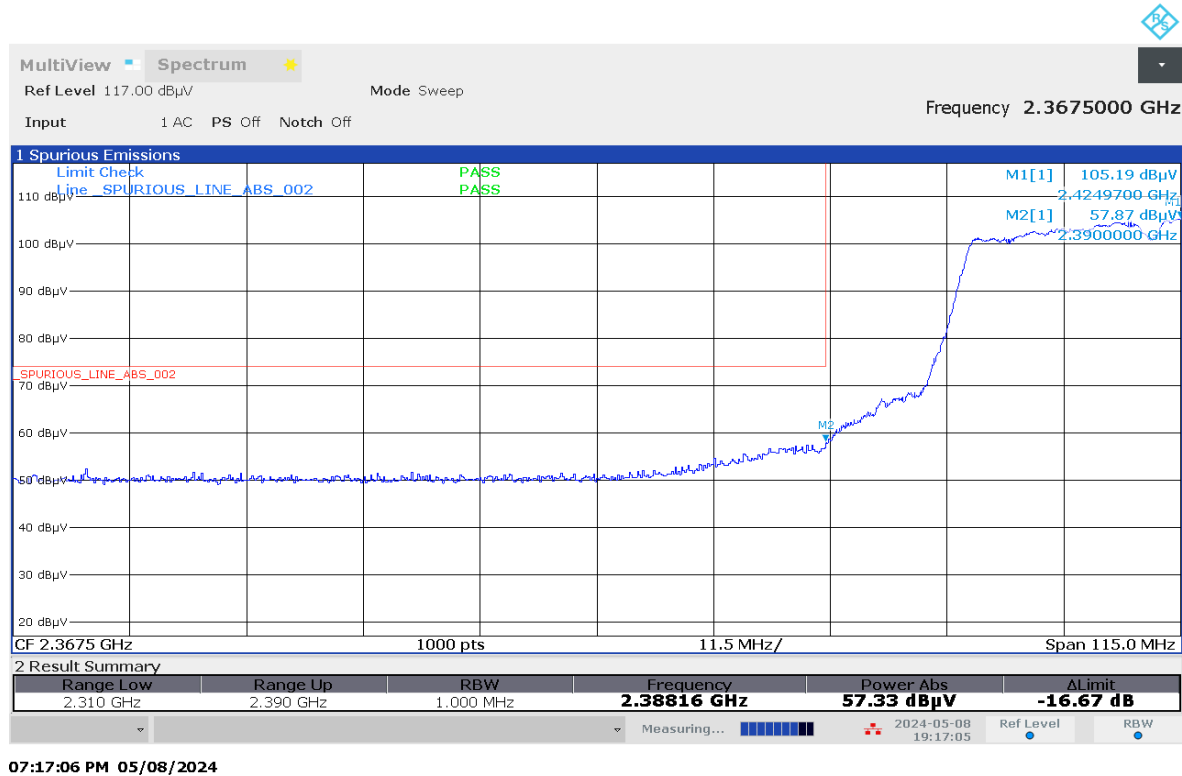
Test Channel: Low Test Frequency: 2422.0000 MHz Test Standard: ANSI C63.10-2013 Worst Case Plane: Z-Plane (802.11n 40MHz)

[illegible]

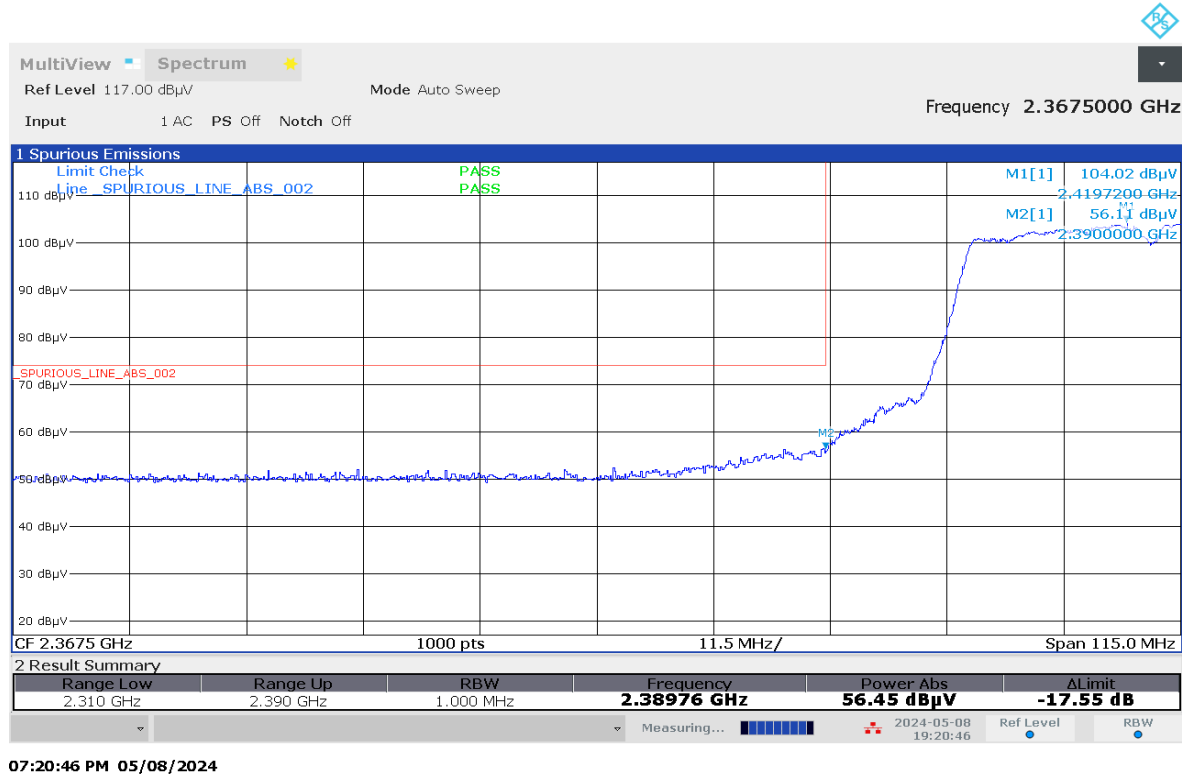
Remarks: Pass Result	Marginal Result	Fail Result
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Humidity (%): 68.7
Test Date: Thu, 9 May, 2024

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



07:08:29 PM 05/08/2024

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



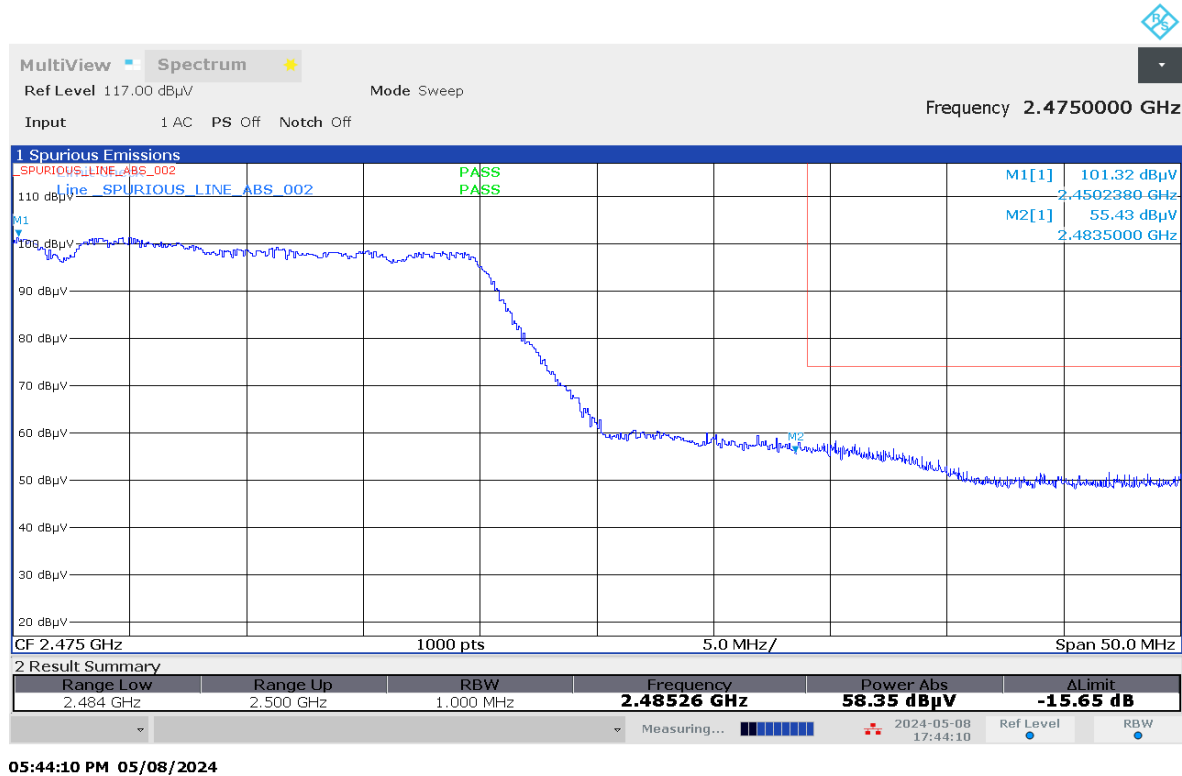
07:12:09 PM 05/08/2024

Restricted Band Edge (High Channel) tabular data

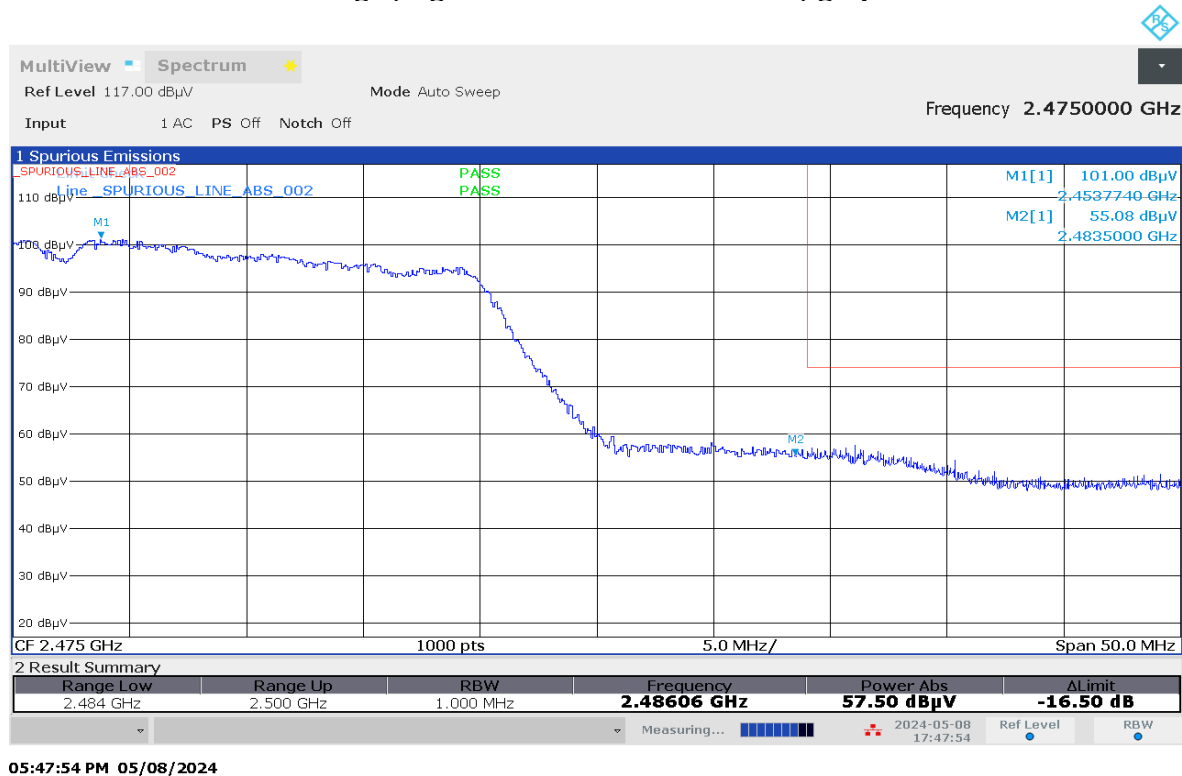
Remarks: Pass Result	Marginal Result	Fail Result
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Humidity (%): 68.7
Test Date: Thu, 9 May, 2024

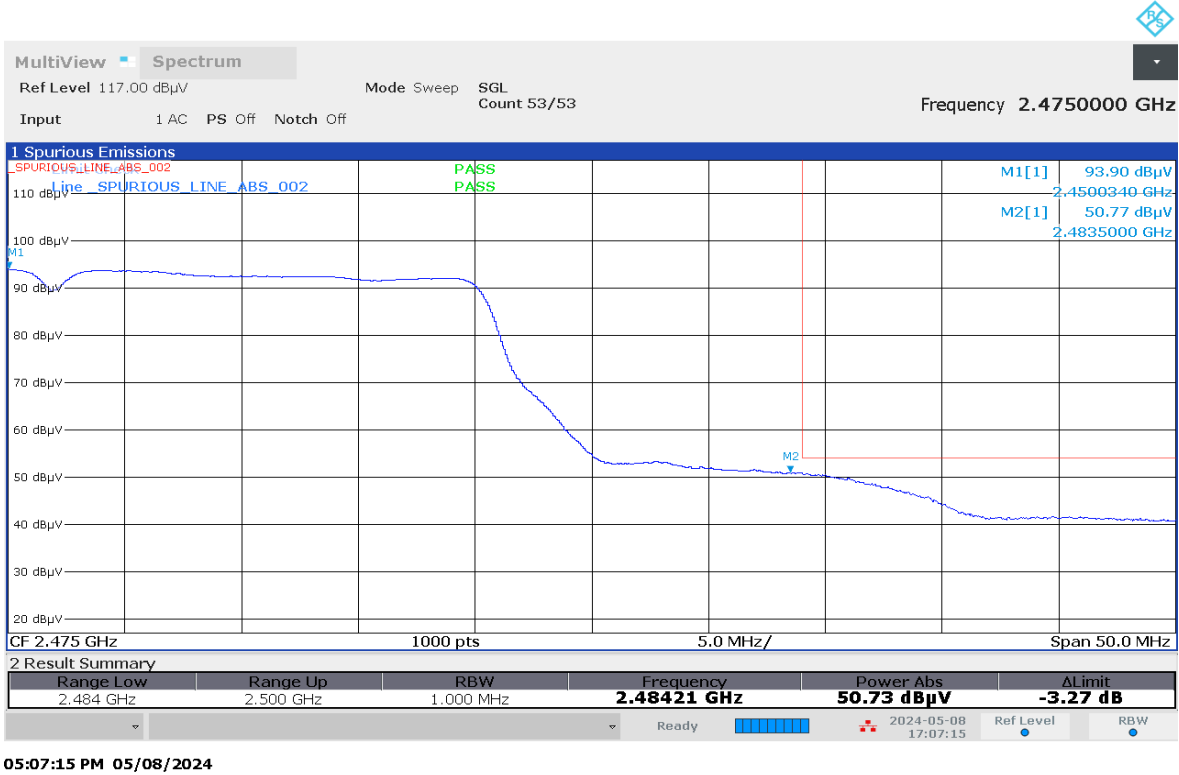
Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



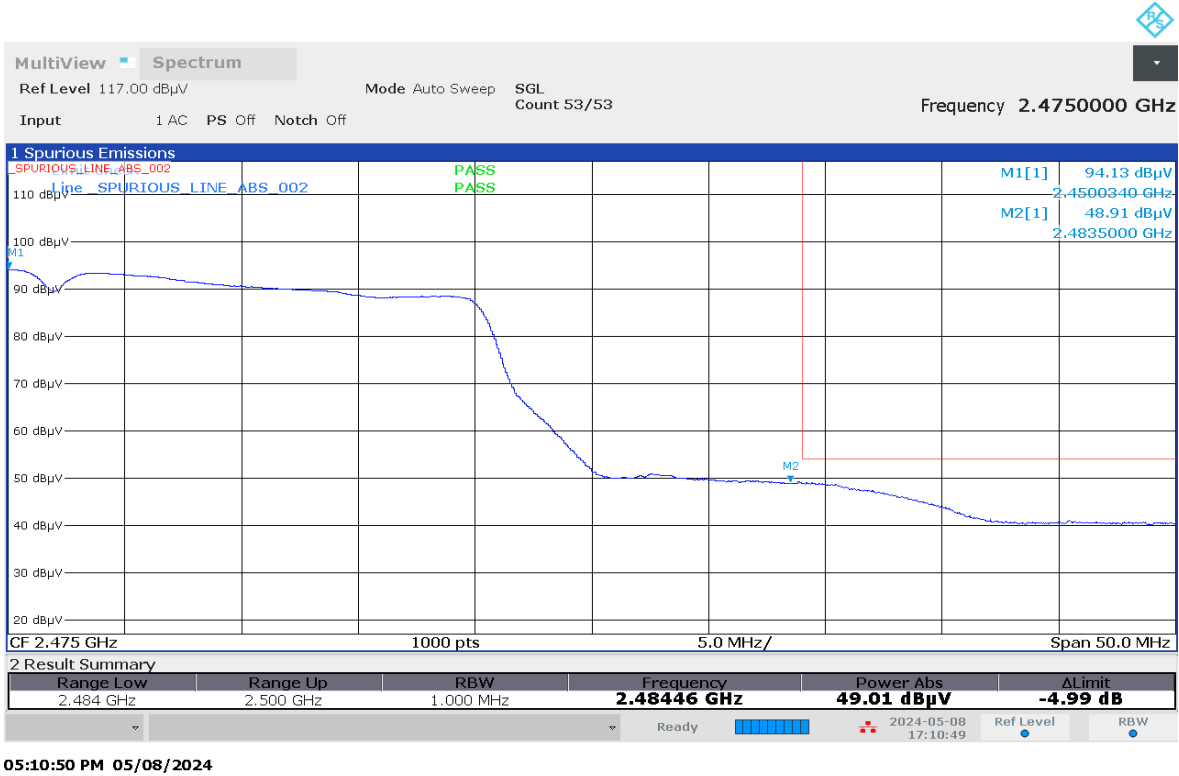
Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



Test: WIFI SAC Transmitter Radiated Emission
Model#: H35KET9PW8AN-H S/N: 022TAF1508 EMC SR ID#: 30468-EMC-00044
Battery: PMNN4818A Softpot power (19dBm) Accessory: AN00041A01
Test Channel: Low Test Frequency: 2412.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (802.11b)

Radiated Emission (Low Channel) tabular data

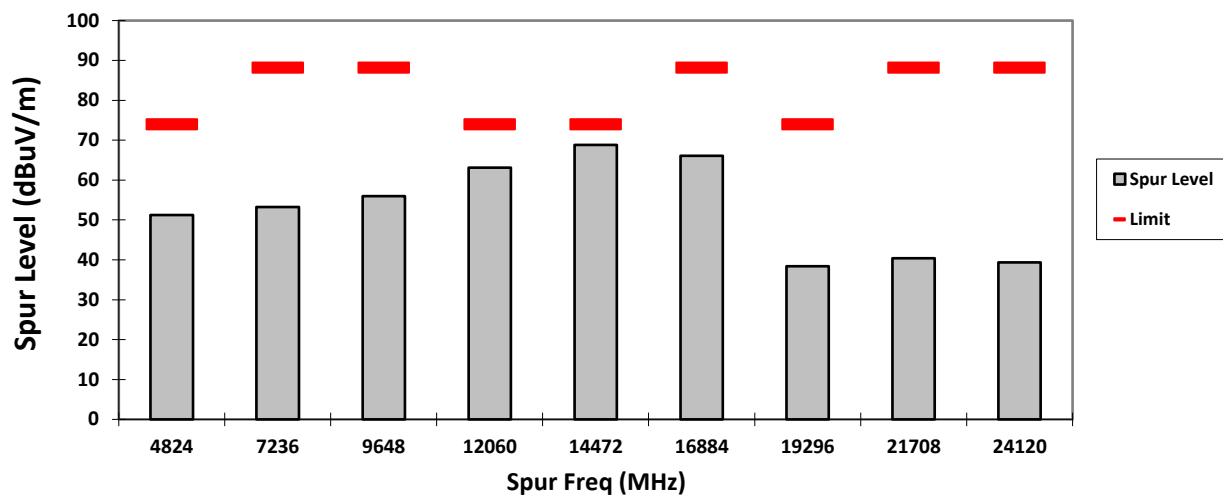
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4824	-	51.2730**	-	-	74.0000	-	-	22.7270	-	-
7236	-	53.2212**	-	-	88.2700	-	-	35.0488	-	108.2700
9648	-	56.0099**	-	-	88.2700	-	-	32.2601	-	108.2700
12060	-	63.0915**	49.3920**	-	74.0000	54.0000	-	10.9085	4.6080	-
14472	-	68.8129**	53.5053**	-	74.0000	54.0000	-	5.1871	0.4947	-
16884	-	66.1016**	-	-	88.2700	-	-	22.1684	-	108.2700
19296	-	38.4355**	-	-	74.0000	-	-	35.5645	-	-
21708	-	40.4261**	-	-	88.2700	-	-	47.8439	-	108.2700
24120	-	39.3749**	-	-	88.2700	-	-	48.8951	-	108.2700
Horizontal Radiated Emission Result										
4824	-	47.4705**	-	-	74.0000	-	-	26.5295	-	-
7236	-	49.9290**	-	-	88.2700	-	-	38.3410	-	108.2700
9648	-	53.7153**	-	-	88.2700	-	-	34.5547	-	108.2700
12060	-	62.7465**	49.3908**	-	74.0000	54.0000	-	11.2535	4.6092	-
14472	-	68.2342**	53.5015**	-	74.0000	54.0000	-	5.7658	0.4985	-
16884	-	63.9370**	-	-	88.2700	-	-	24.3330	-	108.2700
19296	-	39.8738**	-	-	74.0000	-	-	34.1262	-	-
21708	-	40.6188**	-	-	88.2700	-	-	47.6512	-	108.2700
24120	-	41.1935**	-	-	88.2700	-	-	47.0765	-	108.2700

Remarks: Pass Result	Marginal Result	Fail Result
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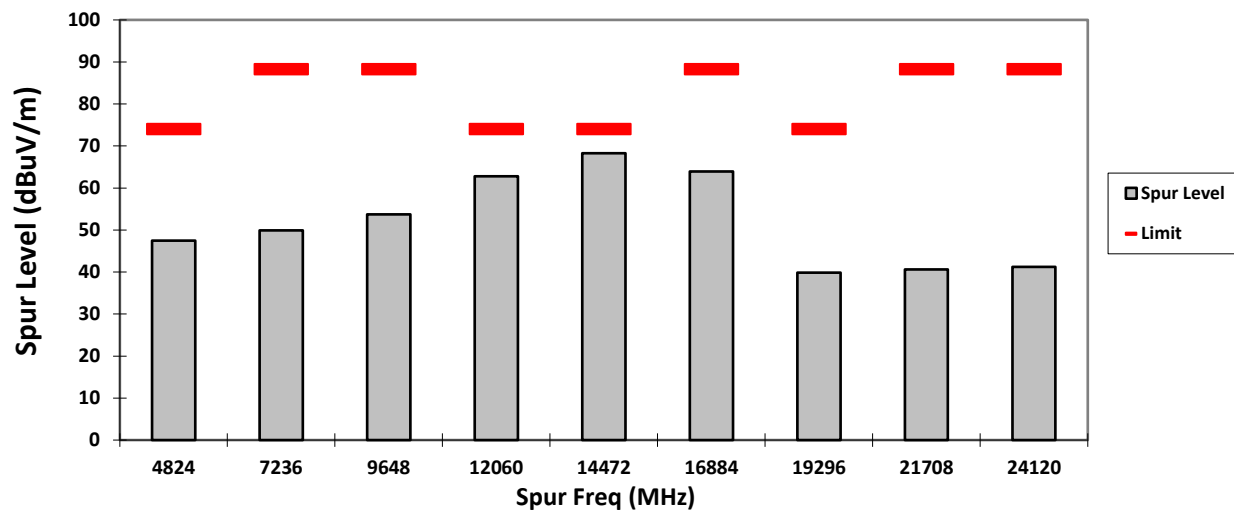
Temperature (degC): 23.3 Humidity (%): 68.7
Test Performed by: Nazrin & Rezza Test Date: Thu, 9 May, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

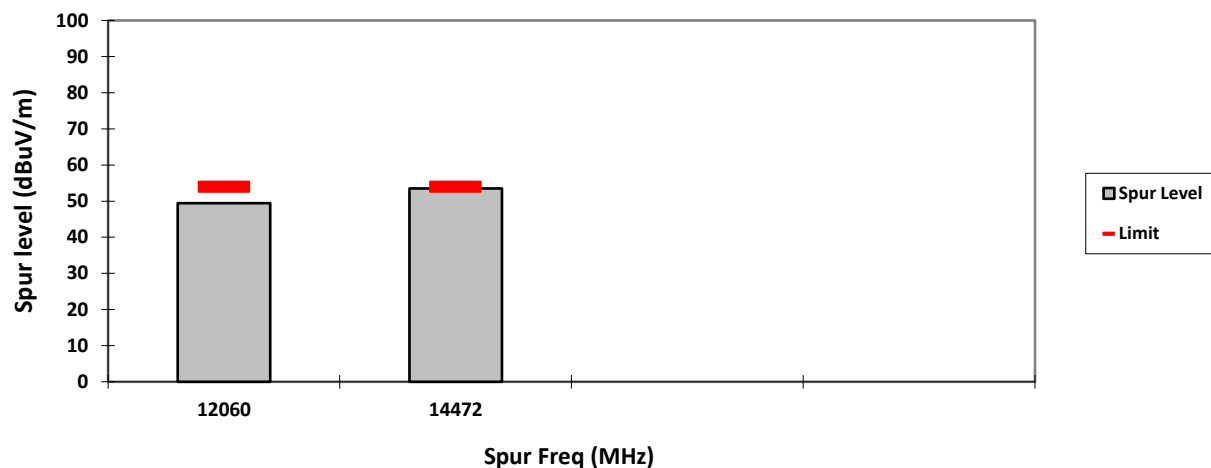
VERTICAL, PK



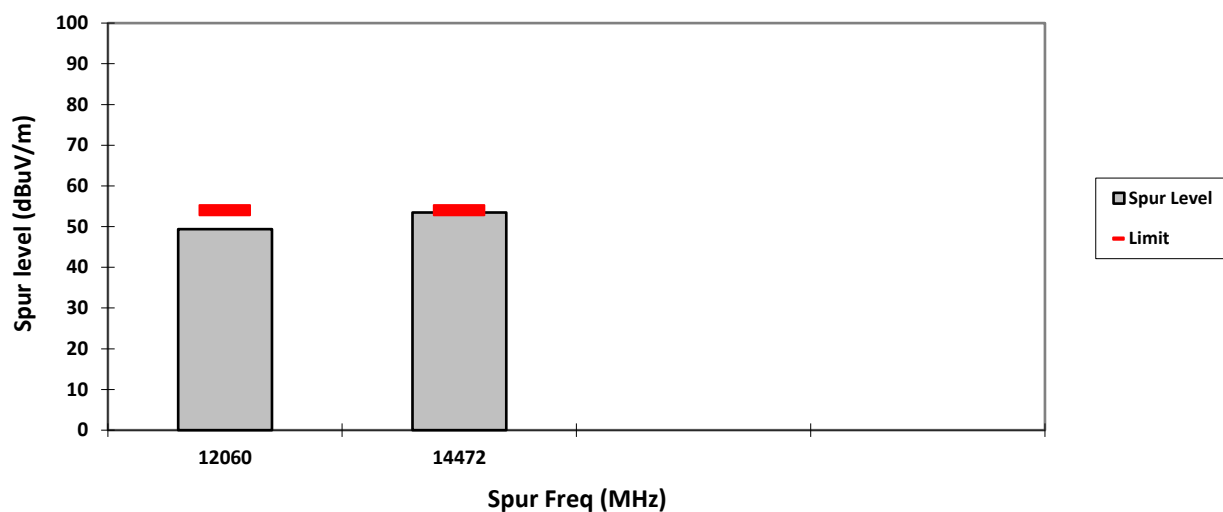
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

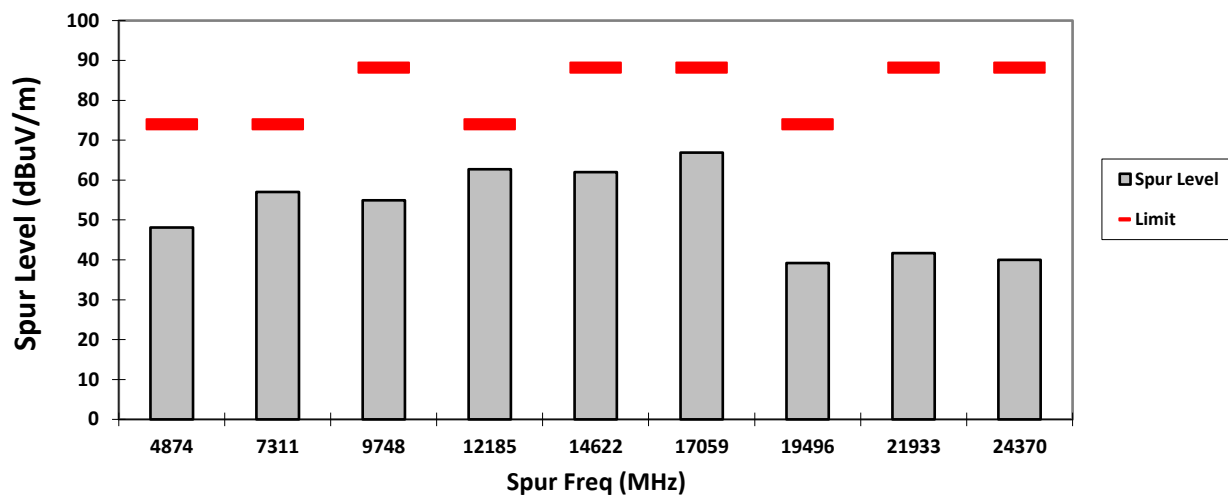


Radiated Emission (Mid Channel) tabular data

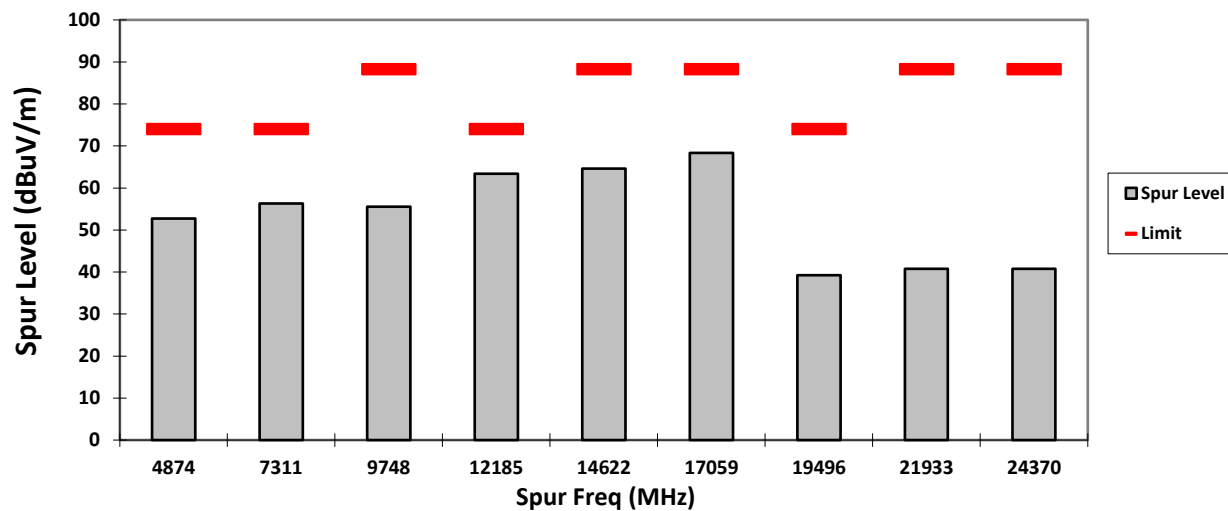
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

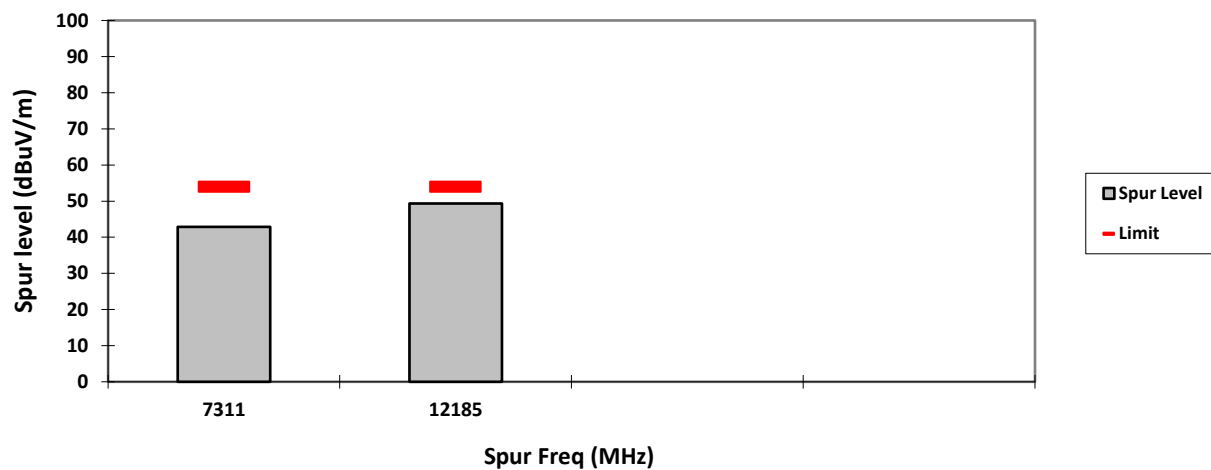
VERTICAL, PK



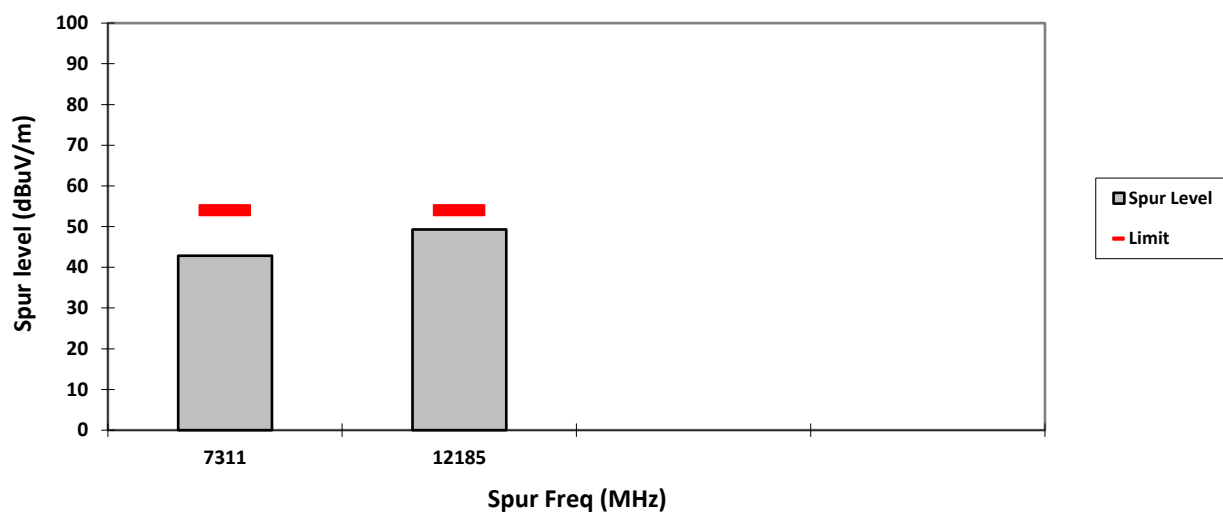
HORIZONTAL, PK



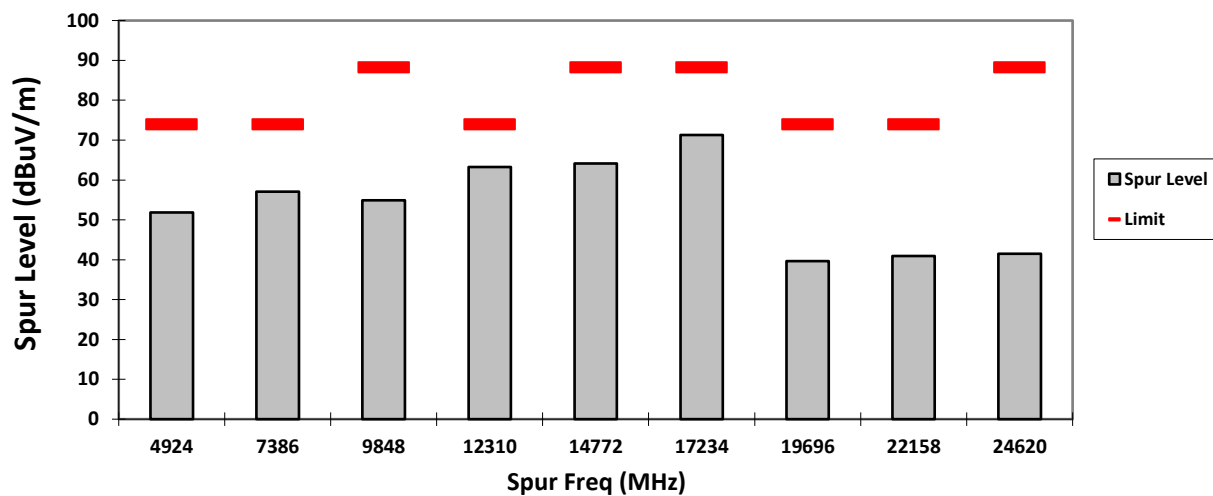
VERTICAL, AV



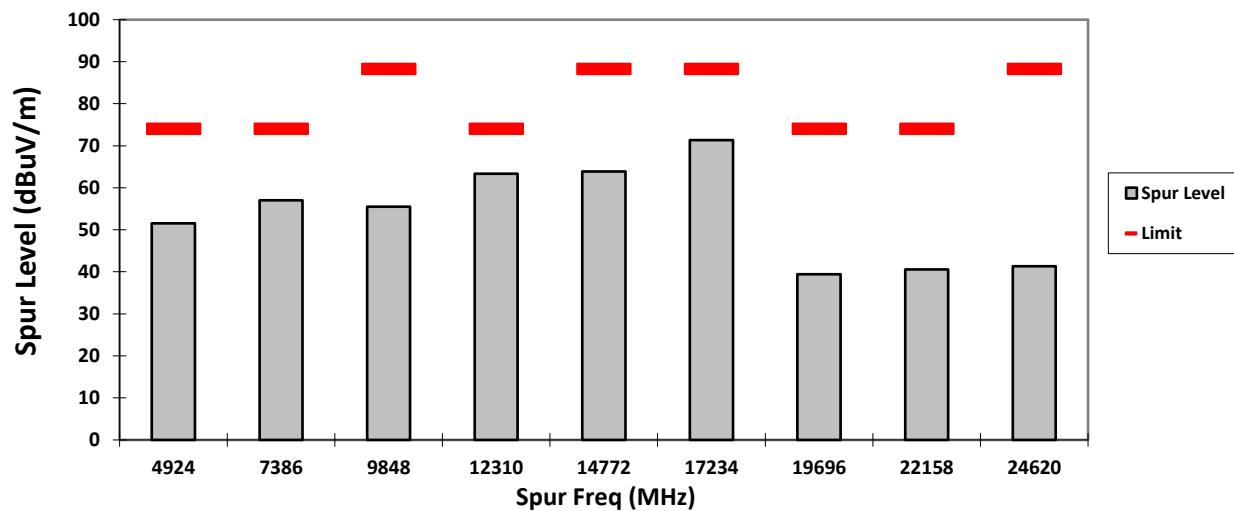
HORIZONTAL, AV



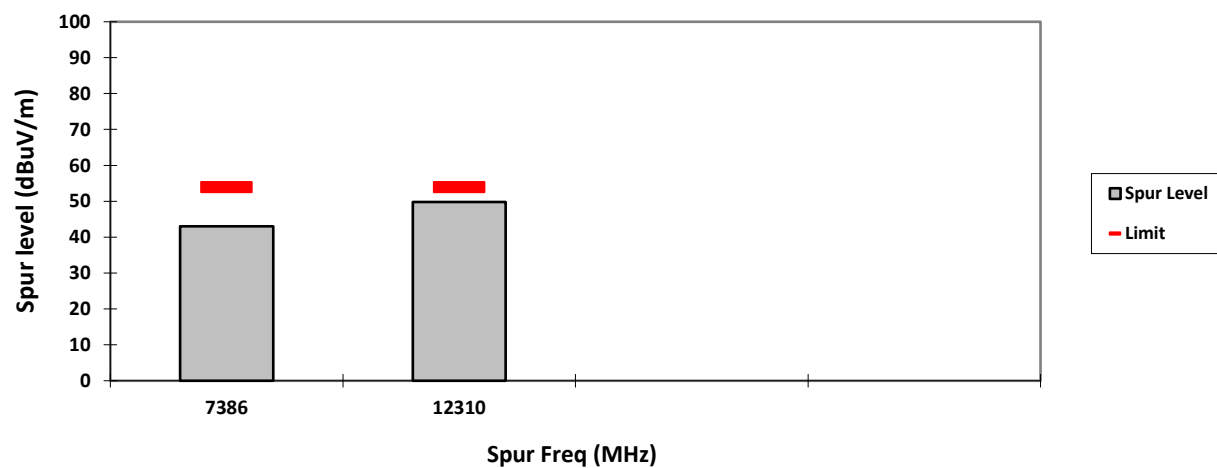
VERTICAL, PK



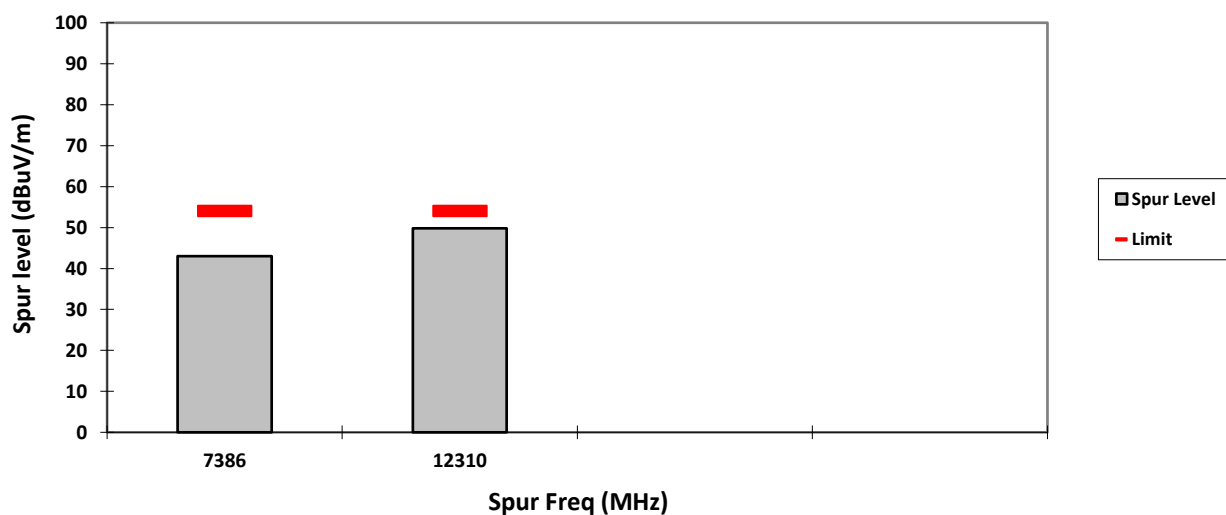
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

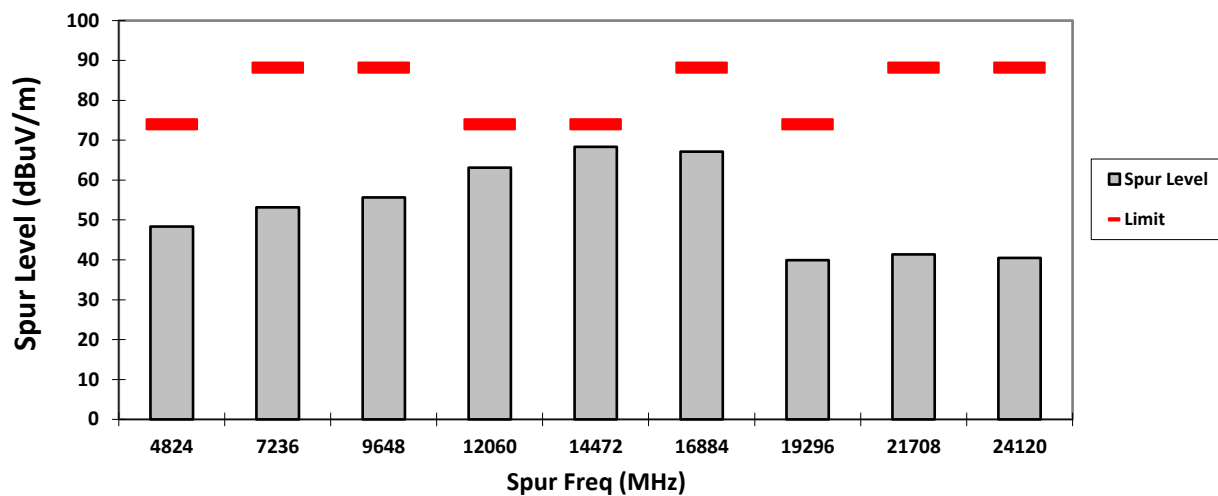


Radiated Emission (Low Channel) tabular data

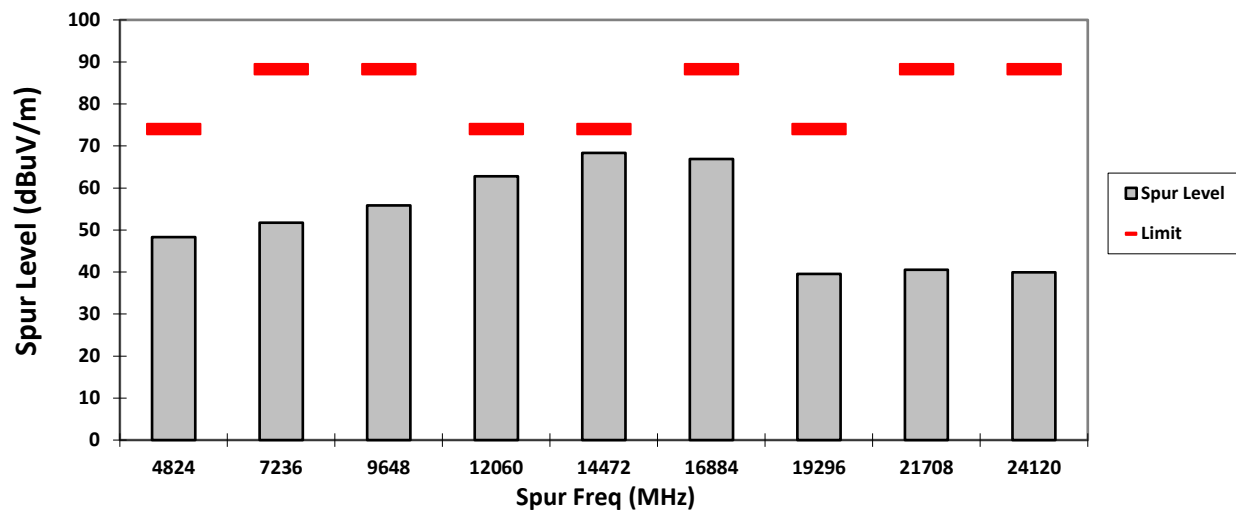
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

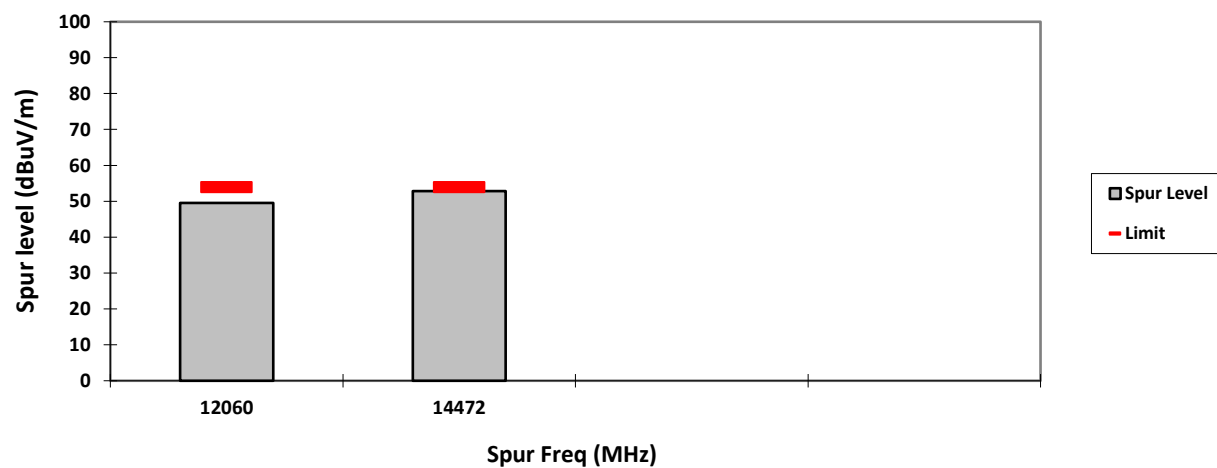
VERTICAL, PK



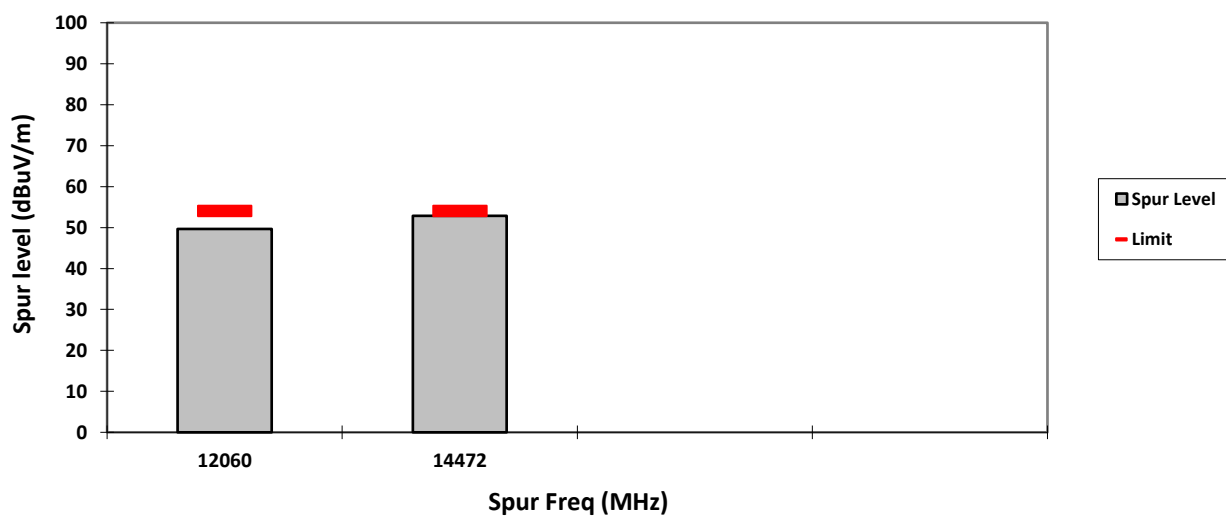
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

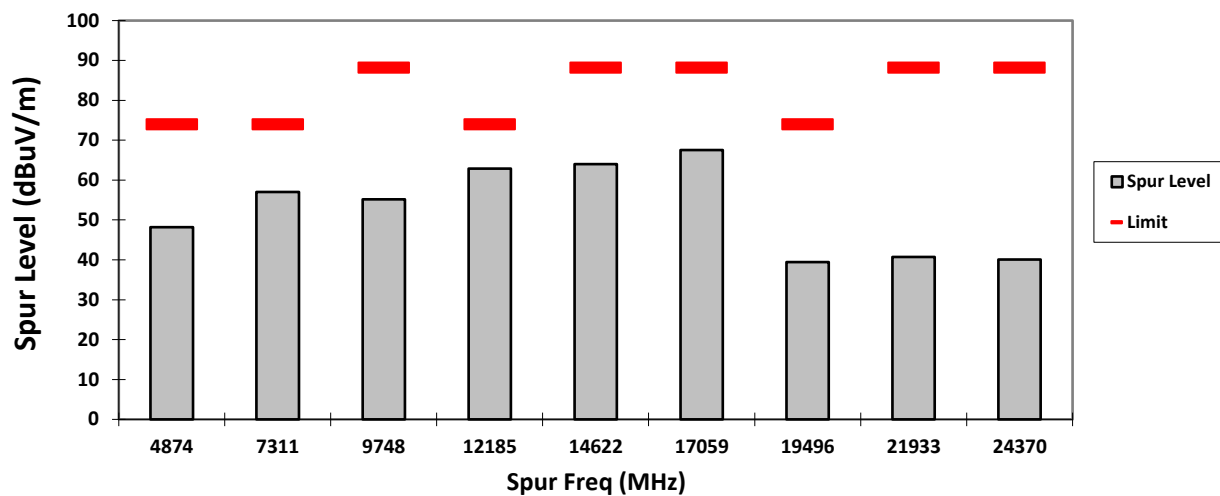


Radiated Emission (Mid Channel) tabular data

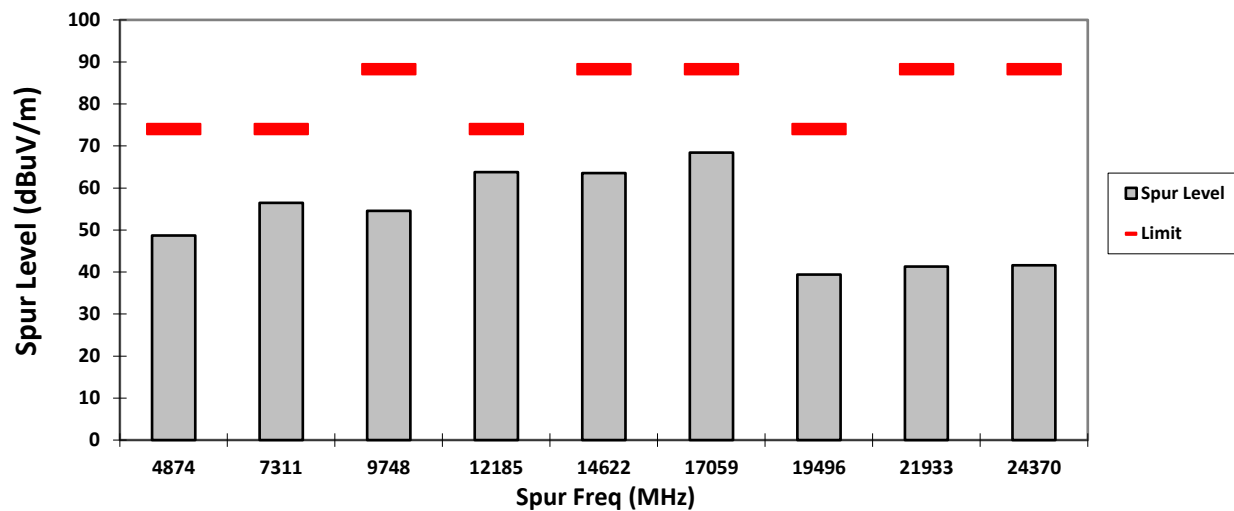
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

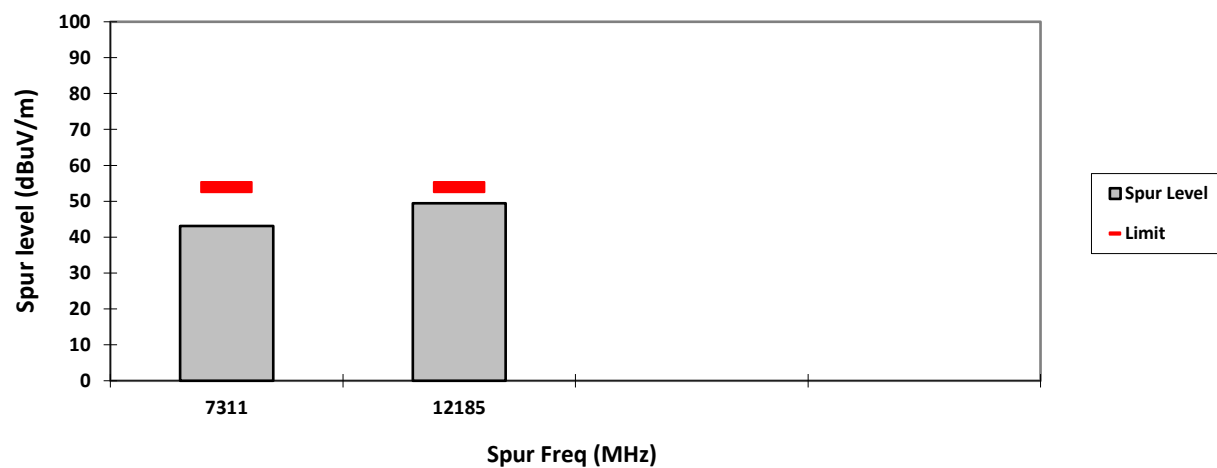
VERTICAL, PK



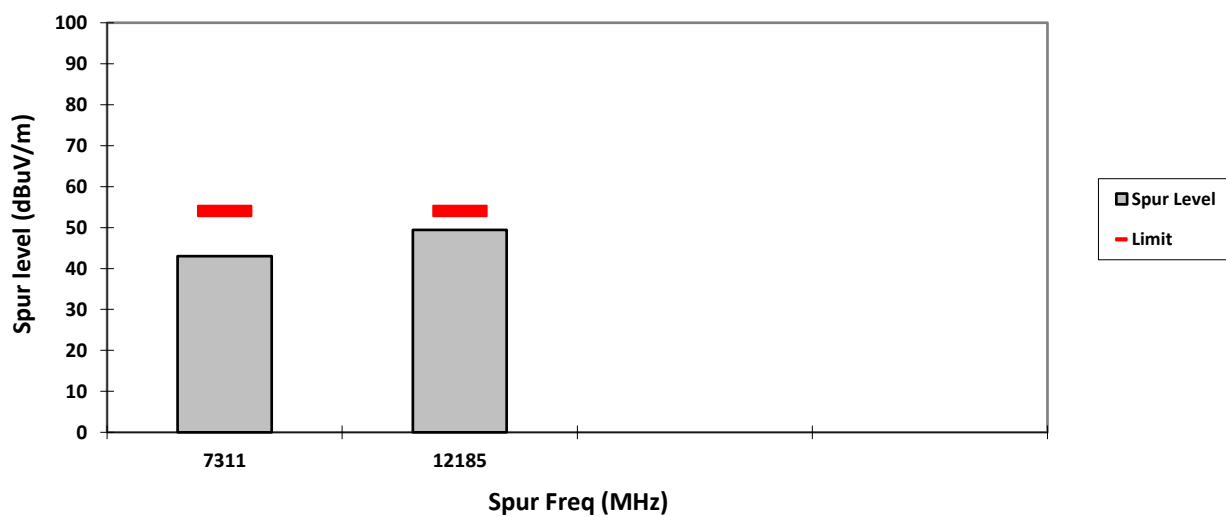
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

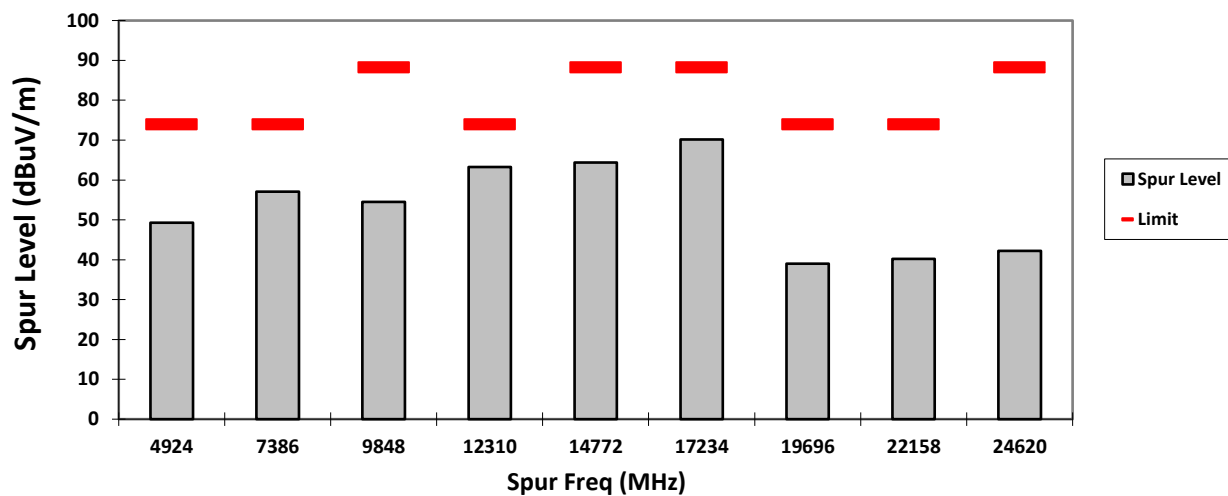


Radiated Emission (High Channel) tabular data

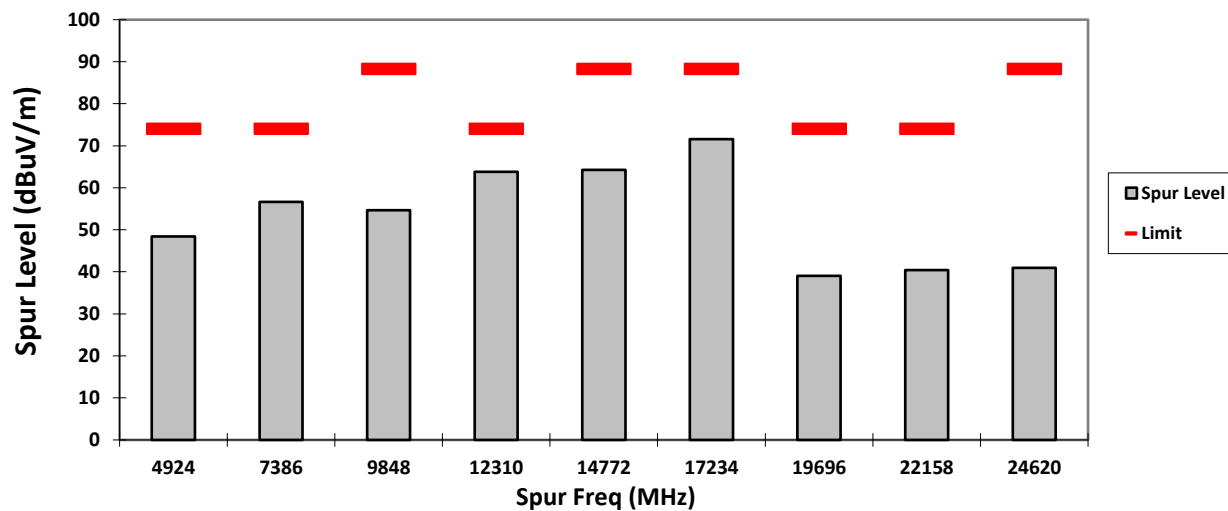
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

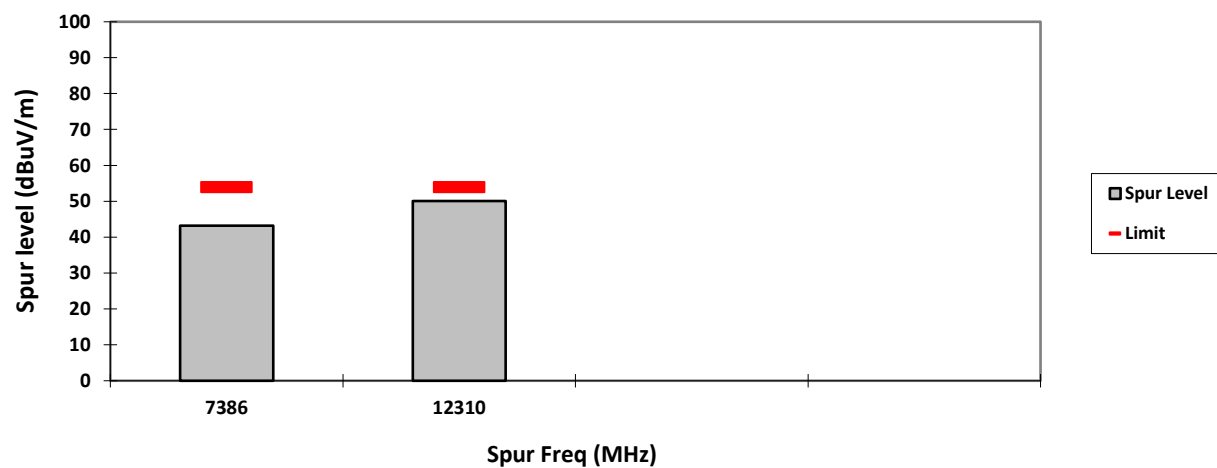
VERTICAL, PK



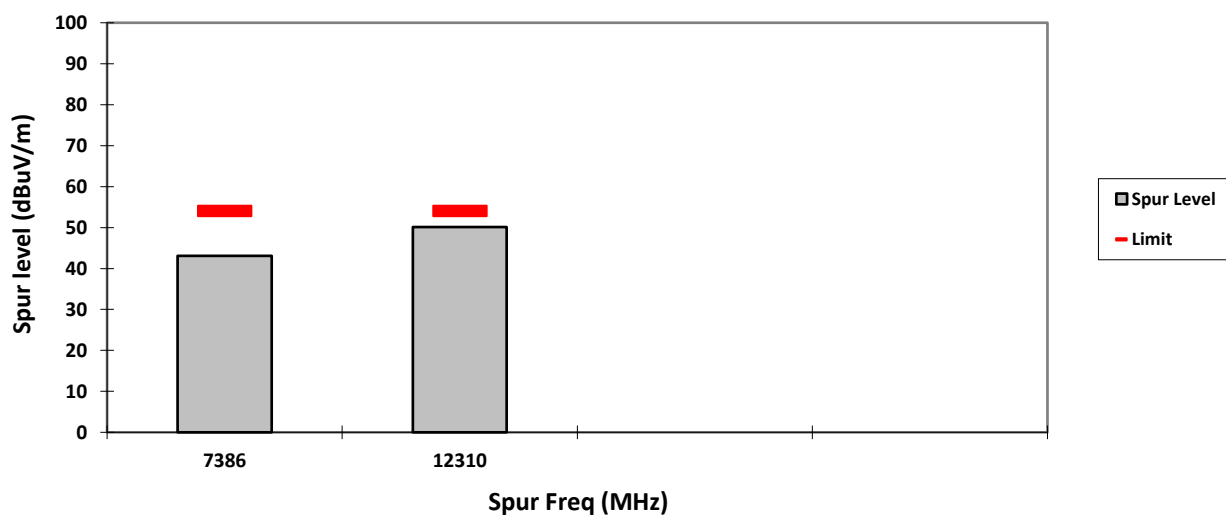
HORIZONTAL, PK



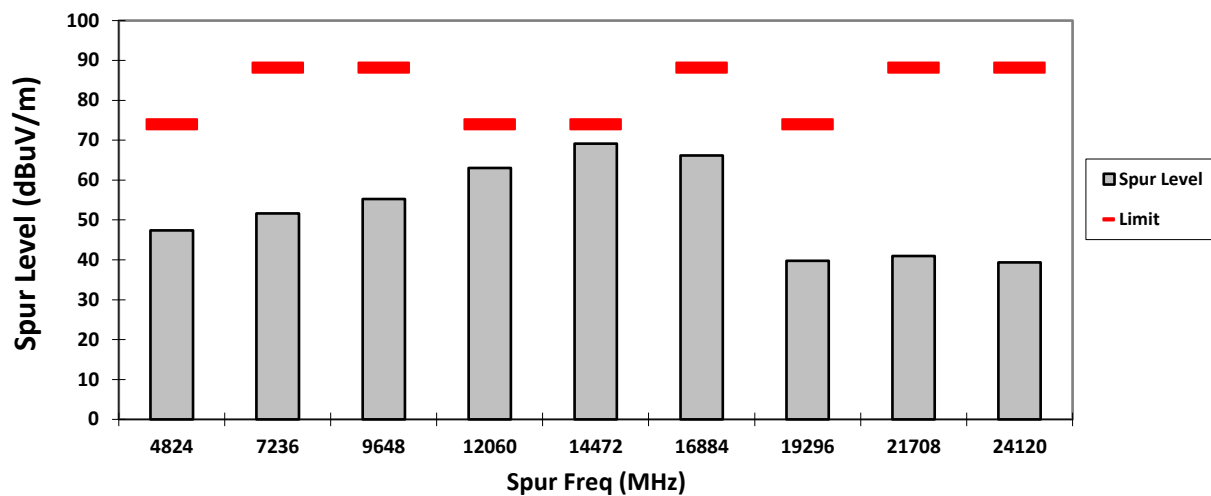
VERTICAL, AV



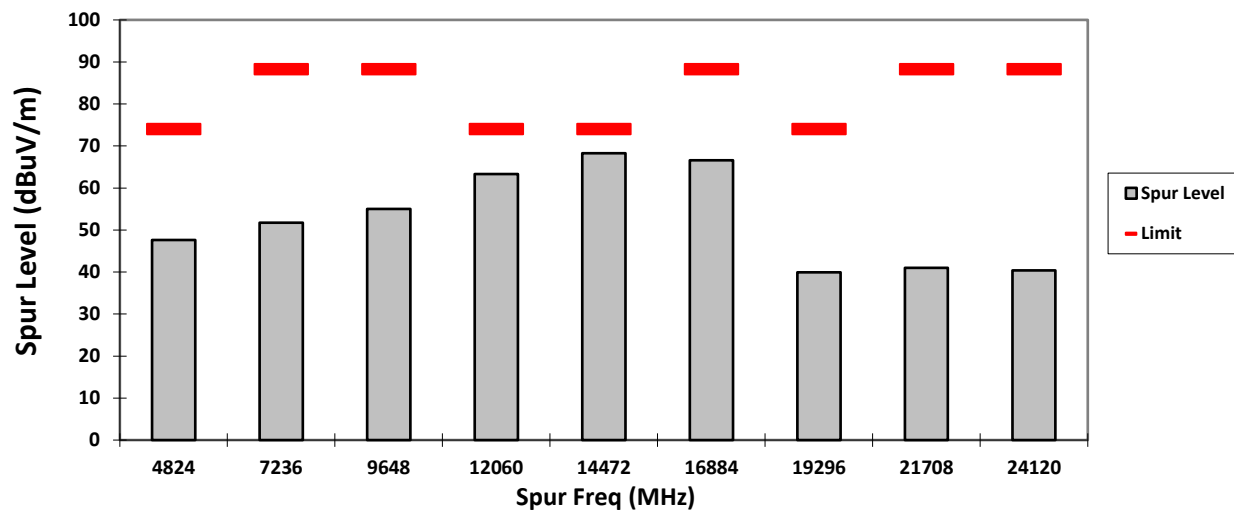
HORIZONTAL, AV



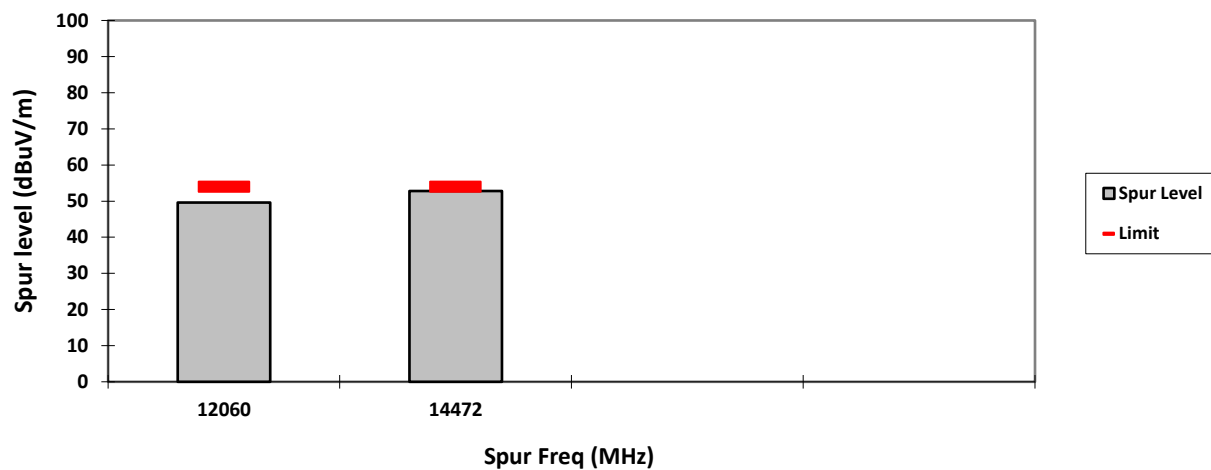
VERTICAL, PK



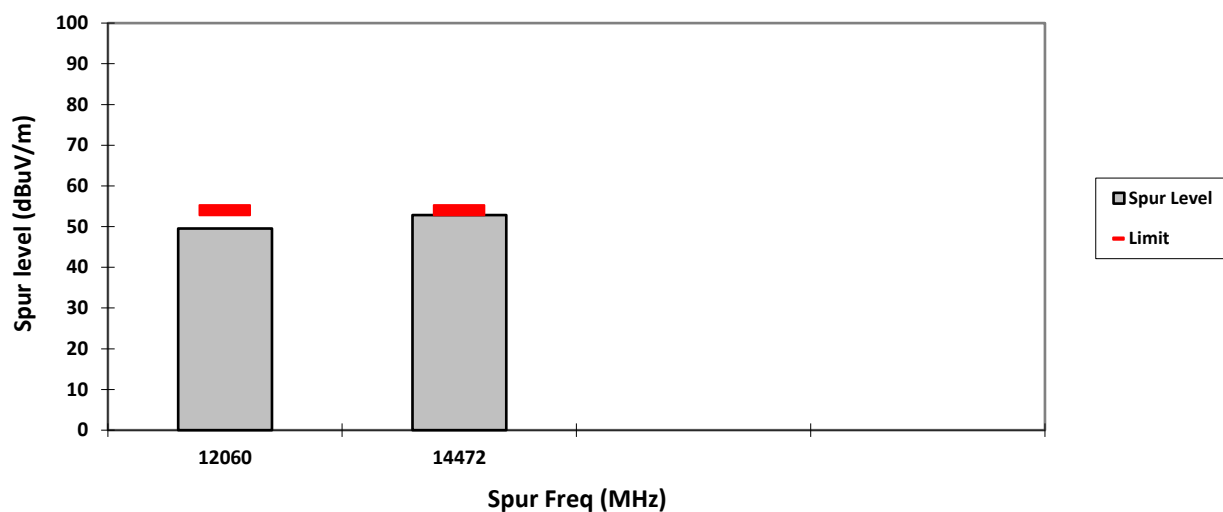
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

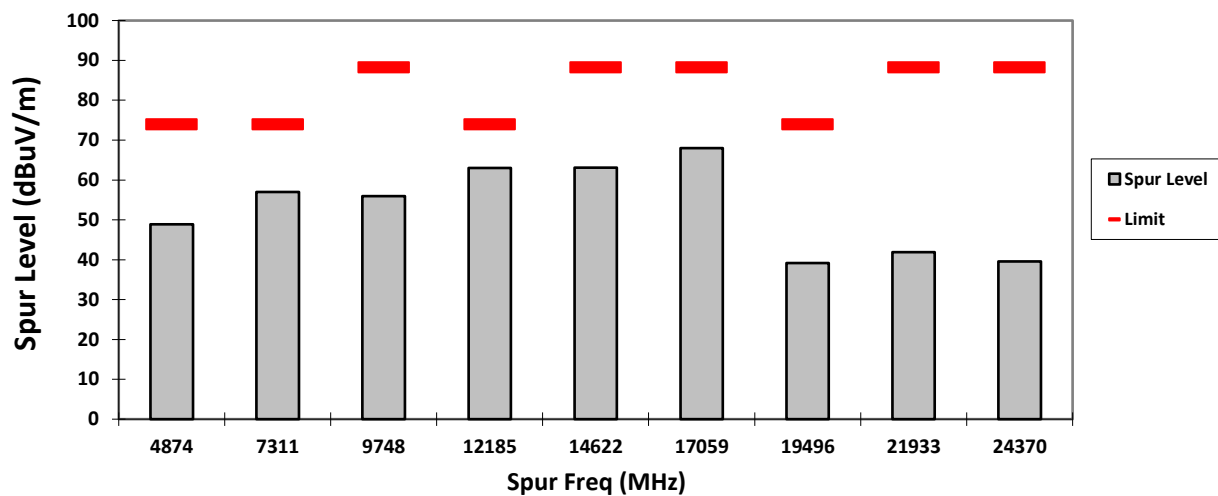


Radiated Emission (Mid Channel) tabular data

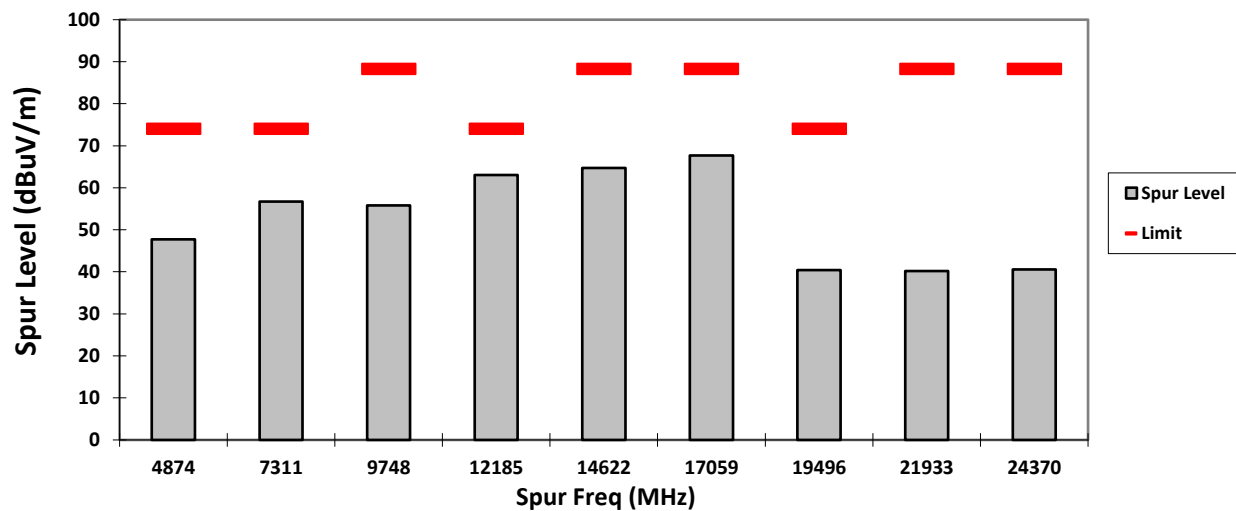
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

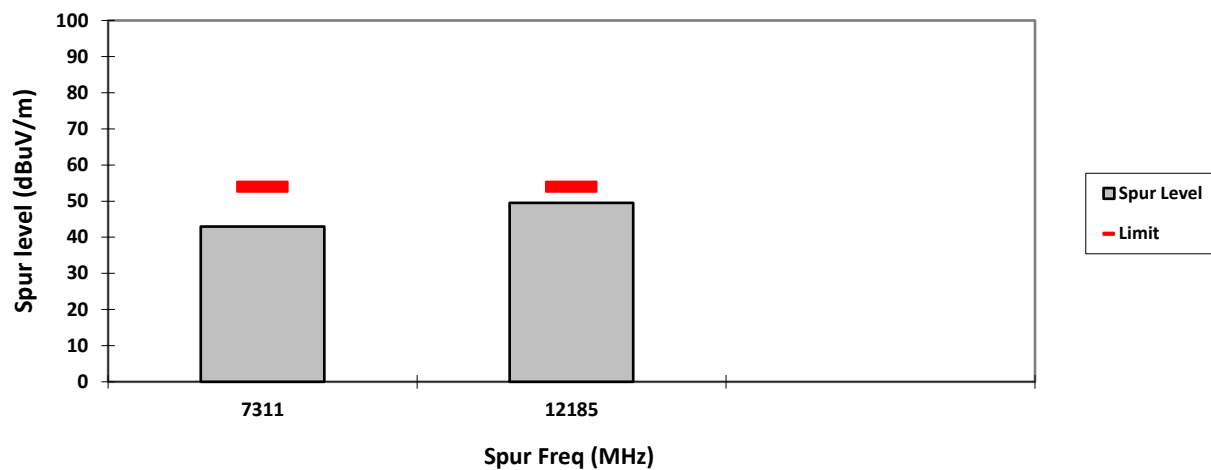
VERTICAL, PK



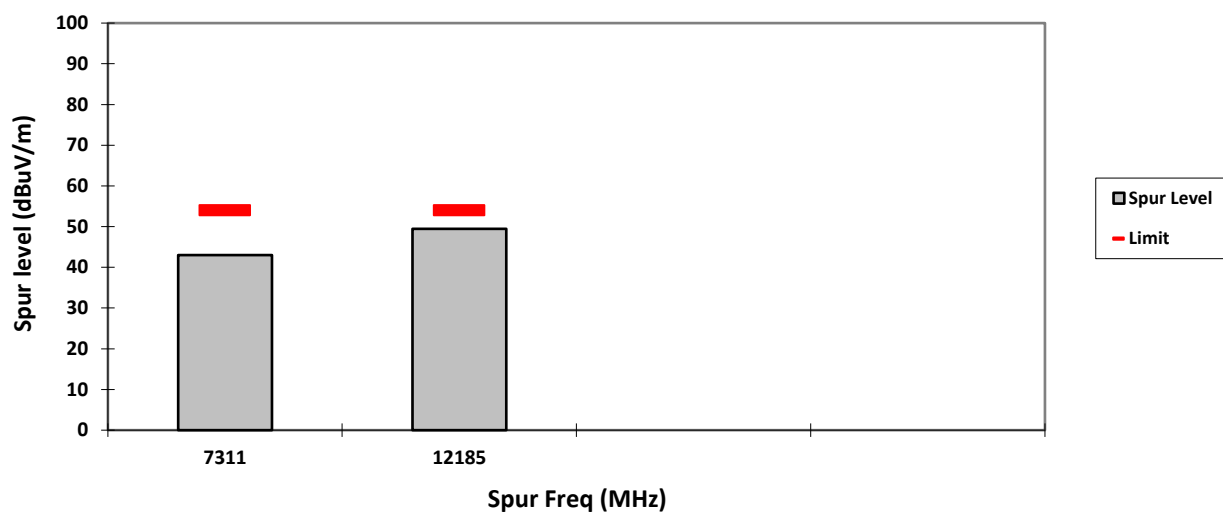
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

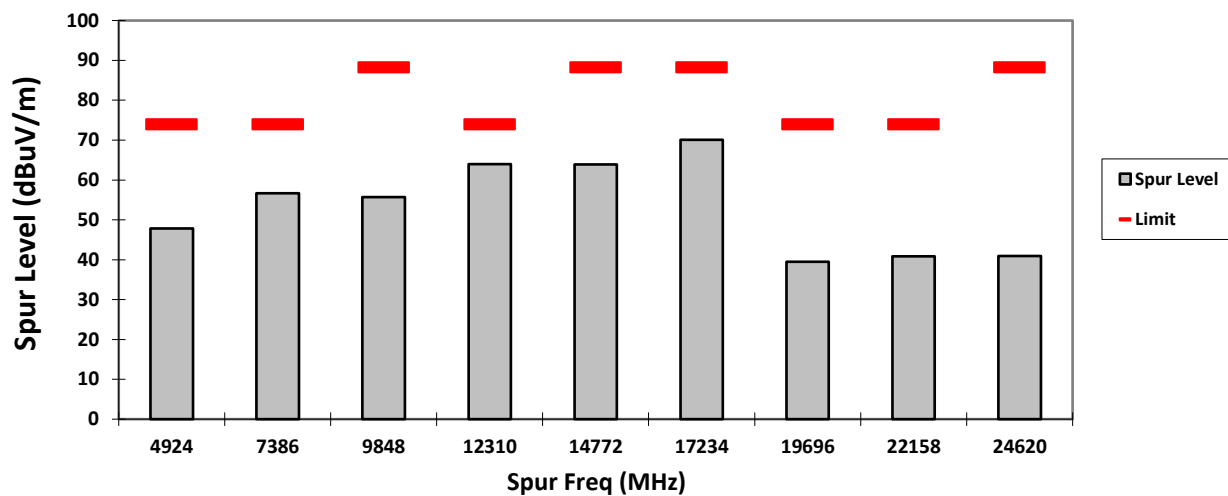


Radiated Emission (High Channel) tabular data

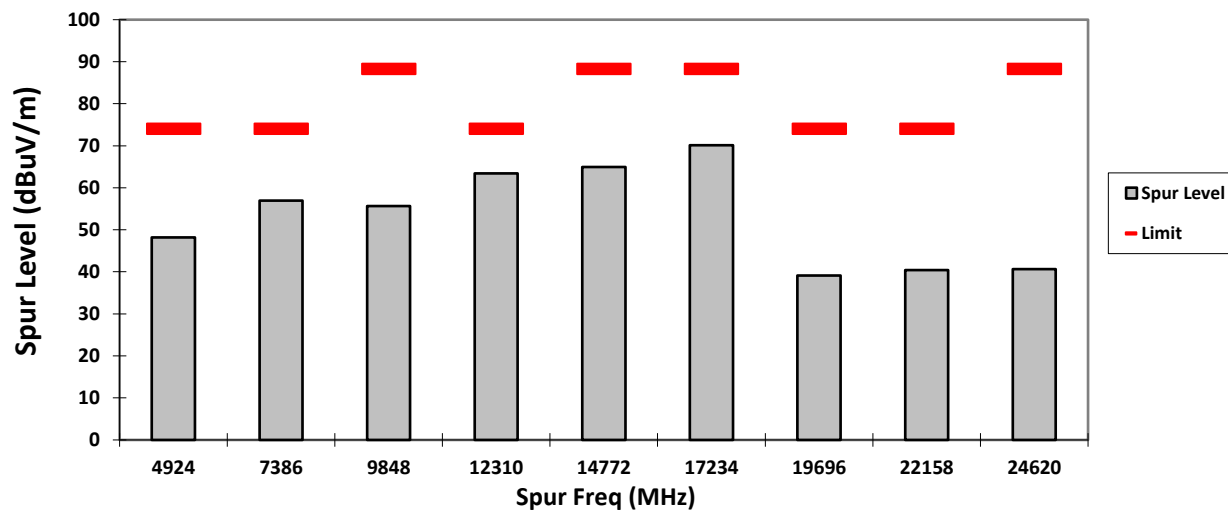
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

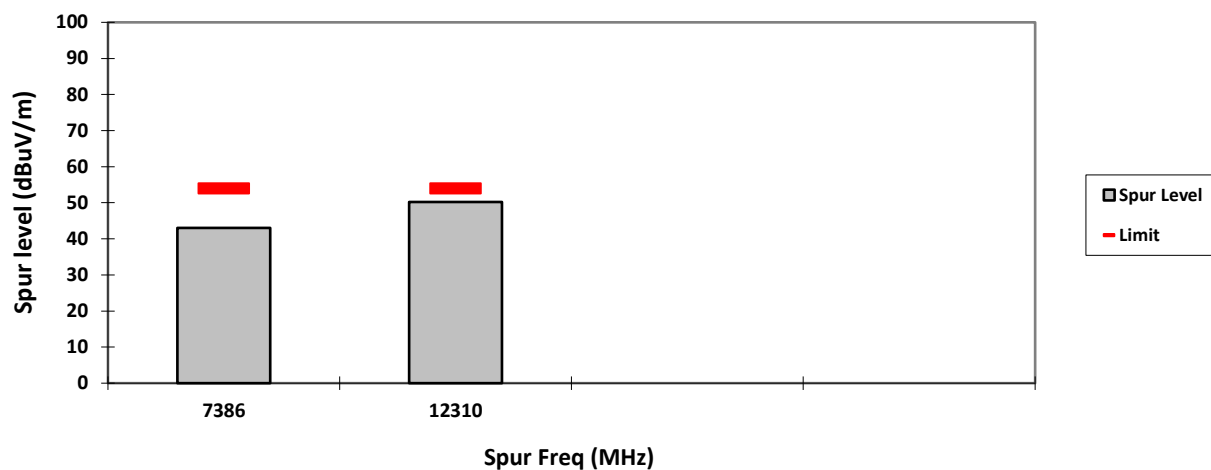
VERTICAL, PK



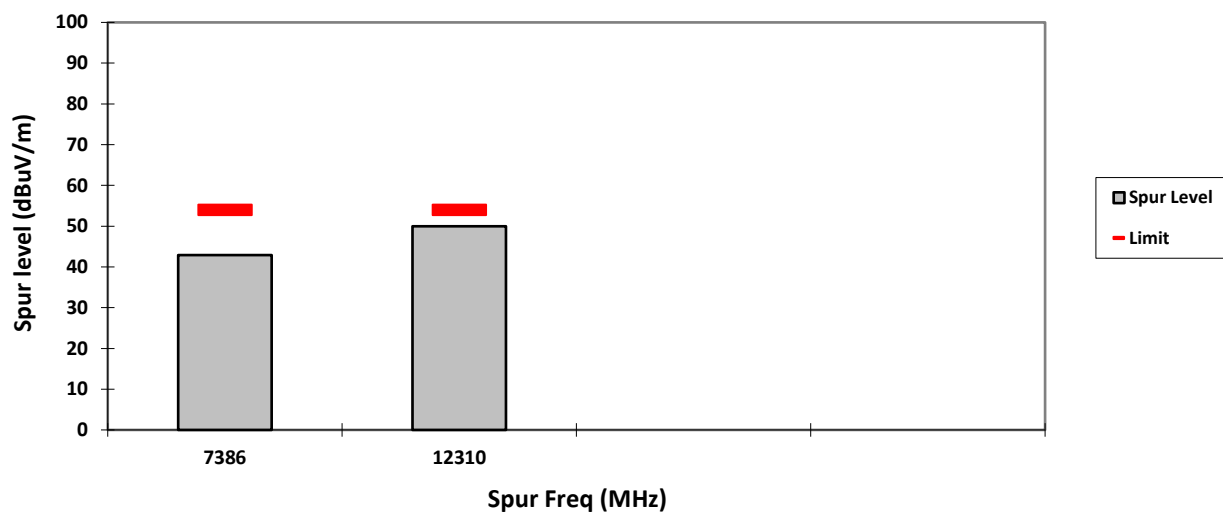
HORIZONTAL, PK



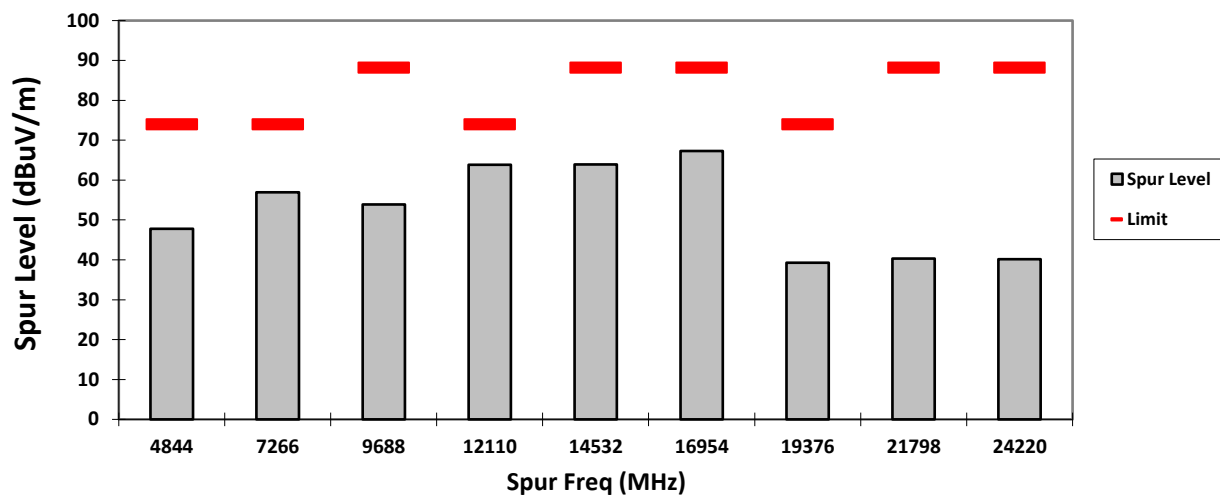
VERTICAL, AV



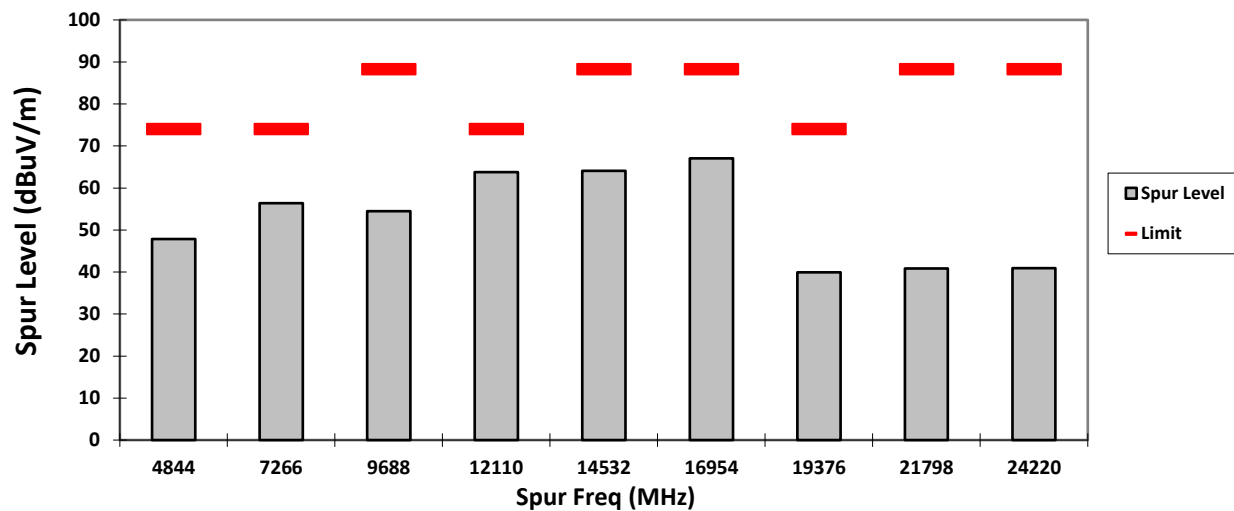
HORIZONTAL, AV



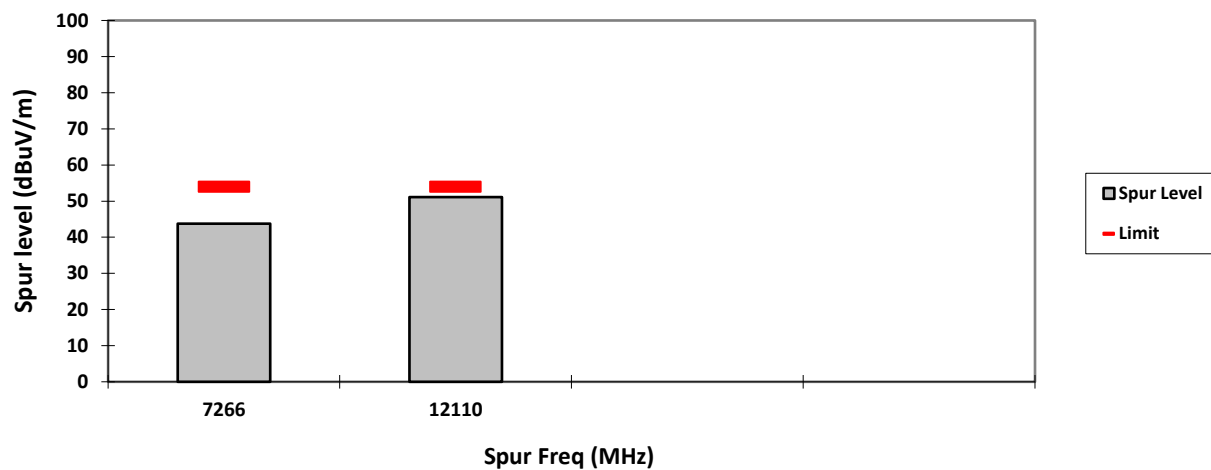
VERTICAL, PK



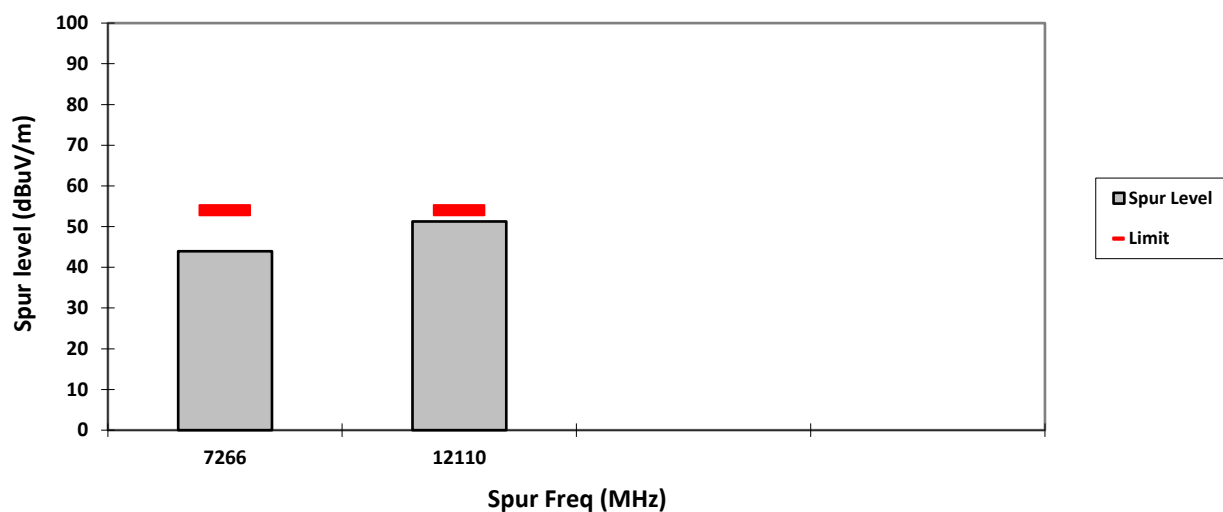
HORIZONTAL, PK



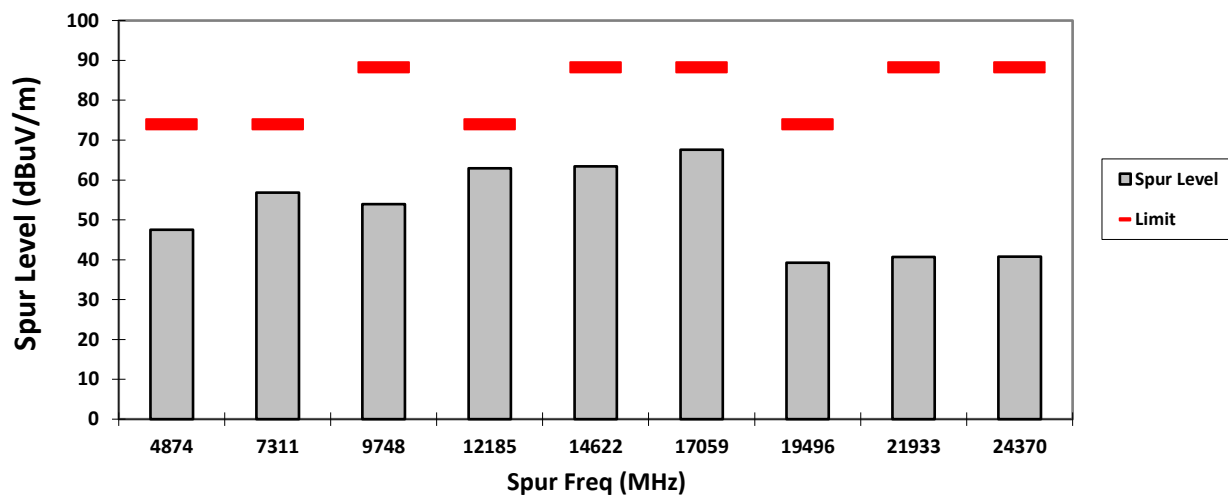
VERTICAL, AV



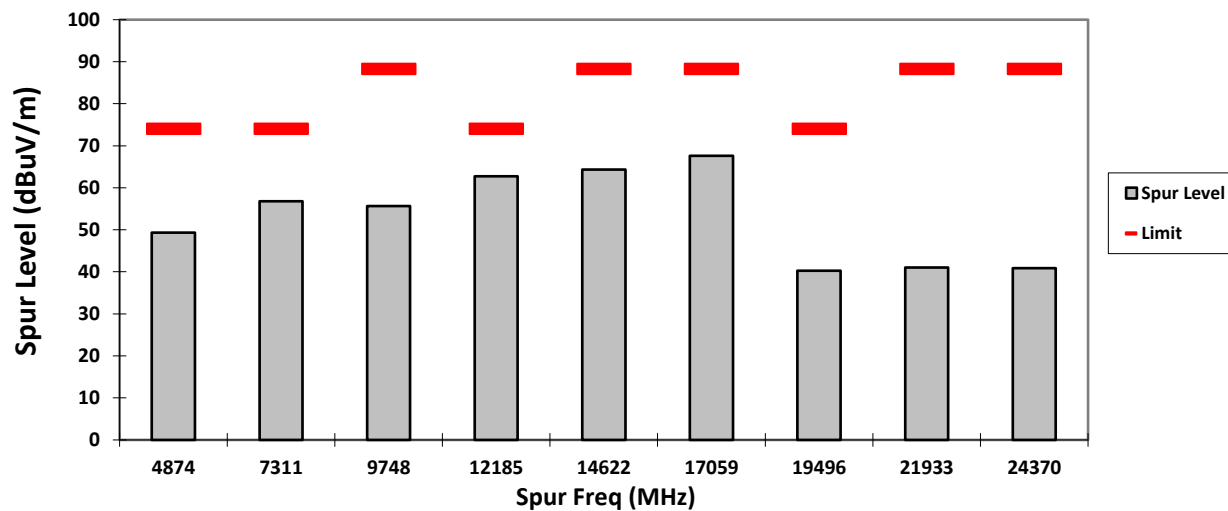
HORIZONTAL, AV



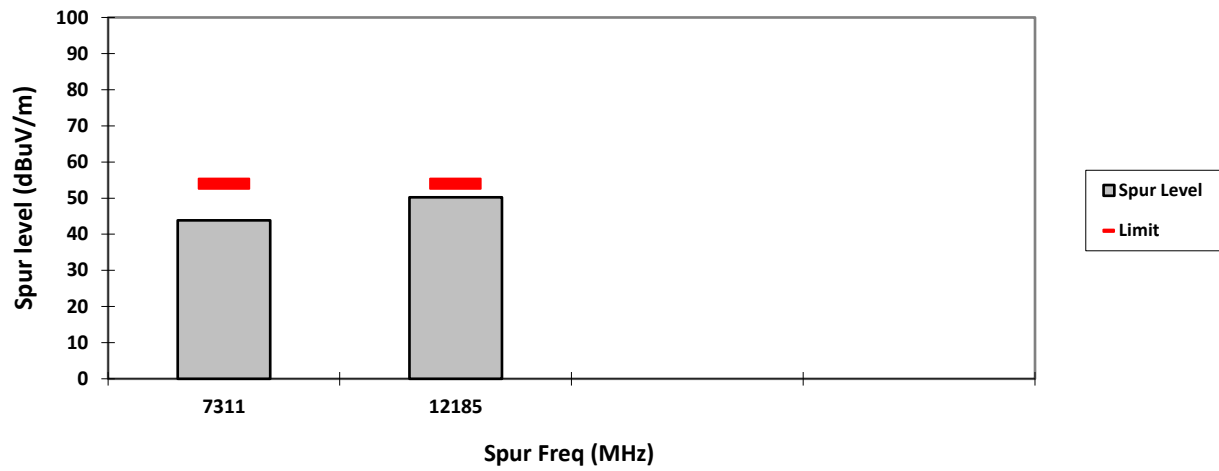
VERTICAL, PK



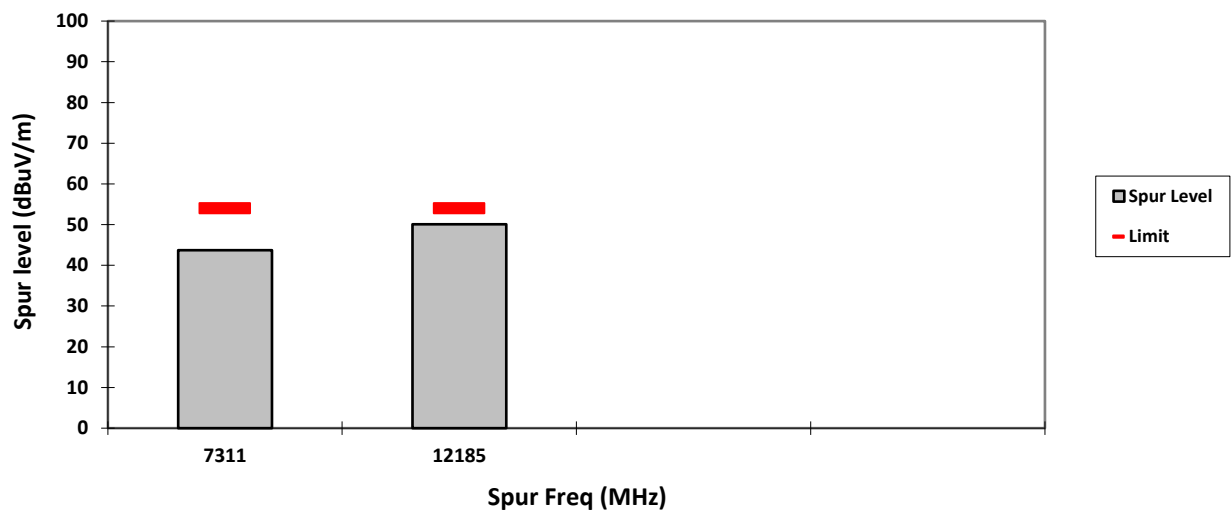
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV

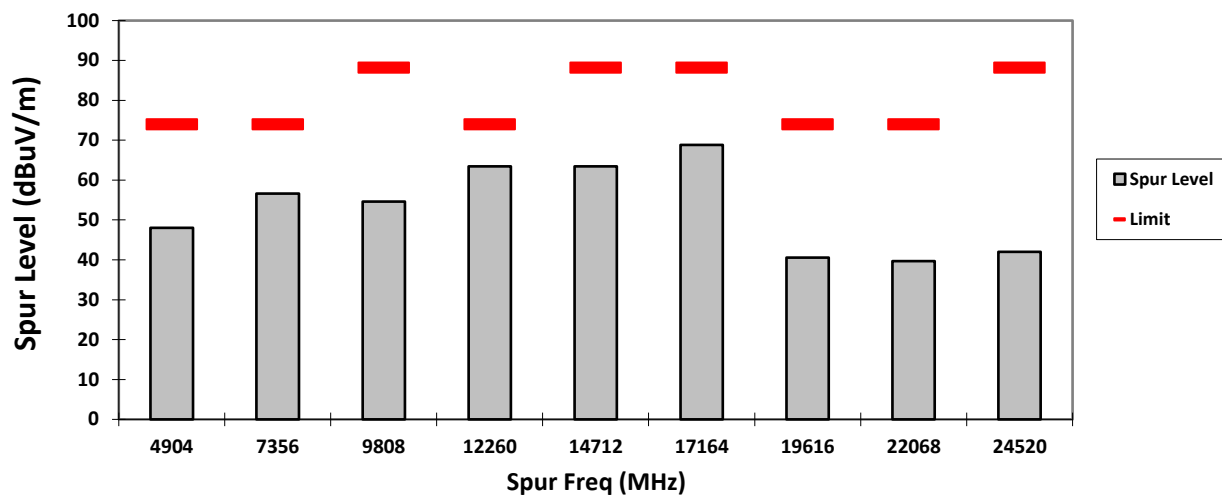


Radiated Emission (High Channel) tabular data

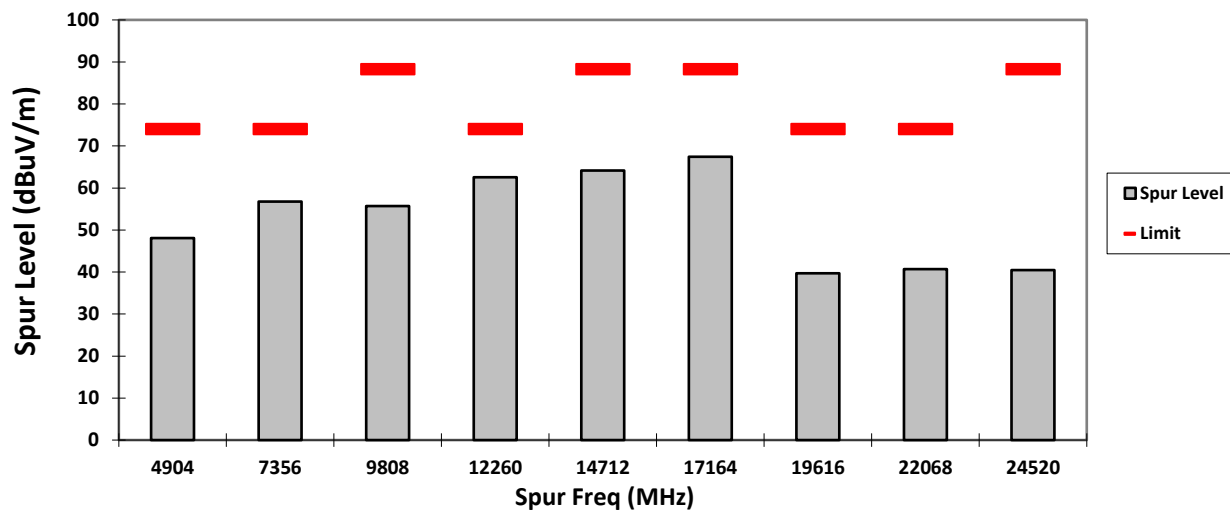
Remarks: Pass Result	Marginal Result	Fail Result
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Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

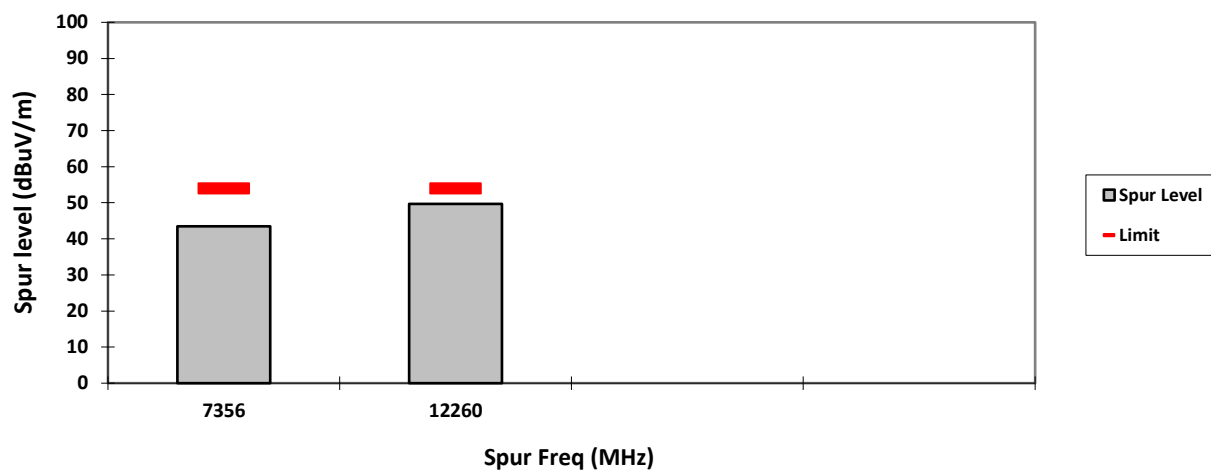
VERTICAL, PK



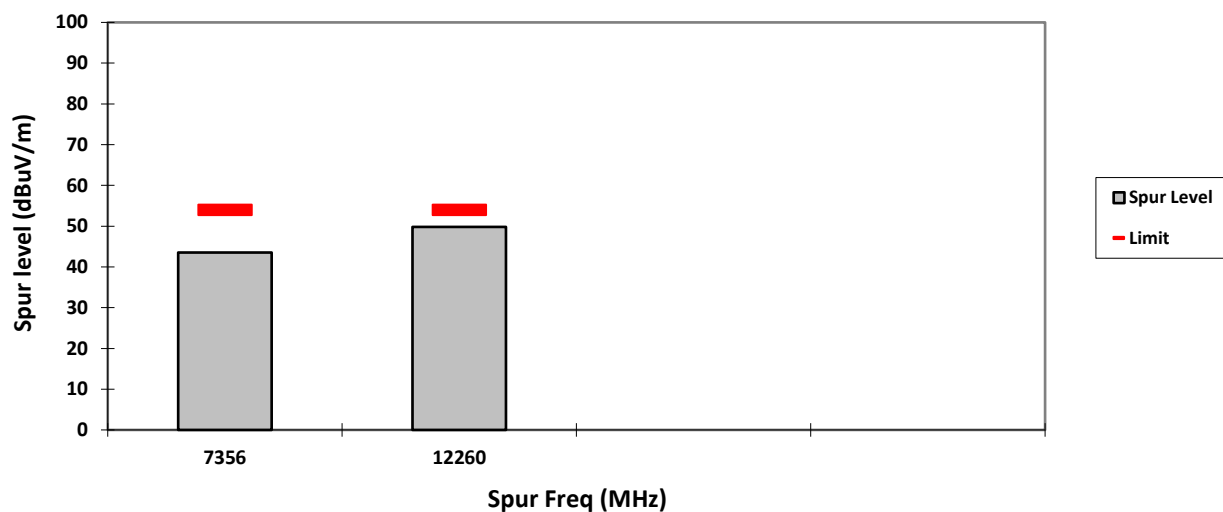
HORIZONTAL, PK



VERTICAL, AV

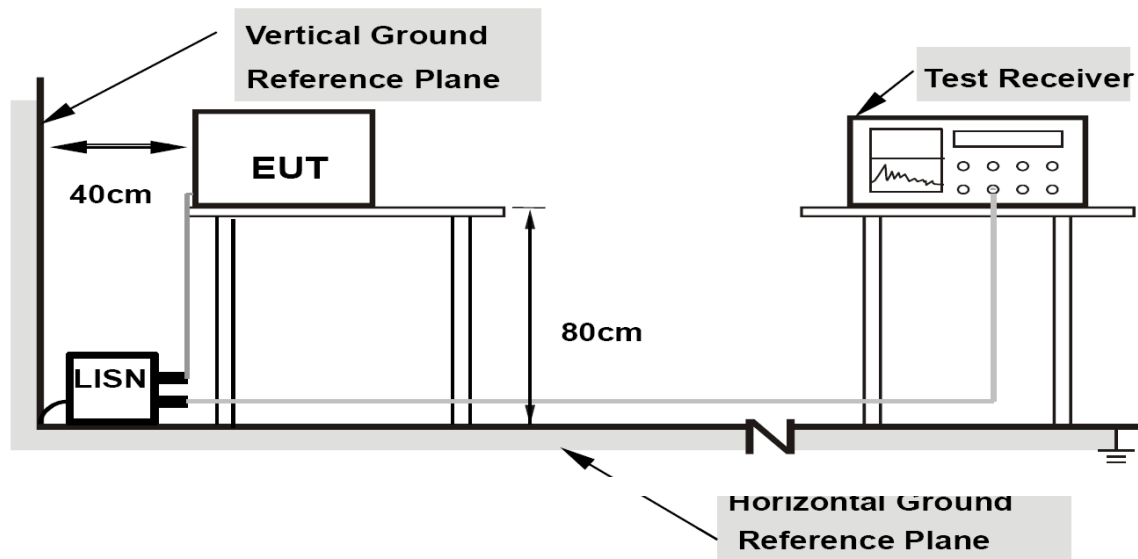


HORIZONTAL, AV



6.8. AC Powerline Conducted Emission

6.8.1. Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) 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.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

6.8.2. Test Limits:

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

Limits for conducted disturbance at the mains ports
of class A ITE

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

**Limits for conducted disturbance at the mains ports
of class B ITE**

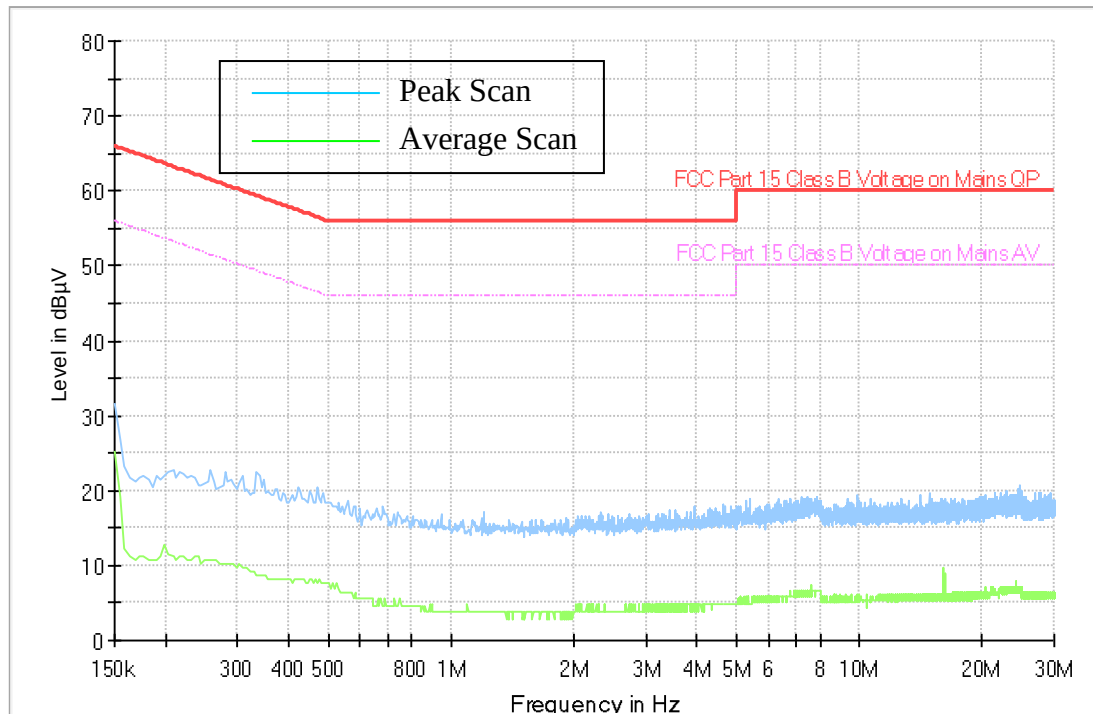
Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

6.8.3. Test Result

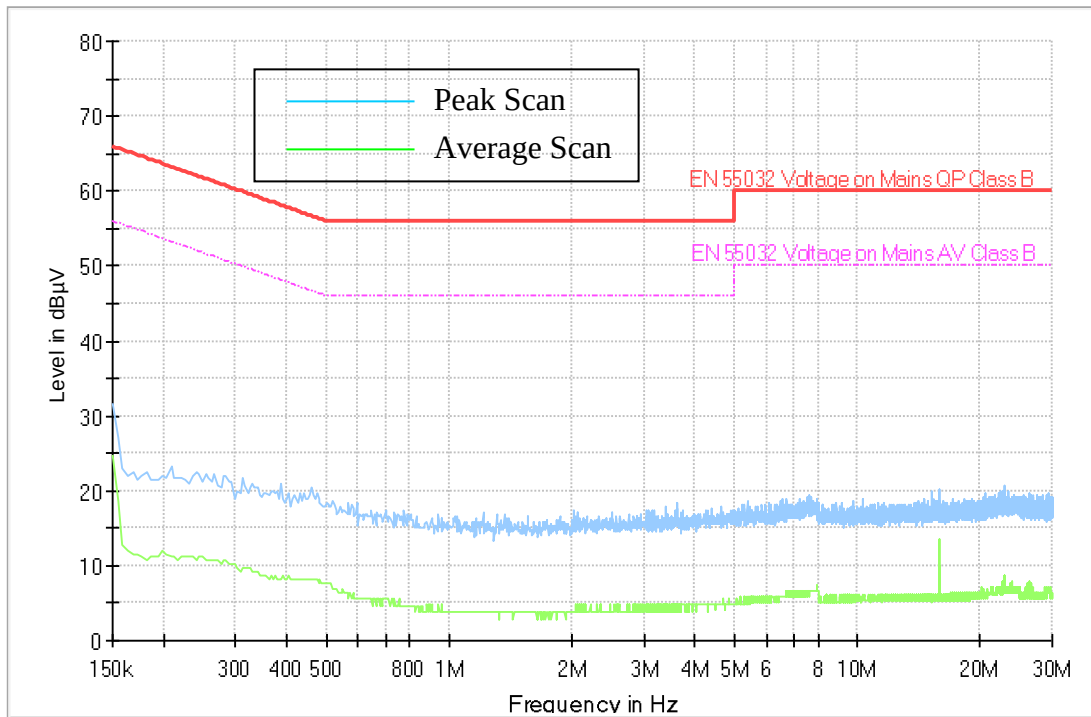
1) Ambient SUC

Full Spectrum



2) Ambient MUC

Full Spectrum

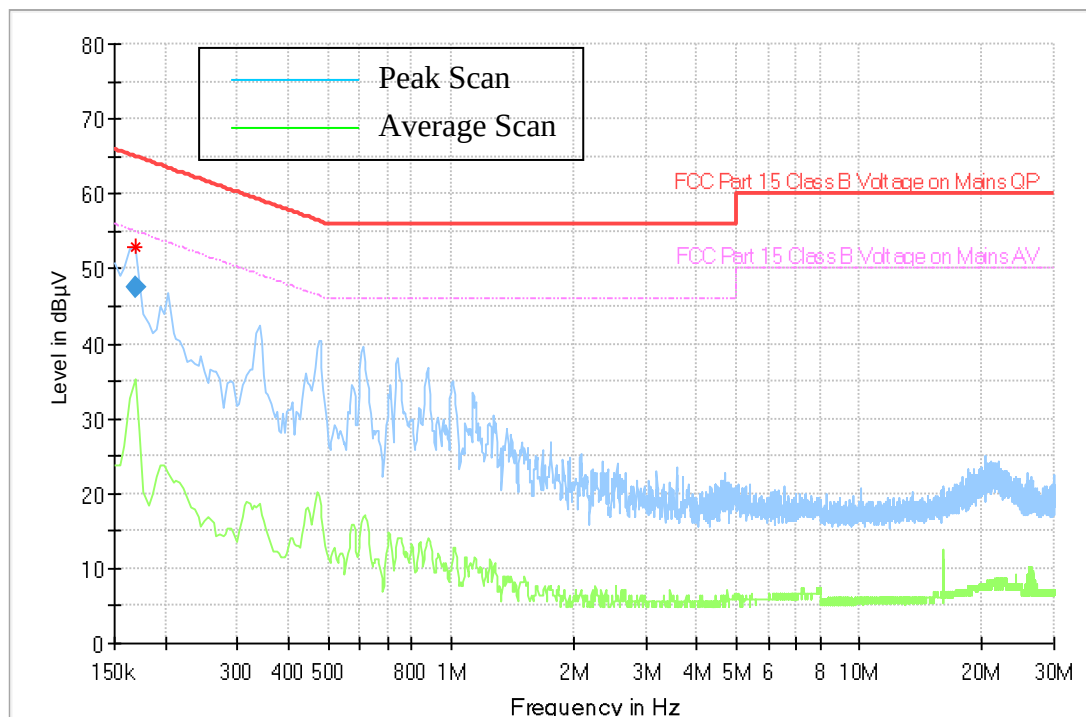


SUC

120 Vac, 60Hz

1) Charger Alone

Full Spectrum



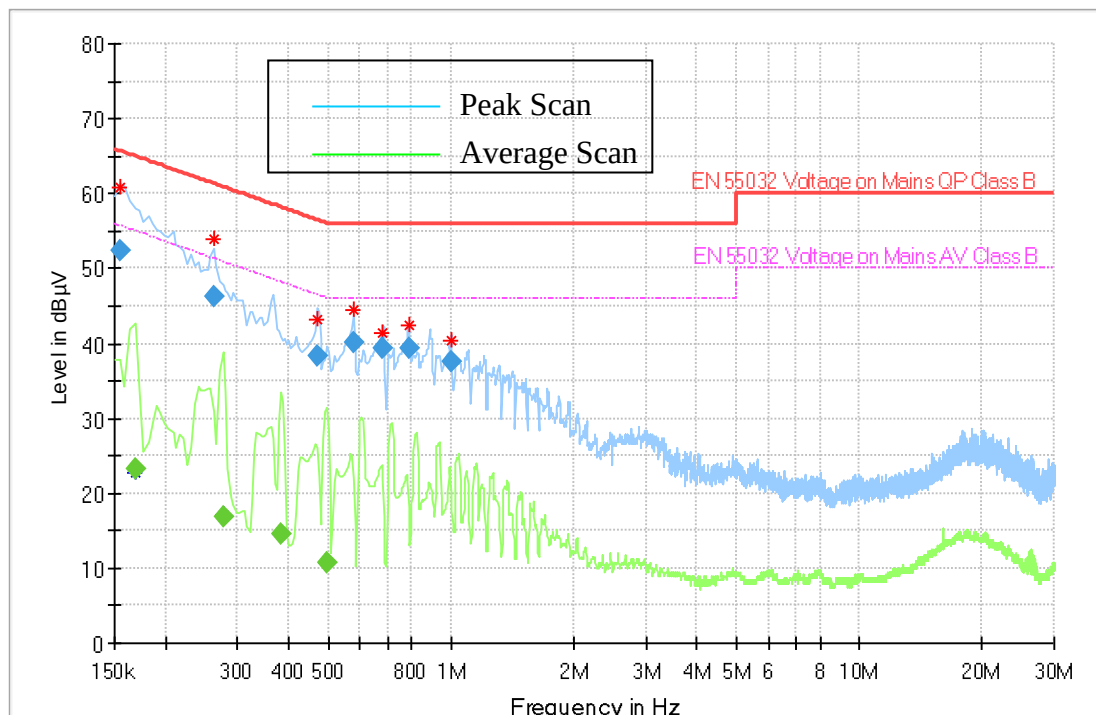
Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.168000	47.43	---	65.06	17.63	1000.0	9.000	N	ON	10.3	PASS

* Expanded Uncertainty (U) = +/- 3.48dB

2) Charger + Radio Off

Full Spectrum



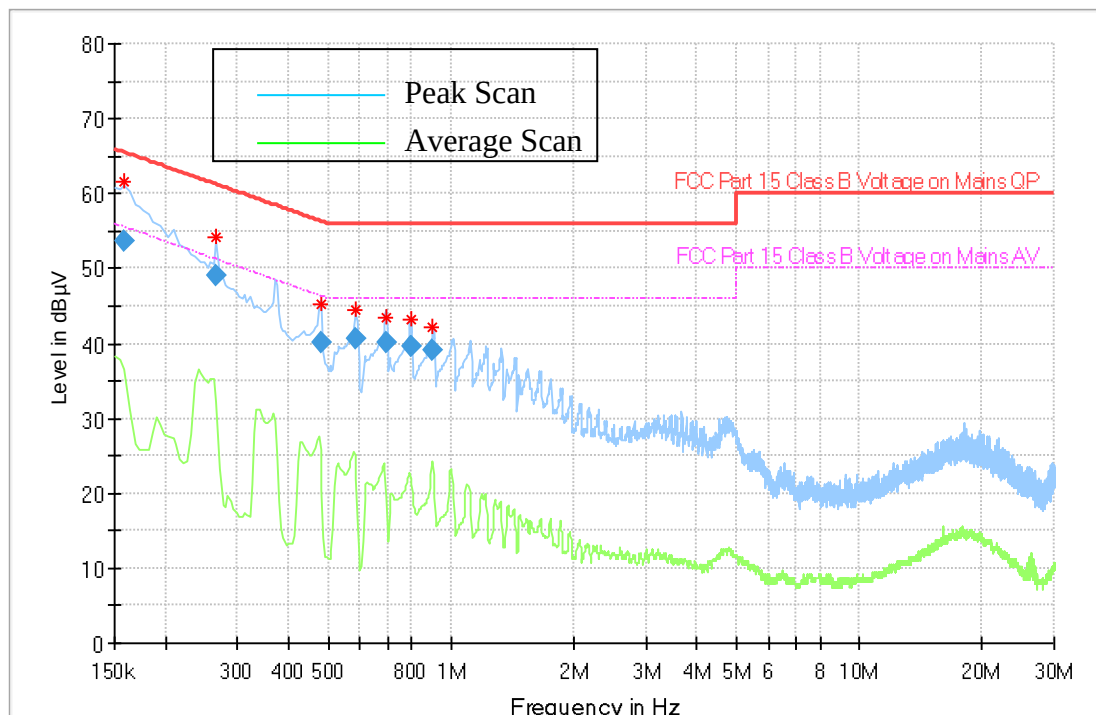
Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.154500	52.40	---	65.75	13.36	1000.0	9.000	L1	ON	10.3	PASS
0.168000	---	23.20	55.06	31.86	1000.0	9.000	L1	ON	10.3	PASS
0.262500	46.34	---	61.35	15.02	1000.0	9.000	N	ON	10.3	PASS
0.276000	---	16.75	50.94	34.18	1000.0	9.000	L1	ON	10.3	PASS
0.384000	---	14.54	48.19	33.65	1000.0	9.000	N	ON	10.3	PASS
0.469500	38.37	---	56.52	18.15	1000.0	9.000	N	ON	10.3	PASS
0.496500	---	10.73	46.06	35.33	1000.0	9.000	N	ON	10.3	PASS
0.577500	40.20	---	56.00	15.80	1000.0	9.000	L1	ON	10.3	PASS
0.681000	39.34	---	56.00	16.66	1000.0	9.000	L1	ON	10.3	PASS
0.789000	39.27	---	56.00	16.73	1000.0	9.000	L1	ON	10.3	PASS
1.000500	37.58	---	56.00	18.42	1000.0	9.000	L1	ON	10.3	PASS

* Expanded Uncertainty (U) = +/- 3.48dB

3) Charger + Radio Standby

Full Spectrum



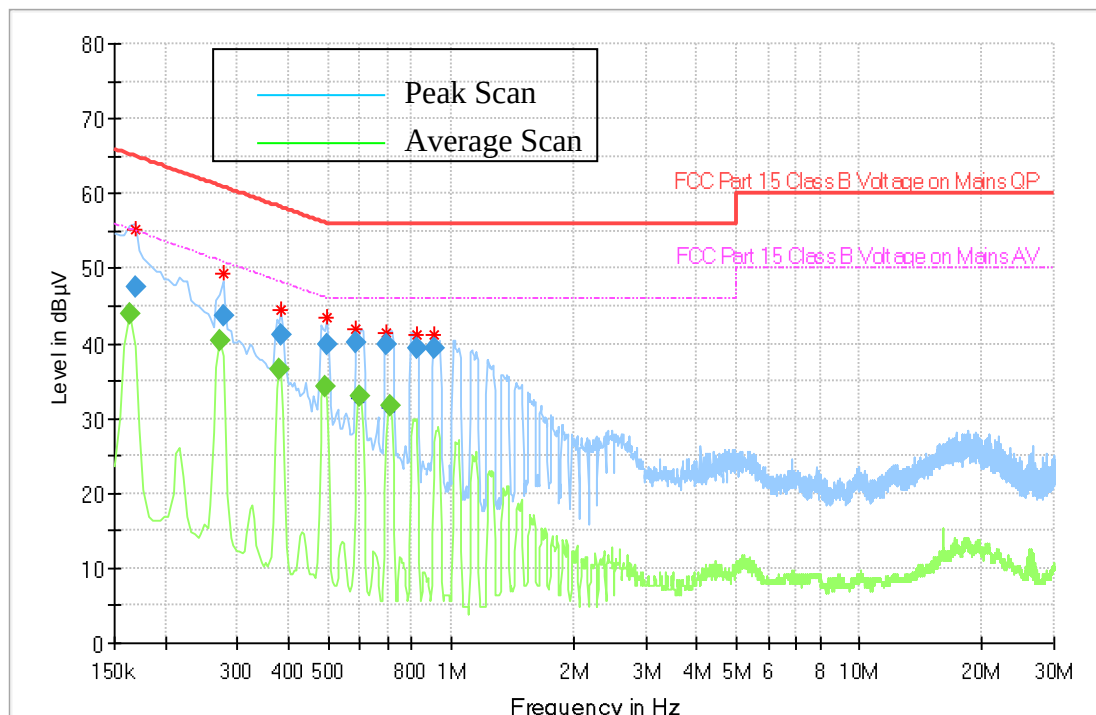
Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.159000	53.68	---	65.52	11.84	1000.0	9.000	L1	ON	10.3	PASS
0.267000	48.96	---	61.21	12.25	1000.0	9.000	L1	ON	10.3	PASS
0.483000	40.19	---	56.29	16.10	1000.0	9.000	L1	ON	10.3	PASS
0.582000	40.75	---	56.00	15.25	1000.0	9.000	L1	ON	10.3	PASS
0.694500	40.09	---	56.00	15.91	1000.0	9.000	L1	ON	10.3	PASS
0.802500	39.54	---	56.00	16.46	1000.0	9.000	L1	ON	10.3	PASS
0.901500	39.04	---	56.00	16.97	1000.0	9.000	L1	ON	10.3	PASS

* Expanded Uncertainty (U) = +/- 3.48dB

4) Charger + Radio TX WIFI 2.4GHz 802.11b DBPSK (CH:2437)

Full Spectrum



Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.163500	---	44.06	55.28	11.23	1000.0	9.000	N	ON	10.3	PASS
0.168000	47.55	---	65.06	17.51	1000.0	9.000	L1	ON	10.3	PASS
0.271500	---	40.50	51.07	10.57	1000.0	9.000	L1	ON	10.3	PASS
0.276000	43.77	---	60.94	17.17	1000.0	9.000	L1	ON	10.3	PASS
0.379500	---	36.62	48.29	11.67	1000.0	9.000	L1	ON	10.3	PASS
0.384000	41.21	---	58.19	16.99	1000.0	9.000	L1	ON	10.3	PASS
0.492000	---	34.37	46.13	11.76	1000.0	9.000	L1	ON	10.3	PASS
0.496500	39.83	---	56.06	16.23	1000.0	9.000	L1	ON	10.3	PASS
0.586500	40.21	---	56.00	15.79	1000.0	9.000	L1	ON	10.3	PASS
0.600000	---	32.85	46.00	13.15	1000.0	9.000	L1	ON	10.3	PASS
0.694500	39.93	---	56.00	16.07	1000.0	9.000	L1	ON	10.3	PASS
0.712500	---	31.57	46.00	14.43	1000.0	9.000	L1	ON	10.3	PASS
0.825000	39.24	---	56.00	16.76	1000.0	9.000	L1	ON	10.3	PASS
0.906000	39.23	---	56.00	16.77	1000.0	9.000	L1	ON	10.3	PASS

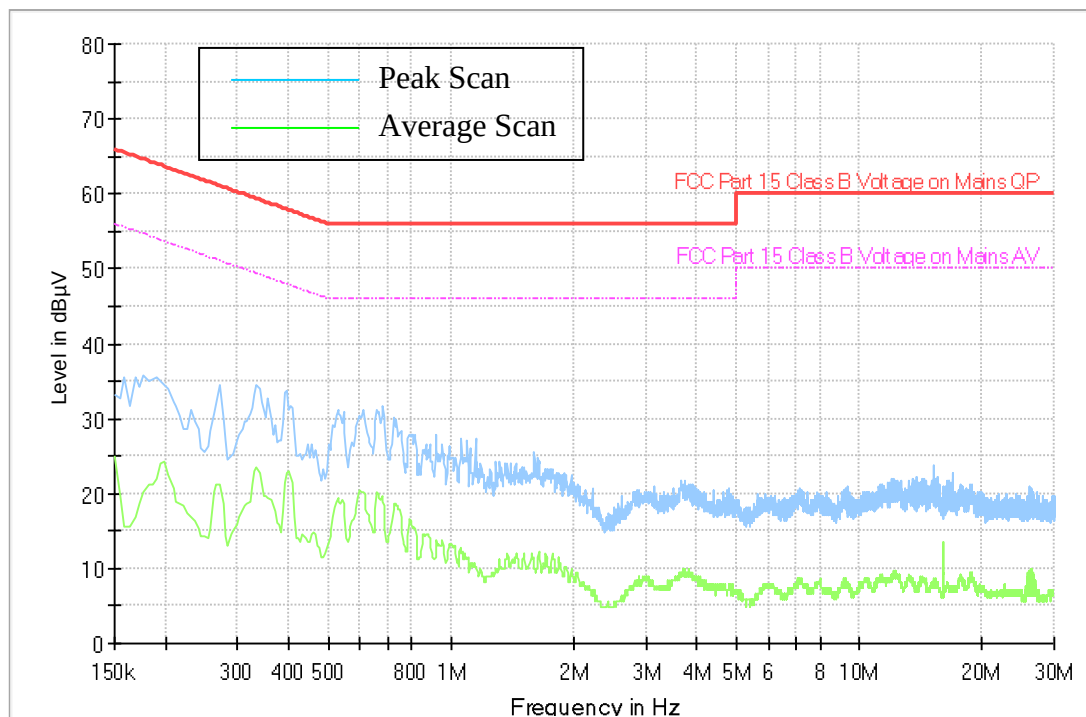
* Expanded Uncertainty (U) = +/- 3.48dB

MUC

120 Vac, 60Hz

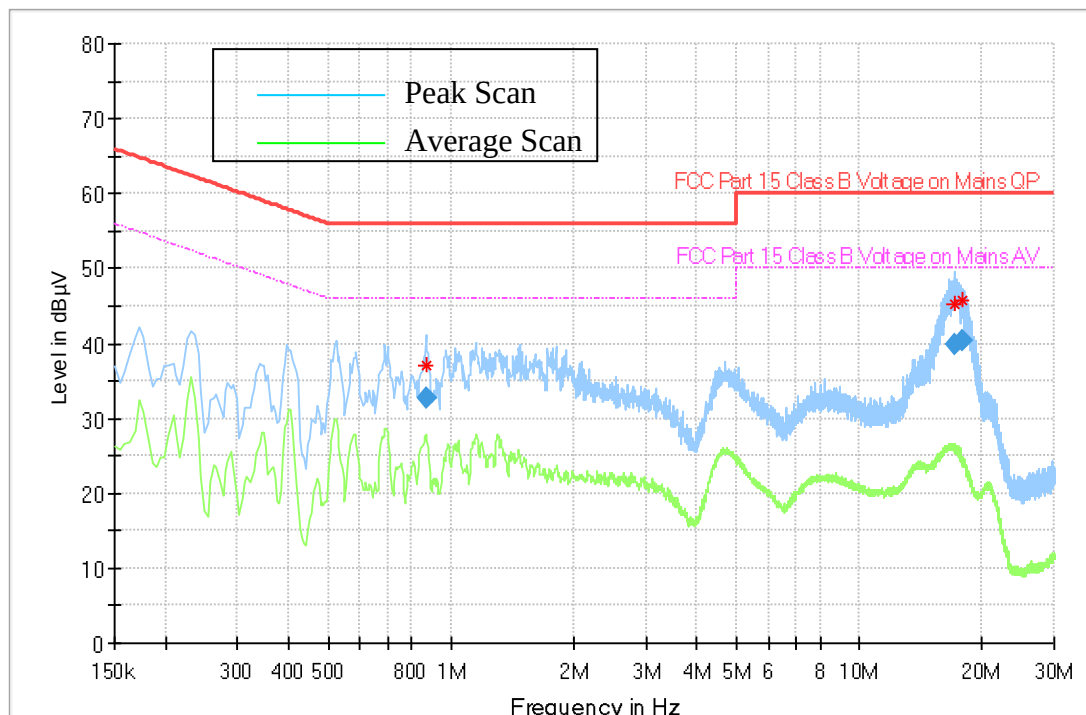
5) Charger Alone

Full Spectrum



6) Charger + Radio Off

Full Spectrum



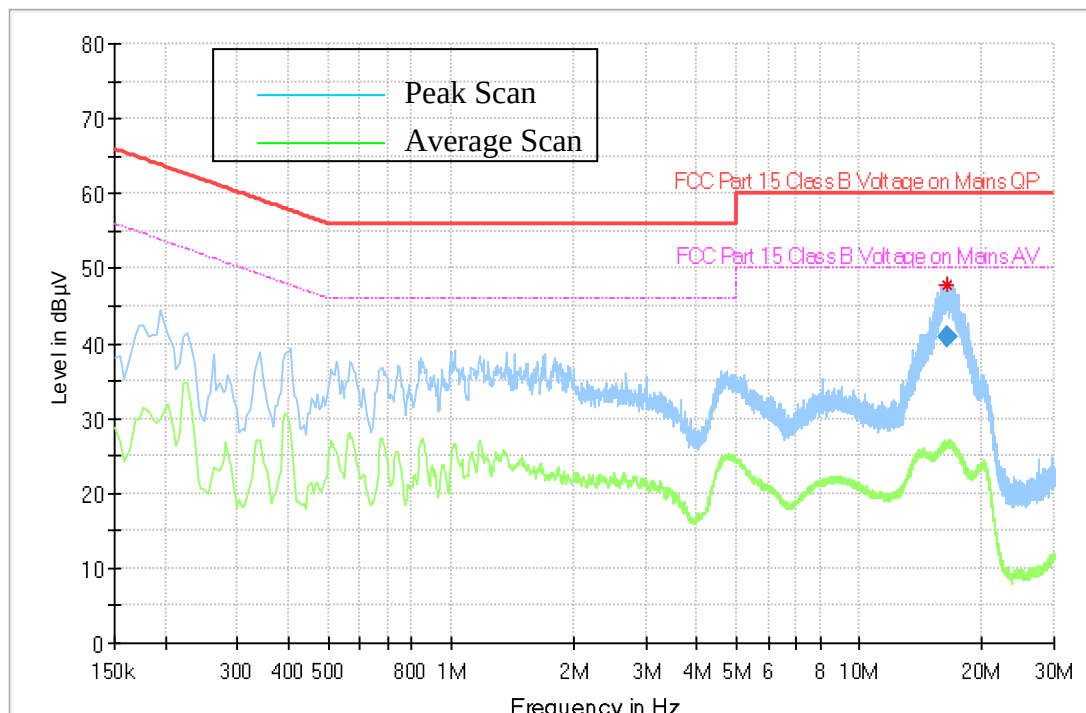
Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.870000	32.69	---	56.00	23.31	1000.0	9.000	L1	ON	10.3	PASS
17.079000	39.79	---	60.00	20.21	1000.0	9.000	L1	ON	10.8	PASS
17.790000	40.40	---	60.00	19.60	1000.0	9.000	L1	ON	10.8	PASS

* Expanded Uncertainty (U) = +/- 3.48dB

7) Charger + Radio Standby

Full Spectrum



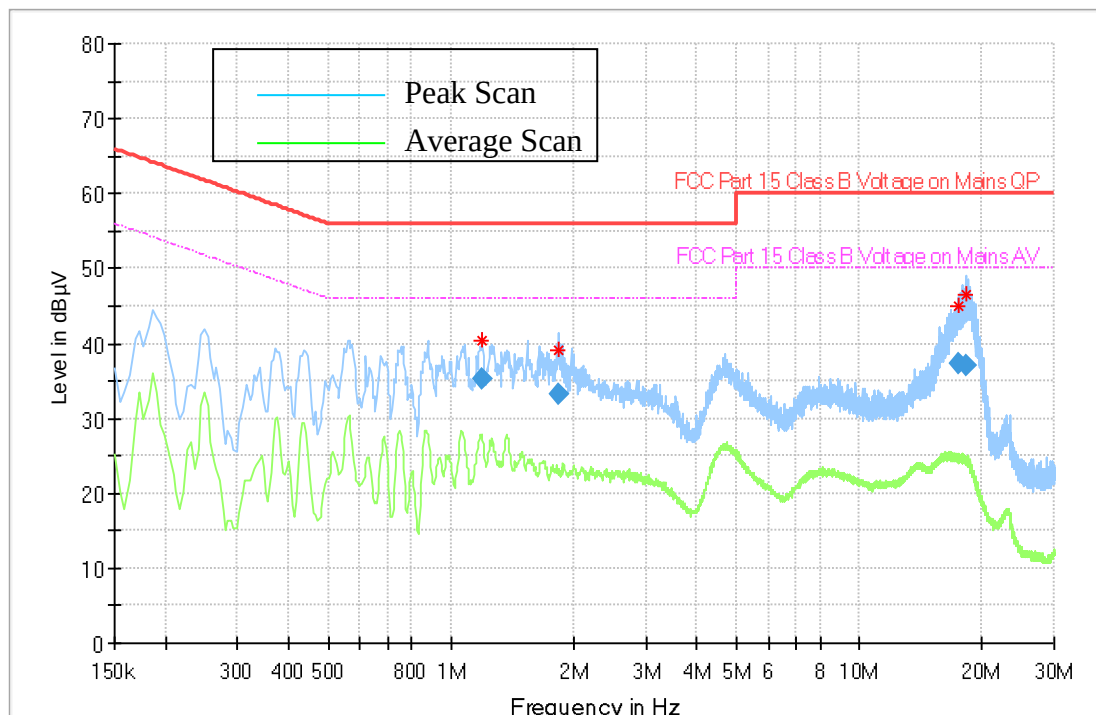
Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
16.480500	40.80	---	60.00	19.20	1000.0	9.000	L1	ON	10.8	PASS

* Expanded Uncertainty (U) = +/- 3.48dB

8) Charger + Radio TX WIFI 2.4GHz 802.11b DBPSK (CH:2437)

Full Spectrum



Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
1.189500	35.19	---	56.00	20.81	1000.0	9.000	N	ON	10.3	PASS
1.833000	33.26	---	56.00	22.74	1000.0	9.000	N	ON	10.3	PASS
17.569500	37.24	---	60.00	22.76	1000.0	9.000	L1	ON	10.8	PASS
18.168000	37.16	---	60.00	22.84	1000.0	9.000	N	ON	11.0	PASS

* Expanded Uncertainty (U) = +/- 3.48dB

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END OF TEST REPORT